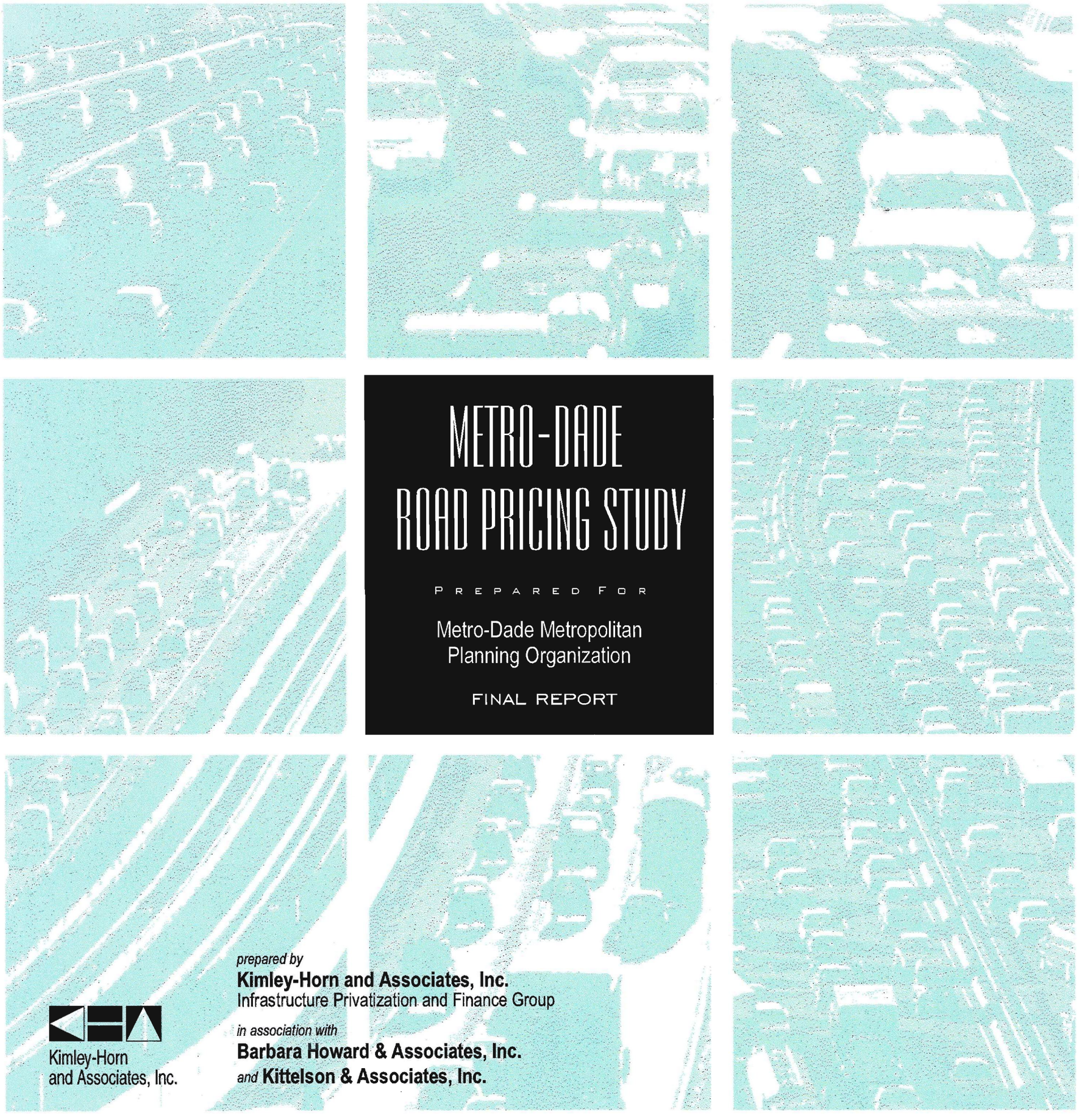

METRO-DADE ROAD PRICING STUDY

PREPARED FOR

Metro-Dade Metropolitan Planning Organization

FINAL REPORT

Kimley-Horn and Associates, Inc.

prepared by
Kimley-Horn and Associates, Inc.
Infrastructure Privatization and Finance Group
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Kimley-Horn
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FINAL

METRO-DADE ROAD PRICING STUDY

prepared for:

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EXECUTIVE SUMMARY

INTRODUCTION

Kimley-Horn and Associates, Inc., in cooperation with the Metro-Dade Metropolitan Planning Organization (MPO) and its designated steering committee, has studied the issues and potential solutions involving the County's growing traffic congestion. This study has specifically examined this urban congestion problem from a road pricing (supply and demand) perspective. In other words, can the County's congestion be partially mitigated through creative pricing solutions that would provide motorists, particularly single occupant vehicles (SOV), with financial incentives sufficient to alter their travel behavior? The results of that analysis and the ensuant recommendations are summarized in the following paragraphs.

What is Road Pricing?

Road pricing is simply imposing a toll on road users. It is a user fee. The more one uses the toll facility, the more one pays. The user has the option of *not* using the toll facility.

What is Congestion Pricing?

Congestion pricing is a subset of road pricing. The value of the roadway network is higher in the peak periods, as demonstrated by the higher demand during peak hours. Even though the value is higher, no one "pays" for this higher value except through congestion "taxes"... perhaps the cruelest tax, if you're the one in the ambulance that cannot reach the emergency room in time. Congestion pricing simply involves placing premium or congestion tolls on roads, airport gates or other congested assets during peak periods. These higher user fees are customarily designed to 1) discourage peak usage and reduce congestion, and 2) increase revenues to improve peak capacity of the congested assets.

Does Road Pricing Mean Toll Booths on All Highways?

It generally does not make sense to place tolls on all highways. Only carefully selected roads should be tolled at all. Secondly, modern technology has evolved to a point where toll booths are almost obsolete: tolls can be electronically credited, debited or billed to the road user's "smart card" account (a special transponder that automatically identifies the user). Enforcement can be electronic and semi-automatic, or fully automated, too. Eventually, toll booths will disappear entirely.

Is Road Pricing Fair?

As a user fee, road pricing is judged to be one of the fairest forms of pricing because the fee paid increases/decreases with usage. There is also the option of not using the toll facility. "Free" roads are almost always available. Special hardships sometimes do occur. These must be dealt with by issuing special passes or discounted passes for the transit or highway system. The best technique might be to offer free transit passes and discounted road user passes for the economically disadvantaged.

Congestion Pricing and Current Federal Law

The Intermodal Surface Transportation Efficiency Act (ISTEA) was signed into law on December 18, 1991. This Act authorizes the use of Federal funds to be allocated for a wide-range of transportation programs throughout a six-year period (1992-1997). Section 1012(b) of the ISTEA authorizes the Secretary of Transportation to create a Congestion Pricing Pilot Program by establishing agreements with up to five state or local governments or public authorities to conduct and monitor congestion pricing pilot projects. Three such agreements may involve the use of tolls on the Interstate System. Annual funding for this program is $25 million of which no more than $15 million may be allocated to any single entity in a given year. The intent of this program, as further defined by FHWA, is to use congestion charges to encourage driver behavior in a manner that will promote the use of alternative times, routes, modes or trip patterns to reduce congestion. These charges shall be direct point, time-of-travel charges varying by location and/or time.

Since initially receiving proposals in February of 1993, many proposals and pre-project proposals have been submitted to the Federal Highway Administration (FHWA), but none has been formally selected to participate in the Congestion Pricing Pilot Program. Failure to meet the request's criteria, insufficient public involvement programs, and lack of local public/political support appear to be the primary reasons that no projects have been selected. As a result, the FHWA is working very closely with the local entities which have submitted proposals in order that this pilot program may become a reality. Should the Metro-Dade MPO decide to pursue congestion pricing as a road pricing strategy, participation in this Pilot Program would be extremely beneficial during the formative years of the new Dade County Expressway Authority.

Reasons for the Study

The logical reason for implementing any road pricing program is economic. Congestion suffered by individual motorists also increases the less tangible social costs of accidents, pollution, and other services such as emergency medical, police, and the court system. These costs, ranging from 32 cents to 71 cents per vehicle mile, are not perceived by individual road users. Therefore, if drivers could be exposed to these additional social costs through the payment of tolls, a more efficient road system results, and the total system benefits would exceed the total system costs.

Due to limited resources and insufficient right-of-way to build additional expressway facilities, the MPO has commissioned this study of road pricing strategies, including transit alternatives involving high occupancy vehicles (HOV's), to address increasing traffic volumes. One of the main objectives of this study is to investigate the potential of creating a revenue base for the construction of new road pricing facilities and for funding transit. These road pricing strategies were developed in response to new federal requirements contained in the *Intermodal Surface Transportation Efficiency Act of 1991* which now mandate certain compliance measures aimed at curbing air pollution while improving urban mobility.

ROAD/CONGESTION PRICING STRATEGIES

There are six basic pricing strategies that can be employed for any road/congestion pricing program:

1. **Static Pricing, 24 Hours** - Static pricing is road pricing in its simplest form. This consists of a fixed toll which is charged to vehicles along a roadway, at an on or off ramp, at a mainline barrier, or on a causeway. (Tolls can be levied at several locations along the roadway.) Being "static," the amount of toll paid by a particular type of vehicle remains fixed 24 hours a day. The toll collection technique for all strategies are assumed to initially be a combination of manual and electronic--and evolving to almost fully electronic toll collection (ETC).

2. **Static Pricing, Peak Period Only (PPO)** - Similar to strategy number one, except that the toll is only applied at one flat rate during designated predetermined peak periods. Off-peak travel is "free."

3. **Fixed Time, 24 Hour Congestion Pricing** - This strategy has one significant difference from the static 24 hour pricing strategy. In this case, the toll rate will be higher in the peak periods and lower the rest of the day. Within the peak period, the toll rate may change one or more times within predetermined time slots in the peak period. For example, the toll rate may be 25¢ during off-peak periods, 35¢ from 6:00 AM to 7:00 AM and 50¢ from 7:00 AM to 8:00 AM, etc.

4. **Fixed Time, PPO Congestion Pricing** - Similar to strategy number three, however, the tolls are variable during the designated peak hours and peak hour fringes (periods immediately preceding and following the peak period). The toll rates may increase from 25¢ to 35¢ at 6:00 AM, then move upwards again at pre-prescribed times to 40¢ and 50¢ as congestion increases within the peak period. Off-peak travel is "free."

5. **Realtime, 24 Hour Congestion Pricing** - This is the most advanced form of congestion pricing. It is similar to strategy number four, however, the tolls are applied all day and the tolls vary in response to actual congestion present on the road at the time of travel. Actual

congestion levels can be determined using advanced techniques such as embedded freeway loop detectors or video image detection technology. Other dynamic toll structures, based on vehicle occupancy and vehicle type can also be implemented in a similar manner.

6. **Realtime, PPO Congestion Pricing** - Similar to strategy number five, with the tolls only being applied during the peak periods, when congestion beyond a certain predefined tolerance is detected automatically by the system, and toll rates are automatically changed in response to realtime system demand/performance profile. Motorists are notified of impending toll rate changes via variable message signs (VMS).

The strategies to be used for any particular road/congestion pricing program depend on the local conditions. Furthermore, strategies 5 and 6 are still in the development stage, and will require advanced detection, control and other Intelligent Transportation Systems (ITS) equipment to implement. Although Automatic Vehicle Identification (AVI), automated occupancy detection, and other such ITS technology exists to implement these pricing strategies, there are very few examples in use. As freeways become more "intelligent," tollroads will continue to move toward real time congestion pricing and away from static and fixed time pricing.

The above six road pricing strategies can be applied to either the entire freeway (or causeway), or only along any HOV lanes that may be present. Therefore, a total of twelve road pricing techniques are available. The HOV lane pricing options involve four possibilities:

1. **Add a Lane** - Adding a lane to an existing facility for exclusive HOV use.

2. **Take a Lane** - Taking an existing lane from a facility and converting it from general use into HOV use. This option is politically very aggressive and often quite difficult to impose.

3. **Add and Take a Lane** - A combination of the above two options. This option involves widening a facility to accommodate a new HOV lane, while at the same time, converting an existing general use lane for exclusive HOV use. The option can be controversial if not handled properly through effective public information processes.

4. **Ramp Metering Bypass (RMB) Lane Pricing** - A ramp metering system is currently under design for I-95 in Dade County. This system is designed to optimize freeway flow. Selected ramps could have bypass lanes for buses and carpools, who may bypass the queue at the ramp meter signal by using a parallel lane. SOV's may also be permitted to use the bypass lane--at a price, and only if the SOV is equipped with an AVI transponder to enable the toll to be electronically exacted.

Levels of Aggressiveness

As indicated previously, certain road pricing strategies can be more aggressive and controversial than others. The degree of aggressiveness of any particular strategy can be classified from very conservative to ultra-aggressive. The level of aggressiveness for any road pricing strategy also depends on the toll rate that is used. An aggressive plan would generally implement tolls at a high rate, say 10¢ to 15¢ per mile, while a conservative plan may charge 7¢ to 10¢ per mile. Research by the authors has shown that major metropolitan markets can sustain optimum toll rates averaging between 10¢ to 15¢ per mile during the off-peak period and 20¢ to 25¢ per mile during the peak period.

Toll Collection Systems

The collection systems involved with traditional road pricing include manual toll booths in combination with automatic collection systems using pre-sold decals. Electronic Toll Collection (ETC) systems are coming of age with technological advancements in both hardware and software. One form of this technology is the Automatic Vehicle Identification (AVI) system. This technology uses both credit and debit collection systems in combination with manual collection techniques for users who do not have the automatic payment equipment installed in their vehicles.

The consultant team is supportive of the rapid implementation of AVI/ETC technology on all new and existing toll facilities. For the purposes of this study, it is recommended, and it was assumed that any new toll facilities would be constructed with AVI/ETC equipment, and existing facilities would be converted to uniform AVI/ETC facilities on a countywide basis.

Uses of Funds

Potential applications for use of road/congestion pricing revenues are many with the goal being to advance the state-of-the-art for improved congestion management. The following list summarizes some of the more popular funding opportunities with state and federal governments.

- Additional, revenue-producing road pricing projects, such as the SR 112 extension and other unfunded projects.
- ITS projects, including AVI/ETC hardware and software applications, either for capital or operating costs.
- Fixed guideway transit or commuter rail, or high speed rail projects, either for capital or operating improvements.
- The acquisition or operation of express bus routes and park-ride facilities, possibly as part of an HOV lane pricing project.
- Any HOVL or busway project, especially those that promote a reduction in SOV's.

Congestion pricing revenues derived from one facility are generally used to improve operations in the immediate corridor. However, they could also be used in other corridors to promote regional improvements.

The use of pricing revenues must be placed in proper perspective during the decision-making process for selecting the appropriate strategy. The intended use of funds could mollify the degree of aggressiveness assumed for a pricing strategy.

For example, the placement of a peak period only toll on I-95 and the Palmetto Expressway would normally be considered "very aggressive" or "ultra aggressive." However, if the funds generated could change the outcome of the NW 27th Avenue extension of the Metrorail Extension from "not feasible" to "feasible," then the acceptability of the pricing strategy might be judged less harshly.

PACKAGING PROJECTS INTO PLANS

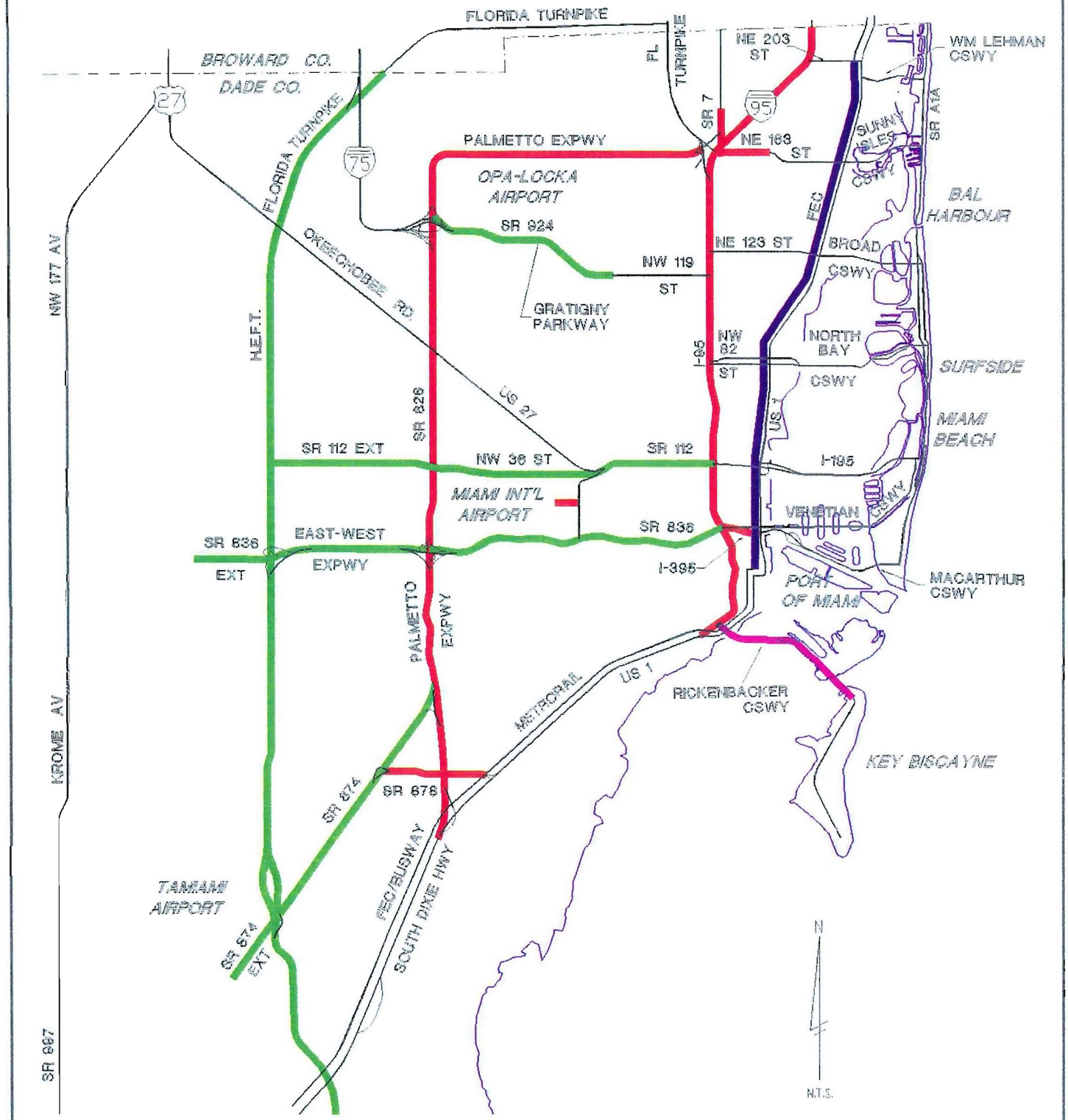
Numerous combinations of eligible roadway facilities and congestion pricing strategies were considered in structuring packages and sub-packages of congestion pricing projects. Initially eight packages of projects were developed from the eligible facilities previously identified. Subsequently, those categories were reduced to four by combining those that were similar. The resultant road pricing plans were: Do Nothing, Conservative, Moderate, and Aggressive.

RECOMMENDATIONS

Based on the program's evaluation factors in combination with the projected revenue, it is recommended that Dade County implement (in phases) the Moderate Package of congestion pricing strategies. Table I shows the evaluation of the four (4) plans and the Year 2030 Net Present Values (NPV) of the revenues in 1994 dollars. Figure I shows the recommended plan at the end of its full implementation. It must be noted that a phased implementation of this plan is recommended, and Figure I only shows the final phase, which includes strategies implemented in previous phases.

TABLE I
PLAN EVALUATION

	Evaluation	Year 2030 Net Present Value
Do Nothing	Poor	$ 0.2 Billion
Conservative	Good	$ 1.5 Billion
Moderate	Very Good	$ 6.2 Billion
Aggressive	Good	$ 13.0 Billion



LEGEND

- 24 HOUR TOLL (CONGESTION PRICING)
- BUSWAY/HOV-WAY - ADD 1 LANE
- PEAK PERIOD ONLY PRICING
- WEEKEND CONGESTION PRICING

FIGURE I

METRO DADE ROAD PRICING STUDY

MODERATE ROAD PRICING PACKAGE

Kimley-Horn and Associates, Inc.

INFRASTRUCTURE PRIVATIZATION AND FINANCE GROUP

All recommendations are being made at a sketch-planning level of analysis. Therefore, each project recommendation should be confirmed by a detailed, project-specific feasibility study prior to its implementation. In general, the recommendations developed as part of this study are the result of the following considerations:

1. The MPO should adopt a road pricing policy for Metro-Dade County.

2. Certain strategies, such as raising tolls on existing toll facilities up to reasonable national norms, should be instituted as soon as possible to create more revenue for modernizing existing toll operations in the short term, and creating capital for more assets in the long term.

3. All existing toll facilities should be converted from manual operation to automated AVI/ETC operation as soon as possible to reduce operating costs and increase net revenues.

4. All toll facilities (city, county, and state) should utilize consistent AVI technology, such as that being deployed by Florida's Turnpike, to reduce operating costs and increase net revenues. A centralized computer-based management control center for all city, county and state toll facilities should be implemented to further reduce operating costs.

5. An application should be made for federal funding under the ISTEA (Section 1012(b)) Congestion Pricing Pilot Program for selected elements of the Metro-Dade Road Pricing Plan, including: AVI technology and congestion pricing.

6. To effectively deal with Year 2030 traffic volumes, Dade County must implement certain congestion pricing strategies regardless of their political and/or social "acceptability".

7. In the final analysis, the "best" package is one consisting of a good balance between public acceptability and revenue generating ability.

The following list summarizes recommended specific road pricing projects by phase over the next 15 to 20 years. These projects are also shown in Table II.

Phasing

- Phase 1 (2 years) 1995 - 1996

  - Convert all existing tolled facilities to AVI/ETC.
  - Apply for FHWA grant under the Congestion Pricing Pilot Program and implement congestion pricing on selected facilities in 1996-97.

- Increase existing 24-hour tolls (first to 7¢/mile and then to 12¢/mile) on all existing tolled expressways including a new toll plaza on SR 836 west of SR 826 and bi-directional tolls on existing SR 836/SR 112 plazas in 1995-96.
- Build 2 "priced" HOVL's (3 passengers or more) on SR 826.
- Prepare PD&E studies and obtain location/design approval of the SR 112 Extension, the SR 836 Extension, and the SR 874 Extension.
- Implement weekend/holiday congestion pricing on the Rickenbacker Causeway in 1996.

• Phase 2 (4 years) 1997 - 2000

- Implement congestion pricing on all existing tolled expressways.
- Implement ramp-metering bypass pricing on I-95.
- Construct the planned freeway extensions: SR 836, SR 874, SR 112 and implement congestion pricing.

• Phase 3 (5 years) 2001 - 2005

- Take a lane on I-95 and implement HOVL pricing (2 HOV lanes in each direction, total).
- Take a lane on SR 826 and implement HOVL pricing.

• Phase 4 (5 years) 2006 - 2010

- Apply PPO congestion pricing to all "generators" including (AM peak) approaches to the Golden Glades interchange, and the entrance to the Miami International Airport.
- PPO congestion pricing on all existing non-toll freeways.
- Construct U.S. 1/Biscayne Boulevard busway/HOV-way and sell the surplus capacity to SOV's at a premium.

ARTERIAL IMPACTS

A diversion analysis was conducted to determine the impacts that the Moderate Road Pricing Package may have on Dade County's arterial roadway network. The volumes and LOS for the Year 2000 Existing+Committed network were compared to the volumes and LOS for the Moderate Package network to determine the significance of the traffic diversion.

The diversion analysis indicates that the addition of tolls (as identified in the moderate road pricing plan) to currently untolled facilities produces significant diversions of traffic to parallel arterial streets. The amount of diversion varies substantially from facility to facility, anywhere from 20% to 70 %, largely based upon the alternative routes available.

However, the analysis shows that the LOS on the parallel arterial facilities on almost all the segments analyzed does not exceed LOS "D." There are only three segments where the LOS falls to "F" after the tolls are imposed. It can therefore be concluded that there is a significant amount of unused capacity on arterial streets that is more efficiently utilized once these tolls are imposed.

The peak hour conditions are expected to be more severe on the arterial streets, since currently, there are already some capacity problems on these facilities. In general, the amount of peak hour diversion desired can be managed by the toll rate that is in effect during these hours. Pricing can be used as an effective management tool, and the ability to control the toll rates on a real-time basis in the future will further enhance this tool.

CONCLUSION

Further detailed study is needed to confirm or deny the rough sketch planning estimates of revenue and net present value. It is recommended that detailed project-specific road pricing feasibility studies, implementation plans, and project-specific concept development reports be prepared for all the projects listed above before implementation of any of these sketch planning recommendations.

A comprehensive public involvement and public relations program should be undertaken to educate and inform the affected communities. In addition to this, an administrative program to balance/equitably distribute the economic impact should also be designed in detail.

Table II

SUMMARY OF RECOMMENDED ROAD PRICING PROGRAM

Criteria	Phase 1	Phase 2	Phase 3	Phase 4
STRATEGIES	Increase tolls on all tolled expressways and implement AVI/ETC Add one lane in each direction for HOV use and implement HOV lane pricing Apply for FHWA Congestion Pricing Grant	Implement congestion on tolled expressways Ramp metering bypass pricing on I-95 Construct all planned freeway extensions and implement congestion pricing	HOV lane pricing - Take-a-lane strategy	Congestion pricing of all "generators" PPO pricing of non-toll freeways Busway / HOVway Pricing Busway / HOVway Pricing
KEY FACILITIES AFFECTED	Florida Turnpike HEFT Gratigny Parkway SR 112 SR 836 SR 874 SR 826	Florida Turnpike HEFT Gratigny Parkway SR 112 SR 836 SR 874 I-95 SR 112 Extension SR 836 Extension SR 874 Extension	SR 826 I-95	MIA Golden Glades Interchange I-95 SR 826 SR 878 US 1/Biscayne Blvd

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CHAPTER 1
INTRODUCTION

1.1 Introduction

An efficient and effective transportation infrastructure is a key factor in the economic well being of any community, state, or country. It is the transportation infrastructure that provides the means by which goods, services, and people can be moved between the activity points within the community. Because of this function, the efficiency and effectiveness with which the transportation infrastructure operates can have a significant impact on the health and growth potential of the community it serves.

A community with an inadequate and poorly maintained transportation infrastructure will have a difficult time keeping its existing economic base businesses and industries and an even more difficult time attracting new ones. Existing companies will begin to seek new locations for their operations as the use of the community's inadequate transportation network becomes more costly and frustrating. Additionally, businesses considering moving to the community may decide to look elsewhere for a location with an infrastructure and network that will allow them to operate in a more efficient and profitable manner.

On the other hand, a community that maintains an efficient and effective transportation network will have an enhanced ability to grow and prosper. Maintaining and improving the transportation system also provides its own direct economic stimulus by putting people to work.

Today, most urbanized areas throughout the United States are finding it increasingly difficult to maintain an adequate transportation network. The problems facing these areas include ever increasing traffic congestion, declining air quality, and fierce competition for funding. Although these problems are difficult to solve, creative solutions will likely involve two key strategies: 1) congestion management, and 2) generating new revenues from which to fund enhanced or new facilities. Road pricing and congestion pricing are two techniques which focus on these two strategies. As a result, interest in these techniques has been growing rapidly in recent years.

1.2 Economic Theory

The case for implementing congestion pricing can be made by examining the economics of a freeway system. It relates to the overall efficiency with which congested road networks are used.

As demand to use a freeway increases, speeds decrease, adding to the private cost to individual users. Drivers decide to use the freeway if their personal benefits are equal to or greater than their costs.

The traffic volume on a freeway is determined by the point at which the user benefits and the user costs are in equilibrium.

With falling speeds, each additional user not only further reduces speeds, but imposes additional social costs. These costs include additional delays, accidents, air, water and noise pollution, and degrade public services such as emergency medical service, police and the court system. These social costs can be substantial. Research has shown that the combined social costs of a congested freeway range between 32 cents and 71 cents per vehicle-mile.[1] The individual driver generally does not perceive these costs and decides to travel even though the total system costs exceed the total benefits. The fact of the matter is that highway infrastructure is more valuable during peak periods than off-peak periods. However, this increase in value is not reflected in the cost of usage. As a result, a very large, and growing demand-supply imbalance is produced in the peak periods of every major western city.

This is a situation where an additional private cost, or "toll" can be imposed. If all freeway users were charged a toll equal to the social costs of their trip, efficiency of the freeway, according to economic theory, would be maximized. A driver exposed to this additional cost, must then decide whether or not the benefits derived from the use of the transportation network warrant the additional cost.

Once the cost of freeway usage becomes "perceived" by the motorist, more rational and economically productive decisions are created:

1. Truckers and business persons who can make the tolled trip "pay" for itself will use the tolled highway. They will be able to use it in a more efficient and economically productive way, since traffic flow conditions will improve because of those "tolled-off" the freeway.

2. Motorists that don't really need to make the trip at that price will often defer, delay or suppress the trip. This results in less travel and less air pollution.

3. Some motorists will decide that the cost of the transit fare is cheaper, and elect to use the transit system. New transit usage is created.

4. The new revenues created can be used to fund:

[1]De Corla-Souza, Patrick and Anthony Kane. "Peak Period Tolls: One Cure for Urban Congestion." Compendium of Technical Papers for the 61st Annual Meeting of the Institute of Transportation Engineers, September 1991.

a. more road-pricing options to create even more revenues, and
b. new transit services and new transit assets to attract more transit usage.

At the same time, it must be recognized that economic inequities can be produced by road pricing for the economically disadvantaged. Modern road pricing strategy provides some methods to overcome this valid concern:

1. First, alternative "free" (often less congested) routes are always available to all users.

2. Second, transit passes or toll "passes" (transponders) can be discounted and given or sold to the qualified economically disadvantaged population.

In summary, road pricing, and particularly congestion pricing, are two of the most powerful behavior-modification tools available in the realm of travel behavior. Perceived, out-of-pocket costs can produce large-scale changes in road-user behavior and simultaneously solve the demand-supply problem in a two-fold manner:

1. by increasing the perceived cost, demand can be reduced, and

2. by increasing revenues, new supply-side assets can be created.

1.3 Overview of the Report

The overall purpose of this study is to identify, on a preliminary basis, several promising road pricing strategies and possible application sites in Dade County.

Chapter 2 provides a brief discussion of the issues and economic rationale associated with the congestion pricing and road pricing concepts. Also included in this chapter is a summary of interviews conducted with entities either planning or currently operating congestion/road pricing programs. These interviews were conducted at the national as well as international level.

Chapter 3 presents the goals, objectives, and evaluation criteria of a road pricing and congestion pricing program. These are not specific to Metropolitan Dade County but would apply to most transportation pricing programs throughout the world.

Pricing strategies for a congestion pricing program are developed and presented in Chapter 4. These strategies range from "very conservative" (small increases in existing tolls) to "ultra aggressive" (24-hour pricing of selected major highways).

Eligible facilities within Metropolitan Dade County are identified in Chapter 5. These facilities include existing tolled expressways as well as major arterial streets.

In Chapter 6, pricing strategies and eligible facilities are combined to form project "packages" and "subpackages" which are classified according to their respective levels of aggressiveness. Revenue forecasts for the project packages are developed and presented in Chapter 7. And finally, a summary of findings and recommendations is presented in Chapter 8.

CHAPTER 2
ROAD PRICING CONCEPTS

2.1 Congestion Pricing

The cost of a trip on a transportation facility includes the traveler's time and vehicle operating costs as well as the impact on other travellers by adding to the level of congestion. A congestion price is a user fee based on the difference between the perceived cost and the actual cost imposed on other users as a result of additional delay. "Congestion Pricing" is a method of road pricing which implements time-of-travel charges for roadway use which can vary by location, time of day, and/or vehicle occupancy. The goal, in addition to raising sufficient revenue, is to reduce congestion, improve air quality and economic efficiency, conserve energy, and shift traffic to off-peak periods, to other modes of transportation, to higher occupancy vehicles, or to less congested routes.

One example of congestion pricing is the charging of different toll rates by time of day. For example, a causeway toll rate could be double the regular rate during the morning and evening peak periods. This strategy discourages travel during the peak hours, and therefore could be used to manage congestion levels on the causeway.

A more creative example of congestion pricing would be to charge Single Occupant Vehicles (SOV) a fee to use under-utilized High Occupancy Vehicle (HOV) lanes during the peak traffic periods. This strategy, sometimes referred to as "selling excess HOV lane capacity" has a number of benefits. First, it derives additional transportation revenues for use in maintaining existing facilities or constructing new HOV lanes. Second, it balances facility utilization by increasing the volumes within the HOV lanes so that they are better utilized. Third, congestion relief is provided in the SOV lanes by diverting some of the traffic that is willing to pay a premium for using the HOV lanes. Finally, air and noise impacts are reduced due to the traffic operating at a higher Level of Service (LOS).

It should be noted that road pricing is only one of several ways to increase revenue for transportation purposes. While this report focuses on road pricing, it is not our intent to suggest that this is the preferred method for increasing transportation revenues. Motor fuel taxes and other pricing mechanisms such as sales taxes were not comparatively analyzed nor included within the scope of this study. This report does, however, analyze a variety of road pricing applications and strategies and identifies eligible facilities for the possible application of these strategies. In the final analysis, any revenue stream derived from the implementation of road pricing strategies must be optimally blended with other new sources of revenue to completely achieve the County's strategic transportation objectives.

The variety of road/congestion pricing options is almost limitless. The list below presents some strategies identified by the Federal Highway Administration:

- Fixed Point Tolls: Tolls collected at fixed intervals along a freeway or causeway.
- Regional/Area-wide Tolls: Tolls implemented at several critical locations to have a regional congestion management impact.
- Corridor Tolls: Tolls implemented along congested corridors on one or more parallel facilities.
- Congestion Generators: Tolls implemented at entrances to major congestion generators such as airports.
- Existing or New & Public or Private Toll Facilities: Tolls implemented on expressways.
- Area Licensing: Tolls charged usually at several entry points into a large area such as a CBD.
- Peak Period Discounts: Strategy usually used on transit alternatives, particularly LRT and busways, to encourage transit use.
- Sales of Excess HOVL Capacity: Allow SOV's to use the HOV lanes at a premium rate.
- Area-wide Parking Charges: A strategy that is generally applicable in certain areas such as a theater or historic district.
- Graduated Pricing: Pricing that varies with congestion levels. Realistically can only be used in combination with AVI technology.

This report presents a broad, but finite, array of policy choices and their consequences. The ultimate policy decision will involve balancing trade-offs between the positive and negative impacts derived from implementing a comprehensive road pricing plan. Ultimately, this report should result in a conscious decision by the County to either maintain the status quo, or adopt some level of aggressiveness by including a road pricing element in the Comprehensive Development Master Plan.

The strategies described above have differing degrees of aggressiveness. Some, such as area licensing, are much more controversial than others, as they could have significant consequences for business in the area. Others, such as fixed point tolls, have a long history of implementation and as a result, are much less controversial.

2.2 Equity

A congestion pricing program that effects the desired congestion level goals would have negative implications for lower income households. This would be particularly true for work trips, which would be hardest hit by congestion pricing, since these trips generally occur during the peak periods.

The impact on lower income groups would be disproportionate to the relative benefits received by these groups, unless countermeasures or "special benefit payments" (rebates) were implemented to offset this impact. Such countermeasures might include the following:

- Discounted rates for lower income groups. This can be implemented by accessing the existing welfare system database. Persons currently eligible for food stamps or other welfare payments could receive discount toll cards for use on the toll facilities.

- Allow a portion of the revenues derived from the congestion pricing program to be used to subsidize transit fares for lower income households.

2.3 Impacts of Road Pricing

In addition to the equity issues described above, there are both positive and negative impacts associated with the implementation of a road pricing program. These include impacts on revenue yield, roadway congestion (on the subject facility as well as the adjacent street system) the environment (primarily air quality), beach residents and workers, and the tourist industry. Impacts on these elements and various economic groups have been analyzed in a qualitative manner and the results are presented in Table 2.1.

2.4 Literature Search and Current Applications

Kimley-Horn undertook a literature search of the congestion pricing subject. The search was conducted using the Transportation Research Information Service (TRIS), which searches several United States and European databases for articles on a given topic. The resulting data includes the name, author, source, and abstract of the related articles. This information is included in Appendix A of this report.

In addition to the TRIS literature search, detailed research was conducted by Kittelson & Associates, Inc. on existing or planned congestion pricing programs. This effort details programs in Singapore, Hong Kong, Norway, and also the United States. A comparison summary of all the programs is shown in Table 2.2. This report is attached as Appendix B.

TABLE 2.1
ROAD PRICING IMPACTS

Category	Do Nothing	Increase Tolls on Existing Toll Facilities[1]	New Tollroads[2]	HOVL Pricing[3]	Toll Existing Non-Toll Causeways[4]	Toll Existing Non-Toll Freeways	Toll Arterial Streets
Revenues	0	1	2	1	1	3	3
Congestion							
- On expressways/causeways	-3	1	2	1	1	3	-1
- On adjacent arterial streets	-1	-1	2	0	0	-2	-2
Environment	-1	1	-1	1	0	2	2
Social/Financial							
- Beach residents	0	0	0	0	0	0	0
- Low income persons[5]	0	0	0	0	0	0	0
- Moderate income persons	0	-2	0	0	-2	-2	-2
- High income persons	0	-1	0	0	-1	-1	-1
- Tourists	0	-1	0	0	-2	-2	-2
- SOVs	0	-1	0	-2	-2	-2	-2
- HOVs[6]	0	0	0	2	0	0	0

Scale: Negative Impacts — No Impacts — Positive Impacts

-3 -2 -1 0 1 2 3

Worse ← ---------- ---------- ---------- ----------|---------- ---------- ---------- → Better

Notes:
[1] Assumes no increases in the number of toll roads.
[2] Includes tollroads on new alignments, plus increasing tolls on existing toll roads, coupled with added capacity.
[3] HOVL pricing involves adding HOVL capacity to an existing freeway or arterial, sometimes by taking an existing SOVL, and sometimes adding lanes for HOV usage.
[4] Beach residents and low income persons travel free.
[5] All low-income households receive discounted or free access to transportation facilities.
[6] HOV3s would always receive free travel under the proposed pricing schemes.

TABLE 2.2

CONGESTION PRICING PROGRAMS
SUMMARY TABLE

ITEMS	SINGAPORE	HONG KONG	BERGEN	OSLO	ORANGE COUNTY	SAN FRANCISCO
TYPE	Area Licensing Scheme 33 entry points Manual toll collection	Area Licensing Scheme 18 toll points, plus higher gas taxes, registration / licence fees	Area Licensing Scheme Random video surveillence	Area Licensing Scheme Inbound-only 18 gates, video surveillence	Corridor Pricing Scheme New toll facility, includes ETTM collection	Bridge Pricing Scheme Existing tolls will be replaced variable tolls, including ETTM
START	June 1975	March 1983	January 1986	February 1990	Expected to open in 1995	Pending approval
GOALS	Reduce congestion 25-30% Slow vehicle ownership Encourage transit use	Reduce traffic Observe driver behaviour Test ETTM technology	Fund road improvements and additional roads	Fund road improvements and additional roads	Increase throughput and person trips, encourage car pooling	Reduce congestion, increase mobility, influence behaviour, demonstrate congestion pricing
TIMES	Start: AM, 1989: AM/PM Since Jan 1994: All day	5 periods between 7 AM and 7 PM	6AM to 10PM weekdays	24 hours a day	24-hour real-time congestion pricing	24-hour real-time congestion pricing
VEHICLES	All vehicles except scheduled buses	2,600 equipped vehicles	All vehicles except scheduled buses	All motorists entering the CBD	All vehicles except those with three or more passengers	All vehicles except those with three or more passengers
TOLLS	Vehicles $1.25 /day, motor-cycles $0.50 /day, company vehicle $2.50 /day	$0.90 peak period, half price during "shoulder" peaks	$0.70 - $1.60 per day with discounted seasonal passes (month, six-month, year)	$1.60 per transaction	Dependant on congestion between 25 cents and $2.	Dependant on congestion
RESULTS	Inbound AM traffic decreased by 44%, car pooling trips went from 23% to 53%.	% of vehicle fleet that were private cars decreased 50%. Private car use decreased 10%.	5.4% (seasonal), 29.8% (daily) decrease in vehicle trips, 10% reduction in CBD-bound vehicles	Evaluation is underway. Preliminary results show 5% reduction in CBD traffic	Not open yet	Not open yet
SUCCESSES	Reduction in CBD vehicle trips Increased transit use and funding	Tecnical success with use of vehicle identification technology and roadside computers	Very carefully negotiated, all parties were involved	Not yet documented	Not open yet	Not open yet
PROBLEMS	Some outlying congestion	Public outcry, poor timing Experiment was stopped	No significant problems	N/A	Not open yet	Not open yet
COSTS	$2.8M (1975) + $0.4M between 1975 and 1989 capital costs. Operation: $118,000 / month	Estimated at $31.65M	$2.58M capital, plus $1.45M per year operating (in 1986 $)	Approx. $2 billion capital costs, plus approx. $1 M / year in operating costs	Approx. $125 M	Estimated to be $28.9M
REVENUES	$15M per year	N/A	$11.1M in 1986, matched by central government	Estimated at $96 M	Not open yet	Not open yet
USES OF FUNDS	All revenues go to Central Revenue Fund	N/A	80% for roads, 20% for bus lanes and transit, and some bikeways	80% for roads, 20% for transit, including busways	O&M of the facility, profits returned to investors	Improve rideshare, bus, ferry, BART, drive-alone services
FUTURE	ETTM and AVI being tested	ETTM and AVI being tested for harbor tunnels	Outer loop being considered	No other plans	Not applicable	Not applicable

Note: All currencies are in U.S. dollars.

As Table 2.2 shows, there are no existing congestion pricing programs currently in operation in the United States, however, two are pending; one in San Francisco, and the other in Orange County, California. Both programs would employ 24 hour real-time congestion pricing techniques and will include electronic toll collection.

Internationally, Singapore's Area Licensing Scheme was the world's first congestion pricing program, implemented in 1975. Single Occupant Vehicles (SOVs) are required to pay premium rates to enter the CBD area. An excellent transit system and high vehicle ownership taxes encourage transit and carpool usage. Other area licensing schemes are in operation in the cities of Bergen and Oslo, in Norway.

2.5 Congestion Pricing and Current Federal Law

The Intermodal Surface Transportation Efficiency Act (ISTEA) was signed into law on December 18, 1991. This Act authorizes the use of Federal funds to be allocated for a wide-range of transportation programs throughout a six-year period (1992-1997). Section 1012(b) of the ISTEA authorizes the Secretary of Transportation to create a Congestion Pricing Pilot Program (CPPP) by establishing agreements with up to five state or local governments or public authorities to conduct and monitor congestion pricing pilot projects. Three such agreements may involve the use of tolls on the Interstate System. Annual funding for this program is $25 million of which no more than $15 million may be allocated to any single entity in a given year. The intent of this program, as further defined by FHWA, is to use congestion charges to encourage driver behavior in a manner that will promote the use of alternative times, routes, modes or trip patterns to reduce congestion. These charges shall be direct point, time-of-travel charges varying by location and/or time.

Since initially receiving proposals in February of 1993, many proposals and pre-project proposals have been submitted to the Federal Highway Administration (FHWA), but none has been formally selected to participate in the Congestion Pricing Pilot Program. Failure to meet the request's criteria, insufficient public involvement programs, and lack of local public/political support appear to be the primary reasons that no projects have been selected. As a result, the FHWA is working very closely with the local entities which have submitted proposals in order that this pilot program may become a reality. Should the Metro-Dade MPO decide to pursue congestion pricing as a road pricing strategy, participation in this Pilot Program would be extremely beneficial during the formative years of the new Dade County Expressway Authority.

CHAPTER 3
GOALS AND OBJECTIVES OF A CONGESTION PRICING PROGRAM

The ultimate goal of any congestion pricing program is to produce a systemic change in transportation philosophy. A change that will result in increased transportation system efficiency coupled with the resultant gains in mobility, air quality, and energy conservation. This goal is typically sought through a comprehensive program of improvements which are designed to influence traveler behavior through the effective use of existing and proposed facilities, pricing strategies, state-of-the-art technology such as Automated Vehicle Identification (AVI), Electronic Toll Collection (ETC), and Intelligent Transportation Systems (ITS), and a focused promotional program. A secondary, but extremely important benefit to the overall goal of system efficiency is the revenue producing potential of the program.

3.1 Goals and Objectives

Goals and objectives are the tools that must be developed in order to establish and maintain the direction and evaluation of any program. Goals are long term in nature and reflect the ultimate desired targets. Objectives, on the other hand, are measurable, intermediate steps which typically must be met in order to achieve the associated long-range goals.

3.1.1 - Goal 1: Reduce congestion by promoting the efficient use of available roadway capacity.

Objectives for Goal 1 include:

- To effect a paradigm shift in traveller behavior through a road pricing structure which more closely represents the actual cost of a trip on the highway network. Pricing may vary by time of day, vehicle occupancy, location, and/or actual level of congestion (real time pricing).

- To provide a means, such as pricing, by which Single Occupant Vehicles (SOV) can legally use High Occupancy Vehicle (HOV) lanes to effect more efficient utilization of under-utilized HOV lanes.

- To encourage greater utilization of the region's under-utilized major arterial street system assets.

- To increase transit ridership through subsidized fares and increased services funded by road pricing revenues.

Evaluation Criteria for Goal 1 are:

- System travel time and delay
  - Vehicle-miles of travel (VMT)
  - Volume to capacity ratios (v/c)
  - Roadway levels of service (LOS)
  - Traffic accident rates
  - Vehicle occupancy rates
  - Transit ridership
  - HOV lane throughput

3.1.2 - Goal 2: Increase revenues available for transportation infrastructure.

Objectives for this goal are:

- To develop a road pricing structure which more accurately represents actual the cost of a trip which is the sum of individual and societal costs.

- To generate revenues through road pricing strategies which may be used to subsidize and/or improve a transit facility within the same corridor.

- To secure discretionary, competitive ISTEA Section 1012(b) funding for the development of a congestion pricing pilot program.

Evaluation Criteria include:

- Transportation revenues and funding
- Transit ridership
- Transportation infrastructure improvements

3.1.3 - Goal 3: Improve air quality and reduce energy consumption.

Objectives are:

- To create a road pricing structure designed to reduce congestion and manage traffic operations thereby reducing emissions and energy consumption.

- To increase transit ridership through the development of a congestion pricing program.

Evaluation Criteria are:

- CO and ozone levels
- Fuel consumption
- Travel time and delay
- Transit ridership

To attain these goals, a congestion pricing program will likely consist of the following components:

- Pricing strategies according to time of day, vehicle occupancy, and location.
- Introduction of AVI and ETC technology.
- Sale of excess HOV-lane capacity.
- Expanded transit facilities and service.

Potential road/congestion pricing packages for Dade County were developed with the goals, objectives, and components of this chapter in mind.

CHAPTER 4
ROAD/CONGESTION PRICING STRATEGIES

The purpose of this chapter is to identify possible road/congestion pricing strategies which could be implemented as a part of a Dade County Congestion Pricing Program.

4.1 Strategy Definitions

There are six basic pricing strategies that can be employed for any road/congestion pricing program:

1. **Static Pricing, 24 Hours** - Static pricing is road pricing in its simplest form. This consists of a fixed toll which is charged to vehicles along a roadway, at an on or off ramp, at a mainline barrier, or on a causeway. (Tolls can be levied at several locations along the roadway.) Being "static," the amount of toll paid by a particular type of vehicle remains fixed 24 hours a day. The toll collection technique for all strategies are assumed to initially be a combination of manual and electronic--and evolving to almost fully electronic toll collection (ETC).

2. **Static Pricing, Peak Period Only (PPO)** - Similar to strategy number one, except that the toll is only applied at one flat rate during designated predetermined peak periods. Off-peak travel is "free."

3. **Fixed Time, 24 Hour Congestion Pricing** - This strategy has one significant difference from the static 24 hour pricing strategy. In this case, the toll rate will be higher in the peak periods and lower the rest of the day. Within the peak period, the toll rate may change one or more times within predetermined time slots in the peak period. For example, the toll rate may be 25¢ during off-peak periods, 35¢ from 6:00 AM to 7:00 AM and 50¢ from 7:00 AM to 8:00 AM, etc.

4. **Fixed, Time PPO Congestion Pricing** - Similar to strategy number three, however, the tolls are variable during the designated peak hours and peak hour fringes (periods immediately preceding and following the peak period). The toll rates may increase from 25¢ to 35¢ at 6:00 AM, then move upwards again at pre-prescribed times to 40¢ and 50¢ as congestion increases within the peak period. Off-peak travel is "free."

5. **Realtime, 24 Hour Congestion Pricing** - This is the most advanced form of congestion pricing. It is similar to strategy number four, however, the tolls are applied all day and the tolls vary in response to actual congestion present on the road at the time of travel. Actual congestion levels can be determined using advanced techniques such as embedded freeway

loop detectors or video image detection technology. Other dynamic toll structures, based on vehicle occupancy and vehicle type can also be implemented in a similar manner.

6. **Realtime, PPO Congestion Pricing** - Similar to strategy number five, with the tolls only being applied during the peak periods, when congestion beyond a certain predefined tolerance is detected automatically by the system, and toll rates are automatically changed in response to realtime system demand/performance profile. Motorists are notified via variable message signs (VMS).

Table 4.1 displays a hypothetical set of pricing regimes for these strategies.

TABLE 4.1
EXAMPLE OF PRICING STRATEGIES

TIME OF DAY	STATIC 24-HOUR PRICING	STATIC - PPO	FIXED-TIME 24-HOUR CONGESTION	FIXED-TIME PPO CONGESTION	REALTIME 24-HOUR CONGESTION	REALTIME PPO CONGESTION
6:00 AM - 7:00 AM	25¢	0¢	35¢	35¢	Varies	Varies
7:00 AM - 8:00 AM	25¢	50¢	50¢	50¢	Varies	Varies
8:00 AM - 9:00 AM	25¢	0¢	25¢	0¢	Varies	0¢
9:00 AM - 4:00 PM	25¢	0¢	25¢	0¢	Varies	0¢
4:00 PM - 5:00 PM	25¢	0¢	35¢	35¢	Varies	Varies
5:00 PM - 6:00 PM	25¢	50¢	50¢	50¢	Varies	Varies
6:00 PM - 6:00 AM	25¢	0¢	0¢	0¢	Varies	0¢
Note: Pricing shown is a hypothetical structure, not a recommendation.						

The strategies to be used for any particular road/congestion program depend on the local conditions. Furthermore, strategies 5 and 6 are still in the development stage, and will require advanced detection, control and other ITS equipment to implement. Although Automatic Vehicle Identification (AVI), automated occupancy detection, and other such ITS technology exists to implement these pricing strategies, there are very few examples in use. As freeways become more

"intelligent," we will continue to move toward real time congestion pricing and away from static and fixed time pricing.

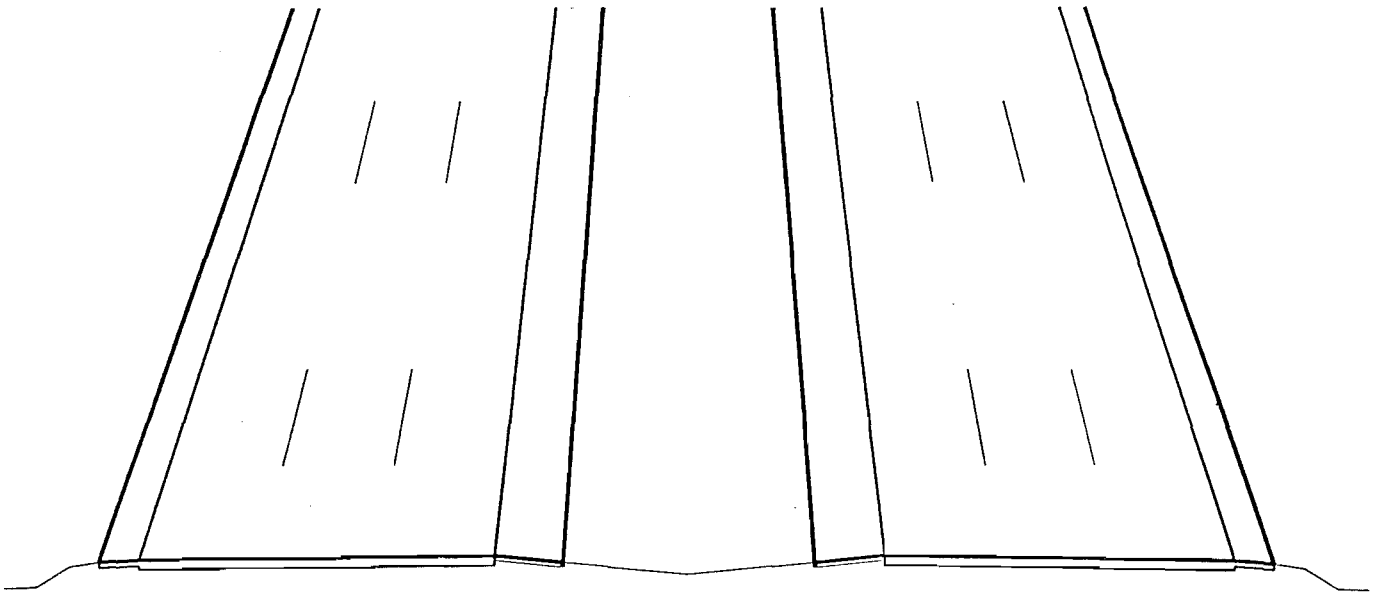
The above six road pricing strategies can be applied to either the entire freeway (or causeway), or only along any HOV lanes that may be present. Therefore, a total of twelve road pricing techniques are available. The HOV lane pricing options involve four possibilities:

1. **Add a Lane** - Adding a lane to an existing facility for exclusive HOV use. (See Figure 4.1.)

2. **Take a Lane** - Taking an existing lane from a facility and converting it from general use into HOV use. This option is politically very aggressive and often quite difficult to impose. (See Figure 4.2.)

3. **Add and Take a Lane** - A combination of the above two options. This option involves widening a facility to accommodate a new HOV lane, while at the same time, converting an existing general use lane for exclusive HOV use. The option can be controversial if not handled properly through effective public information processes. (See Figure 4.3.)

4. **Ramp Metering Bypass (RMB) Lane Pricing** - A ramp metering system is currently under design for I-95 in Dade County. This system is designed to optimize freeway flow. Selected ramps could have bypass lanes for buses and carpools, who may bypass the queue at the ramp meter signal by using a parallel lane. SOV's may also be permitted to use the bypass lane--at a price, and only if the SOV is equipped with an AVI transponder to enable the toll to be electronically exacted (see Figure 4.4).



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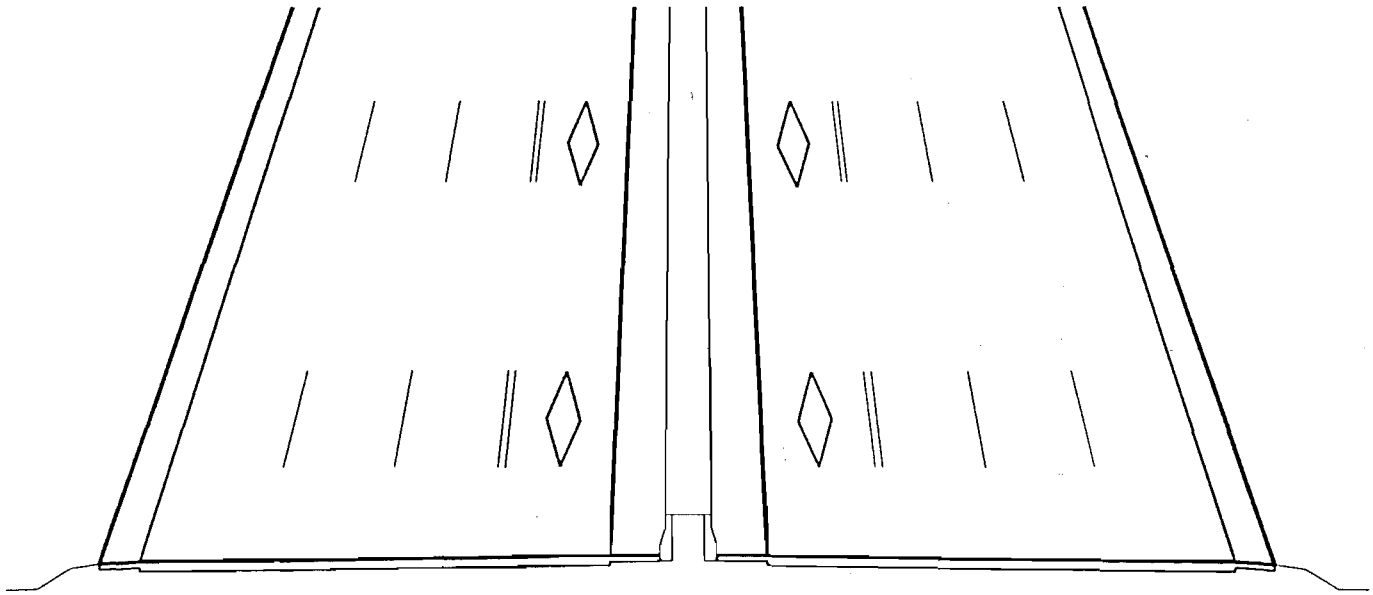

ADD-A-LANE

FIGURE 4.1

DADE ROAD PRICING

HOV LANE STRATEGIES
ADD-A-LANE

NOT TO SCALE

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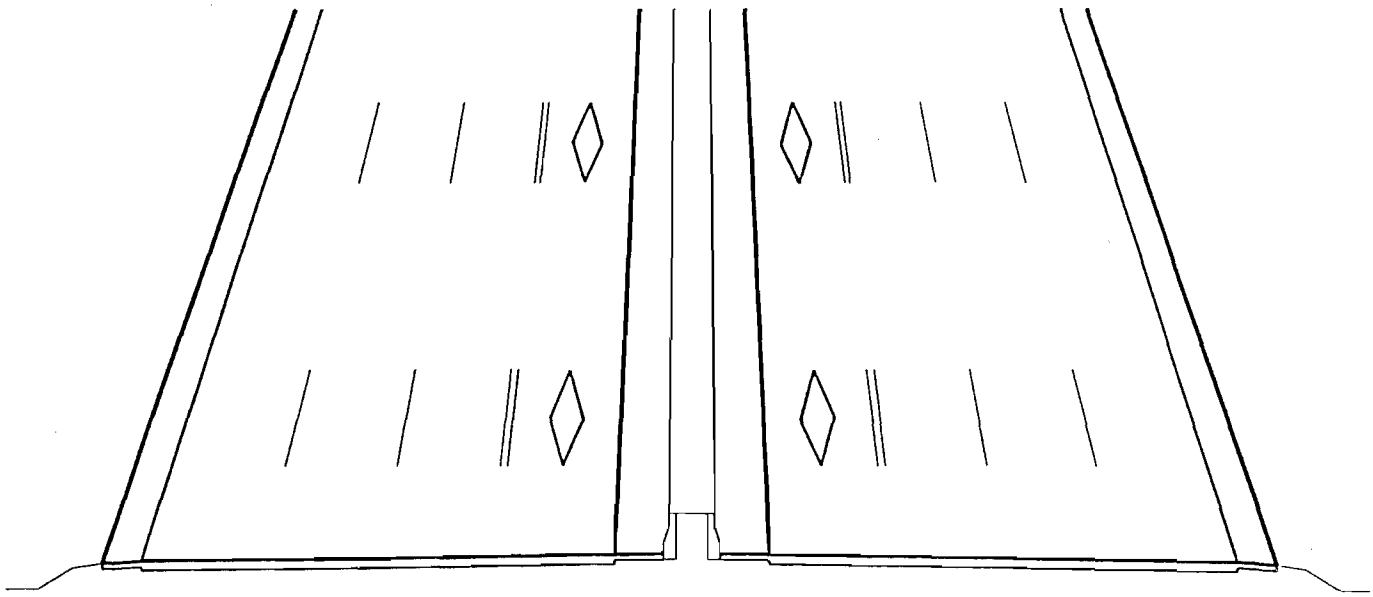

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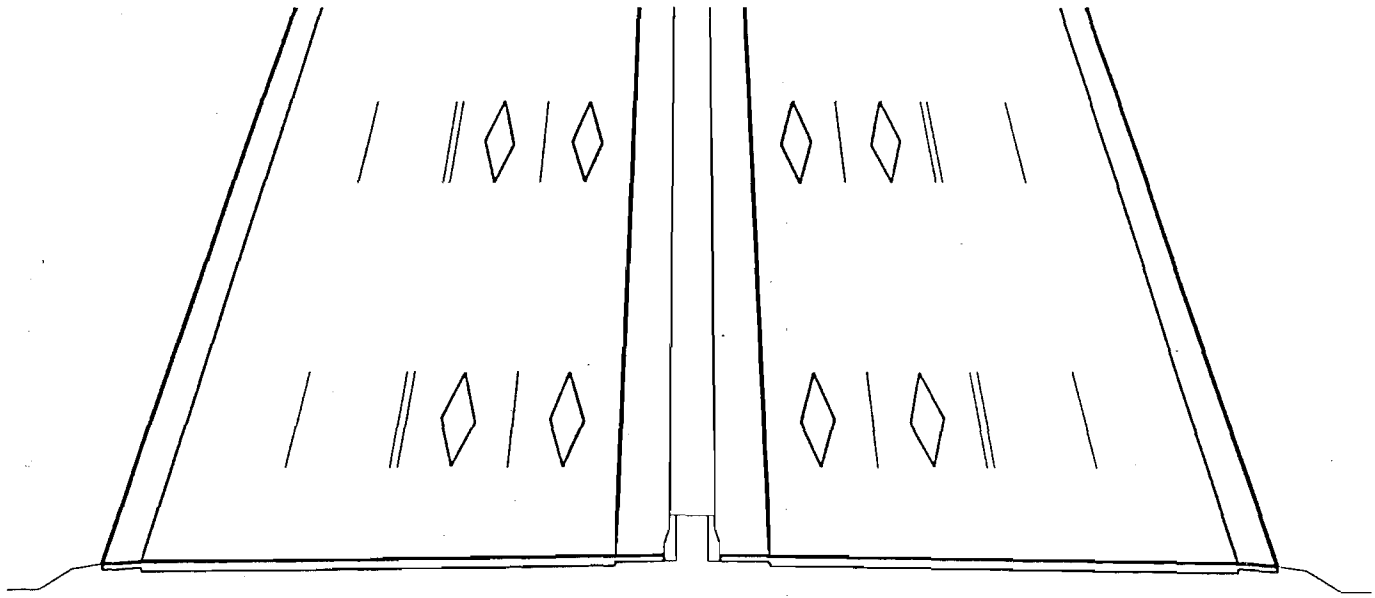

TAKE-A-LANE

FIGURE 4.2

DADE ROAD PRICING

HOV LANE STRATEGIES
TAKE-A-LANE

Kimley-Horn

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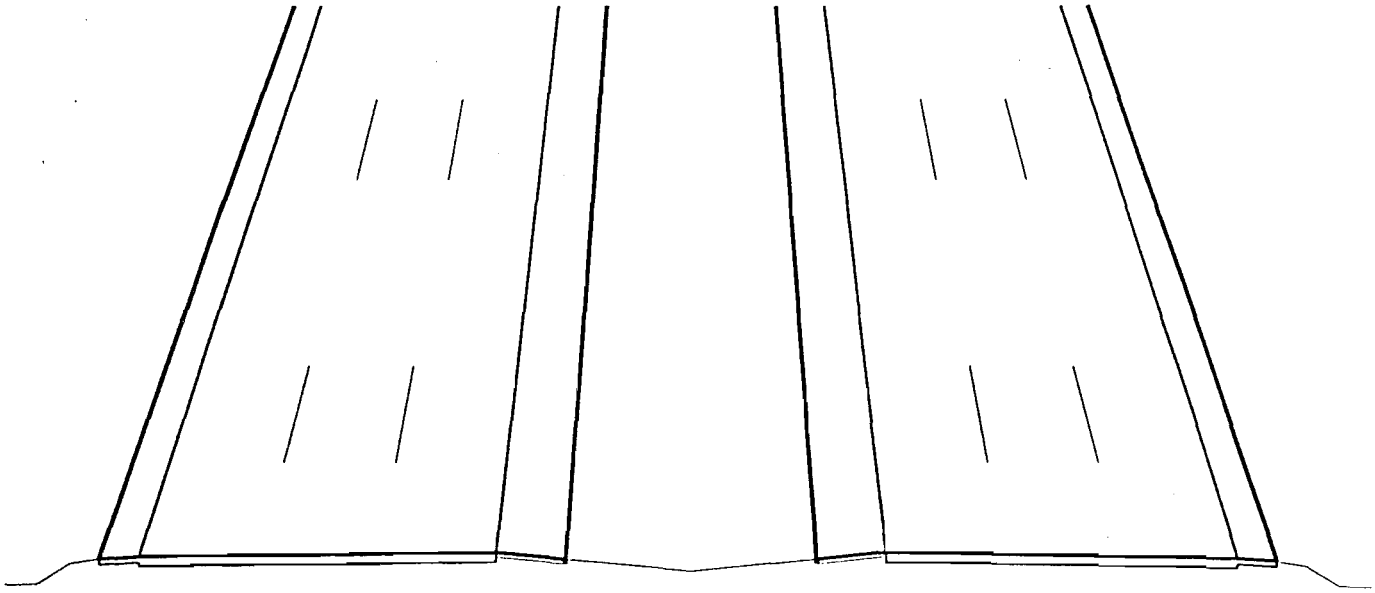

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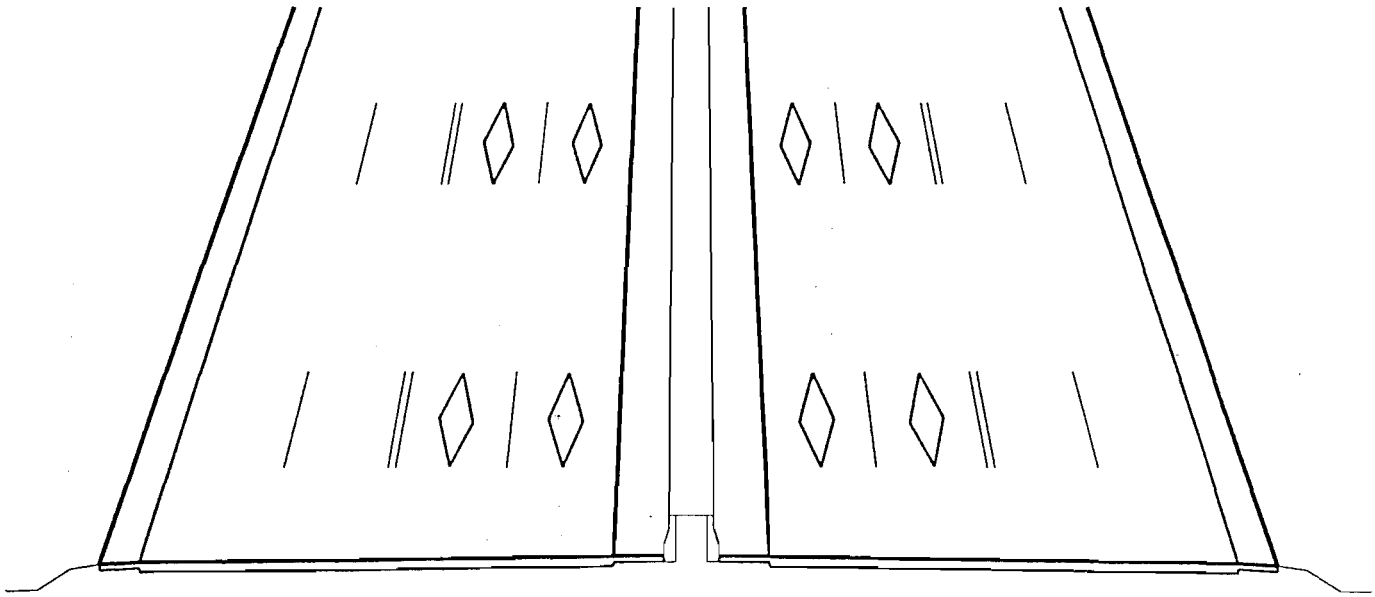

ADD & TAKE-A-LANE

FIGURE 4.3

DADE ROAD PRICING

HOV LANE STRATEGIES
ADD & TAKE-A-LANE

NOT TO SCALE

Kimley-Horn

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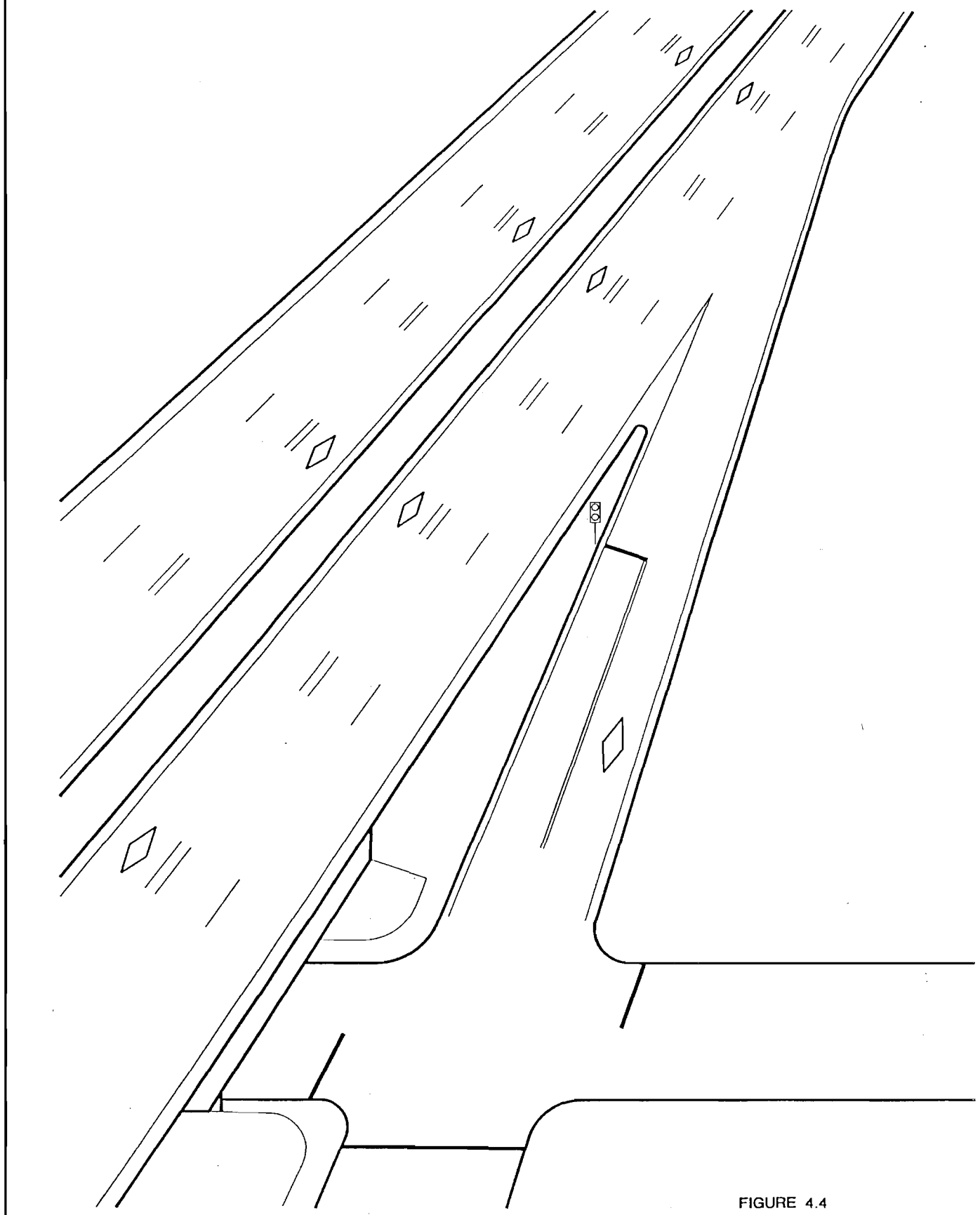

FIGURE 4.4

DADE ROAD PRICING

RAMP METERING
BYPASS CONCEPT

Kimley-Horn

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NOT TO SCALE

\DADESTRT

On the I-95 HOV lanes in South Florida, HOV's are currently defined as vehicles with two or more passengers. The general recommended strategy is to classify vehicles by type and occupancy. HOV3's (three or more persons) could travel free, while HOV2's (two persons) would pay a discounted rate. The rational for this is that HOV3's produce 50% greater societal benefits than HOV2's and they should be rewarded equitably. All three of the above options could include the "selling" of excess HOVL capacity to SOV's at a premium rate. Trucks and other heavy vehicles would be required to pay the highest rates (usually three to five times the SOV rate). Furthermore, the actual amount of toll paid would be determined by the degree of congestion at the time of travel.

The current I-95 Intelligent Corridor System (ICS) design project being conducted by the FDOT includes the implementation of ramp metering on selected ramps along I-95. A concern expressed by some authorities is the apparent conflict of implementing HOVL pricing in conjunction with ramp metering. Kimley-Horn's extensive experience with both strategies on the Phoenix Freeway Management System has shown that there are situations where both need to be implemented simultaneously to achieve the required congestion management. Selected (and possibly all) ramp metering locations on I-95 are recommended to be designed with HOV bypass lanes. With these, HOV3's could bypass ramp meters for free, while HOV2's could bypass ramp meters at a discounted rate. SOV's would be required to pay premium rates to bypass the ramp meters.

4.2 Levels of Aggressiveness

As indicated previously, certain road pricing strategies can be more aggressive and controversial than others. The degree of aggressiveness of any particular strategy can be classified from very conservative to ultra-aggressive. Table 4.2 shows the various road pricing strategies and their particular classification, as assessed by Kimley-Horn and Associates, Inc. road pricing experts.

The level of aggressiveness for any road pricing strategy also depends on the toll rate that is used. An aggressive plan would generally implement tolls at a high rate, say 10¢-15¢ per mile, while a conservative plan may charge 7¢-10¢ per mile. Research by the authors has shown that major metropolitan markets can comfortably sustain toll rates averaging between 10¢-15¢ per mile during the off-peak period and 20¢-25¢ per mile during the peak period.

Table 4.3 illustrates the application of a range of congestion pricing strategies on some of Dade County's existing toll roads and the resultant tolls. As shown, the tolls required to achieve these rates on a mileage basis are fairly typical in today's market. Compared to international tolls, Dade County's existing rates are exceptionally low.

TABLE 4.2

CONGESTION PRICING STRATEGIES VS AGGRESSIVENESS

Strategy Description	Do Nothing	Very Conservative	Conservative	Moderate	Moderately Aggressive	Aggressive	Very Aggressive	Ultra Aggressive
Toll at existing rates	X							
Raise tolls to 7 cents/mile		X						
Raise expressway tolls to premium levels (10-15 cents/mile)			X	X	X	X	X	X
Add planned freeway extensions as toll roads			X	X	X	X	X	X
HOVL Pricing - Add a lane				X				
Add unplanned freeway extensions as toll roads							X	X
Congestion pricing and toll indexing of all toll facilities				X	X	X	X	X
Congestion pricing of all congestion "generators"					X	X	X	X
Peak period-only pricing of non-toll causeways							X	
HOVL Pricing - Add one lane plus take one lane					X			
HOVL Pricing on arterials - Take one lane (S Dixie Hwy)								X
Busway (HOV-way) pricing - (US 1 / Biscayne Blvd)						X	X	X
Peak period pricing of existing non-toll freeways							X	
24-hour pricing of all non-toll causeways								X
24-hour pricing of existing non-toll freeways								X
24-hour pricing on arterials								X

TABLE 4.3

TOLLS FOR VARIOUS CONGESTION PRICING RATE STRUCTURES

Existing Toll Facility	Existing Toll EB/NB	Existing Toll WB/SB	Average Toll/Mile	Traditional Toll at 7 cents/mile EB/NB	Traditional Toll at 7 cents/mile WB/SB	Contemporary/Premium Toll at 10-15 cents/mile EB/NB	Contemporary/Premium Toll at 10-15 cents/mile WB/SB	Congestion Pricing Toll at 20-25 cents/mile EB/NB	Congestion Pricing Toll at 20-25 cents/mile WB/SB
Gratigny Parkway	$0.25	$0.25	$0.06	$0.30	$0.30	$0.50	$0.50	$1.00	$1.00
SR 112 / Airport Expressway	$0.25	$0.00	$0.06	$0.30	$0.00	$0.60	$0.00	$1.00	$0.00
Option 1						$0.30	$0.30	$0.50	$0.50
SR 836 / Dolphin / E-W Expressway	$0.25	$0.00	$0.02	$0.75	$0.00	$1.50	$0.00	$2.50	$0.00
Option 1				$0.45	$0.45	$0.75	$0.75	$1.25	$1.25
Option 2								2 x $0.75	2 x $0.75
SR 874 / Don Shula Expressway	$0.25	$0.25	$0.03	$0.50	$0.50	$1.00	$1.00	$2.00	$2.00
Option 3								2 x $0.75	2 x $0.75

10-May-95
4613.15
TOLLCALC.WB1

Notes:
Option 1 - Add a westbound toll plaza at the same location as the current eastbound plaza, and toll in both directions.
Option 2 - Add a bi-directional toll facility between the Palmetto and the Turnpike, and toll at both locations (75 cents at each plaza in each direction.)
Option 3 - Add a bi-directional toll facility south of the Snapper Creek Expressway, and toll at both locations (75 cents at each plaza in each direction.)

4.3 Toll Collection Systems

The collection systems involved with traditional road pricing include manual toll booths (see Exhibit 4.1) in combination with automatic collection systems using pre-sold decals. Electronic Toll Collection (ETC) systems are coming of age with technological advancements in both hardware and software. One form of this technology is Automatic Vehicle Identification (AVI) systems. This technology uses both credit and debit collection systems in combination with manual collection techniques for users who do not have the automatic payment equipment installed in their vehicles (see Figure 4.5).

AVI/ETC technologies exist on several newer toll facilities in the United States, including the Oklahoma Turnpike, the Garden State Parkway in New Jersey and the North Central Tollway in Dallas, Texas. Other toll roads under construction such as SR 91 Orange Lanes in California and the Dulles Toll Road Extension (Virginia) includes this form of technology. In 5 to 10 years, ETC collection systems with a limited number of manual collection lanes will be the industry standard. With federal encouragement of universal transponder cards, this collection system will significantly advance both the popularity of non-stop toll collection facilities as well as their capacity and ensuant levels of service (LOS).

The next level of automation involves Intelligent Transportation Systems (ITS). In reality, such systems are a number of years off in terms of actual wide-spread public use. However, the federal government is funding significant research and demonstration projects in this area for the purpose of accelerating the inclusion of these technologies into everyday practical use. Current estimates indicate that by the year 2020, several major interstate highways could be operating as fully or partially automated highway systems (AHS) accepting modified "smart" automobiles in a fully computer controlled environment.

The consultant is supportive of the rapid implementation of AVI/ETC technology on all new and existing toll facilities. For the purposes of this study, it was assumed that any new toll facilities would be constructed with AVI/ETC equipment, and existing facilities would be converted to uniform AVI/ETC facilities on a countywide basis.

Exhibit 4.1 - Existing Toll Collection Facility

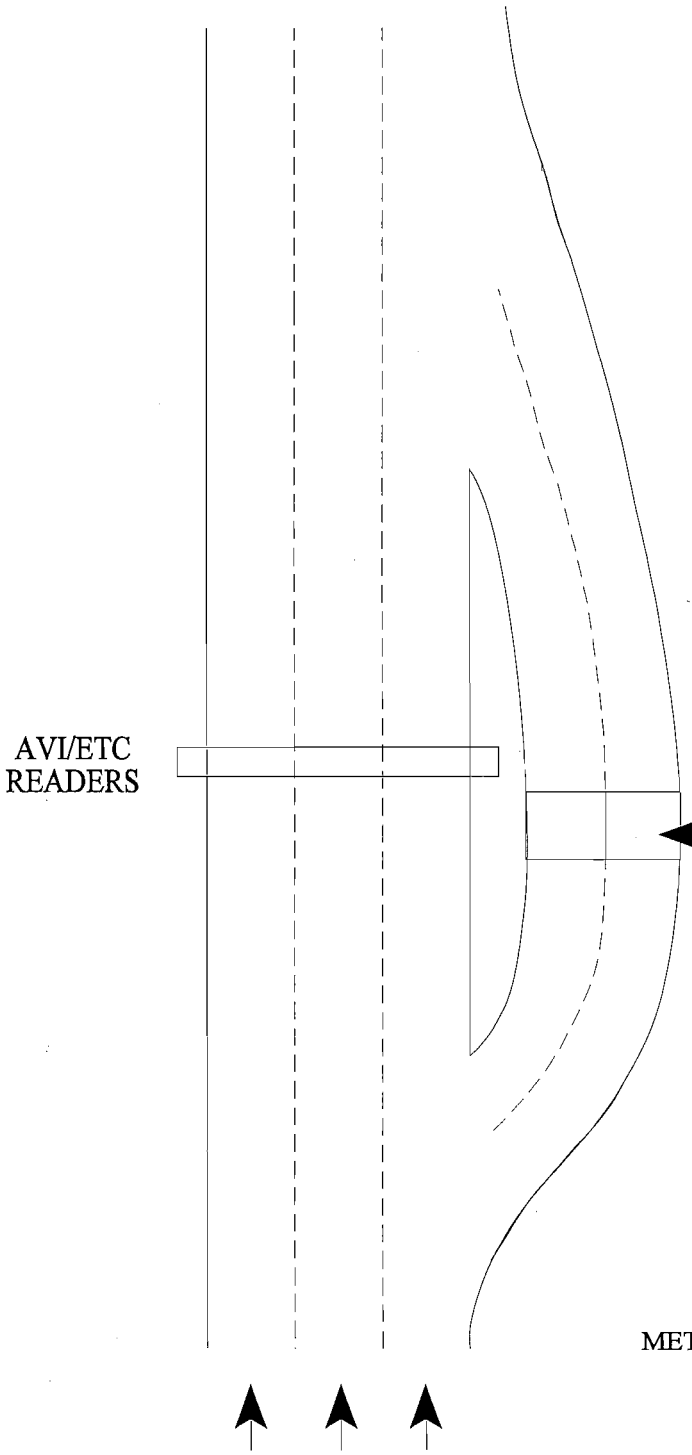

FIGURE 4.5

METRO-DADE ROAD PRICING STUDY

AVI /ETC SYSTEM CONCEPT

INFRASTRUCTURE PRIVATIZATION
AND FINANCE GROUP

4.4 Uses of Funds

Potential applications for use of road/congestion pricing revenues are many with the goal being to advance the state-of-the-art for improved congestion management. The following list summarizes some of the more popular funding opportunities with state and federal governments.

- Additional, revenue-producing road pricing projects, such as the SR112 extension or other unfunded projects.
- ITS projects, including AVI/ETC hardware and software applications, either for capital or operating costs.
- Fixed guideway transit or commuter rail, or high speed rail projects, either for capital or operating improvements.
- The acquisition or operation of express bus routes, possibly as part of an HOV lane pricing project.
- Any HOVL or busway project, especially those that promote a reduction in SOV's.

Congestion pricing revenues derived from one facility are generally used to improve operations in the immediate corridor. However, they could also be used in other corridors to promote regional improvements.

The use of pricing revenues must be placed in proper perspective during the decision-making process for selecting the appropriate strategy. The intended use of funds could mollify the degree of aggressiveness assumed for a pricing strategy.

For example, the placement of a peak period only toll on I-95 and the Palmetto Expressway would normally be considered "very aggressive" or "ultra aggressive." However, if the funds generated could change the outcome of the NW 27th Avenue extension of the Metrorail Extension from "not feasible" to "feasible," then the acceptability of the pricing strategy might be judged less harshly.

CHAPTER 5
IDENTIFYING FACILITIES ELIGIBLE FOR ROAD PRICING

The process used to determine Metro-Dade County facilities eligible for road pricing strategies was the normal functional classification system employed by both the County and the Department. Those classifications were slightly modified for purposes of this study but, generally were as follows:

- Tolled roads versus non-tolled.
- Interstate highways versus non-interstate.
- Expressways versus arterial streets.
- Causeways versus non-water crossing bridges.
- HOV-ways versus normal expressways or arterial streets.

The exception to the classification scheme above, was the consideration of the U.S.1 and U.S.27 corridors.

After a preliminary analysis based on potential project costs, projected congestion levels and revenues, some facilities were eliminated as candidates. These were I-75, Krome Avenue, and NE 203rd Street.

Figure 5.1 depicts a map of the roadway facilities considered for congestion pricing projects. These facilities can be grouped into the following categories: Existing tolled roads (expressways, causeways and bridges), existing non-tolled roads (primarily interstates, expressways, causeways and some arterial streets) and new limited access facilities (planned and unplanned). Principal arterial streets considered as potential candidates for road pricing include U.S. 1/Biscayne Boulevard, South Dixie Highway, and Okeechobee Road/US 27 as an expressway upgrade.

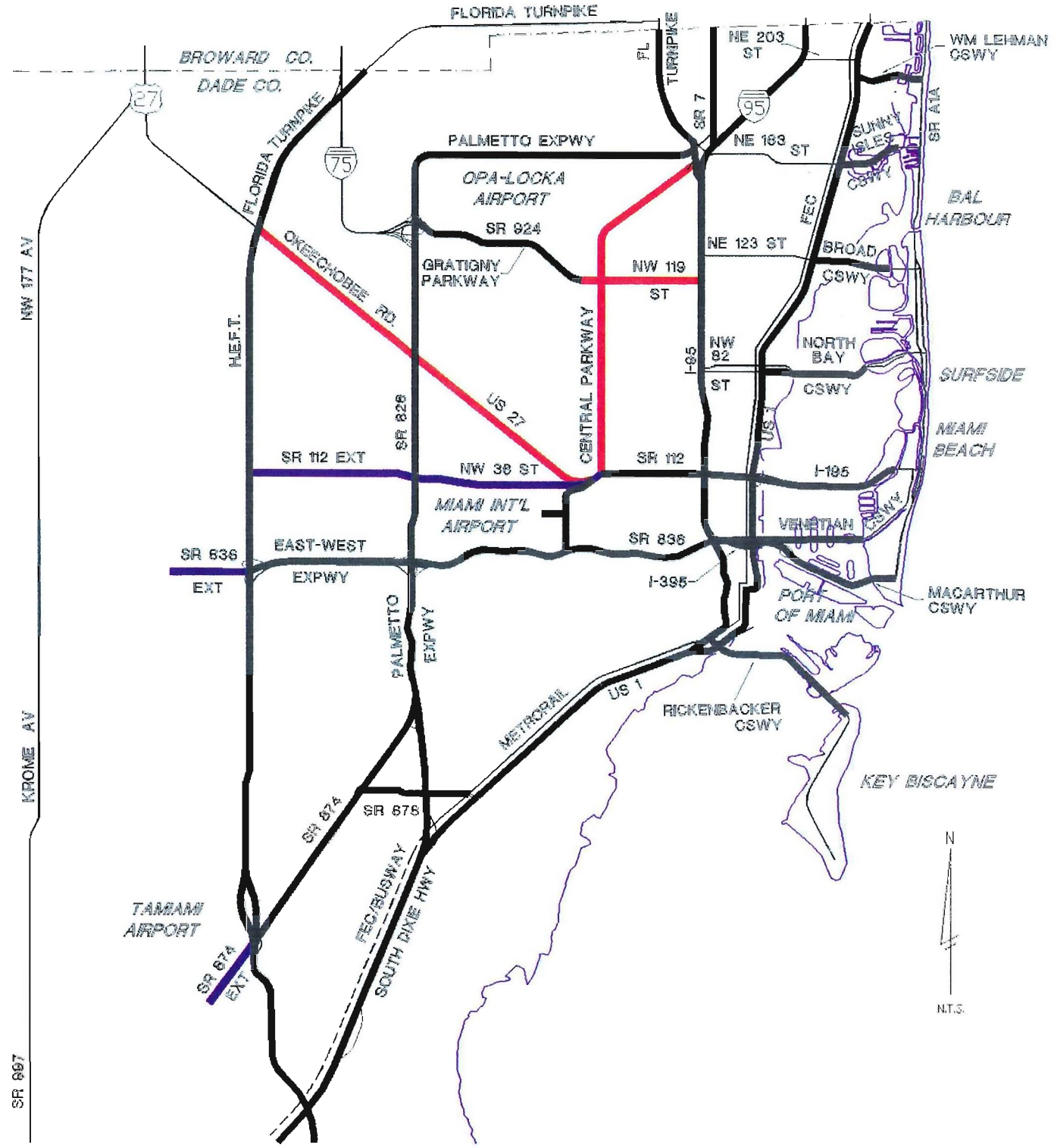

FIGURE 5.1
METRO DADE ROAD PRICING STUDY
FACILITIES CONSIDERED
FOR ROAD PRICING

LEGEND

- EXISTING
- PLANNED
- UNPLANNED

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CHAPTER 6
PACKAGING PROJECTS INTO PLANS

Numerous combinations of eligible roadway facilities and congestion pricing strategies were considered in structuring packages and sub-packages of congestion pricing projects. Initially eight packages of projects were developed from the eligible facilities previously identified. Those packages are graphically illustrated in Figures 6.1 through 6.7. The "Do Nothing" Package is not illustrated for obvious reasons.

The packages are summarized in Table 6.1, which shows the strategies and facilities to be included in each package. The strategies range from small increases of existing toll rates (Very Conservative) to applying 24 hour tolls on existing untolled facilities (Ultra Aggressive). The facilities considered include existing toll expressways in the Very Conservative plan to US 1/S. Dixie Highway and other arterial streets in the Ultra Aggressive plan.

Appendix C includes individual worksheets for each eligible facility within the packages which document the corresponding pricing strategy appropriate for that facility. For example, several different strategies might be applied to a given facility. I-95 might be combined with HOVL pricing or PPO (peak period only) pricing of the entire facility. This would constitute two (2) different road pricing "projects," which were evaluated separately. The set of strategies applied to I-95, for example, could be termed the I-95 "family" of road pricing projects. These individual tables describe advantages and disadvantages for each of the projects in a family. Those projects which survived a preliminary screening based on a subjective analysis of the cited disadvantages were further evaluated based on the study goals and on the following evaluation criteria: Revenue yield, congestion management, environmental benefits, public acceptability, and an overall rating that summarized those results.

Once strategies and facilities were packaged into plans of various levels of aggressiveness, the plans were presented to members of the project's Steering Committee. Comments were solicited, and the Steering Committee members were asked to evaluate the projects and plans. Their responses were used to make refinements to the recommended road pricing strategies.

6.1 Evaluation

The evaluation process resulted in eight different categories of aggressiveness which were cumbersome and somewhat difficult to differentiate, particularly with respect to their revenue yields. Subsequently, those categories were reduced to four by combining those that were similar. The resultant road pricing plans were: Do Nothing, Conservative, Moderate, and Aggressive. Table 6.2 summarizes the results of the evaluation process for the four "final" packages. Although somewhat subjective, this process narrowed the range of options under consideration and clarified some prior misgivings regarding the acceptability of certain strategies. Table 6.3 summarizes the strategies applied to those eligible facilities meeting the evaluation criteria and portrays the degrees of aggressiveness associated with those strategies.

TABLE 6.1

EVALUATION OF CONGESTION PRICING STRATEGIES

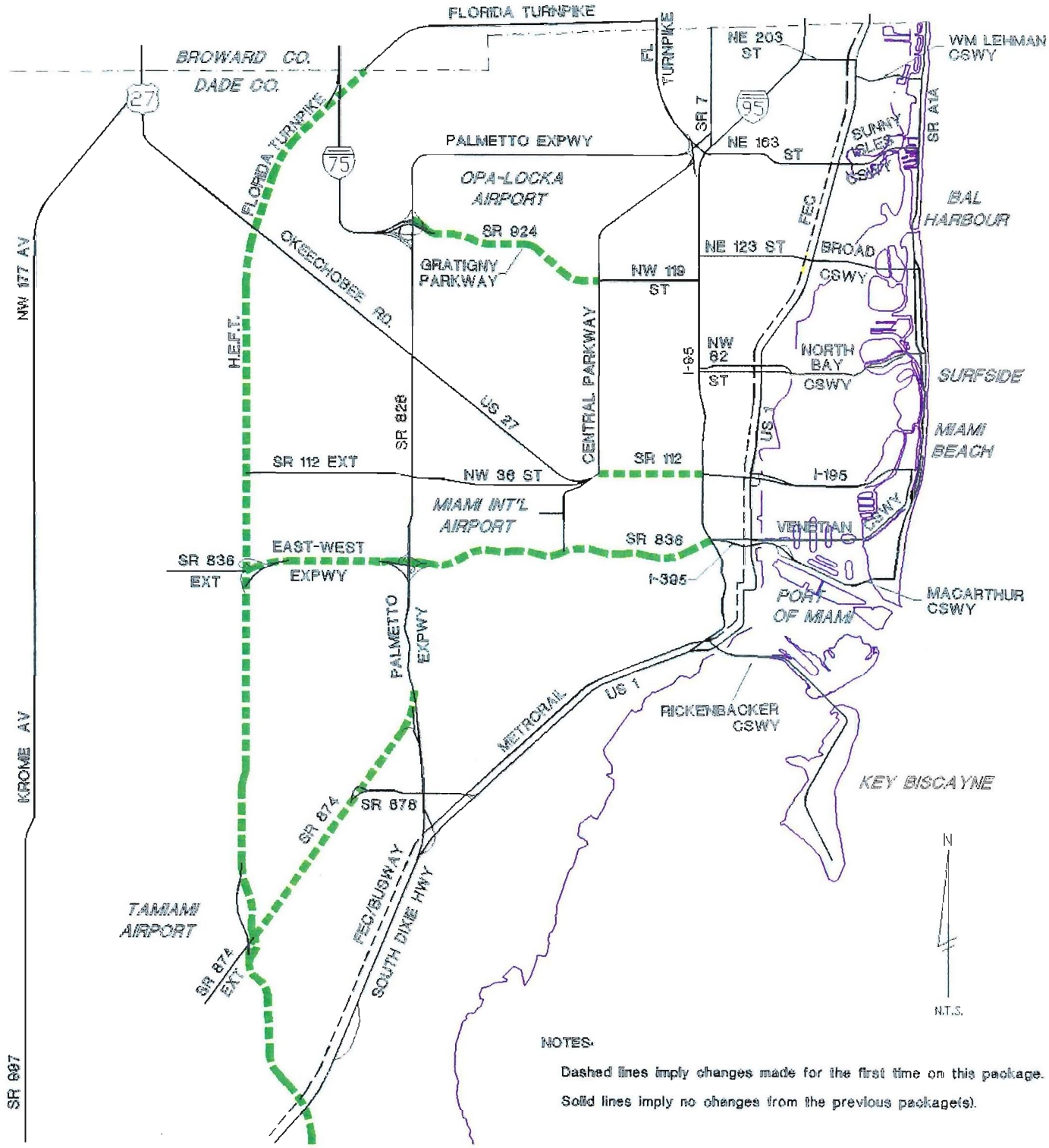
Criteria	Do Nothing	Very Conservative	Conservative	Moderate	Moderately Aggressive	Aggressive	Very Aggressive	Ultra Aggressive
STRATEGIES	Toll at existing rates	Raise tolls to 7 cents/mile	Raise tolls to premium rates (10-15 cents/mile) Add planned freeway extensions and toll at premium level	HOVL Pricing - Add a lane Congestion pricing of all tolled expressways and extensions Weekend/Holiday congestion pricing	Congestion pricing of all congestion "generators" HOVL - Add a lane HOVL Pricing - Take a lane	Busway (HOV-way) pricing PPO pricing of existing non-toll freeways	PPO pricing of existing non-toll causeways Add unplanned freeway extensions Congestion pricing of tolled causeways HOVL Take a lane pricing on arterials	24-hour pricing-existing non-toll freeways 24-hour pricing on arterials 24-hour pricing on non-toll causeways
KEY FACILITIES AFFECTED	HEFT Gratigny Parkway SR 112 SR 836 SR 874 Rickenbacker Cswy Venetian Cswy Broad Cswy	HEFT Gratigny Parkway SR 112 SR 836 SR 874	HEFT Gratigny Parkway SR 112 SR 836 SR 874 SR 112 Extension SR 836 Extension SR 874 Extension	SR 826 All toll facilites from the previous strategy Rickenbacker Cswy	MIA Golden Glades Interchange SR 826 I-95 SR 826	US 1/Biscayne Blvd (FEC Corridor) I-95 SR 826 SR 878	I-195/Julia Tuttle Cswy I-395/MacArthur Cswy North Bay Cswy Port of Miami Bridge Sunny Isles Cswy William Lehman Cswy Central Parkway Gratigny Parkway Ext US 27/Okeechobee Xwy (SR 826 - HEFT) Venetian Causeway Broad Causeway US 1/S Dixie Highway	I-95 SR 826 US 1/S Dixie Highway I-195/Julia Tuttle Cswy I-395/MacArthur Cswy North Bay Cswy Port of Miami Bridge Sunny Isles Cswy William Lehman Cswy
EVALUATION								
Revenue Yield	Worst	Poor	Fair	Good	Good	Very Good	Excellent	Best
Congestion Mgmt	Worst	Poor	Fair	Good	Good	Very Good	Excellent	Best
Environ. Benefit	Worst	Poor	Fair	Good	Good	Very Good	Excellent	Best
Public Accept.	Best	Very Good	Good	Fair	Poor	Very Poor	Very Poor	Worst
Overall	Very Poor	Poor	Fair	Good	Very Good	Excellent	Good	Poor
REVENUES* (NPV, IN $M)	180	682	1,507	5,422	5,729	6,152	7,174	12,951

HEFT: Homestead Extension of the Florida's Turnpike
MIA: Miami International Airport

PPO: Peak period only

* - Revenues, in millions of dollars cumulative from one package to the next, NOT additive.

Note: Revenues based on area-wide sketch planning assumptions believed to be reasonable, but have not been verified by detailed study. Kimley-Horn and Associates, Inc. cannot assume responsibility for the accuracy of theses forecasts until more detailed due diligence studies have been exercised.



NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

24 HOUR TOLL AT 7¢ PER MILE

FIGURE 6.1

METRO DADE ROAD PRICING STUDY

VERY CONSERVATIVE PACKAGE

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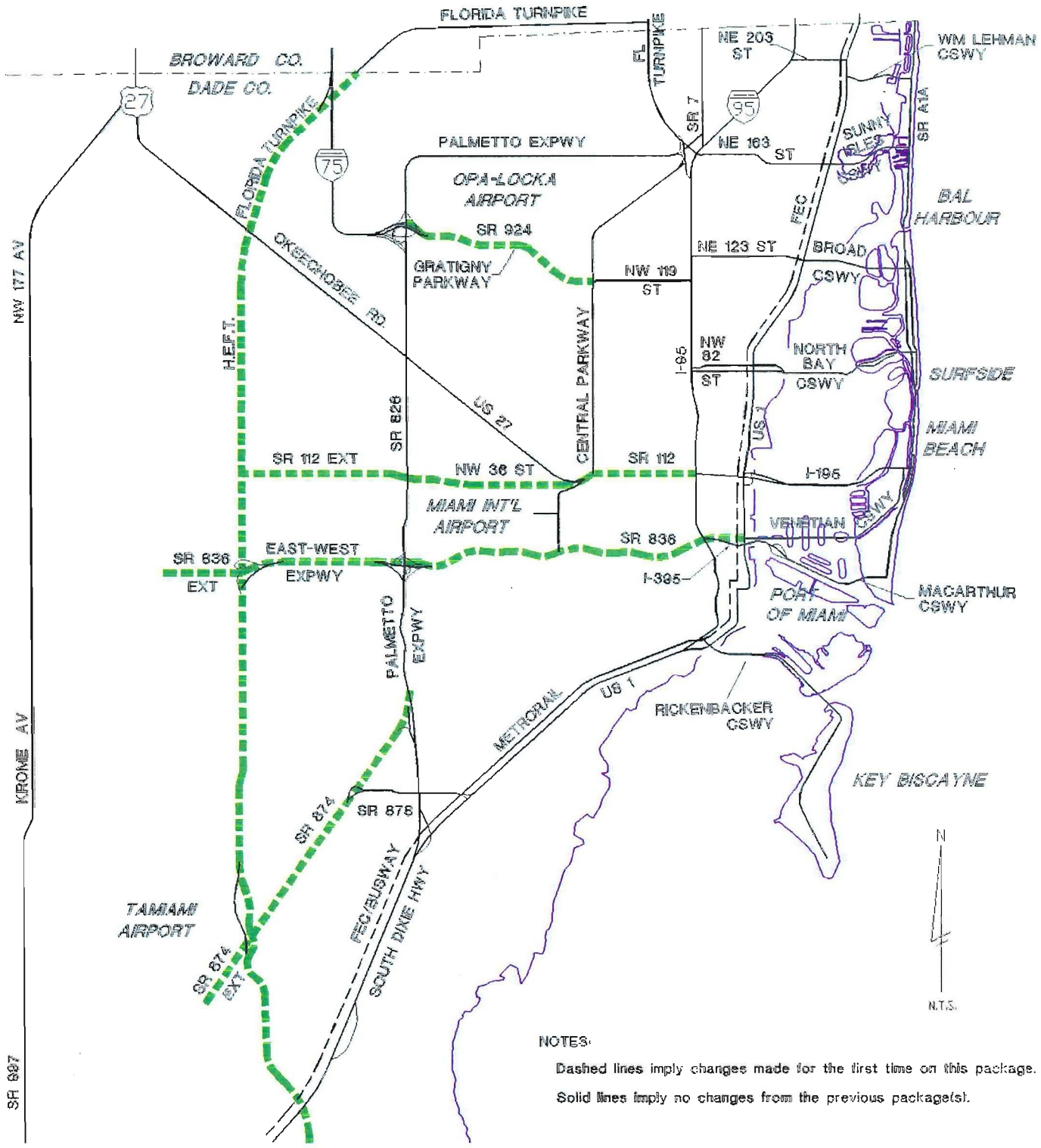

NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

24 HOUR STATIC TOLL (PREMIUM LEVEL)

FIGURE 6.2

METRO DADE ROAD PRICING STUDY

CONSERVATIVE PACKAGE

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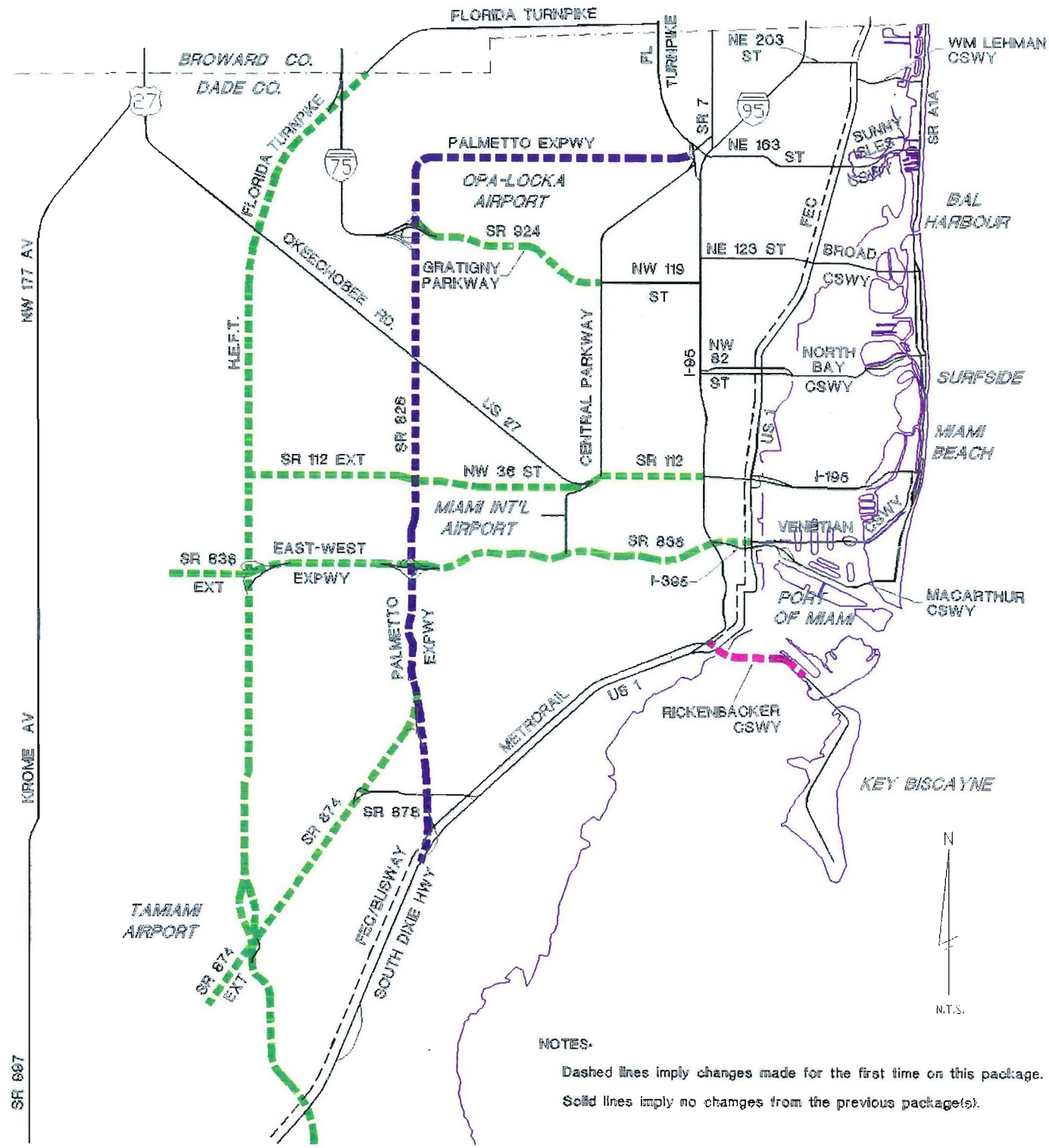
INFRASTRUCTURE PRIVATIZATION AND FINANCE GROUP



NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR TOLL WITH CONGESTION PRICING
- HOVL PRICING - ADD 1 LANE
- WEEKEND CONGESTION PRICING

FIGURE 6.3

METRO DADE ROAD PRICING STUDY

MODERATE PACKAGE

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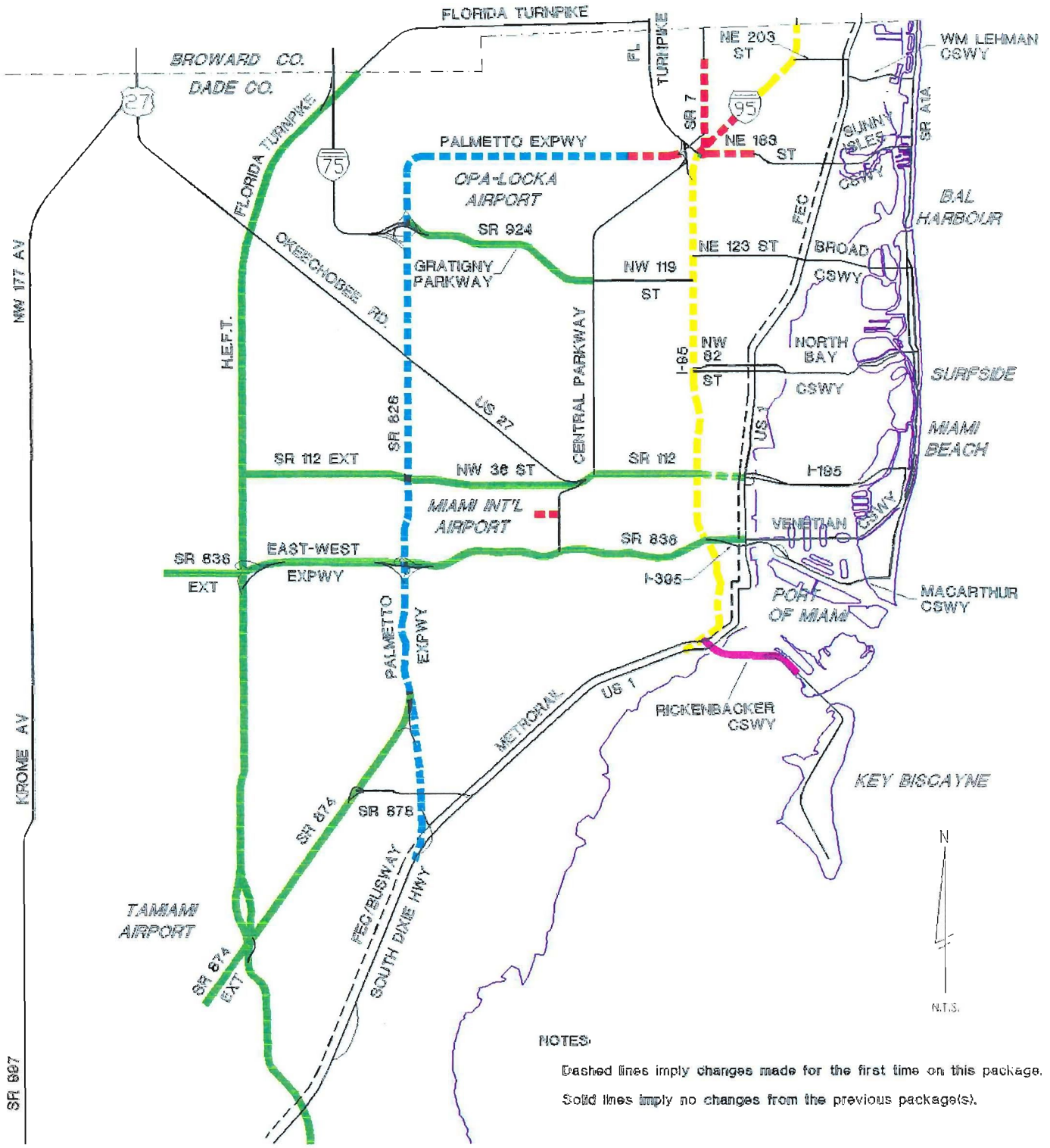

NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR TOLL (CONGESTION PRICING)
- PEAK PERIOD - ONLY PRICING
- HOVL PRICING - ADD 1 LANE & TAKE 1 LANE
- HOVL PRICING - TAKE 1 LANE
- WEEKEND CONGESTION PRICING

FIGURE 6.4

METRO DADE ROAD PRICING STUDY

MODERATLY AGGRESSIVE PACKAGE

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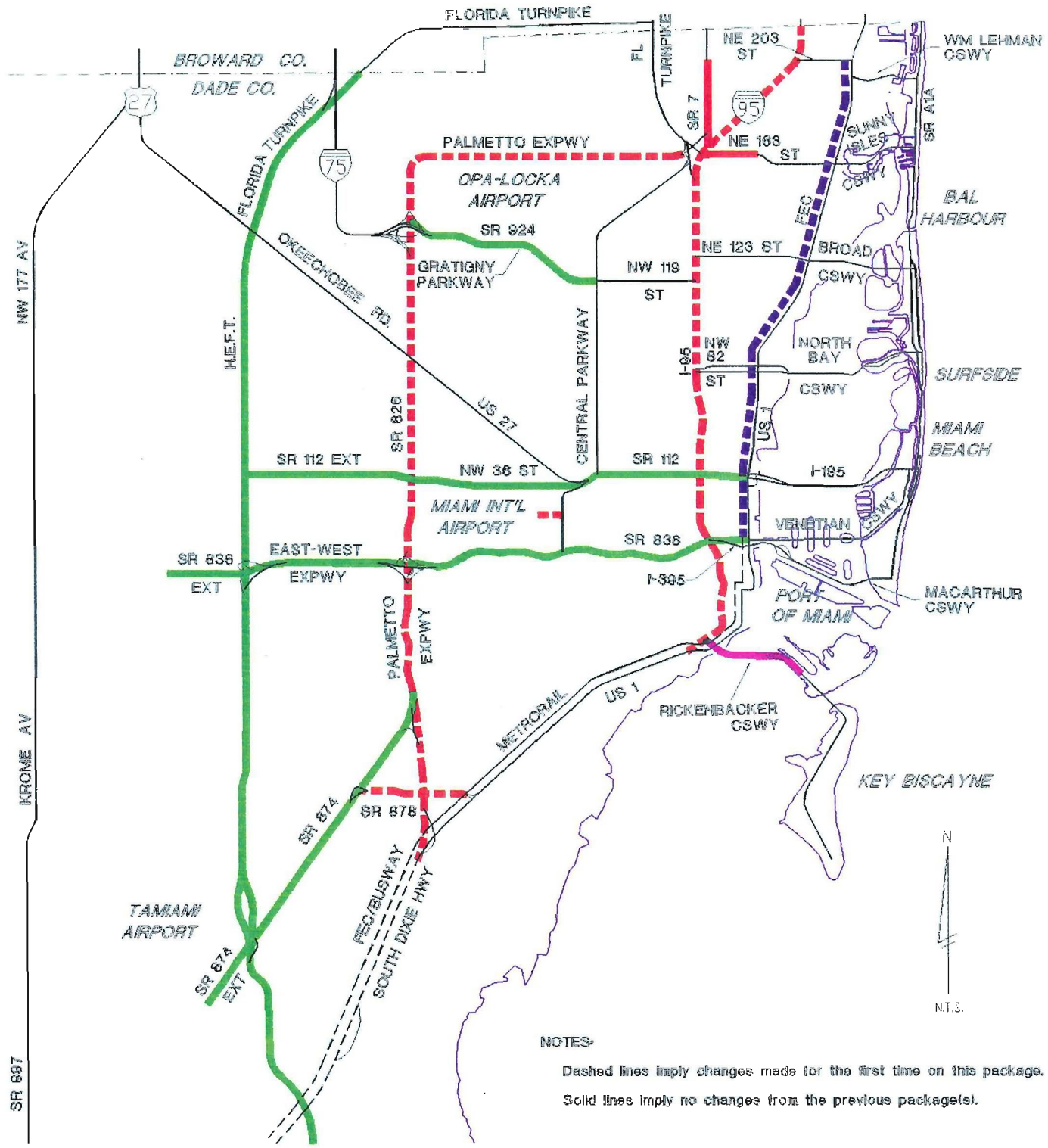

NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR TOLL (CONGESTION PRICING)
- PEAK PERIOD - ONLY PRICING
- BUSWAY/HOV WAY - ADD 1 LANE
- WEEKEND CONGESTION PRICING

FIGURE 6.5

METRO DADE ROAD PRICING STUDY

AGGRESSIVE PACKAGE

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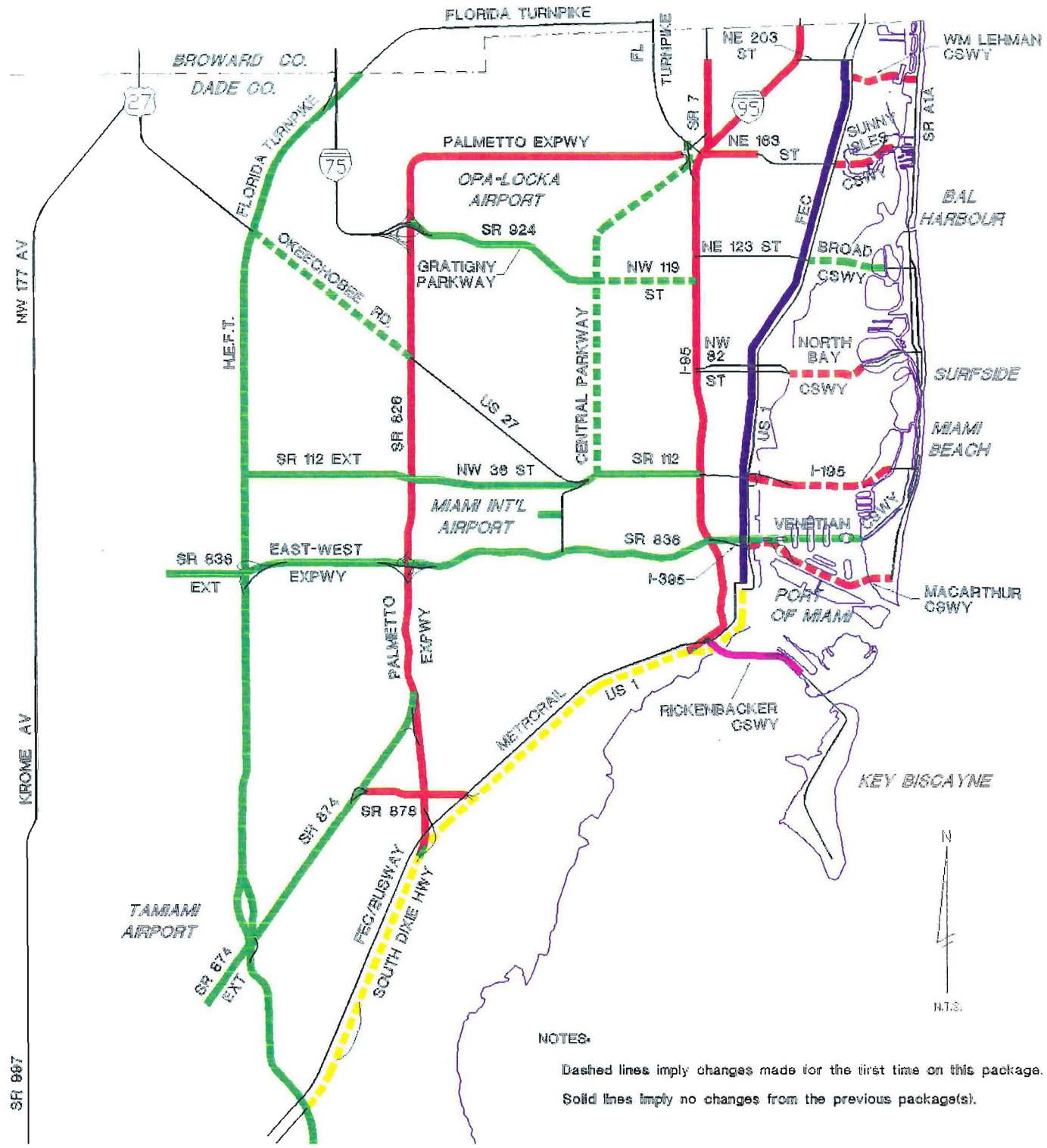
INFRASTRUCTURE PRIVATIZATION AND FINANCE GROUP



NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR CONGESTION PRICING
- PEAK PERIOD - ONLY PRICING
- BUSWAY/HOV-WAY - ADD 1 LANE
- WEEKEND CONGESTION PRICING
- HOVL PRICING - TAKE 1 LANE

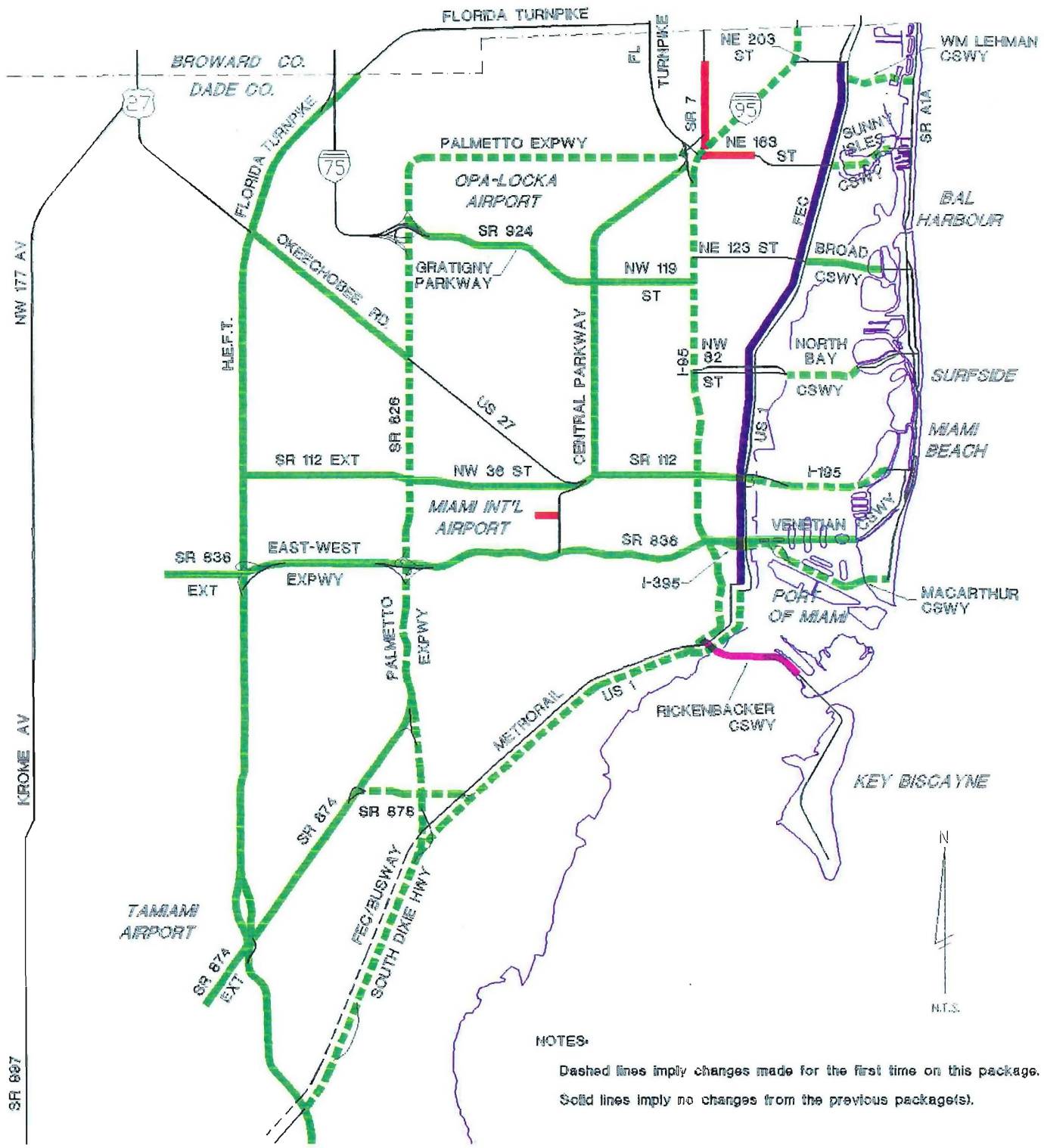
FIGURE 6.6

METRO DADE ROAD PRICING STUDY

VERY AGGRESSIVE PACKAGE

Kimley-Horn and Associates, Inc.

INFRASTRUCTURE PRIVATIZATION AND FINANCE GROUP



NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR CONGESTION PRICING
- PEAK HOUR - ONLY PRICING
- HOVL PRICING - ADD 1 LANE
- WEEKEND CONGESTION PRICING

FIGURE 6.7

METRO DADE ROAD PRICING STUDY

ULTRA AGGRESSIVE PACKAGE

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INFRASTRUCTURE PRIVATIZATION AND FINANCE GROUP

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The following tables provide a "capsule" presentation of each plan package:

THE "DO NOTHING" PACKAGE

DESCRIPTION:	Maintain the existing toll road system.
PROJECTS INCLUDED:	Existing toll roads.
USES OF FUNDS:	Minor projects, debt service, and operations and maintenance. Upgrade toll collection systems.
EVALUATION:	This package results in poor revenue yields. Will not create a regional congestion management strategy, or manage future congestion. Few environmental benefits, since SOV's will not be discouraged. Public acceptance will not be an issue, since no new toll roads will be built.
COMMENTS:	Poor overall rating.

THE CONSERVATIVE PACKAGE

DESCRIPTION:	Increase existing tolls to 7-10 cents/mile. Construct and toll all new planned expressways. Add a toll on the existing untolled section of SR 836 west of SR 826.
PROJECTS INCLUDED:	All existing toll roads. SR 112/Airport Expressway extension. SR 836/Dolphin Expressway extension. SR 874/Don Shula Expressway extension.
USES OF FUNDS:	ITS Projects - capital and operating expenses. Finance fixed guideway (LRT or heavy rail) along SR 836. Fund express buses - capital and/or operating costs. Minor project, debt service, and operations and maintenance Upgrade toll collection systems.

EVALUATION: Premium toll rates will provide good congestion management on the toll roads, but will increase traffic on non-tolled expressways. Will not have significant environmental benefits, since SOV's will still be the primary mode. Some benefits will be realized by increased LRT use along the east-west corridor and express buses.

COMMENTS: The overall rating is good since some benefits will be realized. The main objective of managing congestion will, however, not be accomplished.

THE MODERATE PACKAGE

DESCRIPTION: This package consists of items in the Conservative Package plus the following: Phased increases in toll rates up to premium levels. Implement HOVL pricing on selected non-toll freeways, and implement congestion pricing on all toll facilities and congestion "generators." PPO pricing on all non-toll freeways in the later stages.

PROJECTS INCLUDED: All projects included in the conservative package, plus:

Congestion pricing on all toll expressways.

SR 826/Palmetto Expressway HOVL Pricing-Add a lane.

HOVL Pricing-Take a lane on I-95.

Weekend congestion pricing on Rickenbacker Causeway, with residents travelling free.

AM peak hour-only congestion pricing (SB) at the Golden Glades interchange on SR 826 (W inbound), and US 441, including the Turnpike and I-95.

Miami International Airport (MIA) peak period only.

New HOV-way along FEC corridor parallel to Biscayne Boulevard/US 1 north of downtown Miami. HOV 3's travel free and HOV 2's at a discount. SOV's pay a premium rate.

Add PPO pricing on all non-toll freeways in the later stages of the plan.

USES OF FUNDS: ITS Project - capital and operating expenses, especially on I-95 and the Palmetto Expressway.

Fixed guideway capital and operating expenses (LRT or heavy rail) along SR 836 (MIA to Port of Miami), along the Metro-rail south leg, along I-195, and the MacArthur Causeway.

Express buses - capital and operating expenses along the HOV corridors, especially along US 1 south of Metro-rail, and along the FEC HOV-way north of downtown Miami.

Airport parking and roadway projects using airport tolls.

Adding HOV lanes on SR 826/Palmetto Expressway.

EVALUATION: This package contains a region-wide congestion management strategy that will significantly provide congestion relief. All major freeways are included, so traffic cannot clog other "free" facilities. SOV's will be heavily discouraged when premium toll rates take effect, and HOV and transit use will increase. Very good revenue yields can fund major transportation projects. The environment will benefit from decreased SOV use and increased transit use. Public acceptance may be difficult, but can be mollified by the uses of toll revenues.

COMMENTS: Strategy should provide regional improvements to the entire transportation system and environment. The overall rating for this package is very good.

THE AGGRESSIVE PACKAGE

DESCRIPTION: Moderate package plus implementation of 24-hour congestion pricing on all existing non-toll expressways, causeways, and on selected arterial streets. Build and toll unplanned expressways.

PROJECTS INCLUDED: All the projects in the Moderate Package, plus:

24-hour congestion pricing on US 1/South Dixie Highway.

24-hour congestion pricing on I-95, Palmetto Expressway.

24-hour congestion pricing on all causeways (Lehman, Sunny Isles, North Bay, MacArthur, Julia Tuttle, Venetian and Broad), with all residents travelling free.

24-hour congestion pricing on the Port of Miami bridge, except for port employees.

Central Parkway, Okeechobee Road (from SR 826 to HEFT), Gratigny Parkway extension to I-95.

USES OF FUNDS: Same as for Moderate Package.

EVALUATIONS: This package will generate excellent revenue yields, and effect a regionwide congestion management program. Environmental benefits would also be significant. However, public acceptance would be very difficult, especially with respect to 24-hour tolls on existing "free" roads. Therefore, many of the listed projects may never get approved.

COMMENTS: Overall a good plan to reduce congestion, but should not receive much public support for the aggressive projects.

TABLE 6.2

PLAN EVALUATIONS

DO NOTHING PACKAGE

RATING / CRITERION	EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
REVENUE YIELD					X
CONGESTION MANAGEMENT					X
ENVIRONMENTAL BENEFITS					X
PUBLIC ACCEPTABILITY	X				
OVERALL RATING					X

CONSERVATIVE PACKAGE

RATING / CRITERION	EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
REVENUE YIELD			X		
CONGESTION MANAGEMENT			X		
ENVIRONMENTAL BENEFITS			X		
PUBLIC ACCEPTABILITY			X		
OVERALL RATING			X		

MODERATE PACKAGE

RATING / CRITERION	EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
REVENUE YIELD		X			
CONGESTION MANAGEMENT		X			
ENVIRONMENTAL BENEFITS		X			
PUBLIC ACCEPTABILITY				X	
OVERALL RATING		X			

AGGRESSIVE PACKAGE

RATING / CRITERION	EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
REVENUE YIELD	X				
CONGESTION MANAGEMENT		X			
ENVIRONMENTAL BENEFITS		X			
PUBLIC ACCEPTABILITY					X
OVERALL RATING			X		

TABLE 6.3

CONGESTION PRICING PROJECTS VS AGGRESSIVENESS

Facility	Strategy	Do Nothing	Conservative	Moderate	Aggressive
Broad Cswy	24 - Hour Congestion Pricing	N	N	N	Y
Central Parkway	24 - Hour Congestion Pricing	N	N	N	Y
Florida's Turnpike HEFT	24 - Hour Congestion Pricing	N	N	Y	Y
Gratigny Parkway	24 - Hour Congestion Pricing	N	N	Y	Y
I-195 & Julia Tuttle Cswy	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y
I-395 & MacArthur Cswy	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y
I-95	HOVL Pricing - Take a lane	N	N	Y	N
	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y
MIA	24 - Hour Congestion Pricing	N	N	Y	Y
NE 167 St / SR 826	PPO WB Congestion Pricing	N	N	Y	Y
North Bay Cswy	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y
Okeechobee Rd NW of SR 826	24 - Hour Congestion Pricing	N	N	Y	Y
Port of Miami Bridge	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y
Rickenbacker Cswy	Weekend Premium Cngstn Pricing	N	N	Y	Y
SR 112 / Airport Expwy	24 - Hour Congestion Pricing	N	N	Y	Y
SR 112 / Airport Expwy Ext	24 - Hour Congestion Pricing	N	N	Y	Y
SR 7 / US 441	PPO SB Congestion Pricing	N	N	Y	Y
SR 826 / Palmetto Exwy	HOVL Pricing - Add a lane	N	N	Y	N
	HOVL Pricing - Add + take a lane	N	N	Y	N
	PPO Congestion Pricing	N	N	Y	Y
	24 - Hour Congestion Pricing	N	N	N	Y
SR 836 / Dolphin Expwy	24 - Hour Congestion Pricing	N	N	Y	Y
SR 836 / Dolphin Expwy Ext	24 - Hour Congestion Pricing	N	N	Y	Y
SR 874 / Don Shula	24 - Hour Congestion Pricing	N	N	Y	Y
SR 874 / Don Shula Ext	24 - Hour Congestion Pricing	N	N	Y	Y
SR 878 / Snapper Creek	PPO WB - Congestion Pricing	N	N	Y	Y
Sunny Isles Cswy	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y
US 1 / Biscayne Blvd	HOVL Pricing - Add lanes (+Busway)	N	N	Y	Y
US 1 / S Dixie Hwy	HOVL Pricing - Take a lane	N	N	N	Y
	24 Hour Congestion Pricing	N	N	N	Y
Venetian Cswy	24 - Hour Congestion Pricing	N	N	N	Y
William Lehman Cswy	PPO Congestion Pricing	N	N	N	Y
	24 - Hour Congestion Pricing	N	N	N	Y

Finally, traditional toll revenue bond financing policies were examined in relation to privatized financing and pricing strategies. Because one of our primary objectives is to enhance transportation revenues and create capital, it is important to appreciate the significant differences between these two financing options in a congestion pricing environment. The differences are described in Table 6.4.

TABLE 6.4

TRADITIONAL PUBLIC VS CONTEMPORARY PUBLIC/PRIVATE FINANCING

Strategy	Traditional Public Financing	Contemporary Private Financing
Toll Rates	4¢ to 6¢/mile	10¢ to 15¢/mile
Congestion Pricing	No	20¢ to 25¢/mile
Toll Indexing	No	2% to 4%/year
Deferred Debt Financing	No	Yes
Equity Financing	No	Yes

Toll indexing is a process whereby tolls are adjusted annually to reflect inflationary changes in the economy. The Consumer Price Index was assumed to be 3% per annum. This is a moderately aggressive strategy and can only be implemented efficiently with ETC equipment.

During the package development and evaluation process, certain assumptions were made regarding elasticity parameters. Included in the packaging process was a realtime, dynamic pricing system for the HOV/Express lanes. This pricing system was designed to keep the HOV/Express lanes operating at LOS "C", or better, at all times. The rationale for this is two-fold: to continue to provide preferential treatment for HOV's; and to provide an incentive for low occupancy vehicles (LOVs) to pay for the privileged use of the lanes. To accomplish this, realtime pricing messages and variable pricing is recommended. It was assumed for purposes of our analysis that the average pricing structure would be designed within the pricing regimes shown in Table 6.5.

TABLE 6.5

HOVL PRICING REGIMES IN 1994 DOLLARS (IN CENTS PER MILE)

Passengers Per Vehicle	Off-Peak Toll Rate Range	Peak Toll Rate Range	Peak Range Per Passenger
4 or more	0	0	0
3	0	0	0
2	7 to 10	10 to 15	5 to 7½
1	10 to 15	20 to 25	20 to 25

The final pricing structure will depend on the outcome of more detailed studies, the public hearing process and the actual congestion and financial performance encountered.

6.2 Evaluation Interviews

Evaluation of the various road pricing strategies and packages was also carried out in the form of interviews conducted with a sample of key policy makers. The consulting firm of Barbara Howard and Associates, Inc., was retained to conduct the interviews. Interviewees included selected Dade County Commissioners, and members of various transportation committees. A total of thirteen interviews were conducted with key transportation policymakers in Dade County. The questionnaire used for this survey is attached as Appendix D. The following is a broad overview of the responses:

1. There is strong support for increasing the toll rate on the existing Dade County Expressway system.

2. There is mixed, with a majority negative, reaction to constructing the Central Parkway as a toll facility in the CSX corridor.

3. There is support for privatized delivery of the Central Parkway concept.

4. There is support for a new expressway in the Okeechobee Road corridor.

5. There is mixed reaction to implementing congestion pricing for non-residents on the Rickenbacker Causeway.

6. There is strong support for implementing the added lanes on the Palmetto Expressway as HOV lanes.

7. There is support for HOVL pricing, generally.

8. There is mostly negative reaction to imposing tolls on existing free causeways.

9. There is mixed, but slightly positive support for imposing a peak period toll on South Dixie, if the toll collection system is fully electronic (no toll booths) and if the revenue is used to support Metrorail.

10. There is mixed, but slightly positive support for moderate tolls on I-195 and I-395 if the tolls are used to support the east-west transit line.

11. There is positive support (coupled with small, but strong opposition to) construction of the FEC busway as a 3-lane reversible HOV-way coupled with "sale" of surplus capacity to SOV's.

12. There is support for converting existing general use lanes on I-95 or other expressways to HOV "pricing" lanes.

13. There is support for tolls on existing "free" expressways if there is a way to compensate the poor.

14. There is mixed reaction to placing tolls on existing "free" expressways, like I-95 and SR 826 in the peak period only. However, this mixed reaction becomes positive, if congestion, air quality and/or the feasibility of the Metrorail Extension is improved.

15. There is mixed, but positive support for 24-hour tolls on I-95 and SR 826 if the benefits enumerated above are created.

16. There is positive support for selling excess ramp-metering bypass capacity to SOV's at rates of 50¢ to $1.00 depending on the time of day.

The reader is cautioned that the opinions gathered above do not represent a broad cross-section of public or political opinion, and were considered, but not expressly used to dictate the conclusions and recommendations of this study.

CHAPTER 7
COST AND REVENUE FORECASTS

Toll revenue forecasts were produced using a proprietary congestion pricing computer model developed by Kimley-Horn's Infrastructure Privatization and Finance Group.[2] The process used by the model is outlined below.

1. Input the traffic and roadway data.
2. Compute the 24-hour toll parameters.
3. Compute the peak period only toll parameters.
4. Compute the HOV lane toll-pricing, and demand parameters.
5. Calculate Year 1 revenues for all the different projects.
6. Compute the multi-year annual revenue forecasts for all the projects.
7. Compute the multi-year annual revenue forecasts for all the packages:

   Do-Nothing, Conservative, Moderate, and Aggressive.
8. Print/Display the revenue comparisons between each of the packages.

The Congestion Pricing Model is a revenue analysis model which, with given input data, will forecast annual revenues for the alternative Metro-Dade Road Pricing Plans. The model requires numerous input parameters which are described below. With these input parameters, the model calculates several outputs, which are discussed in a subsequent chapter.

7.1 Model Inputs

The revenue model requires several input variables, consisting mostly of project-specific data, traffic data, pricing/elasticity data, and financial data. The following base variables are required:

- Length of the facility.
- Total vehicle miles of travel along the entire length of the facility for the base year.
- Total vehicle miles of travel along the entire length of the facility for the future year.

[2] *It must be noted here that all of the traffic, revenue, and Net Present Value (NPV) estimates in this report are based on gross area-wide sketch planning assumptions that are believed to be reasonable, but have not been verified by detailed study. Kimley-Horn and Associates, Inc., therefore, cannot assume responsibility for the accuracy of these forecasts until more detailed due diligence studies have been exercised.*

7.2 Model Assumptions

Exact revenues that would be generated by any planned congestion pricing program are difficult to estimate. They vary with project location, market conditions, the state of the economy, the amount of perceived traffic congestion, transit availability and convenience, gas prices, and several other intangible factors. Every person's decision to use a toll road is influenced by a myriad of factors. However, using reasonable assumptions, along with a knowledge of the area, the projected revenues can be forecasted to a "ballpark" level of accuracy. The following assumptions were made:

- Percent HOV3's and HOV2's - Field data collected on I-95 were used to determine the percentage of vehicles with three or more occupants (HOV3's), and the percentage of vehicles with two occupants (HOV2's). The data were included in the Frederick R. Harris report on the System Maintenance of Traffic, based on trip origin/destination tables. The occupancy depends on various factors including time of the trip (AM or PM), and trip purpose (home based work, home based other, and non-home based). It was concluded that approximately 5% of I-95 traffic during the peak hours consists of HOV3's, and another 15% consists of HOV2's. These were the percentages used in the model.

- HOVL Non-Utilization Factor - It has been observed that there is a percentage of HOV's that, although eligible to use HOV lanes, choose not to do so. The model assumed a non-utilization factor of 30%. That is, 30% of eligible HOV's choose not to use the HOVL. This is during normal freeway operations, not as a result of any toll imposition. The diversions caused by implementing tolls on non-toll freeways is further discussed below.

- Diversion Percent - When a toll is imposed on a current non-tolled facility, or if the current toll rate is increased, a percentage of drivers will be diverted from the facility. That is, they would either take a different route, or if the toll is only applied during peak hours, then they may travel during a different time. The percentage diversion depends on the facility and on the time the tolls are applied. The diversion percentages that were assumed in the model are shown below in Table 7.1. The actual diversion should be less than those shown in Table 7.1. These assumptions are made to insure a level of conservatism in the revenue yield estimate.

TABLE 7.1

DIVERSION PERCENTAGES

Type of Facility	Daily Toll Diversion	PPO Toll Diversion
Causeway	10%	10%
Existing Toll Facility	30%	N/A
New Toll Facility	45%	N/A
Existing Non-toll Facility	45%	50%
Existing Arterial Street	N/A	20%
Special Generator (MIA)	20%	N/A

- **T-Factor** - The T-factor is the truck factor, or the percentage of freeway traffic composed of trucks. This was assumed to be 3% for all the facilities. The T-factor is used to determine the truck revenues; trucks are assumed to pay three times the automobile toll rate.

- **K-Factor** - The K-factor is the percentage of the total 24-hour traffic volume that occurs during the peak hour. This number has been derived from the average daily traffic on the freeway network and a system-wide average of 8% is used throughout the model.

- **D-Factor** - This is the directional factor used in computing the revenues for HOVL pricing and for PPO pricing. This represents the effect of the peak direction, that is, during the peak hours, 60 percent of the traffic is travelling in the peak direction.

- **ADT Multiplier** - This is a multiplier that is used to factor daily revenues up to annual revenues. The factor used was 290, to account for weekends, holidays, and special events.

- **Incident Hours per Year** - This is the number of hours per year assumed to be taken up with incidents on a freeway. This value is used in the calculation of revenues for peak hour and HOVL pricing strategies. It assumes that during congestion caused by incident, more people would pay to use the HOV lanes than normal. The value for I-95 is 50 hours per year, while the value for all other facilities is 30 hours per year. A higher value on I-95 was used to reflect the high rate of incidents on the already-heavily congested facility.

- **Number of Peak-Period Hours** - This is the value used in HOVL pricing to determine the length of time in one year that HOVL pricing is applied. It assumes three hours per day, five

days per week, fifty-two weeks per year, and then adds the number of incident hours. The net value is 890 hours per year for I-95, and 870 for all the other facilities.

- **Toll Rate Schedule** - The following toll rate schedule was incorporated into the model for freeways and arterials: SOV's are charged at the premium rate of 25 cents per mile. HOV2's are assumed to pay a discounted rate of 12 cents per mile. HOV3's travel free. Trucks are charged at three times the SOV rate, that is, 75 cents per mile. All causeway tolls were assumed to be $1.50 per transaction.

  To account for inflation and growth in tolls over time, a 4 percent per year growth factor was used for the toll rates during the first twenty years of operation. For new toll facilities, including the addition of HOV lanes, a 5 percent growth rate was used for the first twenty years. Subsequent to that time, a 3 percent growth in tolls was assumed from years 21 through 30, and 2 percent was used from years 31 onwards.

- **Causeway Residents** - It was assumed for the purposes of this analysis that beach residents using the causeways would not be charged a toll. Based on data from Dade County, the percentage of "non-emblem", or paying traffic was between 55% and 65% on the Venetian and Rickenbacker Causeways, on which there are existing tolls. The percentage assumed for this model was 50%, a conservative estimate.

- **HOVL Capacity** - This is the physical capacity of the HOV lane. Data collected in several parts of the country have suggested that due to the increasing aggressiveness of commuters, especially in urbanized areas such as Dade County, as many as 2,000 to 2,200 vehicles per hour can use a single freeway lane. This model uses a value of 1,900 vehicles per lane, which is conservative, since revenues would increase if more vehicles were to use the HOV lane.

- **Operations and Maintenance (O&M) Costs** - The O&M costs used in the model varied with the type of facility and the pricing strategy applied. It was computed at a rate of $100,000 per mile for freeways and arterial streets. For causeways, it was based on the cost per transaction. A value of 25 cents per transaction was used for all causeways except the Venetian, and Rickenbacker, where actual O&M costs were used. Based on FDOT data, O&M costs were 27 cents and 46 cents per transaction, for the Venetian and Rickenbacker Causeways respectively. The O&M costs were assumed to grow at 3% per year.

- **Growth Rates** - The annual growth rates for all the facilities were determined based on FSUTMS model runs. Traffic projections were obtained for the Base Year and Year 2010 networks, and the net growth in traffic for all links making up a facility were calculated. These were in general found to range between 1 and 3 percent, typical for a county in which there are no major increases in roadway capacity planned. The rates used in the model were the calculated rates for each facility. However, when capacity was being added, such as for a new facility, or for an add-a-lane

project this growth rate was increased by 2% to account for the added capacity. The 2% value is a generalized growth rate for the whole county.

- **HOVL Off-Peak Direction Factor** - In general HOVL pricing would generate revenues from traffic moving in the peak direction. On I-95, for example, the peaking characteristics are fairly significant, with pronounced AM southbound and PM northbound peaks. However, some use of the HOV lanes in the off-peak direction is also expected. This model increases the revenue generated by the peak direction HOV lane by 5% to account for revenue generated in the off-peak direction.

- **Peak Period Only Revenue Factor** - The peak period-only congestion pricing strategy is assumed by the model to be applied to the entire freeway in both directions. However, it would generally be applied in such a way that the off-peak pricing rate would be set at half the peak direction pricing rate. Therefore, the revenue calculation must account for this: 60% of the traffic paying at full price, plus 40% percent of the traffic paying at half price. A net PPO revenue factor of 0.8 results.

- **Earliest Opening Year** - This is the year in which any particular project may be expected to open. It was assumed that any project which only involved the implementation of ITS elements, and not major road widening or construction, could open in 1997. These include projects with "take-a-lane" strategies, PPO, and 24-hour congestion pricing. Projects that involved "add-a-lane" pricing strategies were assumed to be operational in 1998. Major construction projects such as expressway extensions and new roadways, were assumed to open in the year 2000.

- **Capital Costs** - Capital costs for ITS implementation typically runs in the order of $1,000,000 per mile, and this was used on the model. Costs for new planned expressway extensions were obtained from the MPO and used directly in the model. New unplanned expressways were calculated based on rates contained in the FDOT cost guidelines.

7.3 Model Results

The outputs from the revenue model are presented and summarized in Appendix E. The tables include individual project revenues, plan revenues, and a summary table showing a revenue comparison of the eight plans. The project and plan sheets project revenues from 1997 through Year 2030. The individual yearly forecast of annual revenues are based on a straight-line projection between 1997 (or the actual project start date) and Year 2030. Consideration was given to accommodate annual growth in traffic and toll rates.

Table 7.2 summarizes the revenue results for the four congestion pricing packages. Included also are the net present values (NPV) of those revenues in the 1994 dollars. The NPV's were determined using an assumed discount rate of 8 percent. The total net revenues are the sum of the net annual revenues which is the difference between the annual revenue and the annual operations and maintenance (O&M) costs.

TABLE 7.2

YEAR 1997 TO 2030 REVENUE SUMMARY

Congestion Pricing Packages	Year 1 Annual Revenues	Year 2030 Total Net Revenues	Year 2030 Net Present Values
Do Nothing	$10.4M	$0.6B	$0.2B
Conservative	$87.2M	$5.0B	$1.5B
Moderate	$301.3M	$24.5B	$6.2B
Aggressive	$610.0M	$46.6B	$13.0B

Indexing is not a factor until the Moderate package strategies are introduced. The encouraging news is that the differences in total net revenues amongst the packages agrees with the implications from the strategies constituting the packages.

In examining the several levels of revenue, it becomes readily apparent that the most significant contributors are the 24-hour congestion pricing scenarios. At the same time, these strategies are also the least acceptable from a political and social stand point. It appears that the most "implementable" rationale is the Moderate package which offers considerable revenue generation without implementation of overly controversial strategies.

CHAPTER 8
RECOMMENDATIONS

Based on the evaluation factors previously presented in combination with the revenue analysis from the prior chapter, it is recommended that Dade County implement (in phases) the Moderate Package of congestion pricing strategies. All recommendations are being made at a sketch-planning level of analysis. Therefore, each project recommendation should be confirmed by a detailed, project-specific feasibility study prior to implementation. In general, the recommendations developed as part of this study are the result of the following considerations:

1. The MPO should adopt a road pricing policy for Metro-Dade County.

2. Certain strategies, such as raising tolls on existing toll facilities up to reasonable national norms, should be instituted as soon as possible to create more revenue for modernizing existing toll operations in the short term, and creating capital for more assets in the long term.

3. All existing toll facilities should be converted from manual operation to automated AVI/ETC operation as soon as possible to reduce operating costs and increase net revenues.

4. All toll facilities (city, county, and state) should utilize consistent AVI technology, such as that being deployed by Florida's Turnpike, to reduce operating costs and increase net revenues. A centralized computer-based management control center for all city, county and state toll facilities should be implemented to further reduce operating costs.

5. An application should be made for federal funding under the ISTEA (Section 1012(b)) Congestion Pricing Pilot Program for selected elements of the Metro-Dade Road Pricing Plan, including: AVI technology and congestion pricing.

6. To effectively deal with Year 2030 traffic volumes, Dade County must implement certain congestion pricing strategies regardless of their political and/or social "acceptability".

7. In the final analysis, the "best" package is one consisting of a good balance between public acceptability and revenue generating ability.

From the revenue tables in Appendix E (which are categorized by strategy and facility), it was determined that certain strategies are more "cost effective" in the sense that they provide considerable net revenue return. That examination provided a phasing concept for the Moderate Package which is illustrated in Figures 8.1 through 8.4. The following list summarizes the specific road pricing project by phase over the next 15 to 20 years. Table 8.1 further summarizes the recommended projects by phase within each pricing strategy.

- Phase 1 (2 years) 1995 - 1996

  - Convert all existing tolled facilities to AVI/ETC.
  - Apply for FHWA grant under the Congestion Pricing Pilot Program and implement congestion pricing on selected facilities in 1996-1997.
  - Increase existing 24-hour tolls (first to 7¢/mile and then to 12¢/mile) on all existing tolled expressways including a new toll plaza on SR836 west of SR826 and bi-directional tolls on existing SR836/SR112 plazas.
  - Build 2 "priced" HOVLs (3 passengers or more) on S.R. 826.
  - Prepare PD&E studies and obtain location/design approval of the SR112 Extension, the SR836 Extension, and the SR874 Extension.
  - Implement weekend/holiday congestion pricing on the Rickenbacker Causeway.

- Phase 2 (4 years) 1997 - 2000

  - Implement congestion pricing on all existing tolled expressways.
  - Implement ramp-metering bypass pricing on I-95.
  - Construct the planned freeway extensions: SR 836, SR 874, SR 112 and implement congestion pricing.

- Phase 3 (5 years) 2001 - 2005

  - Take a lane on I-95 and implement HOVL pricing (2 HOV lanes in each direction, total).
  - Take a lane on S.R. 826 and implement HOVL pricing.

- Phase 4 (5 years) 2006 - 2010

  - Apply PPO congestion pricing to all "generators" including (AM peak) approaches to the Golden Glades interchange, and the entrance to the Miami International Airport.
  - PPO congestion pricing on all existing non-toll freeways.
  - Construct U.S. 1/Biscayne Boulevard busway/HOV-way and sell the surplus capacity to SOV's at a premium.

The application for federal funding under ISTEA's Congestion Pricing Pilot Program should include the following projects:

a. ETC on all toll facilities
b. Implementation of Congestion Pricing on all existing toll facilities
c. Implementation of congestion pricing on selected non-tolled facilities:
   - I-95: Ramp metering bypass pricing, or
     Ramp metering bypass pricing plus HOVL pricing
   - SR 826: HOVL pricing
   - SR 878: PPO pricing

Further detailed study is needed to confirm or deny the sketch planning estimates of revenue and net present value. It is recommended that detailed project-specific road pricing feasibility studies, implementation plans, and project-specific concept development reports be prepared for all the projects listed above before implementation of any of these sketch planning recommendations.

A comprehensive public involvement and public relations program should be undertaken to educate and inform the affected communities. In addition to this, an administrative program to balance/equitably distribute the economic impact should also be designed in detail.

Arterial Impacts

A diversion analysis was conducted to determine the impacts that the Moderate Road Pricing Package may have on Dade County's arterial roadway network. The volumes and LOS for the Year 2000 Existing+Committed network were compared to the volumes and LOS for the Moderate Package network to determine the significance of the traffic diversion.

The diversion analysis indicates that the addition of tolls (as identified in the moderate road pricing plan) to currently untolled facilities produces significant diversions of traffic to parallel arterial streets. The amount of diversion varies substantially from facility to facility, anywhere from 20% to 70 %, largely based upon the alternative routes available.

However, the analysis shows that the LOS on the parallel arterial facilities on almost all the segments analyzed does not exceed LOS "D." There are only three segments where the LOS falls to "F" after the tolls are imposed. It can therefore be concluded that there is a significant amount of unused capacity on arterial streets that is more efficiently utilized once these tolls are imposed.

The peak hour conditions are expected to be more severe on the arterial streets, since currently, there are already some capacity problems on these facilities. In general, the amount of peak hour diversion desired can be managed by the toll rate that is in effect during these hours. Pricing can be used as an effective management tool, and the ability to control the toll rates on a real-time basis in the future will further enhance this tool. For further detail, please see Appendix F.

Concluding Remarks

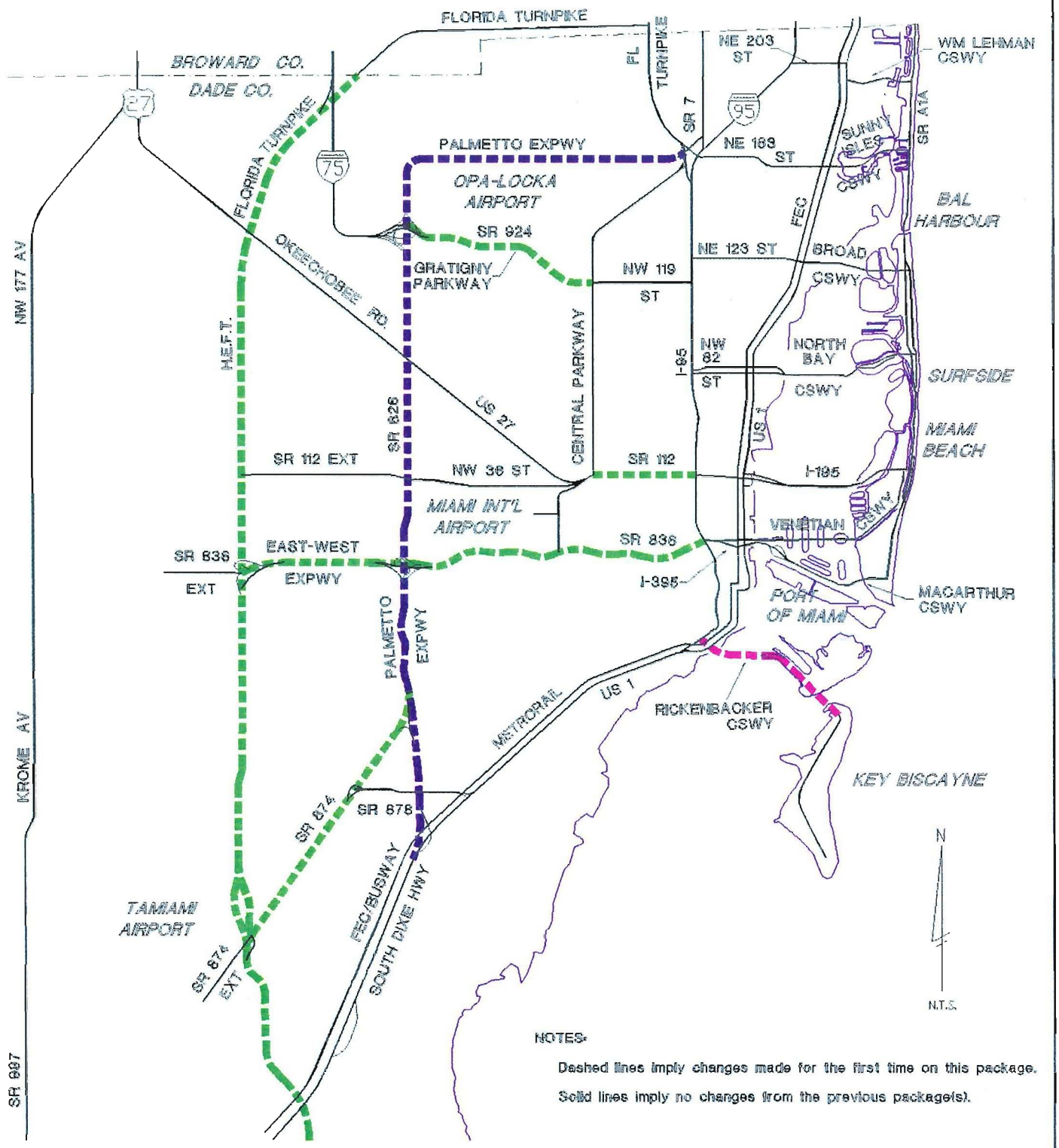
The previous chapter identified numerous projects which are recommended for consideration by the Metro-Dade Metropolitan Planning Organization. In deriving these strategies, a number of considerations were involved, particularly with respect to implementation. The reasoning for this involved the following facts:

1. Dade County's congestion problems are very severe. More funding for highway and transit assets is needed.

2. The notion of people paying for the privilege to drive alone and/or in a non-congested environment is not new, but is controversial.

3. Structuring the projects in the packages such that several strategies are implemented, achieves several objectives identified for this study:

   - It puts equity into the pricing of transportation facilities.
   - It aids in the reduction of congestion and, thus, improves the air quality.
   - It acquaints the public with the notion that these kinds of limitations on personal traveling freedom are both good for the public welfare and are here to stay.



NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- RAISE TOLL TO 7¢/MILE, THEN 12¢/MILE IN 1996
- HOVL PRICING - ADD 1 LANE
- WEEKEND CONGESTION PRICING

FIGURE 8.1

METRO DADE ROAD PRICING STUDY

MODERATE PACKAGE PHASE 1

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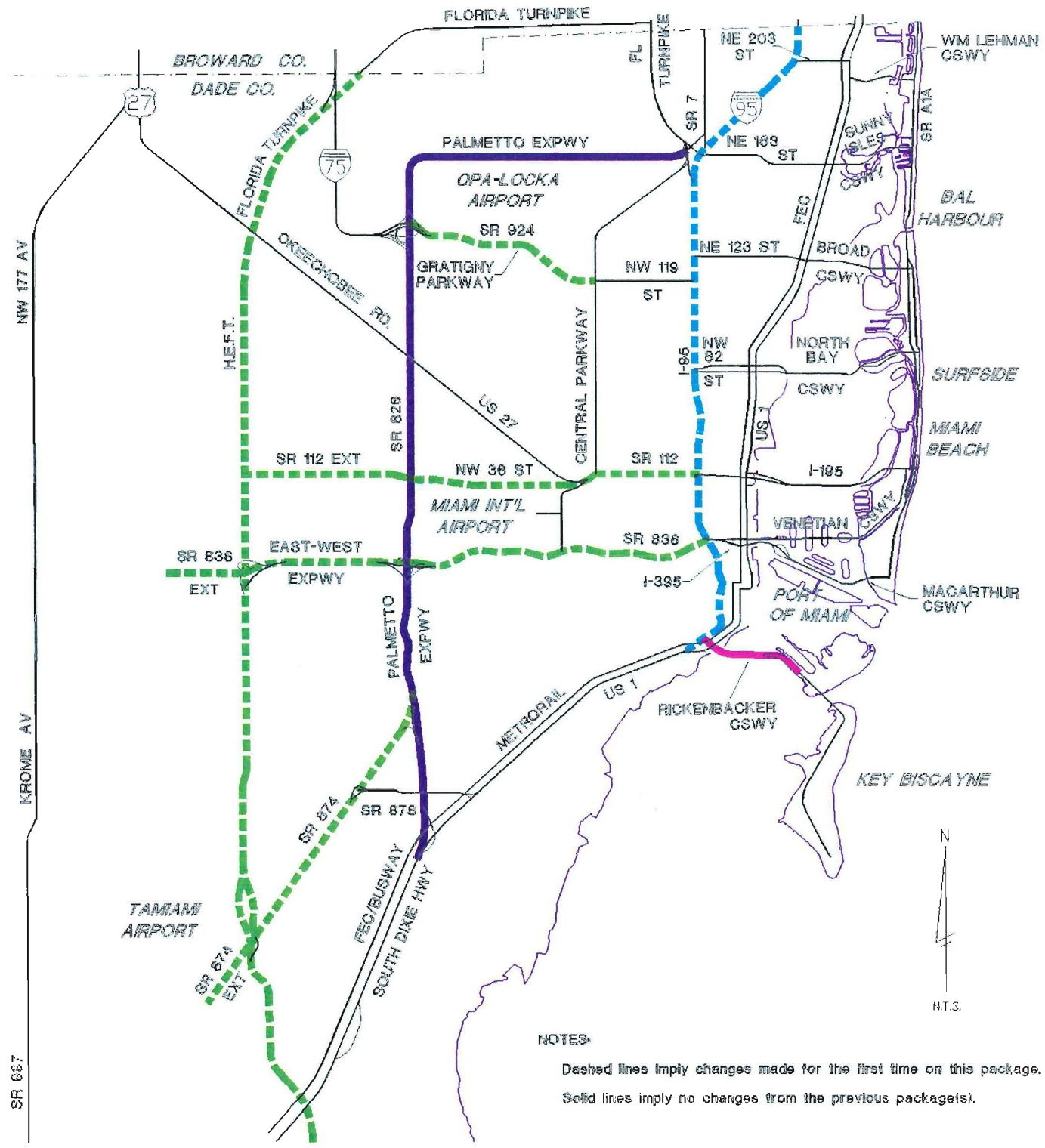

NOTES:

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LEGEND

- 24 HOUR TOLL AND CONGESTION PRICING
- HOVL PRICING - ADD 1 LANE
- RAMP METERING BYPASS PRICING
- WEEKEND CONGESTION PRICING

FIGURE 8.2

METRO DADE ROAD PRICING STUDY

MODERATE PACKAGE PHASE 2

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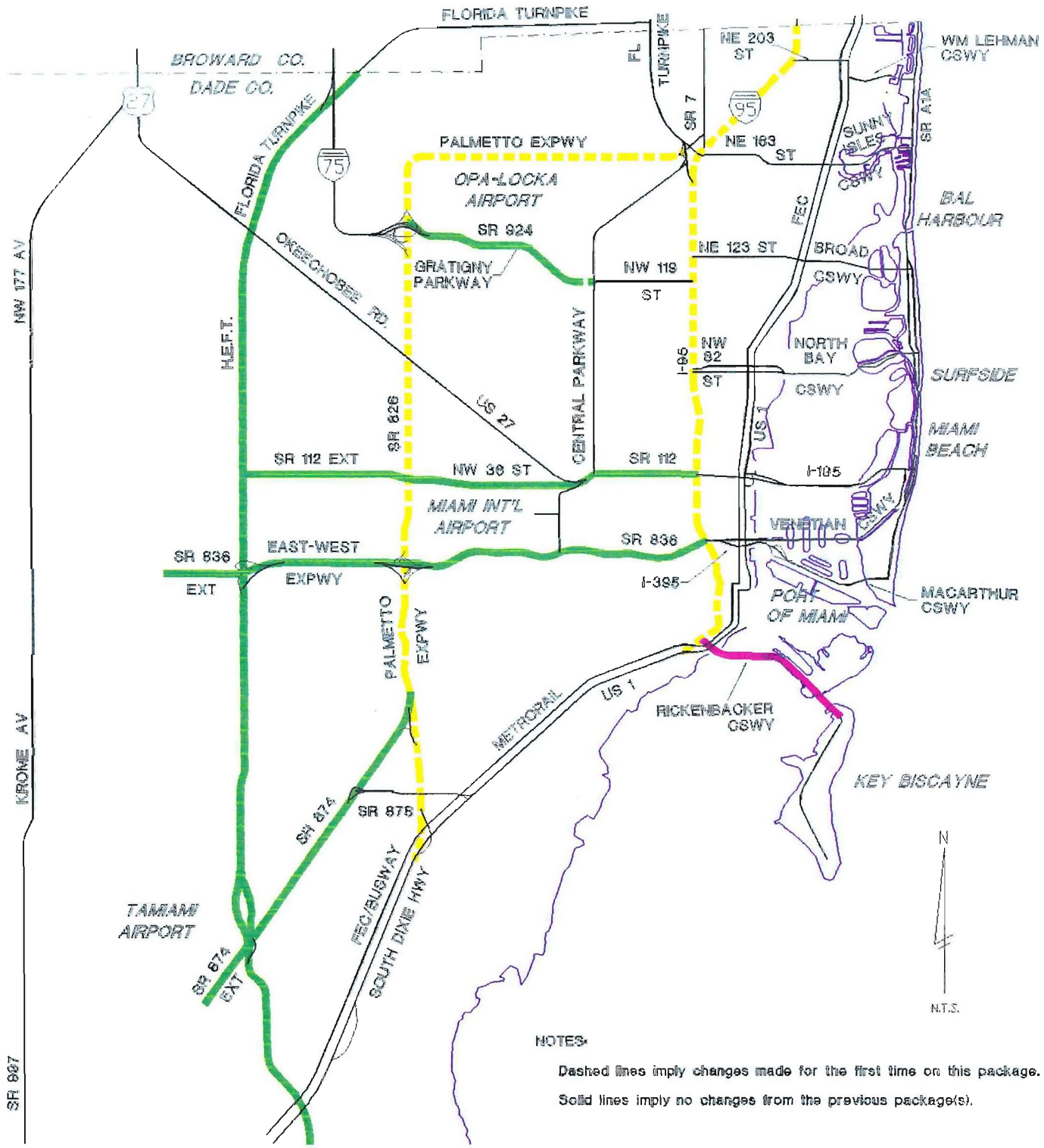

NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR CONGESTION PRICING
- HOVL PRICING - TAKE 1 LANE
- WEEKEND CONGESTION PRICING

FIGURE 8.3

METRO DADE ROAD PRICING STUDY

MODERATE PACKAGE PHASE 3

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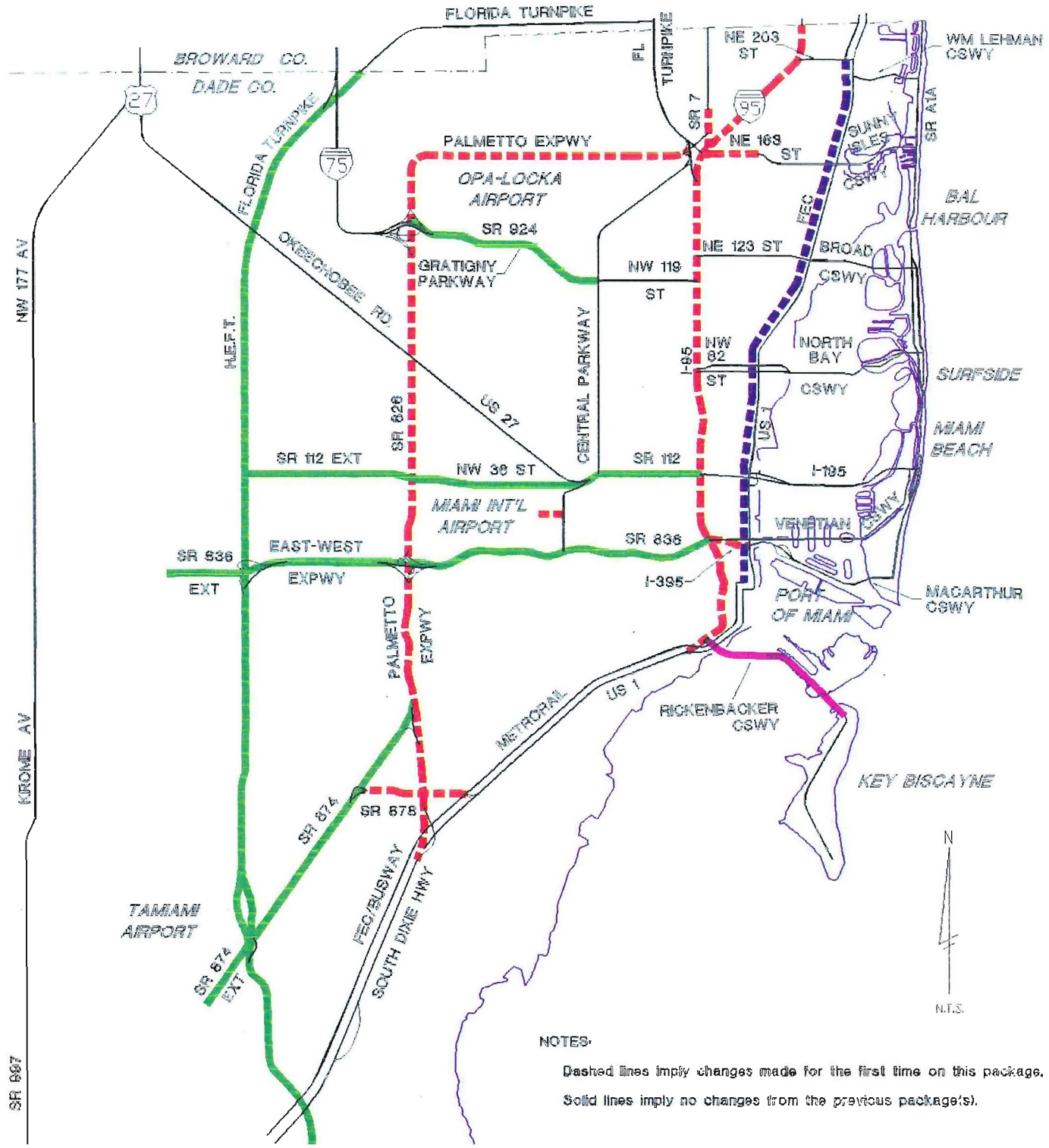

NOTES:

Dashed lines imply changes made for the first time on this package.

Solid lines imply no changes from the previous package(s).

LEGEND

- 24 HOUR TOLL (CONGESTION PRICING)
- BUSWAY/HOV-WAY - ADD 1 LANE
- PEAK PERIOD ONLY PRICING
- WEEKEND CONGESTION PRICING

FIGURE 8.4

METRO DADE ROAD PRICING STUDY

MODERATE PACKAGE PHASE 4

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INFRASTRUCTURE PRIVATIZATION AND FINANCE GROUP

TABLE 8.1

FACILITIES VS STRATEGIES BY PHASE

Facility	Raise toll to 7 cents/mile for existing tolled expwys	HOVL Pricing Add a lane	CP + Indexing of all toll facilities	Raise tolls to premium levels (12 cents/mile)	Add planned frwy extensions + congestion pricing	Ramp meter bypass pricing	HOVL Pricing Take a lane	Congestion pricing of "generators"	PPO pricing of non-toll freeways	Busway/HOV-way Pricing
Broad Cswy										
Central Parkway										
Florida Turnpike and HEFT	Phase 1		Phase 1	Phase 1						
Gratigny Parkway	Phase 1		Phase 1	Phase 1						
I-195 & Julia Tuttle Cswy										
I-395 & MacArthur Cswy										
I-95						Phase 2	Phase 3		Phase 4	
MIA								Phase 4		
NE 167 St / SR 826 at GGI								Phase 4		
North Bay Cswy										
Okeechobee Rd NW of SR 826										
Okeechobee Rd SE of SR 826										
Port of Miami Bridge										
Rickenbacker Cswy			Phase 1							
SR 112 / Airport Expwy Ext.	Phase 1		Phase 1	Phase 1	Phase 2					
SR 7 / US 441								Phase 4		
SR 826 / Palmetto Exwy		Phase 1					Phase 3		Phase 4	
SR 836 / Dolphin Expwy	Phase 1		Phase 1	Phase 1						
SR 836 / Dolphin Expwy Ext					Phase 2					
SR 874 / Don Shula	Phase 1		Phase 1	Phase 1						
SR 874 / Don Shula Ext					Phase 2					
SR 878 / Snapper Creek									Phase 4	
Sunny Isles Cswy										
US 1 / Biscayne Blvd										Phase 4
US 1 / S Dixie Hwy										
Venetian Cswy										
William Lehman Cswy										

HEFT: Homestead Extension of the Florida Turnpike
MIA: Miami International Airport
GGI: Golden Glades Interchange

APPENDIX A

TRIS SEARCH: CONGESTION AND ROAD PRICING

Congestion and road pricing

A SEARCH FROM THE

TRIS* DATABASE

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Suite 157
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If there are any questions, please call
Suzanne Crowther (202) 334-3250

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Title: SYNTHESIS OF INFORMATION RELATED TO HIGHWAY PROBLEMS. TOPIC 24-02. SURVEY OF INTERNATIONAL ROADWAY PRICING

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Abstract: In view of the increased interest in international outreach , this synthesis will report on the state of the practice on **congestion pricing** and other user fees for **road pricing,** focusing on case studies from international experience that represent present and proposed applications that may be suitable to the United States. The case studies will include the pricing objectives, implementation methods, equity and privacy issues, implementation costs, and intergovernmental coordination.

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Abstract Information
Abstract: This article discusses some recent developments in **road pricing** in the UK. Although it is widely perceived as a 'tax on liberty', British research indicates that it would be an effective method of **congestion** control and bring huge environmental benefits. However, there is not yet agreement about the most appropriate form of **road pricing.** The Department of Transport has commissioned the MVA Group to study how to apply **road pricing** in London, but MVA will not report back until late 1994. There are three main types of advanced pricing schemes: (1) 'cordon' schemes that impose fix penalties for vehicles entering a restricted area; (2) 'area toll' schemes where there is continual charging within specified boundaries; and (3) **'congestion pricing',** where charges relate to a vehicle's average speed. More advanced schemes also use the 'smartcard', a plastic card like a credit card but with an embedded microprocessor. This technology allows more sophisticated pricing methods, such as the GEC Marconi Timezone system, developed as an area toll system but also adaptable to one-off charges appropriate to cordon schemes and **congestion pricing.** Its absence of an elaborate central system means that civil liberty concerns can be avoided. The proposed **congestion pricing** scheme for Cambridge uses another innovative system, where drivers are charged only if their vehicle's speed falls below a given average speed over an average distance.

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BATH, BA2 7AY UNITED KINGDOM

Abstract Information
Abstract: The author takes issue with a number of aspects of the paper by Evans (1992) (see IRRD 854491) on the social implications of a congestion-pricing system. Hills argues that: a) **congestion** is more complex than Evans' assumptions allow even at strategic level; b) all three speed/flow relationships explored are conceptually flawed; c) definitions of capacity and throughput are inconsistent and the treatment of time is perverse; and d) mis-specification of both demand and supply arises from the use of a flow-based measure instead of a trips-based one. Each issue is discussed in detail. The paper includes a reply to these comments by Evans covering the standard economic model of road **congestion pricing,** stationarity and time dependence, networks and backward-bending speed-flow and **congestion** cost flow functions.

Miscellaneous Information:
IRRD Document Number i8857544

TRIS accession number: 642978 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: **CONGESTION,** AIR POLLUTION AND ROAD SAFETY IN URBAN AREAS
Foreign Language: ENGLISH

Author(s):
SHEFER, D

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9310SW057E

Volume: **Number:** 93-087
Publication Date: 6/00/93 **Pagination:** 27P
References: 34 **Appendices:**

Publisher/Corporate Author 1:
TECHNION-ISRAEL INSTITUTE OF TECHNOLOGY, TRANSPORTATION RESEARCH INSTITUTE
TECHNION CITY
HAIFA, 32000 ISRAEL

Abstract Information
Abstract: The continuous rapid growth in Vehicle Miles Travelled (VMT), coupled with the rapid increase in traffic **congestion** on highways of virtually every large urban area, explain a major portion of the observed deterioration of urban air quality. In order to (1) halt this deterioration process, (2) secure safe and healthy environments, and (3) improve the quality of life in cities, it is paramount to initiate and implement programmes which jointly treat (i) traffic **congestion,** (ii) air quality, and (iii) road safety.A host of market-based strategies, driven by price mechanisms, have been proposed as the best and most efficient way to decrease both traffic **congestion** and vehicle emission. Strategies such as (a) **congestion pricing,** (b) emission fees, (c) reducing emissions of high polluting vehicles, and (d) introducing more efficient vehicle and fuel technologies, are not mutually exclusive. Therefore, they can be employed jointly within an overall strategy. In view of the conflicting objectives which may exist between improving urban air quality and reducing road fatalities and traffic **congestion,** it is of great importance to thoroughly investigate these functional relationships. The results of such studies will help decision makers identify the "socially optimal level of **congestion**" which will yield the highest net social benefit.

Miscellaneous Information:
IRRD Document Number i8860407

TRIS accession number: 636536 *TRIS files:* HRIS. H 9301.

TRIS Record Flag: 3

Title: PRICING ROAD **CONGESTION**: RECENT EVIDENCE FROM SINGAPORE

Author(s):
McCarthy, PS
Tay, R

Publication Information:
Publication Title: Policy Studies Journal
Volume: 21 **Number:** 2
Report No:
Period Covered: Summer
Publication Date: 0/00/93 **Pagination:** pp 296-308
ISBN: **ISSN:** 0190292X
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
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Urbana, IL 61801-3696

Abstract Information
Abstract: The role of **road pricing** in travel demand management and **congestion** mitigation has been gaining support in many countries. Although the theory of **congestion** pricing is persuasive and straightforward, successful application of **road pricing** mandates that **congestion** externalities be estimated. Using data from a recent traffic survey in Singapore, this paper estimates **congestion** prices for alternative time values and vehicle types. These estimates are compared with the existing cost of area licenses, from which implications for economic efficiency and resource allocation are drawn.

TRIS accession number: 636579 *TRIS files:* HRIS. H 9301.

TRIS Record Flag: 3

Title: INVESTIGATING TOLL ROADS IN CALIFORNIA

Author(s):
Fielding, GJ

Publication Information:
Publication Title: ACCESS
Volume: **Number:** 2
Report No:
Period Covered: Spring
Publication Date: 0/00/93 **Pagination:** pp 22-24
Figures: 1 Fig. **Tables:** **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
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Abstract Information
Abstract: In 1987 the California legislature permitted a joint-powers authority to construct toll roads in Orange County and connect them to the state highway system. Three years later, the legislature passed the AB680 bill, authorizing California State Department of Transportation (Caltrans) to test the feasibility of building four privately funded transportation facilities. More recent encouragement has come from the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), which abolished restraints against tolls on interstate facilities and allowed federal agencies to support toll roads and to participate in their financing. Orange County, just south of Los Angeles, was ready for these changes. The two roads proposed by private firms are: Route 57 Extension, an 11-mile road that will be constructed as an elevated (viaduct) highway down the middle of the seasonal Santa Ana River, and State Route 91, a 10-mile road using the median of an existing freeway along the Santa Ana Canyon. The two private proposals will apply **congestion** pricing both to reduce peak-period demand and to increase revenue.

TRIS accession number: 637851 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 3

Title: ECONOMIC ASPECTS OF PUBLIC-PRIVATE PARTNERSHIPS FOR THE PROVISION OF ROADWAY SERVICES

Author(s):
Stafford, FP
Chen, K

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 1395
Publication Date: 0/00/93 **Pagination:** pp 3-9
ISBN: 0309054656 **ISSN:** 03611981
Figures: 1 Fig. **Tables:** **Photos:**
References: 23 Ref. **Appendices:** 1 App.

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
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Available from:
Transportation Research Board Business Office
2101 Constitution Avenue, NW
Washington, DC 20418

Abstract Information

Abstract: Although **road pricing** is an old and, theoretically, effective approach to traffic **congestion** relief, it has problems of public acceptability. The basic concept and recent developments in **road pricing** were reviewed, and a theoretical framework was developed for the broader issue of public-private partnerships for the provision of roadway services. Within this framework the basic concept of **road pricing** may be implemented in an innovative bundling of private intelligent vehicle-highway systems services with economic incentives for traffic diversion. Future research is suggested for building basic economic models of excludable public goods that would include congestibility. An operational field test is suggested to try out the idea of bundling private services to trucks: public authorities would offer economic incentives to divert trucks from congested routes.

Supplementary notes: This paper appears in Transportation Research Record No. 1395, Finance, Taxation, Pricing, Economic Analysis, Socioeconomics, Education, and Management.

TRIS accession number: 629815 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 4

Title: MICROCOMPUTERS IN TRANSPORTATION. POLICY OPTIONS AND HIGHWAY CAPACITY NEEDS

Author(s):
DeCorla-Souza, P
Caldwell, H
Editor(s):
Chow, J
Litvin, DM
Opiela, KS

Publication Information:
Publication Date: 0/00/93 **Pagination:** pp 155-166
ISBN: 0872628752 **ISSN:**
References: 14 Ref. **Appendices:**

Publisher/Corporate Author 1:
American Society of Civil Engineers
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Abstract Information

Abstract: This is a description of a procedure to assess the impacts at the national level of a broad range of policy choices, including highway supply management such as implementing intelligent vehicle highway systems (IVHS), and travel demand reduction policies such as travel demand management (TDM), land use/urban design, and **congestion pricing**. The paper demonstrates the procedure using representative examples of each of the above types of policies. The paper also considers impacts on travel demand in the Year 2015, and estimates consequent impacts on capital investment requirements for new urban highway capacity for large urban areas.

Conference Information

Conference Title: Fourth International Conference on Microcomputers in Transportation
Sponsored by: Urban Transportation Division, American Society of Civil Engineers
Location: Baltimore, Maryland
Date Held: Jul 22, 1992-Jul 24, 1992

TRIS accession number: 638796 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: POINT OF VIEW: IMPLEMENTING PEAK-HOUR **ROAD PRICING** AT FULLSCALE: FINDING SOLUTIONS TO PRACTICAL PROBLEMS

Author(s):
Downs, A

Publication Information:
Publication Title: TRNews
Volume: **Number:** 167
Publication Date: 7/00/93 **Pagination:** pp 7-9
ISBN: **ISSN:** 07386826
References: 1 Ref. **Appendices:**

Publisher/Corporate Author 1:
Transportation Research Board
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Available from:
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Abstract Information
Abstract: This article raises numerous institutional issues that will have to be addressed if **congestion pricing** is to be introduced successfully. Included are the following: On which roads should peak-hour tolls be charged? What toll-collection method should be used? Should high-occupancy vehicles be included? How should tolls for a system be phased in? Additional issues are the configuring of toll roads, the handling of traffic diverted from toll roads onto other streets, dealing with nonpaying drivers, protecting the privacy of drivers, setting toll limits, determining where funds should go, and reducing peak-hour toll inequity.

TRIS accession number: 639004 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: PACIFIC RIM TRANSTECH CONFERENCE PROCEEDINGS. VOLUME II. **CONGESTION PRICING** WITH TOLLS AND SUBSIDIES

Author(s):
Bernstein, D
Editor(s):
Carr, WP

Publication Information:
Publication Date: 0/00/93 **Pagination:** pp 145-151
ISBN: 0872629724 **ISSN:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
American Society of Civil Engineers
345 East 47th Street
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Abstract Information

Abstract: It is noted that the public has usually perceived **congestion pricing** as unfair, discriminatory, regressive, coercive, and anti-business. This paper describes a method of implementing **congestion pricing** with tolls and subsidies that may overcome these objections. The implementation of such a program with existing technologies is also described.

Supplementary notes: Volume II: Intermodal Ties; Management Systems; Propulsion Technology; Strategic Highway Research Program.

Conference Information

Conference Title: Pacific Rim TransTech Conference. ASCE Third International Conference on Applications of Advanced Technologies in Transportation Engineering.
Sponsored by: ASCE Urban Transportation Division; ASCE Highway Division; Washington State Department of Transportation; U.S. Federal Highway Administration.
Location: Washington State Convention Center, Seattle, Washington, U.S.A.
Date Held: Jul 25, 1993-Jul 28, 1993

TRIS accession number: 639755 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: INTERNATIONAL EXPERIENCES WITH **CONGESTION PRICING**

Author(s):
May, AD

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 14-20
ISBN: **ISSN:** 01628178
References: 34 Ref. **Appendices:**

Publisher/Corporate Author 1:
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Washington, DC 20024-2729

Abstract Information
Abstract: This is an overview of **congestion pricing** experiences outside the United States. Developments in the field are described, the objectives of such pricing are assessed; the types of systems are reviewed; the benefits, both actual and potential are noted; and the potential for future implementation is assessed. Alternative charging structures are discussed, including taxation and cordon charges. The potential contributions of **congestion pricing** are noted, and the best documented case of the Singapore Area Licsensing Scheme is described. The objections to **congestion pricing** are briefly assessed, and comments are made on future developments in this field.

TRIS accession number: 639756 *TRIS files:* HRIS. H 9302.
ATRIS. A.

TRIS Record Flag: 4

Title: EFFECTS OF ROAD ACCESS PRICING AT THE LOS ANGELES AIRPORT: A CASE STUDY

Author(s):
Lampe, AJ

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 22-24
ISBN: **ISSN:** 01628178
Figures: 1 Fig. **Tables:** **Photos:**

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Abstract Information
Abstract: It is described, how after evaluating available technologies, the Los Angeles International Airport (LAX) installed a state-of-the-art automatic vehicle identification (AVI) system to reduce traffic **congestion** and to maximize revenues. The system consists of electronic tags (transponders) in or on registered vehicles and readers. The latter are mounted on existing overhead structures in the terminal area. The flexibility of the system, based on software, allows variable charges for different types of vehicles using the airport. The system has increased revenue collection by more than 250 %, and **congestion** has been reduced by 20 %. Other airports using the AVI monitoring system are noted.

TRIS accession number: 639757 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: **CONGESTION PRICING**: ISSUES AND OPPORTUNITIES

Author(s):
Decorla-Aouza, P

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 27-32
ISBN: **ISSN:** 01628178
Figures: 1 Figs. **Tables:** **Photos:**
References: 8 Ref. **Appendices:**

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Available from:
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Washington, DC 20024-2729

Abstract Information
Abstract: This article attempts to answer some questions facing Metropolitan Planning Organizations (MPO) concerning the adoption of **congestion pricing** policy: what is the rationale for such pricing? How effective is it? What are the critical issues and concerns that must be addressed? and What types of **congestion pricing** are reasonable in the short term and in the long term? Major implementation issues, both technical (technology compatibility; enforcement; privacy; price determination; estimating impacts of pricing alternatives), and political are discussed. The strategies for gaining public acceptance are discussed, as well as implementation opportunities. It is noted that the main benefits of **congestion pricing** for urban areas are economic in nature.

TRIS accession number: 639758 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: IMPLEMENTING **CONGESTION PRICING**: WINNERS AND LOSERS

Author(s):
Bhatt, K

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 33-37
ISBN: **ISSN:** 01628178
References: 10 Ref. **Appendices:**

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Available from:
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2729

Abstract Information
Abstract: It is pointed out that in many situations, **congestion pricing** could provide a long-lasting, relatively more efficient, less inequitable, and financially sound means of increasing mobility and reducing the impacts of traffic. The article considers the impacts of **congestion pricing,** including who would benefit, and who would not. Different subsets of winners and losers are identified. Ways of enhancing the prospects of implementation are reviewed: assess **congestion pricing** together with other policies; assess each proposed application; and assess options for the use of the revenue. Comments are made on the concept of compensating adversely affected parties.

TRIS accession number: 639760 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: SINGAPORE'S **ROAD PRICING** SYSTEM: ITS PAST, PRESENT AND FUTURE

Author(s):
Menon, APG
Lam, S-H
Fan, SL

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 44-48
ISBN: **ISSN:** 01628178
Figures: Figs. **Tables:** Tabs. **Photos:**
References: 5 Ref. **Appendices:**

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Institute of Transportation Engineers
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Available from:
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2729

Abstract Information
Abstract: This article discusses the more important experiences gained in the operation of Singapore's **road pricing**: Area Licensing Scheme (ALS). Success in the management of the ALS has been achieved by managing its four major components: restricted zone (RZ); restricted hours (RH); restricted vehicles and area license fees. The effects of ALS on traffic flows inside the RZ, and its effects on different classes of vehicles is discussed, as well as its effects on travel speeds, and modal split. The effects of ALS on traffic flows outside the RZ, and other impacts of ALS are also considered. Comments are made on the costs and revenues of ALS, and on the future of ALS.

TRIS accession number: 639916 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: **ROAD PRICING**: THEORY AND PRACTICE

Author(s):
Lewis, NC

Publication Information:
Publication Date: 0/00/93 **Pagination:** 128p
ISBN: 0727719637 **ISSN:**
Figures: 23 Fig. **Tables:** 23 Tab. **Photos:** 5 Phot.
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Telford (Thomas) Limited
Thomas Telford House, 1 Heron Quay
London E14 4JD, England

Available from:
Telford (Thomas) Limited
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Abstract Information
Abstract: This book describes the theory of **congestion pricing** using advanced electronic systems. The general principles and potential benefits are described and a framework for good practice established. The financial, institutional, technological and social issues to be addressed are outlined, and the necessary requirements for public acceptability, the financial and economic framework and the technical options are described. A comparative assessment and review of current and pilot projects in Europe and Southeast Asia are also given.

TRIS accession number: 642540 *TRIS files:* HRIS. H 9303.

TRIS Record Flag: 4

Title: PLACING A PREMIUM ON PEAK-PERIOD TRAVEL: IT JUST MIGHT WORK

Publication Information:
Publication Title: Texas Transportation Researcher
Volume: 29 **Number:** 4
Report No:
Period Covered: Winter
Publication Date: 0/00/93 **Pagination:** pp 8-9
ISBN: **ISSN:** 00404748

Publisher/Corporate Author 1:
Texas Transportation Institute
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College Station, TX 77843-3135

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Abstract Information

Abstract: Research is reported which studied the use of **congestion pricing** as a means to reduce fuel consumption. The study evaluated the economic and operational fesibility of implementing **congestion pricing** as a means of reducing energy consumption and developing a strategy for establishing pricing levels. The study attempted to determine the amount of energy that can be saved through the implementation of **congestion pricing**. An extensive literature review was conducted to develop an understanding of the theory, concepts and research on road and **congestion pricing**. The status of toll facilities and other pricing activities in North America were also identified. Study findings suggest that main-lane **congestion pricing** would not only be effective in reducing fuel consumption, but it is also economically and operationally feasible.

TRIS accession number: 637866 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 3

Title: UNDERSTANDING THE COMPETING SHORT-RUN OBJECTIVES OF PEAK PERIOD **ROAD PRICING**

Author(s):
Bernstein, D
Muller, J

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 1395
Publication Date: 0/00/93 **Pagination:** pp 122-128
ISBN: 0309054656 **ISSN:** 03611981
References: 37 Ref. **Appendices:**

Publisher/Corporate Author 1:
Transportation Research Board
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Available from:
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2101 Constitution Avenue, NW
Washington, DC 20418

Abstract Information
Abstract: The interest in peak period **road pricing** has grown considerably in recent years both in the United States and abroad. This increase in interest is usually attributed to worsening **congestion** and improved electronic toll collection technologies. However, there may be a third reason as well: peak period pricing can be used to generate revenues. This use of peak period **road pricing** is explored and compared with programs that are designed to minimize social cost. Using some simple examples, it is shown that it is possible to increase toll revenues but at a significant cost to society. In addition, it is shown that most of the revenues and costs can be attributed to the length and end of the toll period.
Supplementary notes: This paper appears in Transportation Research Record No. 1395, Finance, Taxation, Pricing, Economic Analysis, Socioeconomics, Education, and Management.

TRIS accession number: 639005 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: PACIFIC RIM TRANSTECH CONFERENCE PROCEEDINGS. VOLUME II. **CONGESTION** MANAGEMENT: RIGHT PRICE

Author(s):
Talvitie, AP
Sikow, C
Editor(s):
Carr, WP

Publication Information:
Publication Date: 0/00/93 **Pagination:** pp 152-158
ISBN: 0872629724 **ISSN:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
American Society of Civil Engineers
345 East 47th Street
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Available from:
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Abstract Information

Abstract: It is noted that **road pricing** is the easiest way to manage travel demand, i.e. the traffic volumes. When an appropriate price is set on scarce road space, an acceptable level of **congestion** and other negative externalities of road use (pollution and noice) can be reached. This paper describes the objective of the 'right price' or marginal cost pricing which is to minimize the total cost of the road sector. In the optimum, road users pay for highway maintenance, capacity expansion, and environmental damage according to the principles of marginal cost pricing. The theory is discussed, and pratical applications from Europe, the United States and Asia are described.

Supplementary notes: Volume II: Intermodal Ties; Management Systems; Propulsion Technology; Strategic Highway Research Program.

Conference Information

Conference Title: Pacific Rim TransTech Conference. ASCE Third International Conference on Applications of Advanced Technologies in Transportation Engineering.
Sponsored by: ASCE Urban Transportation Division; ASCE Highway Division; Washington State Department of Transportation; U.S. Federal Highway Administration.
Location: Washington State Convention Center, Seattle, Washington, U.S.A.
Date Held: Jul 25, 1993-Jul 28, 1993

TRIS accession number: 639755 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: INTERNATIONAL EXPERIENCES WITH **CONGESTION** PRICING

Author(s):
May, AD

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 14-20
ISBN: **ISSN:** 01628178
References: 34 Ref. **Appendices:**

Publisher/Corporate Author 1:
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Abstract Information
Abstract: This is an overview of **congestion** pricing experiences outside the United States. Developments in the field are described, the objectives of such pricing are assessed; the types of systems are reviewed; the benefits, both actual and potential are noted; and the potential for future implementation is assessed. Alternative charging structures are discussed, including taxation and cordon charges. The potential contributions of **congestion** pricing are noted, and the best documented case of the Singapore Area Licsensing Scheme is described. The objections to **congestion** pricing are briefly assessed, and comments are made on future developments in this field.

TRIS accession number: 639756 *TRIS files:* HRIS. H 9302.
ATRIS. A.

TRIS Record Flag: 4

Title: EFFECTS OF ROAD ACCESS PRICING AT THE LOS ANGELES AIRPORT: A CASE STUDY

Author(s):
Lampe, AJ

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 22-24
ISBN: **ISSN:** 01628178
Figures: 1 Fig. **Tables:** **Photos:**

Publisher/Corporate Author 1:
Institute of Transportation Engineers
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Available from:
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Abstract Information
Abstract: It is described, how after evaluating available technologies, the Los Angeles International Airport (LAX) installed a state-of-the-art automatic vehicle identification (AVI) system to reduce traffic **congestion** and to maximize revenues. The system consists of electronic tags (transponders) in or on registered vehicles and readers. The latter are mounted on existing overhead structures in the terminal area. The flexibility of the system, based on software, allows variable charges for different types of vehicles using the airport. The system has increased revenue collection by more than 250 %, and **congestion** has been reduced by 20 %. Other airports using the AVI monitoring system are noted.

TRIS accession number: 639757 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: **CONGESTION** PRICING: ISSUES AND OPPORTUNITIES

Author(s):
Decorla-Aouza, P

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 27-32
ISBN: **ISSN:** 01628178
Figures: 1 Figs. **Tables:** **Photos:**
References: 8 Ref. **Appendices:**

Publisher/Corporate Author 1:
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Available from:
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Abstract Information

Abstract: This article attempts to answer some questions facing Metropolitan Planning Organizations (MPO) concerning the adoption of **congestion** pricing policy: what is the rationale for such pricing? How effective is it? What are the critical issues and concerns that must be addressed? and What types of **congestion** pricing are reasonable in the short term and in the long term? Major implementation issues, both technical (technology compatibility; enforcement; privacy; price determination; estimating impacts of pricing alternatives), and political are discussed. The strategies for gaining public acceptance are discussed, as well as implementation opportunities. It is noted that the main benefits of **congestion** pricing for urban areas are economic in nature.

TRIS accession number: 639758 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: IMPLEMENTING **CONGESTION** PRICING: WINNERS AND LOSERS

Author(s):
Bhatt, K

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 33-37
ISBN: **ISSN:** 01628178
References: 10 Ref. **Appendices:**

Publisher/Corporate Author 1:
Institute of Transportation Engineers
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Available from:
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Abstract Information
Abstract: It is pointed out that in many situations, **congestion** pricing could provide a long-lasting, relatively more efficient, less inequitable, and financially sound means of increasing mobility and reducing the impacts of traffic. The article considers the impacts of **congestion** pricing, including who would benefit, and who would not. Different subsets of winners and losers are identified. Ways of enhancing the prospects of implementation are reviewed: assess **congestion** pricing together with other policies; assess each proposed application; and assess options for the use of the revenue. Comments are made on the concept of compensating adversely affected parties.

TRIS accession number: 639760 *TRIS files:* HRIS. H 9302.

TRIS Record Flag: 4

Title: SINGAPORE'S **ROAD PRICING** SYSTEM: ITS PAST, PRESENT AND FUTURE

Author(s):
Menon, APG
Lam, S-H
Fan, SL

Publication Information:
Publication Title: ITE Journal
Volume: 63 **Number:** 12
Publication Date: 12/00/93 **Pagination:** pp 44-48
ISBN: **ISSN:** 01628178
Figures: Figs. **Tables:** Tabs. **Photos:**
References: 5 Ref. **Appendices:**

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Abstract Information
Abstract: This article discusses the more important experiences gained in the operation of Singapore's **road pricing**: Area Licensing Scheme (ALS). Success in the management of the ALS has been achieved by managing its four major components: restricted zone (RZ); restricted hours (RH); restricted vehicles and area license fees. The effects of ALS on traffic flows inside the RZ, and its effects on different classes of vehicles is discussed, as well as its effects on travel speeds, and modal split. The effects of ALS on traffic flows outside the RZ, and other impacts of ALS are also considered. Comments are made on the costs and revenues of ALS, and on the future of ALS.

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TRIS Record Flag: 4

Title: **ROAD PRICING**: THEORY AND PRACTICE

Author(s):
Lewis, NC

Publication Information:
Publication Date: 0/00/93 **Pagination:** 128p
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Thomas Telford House, 1 Heron Quay
London E14 4JD, England

Available from:
Telford (Thomas) Limited
Thomas Telford House, 1 Heron Quay
London E14 4JD, England

Abstract Information
Abstract: This book describes the theory of **congestion** pricing using advanced electronic systems. The general principles and potential benefits are described and a framework for good practice established. The financial, institutional, technological and social issues to be addressed are outlined, and the necessary requirements for public acceptability, the financial and economic framework and the technical options are described. A comparative assessment and review of current and pilot projects in Europe and Southeast Asia are also given.

TRIS accession number: 629815 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 4

Title: MICROCOMPUTERS IN TRANSPORTATION. POLICY OPTIONS AND HIGHWAY CAPACITY NEEDS

Author(s):
DeCorla-Souza, P
Caldwell, H
Editor(s):
Chow, J
Litvin, DM
Opiela, KS

Publication Information:
Publication Date: 0/00/93 **Pagination:** pp 155-166
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Publisher/Corporate Author 1:
American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398

Available from:
American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398

Abstract Information

Abstract: This is a description of a procedure to assess the impacts at the national level of a broad range of policy choices, including highway supply management such as implementing intelligent vehicle highway systems (IVHS), and travel demand reduction policies such as travel demand management (TDM), land use/urban design, and **congestion** pricing. The paper demonstrates the procedure using representative examples of each of the above types of policies. The paper also considers impacts on travel demand in the Year 2015, and estimates consequent impacts on capital investment requirements for new urban highway capacity for large urban areas.

Conference Information

Conference Title: Fourth International Conference on Microcomputers in Transportation
Sponsored by: Urban Transportation Division, American Society of Civil Engineers
Location: Baltimore, Maryland
Date Held: Jul 22, 1992-Jul 24, 1992

TRIS accession number: 644574 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: CHARGING FOR ROAD USE WORLDWIDE. AN APPRAISAL OF **ROAD PRICING,** TOLLS AND PARKING
Foreign Language: ENGLISH

Author(s):
HARROP, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9401TR384E

Publication Title: FINANCIAL TIMES MANAGEMENT REPORT
Publication Date: 0/00/93 **Pagination:** 182P
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Publisher/Corporate Author 1:
FINANCIAL TIMES BUSINESS INFORMATION
7TH FLOOR, BROADWAY BUILDINGS, 50-64 BROADWAY
LONDON, SW1H 0DB UNITED KINGDOM

Abstract Information
Abstract: This report summarises international experience of charging for road use, and the lessons learnt by so doing. Special attention is given to the twentieth century, although a brief summary is given of earlier times. The different needs of each type of road user and highway provider is assessed, and issues such as privacy, safety, and politics are discussed. The principles of each type of **road pricing** method are presented and discussed. These include parking payment methods and **congestion** charging. The idea of banning conventional cars from city centres and replacing these with tiny electric cars operating by prepayment card is also discussed. The market size for each **road pricing** method is assessed, as is the evidence that **road pricing** can either efficiently raise significant funds or reduce traffic flow. The evidence that **road pricing** may reduce pollution is also evaluated, as are any problems which are caused by **road pricing**.

Miscellaneous Information:
IRRD Document Number i8861681

TRIS accession number: 643336 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: MOTORWAY CHARGING AND INVESTMENTS: CAN THE GOVERNMENT'S SUMS ADD UP?
Foreign Language: ENGLISH

Author(s):
MANNA, J

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9312TR397E

Publication Title: LOCAL TRANSPORT TODAY
Publication Date: 6/10/93 **Pagination:** 12-3
ISBN: **ISSN:** 0962-6220
References: 0 **Appendices:**

Publisher/Corporate Author 1:
LOCAL TRANSPORT TODAY LD
QUADRANT HOUSE, 250 KENNINGTON LANE
LONDON, SE11 5RD UNITED KINGDOM

Abstract Information
Abstract: The debate stimulated among academics, the freight industry, contractors, financial consultants and environmental groups by the government's White Paper on motorway charging 'Paying for better motorways' is considered. The operation of the scheme by an independent agency is discussed, in particular its implications for Treasury spending and the government's stated aims of traffic restraint. The effect on the rest of the highway network and concern about the need for an overall transport policy are discussed. The proposal is compared with systems in other countries. The range of technology available for road use charging is described briefly.

Miscellaneous Information:
IRRD Document Number i8860775

TRIS accession number: 644311 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: LONDON **CONGESTION** CHARGING: DEMAND EFFECTS OF TRAVEL TIME RELIABILITY
Foreign Language: ENGLISH

Author(s):
BLACK, IG
TOWRISS, JG

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9312TR354E

Publication Date: 7/00/93 **Pagination:** 60P
ISBN: - **ISSN:**
References: + **Appendices:**

Publisher/Corporate Author 1:
DEPARTMENT OF TRANSPORT
ROOM C14/02, 2 MARSHAM STREET
LONDON, SW1 3EB UNITED KINGDOM

Abstract Information
Abstract: The aim of the study was to provide generalised cost coefficients to be applied to an appropriate measure of reliability, relating to different categories of travel in the Strategic Model (APRIL). This model is being developed within the Department's programme for the assessment of **road pricing** in London. As well as allowing demand responses to be predicted, these coefficients should also be suitable for cost-benefit evaluation. The report is in five parts: (1) methods of incorporating reliability into the generalised cost function; (2) the design of the survey; (4) survey results; and (5) conclusions and recommendations.

Miscellaneous Information:
IRRD Document Number i8860629

TRIS accession number: 644502 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: THE NEW REGIONAL TRANSPORT STRATEGY FOR THE SOUTH-EAST: KEY ISSUES IN DEMAND MANAGEMENT
Foreign Language: ENGLISH

Author(s):
GOODWIN, PB

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9401TR278E

Publication Title: TSU REF 771
Publication Date: 9/00/93 **Pagination:** 21P
References: 0 **Appendices:**

Publisher/Corporate Author 1:
UNIVERSITY OF OXFORD, TRANSPORT STUDIES UNIT
11 BEVINGTON ROAD
OXFORD, OX2 6NB UNITED KINGDOM

Abstract Information
Abstract: This paper outlines some principles and some unresolved questions in demand management, in relation to the New Regional Transport Strategy for the South East Region of England. As a result of background changes in thinking about demand management since 1989 a new consensus emerged on the need for demand management for urban areas. It was also realised that: (a) demand must be matched to supply of roads, because supply cannot be matched to demand, and (b) it is undesirable to provide for all forecast traffic growth in rural areas. Some unresolved issues in inter- urban road policy were also identified. Tools of integrated demand management include: (1) very substantially improved quality and scale of public transport provision; (2) pedestrianisation and traffic calming; and (3) traffic management and priority systems. Successful demand management depends on both technical consistency and public acceptance. Alternative scenarios include: (1) priority for trunk traffic; (2) 'let the market decide'; and (3) priority for local conditions. Areas where problems could arise include commuting, pedestrianisation, park-and-ride, green belts, and **road pricing**. The author concludes that: (1) trunk road assessment procedures must be changed; (2) policy changes to assess specific schemes will probably be based on considerably higher prices for road movement and/or strict restraint; (3) application of forecast traffic growth rates to trunk roads is much more complex than previously supposed.

Miscellaneous Information:
IRRD Document Number i8861026

TRIS accession number: 644513 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: LONDON **CONGESTION** CHARGING: REVIEW AND SPECIFICATION OF MODEL ELASTICITIES
Foreign Language: ENGLISH

Author(s):
EVANS, R
BROWN, M
FOWKES, T
MACKIE, P
TONER, J
SHELDON, R
HEYWOOD, C
ASILZADEH, M

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9401TR297E

Publication Date: 7/00/93 **Pagination:** 116P
ISBN: - **ISSN:**
References: 50 **Appendices:**

Publisher/Corporate Author 1:
DEPARTMENT OF TRANSPORT
2 MARSHAM STREET
LONDON, SW1P 3EB UNITED KINGDOM

Abstract Information
Abstract: The Department of Transport (DOT) is undertaking a wide-ranging programme of research into **road pricing** in London, and other measures to deal with urban road traffic **congestion**. As part of this programme this study was commissioned to provide a set of generalised cost elasticities for use in the development of a model for the evaluation of alternative **road pricing** proposals for London. There are four elements to this report: (1) development of a theoretical framework - definitions of the terms used, and consideration of the factors which influence elasticity values, which provides the information on which to base deductions of likely values; (2) a review of the available literature for all transport modes, but with particular attention to own-price and cross-elasticities relating to private car travel; (3) description of the state preference surveys of 400 interviews; and (4) a set of recommended elasticity values for the **road pricing** model.

Miscellaneous Information:
IRRD Document Number i8861094

TRIS accession number: 642978 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: **CONGESTION,** AIR POLLUTION AND ROAD SAFETY IN URBAN AREAS
Foreign Language: ENGLISH

Author(s):
SHEFER, D

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9310SW057E

Volume: **Number:** 93-087
Publication Date: 6/00/93 **Pagination:** 27P
References: 34 **Appendices:**

Publisher/Corporate Author 1:
TECHNION-ISRAEL INSTITUTE OF TECHNOLOGY, TRANSPORTATION RESEARCH INSTITUTE
TECHNION CITY
HAIFA, 32000 ISRAEL

Abstract Information
Abstract: The continuous rapid growth in Vehicle Miles Travelled (VMT), coupled with the rapid increase in traffic **congestion** on highways of virtually every large urban area, explain a major portion of the observed deterioration of urban air quality. In order to (1) halt this deterioration process, (2) secure safe and healthy environments, and (3) improve the quality of life in cities, it is paramount to initiate and implement programmes which jointly treat (i) traffic **congestion,** (ii) air quality, and (iii) road safety.A host of market-based strategies, driven by price mechanisms, have been proposed as the best and most efficient way to decrease both traffic **congestion** and vehicle emission. Strategies such as (a) **congestion** pricing, (b) emission fees, (c) reducing emissions of high polluting vehicles, and (d) introducing more efficient vehicle and fuel technologies, are not mutually exclusive. Therefore, they can be employed jointly within an overall strategy. In view of the conflicting objectives which may exist between improving urban air quality and reducing road fatalities and traffic **congestion,** it is of great importance to thoroughly investigate these functional relationships. The results of such studies will help decision makers identify the "socially optimal level of **congestion**" which will yield the highest net social benefit.

Miscellaneous Information:
IRRD Document Number i8860407

TRIS accession number: 641134 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: ROAD TRANSPORT: POLLUTION OF CITY CENTRES
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9311TR288E

Publication Title: SCIENCE IN PARLIAMENT
Volume: 50 **Number:** 2
Publication Date: 4/00/93 **Pagination:** 42-8
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References: 0 **Appendices:**

Publisher/Corporate Author 1:
WESTMINSTER PUBLISHING
PO BOX 89C
ESHER, SURREY UNITED KINGDOM

Abstract Information
Abstract: The future of road transport in British cities is of very great concern, with **congestion,** noise, and carbon dioxide emissions likely to rise as car ownership increases. This article reports the debate on this subject, held in the House of Lords on 26 January 1993. The debate was initiated by the Viscount of Oxfuird, who called for the new British Standard BS 7750 for environmental management systems to provide a framework for the debate. He presented the challenges of carbon dioxide emission, air pollution, traffic noise, and traffic **congestion.** He believed that these challenges could be met by British technical skill and ingenuity without any need to abolish cars, and he urged the development of new fuel standards. Lord Ezra reported progress in the development of lean burn engines and natural gas, and addressed the issue of stricter standards. The Earl of Halsbury discussed air pollution from traffic and suggested that advances in information technology and telecommunications could reduce the demand for road traffic. The Earl of Caithness emphasised the importance of catalysts in reducing pollutant emissions from vehicles. He pointed out that fuel price largely determines the priority that motorists and manufacturers attach to fuel economy, and referred to the Government's investigation of how to encourage energy-efficient public transport and of the possible role of **road pricing** to control urban traffic. There were ten other speeches in the debate, which were not reported.

Miscellaneous Information:
IRRD Document Number i8859919

TRIS accession number: 641143 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: BYPASSING OBSTACLES TO **ROAD PRICING**
Foreign Language: ENGLISH

Author(s):
ABBIE, L
NEVIN, M

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9311TR301E

Publication Title: PUBLIC FINANCE AND ACCOUNTANCY
Publication Date: 7/16/93 **Pagination:** 10-1
References: 0 **Appendices:**

Publisher/Corporate Author 1:
CHARTERED INSTITUTE OF PUBLIC FINANCE AND ACCOUNTANCY
3 ROBERT STREET
LONDON, WC2N 6BH UNITED KINGDOM

Abstract Information
Abstract: A recent questionnaire survey of local authorities in eleven historic British cities suggests that drivers' objections to charges can be overcome through consultation and the proper use of revenues. These cities were selected because they might experience acute traffic **congestion** and be unable to extend road capacity or plan lower densities. Public resistance could be overcome by integrating changes within a comprehensive traffic strategy and diverting revenues from **road pricing** into public transport subsidies and other measures to improve traffic **congestion** for all users. This would make public transport cheaper relative to private transport, encouraging a shift of peak hour traffic from private vehicles to more efficient modes making more efficient use of limited space. Only one of the cities surveyed had estimated the cost of traffic delays in terms of pollution, additional vehicle operating costs or time delays. Detailed research is needed on the economic costs of **congestion** and possible impact of **road pricing** on traffic plans. **Road pricing** would need to be complemented by a consultation process and public education to make road users aware of the costs and the alternatives available.

Miscellaneous Information:
IRRD Document Number i8859932

TRIS accession number: 642029 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: PASSENGER TRANSPORT. THE NEW FRAMEWORK. PAPERS PRESENTED AT A CONFERENCE HELD IN APRIL 1993. CHAPTER 1. THE CHANGING SCENE
Foreign Language: ENGLISH

Author(s):
CROSS, T(ED)
PITWOOD, M

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
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References: 0 **Appendices:**

Publisher/Corporate Author 1:
CONSTRUCTION INDUSTRY CONFERENCE CENTRE LTD
PO BOX 31
WELWYN, HERTFORDSHIRE AL6 OXA UNITED KINGDOM

Abstract Information
Abstract: This chapter examines some of the factors which have contributed to the rapid pace of change in public transport operations. Factors considered include deregulation, privatisation, the continued growth in car ownership, public expenditure constraints, urban **congestion,** new funding arrangements for local authority transport investment, urban transport strategies, the use of demand management and **road pricing** and the transport/land use relationship. The author considers that bus deregulation will not be reversed and that bus operating companies will function more effectively free of the public sector. Improved public transport will not on its own however restrain car use. An emerging framework is identified within which local authorities will have the opportunity to develop strategic transport policies to deal with urban transport problems. For the covering abstract see IRRD 857765.

Miscellaneous Information:
IRRD Document Number i8857766

TRIS accession number: 632593 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT, THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT. CHAPTER 5. POLICY RESPONSES IN THE NETHERLANDS
Foreign Language: ENGLISH

Author(s):
BANISTER, D(ED)
BUTTON, K(ED)
RIETVELD, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9302TR066E

Publication Date: 0/00/93 **Pagination:** 102-13
ISBN: 0-419-17870-8 **ISSN:**
References: 13 **Appendices:**

Publisher/Corporate Author 1:
E & FN SPON
2-6 BOUNDARY ROW
LONDON, SE1 8HN UNITED KINGDOM

Abstract Information
Abstract: Long-term policies concerning transport and the environment in the Netherlands are discussed. A number of targets have been set in the fields of air pollution, noise, safety, energy use, mobility and **congestion**. The policies evolved to reach these targets are described and the likelihood of them being achieved evaluated. Fiscal measures concerning car use are a main element including widespread electronic **road pricing**, a 30% increase in fuel prices, the abolition of tax allowances on commuting costs and a doubling of parking charges. Car pooling and bicycle use will be encouraged and investment made in rail infrastructure. Evaluation of the proposals reveals a number of drawbacks particularly in **road pricing** and the adequacy of assumptions. Also noted are an unexpected increase in the use of public transport and the introduction of free travel for students neither of which were part of the policy. For the covering abstract of the textbook see IRRD 854369.

Miscellaneous Information:
IRRD Document Number i8854374

TRIS accession number: 632819 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: SUB-TOPIC 3: INFRASTRUCTURE CAPACITY AND NETWORK ACCESS (CONTRIBUTION FROM FRANCE)
Foreign Language: ENGLISH

Author(s):
MARCHE, R
PAPINUTTI, L

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
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Publication Title: 12TH INTERNATIONAL SYMPOSIUM ON THEORY AND PRACTICE IN TRANSPORT ECONOMICS. TRANSPORT GROWTH IN QUESTION
Publication Date: 0/00/93 **Pagination:** 271-325
ISBN: 92-8-211180-6 **ISSN:**
References: 14 **Appendices:**

Publisher/Corporate Author 1:
OECD
2 RUE ANDRE-PASCAL
PARIS, CEDEX 16 75775 FRANCE

Abstract Information
Abstract: This paper considers the capacity of and access to transport networks at inter-regional, regional and local level for both passenger and freight traffic. Current practical issues such as **congestion** and increasing demand for travel are first considered. The role of access and capacity in determining the level of service for a given service are then considered with conclusions drawn with respect to demand formation and the economic appraisal of infrastructure. This includes an examination of indicators of regional benefit and a description of a number of models for estimating the demand for infrastructure. The possibility of managing capacity by controls on the existing infrastructure or by the introduction of new infrastructure are compared. It is concluded that the scale of growth in travel anticipated will call for new technologies, **road pricing** and new methods of financing. For the covering abstract of the conference see IRRD 856322.

Miscellaneous Information:
IRRD Document Number i8856330

TRIS accession number: 632854 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: OXFORD'S TRANSPORT: A EUROPEAN VIEW
Foreign Language: ENGLISH

Author(s):
SIMON, O

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9305TR003E

Publication Title: PROCEEDINGS OF THE INSTITUTION OF CIVIL ENGINEERS: MUNICIPAL ENGINEER
Volume: 98 **Number:** 1
Publication Date: 3/00/93 **Pagination:** 59-60
ISBN: **ISSN:** 0965-0903
References: 0 **Appendices:**

Publisher/Corporate Author 1:
THOMAS TELFORD SERVICES LTD
THOMAS TELFORD HOUSE, 1 HERON QUAY
LONDON, E14 4JD UNITED KINGDOM

Abstract Information
Abstract: This paper reports on a European Business Workshop organised as part of the European Community's THERMIE programme which promotes the greater use of energy efficient technologies. The subject of the workshop was the efficient management of urban transport in small European towns and cities. Figures are given for the annual consumption of energy, cost to the EC and the proportion consumed by urban traffic. The case of Oxford is described where a series of traffic management policies have been implemented since 1973. Current aims are to restrain traffic growth, and methods under consideration include: (a) land use planning to reduce journeys, (b) traffic calming, (c) **road pricing** and (d) park and ride schemes. Since deregulation bus **congestion** has been a particular problem. Details are given of plans to overcome this. The impact of recent planning legislation on transport plans is discussed and specific schemes outlined. Highlights of the transport plans of Bonn in Germany and Trento in Italy are noted.

Miscellaneous Information:
IRRD Document Number i8857190

TRIS accession number: 635915 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: FUNDING THE ROADS INFRASTRUCTURE
Foreign Language: ENGLISH

Author(s):
STANLEY, J

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9305AR123E

Publication Title: ROAD AND TRANSPORT RESEARCH
Volume: 2 **Number:** 1
Publication Date: 3/00/93 **Pagination:** 32-47
ISBN: **ISSN:** 1037-5783
References: 10 **Appendices:**

Abstract Information
Abstract: Road traffic growth has far exceeded growth in road expenditure over the past two decades. This trend is considerably influenced by the lack of any direct linkage between road expenditure needs and funding mechanisms. Similarly, the use of road systems is not characterised by any serious attempts to apply economic pricing principles to assist efficiency in use. Funding (cost-recovery) and pricing approaches can be applied in an integrated way to improve the efficiency of resource use in the sector and close the link between expenditure and funding somewhat. Beneficiary pays approaches to charging, largely associated with user pays and encompassing charges for externalities associated with road use, are the basis of this change. Fuel charges on all vehicles, registration fees on heavy vehicles, local government internal revenue sources, **congestion** charges, development levies and tolls are the major funding/pricing tools available. While more work is needed to calculate just how developer levies and **congestion** charges might be used for road funding, the paper shows how fuel charges, registration charges and local government revenue- sources might be used to fund road expenditure at about current levels. (A)

Miscellaneous Information:
IRRD Document Number i8849382

TRIS accession number: 635960 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: CHANGING PUBLIC ATTITUDES TO TRAFFIC GROWTH
Foreign Language: ENGLISH

Author(s):
JONES, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9306TR012E

Publication Title: LOCAL TRANSPORT TODAY AND TOMORROW: A COLLECTION OF ESSAYS PUBLISHED TO CELEBRATE THE 100TH ISSUE OF 'LOCAL TRANSPORT TODAY' EDITED BY PETER STONHAM
Publication Date: 0/00/93 **Pagination:** 39-43
ISBN: 0-9520935-0-2 **ISSN:**
References: 8 **Appendices:**

Publisher/Corporate Author 1:
LOCAL TRANSPORT TODAY LTD
QUADRANT HOUSE, 25 KENNINGTON LANE
LONDON, SE11 5RD UNITED KINGDOM

Abstract Information
Abstract: The results of a number of attitude surveys concerning traffic-related problems are discussed. **Congestion** and pollution are seen as a serious problem by up to 95% of those questioned. Up to 85% of the people questioned expect these problems to increase. One survey shows an increase in concern since 1983. When asked what action should be taken, strongest support was for alternatives or supplements to car use such as park and ride schemes, improved public transport and better cycling or pedestrian facilities. A minority of adults supported **road pricing.** The least popular option was increased petrol prices. However support for **road pricing** increases dramatically if this is used as part of an overall transport policy, with the money raised by **road pricing** being used to improve public transport. A survey by the EC found similar patterns of support for alternative transport modes as in the UK. The survey showed that politicians perceived the public to be more pro-car than they actually were. The question of changing attitudes is examined and parallels drawn with drink-driving and pedestrianisation schemes. Evidence from Germany shows the effect of encouraging the use of enviromentally friendly modes. The author suggests that the car should be treated more positively but in a way similar to the best china - only on special occasions. For the covering abstract of the publication see IRRD 857363.

Miscellaneous Information:
IRRD Document Number i8857370

TRIS accession number: 635965 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: CONFRONTING TRAFFIC GROWTH: TEN FINAL THOUGHTS
Foreign Language: ENGLISH

Author(s):
GOODWIN, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9306TR017E

Publication Title: LOCAL TRANSPORT TODAY AND TOMORROW: A COLLECTION OF ESSAYS PUBLISHED TO CELEBRATE THE 100TH ISSUE OF 'LOCAL TRANSPORT TODAY' EDITED BY PETER STONHAM
Publication Date: 0/00/93 **Pagination:** 67-71
ISBN: 0-9520935-0-2 **ISSN:**
References: 0 **Appendices:**

Publisher/Corporate Author 1:
LOCAL TRANSPORT TODAY LTD
QUADRANT HOUSE, 25 KENNINGTON LANE
LONDON, SE11 5RD UNITED KINGDOM

Abstract Information
Abstract: This paper considers the implications of the forecast traffic growth of 83-142% by the year 2025 suggested by the 1989 National Road Traffic Forecasts. The relationship between forecasts and policy and the role of the 1989 forecast in initiating the debate on traffic growth are considered. There is widespread agreement that the way forward is through 'integrated' or 'package' transport policies. The role of **road pricing** in releasing road space and generating revenue is described. Similarities are seen to emerge between economic and environmental arguments and the possibility of a successful green-gold alliance is suggested. A quality margin is recommended when it comes to the supply of capacity. The importance of the integration of public transport services is highlighted. Information technology techniques available are assessed in terms of their usefulness in controlling traffic growth. The effect on other parts of the country of restraining traffic growth in specific areas is discussed. The author suggests that forecasts need to take more account of continually evolving behavioural responses. For the covering abstract of the publication see IRRD 857363.

Miscellaneous Information:
IRRD Document Number i8857375

TRIS accession number: 635985 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: ROAD **CONGESTION** PRICING: WHEN IS IT A GOOD POLICY?
Foreign Language: ENGLISH

Author(s):
HILLS, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9306TR039E

Publication Title: JOURNAL OF TRANSPORT ECONOMICS AND POLICY
Volume: 27 **Number:** 1
Publication Date: 1/00/93 **Pagination:** 91-105
ISBN: **ISSN:** 0022-5258
References: 9 **Appendices:**

Publisher/Corporate Author 1:
UNIVERSITY OF BATH
CLAVERTON DOWN
BATH, BA2 7AY UNITED KINGDOM

Abstract Information
Abstract: The author takes issue with a number of aspects of the paper by Evans (1992) (see IRRD 854491) on the social implications of a congestion-pricing system. Hills argues that: a) **congestion** is more complex than Evans' assumptions allow even at strategic level; b) all three speed/flow relationships explored are conceptually flawed; c) definitions of capacity and throughput are inconsistent and the treatment of time is perverse; and d) mis-specification of both demand and supply arises from the use of a flow-based measure instead of a trips-based one. Each issue is discussed in detail. The paper includes a reply to these comments by Evans covering the standard economic model of road **congestion** pricing, stationarity and time dependence, networks and backward-bending speed-flow and **congestion** cost flow functions.

Miscellaneous Information:
IRRD Document Number i8857544

TRIS accession number: 636180 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: PAYING FOR BETTER MOTORWAYS. ISSUES FOR DISCUSSION
Foreign Language: ENGLISH

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9307TR364E

Publication Title: COMMAND PAPER
Volume: **Number:** CM 2200
Publication Date: 5/00/93 **Pagination:** VI+56P
ISBN: 0-10-122002-2 **ISSN:**
References: 0 **Appendices:**

Publisher/Corporate Author 1:
HER MAJESTY'S STATIONERY OFFICE
49 HIGH HOLBORN
LONDON, WC1V 6HB UNITED KINGDOM

Abstract Information
Abstract: This UK government green paper (a consultation document) sets out the possibilites for financing further investment in the road network. It examines the present system of motoring taxation and considers whether direct charges for the use of motorways would be a fairer way of passing on some of their cost to users. It takes account of the environmental considerations, including the relationship with other relevant economic instruments such as measures to reduce CO2 emissions, and the issue of diversion of motorway traffic onto less suitable roads. It reviews ways in which revenue is raised from motorists and roads are financed in other countries and considers the options for direct charging in this country: conventional tolling using toll booths and barriers, a permit system, or the new possibilities that are opened up by developments in the field of electronic charging. Finally the paper looks at the opportunities that charging would offer to increase private sector finance and management in road construction and operation. Annexes to the report cover: a) how the costing of roads and road use is determined; (b) how an electronic direct charging system would work; (c) examples of private sector involvement; and (d) risk transfer under "design, build, finance, and operate" contracts and franchises.

Miscellaneous Information:
IRRD Document Number i8858491

TRIS accession number: 639420 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: LAND TRANSPORT PRICING FOR NEW ZEALAND
Foreign Language: ENGLISH

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9308AR103E

Publication Title: TRANSIT NEW ZEALAND RESEARCH REPORT
Volume: **Number:** 18
Publication Date: 0/00/93 **Pagination:** 168P
ISBN: 0-478-04739-8 **ISSN:** 1170-9405
References: + **Appendices:**

Publisher/Corporate Author 1:
TRANSIT NEW ZEALAND
20-26 BALLANCE STREET
WELLINGTON, NEW ZEALAND

Abstract Information
Abstract: As part of the management of the land transport system of New Zealand, a study of land transport pricing policies, with particular emphasis on **road pricing,** has been carried out. The study comprised a review of relevant literature and the development of a proposed land transport pricing research programme for New Zealand. The report of this study consists of three parts: (1) A description of the current structure and pricing of land transport infrastructure in New Zealand; (2) A review of the literature on land transport pricing to identify the principles underlying transport pricing policies and current and proposed policies from other countries; and (3) The identification of a proposed land transport pricing research programme for New Zealand. The proposed research programme that was identified has three stages: (1) A preliminary review, based on current information and best estimates, which would derive initial estimates of costs per trip; (2) Conceptual studies to assess the implications of pursuing different policy objectives particularly in urban and rural areas; and (3) A detailed research programme to evaluate land transport pricing systems and to design a preferred pricing system. (A)

Miscellaneous Information:
IRRD Document Number i8849431

TRIS accession number: 639422 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: LAND TRANSPORT PRICING: DIGEST REPORT
Foreign Language: ENGLISH

Author(s):
CLOUGH, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9308AR105E

Publication Title: TRANSIT NEW ZEALAND RESEARCH REPORT
Volume: **Number:** 20
Publication Date: 0/00/93 **Pagination:** 50P
ISBN: 0-478-04741-X **ISSN:** 1170-9405
References: 2 **Appendices:**

Publisher/Corporate Author 1:
TRANSIT NEW ZEALAND
20-26 BALLANCE STREET
WELLINGTON, NEW ZEALAND

Abstract Information
Abstract: This Digest summarises the findings of two reports prepared as part of Transit New Zealand's transport pricing study, excluding recommendations for further research which are the subject of another document. These reports surveyed the international literature on transport pricing, considering the justification and available mechanisms for charges to cover road wear and maintenance, **congestion,** accidents, and various environmental effects. (A)

Miscellaneous Information:
IRRD Document Number i8849433

TRIS accession number: 639469 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: GLOBAL WARMING AND LONDON UPDATE
Foreign Language: ENGLISH

Author(s):
BELL, S

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9309TR016E

Publication Date: 3/00/93 **Pagination:** 21P
References: 0 **Appendices:**

Publisher/Corporate Author 1:
LONDON BOROUGHS ASSOCIATION
COLLEGE HOUSE, GREAT PETER STREET
LONDON, SW1P 3LN UNITED KINGDOM

Abstract Information
Abstract: This report updates a previous London Boroughs Association (LBA) publication on how the London Boroughs and the British Government could respond to global warming. It concentrates on assessing the British Government's subsequent actions, in relation to the LBA's recommendations, and reports on recent research. Many London Boroughs have considered and devised schemes to limit global warming through transport, planning and energy conservation projects. As these schemes require capital investment at a time when local authority funds are limited, additional finance from the Government is needed. Several welcome measures towards tackling global warming have already been taken by the Government. Possible positive measures in transport include: (1) a study of urban **congestion**; (2) **road pricing**; and (3) new measures to improve the enforcement of speed limits. However, there have not been higher levels of investment in public transport. The Government has continued to support its programme of massive investment in new roads, and it has delayed the introduction of catalytic converters for cars and abolished the tax on new cars. Although leaded petrol continues to be more expensive than unleaded petrol, no effort has been made to use fiscal measures to influence people to buy smaller, more fuel- efficient cars.

Miscellaneous Information:
IRRD Document Number i8859082

TRIS accession number: 632307 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: PLANNING AND FINANCING ROADS TO ENHANCE THE QUALITY OF LIFE
Foreign Language: ENGLISH

Author(s):
HARRAL, CG

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9204AR260E

Publication Title: ASPAC 92: IRF/ARF ASIA PACIFIC REGIONAL ROAD CONFERENCE, 1992, GOLD COAST, QUEENSLAND, AUSTRALIA
Volume: KEYNOTE ADDRESS **Number:**
Publication Date: 0/00/92 **Pagination:** 19P
References: 26 **Appendices:**

Publisher/Corporate Author 1:
AUSTRALIAN ROAD FEDERATION
PO BOX 139 (FAX +61-3-752-9234)
BORONIA, VICTORIA 3155 AUSTRALIA

Abstract Information
Abstract: Recent research has reconfirmed the importance of efficient road transport to economic development and growth, for cities, rural areas, and nations alike, whether in developing or mature economies. But deteriorating roads, burgeoning growth (particularly in Asia), **congestion,** and growing concerns at the negative consequences of transport on the environment and quality of life in our cities are all placing huge new demands on public finance at a time of increasing fiscal constraint on governments. How can these problems be dealt with? The answers lie largely within the transport sector itself, it is argued. Appropriate policies are easily identifiable - though less easily implemented - and include the traditional instruments of planning, pricing, finance, and taxation, as well as new advances in road metering technologies, **congestion pricing,** and the recent rediscovery of one of the oldest instruments of transport development: private participation in the provision of public infrastructure and services. For the covering abstract of this conference, see IRRD no 843040.

Miscellaneous Information:
IRRD Document Number i8843041

TRIS accession number: 626715 *TRIS files:* HRIS. H 9204.
UMTRIS. U 9201.

TRIS Record Flag: 4

Title: EXAMINING **CONGESTION PRICING** IMPLEMENTATION ISSUES. SUMMARY OF PROCEEDINGS: **CONGESTION PRICING** SYMPOSIUM

Publication Information:
Report No: FHWA-PL-93-008
Period Covered:
Publication Date: 12/00/92 **Pagination:** 68p
Figures: **Tables:** 8 Tab. **Photos:**
References: **Appendices:** 2 App.

Publisher/Corporate Author 1:
Federal Highway Administration
400 7th Street, SW
Washington, DC 20590

Available from:
Federal Highway Administration
400 7th Street, SW
Washington, DC 20590

Abstract Information
Abstract: This report summarizes the results of a symposium on **congestion pricing** implementation issues sponsored by the Federal Highway Administration and the Federal Transit Administration. The symposium, held in Arlington, Virginia, on June 10-12, 1992, was designed to move the discussion of **congestion pricing** from the academic tone of scholarly discourse to a more practical exchange of ideas about the problems and prospects for real-world demonstrations of **congestion pricing** concepts. More than 160 transportation professionals representing local, State, and Federal government agencies, highway user groups, transit interests, universities, and private industry participated in the symposium. There were five plenary sessions in which 14 papers were presented and discussed, and three breakout sessions in which participants were divided into five groups and charged with specific tasks related to the implementation and evaluation of **congestion pricing** projects. Papers presented during the plenary sessions covered the following topics: the past, present, and future of **congestion pricing**; issues related to pricing and the use of revenues; the role of market-based transportation demand management strategies; distributional impacts of **congestion pricing** and the need to stimulate transportation alternatives; and technological issues related to **congestion pricing**. Many symposium participants indicated that **congestion pricing** can help improve the efficiency of urban transportation systems. The widely held view was that too little attention has been given to dealing with political and other institutional issues. One clear message coming out the symposium is that public and political support must be generated if **congestion pricing** projects are to have any chance of success. Support can best be garnered if **congestion pricing** is included as part of a comprehensive plan for mobility improvement. The use of **congestion pricing** revenues to deal with distributional impacts and to finance transportation improvements should be a key part of the comprehensive plan. In addition, it is important--both for purposes of project development and for generating public support--that the objectives of specific **congestion pricing** applications be clearly defined. **Congestion pricing** cannot be imposed from the top. Support must be developed at the local level, and the public must accept **congestion pricing** as a way to reduce the costs associated with urban **congestion**.

Supplementary notes: The symposium was sponsored by the Federal Highway Administration and the Federal Transit Administration. This summary report is Number 6 in the FHWA's Searching for Solutions: A Policy Discussion Series.

TRIS accession number: 628976 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 3

Title: **CONGESTION** CHARGING MECHANISMS FOR ROADS: AN EVALUATION OF CURRENT PRACTICE. POLICY RESEARCH WORKING PAPER

Author(s):
Hau, TD

Publication Information:
Report No: WPS 1071
Period Covered:
Publication Date: 12/00/92 **Pagination:** 109p
Figures: **Tables:** 5 Tab. **Photos:**
References: Refs. **Appendices:** 3 App.

Publisher/Corporate Author 1:
World Bank
Infrastructure and Urban Development Division, 1818 H Street, NW
Washington, DC 20433

Available from:
World Bank
Infrastructure and Urban Development Division, 1818 H Street, NW
Washington, DC 20433

Abstract Information
Abstract: This paper investigates the implementation aspects of **road pricing** by setting down criteria for a "good" **road pricing** system. Besides analyzing the gamut of indirect and direct methods of charging for road usage, the paper surveys alternative **congestion pricing** technologies including: (1) cordon pricing using manual tollbooths, (2) area licensing schemes, (3) off-vehicle recording systems such as automatic vehicle identification, and (4) on-vehicle charging systems such as smart card technology. Each of these instruments is dealt with by a relatively in-depth case study analysis based on the benefits, costs and revenues of implementing and utilizing each charging mechanism. Since benefit figures are not always readily available, the cost per transaction of operating a system over the long run is used as an index of the relative cost-effectiveness of each technology. Based on alternative quantitative and qualitative criteria, the implications of using each of these technologies for tackling **congestion** are summarized in a key table and conditional policy recommendations are made.

TRIS accession number: 628977 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 3

Title: ECONOMIC FUNDAMENTALS OF **ROAD PRICING**: A DIAGRAMMATIC ANALYSIS. POLICY RESEARCH WORKING PAPER

Author(s):
Hau, TD

Publication Information:
Report No: WPS 1070
Period Covered:
Publication Date: 12/00/92 **Pagination:** 106p
Figures: 14 Fig. **Tables:** **Photos:**
References: Refs. **Appendices:** 1 App.

Publisher/Corporate Author 1:
World Bank
Infrastructure and Urban Development Dept, 1818 H Street, NW
Washington, DC 20433

Available from:
World Bank
Infrastructure and Urban Development Dept, 1818 H Street, NW
Washington, DC 20433

Abstract Information
Abstract: This paper presents a conceptual framework for **road pricing** based on a rigorous diagrammatic -- but non-mathematical -- framework derived from first (economic) principles. It throws light on **congestion pricing** systems and issues surrounding short-run and long-run marginal cost pricing, scale economies and diseconomies, indivisibilities, road durability, the peak-load problem in urban transport and the financial viability of the public provision of road services. The paper integrates the ideas of Mohring, Strotz, Vickrey, Walters, Keeler, Small, Winston and Newbery into a single framework. Analysis of the traditional **road pricing** arguments demonstrates why **congestion pricing** as practiced in the past has understandably encountered obstacles to implementation. This is partly because both types of road users, the tolled and the tolled off (those who avoid a road in order to shun the toll), are shown to be worse off -- with the exception of the government -- under a constant value of time. Even if differences in time valuation are taken into account, it is still essentially the case that primarily those with very high time values are made better off. Unless **congestion** toll revenues are earmarked and travellers perceive that the money is channeled back in the form of reduced taxes, lower user charges or improved transport services, neither the priced nor the priced off would support **road pricing**. It is only in the case of hypercongestion that **congestion pricing** can be shown to make everyone better off.

TRIS accession number: 630270 *TRIS files:* TRAIS. T.
UMTRIS. U.

TRIS Record Flag: 2

Title: PROJECT PAPER FOR FHWA/FTA NATIONAL SYMPOSIUM ON **CONGESTION** MANAGEMENT AND MOBILITY. RESEARCH IN PROGRESS

Publication Information:
Source of Document: FEDERAL TRANSIT ADMINISTRATION

Publication Date: 0/00/00 **Pagination:**

Abstract Information
Abstract: The purpose of the project was for development of resource papers for the National Symposium on **Congestion** Management and Mobility to stimulate thought focus and discussions on the subjects of **Congestion Pricing,** Pricing and Using the Revenues from **Congestion Pricing,** Market-Based vs.Command-and-Control Methods of Reducing **Congestion** and Emissions, the Role of Market-Oriented Pricing Policies, Issues Related to **Road Pricing** Technology, and Transportation Alternatives in a **Congestion Pricing** Environment.

Performed by:
Pool, RW, Jr
Address:
Los Angeles, CA 000

Funding information

Contract/Grant Number:
FTA-CA-26-0002

Funding type:
Grant

Status: Active
Notice Date: Mar 1993
Start Date: Oct 1991

Contract Date:
Completion Date: Oct 1992 **Est.**

Fiscal information

Total Dollars: 4600

Funded by:
Federal Transit Administration
Address:
Office of Technical Assistance and Safety, 400 7th Street, SW
Washington, DC 20590
Responsible Individual: Durham, J - (TTS-12)
Responsible Individual Phone: 202-366-0255

TRIS accession number: 630273 *TRIS files:* TRAIS. T.
UMTRIS. U.

TRIS Record Flag: 2

Title: PROJECT PAPERS FOR FHWA/FTA NATIONAL SYMPOSIUM ON **CONGESTION** MANAGEMENT AND MOBILITY. RESEARCH IN PROGRESS

Publication Information:
Source of Document: FEDERAL TRANSIT ADMINISTRATION

Publication Date: 0/00/00 **Pagination:**

Abstract Information
Abstract: The purpose of the project was to develop resource papers for the National Symposium on **Congestion** Management and Mobility to simulate thought focus and discussions on the subjects of **Congestion Pricing,** Pricing and Using the Revenues from **Congestion Pricing,** Market-Based vs. Command-and-Control Methods of Reducing **Congestion** and Emissions, the Role of Market-Oriented Pricing Policies, Issues Related to **Road Pricing** Technology, and Transportation Alternatives in a **Congestion Pricing** Environment.

Performed by:
Shoup, Donald C
Address:
Los Angeles, CA 000

Funding information

Contract/Grant Number:
FTA-CA-26-0004

Funding type:
Grant

Status: Active
Notice Date: Mar 1993
Start Date: Oct 1991

Contract Date:
Completion Date: Oct 1992 **Est.**

Fiscal information

Total Dollars: 5000

Funded by:
Federal Transit Administration
Address:
Office of Technical Assistance and Safety, 400 7th Street, SW
Washington, DC 20590
Responsible Individual: Durham, J - (TTS-12)
Responsible Individual Phone: 202-366-0255

TRIS accession number: 630272 *TRIS files:* TRAIS. T.
UMTRIS. U.

TRIS Record Flag: 2

Title: PROJECT PAPERS FOR FHWA/FTA NATIONAL SYMPOSIUM ON **CONGESTION** MANAGEMENT AND MOBILITY. RESEARCH IN PROGRESS

Publication Information:
Source of Document: FEDERAL TRANSIT ADMINISTRATION

Publication Date: 0/00/00 **Pagination:**

Abstract Information
Abstract: The purpose of the project was to develop resource papers for the National Symposium on **Congestion** Management and Mobility to simulate thought focus and discussions on the subjects of **Congestion Pricing,** Pricing and Using the Revenues from **Congestion Pricing,** Market-Based vs. Command-and-Control Methods of Reducing **Congestion** and Emissions, the Role of Market-Oriented Pricing Policies, Issues Related to **Road Pricing** Technology, and Transportation Alternatives in a **Congestion Pricing** Environmrnt.

Performed by:
Giuliano, Genevieve
Address:
Irvine, CA 000

Funding information

Contract/Grant Number:
FTA-CA-26-0003

Funding type:
Grant

Status: Active
Notice Date: Mar 1993
Start Date: Oct 1991

Contract Date:
Completion Date: Oct 1992 **Est.**

Fiscal information

Total Dollars: 5000

Funded by:
Federal Transit Administration
Address:
Office of Technical Assistance and Safety, 400 7th Street, SW
Washington, DC 20590
Responsible Individual: Durham, J - (TTS-12)
Responsible Individual Phone: 202-366-0255

TRIS accession number: 630274 *TRIS files:* TRAIS. T.
UMTRIS. U.

TRIS Record Flag: 2

Title: PROJECT PAPERS FOR FHWA/FTA NATIONAL SYMPOSIUM ON **CONGESTION** MANAGEMENT AND MOBILITY. RESEARCH IN PROGRESS

Publication Information:
Source of Document: FEDERAL TRANSIT ADMINISTRATION

Publication Date: 0/00/00 **Pagination:**

Abstract Information
Abstract: The purpose of the project was to develop resource papers for the National Symposium on **Congestion** Management and Mobility to simulate thought focus and discussions on the subjects of **Congestion Pricing,** Pricing and Using the Revenues from **Congestion Pricing,** Market-based vs. Command-and-Control Methods of Reducing **COngestion** and Emissions, the Role of Market-Oriented Pricing Policies, Issues Related to **Road Pricing** Technology, and Transportation Alternatives in **Congestion Pricing** Environment.

Performed by:
Rooney, Steven B
Address:
Costa Mesa, CA 000

Funding information

Contract/Grant Number:
FTA-CA-26-0005

Funding type:
Grant

Status: Active
Notice Date: Mar 1993
Start Date: Oct 1991

Contract Date:
Completion Date: Oct 1992 **Est.**

Fiscal information

Total Dollars: 4930

Funded by:
Federal Transit Administration
Address:
Office of Technical Assistance and Safety, 400 7th Street, SW
Washington, DC 20590
Responsible Individual: Durham, J - (TTS-12)
Responsible Individual Phone: 202-366-0255

TRIS accession number: 630275 *TRIS files:* TRAIS. T.
UMTRIS. U.

TRIS Record Flag: 2

Title: PROJECT PAPERS FOR FHWA/FTA NATIONAL SYMPOSIUM ON **CONGESTION** MANAGEMENT AND MOBILITY. RESEARCH IN PROGRESS

Publication Information:
Source of Document: FEDERAL TRANSIT ADMINISTRATION

Publication Date: 0/00/00 **Pagination:**

Abstract Information
Abstract: The purpose of the project was to develop resource papers for the National Symposium on **Congestion** Management and Mobility to stimulate thought focus and discussions on the subjects of **Congestion Pricing,** Pricing and Using the Revenues from **Congestion Pricing,** Market-Based vs. Command-and-Control Methods of Reducing **Congestion** and Emissions, the Role of Market-Oriented Pricing Policies, Issues Related to **Road Pricing** Technology, and Transportation Alternatives in a **Congestion Pricing** Environment.

Performed by:
Cervero, Robert
Address:
Berkeley, CA 000

Funding information

Contract/Grant Number:
FTA-CA-26-0006

Funding type:
Grant

Status: Active
Notice Date: Mar 1993
Start Date: Oct 1991

Contract Date:
Completion Date: Oct 1992 **Est.**

Fiscal information

Total Dollars: 4981

Funded by:
Federal Transit Administration
Address:
Office of Technical Assistance and Safety, 400 7th Street, SW
Washington, DC 20590
Responsible Individual: Durham, J - (TTS-12)
Responsible Individual Phone: 202-366-0255

TRIS accession number: 630271 *TRIS files:* TRAIS. T.
UMTRIS. U.

TRIS Record Flag: 2

Title: PROJECT PAPERS FOR FHWA/FTA NATIONAL SYMPOSIUM ON **CONGESTION** MANAGEMENT AND MOBILITY. RESEARCH IN PROGRESS

Publication Information:
Source of Document: FEDERAL TRANSIT ADMINISTRATION

Publication Date: 0/00/00 **Pagination:**

Abstract Information
Abstract: The purpose of the project was to develop resource papers for the National Symposium on **Congestion** Management and Mobility to stimulate thought focus and discussions on the subjects of **Congestion Pricing,** Pricing and Using the Revenues from **Congestion Pricing,** Market-Based vs. Command-and-Control Methods of Reducing **Congestion** and Emissions, the Role of Market-Oriented Pricing Policies, Issues Related to **Road Pricing** Technology, and Transportation Alternatives in a **Congestion Pricing** Environment.

Performed by:
Small, Kenneth
Address:
Chestnut Hills, MA 000

Funding information

Contract/Grant Number:
FTA-MA-26-0003

Funding type:
Grant

Status: Active
Notice Date: Mar 1993
Start Date: Oct 1991

Contract Date:
Completion Date: Oct 1992 **Est.**

Fiscal information

Total Dollars: 5000

Funded by:
Federal Transit Administration
Address:
Office of Technical Assistance and Safety, 400 7th Street, SW
Washington, DC 20590
Responsible Individual: Durham, J - (TTS-12)
Responsible Individual Phone: 202-366-0255

TRIS accession number: 642263 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: MODIFYING OUR VOLUME OF TRAFFIC: THE PRIMARY ROUTE TO SUSTAINABLE TRANSPORT
Foreign Language: ENGLISH

Author(s):
GOODWIN, PB
PARKHURST, GP
STOKES, G

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9310TR176E

Publication Title: TSU REF: 729
Publication Date: 10/00/92 **Pagination:** 79P
References: 32 **Appendices:**

Publisher/Corporate Author 1:
TRANSPORT STUDIES UNIT, UNIVERSITY OF OXFORD
11 BEVINGTON ROAD
OXFORD, OXFORDSHIRE OX2 6NB UNITED KINGDOM

Abstract Information
Abstract: This report argues that the primary concern about transport's effects on the environment should be total volume of traffic, but that policies based on the resulting realisation could bring environmental benefits without causing economic collapse. The interaction of economic, environmental and energy requirements is considered. It is now known that the future supply of roads cannot meet the predicted demand for road space or solve environmental transport problems. In view of this, the authors define two main objectives for transport policy: (1) matching demand to supply, as supply cannot be matched fully to demand; (2) encouraging environmentally beneficial and economically efficient methods of achieving personal access and freight distribution. The concept of 'quality margin' is relevant here, and has several practical applications. The main focusses of the new policy approach are: (1) demand-restraint through **road pricing**; (2) developing high-density urban public transport. Other elements, required to achieve a balanced public transport policy, are discussed, and some potential pitfalls are indicated. While considering whether environmental improvement could threaten economic prosperity, the authors argue that: (1) environmental costs are real economic costs; (2) environmental benefits have a real economic value; and (3) there are environmentally friendly, environmentally efficient transport policies.

Miscellaneous Information:
IRRD Document Number i8859579

TRIS accession number: 634009 *TRIS files:* HRIS. H 9301.

TRIS Record Flag: 4

Title: TECHNOLOGICAL RESPONSES TO URBAN TRAFFIC **CONGESTION**. PART THREE: THE TECHNOLOGY OF TRAFFIC RESTRAINT

Author(s):
Khan, AM
Klaesi, E

Publication Information:
Publication Title: JOURNAL OF URBAN TECHNOLOGY
Volume: 1 **Number:** 1
Report No:
Period Covered: Fall 92
Publication Date: 10/00/92 **Pagination:** pp 47-68
ISBN: **ISSN:** 10630732
Figures: 1 Fig. **Tables:** 5 Tab. **Photos:**
References: 17 Ref. **Appendices:**

Publisher/Corporate Author 1:
New York City Technical College
300 Jay Street
Brooklyn, NY 11201-

Available from:
New York City Technical College
300 Jay Street
Brooklyn, NY 11201-

Abstract Information
Abstract: **Congestion** is caused by too many vehicles competing for too little road space. Any city wishing to relieve **congestion** and its concomitant costs must create more roads, better manage the flow of traffic, or restrict the amount of traffic. This paper describes methods of traffic restraint and reports the experience of Singapore with area licensing and that of Hong Kong with electronic **road pricing**. It also discusses the extent of the interest in electronic **road pricing** and the technological developments still needed for its effective implementation

TRIS accession number: 634420 *TRIS files:* HRIS. H 9301.
UMTRIS. U 9301.

TRIS Record Flag: 4

Title: INVESTIGATION OF LEAST COST APPROACH TO LONG TERM **CONGESTION** REDUCTION IN URBAN AREAS

Author(s):
Pollard, WS
Hamilton, WR

Publication Information:
Report No: MPC Rept No. 92-12
Period Covered:
Publication Date: 6/00/92 **Pagination:** 149p
Figures: 85 Fig. **Tables:** **Photos:**
References: 23 Ref. **Appendices:** 4 App.

Publisher/Corporate Author 1:
Mountain-Plains Consortium
North Dakota State University, P.O. Box 5074
Fargo, ND 58105-

Available from:
Mountain-Plains Consortium
North Dakota State University, P.O. Box 5074
Fargo, ND 58105-

Abstract Information
Abstract: This report presents the results of a research effort that is concerned with developing certain tools that can generate information that may be used by policy makers in deciding the desirability and utility of employing certain high technology options in solving ground transportation and **congestion** problems. These options include intelligent vehicle highway systems, roadway powered electric vehicle systems, light rail transit and pricing among others. In addition to the primary concern of traffic **congestion** in urban areas, other important issues that are addressed include: (1) improvement in the air quality in urban areas; (2) conservation of petroleum resources; (3) a significant improvement in the national balance of payments because of the large reduction in the requirements for petroleum for internal combustion engines (ICEs) for automotive use; (4) a reduction in the current trend towards global warming as the result of the smaller amount of carbon dioxide production by the automotive transportation system that uses the advanced technologies; (5) a reduction in automotive operating costs as the result of replacing the ICE power and drive train with electrical systems that have both higher energy conversion efficiencies and more reliable longer life components thus freeing up large sums of money for other more productive uses; and (6) an improvement in automotive safety that may reduce the national death toll by thousands of lives annually and reduce the accident rate resulting in property damage and personal injury.

TRIS accession number: 643317 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: SETTING FORTH: A CONSULTATION DOCUMENT - FIRTH OF FORTH TRANSPORT LINKS
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9312TR370E

Publication Date: 0/00/92 **Pagination:** 59P
References: 0 **Appendices:**

Publisher/Corporate Author 1:
SCOTTISH OFFICE
NEW ST ANDREW'S HOUSE, ST JAMES CENTRE
EDINBURGH, EH1 3SZ UNITED KINGDOM

Abstract Information
Abstract: This document describes the current transport situation in the area around the Forth road and rail bridges and asks for comments on proposals for short, medium and long term improvements. Information about travel in the area is drawn from three studies: () the Trunk and Key Principle Road Network Review; (b) the Forth Road Bridge Short Term Measures Study; and (c) the South Fife to Edinburgh Strategic Rail Study. Statistics are provided for traffic growth on the Forth Bridge, north and south traffic flows, modal split, queue lengths and anticipated queue lengths. The various measures possible and their likely effect are discussed. In the short term these include rail improvements, traffic management measures and **road pricing**. Medium term measures include an additional railway station, upgraded bus services, a fifth lane on the Forth Road Bridge and a number of road projects including the Barnton By-pass. In the long term a second road crossing of the Forth is recommended. Comments are invited on a number of issues raised by these possible measures.

Miscellaneous Information:
IRRD Document Number i8860645

TRIS accession number: 827374 *TRIS files:* TLIB. L.

TRIS Record Flag: 1

Title: ECONOMIC FUNDAMENTALS OF **ROAD PRICING**: A DIAGRAMMATIC ANALYSIS.
Foreign Language: ENGLISH

Author(s):
BY TIMOTHY D. HAU.

Publication Information:
Source of Document: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES

Volume: **Number:** WPS 1070
Publication Date: 0/00/92 **Pagination:**

Publisher/Corporate Author 1:
WORLD BANK,
WASHINGTON, DC:
,

Publisher/Corporate Author 2:
POLICY RESEARCH WORKING PAPERS;

,

Abstract Information
Abstract: No abstract provided.
Supplementary notes: INCLUDES BIBLIOGRAPHICAL REFERENCES (P. 89-96) INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT. "DECEMBER 1992."--COVER.

TRIS accession number: 626204 *TRIS files:* HRIS. H 9203.

TRIS Record Flag: 3

Title: EXPERIMENTAL MEASURES TO CURB ROAD **CONGESTION** IN SINGAPORE: PRICING AND QUOTAS

Author(s):
Toh, RS

Publication Information:
Publication Title: Logistics and Transportation Review
Volume: 28 **Number:** 3
Publication Date: 9/00/92 **Pagination:** pp 289-317
ISBN: **ISSN:** 00474991
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
British Columbia University, Canada
Center for Transportation Studies
Vancouver V6T 1W5, BC Canada

Available from:
British Columbia University, Canada
Center for Transportation Studies
Vancouver V6T 1W5, BC Canada

Order Number:

Abstract Information
Abstract: This is a study of the road **congestion** problem in Singapore and the various experimental measures that have been implemented using the pricing mechanism and quota system. These include the Area Licensing Scheme, the proposed Electronic **Road Pricing** Systme, Weekend Car Concept, general pricing restraints, and quotas on new car purchases. It concludes with a discussion on the impact on welfare, makes several policy recommendations, and outlines lessons for other countries contemplating similar measures.

TRIS accession number: 626715 *TRIS files:* HRIS. H 9204.
UMTRIS. U 9201.

TRIS Record Flag: 4

Title: EXAMINING **CONGESTION** PRICING IMPLEMENTATION ISSUES. SUMMARY OF PROCEEDINGS: **CONGESTION** PRICING SYMPOSIUM

Publication Information:
Report No: FHWA-PL-93-008
Period Covered:
Publication Date: 12/00/92 **Pagination:** 68p
Figures: **Tables:** 8 Tab. **Photos:**
References: **Appendices:** 2 App.

Publisher/Corporate Author 1:
Federal Highway Administration
400 7th Street, SW
Washington, DC 20590

Available from:
Federal Highway Administration
400 7th Street, SW
Washington, DC 20590

Abstract Information
Abstract: This report summarizes the results of a symposium on **congestion** pricing implementation issues sponsored by the Federal Highway Administration and the Federal Transit Administration. The symposium, held in Arlington, Virginia, on June 10-12, 1992, was designed to move the discussion of **congestion** pricing from the academic tone of scholarly discourse to a more practical exchange of ideas about the problems and prospects for real-world demonstrations of **congestion** pricing concepts. More than 160 transportation professionals representing local, State, and Federal government agencies, highway user groups, transit interests, universities, and private industry participated in the symposium. There were five plenary sessions in which 14 papers were presented and discussed, and three breakout sessions in which participants were divided into five groups and charged with specific tasks related to the implementation and evaluation of **congestion** pricing projects. Papers presented during the plenary sessions covered the following topics: the past, present, and future of **congestion** pricing; issues related to pricing and the use of revenues; the role of market-based transportation demand management strategies; distributional impacts of **congestion** pricing and the need to stimulate transportation alternatives; and technological issues related to **congestion** pricing. Many symposium participants indicated that **congestion** pricing can help improve the efficiency of urban transportation systems. The widely held view was that too little attention has been given to dealing with political and other institutional issues. One clear message coming out the symposium is that public and political support must be generated if **congestion** pricing projects are to have any chance of success. Support can best be garnered if **congestion** pricing is included as part of a comprehensive plan for mobility improvement. The use of **congestion** pricing revenues to deal with distributional impacts and to finance transportation improvements should be a key part of the comprehensive plan. In addition, it is important--both for purposes of project development and for generating public support--that the objectives of specific **congestion** pricing applications be clearly defined. **Congestion** pricing cannot be imposed from the top. Support must be developed at the local level, and the public must accept **congestion** pricing as a way to reduce the costs associated with urban **congestion**.

Supplementary notes: The symposium was sponsored by the Federal Highway Administration and the Federal Transit Administration. This summary report is Number 6 in the FHWA's Searching for Solutions: A Policy Discussion Series.

TRIS accession number: 628976 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 3

Title: **CONGESTION** CHARGING MECHANISMS FOR ROADS: AN EVALUATION OF CURRENT PRACTICE. POLICY RESEARCH WORKING PAPER

Author(s):
Hau, TD

Publication Information:
Report No: WPS 1071
Period Covered:
Publication Date: 12/00/92 **Pagination:** 109p
Figures: **Tables:** 5 Tab. **Photos:**
References: Refs. **Appendices:** 3 App.

Publisher/Corporate Author 1:
World Bank
Infrastructure and Urban Development Division, 1818 H Street, NW
Washington, DC 20433

Available from:
World Bank
Infrastructure and Urban Development Division, 1818 H Street, NW
Washington, DC 20433

Abstract Information
Abstract: This paper investigates the implementation aspects of **road pricing** by setting down criteria for a "good" **road pricing** system. Besides analyzing the gamut of indirect and direct methods of charging for road usage, the paper surveys alternative **congestion** pricing technologies including: (1) cordon pricing using manual tollbooths, (2) area licensing schemes, (3) off-vehicle recording systems such as automatic vehicle identification, and (4) on-vehicle charging systems such as smart card technology. Each of these instruments is dealt with by a relatively in-depth case study analysis based on the benefits, costs and revenues of implementing and utilizing each charging mechanism. Since benefit figures are not always readily available, the cost per transaction of operating a system over the long run is used as an index of the relative cost-effectiveness of each technology. Based on alternative quantitative and qualitative criteria, the implications of using each of these technologies for tackling **congestion** are summarized in a key table and conditional policy recommendations are made.

TRIS accession number: 628977 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 3

Title: ECONOMIC FUNDAMENTALS OF **ROAD PRICING**: A DIAGRAMMATIC ANALYSIS. POLICY RESEARCH WORKING PAPER

Author(s):
Hau, TD

Publication Information:
Report No: WPS 1070
Period Covered:
Publication Date: 12/00/92 **Pagination:** 106p
Figures: 14 Fig. **Tables:** **Photos:**
References: Refs. **Appendices:** 1 App.

Publisher/Corporate Author 1:
World Bank
Infrastructure and Urban Development Dept, 1818 H Street, NW
Washington, DC 20433

Available from:
World Bank
Infrastructure and Urban Development Dept, 1818 H Street, NW
Washington, DC 20433

Abstract Information
Abstract: This paper presents a conceptual framework for **road pricing** based on a rigorous diagrammatic -- but non-mathematical -- framework derived from first (economic) principles. It throws light on **congestion** pricing systems and issues surrounding short-run and long-run marginal cost pricing, scale economies and diseconomies, indivisibilities, road durability, the peak-load problem in urban transport and the financial viability of the public provision of road services. The paper integrates the ideas of Mohring, Strotz, Vickrey, Walters, Keeler, Small, Winston and Newbery into a single framework. Analysis of the traditional **road pricing** arguments demonstrates why **congestion** pricing as practiced in the past has understandably encountered obstacles to implementation. This is partly because both types of road users, the tolled and the tolled off (those who avoid a road in order to shun the toll), are shown to be worse off -- with the exception of the government -- under a constant value of time. Even if differences in time valuation are taken into account, it is still essentially the case that primarily those with very high time values are made better off. Unless **congestion** toll revenues are earmarked and travellers perceive that the money is channeled back in the form of reduced taxes, lower user charges or improved transport services, neither the priced nor the priced off would support **road pricing**. It is only in the case of hypercongestion that **congestion** pricing can be shown to make everyone better off.

TRIS accession number: 629255 *TRIS files:* HRIS. H 9204.

TRIS Record Flag: 3

Title: **ROAD PRICING** IN PRACTICE

Author(s):
Field, BG

Publication Information:
Publication Title: Transportation Journal
Volume: 32 **Number:** 1
Publication Date: 0/00/92 **Pagination:** pp 5-14
ISBN: **ISSN:** 00411612
Figures: Figs. **Tables:** **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
American Society of Transportation and Logistics
1816 Norris Place
Louisville, KY 40205

Available from:
University Microfilms International
300 North Zeeb Road
Ann Arbor, MI 48106

Abstract Information
Abstract: The urban transport problem is usually perceived as a disequilibrium, at peak times, between the supply of transport infrastructure and the demand for the use of this infrastructure by an increasing population for more journeys. Policy makers have responded to growing traffic **congestion** problems with a range of vehicle restraint measures including fuel taxes, parking controls, traffic management, etc. Transport economists have generally argued that the only comprehensive long-term solution lies with the introduction of **road pricing.** This article evaluates Singapore's unique experience in actually employing the price mechanism to ration more effectively the use of roads during periods of peak demand and considers some ramifications of such a policy.

TRIS accession number: 629288 *TRIS files:* HRIS. H 9204.
UMTRIS. U 9301.

TRIS Record Flag: 3

Title: RADICAL APPROACHES TO IVHS GOALS

Author(s):
Chen, K

Publication Information:
Publication Date: 0/00/92 **Pagination:** v.p.
Figures: Figs. **Tables:** **Photos:**

Publisher/Corporate Author 1:
IVHS America
1776 Massachusetts Avenue, NW, Suite 510
Washington, DC 20036-1993

Available from:
IVHS America
1776 Massachusetts Avenue, NW, Suite 510
Washington, DC 20036-1993

Abstract Information
Abstract: In the author's opinion, there are five candidates for radical solutions that can have really substantial improvements on one or several of the IVHS goals of **congestion** relief, safety, and environmental protection. These may be called the ABCDE of radical solutions as follows: (A) Automated highways; (B) Bus, HOV, and multimodal travel; (C) **Congestion** metering or **road pricing**; (D) Double-deck expressway construction; (E) Environmental regulation. Although some of these solutions may not require IVHS, it is possible for IVHS to help implement most, if not all, of them.

Conference Information

Conference Title: Surface Transportation and the Information Age. Proceedings of the IVHS America 1992 Annual Meeting, Volume I
Sponsored by:
Location: Newport Beach, CA
Date Held: May 17, 1992-May 20, 1992

TRIS accession number: 629425 *TRIS files:* HRIS. H 9301.
UMTRIS. U 9301.

TRIS Record Flag: 3

Title: TECHNOLOGICAL RESPONSES TO URBAN TRAFFIC **CONGESTION**

Author(s):
Khan, AM
Klaesi, E

Publication Information:
Publication Title: JOURNAL OF URBAN TECHNOLOGY
Volume: 1 **Number:** 1
Report No:
Period Covered: Fall
Publication Date: 0/00/92 **Pagination:** pp 47-68
ISBN: **ISSN:** 10630732
Figures: **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
N/A
300 Jay Street
Brooklyn, NY 11201-

Available from:
N/A
300 Jay Street
Brooklyn, NY 11201-

Abstract Information
Abstract: This paper describes methods of traffic restraint and reports the experience of Singapore with area licensing and that of Hong Kong with electronic **road pricing.** It closes with a discussion of the extent of the interest in electronic **road pricing** and the technological developments still needed for its effective implementation.

TRIS accession number: 639472 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRAFFIC GROWTH AND THE URBAN ENVIRONMENT
Foreign Language: ENGLISH

Author(s):
STOKES, G

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9309TR020E

Publication Title: TSU REF: 731
Publication Date: 11/00/92 **Pagination:** 10P
References: 11 **Appendices:**

Publisher/Corporate Author 1:
TRANSPORT STUDIES UNIT, UNIVERSITY OF OXFORD
11 BEVINGTON ROAD
OXFORD, OXFORDSHIRE OX2 6NB UNITED KINGDOM

Abstract Information
Abstract: This paper reviews how traffic and traffic growth might affect the quality of life in cities, predicts future amounts of traffic in cities, and considers how various forecast levels of traffic could affect cities. Adverse effects of traffic on quality of life include: noise, accidents, loss of social interaction, unviable urban facilities, pollution, and **congestion.** Hitherto, few actions have successfully limited traffic growth, except where full capacity has been reached; steps should be taken to achieve a quality margin, by ensuring that the demand for traffic is kept lower than the capacity. One consequence of forecasts of rapid traffic growth and growth in car ownership in the UK is that the quality of life and vitality of cities could worsen, especially in inner city areas, unless there is some form of demand management. If demand management policies are implemented, as seems likely, they will probably be aimed primarily at cities. Possible policies include: (1) **congestion road pricing;** (2) carbon taxes; (3) improved public transport; (4) use of information technology; (5) encouraging local journeys; (6) traffic calming. Successful urban transport policies require the perceived best quality of life to return from rural to urban areas, and could help to bring about such a change.

Miscellaneous Information:
IRRD Document Number i8859086

TRIS accession number: 642125 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: INTERGRATED ROAD SAFETY, INFORMATION AND NAVIGATION SYSTEM (IRIS). FINAL REPORT
Foreign Language: ENGLISH

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9309TR036E

Volume: **Number:** XIII/F/DR3
Publication Date: 0/00/92 **Pagination:** 135P
References: 0 **Appendices:**

Publisher/Corporate Author 1:
COMMISSION OF THE EUROPEAN COMMUNITIES, DIRECTORATE GENERAL TELECOMMUNICATIONS INFORMATION INDUSTRIES AND INNOVATION
RUE DE LA LOI 200
BRUSSELS, B-1049 BELGIUM

Abstract Information
Abstract: The aim of this report is to provide the Commission with all the necessary material (including cost figures) to support the implementation of an Integrated Road Safety, Information and Navigation System (IRIS) all over Europe. This should include all the simple RTI (Road Transport Informatics) systems already developed, as well as using all the results obtained under the DRIVE Programme. The areas where ATT (Advanced Transport Telematics) techniques could be implemented are as follows. 1) Provision of driver and traveller information. 2) Provision of automatic guidance and navigation systems for drivers. 3) Reduction of travel times and air pollution, and improvement of traffic safety. This area includes: a) motorway traffic control systems, such as ramp metering; b) emergency telephone systems; c) freight management systems; and d) tunnel management systems. In urban areas it includes: a) urban traffic control systems; b) parking management systems; c) traffic demand management systems such as automatic toll collection and **road pricing**; and d) public transport management systems. Examples of what already exists in various European Contries are given in an Appendix.

Miscellaneous Information:
IRRD Document Number i8859102

TRIS accession number: 642251 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: UK TRANSPORT POLICY DEVELOPMENTS IN 1991: ENVIRONMENTAL RELEVANCE
Foreign Language: ENGLISH

Author(s):
PARKHURST, GP

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9310TR155E

Publication Title: TSU REF: 707
Publication Date: 7/00/92 **Pagination:** 31P
References: + **Appendices:**

Publisher/Corporate Author 1:
TRANSPORT STUDIES UNIT, UNIVERSITY OF OXFORD
11 BEVINGTON ROAD
OXFORD, OXFORDSHIRE OX2 6NB UNITED KINGDOM

Abstract Information
Abstract: This paper considers some important UK transport policy changes that have environmental significance. Based on the foci of current debate, seven policy areas are chosen for this review: (1) the British Government's broad attitude to management, ownership and the current aims of transport infrastructure, which strongly favours bus deregulation and advocates rail privatisation; (2) the relative balance of future transport investment in road and rail infrastructure, with ambiguous signs of some shift towards rail; (3) providing adequate urban public transport, and the relative roles of buses and light railways, the main issue being how much funding and priority can be made available; (4) the general environmental quality of urban areas, especially for residents and shoppers, where there are several major initiatives by central and local government, some controversial; (5) environmental protection, especially by direct reduction of polluting emissions but also by using more efficient travel modes; (6) road safety, where there seems to be a tacit complacency about the high levels of accidents, but where quality of life and environmental aspects are evident; and (7) **road pricing** to reduce **congestion**, whose impetus for implementation continues to grow, but whose routine use is still some years ahead and whose major barrier still seems to be widespread lack of acceptance. See also IRRD 859559.

Miscellaneous Information:
IRRD Document Number i8859558

TRIS accession number: 642252 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT POLICY AND THE ENVIRONMENT: EVENTS JANUARY TO JUNE 1992
Foreign Language: ENGLISH

Author(s):
PARKHURST, GP

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9310TR156E

Publication Title: TSU REF: 717
Publication Date: 8/00/92 **Pagination:** 31P
References: 14 **Appendices:**

Publisher/Corporate Author 1:
TRANSPORT STUDIES UNIT, UNIVERSITY OF OXFORD
11 BEVINGTON ROAD
OXFORD, OXFORDSHIRE OX2 6NB UNITED KINGDOM

Abstract Information
Abstract: This paper is a sequel to Report no 707 (see IRRD 859558), and updates it over the first half of 1992. During this period, pure environmental concerns seemed to be more influential; at least they were reported more often. The main policy concerns were related to the central demands for greater efficiency, quality, and safety in the environment. Provision of transport infrastructure referred mainly to competition between policies supporting road- and rail-based investment; for urban areas, there was increasing concern about funding light rail and guided bus networks and about possible funding of multimodal transport policies as a package. In the area of road **congestion,** there was consideration of improving the situation by reducing demand, for example by **road pricing** or parking controls; the controversial priority 'red' routes have reduced **congestion,** but their longer- term effects are not clear. Park-and-ride had a lower profile, as it is no longer new. It tends to be implemented when and where funds become available. There was more consideration of environmental quality measures, such as the provision of pedestrianised or traffic-calmed streets, where the impact of transport on the quality of life and safety of local people can be limited. Some safety measures tend to reduce quality of life. There were several high-profile campaigns for protecting high- quality landscapes from new road construction.

Miscellaneous Information:
IRRD Document Number i8859559

TRIS accession number: 641070 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT POLICY AND ITS IMPLEMENTATION. PROCEEDINGS OF SEMINAR C HELD AT THE PTRC EUROPEAN TRANSPORT, HIGHWAYS AND PLANNING 20TH SUMMER ANNUAL MEETING, UNIVERSITY OF MANCHESTER INSTITUTE OF SCIENCE AND TECHNOLOGY, SEPTEMBER 14-18 1992. VOL P355
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9311TR200E

Publication Date: 0/00/92 **Pagination:** 306P
ISBN: 0-86050-243-0 **ISSN:** 0266-4577
References: + **Appendices:**

Publisher/Corporate Author 1:
PTRC EDUCATION RESEARCH SERVICES LTD
GLENTHORNE HOUSE, HAMMERSMITH GROVE
LONDON, W6 0LG UNITED KINGDOM

Abstract Information
Abstract: For the abstracts of papers presented at this seminar see IRRD 859832-859854.

Miscellaneous Information:
IRRD Document Number i8859831

TRIS accession number: 641079 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: COPING WITH **CONGESTION**: PUBLIC PERCEPTIONS OF EQUITABLE SOLUTIONS
Foreign Language: ENGLISH

Author(s):
BEURET, K
JONES, AR

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9311TR209E

Publication Title: TRANSPORT POLICY AND ITS IMPLEMENTATION. PROCEEDINGS OF SEMINAR C HELD AT THE PTRC EUROPEAN TRANSPORT, HIGHWAYS AND PLANNING 20TH SUMMER ANNUAL MEETING (SEPTEMBER 14-18 1992), UMIST. VOLUME P355.
Publication Date: 0/00/92 **Pagination:** 117-29
ISBN: 0-86050-243-0 **ISSN:** 0266-4577
References: 9 **Appendices:**

Publisher/Corporate Author 1:
PTRC EDUCATION AND RESEARCH SERVICES LTD
GLENTHORNE HOUSE, HAMMERSMITH GROVE
LONDON, W6 0LG UNITED KINGDOM

Abstract Information
Abstract: **Congestion** in city centres is an inevitable characteristic of the urban scene and there is no way that all the needs of different travel groups can be met in full. People themselves are aware of this, yet traditional traffic models are often simplistic in assuming self interest in terms of main mode of travel, and in seeing the reduction of **congestion** as a self-evident good. Recent work based on detailed studies of opinions of motorists and others in UK city centres including Bath, Manchester, Edinburgh, Salisbury, and with particular emphasis on Nottingham, will show that these assumptions are not borne out. The paper argues that most people accept that public transport and pedestrians should have priority in cities, even where this leads to considerable personal inconvenience. It also suggests that traffic restriction policies based on **road pricing** are far less acceptable to most categories of motorists, including the most affluent, than area exclusion policies. Groups who do not hold such views are also discussed. The paper concludes with a discussion of the implications of such findings in the context of transport planning in Nottingham and other cities anxious to maintain a healthy economic base. (A) For the covering abstract of the seminar see IRRD 859831.

Miscellaneous Information:
IRRD Document Number i8859840

TRIS accession number: 641087 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: THE LINKAGE BETWEEN THE TECHNOLOGY AND THE POLITICAL FEASIBILITY OF URBAN **ROAD PRICING**
Foreign Language: ENGLISH

Author(s):
TRUELOVE, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9311TR218E

Publication Title: TRANSPORT POLICY AND ITS IMPLEMENTATION. PROCEEDINGS OF SEMINAR C HELD AT THE PTRC EUROPEAN TRANSPORT, HIGHWAYS AND PLANNING 20TH SUMMER ANNUAL MEETING (SEPTEMBER 14-18 1992), UMIST. VOLUME P355.
Publication Date: 0/00/92 **Pagination:** 225-36
ISBN: 0-86050-243-0 **ISSN:** 0266-4577
References: 13 **Appendices:**

Publisher/Corporate Author 1:
PTRC EDUCATION AND RESEARCH SERVICES LTD
GLENTHORNE HOUSE, HAMMERSMITH GROVE
LONDON, W6 0LG UNITED KINGDOM

Abstract Information
Abstract: A number of plans to introduce **road pricing** or area licensing have failed to be implemented because of lack of political support. Plans in Hong Kong, Sweden and Holland may have been technically satisfactory, but encountered overwhelming political opposition. This paper reviews the factors influencing the political acceptability of traffic limitation measures in terms of: (A) the context: the public perception of the **congestion** problem; the existence of inter-urban tolls; city centre parking provision and charging; the urban structure and the extent of de-centralisation; (B) the powers of the agency charged with introducing **road pricing**, and the relationship between the agency and central and local government; and (C) the technology and the enforcement measures proposed. The paper discusses how the importance of gaining political support for a **road pricing** plan can influence the basic design of a **road pricing** scheme, and the phasing of its introduction. The staged introduction of regulatory measures can be used to mould public opinion to see the benefits of more comprehensive, or more sophisticated measures. Any scheme which can be presented to the public as an electronic means of refining or speeding up an already accepted but technologically primitive system (for example toll booths or supplementary licence windscreen stickers) has clear political advantages over the same scheme proposed in the context of unregulated **congestion.** (A) For the covering abstract of the seminar see IRRD 859831.

Miscellaneous Information:
IRRD Document Number i8859849

TRIS accession number: 641092 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: THE LONDON **ROAD PRICING** RESEARCH PROGRAMME
Foreign Language: ENGLISH

Author(s):
WALSH, M
RICHARDS, M

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9311TR223E

Publication Title: TRANSPORT POLICY AND ITS IMPLEMENTATION. PROCEEDINGS OF SEMINAR C HELD AT THE PTRC EUROPEAN TRANSPORT, HIGHWAYS AND PLANNING 20TH SUMMER ANNUAL MEETING (SEPTEMBER 14-18 1992), UMIST. VOLUME P355.
Publication Date: 0/00/92 **Pagination:** 303-6
ISBN: 0-86050-243-0 **ISSN:** 0266-4577
References: 0 **Appendices:**

Publisher/Corporate Author 1:
PTRC EDUCATION AND RESEARCH SERVICES LTD
GLENTHORNE HOUSE, HAMMERSMITH GROVE
LONDON, W6 0LG UNITED KINGDOM

Abstract Information
Abstract: The London **road pricing** research programme is one part of the Department of Transport's (DOT) programme of research into urban road traffic **congestion**. The MVA Consultancy was appointed to advise on the design of the programme and to assist in its management. Work began in November 1991, and is scheduled to be completed in 1994, at a cost of 3 million pounds. The London **Road Pricing** Programme is required to include: (1) an assessment of the impact of charging on travel behaviour; (2) a forecast of its consequences for all transport modes and for land use; (3) the likely impact on business, property markets, and major services; (4) an evaluation of the costs and benefits of different feasible options; and (5) an assessment of attitudes among those affected. From this, research areas are identified, as is the need for a transport model. Six organisations were commissioned; from these the DOT selected a three tier model, the details of which are briefly given here. For the covering abstract of the seminar see IRRD 859831.

Miscellaneous Information:
IRRD Document Number i8859854

TRIS accession number: 639459 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: **CONGESTION.** ECONOMIC, SOCIAL AND POLITICAL ANSWERS
Foreign Language: ENGLISH

Author(s):
GOODWIN, P
HASS-KLAU, C

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9309TR004E

Publication Title: TSU REF: 695
Publication Date: 0/00/92 **Pagination:** 6P
References: 0 **Appendices:**

Publisher/Corporate Author 1:
TRANSPORT STUDIES UNIT, UNIVERSITY OF OXFORD
11 BEVINGTON ROAD
OXFORD, OX2 6NB UNITED KINGDOM

Abstract Information
Abstract: This paper outlines an approach to solving urban traffic **congestion** problems with the following successive stages: (1) understanding the problems; (2) defining the solutions; (3) considering how to bring public and private sector interests together into a genuinely useful partnership. 'Mainstream thinking' about how cities and urban transport should develop can be formulated as 'the New Realism', a package of policies aimed at cities where transport is civilised and efficient but does not dominate or damage other areas of life. Components of the package include: (1) a realisation that there is relatively little scope for large-scale expansion of urban road networks; (2) making maximum use of transport methods that use resources most efficiently; (3) applying the basic principles of traffic calming; (4) using traffic management methods to give priority to certain classes of traffic; (5) considering the mutual effects of different transport and land use policies; (6) pursuing objectives by using the best combination of incentives, regulation, the market, education, and politics. The authors believe that European urban transport policies are developing in these directions. The potential contribution of partnerships to: (1) road provision; (2) public transport; (3) walking and cycling; (4) traffic calming and pedestrianisation; (5) traffic management; (6) interaction of policies;and (7) **road pricing** are considered.

Miscellaneous Information:
IRRD Document Number i8859070

TRIS accession number: 635518 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: MODEL DRIVERS?
Foreign Language: ENGLISH

Author(s):
ROHR, C
SALTER, M

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9306TR235E

Publication Title: TRANSPORT INNOVATION
Volume: **Number:** 23
Publication Date: 0/00/92 **Pagination:** 10-11
ISBN: **ISSN:** 0960-0078
References: 0 **Appendices:**

Publisher/Corporate Author 1:
TRANSNET LONDON TRANSPORT AND TECHNOLOGY NETWORK LTD
16 WARREN LANE
LONDON, SE18 6DW UNITED KINGDOM

Abstract Information
Abstract: This article describes the use of computer models to test the likely effects of **road pricing,** which is increasingly being viewed as an essential part of urban transport policy. Several systems for charging for the use of road space are now available or being developed. The MEPLAN software, being developed by Marcial Echenique & Partners, assumes that land uses and transport directly affect each other at every level, as spatial patterns of land use and economic activity create transport demands. Its model represents **congestion** effects by comparing the demand for traffic on a road link with link capacity. It allows users to specify which modes may use which link types; all modes using a link contribute to its **congestion.** The introduction of a road-pricing charge on a link increases perceived travel costs on the link, thus affects users' choice of the link. The model also considers users' choice of travel modes. Setting up and running a computer model, to test **road pricing** policies, requires a transport model more sophisticated than many of those now used by local authorities. Although their data requirements are extensive, the models can assess a wider range of issues than **road pricing,** and provide a valuable tool for forecasting and evaluating the effects of transport planning and land use policies.

Miscellaneous Information:
IRRD Document Number i8858012

TRIS accession number: 635750 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: THE ECONOMICS OF PARKING MANAGEMENT SYSTEMS. THE (IM-)POSSIBILITIES OF PARKING POLICIES IN TRAFFIC REGULATION
Foreign Title: DE ECONOMIE VAN PARKEERMANAGEMENT SYSTEMEN. DE (ON-)MOGELIJKHEDEN VAN EEN 'STUREND PARKEERBELEID'
Foreign Language: DUTCH

Author(s):
VERHOEF, ET
NIJKAMP, P
RIETVELD, P

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9302SW062E

Publication Title: COLLOQUIUM VERVOERSPLANOLOGISCH SPEURWERK 1992. INNOVATIE IN VERKEER EN VERVOER. 26-27 NOVEMBER 1992, ROTTERDAM. DEEL III.
Publication Date: 0/00/92 **Pagination:** 1207-1226
References: 23 **Appendices:**

Publisher/Corporate Author 1:
COLLOQUIUM VERVOERSPLANOLOGISCH SPEURWERK
GEERDINKHOF 237
AMSTERDAM, 1103 PZ NETHERLANDS

Abstract Information
Abstract: Already in the 1920's, it was recognised that **'road pricing'** offers the first best solution for road traffic optimisation. Still, it is very unlikely that this instrument will soon be widely used. Both transport economists and policy makers show growing interest in alternatives to **road pricing**. Parking policies constitute one of the suggested alternatives. In this paper, an economic model is presented which allows for a closer inspection of the pro's and cons of parking policies. Under certain circumstances, parking policies offer an acceptable alternative to **road pricing**. Special attention is paid to the differences between the use of parking fees and physical restrictions on parking space supply. Despite the possibilities of parking policies in traffic regulation, **road pricing** will theoretically remain the best method. For the covering abstract of the conference see IRRD 856918.

Miscellaneous Information:
IRRD Document Number i8856979

TRIS accession number: 631637 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: ENVIRONMENTAL PROBLEMS IN THE TRANSPORT SECTOR AND CONCEPTS PROPOSED FOR THEIR SOLUTION
Foreign Language: ENGLISH

Author(s):
ROTHENGATTER, W

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9210TR056E

Publication Title: RAIL INTERNATIONAL
Volume: **Number:** 6-7
Publication Date: 0/00/92 **Pagination:** 271-2
ISBN: **ISSN:** 0020-8442
References: 0 **Appendices:**

Publisher/Corporate Author 1:
INTERNATIONAL RAILWAY CONGRESS ASSOCIATION
85 RUE DE FRANCE
BRUSSELS, B-1070 BELGIUM

Abstract Information
Abstract: The environmental and social damage caused by transport is discussed. The expected trends in transport growth and consequences for the environment are assessed. It is suggested that although some form of regulation will be required to protect the environment, the use of the market economy should predominate. A pricing policy should be based on the recovery of social costs in order to ensure compensation for infrastructure costs, environment-related costs and other external effects such as the cost of **congestion.** This would involve **road pricing,** raising taxes on fuel consumption or by issuing certificates entitling holders to specifc pollution rights. The mechanism for establishing price levels is discussed and suggestions made for levels of charges. At the same time adaptation of the infrastructure on the basis of demand is suggested. Infrastructure would be developed in accordance with economic and ecological criteria following the internalisation of social costs. This paper was presented at the EURAILSPEED 92 conference held in Brussels, April 27-29, 1992. For the covering abstract see IRRD 853180.

Miscellaneous Information:
IRRD Document Number i8850162

TRIS accession number: 632017 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: GREEN PAPER ON THE IMPACT OF TRANSPORT ON THE ENVIRONMENT. A COMMUNITY STRATEGY FOR "SUSTAINABLE MOBILITY"
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9212TR478E

Volume: **Number:** COM(92) 46
Publication Date: 2/20/92 **Pagination:** 72P
References: 0 **Appendices:**

Publisher/Corporate Author 1:
COMMISSION OF THE EUROPEAN COMMUNITIES

BRUSSELS, B-1049 BELGIUM

Abstract Information
Abstract: In this Green Paper, an assessment is provided of the overall impact of transport on the environment and a strategy for "sustainable mobility", so that the economic and social role of transport is achieved whilst containing the adverse environmental effects. A short review of environmental action programmes of the Commission is first given. This Green Paper (which is a discussion document) has sections on: (a) environmental impact of transport, in terms of pollution, land use, **congestion** and safety; and (b) economic trends. Current European research initiatives such as BRITE/EURAM, CORIN, COST, DRIVE, EURET already under implementation are briefly mentioned. Future initiatives are discussed, and statistical tables included on: vehicle emissions; energy consumption by transport mode.

Miscellaneous Information:
IRRD Document Number i8853359

TRIS accession number: 632228 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: MODERN TRANSPORT GEOGRAPHY. CHAPTER 14. TRANSPORT AND THE FUTURE
Foreign Language: ENGLISH

Author(s):
HOYLE, BS(ED)
KNOWLES, RD(ED)
WILLIAMS, A

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9212TR761E

Publication Date: 0/00/92 **Pagination:** 257-70
ISBN: 1-85293-158-2 **ISSN:**
References: 20 **Appendices:**

Publisher/Corporate Author 1:
BELHAVEN PRESS
25 FLORAL STREET
LONDON, WC2E 9DS UNITED KINGDOM

Abstract Information
Abstract: This final chapter examines some aspects of our transport future considered in the short-term (to the end of the twentieth century), in the mid-term (2000-2040AD) and on towards the end of the twenty-first century. During the 1990s it is anticipated that we will continue to improve and modify our inherited systems and continue our reliance on oil. The need to move away from personal motorised transport is acknowledged and techniques already available to accomplish this are outlined including better land-use planning, priority schemes for public transport and **road pricing.** 'Technetronic' advances in the field of information and communications technology likely to be adopted by richer countries are also described. In the twenty-first century it is suggested that it will be cheaper to alter fuels than vehicle technology. Alternatives to petrol are explored including oil from coal, tar, maize, sugar beet, soya, peanuts, sunflower and rape. Towards the middle of the century problems of **congestion** and pollution are likely to cause the balance to swing in favour of public transport. A variety of electrically- powered vehicles are likely to be seen but the car will still compete strongly on a variety of fuels. Beyond the middle of the twenty-first century it is anticipated that as yet unthought of transport technologies will have evolved. For the covering abstract of the book see IRRD 853629.

Miscellaneous Information:
IRRD Document Number i8853642

TRIS accession number: 632306 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: ASPAC 92: IRF/ARF ASIA PACIFIC REGIONAL ROAD CONFERENCE, 1992, GOLD COAST, QUEENSLAND, AUSTRALIA
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9204AR259E

Publication Date: 0/00/92 **Pagination:** -
References: + **Appendices:**

Publisher/Corporate Author 1:
AUSTRALIAN ROAD FEDERATION
PO BOX 139 (FAX +61-3-752-9234)
BORONIA, VICTORIA 3155 AUSTRALIA

Abstract Information
Abstract: The theme of this Conference was "Efficient roads and the quality of life". The Conference is published in six volumes, corresponding to the volume allocated to the keynote address and one volume for each day of proceedings. For the abstracts of relevant papers, see IRRD numbers 843041 to 843075.

Miscellaneous Information:
IRRD Document Number i8843040

TRIS accession number: 632307 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: PLANNING AND FINANCING ROADS TO ENHANCE THE QUALITY OF LIFE
Foreign Language: ENGLISH

Author(s):
HARRAL, CG

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9204AR260E

Publication Title: ASPAC 92: IRF/ARF ASIA PACIFIC REGIONAL ROAD CONFERENCE, 1992, GOLD COAST, QUEENSLAND, AUSTRALIA
Volume: KEYNOTE ADDRESS **Number:**
Publication Date: 0/00/92 **Pagination:** 19P
References: 26 **Appendices:**

Publisher/Corporate Author 1:
AUSTRALIAN ROAD FEDERATION
PO BOX 139 (FAX +61-3-752-9234)
BORONIA, VICTORIA 3155 AUSTRALIA

Abstract Information
Abstract: Recent research has reconfirmed the importance of efficient road transport to economic development and growth, for cities, rural areas, and nations alike, whether in developing or mature economies. But deteriorating roads, burgeoning growth (particularly in Asia), **congestion,** and growing concerns at the negative consequences of transport on the environment and quality of life in our cities are all placing huge new demands on public finance at a time of increasing fiscal constraint on governments. How can these problems be dealt with? The answers lie largely within the transport sector itself, it is argued. Appropriate policies are easily identifiable - though less easily implemented - and include the traditional instruments of planning, pricing, finance, and taxation, as well as new advances in road metering technologies, **congestion** pricing, and the recent rediscovery of one of the oldest instruments of transport development: private participation in the provision of public infrastructure and services. For the covering abstract of this conference, see IRRD no 843040.

Miscellaneous Information:
IRRD Document Number i8843041

TRIS accession number: 632308 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TOLL ROADS IN INDONESIA: POLICY, OPERATION AND FINANCING
Foreign Language: ENGLISH

Author(s):
DJOHARI, D

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9204AR261E

Publication Title: ASPAC 92: IRF/ARF ASIA PACIFIC REGIONAL ROAD CONFERENCE, 1992, GOLD COAST, QUEENSLAND, AUSTRALIA
Volume: MONDAY **Number:**
Publication Date: 0/00/92 **Pagination:** 1-9
References: 2 **Appendices:**

Publisher/Corporate Author 1:
AUSTRALIAN ROAD FEDERATION
PO BOX 139 (FAX +61-3-752-9234)
BORONIA, VICTORIA 3155 AUSTRALIA

Abstract Information
Abstract: Certain areas around and linking metropolitan cities in Indonesia with high density traffic volume result in heavy traffic **congestion,** which causes high vehicle operating costs and excessive travel time; based on this idea, toll roads need to be constructed to overcome these congestions. The government decided to finance toll roads from non government budget items such as issuing bonds and from other foreign and domestic private sector sources as an effort to ensure equity of development among regions. According to road law number 13/1980, ownership and management of toll roads rests with the government, however, the government can delegate its responsibility to one or more toll road corporations through the Highway Corporation, PT Jasa Marga. PT Jasa Marga, the first state Toll Road authority was established in March 1978 and started to operate the first toll road from Jakarta to Cibinong (part of Jagorawi Toll Road) with a total length of about 27kms. At present, PT Jasa Marga operates 9 toll roads with a total length of 350 kms and 3 toll bridges. For the covering abstract of this conference, see IRRD no 843040.

Miscellaneous Information:
IRRD Document Number i8843042

TRIS accession number: 632420 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING** - TECHNOLOGY AND REALITY
Foreign Language: ENGLISH

Author(s):
VEYSEY, M
PETTIGREW, K

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9211AR083E

Publication Title: PROCEEDINGS, 16TH ARRB CONFERENCE, 9-13 NOVEMBER 1992, PERTH, WESTERN AUSTRALIA; VOLUME 16, PART 5
Publication Date: 0/00/92 **Pagination:** 213-29
ISBN: **ISSN:** 0572-1431
References: 10 **Appendices:**

Publisher/Corporate Author 1:
AUSTRALIAN ROAD RESEARCH BOARD LTD (ARRB)
500 BURWOOD HIGHWAY
VERMONT SOUTH, VICTORIA 3133 AUSTRALIA

Abstract Information
Abstract: The current trend in **road pricing** is towards direct cost recovery, rather than indirect taxation mechanisms. The strategic importance of correcting user demand signals by appropriate pricing to ensure that investment decisions are appropriate cannot be over-emphasised. New electronic technology promises to provide the mechanisms. It will facilitate differential pricing regimes which can address both time and place **congestion** issues. Examples of current trials and studies in NSW are given. The problems of matching the real price and the perceived price to the user, will be discussed. The technology offers real opportunities, but also presents real difficulties. The **road pricing** area is politically sensitive and social issues such as privacy and equity must be addressed. The way forward must involve public participation. However, the technology needs to be more relevant to user decisions to affect demand. Without some improvement and public consultation, the technology may not realise perceived productivity gains. (A) For the covering entry of this conference, see IRRD abstract no. 843369.

Miscellaneous Information:
IRRD Document Number i8849163

TRIS accession number: 631072 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: FORECASTING ISSUES IN STATED PREFERENCE SURVEY RESEARCH
Foreign Language: ENGLISH

Author(s):
BRADLEY, MA
KROES, EP

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9209AR138E

Publication Title: SELECTED READINGS IN TRANSPORT SURVEY METHODOLOGY. EDITED PROCEEDINGS OF THE 3RD INTERNATIONAL CONFERENCE ON SURVEY METHODS IN TRANSPORTATION, JANUARY 5-7 1990, WASHINGTON, DC
Publication Date: 0/00/92 **Pagination:** 89-107
ISBN: 0-646-09952-3 **ISSN:**
References: - **Appendices:**

Publisher/Corporate Author 1:
EUCALYPTUS PRESS
338 SPINKS ROAD
GLOSSODIA, NEW SOUTH WALES 2756 AUSTRALIA

Abstract Information
Abstract: The family of market research survey techniques termed stated preference methods (e.g conjoint analysis) has been used quite often in transportation planning over the past decade. While these techniques have been primarily used to gather marketing information, such as willingness to pay for service improvements, an important recent trend is the use of stated preferences in forecasting. Such methods are now becoming seen as a complement to the more traditional revealed preference survey methods in cases where the latter cannot provide the full information necessary. Examples of such cases are the introduction of a qualitatively new transport mode or route (e.g. the Channel Tunnel between France and England), the impact of qualitatively new transport policies (e.g. electronic **road pricing**), or the reactions to large changes in travel conditions which cannot be observed at present (e.g. changes in trip departure times due to increasing peak hour traffic **congestion**). The need to accurately predict travel behaviour across the entire population places special requirements on the design, analysis and application of stated preference survey experiments. Many of these requirements are analogous to those faced in revealed preference studies. There remain important issues specific to stated preference, however, because forecasting requires that a stated preference survey be built upon a hypothetical choice context which will yield realistic and unbiased statements of behaviour. As these issues are addressed, stated preference techniques appear to be evolving into an integrated part of the transport forecasting methodology. The purpose of this paper is to give an overview of this evolution, in terms of the study design, model estimation and forecasting issues involved. The discussion includes a treatment of the various errors and biases which may arise in stated preference as opposed to revealed preference surveys, along with reference to practical examples based on recent projects in the Netherlands, Australia, France and the UK.(A) For the covering entry of this conference, see IRRD abstract no. 843297.

Miscellaneous Information:

IRRD Document Number i8843310

TRIS accession number: 630316 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: ROAD BUILDING OR **ROAD PRICING** FOR JAKARTA, INDONESIA
Foreign Language: ENGLISH

Author(s):
SOEGONDO, T
TUMEWU, W

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9208AR420E

Publication Title: SEVENTH CONFERENCE OF THE ROAD ENGINEERING ASSOCIATION OF ASIA AND AUSTRALASIA, PROCEEDINGS, 22 JUNE - 26 JUNE 1992, SINGAPORE; VOLUME 1
Publication Date: 0/00/92 **Pagination:** 285-92
ISBN: 9971-88-323-6 **ISSN:**
References: 0 **Appendices:**

Publisher/Corporate Author 1:
ROAD ENGINEERING ASSOCIATION OF ASIA AND AUSTRALASIA (REAAA)
OFFICE OF THE DIRECTOR- GENERAL OF PUBLIC WORKS, PUBLIC WORKS DEPARTMENT, HEADQUARTERS, 1A JALAN SETIAPUSPA, MEDAN DEMANSARA
KUALA LUMPUR, 50490 MALAYSIA

Abstract Information
Abstract: Jakarta is the capital of Indonesia; the city is developing rapidly and the demand for roadspace is expected to increase rapidly too. The supply of roadspace is very limited and the demand for it is already much greater than the supply of it, as can be concluded from observing hourly variations of traffic flow. Traffic **congestion** is spreading all over the city and onto the intra urban toll road system, indicating an inelasticity in the toll charge. The cost of road transport is becoming high and this may slow down economic development. Reducing the demand for roadspace through **road pricing** would require high rates to achieve acceptable traffic conditions. Production costs would become too high and business would move to a less costly place. The paper concludes that, if Jakarta wants to sustain all of its present activities and prepare itself for rapid economic development, it must have a lot more road space through roadbuilding. For the covering entry of this conference, see IRRD abstract number 843191.

Miscellaneous Information:
IRRD Document Number i8843222

TRIS accession number: 630353 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: SUMMING UP THE OPTIONS
Foreign Language: ENGLISH

Author(s):
MCCLINTOCK, H
TRENCH, S

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9210TR072E

Publication Title: SURVEYOR
Volume: 177 **Number:** 5195
Publication Date: 6/04/92 **Pagination:** 18-20
ISBN: **ISSN:** 0039-6303
References: 0 **Appendices:**

Publisher/Corporate Author 1:
REED BUSINESS PUBLISHING LTD
QUADRANT HOUSE, THE QUADRANT
SUTTON, SURREY SM2 5AS UNITED KINGDOM

Abstract Information
Abstract: This article reports on the conference "Urban **congestion** and pollution: is **road pricing** the answer?" held at Nottingham University on 21 May 1992. The conference discussed changing public attitudes towards **congestion** and the environment, and heard about different approaches to these problems. P Goodwin of Oxford University opened by saying that **road pricing** was often viewed as entirely negative and unpopular. He considered that it would bring actual benefits, such as extra road space, and revenues that could be used to improve urban environments and subsidise better public transport. Popularity could be 'bought' by distributing the extra road space to improve conditions for different classes of road users; public attitudes could then become more favourable. However, experience from abroad showed that **road pricing** was not a panacea, and may not be the right answer for some localities. Various other viewpoints, research reports, case studies and descriptions of future plans were presented by speakers from several parts of the UK, Norway, Sweden, The Netherlands, and California. In general, proponents of **road pricing** believe that it is important to target measures according to local circumstances, such as where **congestion** and associated traffic pollution are most intense.

Miscellaneous Information:
IRRD Document Number i8850380

TRIS accession number: 622897 *TRIS files:* HRIS. H 9202.

TRIS Record Flag: 3

Title: **ROAD PRICING**: A NEW MODEL FOR ASSESSING THE MANY OPTIONS
Foreign Language:

Author(s):
Ghali, MO
Smith, MJ

Publication Information:
Publication Title: Traffic Engineering and Control
Volume: 33 **Number:** 3
Publication Date: 3/00/92 **Pagination:** pp 156-157
ISBN: **ISSN:** 00410683
Figures: 3 Fig. **Tables:** 1 Tab. **Photos:**
References: 3 Ref. **Appendices:**

Publisher/Corporate Author 1:
Printerhall Limited
29 Newman Street
London W1P 3PE, England

Available from:
Printerhall Limited
29 Newman Street
London W1P 3PE, England

Order Number:

Abstract Information
Abstract: This paper outlines a new computer model which can provide estimates of the effect of various different **road pricing** strategies and it gives some initial simple results to illustrate the utility of the model.

TRIS accession number: 630463 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: NO JAMS TOMORROW
Foreign Language: ENGLISH

Author(s):
GOODWIN, W

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9210TR583E

Publication Title: ENGINEER
Volume: 273 **Number:** 7069
Publication Date: 9/19/91 **Pagination:** 51-2
ISBN: **ISSN:** 0013-7758
References: 0 **Appendices:**

Publisher/Corporate Author 1:
MORGAN-GRAMPIAN (PUBLISHERS) LTD
30 CALDERWOOD STREET
LONDON, SE18 6QH UNITED KINGDOM

Abstract Information
Abstract: Information technology is being used to assist drivers and prevent possible superjams and gridlocks which some experts predict could strike London within a few years. **Road pricing** is being seriously considered by many countries because traffic signal control systems such as TRANSYT and SCOOT cope well with medium traffic flows but they break down in the heavy **congestion** now found in British cities. This drawback can only be overcome if the traffic flow can be predicted in advance. Research is being proposed to create a neural network to predict **congestion** using a set of rules the network teaches itself. The system could be extended to take account of the effect of pedestrians and cyclists. Other systems being investigated include Autoguide which will operate within the bounds of the M25 London orbital motorway, and will enable vehicles to calculate their position and select the optimum route. Travel Pilot, a system using dead-reckoning to display the position of a vehicle on an electronic map, traffic information could be fed in so that the driver can select the best route. Traffic Master is a system giving an in-car display of traffic **congestion** on the M25 motorway.

Miscellaneous Information:
IRRD Document Number i8851140

TRIS accession number: 630691 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: SHAPING BRITAIN FOR THE 21ST CENTURY. A LAND USE AND TRANSPORT PLANNING STRATEGY
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9210TR374E

Publication Date: 0/00/91 **Pagination:** 34P
ISBN: 0-85406-501-6 **ISSN:**
References: 15 **Appendices:**

Publisher/Corporate Author 1:
ROYAL INSTITUTION OF CHARTERED SURVEYORS
12 GREAT GEORGE STREET
LONDON, SW1P 3AD UNITED KINGDOM

Abstract Information
Abstract: This paper examines the conflict between our need for efficient movement of people and goods and our wish to provide space for living, working and recreation. The paper focusses on Britain against the background of Europe and pleads for a combined and long term policy for land use and transport. It address such issues issues as car ownership trends. environmental pollution, land management, **road pricing** and public transport policy.

Miscellaneous Information:
IRRD Document Number i8850931

TRIS accession number: 630963 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRAFFIC GROWTH AND PLANNING POLICY
Foreign Language: ENGLISH

Author(s):
DIXON, M

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9210TR826E

Publication Title: THE PLANNER
Volume: 77 **Number:** 32
Publication Date: 9/20/91 **Pagination:** 8-9
ISBN: **ISSN:** 0309-1384
References: 4 **Appendices:**

Abstract Information
Abstract: The London Research Centre was commissioned in the Spring of 1990 by the RTPI (Royal Town Planning Institute) to carry out a study of traffic growth and planning policy against a background of National Road Traffic Forecasts (NRTF) of growth between 83% and 142% by 2025. A wide range of planning authorities, professionals, business and other organisations were consulted and this article outlines the findings of the report. Transport is seen as a major influence on urban form. NRTF would appear to represent 'unrestrained demand' which would in fact be restrained by capacity. Development control is at present more concerned with highways than the transport issues which influence urban form in the long term. There is also a limit to what town planning mechanisms can achieve in relation to traffic restraint on their own. Other policy instruments such as taxation of fuel and employer-provided parking need to work with land use planning. A debate is advocated on the future form of urban areas and what level of sacrifice people are prepared to accept in private mobility for the common good. Areas requiring further investigation are identified and include the relationship between traffic **congestion**/restraint and the health of local economies, the potential effect of **road pricing** on land-use dispersal, homeworking and the concept of 'car-free' zones.

Miscellaneous Information:
IRRD Document Number i8851383

TRIS accession number: 631414 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: ARE GHANA'S ROADS PAYING THEIR WAY? ASSESSING ROAD USE COST AND USER CHARGES IN GHANA
Foreign Language: ENGLISH

Author(s):
GRONAU, R

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9211TR393E

Publication Title: WORLD BANK WORKING PAPER
Volume: **Number:** WPS 773
Publication Date: 10/00/91 **Pagination:** 44P
References: + **Appendices:**

Publisher/Corporate Author 1:
WORLD BANK
1818 H STREET NW
WASHINGTON O, DC 20433

Abstract Information
Abstract: This PRE (Policy, Research and External Affairs) working paper forms part of a larger World Bank Transport Division study of transport user charges and efficienct transport prices. In this case study, the author examines how much road damage contributes to road use costs in Ghana and how the marginal social costs should be recovered. He found that to bridge the gap between road user costs (including the cost of road maintenance) and charges, the annual fee for heavy trucks should be raised tenfold - to about $800 per vehicle. Fuel taxes alone are not adequate to distinguish fully the large difference in road damage costs incurred by heavy trucks and private cars. The taxing instrument most deficient in Ghana is the annual licensing fee. Not only should licensing fees for heavy trucks be ten times higher that they are now, but exemptions from the licensing fee should be cancelled and registration rules strictly enforced.

Miscellaneous Information:
IRRD Document Number i8852303

TRIS accession number: 617119 *TRIS files:* HRIS. H 9104.

TRIS Record Flag: 4

Title: NEW HIGHWAY USES FOR AVI SYSTEMS
Foreign Language:

Author(s):
Covil, JL
Martin, PC
Regan, EJ, III

Publication Information:
Publication Title: Journal of Transportation Engineering
Volume: 117 **Number:** 6
Publication Date: 11/00/91 **Pagination:** pp697-703
ISBN: **ISSN:** 0733947X
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:** 2 App

Publisher/Corporate Author 1:
American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398

Available from:
American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398
Order Number:

Abstract Information
Abstract: An overview is presented of **road pricing** and congestion-pricing application status of several AVI (automatic vehicle indentification) projects: San Francisco Inernational Airport toll revenue collection; Heavy-vehicle electronic license plate (HELP) study; Hong Kong electronic **road pricing** project; Singapore **congestion pricing** project; and toll industry initiatives. It is noted that present technology is sufficiently advanced to effectively collect user fees (tolls) and to administer **congestion pricing** strategies. Public acceptance of new **road pricing** approaches appears to be the major factor impeding implementation of AVI-based systems. It is pointed out that AVI system development and implementation efforts are more fragmented than desired, and increased efforts to coordinate development and implementation efforts are needed.

TRIS accession number: 644522 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT 21: AN ALTERNATIVE TRANSPORT BUDGET
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9401TR307E

Publication Date: **Pagination:** 24P
References: 17 **Appendices:**

Publisher/Corporate Author 1:
TRANSPORT 2000
WALKDEN HOUSE
10 MELTON STREET, LONDON NW1 2EJ UNITED KINGDOM

Abstract Information
Abstract: This report describes an alternative policy for funding transport provision in the UK. Figures are provided for the government's current and planned expenditure on transport. The failure of current policies to meet the objectives of a better environment, better access and a sustainable economy is examined. 'Transport 21', a 10-year plan to transform transport provision in the UK is outlined. Major elements include: (a) investment in British Rail and London Transport with the aim of doubling public transport usage; (b) traffic calming in 80% of residential roads; c) the encouragement of a ten-fold increase in cycle trips; (d) comprehensive bus priority measures and light rail transit in cities; (e) a doubling of rail freight; and (f) a continuing high level of spending on road maintenance. Figures are given for spending in each area. Funding would come from the diversion of money away from road building and a variety of other sources (including private finance, reduction in company car subsidies, and **road pricing**). This policy, it is argued, would cut pollution, improve access, reduce **congestion**, reduce road casualties and create new jobs.

Miscellaneous Information:
IRRD Document Number i8861104

TRIS accession number: 632044 *TRIS files:* IRRD. I.

TRIS Record Flag: 1

Title: TRANSIT SURVEYS
Foreign Language: ENGLISH

Author(s):
-

Publication Information:
Source of Document: Transport Research Laboratory (TRL)
Source Data: 9212TR518E

Publication Title: INTERNATIONAL RAILWAY JOURNAL
Volume: 31 **Number:** 11
Publication Date: 11/00/91 **Pagination:** P33
ISBN: **ISSN:** 0744-5326
References: 0 **Appendices:**

Publisher/Corporate Author 1:
SIMMONS-BOARDMAN PUBLISHING CORPORATION
345 HUDSON STREET
NEW YORK, NY 10014

Abstract Information
Abstract: This article outlines the results of a survey, conducted on behalf of the International Union of Public Transport (UITP) and European Commission, that provides startling evidence that most people feel that it is time for a change from policies that excessively favour private cars. The Eurobarometer poll was taken throughout the European community, and involved 15000 people. Its representative sample showed that: (1) 71% favoured strict limitations on car traffic in city centres; (2) 73% felt that planners should give preference to public transport over cars; (3) 80% said that public transport was the best method of combating traffic **congestion**; (4) most Euorpeans did not want to pay more in higher petrol prices, **road pricing** or road tolls, to help limit traffic **congestion**; (5) 56% felt that the consequences of urban car traffic were either hardly bearable or completely unbearable. The strongest support for public transport came from Spain (89%) and Italy (88%), and from higher-educated people and opinion-leaders (85%). The second most popular solution was to create more pedestrian areas (75%), but support for stricter parking in city centres showed considerable national variation. A similar German poll in 20 German cities generally supported these findings, and also showed that the general public were far more favourable to public transport than transport specialists, politicians and journalists.

Miscellaneous Information:
IRRD Document Number i8853399

TRIS accession number: 617592 *TRIS files:* HRIS. H 9104.
IRRD. I.

TRIS Record Flag: 1

Title: EVALUATING THE EFFECTS OF **ROAD PRICING** DURING THE MORNING PEAK
Foreign Language:

Author(s):
Vythoulkas, PC

Publication Information:
Source of Document: Transport and Road Research Laboratory

Volume: **Number:** 611
Publication Date: 1/00/91 **Pagination:** 29p
References: 10 Ref. **Appendices:**

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Available from:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Order Number:

Abstract Information
Abstract: This report describes the further development and applications of a dynamic simulation model which is used to analyse the effects of **road pricing** schemes; the analysis is carried out within the context of the DRIVE project IDMS (V1008). The simulation model predicts travellers' mode, departure time and route choices under time dependent demand and traffic conditions, and also estimates the effects that different **road pricing** policies will have on the overall level of **congestion** in an urban network, during the morning peak period. The simulation results illustrate the importance of toll ring location, period of operation, and price level as independent influences on the resulting patterns of traffic on the network. (TRRL)

TRIS accession number: 618018 *TRIS files:* HRIS. H 9104.

TRIS Record Flag: 4

Title: **ROAD PRICING** AND DEMAND MANAGEMENT. IN: COMPENDIUM OF TECHNICAL PAPERS. INSTITUTE OF TRANSPORTATION ENGINEERS, 61ST ANNUAL MEETING, SEPTEMBER 22-25, 1991, MILWAUKEE, WISCONSIN
Foreign Language:

Publication Information:
Report No: PP-023
Period Covered:
Publication Date: 0/00/91 **Pagination:** pp 244-271
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2729

Available from:
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2729
Order Number:

Abstract Information
Abstract: The papers in this session include: A Framework for **Road Pricing** in the European Communities; Transport Demand Management Policies in Hong Kong; Peak Period Tolls: One Cure for Urban **Congestion**; Managing Road Traffic for Metropolitan Activity Centers: The Challenge of Tackling **Congestion**; and, Parking Pricing as a Demand Management Strategy.

TRIS accession number: 610254 *TRIS files:* RRIS. R.
HRIS. H 9102.

TRIS Record Flag: 4

Title: BIG TRUCKS: A SMALL PIECE OF A LARGER PROBLEM
Foreign Language:

Publication Information:
Publication Date: 1/24/91 **Pagination:** 32p

Publisher/Corporate Author 1:
Citizens League
708 South Third Street, Suite 500
Minneapolis, MN 55415

Available from:
Citizens League
708 South Third Street, Suite 500
Minneapolis, MN 55415
Order Number:

Abstract Information
Abstract: The Citizens League Board of Directors, responding to a perception that large trucks were a growing source of metropolitan freeway **congestion,** asked a committee to study how changes in truck traffic could reduce freeway accidents and **congestion** in the Twin Cities metropolitan area. The committee focused primarily on interstate and other freeways in the metropolitan area. Chapter 1 of this report presents the committee's findings on the role of large trucks in this metropolitan area's transportation system. Chapter 2 presents the committee's conclusions and recommendations. Among the committee's principal conclusions are the following: Large trucks do not significantly reduce Twin Cities freeway capacity, because they represent only a small part of total traffic. Trucks are and will continue to be an important component of the movement of goods in the Twin Cities metropolitan area. However, large trucks and autos operating in mixed, heavy traffic present safety and capacity problems that will compound in the future. A number of small steps each promise to produce marginal improvements and, collectively, have the potential to alleviate future safty and **congestion** problems. The committee's recommendations include the following: 1) The MnDOT's Metro Truck Management Program to divert trucks from congested corridors during peak travel times should be renewed and expanded. 2) The Minnesota Legislature should act on the results of the 1990 Minnesota highway cost-allocation study. 3) MnDOT and DPS should cooperatively develop and institute a more aggressive incident-management program in order to reduce delays and **congestion.** 4) MnDOT should conduct a thorough evaluation of peak-hour pricing on the most congested sections of metropolitan freeways and other major roads. 5) The Minnesota Senate and House Transportation committees should seek innovative ways to increase freight movement on the under-utilized capacity of railroads in the Twin Cities area.

TRIS accession number: 610561 *TRIS files:* HRIS. H 9102.

TRIS Record Flag: 4

Title: GAINING PUBLIC SUPPORT FOR **ROAD PRICING** THROUGH A PACKAGE APPROACH
Foreign Language:

Publication Information:
Publication Title: Traffic Engineering and Control
Volume: 32 **Number:** 4
Publication Date: 4/00/91 **Pagination:** pp 194-196
ISBN: **ISSN:** 00410683
Figures: 1 Fig. **Tables:** 3 Tab. **Photos:**
References: 12 Ref. **Appendices:**

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Printerhall Limited
29 Newman Street
London W1P 3PE, England

Available from:
Printerhall Limited
29 Newman Street
London W1P 3PE, England

Order Number:

Abstract Information
Abstract: Problems created by the growing volume of urban road traffic are high on the political agenda in many countries, at both national and local levels; and with **congestion,** road safety and environmental pollution are of widespread concern to all sections of the community. A number of recent studies have attempted to quantify the impacts of traffic on urban life. Following on from a general recognition of the seriousness of the problem, several recent surveys have shown that the public accept the need to limit in some ways the amount of road traffic in large towns and cities. This paper reviews several of the public-opinion surveys in the U.K. The results have been found to be consistent in that the absolute percentage of people supporting a given measure may vary, but the rank orderings are the same.

TRIS accession number: 610596 *TRIS files:* HRIS. H 9102.

TRIS Record Flag: 4

Title: PRICING CARS OFF CITY STREETS
Foreign Language:

Author(s):
Hamer, M

Publication Information:
Publication Title: New Scientist
Volume: 129 **Number:** 1758
Publication Date: 3/02/91 **Pagination:** pp 40-42

Publisher/Corporate Author 1:
IPC Magazines Limited
Holborn Group, King's Reach Tower, Stamford Street
London SE1 9LS, England

Available from:
IPC Magazines Limited
Holborn Group, King's Reach Tower, Stamford Street
London SE1 9LS, England

Order Number:

Abstract Information
Abstract: The article discusses the problem of **congestion** on city streets. Gridlock is the extreme version of the traffic **congestion** that affects almost every western city. Suggestion is made to make motorists pay extra for the priviledge of driving into a city, technique known as **road pricing**. The practice, started in Singapore in 1975, seems to work. Both benefits and problems caused by **road pricing** are discussed, specifically from British point of view.

TRIS accession number: 617119 *TRIS files:* HRIS. H 9104.

TRIS Record Flag: 4

Title: NEW HIGHWAY USES FOR AVI SYSTEMS
Foreign Language:

Author(s):
Covil, JL
Martin, PC
Regan, EJ, III

Publication Information:
Publication Title: Journal of Transportation Engineering
Volume: 117 **Number:** 6
Publication Date: 11/00/91 **Pagination:** pp697-703
ISBN: **ISSN:** 0733947X
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:** 2 App

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American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398

Available from:
American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398
Order Number:

Abstract Information
Abstract: An overview is presented of **road pricing** and congestion-pricing application status of several AVI (automatic vehicle indentification) projects: San Francisco Inernational Airport toll revenue collection; Heavy-vehicle electronic license plate (HELP) study; Hong Kong electronic **road pricing** project; Singapore **congestion** pricing project; and toll industry initiatives. It is noted that present technology is sufficiently advanced to effectively collect user fees (tolls) and to administer **congestion** pricing strategies. Public acceptance of new **road pricing** approaches appears to be the major factor impeding implementation of AVI-based systems. It is pointed out that AVI system development and implementation efforts are more fragmented than desired, and increased efforts to coordinate development and implementation efforts are needed.

TRIS accession number: 617353 *TRIS files:* HRIS. H 9104.
IRRD. I.

TRIS Record Flag: 1

Title: CAMBRIDGE **ROAD PRICING** PLANS COME UNDER EXPERT SCRUTINY
Foreign Language:

Author(s):
Goldsack, P

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Highways
Volume: 58 **Number:** 1967
Publication Date: 11/00/90 **Pagination:** pp 16-17
ISBN: **ISSN:** 01426168

Publisher/Corporate Author 1:
D.R. Publications Limited
Faversham House, 111 St James Road
Croydon, Surrey CR9 2TH, England

Available from:
D.R. Publications Limited
Faversham House, 111 St James Road
Croydon, Surrey CR9 2TH, England

Order Number:

Abstract Information
Abstract: This article reports criticisms of Cambridgeshire County Council's proposals to introduce an electronic **road pricing** (ERP) scheme in Cambridge, and the reply by the Council's Director of Transportation, Brian Oldridge. Leading advocates of ERP, including Ian Catling, John Hibbs, and Martin Mogridge, have criticised aspects of the scheme. Catling thinks that it is not properly thought through. Hibbs is not sure that the technology proposed would work equitably and become satisfactory to the public. Mogridge is not convinced that the Cambridge proposals are the most effective way of running an ERP scheme. In general, critics believe that the proposals' approach of levying charges for driving slowly or being halted on congested roads is misguided. Oldridge explains that the scheme is not the usual form of **road pricing,** but uses a system where a car is charged if it helps to contribute to **congestion** on specific roads, and only if the road on which it is driving is congested. It will enable scarce road space at seriously crowded places to be paid for and visually seen to be paid for. Vehicles would be electronically debited by computer from a pre-paid, pre-metered "smart card"; the charge would be determined by travel time, distance travelled, and inertia. The current status of ERP in Hong Kong, Singapore, and Norway is reported briefly. (TRRL)

TRIS accession number: 617431 *TRIS files:* HRIS. H 9104.
IRRD. I.

TRIS Record Flag: 1

Title: THE GREAT NORDIC TOLL PLAZA
Foreign Language:

Author(s):
Hall, P

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Planner
Volume: 76 **Number:** 26
Publication Date: 7/06/90 **Pagination:** p 10
ISBN: **ISSN:** 03091384

Publisher/Corporate Author 1:
Royal Town Planning Institute
26 Portland Place
London W1N 4BE, England

Available from:
Royal Town Planning Institute
26 Portland Place
London W1N 4BE, England

Order Number:

Abstract Information
Abstract: Opposition to **road pricing** seems to be political in most cases, but environmental pressures are increasing and many authorities are now seriously considering introducing **road pricing**. **Road pricing** schemes are reviewed with examples from Oslo and Stockholm to illustrate the relative merits of different types of schemes. All motorists entering the city centre of Oslo must pass through one of 18 toll plazas situated at a distance of about three miles from the city hall. The amount of car traffic was less after the introduction of the scheme, but traffic soon reverted to pre-toll patterns resulting in the collection of 60 million pounds a year. The object of the scheme is to generate enough capital over a 15 year period to build a new highway system, one element of which, a mile-long motorway tunnel under the centre, opened in 1990. The Oslo scheme has the facility to charge variable rates according to the **congestion**. Stockholm is introducing **road pricing** in an attempt to protect the city environment by restraining traffic, all other methods having failed. Daily charges between 7 am and 6 pm are high, but a monthly fee includes a travel card to go anywhere by public transport. (TRRL)

TRIS accession number: 606939 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: NEW INITIATIVES IN THE MANAGEMENT OF URBAN CONJESTION
Foreign Language:

Author(s):
Martin, KW

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Municipal Engineer
Volume: 7 **Number:** 2
Publication Date: 4/00/90 **Pagination:** pp 59-68
ISBN: **ISSN:** 0263788X

Publisher/Corporate Author 1:
Telford (Thomas) Limited
Thomas Telford House, 1 Heron Quay
London E14 9XF, England

Available from:
Telford (Thomas) Limited
Thomas Telford House, 1 Heron Quay
London E14 9XF, England

Order Number:

Abstract Information
Abstract: This paper highlights the increasing level of **congestion** in urban areas and suggests possible remedies. It stresses the need for a co-ordinated and comprehensive approach to **congestion** and the importance of maximising the use of existing infrastructure such as traffic control and restraint, including **road pricing**. It also urges the case for investment in new road and rail provision.

TRIS accession number: 606966 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: TRAVEL IN TOWNS. JAM YESTERDAY, JAM TODAY AND JAM TOMORROW?
Foreign Language:

Author(s):
Mogridge, MJH

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/90 **Pagination:** 326p
ISBN: 0-333-53204-X **ISSN:**

Publisher/Corporate Author 1:
MACMILLAN
HOUNDMILLS
Basingstoke, Hampshire, United Kingdom

Abstract Information
Abstract: This book contains a summary of work from a series of research papers produced over the last six years on how to improve travel in towns. The author examines the theory of traffic **congestion** in the light of recent reassessments of the extensive surveys in London of traffic flows and speeds, and in particular of journey speeds by all forms of transport. Chapters are included on: road speeds; journey speeds; transportation models such as NETRAN, STEM, GLTS, LTS; **road pricing**; the Downs-Thompson Paradox; public transport; transport revolutions; and road building. Data on travel speeds is presented in tabular form, and a bibliography is included. The key conclusion presented is that an efficient pattern of transport supply will only be made when travellers pay the true costs of the resources they use on each journey.

TRIS accession number: 607129 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT IN CITIES
Foreign Language:

Author(s):
Richards, B

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/90 **Pagination:** 152p
ISBN: 1-85454-545-0 **ISSN:**

Publisher/Corporate Author 1:
ARCHITECTURE DESIGN AND TECHNOLOGY PRESS
128 LONG ACRE
London, United Kingdom

Abstract Information
Abstract: This book explores what methods are available today for restraining vehicular traffic in cities all over the world, and looks at a range of transport alternatives. It suggests that a combination of measures could lead to major environmental improvements in the cities of today. Topics covered include transport and the city, walking, mobility for elderly and disabled people, cycling, the car, **road pricing** and controls, freight, buses, travel interchanges, rail and water transport.

TRIS accession number: 609287 *TRIS files:* HRIS. H 9102.
IRRD. I.

TRIS Record Flag: 1

Title: ROADS FOR THE FUTURE. TRANSPORT COMMITTEE 1ST REPORT. SESSION 1989-1990. REPORT AND MINUTES OF PROCEEDINGS. VOLUMES 1 AND 2
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory

Report No: 198-I,II
Period Covered:
Publication Date: 2/00/90 **Pagination:** 59p, 562p
ISBN: 0-10-219890-X **ISSN:**

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Her Majesty's Stationery Office
49 High Holborn
London WC1V 6HB, England

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Her Majesty's Stationery Office
49 High Holborn
London WC1V 6HB, England

Order Number:

Abstract Information
Abstract: This document contains the report and minutes of evidence submitted to the the Transport Committee's inquiry into future road needs in Britain. Public transport was excluded from the inquiry. Volume one contains the main report and is divided into 10 main sections: 1) Introduction and background; 2) Strategy; 3) Land use planning; 4) Forecasting; 5) Evaluation; 6) Planning procedures; 7) Road design and traffic control; 8) Private finance for roads; 9) Management of road use, and 10) Summary of main recommendations. The government's reply to the points raised in this document may be found in the Transport Committee's third special report 1989/90 (HC574) (IRRD 833377). Volume two contains the memoranda submitted to the Committee from the following bodies: Department of Transport, Automobile Association, Friends of the Earth, British Road Federation, Trades Union Congress, Transport and General Worker's Union, County Planning Officers' Society, Association of London Borough Engineers and Surveyors, Institution of Civil Engineers, County Surveyors' Society, British Tourist Authority, Somerset County Council, Mr Clive Buckmaster, British Aggregate Construction Materials Industry, Cheshire County Council, East Sussex County Council, Nottinghamshire County Council, West Sussex County Council, Scottish Development Department, Royal Automobile Club, Freight Transport Association, Mr David Gregg, Oxford Polytechnic, Railway Conversion Campaign, Kent County Council, Humberside County Council, Institute for Transport University of Leeds, Transport 2000, Association of County Councils, Association of Metropolitan Authorities(with Assoc of London Authorities and London Boroughs' Assoc), J Henry Schroder Wagg & Co Limited, Wimpey. Construction Limited, and Barclays de Zoete Wedd Limited (Author/TRRL)

TRIS accession number: 609344 *TRIS files:* HRIS. H 9102.
IRRD. I.

TRIS Record Flag: 1

Title: MANAGING TRAVEL DEMAND . 15TH ARRB CONFERENCE, DARWIN, NORTHERN TERRITORY, 26-31 AUGUST 1990; PROCEEDINGS PARTS 1 TO 7
Foreign Language:

Author(s):
Wigan, MR

Publication Information:
Source of Document: Transport and Road Research Laboratory

Volume: 15 **Number:** 4
Publication Date: 0/00/90 **Pagination:** pp 267-292
ISBN: **ISSN:** 05721431
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Australian Road Research Board
500 Burwood Highway
Vermont South, Victoria 3133, Australia

Available from:
Australian Road Research Board
P.O. Box 156
Nunawading, Victoria 3131, Australia

Order Number:

Abstract Information
Abstract: Patterns of usage of the road and transport system have changed considerably in the last 30 years. The concern for making the best use of available transport and road capacity expressed in the 1960s was to ensure that only appropriate journeys were made: the mechanism was road (**congestion**) pricing, and this theme was developed steadily over the next decade or more to include physical constraints on access to certain areas, capacity reductions, and a heightened awareness of environmental and social impacts. However, the rapid improvement of traffic management techniques, particularly area traffic control, led to significant increases in effective capacity, and the issue lay unacted upon. Recent developments in the fiscal analysis of toll roads have now begun to contribute anew to this debate, and the rising levels of urban and suburban **congestion** in several countries has led to tentative political backing for road (**congestion**) pricing, reaching the level of a formally-endorsed policy in the Netherlands. At the same time the major gains from traffic management innovations have begun to lose momentum, and the earlier solutions (including road **congestion** pricing) are becoming attractive and economic once again, with new technology making the technical aspects easier while raising more severe privacy and surveillance issues. The new technology is raising the level of capacity and safety by greater information and control for the driver and the vehicle. The difference now is that the changes in land use and activity locations, and the investments in public transport can no longer be treated separately. The management of travel demand must now be underpinned by methods of projection and proposal analysis that recognise these interactions in a reasonably quantitative manner and the information flows required to exercise this option also need attention. It is no longer possible to omit wider population, employment and

environmental impacts arising from any of the three major players in the transport and land use system: the roads, the public transport and land use release and usage. More technology applied to the roadway and to the vehicle has a part to play, so too does land use release and regulation, public transport policies and expenditures and road provision. If travel demand is to be managed successfully, all three elements must be balanced with the social, fiscal and environmental costs and the responses of the users of each part of the total system. Work aimed solely at one part of this system is unlikely to be as successful. (Author/TRRL)

TRIS accession number: 606318 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: ROADS FOR THE FUTURE. TRANSPORT COMMITTEE 1ST REPORT. SESSION 1989-1990. REPORT AND MINUTES OF PROCEEDINGS. VOLUMES 1 AND 2
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: House of Commons Paper
Report No: 198-I and 198-II
Period Covered:
Publication Date: 2/00/90 **Pagination:** 621p
ISBN: 0-10-219890-X **ISSN:**

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Her Majesty's Stationery Office
49 High Holborn
London WC1V 6HB, England

Available from:
Her Majesty's Stationery Office
49 High Holborn
London WC1V 6HB, England

Order Number:

Abstract Information
Abstract: This document contains the report and minutes of evidence submitted to the the Transport Committee's inquiry into future road needs in Britain. Public transport was excluded from the inquiry. Volume one contains the main report and is divided into 10 main sections: 1) Introduction and background; 2) Strategy; 3) Land use planning; 4) Forecasting; 5) Evaluation; 6) Planning procedures; 7) Road design and traffic control; 8) Private finance for roads; 9) Management of road use, and 10) Summary of main recommendations. Volume two contains the memoranda submitted to the Committee from the following bodies: Department of Transport, Automobile Association, Friends of the Earth, British Road Federation, Trades Union Congress, Transport and General Worker's Union, County Planning Officers' Society, Association of London Borough Engineers and Surveyors, Institution of Civil Engineers, County Surveyors' Society, British Tourist Authority, Somerset County Council, Mr Clive Buckmaster, British Aggregate Construction Materials Industry, Cheshire County Council, East Sussex County Council, Nottinghamshire County Council, West Sussex County Council, Scottish Development Department, Royal Automobile Club, Freight Transport Association, Mr David Gregg, Oxford Polytechnic, Railway Conversion Campaign, Kent County Council, Humberside County Council, Institute for Transport University of Leeds, Transport 2000, Association of County Councils, Association of Metropolitan Authorities (with Assoc of London Authorities and London Boroughs' Assoc), J Henry Schroder Wagg & Co Limited, Wimpey Construction Limited, and Barclays de Zoete Wedd Limited.

TRIS accession number: 619524 *TRIS files:* HRIS. H 9201.

TRIS Record Flag: 2

Title: POLICIES FOR ALLEVIATING TRAFFIC **CONGESTION** IN LARGER CITIES
Foreign Language:

Author(s):
Jones, P

Publication Information:
Source of Document: National Technical Information Service

Report No: TSU/REF-587
Period Covered:
Publication Date: 10/00/90 **Pagination:** 15p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Available from:
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Order Number: PB91-230599/WTS

Abstract Information
Abstract: Traffic **congestion** in large cities is now recognized as a major problem throughout the world. A variety of different responses can be identified, including: (1) Do nothing - let the traffic find its own level; (2) increase road capacity, either through new road construction, or more efficient use of existing road space; (3) reduce the environmental impacts of car use through cleaner, quieter engines; (4) encourage a shift from car to public transit; (5) use of parking controls to limit car use; (6) explicit restrictions on car use; (7) regulate demand through **road pricing**; (8) restrictions on car ownership; (9) changes to land use, to encourage more even use of road space; (10) encourage home working, use of telecommunications, etc., to reduce the need to travel. The paper briefly discusses each of these measures, and the contribution that they can make to alleviating urban traffic **congestion**.

TRIS accession number: 619826 *TRIS files:* HRIS. H 9201.
IRRD. I.

TRIS Record Flag: 1

Title: APPLICATION OF A TIME-OF-DAY MODULE WITHIN THE NATIONAL MODEL . TRANSPORTATION PLANNING RESEARCH COLLOQUIM 1990. MEASURING, MODELLING, MONITORING. NEW DEVELOPMENTS IN RESEARCH METHODS. THE HAGUE, NOVEMBER 29-30, 1990. VOLUME I AND II
Foreign Title: TOEPASSING VAN EEN TIME-OF-DAY MODULE IN HET LANDELIJK MODEL
Foreign Language: Dutch

Author(s):
Mijjer, PH
Daly, AJ
Hungerink, GJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 835898

Publication Date: 0/00/90 **Pagination:** pp 833-852
References: 9 Ref. **Appendices:**

Publisher/Corporate Author 1:
Colloquium Vervoersplanologisch Speurwerk
Geerdinkhof 237
Amsterdam, Netherlands

Available from:
Colloquium Vervoersplanologisch Speurwerk
Geerdinkhof 237
Amsterdam, Netherlands

Order Number:

Abstract Information
Abstract: The evaluation and determination of transportation policies require considerations of both 24-hour and peak-hour traffic flows. The split between peak and off-peak is often assumed to be fixed. In addition to **congestion,** however, several policy decisions also effect the distribution of trips between peak and off-peak. The interaction of policy measures and **congestion** can create second-order' effects that reduce the impact of traffic reducing measures. The national model has been extended by incorporating a flexible time-of-day module to model time-of-day changes including second order effects. The system has been applied to a policy which contains time period specific **road pricing.** The results show that this form of **road pricing** is more effective in reducing **congestion** than in reducing kilometres travelled. (Author/TRRL)

TRIS accession number: 619845 *TRIS files:* HRIS. H 9201.
IRRD. I.

TRIS Record Flag: 1

Title: STUDY OF EMPLOYERS' REACTION TO **ROAD PRICING AND CONGESTION** . TRANSPORTATION PLANNING RESEARCH COLLOQUIUM 1990. MEASURING, MODELLING, MONITORING. NEW DEVELOPMENTS IN RESEARCH METHODS. THE HAGUE, NOVEMBER 29-30, 1990. VOLUME I AND II
Foreign Title: REACTIES VAN WERKGEVERS OP REKENING RIJDEN EN CONGESTIE
Foreign Language: Dutch

Author(s):
Vrolijk, PC
Hadjitofi, TLG
Kleijn, HJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 835917

Publication Date: 0/00/90 **Pagination:** pp183-1200

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Colloquium Vervoersplanologisch Speurwerk
Geerdinkhof 237
Amsterdam, Netherlands

Available from:
Colloquium Vervoersplanologisch Speurwerk
Geerdinkhof 237
Amsterdam, Netherlands

Order Number:

Abstract Information
Abstract: This paper describes the procedures used by, and the results of a study amongst companies and institutions concerning changes in the patterns of business travel due to the introduction of **road pricing.** In interviews with company executives possible changes for the next years were presented and discussed. Data have been collected for two scenarios. The first scenario assumes that **road pricing** has been succesfully implemented. The second scenario considers a situation without **road pricing** and in which traffic conditions have deteriorated. The employers' reactions are limited to marginal adjustment of the business travel pattern. The strongest effect is a minor shift to off peak periods. The reactions to both scenarios are comparable, but the opinions are quite different. In a forced choice situation, a preference exist for **road pricing** rather than the congested scenario. (Author/TRRL)

TRIS accession number: 606338 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: OPTIMAL PRICING OF TRAFFIC EXTERNALITIES: THEORY AND MEASUREMENT
Foreign Language:

Author(s):
Shah, AM

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: International Journal of Transport Economics
Volume: 17 **Number:** 1
Publication Date: 2/00/90 **Pagination:** pp 3-19
ISBN: **ISSN:** 03918440

Available from:
International Journal of Transport Economics
Via GA Guattani 8
00161 Rome, Italy

Order Number:

Abstract Information
Abstract: This paper investigates the effects of externalities engendered in particular case of traffic **congestion** upon the Pareto-optimal allocation of resources under perfect competition and develops estimates of optimum **congestion** tolls for an urban street in Edmonton, Canada. External diseconomies manifested in the case of traffic **congestion** bring above a divergence between marginal private cost and marginal social cost. Hence the market mechanism under conditions of perfect competition fails to sustain that allocation of **congestion** that ensures the lowest cost for the society as a whole. This situation may be alleviated by two methods. First, a variable tool bridging the gap between marginal social and private costs may be levied. The imposition of such a variable tax has the effect of superimposing the marginal private cost schedule of the individual over the marginal social cost schedule. This in a sense nullifies the effects of external diseconomies standing in the way of the market mechanism to ensure that level of **congestion** compatible with marginal social cost pricing. Second, the road capacity can be expanded up to that point where **congestion** costs do not appear. Many complications such as the social cost of collecting tolls, of measuring reliably the **congestion** levels, of considering travellers with different time opportunity costs, and the like have been abstracted. That such complications arise in real life is undeniable, but it is unlikely that the analysis presented in this paper would be substantially altered thereby. Rather these simplifications help in focussing directly upon the problem of traffic **congestion** and the means to correct for the external diseconomies it engenders. (A)

TRIS accession number: 606368 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: WORLD RESEARCH IN TRANSPORT ECONOMICS
Foreign Language:

Author(s):
-

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: International Journal of Transport Economics
Volume: 17 **Number:** 1
Publication Date: 2/00/90 **Pagination:** pp 95-102
ISBN: **ISSN:** 03918440

Available from:
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Via GA Guattani 8
00161 Rome, Italy

Order Number:

Abstract Information
Abstract: In this paper, a summary of the discussions on **road pricing** held at the European Conference of Ministers of Transport (ECMT) Round Table on Transport Economics, Paris 1989, is presented. Discussions were held on: the various applications of **road pricing**; private and public financing of infrastructure; traffic management; the role of **road pricing as a congestion** tax; the internalization of external costs; harmonization of charges where there is competition; and the guiding of demand where necessary. The consensus of opinion of the ECMT Round Table, was that **road pricing** should be viewed as one of a set of measures to decrease **congestion,** including improvements to public transport, and that any charging system should generate revenue to improve the urban environment. Experiences from the member countries in using charging systems, including electronic payment systems are also briefly reviewed.

TRIS accession number: 571606 *TRIS files:* TLIB. L.

TRIS Record Flag: 3

Title: URBAN **ROAD PRICING** AND SWEDISH TRANSPORT POLICY
Foreign Language: ENGLISH

Author(s):
WOOD, C

Publication Information:
Source of Document: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES 22886903

Publication Title: MODERN TRAMWAY AND LIGHT RAIL TRANSIT
Volume: 53 **Number:** 635
Publication Date: 11/00/90 **Pagination:** PP 376-382

Abstract Information
Abstract: No abstract provided.
Supplementary notes: CHRIS WOOD COL. ILL., MAPS INCLUDES BIBLIOGRAPHICAL REFERENCES

TRIS accession number: 601224 *TRIS files:* HRIS. H 9004.

TRIS Record Flag: 2

Title: PAYING FOR PROGRESS
Foreign Language:

Publication Information:
Source of Document: UITP Biblio-Index
Source Data: 6-7/1990

Publication Date: 0/00/90 **Pagination:** 54p

Publisher/Corporate Author 1:
Chartered Institute of Transport
80 Porland Place
London W1N 4DP, England

Available from:
Chartered Institute of Transport
80 Porland Place
London W1N 4DP, England

Order Number:

Abstract Information
Abstract: The changing transport scene. The case for selective road user charges. Existing methods of charging road users in the UK. Experience of road **congestion** charges elsewhere. Conclusions from studies in the UK. Criteria and concerns. The effect on different groups. The main options. Application of **road pricing** in the UK.

TRIS accession number: 606613 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: MAKE YOURSELF SCARCE
Foreign Language:

Author(s):
-

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: New Civil Engineer
Volume: **Number:** 885
Publication Date: 3/01/90 **Pagination:** pp 46-47
ISBN: **ISSN:** 03077683

Publisher/Corporate Author 1:
Telford (Thomas) Limited
Thomas Telford House, 1 Heron Quay
London E14 9XF, England

Available from:
Telford (Thomas) Limited
Thomas Telford House, 1 Heron Quay
London E14 9XF, England

Order Number:

Abstract Information
Abstract: This article criticises the British Government's road building programme, as presented in its White Paper 'Roads for Prosperity' (see IRRD 823662), and presents proposals for pricing road use by scarcity value. The Government's overall transport objective is to increase the economic effectiveness of commerce and industry. The author argues that, despite the planned major increase in capital investment in roads, supply and demand are now hopelessly out of balance, and that the programme will reduce neither traffic growth nor **congestion.** As long as road use is perceived as being 'free', expected increases in car ownership will continue to fill growing road space to full capacity and **congestion** during peak periods. After reviewing several alternative approaches, the author advocates levying a charge on vehicle **congestion** whenever it occurs, as he believes that this perceived charge would deter enough users to control **congestion.** An electronic device in the car would reliably detect the occurrence of **congestion,** as the behaviour of all vehicles has been observed to be identical in severe **congestion.** For example, a **congestion** charge could be levied, either when a vehicle stops at least four times within any 0.5 km, or when the speed without stopping falls below 4 kph within any 0.5 km. An additional charge could be levied for severe **congestion.** Payment would be via a prepaid card, costing 10 and containing 100 **congestion** units, for example.

TRIS accession number: 606274 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: ROAD USE CHARGES AND VEHICLE REGISTRATION: A NATIONAL SCHEME. VOLUMES 1 AND 2
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 3/00/90 **Pagination:** 650p
ISBN: 0-644-11959-4 **ISSN:**

Publisher/Corporate Author 1:
Australian Government Publishing Service
P.O. Box 84
Canberra, A.C.T. 2600, Australia

Abstract Information
Abstract: The Inter-State Commission has recommended a program of micro-economic reform in the road transport industry and in the provision, management and use of our road system. The Commission concludes that the existing road user charging arrangements are inefficient and inequitable and proposes a national road user charging and registration scheme based on the user pays principle. The Commission has asked the Federal Government to consider: 1) Establishing a national road user charging and vehicle registration scheme with one uniform set of rules and regulations. 2) Replacing widely varying State petrol and diesel fuel taxes and registration fees with a uniform national charging system based on the Federal fuel excise and weight/ distance charges for heavy vehicles. 3) Establishing a clear link between road funding and road user charging. 4) Full cost recovery for all vehicles, including actual costs attributable to road crashes, **congestion** and atmospheric and noise pollution. 5) Developing a national road program, as at present, but alter its basis to one involving consultation with road users. 6) Separation of road user and administrative costs to ensure that State road authorities are properly accountable for administrative efficiency. Volume 2 contains the appendices.

TRIS accession number: 606316 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING** FOR LONDON: AN LBA POLICY REPORT
Foreign Language:

Author(s):
Hurdle, D

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 5/00/90 **Pagination:** 29p
ISBN: 0-9511219-3-6 **ISSN:**

Publisher/Corporate Author 1:
London Boroughs Association
23 Buckingham Gate
London, England

Abstract Information
Abstract: In seeking to contribute to the growing debate on London's transport problems, the London Boroughs Association (LBA) has recently examined the case for **road pricing** - charging drivers for using roads. This report traces the historical development of **road pricing,** reviews the current interest in it and outlines current and proposed schemes abroad, such as the Hong Kong and Singapore schemes. It then discusses the economic and environmental problems that **road pricing** could address. Other forms of traffic restraint are summarised together with the current stance of central government and the London boroughs. The LBA believes that **road pricing** has a great many benefits, though practical difficulties in London must not be underestimated, and is worthy of further study urgently. The report should be useful to a wide range of authorities and practitioners concerned about the adverse effects of road vehicle use in urban areas. (A)

TRIS accession number: 604989 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: PAYING FOR PROGRESS. A REPORT ON **CONGESTION** AND ROAD USE CHARGES
Foreign Language:

Author(s):
-

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 3/00/90 **Pagination:** 48p

Publisher/Corporate Author 1:
CHARTERED INSTITUTE OF TRANSPORT
80 PORTLAND PLACE
London, United Kingdom

Abstract Information
Abstract: This report presents the results of an investigation into the merits of **road pricing** as a means of reducing traffic **congestion** in Great Britain. The types of system currently available and in use in other countries are reviewed briefly, and the criteria and concerns which should be taken into account when designing such a scheme are presented. The effects of **road pricing** upon different road user groups, and the costs and benefits of introducing such a scheme in Great Britain are discussed. These facts are used to advocate the introduction of **road pricing** in London (including the M25), and for the application of **road pricing** on inter urban corridors between London and Birmingham, and London and Bristol.

TRIS accession number: 605917 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: AN ELECTRONIC DECONGESTANT
Foreign Language:

Author(s):
Patel, K

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Engineer
Volume: 270 **Number:** 6995
Report No: /6
Period Covered:
Publication Date: 4/19/90 **Pagination:** p 48
ISBN: **ISSN:** 00137758

Publisher/Corporate Author 1:
Morgan-Grampian (Publishers) Limited
Morgan Grampian House, 30 Calderwood Street
London SE18 6QH, England

Available from:
Morgan-Grampian (Publishers) Limited
Morgan Grampian House, 30 Calderwood Street
London SE18 6QH, England

Order Number:

Abstract Information
Abstract: In this article, an electronic **road pricing** system, Telepass is described. Trials of Telepass by the Italian motorway authority, Autostrade, have started in schemes in Italy on the highway linking Milan, Florence and Rome, and will involve 10000 users. Telepass was developed by Olivetti, and utilizes 5.7 GHz radio frequency. Smart cards for the Telepass system are being supplied by AT&T of the United States. The card can be used either as a pre-paid stored value card, or as a charge card. Apart from the radio, roadside to vehicle links can be made by magnetic, ultrasound or infra-red systems. The cost to the motorist for the Telepass system is less than 100. In the UK a report by the Institute of Public Policy Research (see IRRD 824678) gives estimates of 10 million to install such a system in central London, with annual running costs of between 10 million and 25 million, the benefits would be an increase in traffic speeds in central London from 11 to 16 mph.

TRIS accession number: 604539 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: **CONGESTION** AND TRANSPORT DEMAND MANAGEMENT ASSOCIATED WITH THE FEASIBILITY OF **ROAD PRICING** IN METROPOLITAN MELBOURNE
Foreign Language:

Author(s):
Jraiw, K

Publication Information:
Source of Document: Transport and Road Research Laboratory

Report No: GR/90-1
Period Covered:
Publication Date: 1/00/90 **Pagination:** 49p
ISBN: 0-7241-7335-8 **ISSN:**

Publisher/Corporate Author 1:
Victoria Roads
Research and Development Department, 60 Denmark Street
Kew, Victoria, Australia

Abstract Information
Abstract: This paper outlines the framework of a **road pricing** strategy, and the alternatives, as a measures to control traffic **congestion,** and manage transportation demand in Melbourne. The process of transportation planning and engineering are summarised. Elements which characterise the structure of study area and are necessary for the work of designers, planners and decision makers at various levels are pointed out. The lack of knowledge associated with these elements is also considered. The advantages of short term and strategic planning are highlighted, as well as the importance of the integration between transportation planning and planning of other sectors. Identification of how the various elements might relate to one another and a comprehensive framework are introduced to facilitate the creation of efficient and functional strategy. Evaluation of the characteristics of **congestion** is also presented, as well as traffic capacity. The paper covers **road pricing** methods, international practice of **road pricing,** examination of **road pricing** strategy, methods of payment and cost benefit analysis. **Road pricing** strategy can fulfill two functions. Firstly, raise funds from which the costs and the improvement of the road system can be met. Secondly, restrain road traffic in some urban areas to control **congestion.** Most countries have practised the first function for many years. Concerning **road pricing** as a means to control **congestion,** Hong Kong and Singapore represent the obvious practice in this field while other countries are now thinking seriously to implement such a strategy. A proposed study approach to deal with transportation demand management and **congestion** in Melbourne is introduced. The study approach includes: problem solving procedures; objectives for the proposed Melbourne transport strategy; establishment of solution methods and options; evaluation criteria; technical requirements; identification of the relevant elements; proposed implementation plan; proposed study stages; where to go from here.

TRIS accession number: 497109 *TRIS files:* HRIS. H 9004.

TRIS Record Flag: 2

Title: UNDERSTANDING **CONGESTION**
Foreign Language:

Author(s):
Goodwin, PB

Publication Information:
Publication Title: Recherche Transports Securite
Volume: **Number:** 5
Publication Date: 6/00/90 **Pagination:** pp75-80

Publisher/Corporate Author 1:
Institut National Recherche sur Transp et Securite
2, Avenue du General Malleret-Joinville, BP 34
94114 Arcueil Cedex, France

Available from:
Institut National Recherche sur Transp et Securite
2, Avenue du General Malleret-Joinville, BP 34
94114 Arcueil Cedex, France

Order Number:

Abstract Information
Abstract: **Congestion** is characteristic of all heavily used transport systems, and consists of the interference by one traveller in the free movement of another. Although there are well established methods of measuring the cost of **congestion,** they rely on an unstated subjective element, the "target" speed considered as reasonable. This is a moving target. At present there is a profound debate among different solutions to **congestion,** derived from different perceptions of its causes; these alternative solutions include road construction, traffic management, public transport improvements, traffic calming, doing nothing, and **road pricing.** Apparently there is no consensus on objective methods, but there is a possibility of a new consensus, based on an integral approach to all transport systems, a recognition of the impossibility of providing for all potential demand for movement, and an understanding of the importance of human factors and travellers' motivations.

TRIS accession number: 498496 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: PLANNING INFRASTRUCTURE INVESTMENT IN THE UK
Foreign Language:

Author(s):
Bonham, J

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Highways and Transportation
Volume: 37 **Number:** 1
Publication Date: 1/00/90 **Pagination:** pp 5-7
ISBN: **ISSN:** 02656868

Publisher/Corporate Author 1:
Institution of Highways and Transportation
3 Lygon Place, Ebury Street
London SW1, England

Available from:
Institution of Highways and Transportation
3 Lygon Place, Ebury Street
London SW1, England

Order Number:

Abstract Information
Abstract: Road **congestion,** it is estimated, costs Britain 15000 m per year; this paper, which was presented at the Institution of Highways and Transportation Presidential Conference at Lancaster in 1989, proposes a number of ways in which Britain's transport infrastructure (road, rail and air transport) can be brought up to date to allow the whole country to be able to compete in the Single European Market. The proposals are; (1) to make long term transport plans to produce a better transport network than our competitors; (2) to increase private sector financing, on top of additional public expenditure; (3) to introduce a new, less prolonged, planning framework; (4) to develop an integrated approach, involving road, rail and air transport, and (5) to investigate the possibilities of **road pricing.**

TRIS accession number: 498730 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING**: THE POLITICAL AND STRATEGIC POSSIBILITIES
Foreign Language:

Author(s):
Goodwin, PB
Jones, PM

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: TSU Report
Volume: **Number:** 440
Publication Date: 0/00/89 **Pagination:** 53p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Abstract Information
Abstract: In this report, **road pricing** theory and application is assessed. Firstly the historical background to the formation of **road pricing** theory is briefly outlined. The practical issues involved in implementation are given, these include: (1) site location; (2) method and levels of charging; (3) definitions of exemptions; (4) fraud and enforcement; (5) privacy and security; (6) methods of monitoring effects. The conclusions of the report are: (a) **road pricing** is better able to restrain traffic levels in congested areas than parking controls or car ownership restraint; (b) higher levels of car ownership can be absorbed; (c) an indication is given of the economic demand for road space and a revenue source; and (d) schemes are likely to be most effective when used in conjunction with other forms of restraint. An appendix is given detailing the various measures available for controlling urban **congestion**.

TRIS accession number: 498888 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: THE RESTRAINT OF ROAD TRAFFIC IN URBAN AREAS: OBJECTIVES, OPTIONS AND EXPERIENCES. REES JEFFREYS DISCUSSION PAPER
Foreign Language:

Author(s):
Jones, MP

Publication Information:
Source of Document: Transport and Road Research Laboratory

Volume: **Number:** 482
Publication Date: 10/00/89 **Pagination:** 80p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Abstract Information
Abstract: The objective of this review is to examine some of the main options for restraining road traffic in urban areas (particularly cars), and to assess their effectiveness. The focus of the paper is primarily on controls on moving traffic; restraint through parking controls is not covered here. Data was collected in conjunction with the eec drive project on strategies for integrated demand management'. Examples are given of traffic restraint schemes in cities around the world, such as bradford, Southampton, Nottingham, London, Gothenburg, Delft, hanover, York, bologna, Athens, Milan, St ives, bergen, Hong Kong, Singapore and York. The review has six sections: 1) introduction; 2) a framework for analysis; 3) restrictions on road capacity and traffic speeds; 4) regulating traffic access to a link, network or area; 5) charging to the use of roadspace; and 6) assessment of the options.

TRIS accession number: 617618 *TRIS files:* HRIS. H 9104.
IRRD. I.

TRIS Record Flag: 1

Title: THE FINAL GRIDLOCK
Foreign Language:

Author(s):
Banister, D

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Built Environment
Volume: 15 **Number:** 3/4
Publication Date: 0/00/89 **Pagination:** pp 163-165
ISBN: **ISSN:** 02637960

Publisher/Corporate Author 1:
Alexandrine Press
P.O. Box 15, Cornmarket Street
Oxford OX1 3EB, England

Available from:
Alexandrine Press
P.O. Box 15, Cornmarket Street
Oxford OX1 3EB, England

Order Number:

Abstract Information
Abstract: The author summarises a collection of nine papers on the possibility of gridlock - parts of a city being completely seized up due to traffic **congestion** - and possible approaches to easing the problem. Two papers cover the strategic policy background and the need for a radical rethinking of current approaches. It is suggested that America has advanced through the process of suburbanisation, population structure changes and the mismatch of jobs and housing. The need for action is now reinforced by environmental and health concern. Approaches available are reviewed in the other papers; these include **road pricing,** controls through taxation on ownership or usage and improved public transport facilities. There is evidence that a co-ordinating policy of demand management and investment in high quality public transport can tempt people from their cars. Information systems can also help to reduce **congestion** but it may only delay the gridlock. Cities cannot accommodate an unrestricted demand from car drivers but it seems that people are very reluctant to give up their cars no matter how bad **congestion** is. Government appears reluctant to support draconian measures to combat **congestion.** (TRRL)

TRIS accession number: 604956 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: TRAFFIC RESTRAINT AND **ROAD PRICING** IN EUROPEAN CITIES: THE CURRENT SITUATION
Foreign Language:

Author(s):
Jones, PM

Publication Information:
Source of Document: Transport and Road Research Laboratory

Report No: REF 49
Period Covered:
Publication Date: 0/00/89 **Pagination:** 16p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Abstract Information
Abstract: This paper outlines the various non pricing measures that are being used to restrain car traffic in European cities. These are: controlled parking, traffic collars and throats, traffic cells and mazes, pedestrianization, hierarchical road networks, restrictions on entry of certain vehicle types and car access by permit. The paper goes on to discuss plans for **road pricing** in European cities, for example in Bergen, Oslo and Trondheim in Norway, Stockholm in Sweden and in the Netherlands. It examines the debate concerning the role which **road pricing** might play in solving urban transport problems, pointing out that it is viewed variously as a revenue raising device, a means of alleviating **congestion,** or as a way of making traffic face the environmental costs. The report also looks at the issues of privacy, enforcement, technological compatibility across Europe, long term effectiveness of **road pricing** schemes and the need for them to be viewed as a part of a package of traffic restraint measures. This paper was originally prepared for the IATSS Review, vol 15, no 4, December 1989.

TRIS accession number: 606043 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT IN THE NINETIES. THE SHAPING OF EUROPE
Foreign Language:

Author(s):
Bendixson, T

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/89 **Pagination:** 54p
ISBN: 0-85406-430-3 **ISSN:**

Publisher/Corporate Author 1:
Royal Institution of Chartered Surveyors
12 Great George Street
London, England

Abstract Information
Abstract: This report is about the institutional changes and the investment needed to create a transport infrastructure that is European in scale. It also includes information on several national motorway programmes and the different approaches of countries with mature and still incomplete networks. It describes the problem of road traffic **congestion,** and measures to reduce it, including the development and use of modern electronic traffic management techniques. Some examples of car and highway electronics are briefly described: (1) Systeme Integre de Regulation et d'Information des Usagers (SIRIUS), which is being installed on the expressways around Paris to provide drivers with information on alternative routes; (2) AUTOGUIDE, a driver navigation system, which GEC will install in London under licence from the Department of Transport; (3) automatic toll collection to be used in the Netherlands initially to finance motor tunnels; (4) ALISCOUT an in-car navigation system being developed in Berlin as a commercial service not a public utility; and (5) some experiments with electronic **road pricing** systems in Europe are briefly mentioned. Measures to protect the environment, the task of attaching the 'polluter pays' principle to cars and lorries, and problems associated with vehicle noise are discussed. In the final chapter aspects of financing Europe's transport infrastructure are outlined.

TRIS accession number: 606125 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: DRIVING AMBITION ON ROADS TO RUIN
Foreign Language:

Author(s):
Cowan, R

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Architects' Journal
Volume: 190 **Number:** 15
Publication Date: 10/11/89 **Pagination:** p 17
ISBN: **ISSN:** 00038466

Publisher/Corporate Author 1:
Architectural Press Limited
9 Queen Annes Gate
London SW1H 9BY, England

Available from:
Architectural Press Limited
9 Queen Annes Gate
London SW1H 9BY, England

Order Number:

Abstract Information
Abstract: The article is based on a criticism by John Adams of the Government's current proposals for solving London's transport problems. He argues that **road pricing** would move numbers of cars and **congestion** around rather than driving them to the suburbs. His case is that the Department of Transport's proposed new roads for prosperity would in fact be roads to ruin. He suggests that evidence from the United States shows that a motorway system rather than connecting cities to each other has the effect of draining life out of the cities and redistributing it at low densities along the outer beltways and other high-capacity roads. The consequences of trying to build a road network to fit the forecasts will be to cover the country with low-density urban sprawl abandoning the older, denser parts of the built environment to be ringed by roads. There are methods of controlling the increasing numbers of cars - taxation has been used to control Singapore's population of cars and reduce Hong Kong's. Adams claims the key to transport is to provide the most democratic public transport modes first.

TRIS accession number: 606317 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: STUDY OF TRANSPORT NEEDS FOR THE 21ST CENTURY. AN INTERIM REPORT
Foreign Language:

Author(s):
Goodwin, PB

Publication Information:
Source of Document: Transport and Road Research Laboratory

Report No: TSU REF RJ
Period Covered:
Publication Date: 0/00/89 **Pagination:** 12p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Abstract Information
Abstract: This paper, which introduces the Transport and Society Project running at the TSU Oxford from 1989-1991, looks at the problems of balancing transport demand with supply, traffic forecasting, and various alternative policies on **congestion,** such as traffic calming and **road pricing.** The paper ends by suggesting a new consensus approach to transport involving an integrated approach to demand management.

TRIS accession number: 606854 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING**: THE POLITICAL AND STRATEGIC POSSIBILITIES. SYSTEMS OF ROAD INFRASTRUCTURE COST COVERAGE. REPORT OF THE 80TH ROUND TABLE ON TRANSPORT ECONOMICS, PARIS, FEBRUARY 9-10, 1989
Foreign Language:

Author(s):
Goodwin, PB
Jones, PM

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/89 **Pagination:** pp 5-59
ISBN: 92-821-1144-X **ISSN:**

Publisher/Corporate Author 1:
Organization for Economic Cooperation and Devel
2 rue Andre Pascal
75775 Paris Cedex 16, France

Publisher/Corporate Author 2:
European Conference of Ministers of Transport
19 rue de Franqueville
75775 Paris Cedex 16, France

Abstract Information
Abstract: This paper aims to assess the state of the art of **road pricing** theory and applications, and to provide useful guidelines for policy development. The ECMT (European Conference of Ministers of Transport) has raised two key questions: (1) why **road pricing** has not worked; (2) how **road pricing** could be enabled to work, in view of new technologies and policies on private financing and regulation. The paper considers: (1) the possible objectives of **road pricing**; (2) theoretical developments and policy implications; (3) practical implementation issues; (4) political attitudes to **road pricing** in the UK and other countries; (5) a role for **road pricing**; (6) a framework for the development of **road pricing**; (7) the effectiveness of various methods for controlling urban traffic **congestion**. The authors conclude that: (1) although no completely comprehensive, rational and optimal **road pricing** scheme has yet been implemented, there have been many important attempts to develop good second-best **road pricing** systems; (2) **road pricing** can restrain traffic levels in congested areas better than parking controls or car ownership restraint; (3) it enables higher car ownership levels in cities than would otherwise by possible; (4) it provides an indication of the economic demand for road space and a source of revenue for future transport or environmental improvements; (5) it will be most effective in conjunction with other forms of restraint. For the covering abstract of the conference see IRRD 831508.

TRIS accession number: 499092 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: WITH THE STRUCTURE SCHEME ON TRAFFIC AND TRANSPORT NO MORE QUEUES? . CONFERENCE PAPERS ON THE WORKING DAYS ON TRAFFIC ENGINEERING 1989
Foreign Title: MET HET SVV DE FILE VAN DE WEG?
Foreign Language: Dutch

Author(s):
Graumans, AFC
Vogel, B

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 821549

Publication Title: Crow Publikatie 23
Publication Date: 5/00/89 **Pagination:** pp 169-179

Publisher/Corporate Author 1:
Stichting Crow
P.O. Box 37
Ede, Netherlands

Available from:
Stichting Crow
P.O. Box 37
Ede, Netherlands

Order Number:

Abstract Information
Abstract: The Netherlands has a traffic **congestion** problem. This paper describes and discusses the solutions put forward to decrease the problem in the recently published "tweede struktuurschema verkeer en vervoer (svv2)", the policy for traffic and transport till the year 2010. According to svv2 nineteen milliard guilders will be invested in highways and twelve milliard guilders in the public transport. The use of private cars will be reduced by a parking-policy, tax-policy and road-pricing. Svv2 provides little choice of priority concerning schedule and finances. The mean problems of traffic **congestion** are given as the damage on the economy and the environment. Can svv2 offer a stable solution for these problems? The conclusions are: (a) investment in road-building and the introduction of road-pricing don't assure the improvement in road **congestion** for business-traffic, the transport of goods and the environment; and (b) the financial policy has to give priority to public transport, the transport of goods and business-traffic. (TRRL)

TRIS accession number: 623724 *TRIS files:* HRIS. H 9103.
IRRD. I.

TRIS Record Flag: 1

Title: TOLL ROADS: A NEW DIRECTION FOR US HIGHWAYS?
Foreign Language:

Author(s):
Deakin, E

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Built Environment
Volume: 15 **Number:** 3/4
Publication Date: 0/00/89 **Pagination:** pp 185-94
ISBN: **ISSN:** 02637960
References: 29 Ref **Appendices:**

Publisher/Corporate Author 1:
Alexandrine Press
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Oxford OX1 3EB, England

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Alexandrine Press
P.O. Box 15, Cornmarket Street
Oxford OX1 3EB, England

Order Number:

Abstract Information
Abstract: This paper discusses the past history, present situation, and future prospects of toll roads in the USA. Toll financing, which had already been used for some inter-regional roads built in the 1940s and 1950s, is again emerging as a major method of paying for new highways. About 1200 miles (1900km) of new toll facilities are being studied, designed, or constructed, with 35 projects in 17 states. Advocates of toll roads believe that they will be used increasingly in the future, by overcoming the financial obstacles facing most highway programmes and offering scope for new technologies. Their opponents question their social acceptability and fairness, and consider that they might be sensible only in very limited circumstances. The new, privately funded toll roads are being built mainly in rapidly developing suburban areas; tolls will finance only part of their cost, so that supplementary funds and guarantees are required to make them possible. Many existing toll roads are being widened and upgraded. Toll roads may also offer some opportunities for **congestion** relief, but the scope for applying genuine **road pricing** there is not yet clear. Concerns expressed about toll roads include the dangers that: (1) they will facilitate new growth at the expense of existing non-affluent areas needing relief; (2) they will be used to avoid environmental controls and public scrutiny; (3) there will be less federal supervision of environmental matters. (TRRL) (Author/TRRL)

TRIS accession number: 600306 *TRIS files:* HRIS. H 9004.

TRIS Record Flag: 2

Title: TRAFFIC RESTRAINT AND **ROAD PRICING** IN EUROPEAN CITIES: THE CURRENT SITUATION
Foreign Language:

Author(s):
Jones, PM

Publication Information:
Source of Document: National Technical Information Service

Report No: TSU-REF-492
Period Covered:
Publication Date: 0/00/89 **Pagination:** 20p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, England

Available from:
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Order Number: PB90-213216/WTS

Abstract Information
Abstract: Urban transport problems and traffic restraint are now a key political issue in many European countries. Much of the debate concerns the role which **road pricing** might play in solving urban transport problems; it is viewed variously as a revenue-raising device, a means of alleviating **congestion,** or as a way of making traffic face their environmental costs. However, issues of privacy, equity and enforcement remain to be resolved. The paper first outlines the various non-pricing measures that are being used to restrain car traffic in European cities; it then discusses plans for **road pricing** in several Northern European countries, and presents aspects of the current debate.

TRIS accession number: 604123 *TRIS files:* HRIS. H 9101.
IRRD. I.

TRIS Record Flag: 1

Title: UNDERSTANDING **CONGESTION**
Foreign Language:

Author(s):
Goodwin, PB

Publication Information:
Source of Document: Transport and Road Research Laboratory

Report No: REF 46
Period Covered:
Publication Date: 0/00/89 **Pagination:** 14p

Publisher/Corporate Author 1:
Oxford University, England
Transport Studies Unit, 11 Bevington Road
Oxford OX2 6NB, Oxfordshire, England

Abstract Information
Abstract: Traffic **congestion** is now a characteristic of all heavily used transport systems. The costs of **congestion** include money and time wasted in delays and the indirect repercussions of those in inefficiencies in the economy. In this paper six different approaches that have developed into understanding **congestion** as a problem and the solutions that they have implied are discussed. These are: (1) to build more roads; (2) make optimal use of existing road capacity; (3) increase use of public transport; (4) traffic calming measures; (5) a do minimum approach; and (6) **road pricing**. The author states that there is now an emerging consensus that there is more that one strategy required to achieve traffic movement, in the form of integrated demand management. In this context **road pricing** emerges as a key issue. Previous work has shown that **road pricing** will only be acceptable to the public when part of an integrated transport strategy.

TRIS accession number: 499098 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: LANES FOR ESSENTIAL MOTOR TRAFFIC ON EXISTING EXPRESSWAYS AND MOTORWAYS, OR: ACCEPT TRAFFIC JAMS IN COMMUTER TRAFFIC . CONFERENCE PAPERS ON THE WORKING DAYS ON TRAFFIC ENGINEERING 1989
Foreign Title: ROUTES VOOR ZAKELIJK AUTOVERKEER OP BESTAANDE AUTOSNELWEGEN, OF: AANVAARDT FILES VOOR WOONWERKAUTOVERKEER
Foreign Language: Dutch

Author(s):
Kroon, P

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 821555

Publication Title: Crow Publikatie 23
Publication Date: 5/00/89 **Pagination:** pp 245-258
References: 8 Ref.**Appendices:**

Publisher/Corporate Author 1:
Stichting Crow
P.O. Box 37
Ede, Netherlands

Available from:
Stichting Crow
P.O. Box 37
Ede, Netherlands

Order Number:

Abstract Information
Abstract: This contribution suggests that lanes for essential motor traffic (freight and business traffic) be constructed "on special locations" on existing expressways, to improve the accessibility of the conurbations in the "randstad Holland". The example given is set in the neighbourhood of Rotterdam. The infrastructure required is relatively modest, as it is restricted to the spots where traffic jams arise. At these spots, it is necessary to separate freight and business traffic from commuter traffic, by means of height and/or weight detection, and a "sophisticated toll paying system", combined with a traffic control system. The introduction of lanes on new expressways costs a lot of money and takes a long time, and in the long term it will lead to: (a) too much infrastructure: this will then also be used by commuter traffic, which will encourage too much car use; (B) spreading effects in town, country and physical planning processes; (c) a modest position for public transport; (D) less pronounced urban development; and (e) accompanying negative environmental effects. The introduction of lanes for essential motor traffic on existing expressways will, on the contrary, lead to: (a) a better accessibility for essential motor traffic in a relatively short period of time (appr two years); and (b) in the long term (appr 5-20 years), to: (i) restriction in the expansion of infrastructure for motor traffic; (II) a more competitive situation for public transport; (III) implementation of the intended physical planning as regards to the policy concerning traffic concentration; and (IV) a reduction in the increase of car use. This in turn will: (a) decrease the damage to the environment; and (b) the saving

of several milliard guilders a year on transport, in spite of providing a substantial increase in the use of public transport. (TRRL)

TRIS accession number: 497708 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: THE INTRODUCTION OF TOLLS ON CALIFORNIAN MOTORWAYS
Foreign Title: L'INTRODUZIONE DEL PEDAGGIO PER LE AUTOSTRADE CALIFORNIANE
Foreign Language: ITALIEN

Author(s):
Poole, RW

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 824982

Publication Title: Autostrade
Volume: 31 **Number:** 1
Publication Date: 1/02/89 **Pagination:** 7-19
ISBN: **ISSN:** 00051756

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Autostrade Concessioni e Costruzioni Autostrade
Via Bergamini 50
00159 Rome, Italy

Available from:
Autostrade Concessioni e Costruzioni Autostrade
Via Bergamini 50
00159 Rome, Italy

Order Number:

Abstract Information
Abstract: Traffic and population forecasts for southern California indicate that licenced drivers will increase by 27% and the number of vehicles by 30.5%, by the year 2000. Population is calculated to increase from its present 12.4 million to 18.3 million by 2010. This will mean that today's average speed of 35 mph will be reduced to 11 mph by the year 2010. This study of motorway **congestion** in southern California pays special attention to the counties of Los Angeles and Orange and suggests that an increase in toll rates and of toll roads is the most adequate solution to the problem. An economic analysis of road financing and **road pricing** strategies in several different countries worldwide includes an examination of toll collection methods, with special reference to avi (automatic vehicle identification) systems. (TRRL)

TRIS accession number: 498079 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: PRICING CARS OUT OF THE CITIES
Foreign Language:

Author(s):
Mathew, D

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: Surveyor
Volume: 172 **Number:** 5064
Publication Date: 9/28/89 **Pagination:** pp 20-1
ISBN: **ISSN:** 00396303

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Sutton, Surrey SM2 5AD, England

Available from:
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Sutton, Surrey SM2 5AD, England

Order Number:

Abstract Information
Abstract: In this article, Swedish initiatives to introduce **road pricing** are described. Feasibility studies have been carried out in gothenberg, Malmo and Stockholm. A government bill, which will define **road pricing** as a 'charge' not a tax, enabling city councils to introduce systems, is scheduled for later in the year. Stockholm city council is planning to introduce a manual "pay and display" system in the summer of 1990, with a monthly fee of 30-00 payable, and public transport travel card included as an incentive to use public transport. Enforcement problems are likely to be encountered: toll booths will operate on minor roads only, traffic wardens will carry out spot checks in the city centre. The level at which tolls are set will determine the percentage reduction in traffic. Studies suggest that a 2-00 daily charge in gothenberg might lead to a 35 per cent reduction in traffic, whereas in Malmo a similar fee might lead to a 50% reduction. For electronic systems, flat rate fees are being proposed, however variable charging could be introduced, variables might include: time of day, vehicle type and engine size, traffic intensity and pollution levels.

TRIS accession number: 498149 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: A CLEANER FASTER LONDON: **ROAD PRICING,** TRANSPORT POLICY AND THE ENVIRONMENT
Foreign Language:

Author(s):
Hewitt, P(CH)

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: IPPR Green Paper
Volume: **Number:** 1
Publication Date: 0/00/89 **Pagination:** 44p
ISBN: 1-872452-00-0 **ISSN:**

Publisher/Corporate Author 1:
Institute for Public Policy Research
18 Buckingham Gate
London, England

Abstract Information
Abstract: This paper presents a study of the increasingly urgent problems of **congestion** and pollution caused by cars, particularly in central London; it views **congestion** as both an economic and an environmental problem. The paper discusses: (1) why cities require fewer cars; (2) how **road pricing** works; (3) **road pricing** issues; (4) public and political opinions about transport; (5) **road pricing** in relation to other policies. The author advocates the introduction of **road pricing** in central London as part of a comprehensive package of policies designed to reduce **congestion** and pollution, including: (1) other fiscal measures, such as the removal of tax subsidies for company car driving; (2) substantial improvements to public transport; (3) physical measures, such as the introduction of more extensive bus and cycle lanes; (4) in the longer term, a new approach to land use planning and urban communications. Properly used, **road pricing** would: (1) free road space for buses, delivery vehicles, essential services, cyclists and additional pedestrian areas; (2) substantially increase average traffic speeds for all vehicles, including car drivers who 'pay and stay'; (3) help to reduce pollution in city centres. Initially, **road pricing** should take the form of supplementary licensing, an additional payment for driving in central London during peak hours. By 1995, as the technology becomes available, electronic **road pricing** should be used, but only in a form involving 'smart card' technology in order to guarantee anonymity.

TRIS accession number: 498315 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: ON THE ECONOMIC THEORY OF **ROAD PRICING.** TRAFFIC AND TRANSPORT POLICY BETWEEN RURAL AND URBAN AREA, TO AN INTEGRAL APPROACH ON REGIONAL LEVEL. TRANSPORTATION PLANNING COLLOQUIUM 1989, THE HAGUE, NOVEMBER 30 - DECEMBER 1, 1989. VOLUME I
Foreign Title: OVER DE ECONOMISCHE THEORIE VAN HET REKENING RIJDEN
Foreign Language: DUTCH

Author(s):
Rouwendal, J
Rietveld, P

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/89 **Pagination:** pp 285-304

Publisher/Corporate Author 1:
Colloquium Vervoersplanologisch Speurwerk
Geerdinkhof 237
Amsterdam, Netherlands

Abstract Information
Abstract: In this paper the optimal value of a **congestion** toll is studied under different circumstances: (1) the revenues will be divided over the total population, irrespective of the use that is made of the road; (2) the revenues will be given to those who don't use the road in their own car, e.g. By means of investment in public transport; (3) the revenues will be given to those who use the road in their own car, by means of an increase in road capacity. With the aid of a logit model for transportation demand it is shown that for each of these cases the optimal value of the **congestion** toll will be different. The way in which the revenues are spent is thus important for the determination of the height of the toll.(a) for the covering abstract of the conference see IRRD 825702.

TRIS accession number: 498321 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: ROUTE GUIDANCE AND **ROAD PRICING** - WHERE DO THEY LEAD US? TRAFFIC AND TRANSPORT POLICY BETWEEN RURAL AND URBAN AREA, TO AN INTEGRAL APPROACH ON REGIONAL LEVEL. TRANSPORTATION PLANNING COLLOQUIUM 1989, THE HAGUE, NOVEMBER 30 - DECEMBER 1, 1989. VOLUME I
Foreign Title: ROUTE GUIDANCE EN REKENING RIJDEN - SCHIETEN WE ER IETS MEE OP?
Foreign Language: DUTCH

Author(s):
Van Vuren, T
Smart, MB

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/89 **Pagination:** pp 381-398

Publisher/Corporate Author 1:
Colloquium Vervoersplanologisch Speurwerk
Geerdinkhof 237
Amsterdam, Netherlands

Abstract Information
Abstract: Electronic route guidance and **road pricing** are not necessarily the ultimate solutions to today's traffic problems. On the contrary, they may well create new problems if not properly introduced. The final result could be very disappointing indeed. This paper demonstrates that the key to success with these systems lies in the acceptability to the general public. A case is made for the public operation of both the **road pricing** system and the route guidance system. The importance of environmental issues in network definition and the compensation strategy is also emphasized. Finally, we indicate that the combined introduction of route guidance and **road pricing** (which tackle supply and demand respectively) might lead to a synergy, with maximum profits to the system as a whole. For the covering abstract of the conference see IRRD 825702.

TRIS accession number: 489362 *TRIS files:* UMTRIS. U 9001.
HRIS. H 9001.

TRIS Record Flag: 4

Title: URBAN TRAFFIC **CONGESTION**: A SEARCH FOR NEW SOLUTIONS
Foreign Language:

Author(s):
Howie, D

Publication Information:
Publication Title: ITE Journal
Volume: 59 **Number:** 10
Publication Date: 10/00/89 **Pagination:** pp 13-16
ISBN: **ISSN:** 01628178
References: 12 Ref. **Appendices:**

Publisher/Corporate Author 1:
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2729

Available from:
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2729
Order Number:

Abstract Information
Abstract: This is an exploration of the opportunity to apply new and innovative solutions available as a result of advances in technology over recent years. The paper holds that the available technology has outstripped the ability of traffic engineers to deliver creative solutions to traffic problems. Current traffic management strategy has failed to recognize that management of the supply of traffic capacity is only half of the picture; the task of managing traffic demand is equally important. Trends in urban societies that affect traffic management strategies are listed and discussed. These forces can reshape urban transport needs at a time when traditional funding sources for new facilities are being cut back. Demand management is discussed. Road user charging provides a means to influence and manage demand at critical times of **congestion.** Sophisticated vehicle-to-vehicle and vehicle-to-roadside communication may aid in adding flexible **road pricing** features. In this regard, the need for protection of personal rights and freedoms must be recognized. Safety features may also be incorporated into such systems.

TRIS accession number: 492194 *TRIS files:* HRIS. H 9002.

TRIS Record Flag: 3

Title: UNDERSTANDING **CONGESTION**
Foreign Title: COMPRENDRE LA **CONGESTION**
Foreign Language: French

Author(s):
Goodwin, PB

Publication Information:
Publication Title: Recherche Transports Securite
Volume: **Number:** 24
Publication Date: 12/00/89 **Pagination:** pp 23-28
ISBN: **ISSN:** 07618980

Publisher/Corporate Author 1:
Institut National Recherche sur Transp et Securite
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94114 Arcueil Cedex, France

Available from:
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Order Number:

Abstract Information
Abstract: **Congestion** is a characteristic of all heavily used transport systems, and consists of the interference by one traveller in the free movement of another. Although there are well established methods of measuring the cost of **congestion,** they rely on an unstated subjective element, the 'target' speed considered as reasonable. This is a moving target. At present there is a profound debate among different solutions to **congestion,** derived from different perceptions of its causes; these alternative solutions include road construction, traffic management, public transport improvements, traffic calming, doing nothing, and **road pricing**. Apparently there is no consensus on objectives or methods but there is a possibility of a new consensus, based on an integrated approach to all transport systems, a recognition of the impossibility of providing for all potential demand for movement, and an understanding of the importance of human factors and travellers' motivations.

TRIS accession number: 493063 *TRIS files:* HRIS. H 9002.
IRRD. I.

TRIS Record Flag: 1

Title: THE AUTOMATION OF TOLL-COLLECTION AND ROAD-USE PRICING SYSTEMS. SECOND INTERNATIONAL CONFERENCE ON ROAD TRAFFIC MONITORING
Foreign Language:

Author(s):
Hills, P
Blythe, PT

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 819763

Publication Date: 0/00/89 **Pagination:** pp 118-122
ISBN: 0-85296373-4 **ISSN:**
References: 8 Ref. **Appendices:**

Publisher/Corporate Author 1:
Institution of Electrical Engineers
Savoy Place
London WC2R OBL, England

Available from:
Institution of Electrical Engineers
Savoy Place
London WC2R OBL, England

Order Number:

Abstract Information
Abstract: This article discusses the various methods used to pay for improvements in national road networks or to decrease traffic **congestion**. Sections are provided on the various methods used to charge for use of the roadspace. Variable and fixed taxation methods are compared briefly, and the recent electronic roads pricing experiment in Hong Kong is described. Cordon pricing, area licencing, and comprehensive variable road-use pricing methods are also discussed briefly. Current examples of automatic toll collection are described, and the future developments of toll pricing in Europe summarized. (TRRL)

TRIS accession number: 499185 *TRIS files:* HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: COST OF CUTTING QUEUES
Foreign Language:

Author(s):
Plowden, S

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD

Publication Title: SURVEYOR
Volume: 170 **Number:** 5019
Publication Date: 11/03/88 **Pagination:** pp 12-13
ISBN: **ISSN:** 00396303

Publisher/Corporate Author 1:
REED BUSINESS PUBLISHING LTD
CAREW HOUSE
Wallington, Surrey, United Kingdom

Abstract Information
Abstract: This article argues that **road pricing,** the charging of vehicles for trips in congested areas, could be an effective urban traffic control measure. It was originally proposed in the 1964 smeed report, **road pricing**: the economic and technical possibilities, and it is now being widely advocated as a solution to the traffic problems of central London. The technical success of the Hong Kong **road pricing** experiment convinced many former doubters, despite the scheme's abandonment for political reasons. **Road pricing** can be implemented technically by fitting each vehicle in its area with an electronic transmitting device. One of its advantages is that the reduction in traffic **congestion,** resulting from a switch of some drivers to public transport, would further improve the conditions for bus transport. Another advantage is the reduced environmental impact of traffic in city centres. **Road pricing** caters for the occasional need in addition to regular users. However, **road pricing** also raises several difficult questions, for example: (1) how far it would favour richer car owners as compared to poorer car owners; (2) how far its traffic reduction would improve conditions for other road users and in the environment; (3) what prices should be set; (4) whether or not it would be better to ban cars from central London altogether. The author considers that some careful and detailed attitude surveys are needed to find out which traffic restraint methods londoners would themselves consider fair and reasonable. (TRRL)

TRIS accession number: 618745 *TRIS files:* HRIS. H 9201.

TRIS Record Flag: 4

Title: PRIVATE TOLLWAYS: RESOLVING GRIDLOCK IN SOUTHERN CALIFORNIA
Foreign Language:

Author(s):
Poole, RW, Jr

Publication Information:
Report No: No. 111
Period Covered:
Publication Date: 5/00/88 **Pagination:** 28p
Figures: 1 Fig. **Tables:** 3 Tab. **Photos:**

Publisher/Corporate Author 1:
Reason Foundation
3415 S Sepulveda Boulevard, Suite 400
Los Angeles, CA 90034

Available from:
Reason Foundation
3415 S Sepulveda Boulevard, Suite 400
Los Angeles, CA 90034
Order Number:

Abstract Information
Abstract: Traffic **congestion** threatens to destroy Southern California's economic vitality, strangling growth and curtailing economic opportunities for lower and middle-income people. Direct pricing, with higher prices during peak hours, would bring demand into balance with supply, would shift non-work trips away from rush hours, and would also generate revenues to increase roadway capacity. This paper discusses private tollways for resolving gridlock in Southern California in the following sections: (1) Traffic **congestion** and Southern California; (2) Why road use should be priced directly; (3) Toll-road practice today; (4) Electronic **road pricing**; (5) Private tollways for Southern California; and (6) Taking the next steps.

TRIS accession number: 493494 *TRIS files:* UMTRIS. U 9001.
HRIS. H 9002.
IRRD. I.

TRIS Record Flag: 1

Title: URBAN TRANSPORT AND MARKET FORCES IN BRITAIN. FROM THE BOOK, NEW LIFE FOR CITY CENTRES: PLANNING, TRANSPORT AND CONSERVATION IN BRITISH AND GERMAN CITIES
Foreign Language:

Author(s):
Buchanan, M

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 820425

Publication Date: 0/00/88 **Pagination:** pp 211-219
ISBN: 0-905492-57-9 **ISSN:**

Publisher/Corporate Author 1:
Anglo-German Foundation for Study Industrial Soc
17 Bloomsbury Square
London, England

Available from:
Anglo-German Foundation for Study Industrial Soc
17 Bloomsbury Square
London, England

Order Number:

Abstract Information
Abstract: This article discusses the application of market forces and competition to decrease the public cost of transport and to decrease traffic **congestion** in the United Kingdom. Sections are provided on buses, trains and roads. So far, market forces policy has been confined largely to the bus services. Deregulation has produced little change in services. However, although public money has been saved in large urban areas, the tendering process has led to major increases in county council public transport co-ordinating staff and cost. Market forces haven't been introduced on the railways in the same way, and large subsidies are still required. Tighter financial targets, the disposal of surplus land, and the subcontracting of work have all been undertaken, as have improvements in administration. Some construction of new railways is being funded in part by the increase in land values following their construction. An example being the London docklands railway. Four methods for increasing commercial pressures still further are discussed: Allocating the subsidy to specific purposes; paying the subsidy via a third party, for example, local governments separating the operation of the railways from the provision and maintenance of its infrastructure; and privatisation. The methods to commercialize the road infrastructure include: urban parking management, the financing of new highway construction by tolls, and **road pricing.** (TRRL)

TRIS accession number: 476941 *TRIS files:* HRIS. H 8804.

TRIS Record Flag: 4

Title: RESOLVING GRIDLOCK IN SOUTHERN CALIFORNIA
Foreign Language:

Author(s):
Poole, RW, Jr

Publication Information:
Publication Title: Transportation Quarterly
Volume: 42 **Number:** 4
Publication Date: 10/00/88 **Pagination:** pp 499-527
Figures: 2 Fig. **Tables:** 3 Tab. **Photos:**
References: 23 Ref. **Appendices:**

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Eno Foundation for Transportation, Incorporated
P.O. Box 2055, Saugatuck Station
Westport, CT 06880

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Westport, CT 06880
Order Number:

Abstract Information
Abstract: This article contends that peak-hour pricing would bring about a significant reduction in traffic **congestion,** if it were implemented on Southern California's freeways. It points to the growing popularity of toll roads in Europe and the Pacific Rim countries and in some parts of the United States. It also points out that state-of-the-art tollways can largely dispense with congestion-causing toll booths, substituting electronic pricing via automatic vehicle identification (AVI) systems. Advantages of the build-operate-transfer (B-O-T) model for private tollways include faster procurement, lower operating costs, innovation, the privacy issue (Americans would prefer AVI by private agencies rather than government), and lower construction cost. Suggestions for possible tollway innovations include light-vehicles-only operation, building a second deck to operate in the peak hour traffic direction, new tunnels between the San Fernando Valley and the Hollywood Freeways, and development of other revenue sources (e.g., tollway firms leasing space to pipelines). Concluding comments center on building a private-tollways coalition and establishing a research agenda including potential providers, gasoline tax revenue allocation, federal funding, regulatory regime identification, double-decking feasibility, AVI issues, legal issues, policing policy, and assembling and publishing a bibliography.

TRIS accession number: 478220 *TRIS files:* HRIS. H 8804.

TRIS Record Flag: 3

Title: **ROAD PRICING**: A SOLUTION FOR HONG KONG?
Foreign Language:

Author(s):
Pretty, RL

Publication Information:
Publication Title: Transportation Research. Part A: General
Volume: 22A **Number:** 5
Publication Date: 9/00/88 **Pagination:** pp 319-327
ISBN: **ISSN:** 01912607
Figures: 4 Fig. **Tables:** **Photos:**
References: Refs. **Appendices:**

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Available from:
Engineering Information, Inc
Document Delivery Service, Room 204, 345 East 47th Street
New York, NY 10017
Order Number:

Abstract Information
Abstract: The Government of the Territory of Hong Kong is the first in the world to propose a system of charging motorists directly for the use of congested roads. Hong Kong has more registered motor vehicles per unit length of road than any other country and the road system is physically separate from China. Despite the scheme's technical proficiency and ability to earn revenue well in excess of operating costs, there is doubt about equity and efficiency. In the end, traffic conditions were not seen to be sufficiently bad so the scheme's introduction has been postponed.

TRIS accession number: 481921 *TRIS files:* HRIS. H 8901.
IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT POLICY ON THE MOVE
Foreign Title: VERVOERBELEID IN BEWEGING
Foreign Language: DUTCH

Author(s):
Van DAM, F

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: TIJDSCHR VERVOERSWET
Volume: 24 **Number:** 1
Publication Date: 0/00/88 **Pagination:** 4-19
ISBN: **ISSN:** 00407623

Abstract Information
Abstract: Transport policy is an important issue in the Dutch cabinet, as **congestion** is an increasing constraint for economic development. Simultaneously, a new public transport act has become effective January 1St, 1988. Under this act, government interference diminishes in favour of more emphasis on commercial issues. To improve optimalisation between companies -integration of public transport networks -all public transport companies cooperate in an organisation called 'samove'. Where do policy-makers stand in this picture? Locally, city councils are responsible for public transport. Provinces do not play an important role in the Dutch public transport scene, so for all non municipal public transport, the minister of transport is involved. The minister provides all budgets, included those for municipal public transport (as a lump sum). 'samove' encounters several handicaps, but the challenge is great. One of the handicaps is, that under the new act, optimalisation tends to be on company level, and not primarily on overall level. Another handicap is the difference in size, power and statue of the participants in 'samove'. These are the national railway company, regional bus companies and aldermen of cities (responsible for the corporations). It is also a handicap, that public transport companies are confined within administrative lines (municipalities), but mobility does not stop there. So cooperation between regional bus companies and municipalities is a must to achieve logical networks. But as the two refer to different criteria, this is not an easy affair. The challenge arises from several recent studies with great political impact. The trend is, that public transport must play an important role to ease **congestion,** otherwise environmental costs as well as costs in terms of money would be prohibitive. Recently, political concensus has been reached on this issue. Additional money has been made available by the cabinet to invest in both roads and rail. The money will be raised by increasing annual tax on private cars and lorries. However this will not discourage use of the private car. This will be a temporary problem only, as in 1995 **road pricing** will take over. This is a quite interesting move, as it may be used to manipulate the use of private cars. The conclusion is, that there are great possibilities for successful cooperation, but that it will not come without hard work and much common sense of all parties involved.(a)

TRIS accession number: 483616 *TRIS files:* HRIS. H 8902.
IRRD. I.

TRIS Record Flag: 1

Title: URBAN TRANSPORT DEMAND MANAGEMENT STUDY, STAGE 1: ANALYSIS OF MEASURES
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 6/00/88 **Pagination:** 36P

Publisher/Corporate Author 1:
SOUTH AUSTRALIA. DEPARTMENT OF TRANSPORT
VICTORIA SQUARE
Adelaide, South Australia, Australia

Publisher/Corporate Author 2:
TRAVERS MORGAN PTY LTD

Abstract Information
Abstract: The basic objective in this study is to examine measures which can reduce urban transport **congestion,** or at least prevent or inhibit its increase, without substantial increases in expenditure (or even with reductions in expenditure). There are several reasons for considering transport demand management measures in Adelaide. The need for new infrastructure can be minimised and postponed for as long as possible. Funds available for expansion may continue to decline. Although Adelaide does not currently have a high level of **congestion,** growth in population in future years will increase loads on the transport network. Once the capacity of the transport system is reached operating conditions can quickly deteriorate for only small increases in demand. There are signs in certain locations in Adelaide that **congestion** is already becoming a problem. An underlying objective which may be inferred is that of economic efficiency, ie the best possible allocation and use of total resources used by urban transport. A full consideration of economic efficiency must include resources beyond those included in a simple accounting framework. Such resources may include travel time and the opportunity cost of funds used for roads and other assets.

TRIS accession number: 485396 *TRIS files:* UMTRIS. U 8901.
HRIS. H 8903.

TRIS Record Flag: 3

Title: DYNAMIC AND ACTIVITY-BASED APPROACHES TO TRAVEL: THE OXFORD TSU CONFERENCE, JULY 1988. TECHNICAL NOTE NO. 2
Foreign Language:

Author(s):
Wigan, MR

Publication Information:
Publication Title: Australian Road Research
Volume: 18 **Number:** 4
Publication Date: 12/00/88 **Pagination:** pp 253-263
ISBN: **ISSN:** 00050164
Figures: 2 Fig. **Tables:** **Photos:**
References: **Appendices:** 1 App.

Publisher/Corporate Author 1:
Australian Road Research Board
500 Burwood Highway
Vermont South, Victoria 3133, Australia

Available from:
Australian Road Research Board
Executive Director, P.O. Box 156
Nunawading, Victoria 3131, Australia

Order Number:

Abstract Information
Abstract: The second Oxford Conference on new approaches, and dynamic and activity methods in transport was held in July 1988. The first was in 1981, at about the time a reappraisal of transport analysis methods was under way. This note covers papers, discussions and views formed at this conference, and makes some selective recommendations for Australian circumstances. A wide range of practical and theoretical results were covered. The specific needs for both pragmatic and theoretical work were considered in workshops. The major finding was that the long running panel surveys operated in several countries over half a decade or more were now helpful in understanding the process of changes in transport needs and demand. The activity gaming methods had become a useful component of policy sensitive investigations of transport and traffic proposals in some countries. There has been a large improvement in the ability to use such methods consistently and effectively. The processes over time--especially for private travel demands--had reached a stage where analytical models were needed, and it was in precisely this area that one of the best prospects of an early practical outcome were cohort models of vehicle life, ownership, access and usage. Urban **congestion** management and pricing were widely recognised as becoming major policy issues: ones where the special contributions of activity and dynamic approaches were needed.

TRIS accession number: 486927 *TRIS files:* HRIS. H 8904.
IRRD. I.

TRIS Record Flag: 1

Title: THE SOCIAL COSTS OF TRAFFIC **CONGESTION** DURING PEAK HOURS ---PRE CONFERENCE PROCEEDINGS 3RD IRF MIDDLE EAST REGIONAL MEETING. TOWARDS BETTER ROAD PERFORMANCE, RIYADH, SAUDI ARABIA, 13-18 FEBRUARY 1988. 6 VOLUMES.
Foreign Language: FRANCAIS/ARABIC

Author(s):
Khisty, CJ
Kaftanski, PJ

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/88 **Pagination:** 2.507-2.53

Publisher/Corporate Author 1:
INTERNATIONAL ROAD FEDERATION
Washington, DC Usa

Abstract Information
Abstract: **Road pricing** schemes recommend that tolls or user charges be imposed on congested roads as a means of reducing **congestion**. "optimum" tolls are generally based only on commuters travel time to the total exclusion of all other social costs, such as excessive fuel consumption, air and noise pollution, and an increase in the probability of accidents. This paper sums up studies in diverse fields in order to assess the true social costs of traffic **congestion** during peak commuting hours by accounting for all of the other social costs mentioned. A brief discussion of social costs vis-a-vis traffic **congestion** is also presented. A conservative estimate of the social cost of traffic **congestion** is shown to be about 38 cents per vehicle-mile. The break down is as follows: travel time 11.5 cents; air pollution 2.5 cents; noise pollution 0.4 cents; excess fuel consumption 11 cents; and traffic accidents 13 cents.(a) for the covering abstract of the proceedings see IRRD 817883.

TRIS accession number: 487083 *TRIS files:* HRIS. H 8904.
IRRD. I.

TRIS Record Flag: 1

Title: QUESTIONING THE COST OF **ROAD PRICING**
Foreign Language:

Author(s):
King, E

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Title: SURVEYOR
Volume: 170 **Number:** 5023
Publication Date: 12/00/88 **Pagination:** 15-6
ISBN: **ISSN:** 00396303

Publisher/Corporate Author 1:
REED BUSINESS PUBLISHING LTD
CAREW HOUSE
Wallington, Surrey, United Kingdom

Abstract Information
Abstract: Electronic **road pricing** has been suggested as a method of reducing traffic **congestion** in London. Cars are fitted with an electronic device to activate electronic loops in the road. Road users are charged, by monthly computerised billing, for using highly congested areas and for using roads at peak hours; it is hoped this would deter the casual driver. The problems associated with this system are outlined: (1) **road pricing** would act as a form of double road taxation on central London residents and motorists; (2) the designation of pricing zones, since London has only one complete ring road, the m25; (3) alternative choices would have to be offered to pay zones; (4) charging policy might vary between London boroughs. Comparison is made with the Hong Kong **road pricing** experiment. The advice given to the Department of Transport by the London planning advisory committee is currently based on a traffic restraint policy of restricting or charging road users for access to central London. Ove arup and partners concluded in their interim East London assessment study report that this policy would result in traffic **congestion** outside the restricted area, and in further pressure for the development of the green belt land around London. The author concludes that the policy would be unpopular in social and economic terms. Road management could be improved by better use of the urban traffic control systems available. Finally autoguide is mentioned as a new initiative which could help drivers reduce their average journey times and road usage.

TRIS accession number: 481916 *TRIS files:* HRIS. H 8901.
IRRD. I.

TRIS Record Flag: 1

Title: RESEARCH INTO QUEUE-PROBLEMS
Foreign Title: ONDERZOEK FILEPROBLEMEN
Foreign Language: DUTCH

Author(s):
-

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 10/00/87 **Pagination:** 22P

Publisher/Corporate Author 1:
NSS MARKTONDERZOEK BV
BANKAPLEIN 1A
's-gravenhage, Netherlands

Abstract Information
Abstract: In the Netherlands the queue problem is generally considered as a social problem. Not alone by the direct involved people, those people driving a car by themselves, but also by non-automobile drivers. The importance of the problem can be determined from the big number of people involved. From the 5870000 car drivers 415000 are in a queue one or more times each day. 900000 car drivers are in a queue at least once in a week. Of the whole Dutch population 70% find the problem very or rather important. A majority of the Dutch thinks that asking for an extra contribution for the queue problem is not reasonable (61%). For the selection of **road pricing** most persons (46%) prefer an increase of excise duties, 29% prefer toll payments, and 18% prefer an increase on road-tax. Automatic registration for payment is acceptable by 58%.

TRIS accession number: 474887 *TRIS files:* HRIS. H 8801.

TRIS Record Flag: 3

Title: ELECTRONIC **ROAD PRICING** IN HONG KONG: AN OPPORTUNITY FOR ROAD PRIVATIZATION?
Foreign Language:

Author(s):
Catling, I
Roth, G

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 1107
Publication Date: 0/00/87 **Pagination:** pp 51-55
ISBN: 0-309-04455-3 **ISSN:** 03611981
Figures: 3 Fig. **Tables:** **Photos:**
References: 6 Ref. **Appendices:**

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board Business Office
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: The Hong Kong Government investigated the feasibility of introducing electronic **road pricing** (ERP) to the territory as a means of controlling **congestion**. By selectively charging road users at busy times and places, **road pricing** offers a method of restraining the usage of vehicles on the road network and is potentially more equitable and more efficient than the main alternative policy option, restraint of car ownership. To assess all aspects of the feasibility of ERP, the government engaged Transpotech to carry out a 2-year pilot project. A full subset of the road system engineering components of a road-pricing system ran successfully for more than 6 months in the central area of Hong Kong. Evaluation of the system has shown that there are no technological barriers to the introduction of ERP in Hong Kong. A major transportation study was conducted to assess the effects of **road pricing** in Hong Kong. The results showed that full system would be extremely efficient and cost-effective, and a number of viable schemes were presented. The accounting, administrative, and legislative aspects of ERP were fully investigated and reported on by Transpotech. These aspects present no problems. ERP was presented as a method of restraining traffic and not as a way of financing roads. Privatization issues were not explored in the studies, nor in subsequent discussions. ERP was not well received by local people and the government of Hong Kong is not proceeding with the implementation of a full ERP system.
Supplementary notes: This paper appeared in Transportation Research Record N1107, Private-Sector Involvement and Toll Road Financing in the Provision of Highways.

TRIS accession number: 416512 *TRIS files:* TLIB. L.

TRIS Record Flag: 3

Title: **ROAD PRICING**
Foreign Language: ENGLISH

Author(s):
BUTTON, KJ

Publication Information:
Source of Document: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES 13806606

Publication Title: TRANSPORTATION RESEARCH PART A, GENERAL,
Volume: V20A **Number:** ,N2
Publication Date: 3/00/86 **Pagination:** PP 85-184

Publisher/Corporate Author 1:
PERGAMON PRESS
NEW YORK, ..ZIP:, ZZ N/A

Abstract Information
Abstract: No abstract provided.
Supplementary notes: GUEST EDITOR: KENNETH J. BUTTON DEPARTMENT OF ECONOMICS, LOUGHBOROUGH UNIVERSITY ILLUSTRATED MARCH 1986--COVER INCLUDES BIBLIOGRAPHIES

TRIS accession number: 481819 *TRIS files:* HRIS. H 8901.
IRRD. I.

TRIS Record Flag: 1

Title: URBAN TRANSPORT: A WORLD BANK POLICY STUDY --DEVELOPING COUNTRIES: URBAN AND PASSENGER TRANSPORT. PROCEEDINGS OF SEMINAR H HELD AT PTRC SUMMER ANNUAL MEETING, SUSSEX UNIVERSITY, ENGLAND, JULY 14-17, 1986. VOLUME P278
Foreign Language:

Author(s):
Armstrong-wright, AT

Publication Information:
Source of Document: Transport and Road Research Laboratory

Publication Date: 0/00/86 **Pagination:** 1-7
ISBN: 086050-163-9 **ISSN:** 02664550

Publisher/Corporate Author 1:
PTRC EDUCATION AND RESEARCH SERVICES LTD
110 STRAND
London, United Kingdom

Abstract Information
Abstract: After stating the 3 principles underlying world bank policies: economic viability, financial viability and efficiency, the author examines the growth patterns of third world cities and the growth in demand for urban transport in developing countries. Several methods can be employed to reduce excessive demand. These include: **road pricing,** area licensing schemes, physical restraints, parking controls, user taxes on fuel, financial restraints on vehicle ownership, and land use controls. Traffic management measures can improve efficiency and reduce **congestion.** In most developing countries buses are the major mode of urban transport. Emphasis is being placed on self-supporting services now flourishing in many cities in the third world. Careful transport planning and examination of options must be exercised before any investment decisions are taken. Lastly, the world bank's involvement with transport is discussed. For the covering abstract of the seminar see IRRD 813579.

TRIS accession number: 455405 *TRIS files:* UMTRIS. U 8601.
HRIS. H 8604.
IRRD. I.

TRIS Record Flag: 1

Title: NATIONAL POLICY TOWARDS CARS: HONG KONG
Foreign Language:

Author(s):
MacE, S

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 287538

Publication Title: Transport Reviews
Volume: 6 **Number:** 2
Publication Date: 4/00/86 **Pagination:** pp 173-191
Figures: 3 Fig. **Tables:** 6 Tab. **Photos:**
References: 9 Ref. **Appendices:**

Publisher/Corporate Author 1:
Taylor and Francis Limited
Rankine Road
Basingstoke, Hantshire RG24 0PR, England

Available from:
Taylor and Francis Limited
Rankine Road
Basingstoke, Hantshire RG24 0PR, England

Order Number:

Abstract Information
Abstract: The Hong Kong transport policy objective is simply, mobility. With this the automobile must conform. A confined land area, difficult to develop, has absorbed excessive immigration and must now service a dynamic entrepreneurial economy. Transport infrastructure based on major planning studies is created through government capital and is backed by careful legislation, effective administration and private sector participation. The problem is that overall expansion is even faster: widespread urban renewal -roads cannot equally expand; enormous new territories new towns -people still want to move in and out so the need for more transport accelerates. Over ten million trips daily are made by 5.5 million people. The answers cannot be more and more private cars: it must be promoting the most effective use of major transport investments, where possible off roads, and the mass carriers on roads. The need to curb **congestion** by containing escalating car numbers (especially as so far only 17% of households have access to an automobile) led in May 1982 to imposition of severe taxes on ownership. The ultimate and equitable objective is to control usage. **Road pricing** may be the answer. In Hong Kong the private car is part only of a complex strategy including metro, rail, bus, minibus, ferry, taxi and tram. The car cannot take precedence.(a)

Miscellaneous Information:
IRRD Document Number i8IRRD 287538

TRIS accession number: 457334 *TRIS files:* UMTRIS. U 8601.
HRIS. H 8701.
IRRD. I.

TRIS Record Flag: 1

Title: ELECTRONIC **ROAD PRICING** IN HONG KONG
Foreign Language:

Author(s):
Clancy, MJ
Dawson, JAL
Catling, I
Turner, JD
Harrison, WJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 286718

Publication Title: Planning & Transport Res & Comp, Sum Ann Mtg, Proc
Publication Date: 0/00/85 **Pagination:** pp 149-162
Figures: 6 Fig. **Tables:** **Photos:**

Publisher/Corporate Author 1:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Available from:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Order Number:

Abstract Information
Abstract: In order to assess all aspects of the feasibility of Electronic **Road Pricing** (ERP), the Hong Kong government engaged Transpotech to carry out a two year pilot stage project with the following objectives: 1) to demonstrate the technical viability of ERP by supplying a fully functional subset of the equipment that would be needed for a full system; 2) to estimate all the effects of **road pricing** on the community, and to evaluate fully the impacts that a viable system would have: 3) to investigate, report and advise on all accounting, administrative and legislative aspects of introducing a full **road pricing** system; and 4) to provide reports of sufficient detail to facilitate the progression to the implementation of a full system. A full subset of the road system engineering components of a **road pricing** system has been supplied by Plessey Controls Limited and is currently fully operational on site in the central area of Hong Kong. Evaluation of the system has shown that there are no technological barriers to the introduction of ERP in Hong Kong. The MVA Consultancy has conducted a major transportation study to assess the effects of **road pricing** in Hong Kong. The results have shown that a full system in Hong Kong would be extremely efficient and cost-effective, and a number of viable schemes have been presented. For the covering abstract of the seminar see IRRD 286719. (TRRL)
Supplementary notes: Transport Policy. Proceedings of Seminar K held at the PTRC Summer Annual Meeting, University of Sussex, England, 15-18 July 1985, Volume P267.

TRIS accession number: 457333 *TRIS files:* UMTRIS. U 8601.
HRIS. H 8701.
IRRD. I.

TRIS Record Flag: 1

Title: **CONGESTION** PRICING OF PUBLIC TRANSPORT
Foreign Language:

Author(s):
Jara-diaz, SR
Martinez, F

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 286717

Publication Title: Planning & Transport Res & Comp, Sum Ann Mtg, Proc
Publication Date: 0/00/85 **Pagination:** pp 137-148
Figures: 3 Fig. **Tables:** 2 Tab. **Photos:**
References: 12 Ref. **Appendices:**

Publisher/Corporate Author 1:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Available from:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Order Number:

Abstract Information
Abstract: This paper deals with the calculation of zone-to-zone optimum fares for surface transit in the Las-Condes CBD corridor in Santiago, Chile. The analysis is carried out for each of eight zones identified within that corridor. An innovation in methodology is the introduction of **congestion** costs caused by cars and buses. A disaggregate demand model which takes into account three levels of income is used. Optimum fares are obtained using an iterative method. Welfare gain is calculated for each zone using the equivalent variation, social costs and private expenditure. Results indicate that all competing modes are priced over marginal social costs, but the largest difference is associated with the bus-subway combination for all zones. The demand for subway transport (or combination) is the most sensitive to variations in surface transit fare. The combination of these two effects makes the subway (or bus-subway) the mode that contributes most to a significant difference between the optimum fare and the marginal cost of surface transit services. Results also suggest a linear variation in the optimum fare with distance from the CBD. **A road pricing** system would achieve its primary objective of controlling **congestion** and would bring a number of subsidiary benefits, including automatic toll collection, traffic data collection and fleet management facilities. For the covering abstract of the seminar see IRRD 286719. (TRRL)
Supplementary notes: Transport Policy. Proceedings of Seminar K held at the PTRC Summer Annual Meeting, University of Sussex, England, 15-18 July 1985, Volume P267.

TRIS accession number: 450822 *TRIS files:* HRIS. H 8603.
IRRD. I.

TRIS Record Flag: 1

Title: ISSUES OF THE ELECTRONIC **ROAD PRICING** SYSTEM IN HONG KONG
Foreign Language:

Author(s):
Fong, PKW

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 283248

Publication Title: Transportation Planning and Technology
Volume: 10 **Number:** 1
Publication Date: 0/00/85 **Pagination:** pp29-41
ISBN: **ISSN:** 03081060
Figures: 2 Fig. **Tables:** 2 Tab. **Photos:**
References: 21 Ref. **Appendices:**

Publisher/Corporate Author 1:
Gordon and Breach Science Publishers Limited
42 William IV Street
London WC2N 4DE, England

Abstract Information
Abstract: This paper attempts to examine the issues relating to the experiment of the world's first pilot scheme on electronic **road pricing** system in Hong Kong. A brief review on theories on **road pricing** and a description on the technical components as well as an analysis on the social, economic, political and environmental impacts of the system are given. It intends to generate further research and analysis on the system's applicability in tackling urban traffic **congestion** problems. (Author/TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 283248

TRIS accession number: 457333 *TRIS files:* UMTRIS. U 8601.
HRIS. H 8701.
IRRD. I.

TRIS Record Flag: 1

Title: **CONGESTION PRICING** OF PUBLIC TRANSPORT
Foreign Language:

Author(s):
Jara-diaz, SR
Martinez, F

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 286717

Publication Title: Planning & Transport Res & Comp, Sum Ann Mtg, Proc
Publication Date: 0/00/85 **Pagination:** pp 137-148
Figures: 3 Fig. **Tables:** 2 Tab. **Photos:**
References: 12 Ref. **Appendices:**

Publisher/Corporate Author 1:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Available from:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Order Number:

Abstract Information
Abstract: This paper deals with the calculation of zone-to-zone optimum fares for surface transit in the Las-Condes CBD corridor in Santiago, Chile. The analysis is carried out for each of eight zones identified within that corridor. An innovation in methodology is the introduction of **congestion** costs caused by cars and buses. A disaggregate demand model which takes into account three levels of income is used. Optimum fares are obtained using an iterative method. Welfare gain is calculated for each zone using the equivalent variation, social costs and private expenditure. Results indicate that all competing modes are priced over marginal social costs, but the largest difference is associated with the bus-subway combination for all zones. The demand for subway transport (or combination) is the most sensitive to variations in surface transit fare. The combination of these two effects makes the subway (or bus-subway) the mode that contributes most to a significant difference between the optimum fare and the marginal cost of surface transit services. Results also suggest a linear variation in the optimum fare with distance from the CBD. A **road pricing** system would achieve its primary objective of controlling **congestion** and would bring a number of subsidiary benefits, including automatic toll collection, traffic data collection and fleet management facilities. For the covering abstract of the seminar see IRRD 286719. (TRRL)
Supplementary notes: Transport Policy. Proceedings of Seminar K held at the PTRC Summer Annual Meeting, University of Sussex, England, 15-18 July 1985, Volume P267.

TRIS accession number: 450991 *TRIS files:* HRIS. H 8603.
IRRD. I.

TRIS Record Flag: 1

Title: ELECTRONIC **ROAD PRICING** IN HONG KONG
Foreign Language:

Author(s):
Clancy, MJ

Publication Information:
Source of Document: Transport and Road Research Laboratory Australian Road Research Board
Source Data: IRRD 277685

Publication Title: Institution of Engrs, Aust Queensland Div Tech Pap
Volume: 26 **Number:** 15
Publication Date: 5/00/85 **Pagination:** pp26-28
ISBN: **ISSN:** 03144216
Figures: 3 Fig. **Tables:** **Photos:**
References: 1 Ref. **Appendices:**

Publisher/Corporate Author 1:
Institution of Engineers, Australia
447 Upper Edward Street
Brisbane, Queensland 4000, Australia

Abstract Information
Abstract: Dr Pretty in his Queensland Division technical paper delivered on 13 November 1984 described the electronic **road pricing** pilot scheme in Hong Kong (see IRRD no 277503). In general this article was factually correct. However, he felt able after a few months in Hong Kong, no formal meeting with the transport policy authority, and at just over the half way stage of a two year pilot scheme to dismiss **road pricing** as unnecessary in Hong Kong. **Road pricing** as a theoretical concept has long been recommended by a number of transport economists, and the first on-the-road trial of a **road pricing** scheme which could tackle **congestion** in an urban area of over 3 million people, deserves more serious consideration. This paper, therefore, deals with the main problems and doubts which Pretty raised. It discusses cost, equity, privacy and the life of the scheme. There is a short reply by Dr Pretty following this paper. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 277685

TRIS accession number: 451350 *TRIS files:* HRIS. H 8604.
IRRD. I.

TRIS Record Flag: 1

Title: THE FUNDAMENTAL THEOREM OF ROAD USER CHARGES
Foreign Language:

Author(s):
Newbury, DM

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 283558

Report No: CEPR Disc Pap 59
Period Covered:
Publication Date: 4/00/85 **Pagination:** 24p
Figures: **Tables:** 3 Tab. **Photos:**
References: 7 Ref. **Appendices:**

Publisher/Corporate Author 1:
Centre for Economic Policy Research
6 Duke of York Street
London, England

Available from:
Centre for Economic Policy Research
6 Duke of York Street
London, England

Order Number:

Abstract Information
Abstract: Highway authorities are divided as to whether to charge road users the average cost of road maintenance or the social marginal cost of road use, which includes not only the extra maintenance costs, but also the increased vehicle costs attributable to the road damage caused by vehicle passage. The fundamental theorem, derived in this paper, states that in a steady state with a consistent (but not necessarily optimal) maintenance policy the two concepts are identical for zero traffic growth on uncongested roads for a wide class of road damage and vehicle operating cost functions, and approximately equal in other cases. This result greatly simplifies the problem of calculating road user charges. It does not, however, deal with two other important components of road user charges -recovering the original capital costs, and assimulating **congestion** costs. It strengthens the case for allocating maintenance costs in proportion to the damaging power of different vehicles (i.e. heavy lorries). (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 283558

TRIS accession number: 385698 *TRIS files:* HRIS. H 8501.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING**: SOME FURTHER COMMENTS
Foreign Language:

Author(s):
Else, PK

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 274923

Publication Title: Transportation Planning and Technology
Volume: 8 **Number:** 4
Publication Date: 0/00/84 **Pagination:** pp 295-300
ISBN: **ISSN:** 03081060
Figures: 2 Fig. **Tables:** **Photos:**
References: 12 Ref. **Appendices:**

Publisher/Corporate Author 1:
Gordon and Breach Science Publishers Limited
42 William IV Street
London WC2N 4DE, England

Abstract Information
Abstract: This paper extends the discussion of certain problems associated with **road pricing** raised in an earlier contribution to this journal. Firstly it is shown that where the value of time varies between different groups of traffic using the same congested road, optimal **road pricing** requires price discrimination between the groups such that those with the lowest value of time pay the highest charge and suffer the greatest losses. However, a uniform price based on an "equity" value of time would reduce the relative distributional effects. Secondly the paper takes up the suggestion that queueing (and by extension **congestion**) may be positively helpful in the allocation of resources and shows that this is not in general correct although there are situations in which the use of queueing alongside conventional pricing may have a role to play. Finally it is argued that governments' apparent lack of enthusiasm for **road pricing** stems as much from political considerations as the more technical problems of applying it. (Author/TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 274923

TRIS accession number: 386067 *TRIS files:* HRIS. H 8501.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING** - AN OUTSIDER'S VIEW OF AMERICAN EXPERIENCES
Foreign Language:

Author(s):
Button, KJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 275243

Publication Title: Transport Reviews
Volume: 4 **Number:** 1
Publication Date: 1/00/84 **Pagination:** pp 73-98
ISBN: **ISSN:** 01441647
Figures: 2 Fig. **Tables:** 6 Tab. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Taylor and Francis Limited
Rankine Road
Basingstoke, Hantshire RG24 0PR, England

Abstract Information
Abstract: Substantial changes in urban transport policy have taken place over the past decade. The concern with expanding infrastructure and the preoccupation with providing sufficient road capacity to meet the increasing demand of unrestricted car use, which characterized transport policy in the 1950's and 1960's, has gradually given way to the idea that there is a need to restrain motor traffic if urban society is to function efficiently. A variety of restrictive physical traffic management, land use planning and economic policies have, in consequence, been pursued. One option which has attracted considerable attention in the academic literature, but which has been received more cooly by policy-makers, is the possibility of optimizing urban traffic **congestion** through the imposition of **road pricing**. The introduction and relative success of the area licensing scheme in Singapore has added fuel to the arguments of the advocates of such a policy. This review is not directly concerned with either the experiment with **road pricing** in Singapore nor the theoretical debates which have taken place concerning the potential merits and defects of such policies but rather looks at the applied work in the United States which has looked into the practical implications of **road pricing** for its cities. Further, it seeks to explore, again drawing on American experiences, just why there has been so much opposition to the employment of economic pricing principles in the urban road transport market. The author presents the results of an SSRC sponsored study into the practical problems of introducing **road pricing** to cities in the United States. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 275243

TRIS accession number: 390988 *TRIS files:* HRIS. H 8601.

TRIS Record Flag: 3

Title: MOVING PEOPLE AND GOODS BEFORE THE YEAR 2000
Foreign Language:

Author(s):
Wilson, DG

Publication Information:
Publication Title: Technology Review
Volume: 87 **Number:** 4
Publication Date: 5/00/84 **Pagination:** pp 61-87
Figures: Figs. **Tables:** **Photos:** Phots.

Publisher/Corporate Author 1:
Massachusetts Institute of Technology Alumni Assoc
Cambridge, MA 02139

Available from:
Massachusetts Institute of Technology
Massachusetts Institute of Technology, Alumni Association
Cambridge, MA 02139
Order Number:

Abstract Information
Abstract: Sooner or later, towns and countries will have to find fairer ways to apportion the costs of the automobile, and to limit the space given over to arteries and parking. Singapore and Hong Kong have recently adopted new policies to deal with serious **congestion,** and transportation planners and policymakers elsewhere are watching these experiments with great interest. Singapore has rationed its roads. Motorists are allowed to travel only on alternate days, just as U.S. car owners were allowed to buy fuel only on "odd" or "even" days during the energy crisis of 1973. The Hong Kong system requires that each vehicle be fitted with a transponder roughly the size of a tape cassette. Streets subject to **congestion** are equipped with interrogator-recorders connected to a central computer. As vehicles pass over these sensors, they are identified by the transponders they carry. The computer assesses charges according to location and time of day, and each vehicle's owner is billed for road use at the end of every month.

TRIS accession number: 391213 *TRIS files:* HRIS. H 8503.
IRRD. I.

TRIS Record Flag: 1

Title: PENALTIES FOR ROAD USERS PUT IN PERSPECTIVE
Foreign Language:

Author(s):
Atkins, ST

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 278476

Publication Title: Surveyor
Volume: 163 **Number:** 4800
Publication Date: 7/00/84 **Pagination:** pp 4-5
ISBN: **ISSN:** 00396303
Figures: **Tables:** **Photos:** 2 Phot.
References: 3 Ref. **Appendices:**

Publisher/Corporate Author 1:
Specialist and Professional Press
Surrey House, 1 Throwley Way
Sutton, Surrey SM1 4QQ, England

Abstract Information
Abstract: The author examines the problems involved in attempting to remove traffic **congestion** from cities. Large-scale highway reconstruction is generally impossible, and in many cases traffic management schemes to make better use of existing road space are at their limit. Demand management has been less successful; attempts to change travel times and to impose parking control have failed. **Congestion** is self-regulating to some extent as drivers change routes or modes to reduce delays and then switch back as the new methods become congested. Equilibrium is partly related to the level of service provided by the alternative means of transport. There is insufficient personal disincentive to individual drivers using congested roads and individuals take no account of the additional delay their presence causes other road users. It is suggested that only by altering the balance of perceived costs so that social costs are internalised can progress be made. The **road pricing** scheme for Hong Kong, outlined by the author, is seen as a possible solution. This is supported by evidence from the use of a tolled river crossing in Southampton compared with that of a free crossing. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 278476

TRIS accession number: 393302 *TRIS files:* HRIS. H 8504.
IRRD. I.

TRIS Record Flag: 1

Title: RIGHT OF WAY AND **CONGESTION** TOLL
Foreign Language:

Author(s):
Berglas, E
Fresko, D
Pines, D

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 279848

Publication Title: Journal of Transport Economics and Policy
Volume: 18 **Number:** 2
Publication Date: 5/00/84 **Pagination:** pp 165-187
ISBN: **ISSN:** 00225258
Figures: **Tables:** 2 Tab. **Photos:**
References: 11 Ref. **Appendices:**

Publisher/Corporate Author 1:
Bath University
Claverton Down
Bath BA2 7AY, England

Abstract Information
Abstract: This paper is concerned with the economics of separate facilities (roads or lanes within roads) for automobiles and buses in congested urban areas. It shows that assigning separate facilities may be optimum both when a **congestion** toll is charged to automobile drivers ("first best") and when no such toll is charged ("second best"). This paper is based exclusively on differences in the characteristics of modes. Two main differences between modes are distinguished. (1) modes differ in the contribution of a passenger trip to **congestion**; (2) they differ in the effect of **congestion** on cost, defined as aversion to **congestion**. The paper elaborates on the role of these two kinds of differences between modes in justifying separation of facilities. A comparison is made between the characteristics of the allocations under common and separate use of transport facilities, and between first and second-best for each regime. Finally, the question of a second-best optimum policy of buses is examined. The analysis implies that under a regime of separate facilities it is less likely (relative to the common use of facilities extensively analysed in literature) that the buses should be subsidised. Details are given of the model used in the study. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 279848

TRIS accession number: 394821 *TRIS files:* HRIS. H 8604.
IRRD. I.

TRIS Record Flag: 1

Title: ELECTRONIC **ROAD PRICING**
Foreign Language:

Author(s):
Pretty, RL

Publication Information:
Source of Document: Transport and Road Research Laboratory Australian Road Research Board
Source Data: IRRD 277503

Publication Title: Institution of Engrs, Aust Queensland Div Tech Pap
Volume: 25 **Number:** 33
Publication Date: 10/00/84 **Pagination:** pp 19-25
ISBN: **ISSN:** 03144216
Figures: 4 Fig. **Tables:** **Photos:**
References: 9 Ref. **Appendices:**

Publisher/Corporate Author 1:
Institution of Engineers, Australia
447 Upper Edward Street
Brisbane, Queensland 4000, Australia

Abstract Information
Abstract: The government of Hong Kong is currently evaluating a pilot study with a view to introducing electronic **road pricing** in 1987. Hong Kong has unique topographical, economic, geographical and political features to make it an ideal place to be the first in the world to introduce this measure to combat highway **congestion**. The paper has reviewed other methods of restraining private motor vehicle trips and, apart from restraining ownership because of off-street vehicle storage difficulties, **road pricing** seems to be the most appropriate technique for Hong Kong. The problems with **road pricing** would seem to be concerned with cost, equity, privacy and time. The biggest problem of all is the lifespan of the scheme. Could it last beyond 1997? If not ten years is a very short time. In summing up the case for or against **road pricing,** one cannot help but think that this is a last attempt to impose British technology in the one place in the world where the political situation would allow it, but where the need for the scheme may be disappearing. The falling registration figures are evidence of this and there is no likelihood that they will rise if the scheme is imposed. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 277503

TRIS accession number: 395082 *TRIS files:* HRIS. H 8604.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING**: THE RIGHT SOLUTION FOR THE RIGHT PROBLEM?
Foreign Language:

Author(s):
Mogridge, MJH

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 281372

Report No: Monograph
Period Covered:
Publication Date: 8/00/84 **Pagination:** 25p
Figures: **Tables:** 14 Tab. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
University College, London
Transportation Studies Group, Gower Street
London WC1E 6BT, England

Abstract Information
Abstract: **Road pricing** theory asserts that the optimum speed of a road network is that where vehicles pay the marginal social cost of their journey, rather than an average private cost if no price is imposed. The aim of this paper is to show that this is misconceived. In large, congested cities, the running speed of the road network is set by the direct journey speed achieved on the appropriate high-capacity network, both within and to the city centre. After dividing by the appropriate route factors to convert running speed to direct speed and allowing for access to convert kerb-to-kerb to door-to-door speed, the average direct journey speeds by car are identical to those on the high capacity system for equivalent journeys, when there is suppressed demand for car travel. **Road pricing** should thus be seen not as a tool for increasing road speeds, but as a tool for estimating the socially desirable demand level on the roads as opposed to on the high-capacity systems. Road speeds in large, congested cities can only be increased by increasing the direct speeds of the high-capacity systems. Methods of achieving such increases are discussed. (Author/TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 281372

TRIS accession number: 387770 *TRIS files:* HSL. S 8404.

TRIS Record Flag: 3

Title: SOLVING TRAFFIC **CONGESTION**
Foreign Language:

Publication Information:
Source of Document: National Highway Traffic Safety Administration

Publication Title: On the Road
Volume: 6 **Number:** 3
Report No: HS-036 447
Period Covered: Autumn
Publication Date: 0/00/83 **Pagination:** pp 26-28
Figures: **Tables:** **Photos:** 1 Phot.

Publisher/Corporate Author 1:
Southern Africa Commercial Travellers Association
Box 828
Cape Town, South Africa

Available from:
Southern Africa Commercial Travellers Association
Box 828
Cape Town, South Africa

Order Number:

Abstract Information
Abstract: This article describes the Hong Kong "electronic **road pricing**" (ERP) which brings the old concept of road tolls into the computer age, in an effort to deter motorists from using the most congested roads at peak hours. ERP calls for every private car to be fitted with a device known as an electronic number plate which will emit a unique signal positively identifying each car. In addition, between 200 and 300 wire loops will be inset into Hong Kong roads four inches below the surface. When a car passes over the loops, they will interact with the electronic number plate, sending a signal to a contral computer which will add up the tolls. Each car owner will then receive monthly toll bills.

TRIS accession number: 376797 *TRIS files:* HRIS. H 8401.
IRRD. I.

TRIS Record Flag: 1

Title: **ROAD PRICING** - SOME OF THE MORE NEGLECTED THEORETICAL AND POLICY IMPLICATIONS
Foreign Language:

Author(s):
Button, KJ
Pearman, AD

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 259159

Publication Title: Transportation Planning and Technology
Volume: 8 **Number:** 1
Publication Date: 0/00/83 **Pagination:** pp 15-27
ISBN: **ISSN:** 03081060
Figures: 3 Fig. **Tables:** **Photos:**
References: 29 Ref. **Appendices:**

Publisher/Corporate Author 1:
Gordon and Breach Science Publishers Limited
42 William IV Street
London WC2N 4DE, England

Abstract Information
Abstract: The conventional argument on urban traffic **congestion** is examined; some doubts are expressed about its theoretical basis and its value as a guide to policy making. Little is known of the extent to which society should tolerate **congestion** on urban highways, and less is known of the balance between the expenditure of money on the road system and the expenditure of time in transit. However, despite some doubts, it appears that the basic theory, applied to a very simple situation, is technically correct. There appears to be some foundation in the argument that the main impact of **road pricing** is to reduce the welfare of low income motorists and increase that of high income road users. The empirical basis for the conventional view that the elimination of traffic **congestion** is worthwhile is questioned. An argument is put forward to support the view that **congestion** is a positively helpful way of dealing with a resource allocation problem. Quite often people would prefer to queue rather than pay higher prices for expanded services which would remove waiting. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 269159

TRIS accession number: 381173 *TRIS files:* HRIS. H 8404.
IRRD. I.

TRIS Record Flag: 1

Title: ELECTRONIC **ROAD PRICING** IN HONG KONG: THE PILOT STAGE
Foreign Language:

Author(s):
Dawson, JAL

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 272602

Publication Title: Traffic Engineering and Control
Volume: 24 **Number:** 8
Publication Date: 8/00/83 **Pagination:** pp 372-377
ISBN: **ISSN:** 00410683
Figures: 2 Fig. **Tables:** **Photos:**
References: 6 Ref. **Appendices:**

Publisher/Corporate Author 1:
Printerhall Limited
29 Newman Street
London, England

Abstract Information
Abstract: A high level of car ownership in Hong Kong has resulted in severe traffic **congestion** problems despite a continuing programme of capital-intensive road and mass transit construction. As government action to restrain vehicle ownership has proved unsatisfactory, a means of restricting vehicle usage such as **road pricing** is being advocated. Electronic **road pricing** (ERP) is the most selective of **road pricing** systems as, for example, it does not require a blanket charge to enter a defined area covered by a supplementary licence scheme, nor need it create the associated effects in time and space. The effect of ERP is to impose, as selectively as possible, a small charge that makes the marginal road user consider the need to make a particular journey at a given time. The system designed for Hong Kong will require every vehicle to be fitted with a physical number plate as well as an electronic version mounted underneath the vehicle. The pilot stage of the project now planned requires co-ordinated action to include transport engineering, traffic planning, road system engineering and legislation. The article describes the operation and installation of the proposed system for Hong Kong. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 272602

TRIS accession number: 382802 *TRIS files:* UMTRIS. U 8401.
HRIS. H 8403.
IRRD. I.

TRIS Record Flag: 1

Title: THE ECONOMICS AND PLANNING OF TRANSPORT
Foreign Language:

Author(s):
Bell, GJ
Blackledge, DA
Bowen, PJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 273702

Report No: Monograph
Period Covered:
Publication Date: 0/00/83 **Pagination:** 248p
ISBN: 0 434 90133 4 **ISSN:**
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Heinemann (William) Books Limited
10 Upper Grosvenor Street
London, England

Available from:
Heinemann (William) Books Limited
10 Upper Grosvenor Street
London, England

Order Number:

Abstract Information
Abstract: This book presents the elementary theory of economics and applies it to the transport sector. The demand for and supply of transport are discussed together with pricing policy; the concept of marginal cost pricing is explained by using actual figures in pounds and pence. The urban traffic **congestion** problem is treated from the economist's viewpoint, stressing the case of road passenger transport and the way it approaches the pricing of its services. The subject of subsidy in transport is examined and the question of worsening rural transport is highlighted. An up-to-date assessment of the role of cost-benefit analysis is presented as part of investment appraisal. Included are chapters on the role of government and transport planning. Details are given of the financing and control of local government and nationalised industries. The structure of the Department of Transport is outlined. The concept of free market economy, departures from it and their significance in the international context are dealt with. A discussion is included on the progress towards the common transport policy of the EEC. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 273702

TRIS accession number: 381614 *TRIS files:* UMTRIS. U 8401.
HRIS. H 8403.
IRRD. I.

TRIS Record Flag: 1

Title: TRAFFIC RESTRAINT BY PRICING : EXPERIENCE FROM THE ITCHEN BRIDGE, SOUTHAMPTON
Foreign Language:

Author(s):
Atkins, ST

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 272890

Publication Title: Planning & Transport Res & Comp, Sum Ann Mtg, Proc
Publication Date: 0/00/82 **Pagination:** pp 105-117
ISBN: 0-86050-112-4 **ISSN:** 02604418
Figures: 6 Fig. **Tables:** **Photos:**
References: 9 Ref. **Appendices:**

Publisher/Corporate Author 1:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Available from:
Planning and Transport Res and Computation Co Ltd
110 Strand
London WC2, England

Order Number:

Abstract Information
Abstract: Southampton's Itchen Bridge was opened in June, 1977. One of three toll-setting criteria contained in the Southampton corporation act (1973) explicitly permits toll levels to be set to control the volume and composition of traffic flow over the bridge for the purposes of avoiding **congestion** and limiting adverse environmental impact in areas adjacent to the bridge. This represents the first deliberate introduction of traffic restraint by price in the United Kingdom. This paper explains the background and context for the construction of the bridge, the initial setting of the toll levels and the two subsequent changes. Within the limitations of available data the restraining influence of toll price on both flow and composition of traffic are examined. The toll level for heavy commercial vehicles was clearly designed to be intimidatory and has succeeded in its aim. H.c.v. Flow as a percentage of total flow using the bridge is tiny. Almost all h.c.v.'s crossing the bridge are locally generated, paying a special concessionary rate only available to local businesses. Traffic restraint has played a minor role in establishing the toll levels for other vehicles, thus firm conclusions on control of total vehicle flow are less easy to draw. Evidence from toll price changes, however, indicates an ability to coarsely control flow levels. It is concluded that Southampton's example demonstrates that toll pricing is an effective and flexible tool for control of vehicle flow and composition. The experience gained has relevance for specific strategies of traffic limitation as well as area-wide **road pricing.** (Author/TRRL)
Supplementary notes: Proceedings of Seminar P held at the PTRC 10th Summer

Annual Meeting, University of Warwick, England.

Miscellaneous Information:
IRRD Document Number i8IRRD 272890

TRIS accession number: 370493 *TRIS files:* HRIS. H 8303.

TRIS Record Flag: 3

Title: TOWARD A THEORY OF RATIONAL **ROAD PRICING**
Foreign Language:

Author(s):
Brander, JRG

Publication Information:
Publication Title: Transportation Research Forum Proceedings
Volume: 23 **Number:** 1
Report No: Proceeding
Period Covered:
Publication Date: 0/00/82 **Pagination:** pp 323-333

Publisher/Corporate Author 1:
Cross (Richard B) Company, Incorporated
P.O. Box 405
Oxford, Indiana, 47971

Available from:
Cross (Richard B) Company, Incorporated
P.O. Box 405
Oxford, Indiana, 47971
Order Number:

Abstract Information
Abstract: This paper explores one aspect of a broader, on-going research effort focusing on the questions of the pricing of and investment in transportation infrastructure. In the broader context, the questions of user pay, **congestion pricing** and investment expenditure are all considered. Research to date indicates that the three questions must be answered simultaneously, and prior to the installation of the facilities. The objective of the present paper is much more limited, focusing only on the issue of user pay. The objective is to develop a theoretical framework for the user pay component which can be integrated into the broader analysis. The first part of the paper deals with the overall analytical framework, and discusses some differences between the present approach and that in the received literature. The following section is devoted to a consideration of the problem of excess capacity in the highway system. With this background in place, attention is turned to the question of nonuser cost responsibility for infrastructure costs. It will be argued that the separation of cost responsibility between users and nonusers must be the first step in the analysis. The next section of the paper deals with the allocation of the remaining costs among classes of user. With this issue resolved, the actual mechanism for determining the level of user charges is explored. A final section of the paper presents some conclusions and implications of the analysis. (Author)
Supplementary notes: Proceedings of the 23rd Annual Meeting, Theme: Developing Concinnity in Transportation, held at Fairmont Hotel, New Orleans, La., October 28-30, 1982.

TRIS accession number: 399704 *TRIS files:* UMTRIS. U 8502.

TRIS Record Flag: 4

Title: PEAK-PERIOD TRAFFIC **CONGESTION**: A STATE-OF-THE-ART ANALYSIS AND EVALUATION OF EFFECTIVE SOLUTIONS
Foreign Language:

Author(s):
Rosenbloom, S

Publication Information:
Publication Date: 0/00/82 **Pagination:** pp 157-168
Figures: 1 Fig. **Tables:** 4 Tab. **Photos:**
References: 16 Ref. **Appendices:**

Publisher/Corporate Author 1:
Eno Foundation for Transportation, Incorporated
P.O. Box 2055, Saugatuck Station
Westport, CT 06880

Available from:
Eno Foundation for Transportation, Incorporated
P.O. Box 2055, Saugatuck Station
Westport, CT 06880
Order Number:

Abstract Information

Abstract: Peak-period traffic **congestion** has two basic alternative solutions: changing demand to meet system capability or changing system capacity to meet demand. The demand for road system capacity may be changed by reducing the vehicle number needed by increasing vehicle occupancy, reorienting travel to off-peak periods or to less congested routes, or reducing demand for travel. System capacity can be changed by building additional roadways or by increasing road capacity by improving traffic flow. Twenty-two techniques with the apparent potential to reduce or redistribute demand are listed. Four major categories of approach are involved: social approaches, socioeconomic approaches, socio-technical approaches, and technical approaches. Two major social approaches are staggered and flexible work hours, which attempts to spread peak-period commuter trips over a longer interval, and shortened work weeks, which tries to direct home-to-work trips to off-peak times and to cut the total number of such trips. Socioeconomic approaches consist of five groups of possible solutions. Pricing and regulatory mechanisms might be helpful in reducing peak-period use of crowded transportation facilities, but their immediate implementation does not seem feasible. Serious problems exist in the selection of appropriate schedules of charges and administration, operation, and enforcement of a working system. Public acceptance of variable **road pricing** is not likely. Parking controls may be effective in reducing traffic and counteracting the effects of **congestion**. Two ways of restricting access are traffic cells, in which through travel by automobiles is eliminated, and auto-free zones, where all private vehicles are prohibited and pedestrian travel is promoted. Land use planning includes such approaches as new towns, planned communities, planned neighborhoods, and zoning and building codes. Marketing techniques in general provide incentives for using high-occupancy vehicles. Carpooling and other ridesharing approaches are another socioeconomic approach. Socio-technical approaches include the use of communications in place of travel. Technical approaches use technical advances and technological innovations to modify travel behavior at the immediate source of **congestion**. They include traffic engineering techniques, transit

operations, and vehicle design factors. Analysis of various approaches is done, and packages of techniques are evaluated for their compatibility. Modifying urban land uses is apparently the best long-range solution to peak-period traffic **congestion.**

Supplementary notes: Published in Urban Transportation Perspectives and Prospects.

TRIS accession number: 369522 *TRIS files:* HRIS. H 8302.
IRRD. I.

TRIS Record Flag: 1

Title: TRANSPORT WITHOUT POLITICS ...? A STUDY OF THE SCOPE FOR COMPETITIVE MARKETS IN ROAD, RAIL AND AIR
Foreign Language:

Author(s):
Hibbs, J

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 264364

Publication Title: Hobart Paper
Volume: **Number:** 95
Report No: Monograph
Period Covered:
Publication Date: 0/00/82 **Pagination:** 95p
ISBN: 0-255-36155-6 **ISSN:** 00732818
Figures: **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Institute of Economic Affairs
2 Lord North Street, Westminster
London SW1, England

Abstract Information
Abstract: The author challenges the conventional view that transport requires close governmental control of its structure and management. He traces the origins of this thinking to the emotions aroused by the early railways and questions whether important parts of the transport industry must necessarily be subject to central administration. From these beginnings, administrative regulation of public transport has become all-pervasive, imposing territorial divisions, cross-subsidisation, quantity licensing, and price controls. Its proliferation has been justified by a variety of arguments about economies of scale in the industry, the supposed instability of competition, the requirements of land use planning, and the "right" of every citizen to mobility. The stifling of market mechanisms has led to misallocations of resources and such large and consistent losses as to create the myth that public transport can never be run profitably. Reform is urgently required to permit the market much wider scope; but little progress can be made as long as the marginal price of using the costly road infrastructure remains zero. The introduction of marginal pricing related to size/weight of vehicle and route **congestion** would improve efficiency in the use of roads and provide a rational economic basis for reorganizing passenger and freight services throughout the transport industry. A national corporation should be given responsibility for the road infrastructure and subsequently for the rail track to facilitate the decentralisation of the railways and marginal pricing of track use. Cross-subsidisation and standard charging in rail and bus should be abandoned; the territorial bus companies should be phased out and their operations transferred to smaller units operating smaller vehicles at higher frequencies. Conurbation transport authorities should be established to co-ordinate land use and transport policies in the special conditions of major urban areas; they should not own transport undertakings and should have the duty of encouraging decentralisation in the industry. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 264364

TRIS accession number: 370493 *TRIS files:* HRIS. H 8303.

TRIS Record Flag: 3

Title: TOWARD A THEORY OF RATIONAL **ROAD PRICING**
Foreign Language:

Author(s):
Brander, JRG

Publication Information:
Publication Title: Transportation Research Forum Proceedings
Volume: 23 **Number:** 1
Report No: Proceeding
Period Covered:
Publication Date: 0/00/82 **Pagination:** pp 323-333

Publisher/Corporate Author 1:
Cross (Richard B) Company, Incorporated
P.O. Box 405
Oxford, Indiana, 47971

Available from:
Cross (Richard B) Company, Incorporated
P.O. Box 405
Oxford, Indiana, 47971
Order Number:

Abstract Information
Abstract: This paper explores one aspect of a broader, on-going research effort focusing on the questions of the pricing of and investment in transportation infrastructure. In the broader context, the questions of user pay, **congestion** pricing and investment expenditure are all considered. Research to date indicates that the three questions must be answered simultaneously, and prior to the installation of the facilities. The objective of the present paper is much more limited, focusing only on the issue of user pay. The objective is to develop a theoretical framework for the user pay component which can be integrated into the broader analysis. The first part of the paper deals with the overall analytical framework, and discusses some differences between the present approach and that in the received literature. The following section is devoted to a consideration of the problem of excess capacity in the highway system. With this background in place, attention is turned to the question of nonuser cost responsibility for infrastructure costs. It will be argued that the separation of cost responsibility between users and nonusers must be the first step in the analysis. The next section of the paper deals with the allocation of the remaining costs among classes of user. With this issue resolved, the actual mechanism for determining the level of user charges is explored. A final section of the paper presents some conclusions and implications of the analysis. (Author)
Supplementary notes: Proceedings of the 23rd Annual Meeting, Theme: Developing Concinnity in Transportation, held at Fairmont Hotel, New Orleans, La., October 28-30, 1982.

TRIS accession number: 373369 *TRIS files:* HRIS. H 8303.

TRIS Record Flag: 3

Title: SOME CONVENTIONAL AND NOT-SO-CONVENTIONAL VIEWS OF **CONGESTION**
Foreign Language:

Author(s):
Pearman, AD
Button, KJ

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 887
Publication Date: 0/00/82 **Pagination:** pp 29-34
Figures: 2 Fig. **Tables:** **Photos:**
References: 30 Ref. **Appendices:**

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board Business Office
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: The purpose of this paper is to explore the extent to which the conventional treatment of highway **congestion,** as developed in the economic analysis of **road pricing,** provides an acceptable theoretical or practical foundation for policy. The conventional theory is first outlined, and it is emphasised that, although it is probably technically sound, it relates to highly abstract circumstances. The main body of the paper then develops two themes. First, a number of arguments are put forward that imply that, in quantitative if not qualitative terms, the conventional analysis of **congestion** seems unlikely to provide an adequate basis for the proper formulation of policy. Second, some reasons for regarding **congestion** as an effective allocative mechanism in its own right are given. Although the arguments in the paper are not developed sufficiently far to reach firm conclusions of an operational kind, there are clear indications that traffic management and related policies aimed at securing efficient use of existing highway facilities should proceed with care when valuing **congestion** savings and when assessing optimal **congestion** levels. (Author)
Supplementary notes: This paper appeared in Transportation Research Board Record No. 887, Economic Analysis Issues.

TRIS accession number: 371976 *TRIS files:* UMTRIS. U 8301. IRRD. I.

TRIS Record Flag: 1

Title: WORLD BANK EXPERIENCE WITH URBAN TRANSPORT PROJECTS: WITH PARTICULAR REFERENCE TO LATIN AMERICA AND AFRICA
Foreign Language:

Author(s):
Midgley, P
Watson, PL

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 266713

Publication Title: Planning & Transport Res & Comp, Sum Ann Mtg, Proc
Volume: **Number:** P207
Publication Date: 0/00/81 **Pagination:** pp 75-88
ISBN: 086050-089-6 **ISSN:** 01434438

Publisher/Corporate Author 1:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Available from:
PTRC Education and Research Services Limited
110 Strand
London WC2, England

Order Number:

Abstract Information
Abstract: The authors outline the principles used by the World Bank in the preparation of urban transport projects: (1) priority should be given to traffic engineering and management measures that increase the functional capacity of the existing street system, together with measures to improve the efficiency of bus fleet operations; (2) new road construction should only be considered when the above measures are insufficient, when specific links in the road network are missing, when justified by urban or regional development strategies, or when special facilities, such as bus lanes, are required; (3) priority should be given to the improvement of public transport services; (4) public transport improvements should be oriented towards services for low-income areas. Details are given of urban transport projects financed by the World Bank in several cities in Latin America and Africa (San Jose in Costa Rica, Salvador, Recife, Curitiba, Porto Alegre and Belo Horizonte in Brazil, Abidjan in the Ivory Coast, and Nairobi in Kenya). **Road pricing** is advocated as a means of reducing the demand for scarce road space. Examples of such schemes in Singapore, Kuala Lumpur, and Bangkok are given.

Miscellaneous Information:
IRRD Document Number i8IRRD 266713

TRIS accession number: 345507 *TRIS files:* HRIS. H 8201.
IRRD. I.

TRIS Record Flag: 1

Title: THE FUTURE OF ROAD TRANSPORTATION: RESTRAINT OR RELEASE?
Foreign Language:

Author(s):
Willoughby, C

Publication Information:
Source of Document: Transport and Road Research Laboratory National Swedish Road & Traffic Research Institute
Source Data: IRRD 257181

Publication Date: 0/00/81 **Pagination:** pp 103-108

Publisher/Corporate Author 1:
Svenska Vaegfoereningen
Box 27115
S-102 52 Stockholm, Sweden

Abstract Information
Abstract: The industry's potential needs to be released by three interlinked measures: gradually introduce the large changes in vehicle taxation necessary to approximate the principle of users paying the costs they actually impose on society (incremental maintenance, **congestion** and environmental nuisance); make clear in planning, and to users, the link between these user taxes and investment to relieve **congestion** and related problems; and allow full commercial freedom to private enterprises to find the best means, given these taxing arrangements, for responding to market demands. Recent experience is positive, from Singapore and France on the levying of infrastructure charges reflecting costs, and from Chile, Sri Lanka and Buenos Aires on deregulation of bus services. Developments in telecommunications and administrative decentralization add to the importance of realistic pricing for road use. Progress in restructuring user taxation is vital to the future of the industry, but a pragmatic approach should be adopted in the selection of technical means. Public education is also needed. (TRRL)
Supplementary notes: Papers from the 9th IRF World Meeting, Road Into the Future--General Session, held in Stockholm, June 1-5, 1981.

Miscellaneous Information:
IRRD Document Number i8IRRD 257181

TRIS accession number: 367741 *TRIS files:* HRIS. H 8302.
IRRD. I.

TRIS Record Flag: 1

Title: AN ATTEMPT TO ESTIMATE THE INCOME FROM **ROAD PRICING** IN A DUTCH CITY
Foreign Title: EEN POGING TOT SCHATTING VAN DE OPBRENGST UIT CONGESTIEHEFFINGEN
Foreign Language: Dutch

Author(s):
Roos, HB

Publication Information:
Source of Document: Transport and Road Research Laboratory Institute for Road Safety Research
Source Data: IRRD 262323

Publication Date: 0/00/81 **Pagination:** pp 343-356
Figures: 1 Fig. **Tables:** 1 Tab. **Photos:**
References: 9 Ref. **Appendices:**

Publisher/Corporate Author 1:
Colloquium Vervoersplanologisch Speurwerk
P.O. Box 45
Delft, Netherlands

Abstract Information
Abstract: Discussion on **road pricing** in the Netherlands has intensified because of the difficult financial position of the municipalities. Property tax burden especially has reached the limits permitted by the central government. In order to give insight in the income from **road pricing** a method is developed to give this information for any city. As an example the income for the city of Rotterdam has been worked out. The results show a relative small income, because of the low traffic volumes in the direction of the CBD of Rotterdam. For the covering abstract of the conference see TRIS abstract no. 367725. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 262323

TRIS accession number: 330849 *TRIS files:* HSL. S 8304.
HRIS. H 8103.
IRRD. I.

TRIS Record Flag: 1

Title: IMPROVEMENT OF AIR QUALITY BY MEANS OF TRANSPORTATION SYSTEM MANAGEMENT
Foreign Language:

Author(s):
Provenzano, G
Cromwell-Cain, K

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 252202

Publication Title: Transportation (Netherlands)
Volume: 9 **Number:** 3
Report No: HS-030 990
Period Covered:
Publication Date: 10/00/80 **Pagination:** pp 269-285
ISBN: **ISSN:** 00494488
Figures: **Tables:** 3 Tab. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Elsevier Scientific Publishing Company
P.O. Box 211, Journal Division
1000 AE Amsterdam, Netherlands

Available from:
Elsevier Scientific Publishing Company
P.O. Box 211, Journal Division
1000 AE Amsterdam, Netherlands

Order Number:

Abstract Information
Abstract: Under the United States Federal Clean Air Act Amendments of 1977, states must implement transportation system management (tsm) tactics in urban areas that have not attained national ambient air quality standards for carbon monoxide and photochemical oxidants. This paper provides a preliminary assessment of the effectiveness and feasibility of using tsm tactics to improve air quality. Based on this assessment, the authors conclude that tsm measures should be effective in eliminating localized carbon monoxide problems, but that such measures are not likely to contribute significantly toward reducing regional oxidant levels. In addition, because most individual tsm tactics can have only marginal impacts on regional motor vehicle emissions, coordinating the planning and implementation of a portfolio of tsm measures will be an essential element of an effective tsm program for improving air quality. (Author/TRRL)
Supplementary notes: Research supported by State of Illinois, Institute for Natural Resources.

Miscellaneous Information:
IRRD Document Number i8IRRD 252202

TRIS accession number: 324674 *TRIS files:* UMTRIS. U 8201.
HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: FORMULATING AN URBAN PASSENGER TRANSPORT POLICY: A RE-APPRAISAL OF SOME ELEMENTS
Foreign Language:

Author(s):
Hensher, D

Publication Information:
Source of Document: Transport and Road Research Laboratory Australian Road Research Board
Source Data: IRRD 239805

Publication Title: Australian Economic Papers
Volume: 18 **Number:**
Publication Date: 6/00/79 **Pagination:** pp 119-130
ISBN: **ISSN:** 0004900X
References: 27 Ref. **Appendices:**

Publisher/Corporate Author 1:
Adelaide University, Australia
North Terrace
Adelaide, South Australia 5001, Australia

Available from:
Adelaide University, Australia
North Terrace
Adelaide, South Australia 5001, Australia

Order Number:

Abstract Information
Abstract: The aim of this article is to consider the appropriateness of the dominant role of speed improvements and **congestion** reduction, with particular reference to the total urban system. An alternative operational principle, accessibility to opportunities (ato) is proposed as a preferred reflection of the primary economic objective of efficiency in resource allocation. The call for the alternative emphasis is reinforced by an accumulation of evidence that tends to question many of the assumptions used to justify the emphasis of earlier research. The prime assumptions under dispute are: (I) cross elasticities within the modal competition sub-sector, ceteris paribus, are greater than between transport sub-sectors and between a transport sub-sector and other sectors; (II) travel time in a mode choice context, defined in a linear dimension, is considered by planners as the most important variable in the overall transport decision; (III) human activities, such as employment and entertainment, within an urban area concentrate towards the centre. This critique introduces interrelationship of travel decisions (i.e. choices of frequency, destination, mode and route) and urban form, the management of **congestion**, the potential for multi-trip and multi-purpose journeys, and the constancy of the travel time and transport expenditure budgets. It is assumed that existing living densities will continue and are consistent with individual preferences. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 239805

TRIS accession number: 310129 *TRIS files:* HRIS. H 803.
IRRD. I.

TRIS Record Flag: 1

Title: A NEW FUTURE FOR ROAD-PRICING?
Foreign Title: HEEFT ROAD-PRICING NIEUWE TOEKOMST?
Foreign Language: Dutch

Author(s):
Roos, HB

Publication Information:
Source of Document: Transport and Road Research Laboratory Institute for Road Safety Research
Source Data: IRRD 244563

Publication Title: Verkeerskunde
Volume: 30 **Number:** 10
Publication Date: 10/00/79 **Pagination:** pp 497-499
ISBN: **ISSN:** 03778495
Figures: **Tables:** **Photos:** 2 Phot.
References: 8 Ref. **Appendices:**

Publisher/Corporate Author 1:
Dutch Touring Club ANWB
Wassenaarseweg 220, Box 2200
The Hague, Netherlands

Abstract Information
Abstract: The article is a discussion of socio-economic and technical-legal measures to influence modal choice if road capacity proves to be insufficient. The author prefers simple systems, such as pay-and-display tickets to be stuck on the windscreen to authorize drivers to enter a congested area. Some results are given of the Singapore system and the author gives an impression of the American vision and Dutch possibilities. (Author/TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 244563

TRIS accession number: 300742 *TRIS files:* UMTRIS. U. HRIS. H 7904.

TRIS Record Flag: 3

Title: IMPLEMENTING PACKAGES OF CONGESTION-REDUCING TECHNIQUES. STRATEGIES FOR DEALING WITH INSTITUTIONAL PROBLEMS OF COOPERATIVE PROGRAMS
Foreign Language:

Author(s):
Remak, R
Rosenbloom, S

Publication Information:
Publication Title: NCHRP Report
Volume: **Number:** 205
Publication Date: 6/00/79 **Pagination:** 128 p.
ISBN: **ISSN:** Proj 710(2) FY '75
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:** 3 App.

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board Business Office
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information

Abstract: Institutional problems have been identified as being the most serious obstacles to implementing programs to reduce traffic **congestion,** reduce air pollution, and conserve energy. This report, therefore, will be of special interest to transportation professionals and administrators, at all levels of government, who are attempting to implement programs to meet these goals. Institutional barriers to cooperative programs for implementing complex packages of congestion-reducing techniques are identified. Incentives and penalties are suggested to obtain essential participation of existing institutions. Peak-period traffic **congestion** continues to be a widespread urban transportation problem despite the availability of technologically feasible solutions. Research reported in NCHRP Report 169 revealed that the most effective congestion-reducing (C-R) programs were those combining several of these techniques into coordinated implementation packages. These packages, designated by the names of their primary techniques, were (1) Changes in Work Hours, (2) Pricing Techniques, (3) Restriction of Access, (4) Changes in Land Use, (5) Prearranged Ride Sharing, (6) Communications Substitutes for Travel, (7) Traffic Engineering, and (8) Transit Treatment. Implementing these C-R packages and similar packages to obtain compliance with the Clean Air Act Amendments of 1977 calls for the cooperation of a number of independent public agencies and private organizations. Barriers to such cooperation are vested interests, inadequate funds, legal and regulatory constraints, and failure to provide an effective organizational structure for joint implementation. The research agency, Remak/Rosenbloom, documented experiences of 18 cities in carrying out joint-agency transportation projects. In addition, case studies in Jacksonville, Seattle, Houston, and Dallas were conducted. Institutional problems found were grouped into three categories as they relate to (1) individual techniques selected for

the package, (2) needs to coordinate activities of independent agencies, and (3) site-related problems. Findings and recommendations in the form of incentives and penalties are presented in tabular form for respective techniques in category 1. For categories 2 and 3, general guidelines are presented. An example application of these results to a metropolitan planning organization is provided. /Author/

TRIS accession number: 193613 *TRIS files:* UMTRIS. U.
HRIS. H 7903.

TRIS Record Flag: 4

Title: TOLLS PRICING STUDY
Foreign Language:

Publication Information:
Publication Date: 2/00/79 **Pagination:** 51 p.
Figures: Figs. **Tables:** Tabs. **Photos:**

Publisher/Corporate Author 1:
Port Authority of New York and New Jersey
One World Trade Center
New York, NY 10048

Abstract Information
Abstract: An attempt is made to present a comprehensive feasibility study and recommendations for peak-hour charges and the impact that carpooling and commuter discounts have upon **congestion.** Coefficients of elasticity were derived that would reflect a motorists reaction to any toll charge, peak period or otherwise. Elasticities for automobiles and for commercial vehicles were developed by market group. Also developed was a unique and complex simulation model which, in addition to providing the estimated traffic and revenue resulting from a given toll schedule, also generated estimates of delay time, the various energy and environmental impacts of delay, vehicle miles travelled and other pertinent data. As a means of evaluating toll schedules, specific yardsticks or measures were developed to determine their impact on various factors such as transit patronage, pollution, **congestion,** energy consumption, etc. The selection and evaluation of candidate toll schedules are also covered. The major conclusions drawn from the study and the recommendations made are given. Details are also given of the study method (including the computer program, the data base, models, capacity restraints, etc.), elasticities and patterns of travel behavior, and the analysis of the final candidate toll schedules. Data and detailed descriptions mentioned in or expanding the main report are included in 3 appendices.

TRIS accession number: 194617 *TRIS files:* UMTRIS. U. HRIS. H 7903.

TRIS Record Flag: 3

Title: THE ROLE OF CITIZENS IN IMPLEMENTING TRANSPORTATION PRICING
Foreign Language:

Publication Information:
Publication Title: Transportation Research Circular
Volume: **Number:** 205
Publication Date: 5/00/79 **Pagination:** 11 p.

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board Business Office
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: This is a report of a conference session dealing with the role of citizens in implementing transportation pricing. The session resulted from activities of the Committee on Citizen Participation to help implement research fundings or transportation policies by improving general awareness and understanding of the research or policy. Schemes for pricing transportation facilities are summarized and reviewed here. For example, the Urban Mass Transportation Administration's experience with pricing to control traffic in several cities is summerized. Pricing approaches considered include parking licenses, morning peak surcharges, parking space charges, and revenue taxes. Experience indicates that these concepts are not now generally accepted or implementable. In Berkeley, an investigation to identify locations where pricing might alleviate traffic **congestion** failed for several reasons: public misunderstanding, uncertainty by the city council, and sponsorship by a non-local organization. In Madison, Wisconsin, some of the impacts of **road pricing** were estimated and analyzed. Failure of **road pricing** schemes to proceed apparently resulted from lack of understanding, especially by people who would have benefitted from reduced traffic in their neighborhood or better transit service. The session identified factors contributing to the demise of pricing schemes and made suggestions for implementing similar adventures in the future. For example, costs imposed by road-pricing are more likely to stimulate opposition than the benefits are to stir up positive response. /Author/

TRIS accession number: 300116 *TRIS files:* UMTRIS. U.
HRIS. H 7904.
IRRD. I.

TRIS Record Flag: 1

Title: FINDING WAYS OF HOLDING BACK THE TRAFFIC AVALANCHE
Foreign Language:

Author(s):
Coombe, D
Foyster, M
Riley, T

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 241064

Publication Title: Surveyor - Public Authority Technology
Volume: 152 **Number:** 4513
Publication Date: 12/07/78 **Pagination:** p 18
ISBN: **ISSN:** 00396303
Figures: **Tables:** 1 Tab. **Photos:** 2 Phot.
References: 1 Ref. **Appendices:**

Publisher/Corporate Author 1:
IPC Building and Control Journals Limited
Surrey House, 1 Throwley Way
Sutton, Surrey SM1 4QQ, England

Abstract Information
Abstract: The article summarises the findings of the West Yorkshire transportation study. A wide variety of communities and aspects of transportation were studied. The Leeds forecast for the 1990's showed that increased car ownership and centralisation of jobs would cause severe **congestion** if counteractive measures were not taken. Although the study considered the effect of traffic constraint, car pooling and the staggering of working and school hours, the article compares only the effectiveness of the five main forms of restraint: parking and physical controls, **road pricing,** cordon pricing and supplementary licensing. The efficiency, practicality and fairness of each restraint mechanism is considered separately and compared with criteria of performance laid down in the article. No one method has a clear advantage over any other. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 241064

TRIS accession number: 300770 *TRIS files:* HRIS. H 8001.
IRRD. I.

TRIS Record Flag: 1

Title: TRAFFIC RESTRAINT THROUGH **CONGESTION** PRICING
Foreign Language:

Author(s):
McMenamin, DA

Publication Information:
Source of Document: Transport and Road Research Laboratory Australian Road Research Board
Source Data: IRRD 239167

Report No: RR/TRANS/11/78 Monograph
Period Covered:
Publication Date: 12/00/78 **Pagination:** 28 p.
Figures: 5 Fig. **Tables:** **Photos:**
References: 16 Ref. **Appendices:**

Publisher/Corporate Author 1:
Melbourne University, Australia
Department of Civil Engineering, Grattan Street
Parkville, Victoria 3053, Australia

Abstract Information
Abstract: The urban road network is presently beset with many problems, one of which is traffic **congestion** and the need for efficient road use. The study summarised in the report investigates the method of traffic restraint known as "**congestion** pricing" and its role as a possible partial solution. After defining the problem and suggesting alternative ways of dealing with it, the major attributes of **congestion** pricing, both as means of traffic restraint and of charging for road use, are outlined. Particular attention is paid to the study of heavy **congestion** (or "ingression") and past work is evaluated and extended. A formulation for an optimal ingression charge is presented. The relationship between pricing and investment is examined and specifically related to **congestion** pricing. Under "ideal" conditions the equivalence of **congestion** revenue and road costs is demonstrated. The present cost and revenue structure of the Victorian road system is detailed and divided into that in the urban (Melbourne) sector and the non-urban sector. A number of adverse criticisms have been raised concerning **congestion** pricing. Each of these objections are analysed and discussed, and conclusions drawn as to the validity of each. /Author/TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 239167

TRIS accession number: 324475 *TRIS files:* HRIS. H 8102.

TRIS Record Flag: 2

Title: TRANSPORTATION IMPROVEMENTS IN MADISON, WISCONSIN: PRELIMINARY ANALYSIS OF PRICING PROGRAMS FOR ROADS AND PARKING IN CONJUNCTION WITH TRANSIT CHANGES
Foreign Language:

Author(s):
Spielberg, F

Publication Information:
Report No: URI No. 22400
Period Covered:
Publication Date: 0/00/78 **Pagination:** 65p

Publisher/Corporate Author 1:
Urban Institute
2100 M Street, NW
Washington, DC 20037

Available from:
Urban Institute
2100 M Street, NW
Washington, DC 20037
Order Number:

Abstract Information
Abstract: Several alernative combinations of road and parking pricing strategies along with transit improvements are analyzed for Madison, Wisconsin, a community of about 200,000 people. The combinations differ as to the type of traffic that is the focus of restraint, the extent of area involved, and the level of transit improvements. The author estimates costs for the necessary transit service expansion as well as for adminitration and enforcement of the pricing strategies. It is shown that some of the proposed programs could effectively reduce traffic and decrease reliance on the private automobile. Further, it appears that revenues generated by charging at least a dollar per day for road use or parking would be sufficient to pay for the transit improvements included in the programs. (Urban Institute)
Supplementary notes: This abstract appeared in the Urban Institute Publications in Urban Affairs.

TRIS accession number: 176477 *TRIS files:* UMTRIS. U. HRIS. H 7901.

TRIS Record Flag: 4

Title: SUMMARY OF OBJECTIVES OF PRICING
Foreign Language:

Author(s):
Thompson, W

Publication Information:
Publication Title: Transportation Research Board Special Report
Volume: **Number:** 181
Publication Date: 0/00/78 **Pagination:** pp 16-17

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board Business Office
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: It is noted that analyses of urban transportation problems and pricing strategy have been only incidentally expressed in terms of space and their intimate relation with the rest of the urban system. There has been no mention of what a rigorous and socially responsible transportation pricing policy would require in governmental reorganization. Current urban systems analysis is largely unidirectional. There may be a need to coordinate pricing policy with a complementary land use strategy. Sophisticated land use planning should be able to ensure the availability of low-income housing sites for a lesser subsidy than that required to run a nearly empty, too-big transit system. The present discussions have made little or no mention of the impact that the slowing rate of population growth might have on **congestion** and the need for stern **road pricing** policies. Another trend that seems to have been missed is the rising shove of urban movement accounted for by recreation, social, and shipping trips. The discussions considered here have all focussed exclusively on the metropolitan area.
Supplementary notes: This paper appeared in Transportation Research Board Special Report No. 181, Urban Transportation Economics. It contains proceedings of Five Workshops on Pricing Alternatives, Economic Regulations, Labor Issues, Marketing, and Government Financing Responsibilities held by Transportation Research Board. Sponsored by Office of the Secretary, Federal Highway Administration, and Urban Mass Transportation Administration of DOT; Environmental Protection Agency; and Federal Energy Administration.

TRIS accession number: 183440 *TRIS files:* UMTRIS. U.
HRIS. H 7901.
IRRD. I.

TRIS Record Flag: 1

Title: A NOTE ON THE **ROAD PRICING** OF COMMERCIAL TRAFFIC
Foreign Language:

Author(s):
Button, KJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD-234542

Publication Title: Transportation Planning and Technology
Volume: 4 **Number:** 3
Publication Date: 5/00/78 **Pagination:** pp 175-178
ISBN: **ISSN:** 0308 1060
Figures: **Tables:** 2 Tab. **Photos:**
References: 15 Ref. **Appendices:**

Publisher/Corporate Author 1:
Gordon and Breach Science Publishers, Incorporated
One Park Avenue
New York, NY 10016

Abstract Information
Abstract: With renewed interest being shown in the UK in the introduction of **road pricing** as a means of restraining urban traffic, the article assesses its possible effect on urban freight transport. Two cases are examined in which (1) the only effect of **road pricing** is to increase haulage costs, and (2) any beneficial effects of reduced **congestion** resulting from **road pricing** are also considered. Although comprehensive **road pricing** may have little effect on total urban freight traffic flow, it might encourage more efficient methods and the retiming of deliveries and collections. The long-term effects of a road-pricing policy are considered as well as criticisms of its application such as increased haulage rates and the possibility of causing more frequent trips by smaller vehicles. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD-234542

TRIS accession number: 407274 *TRIS files:* TLIB. L.

TRIS Record Flag: 3

Title: **ROAD PRICING** AND ITS APPLICATION IN BERKELEY
Foreign Language: ENGLISH

Author(s):
EVMOLPIDIS, V

Publication Information:
Source of Document: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES

Publication Date: 0/00/77 **Pagination:**

Abstract Information
Abstract: No abstract provided.
Supplementary notes: VASSILIS EVMOLPIDIS OTHER PHYS. DESCRIPTION: 50 LEAVES ILL., MAPS INCLUDES BIBLIOGRAPHY

TRIS accession number: 407671 *TRIS files:* TLIB. L.

TRIS Record Flag: 3

Title: **ROAD PRICING** : MANAGING THE RISKS
Foreign Language: ENGLISH

Author(s):
HIGGINS, TJ

Publication Information:
Source of Document: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES

Publication Title: POLICY ANALYSIS
Volume: 3 **Number:** 4
Publication Date: 0/00/77 **Pagination:** PP 579-5

Abstract Information
Abstract: No abstract provided.
Supplementary notes: TOM HIGGINS

TRIS accession number: 186648 *TRIS files:* UMTRIS. U.

TRIS Record Flag: 1

Title: REPORT TO THE NINTH LEGISLATURE OF THE STATE OF HAWAII, REGULAR SESSION OF 1978, RELATING TO THE STATEWIDE TRANSPORTATION COUNCIL (LIMITING NUMBERS OF VEHICLES - ACT 179, SEC. 9)
Foreign Language:

Publication Information:
Source of Document: National Technical Information Service
Source Data: u7825

Publication Date: 0/00/77 **Pagination:** 63p

Publisher/Corporate Author 1:
Hawaii State Dept. of Transportation, Honolulu.

Available from:
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Order Number: PB-285506/2ST

Abstract Information
Abstract: The document contains the report relating to the work of the Interdepartmental Transportation Control Commission, 1972 to 1975 on the following: vehicle emission inspection and maintenance program, staggered working hours demonstration, commuter carpooling, **road pricing,** alternative transportation modes, and automobile tax based on weight and engine displacement. The document also contains the report relating to the work of the Statewide Transportation Council, 1975 to 1977 on the following: the Seminar on Limiting the Number and Kinds of Vehicles, September-October 1975 (Seminar topics--congestion, mass transit not enough, proposed vehicular limits - 1975, survey of alternative transportation strategies, vehicle emissions, safety, economics); the Workshop on Limiting Numbers of Transportation Units, 1976 (limiting numbers of land transportation units, environmental criteria, **congestion** criteria, aircraft limits, marine criteria); and Limiting Number of Vehicles Update (vehicle linits - 1978, public opinion). The document further contains the following legislation for consideration by the 1978 Legislature to attempt to limit the vehicle population: An Act Relating to **Congestion,** An Act Relating to Automobile Emissions, An Act Relating to Limiting the Size of the Vehicle Population Through Safety.

TRIS accession number: 164231 *TRIS files:* UMTRIS. U.
HRIS. H 7803.
IRRD. I.

TRIS Record Flag: 1

Title: THE ECONOMICS OF URBAN TRANSPORT
Foreign Language:

Author(s):
Button, KJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD-226982

Publication Date: 0/00/77 **Pagination:** 181 pp
ISBN: **ISSN:** 0 566 00148 9
Figures: 20 Fig. **Tables:** 15 Tab. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Saxon House, Teakfield Limited
Westmead
Farnborough, Hampshire, England

Abstract Information
Abstract: An attempt is made to analyse the economic problems arising in urban transport and to outline the economic principles upon which solutions may be formulated. In the introduction, urban transport is defined together with its relation with urban development in Britain and its control. The various topics discussed cover: urban traffic **congestion, road pricing,** the economics of parking and traffic management, urban public transport, urban freight movements, transport and the urban environment, urban transport planning and modelling, transport investment appraisal, and urban transport policy. An extensive bibliography is appended. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD-226982

TRIS accession number: 153313 *TRIS files:* UMTRIS. U.
HRIS. H 7704.
IRRD. I.

TRIS Record Flag: 1

Title: URBAN ECONOMICS. THEORY AND POLICY
Foreign Language:

Author(s):
Button, KJ

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 224386

Report No: Monograph
Period Covered:
Publication Date: 0/00/76 **Pagination:** 218 pp
ISBN: **ISSN:** 33185943
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Macmillan Press, Limited
4 Little Essex Street
London WC2R 3LF, England

Abstract Information
Abstract: The book deals with the financing of local government expenditure, regulation of urban land-use patterns, limitation of traffic **congestion** and control of urban environmental decay. The theoretical background is given, followed by a more detailed discussion of current urban problems from the economist's view point. Chapters are included on: the economics of geographical concentration, intra-urban location and land use, the urban labour market, the dynamic urban economy, the theory of city size and spacing, the urban environment, the urban transport problem, urban housing, the urban public economy, urban planning. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 224386

TRIS accession number: 324382 *TRIS files:* UMTRIS. U 8201.
HRIS. H.
IRRD. I.

TRIS Record Flag: 1

Title: REPORT OF THE WORKING GROUP ON TRAFFIC RESTRAINT
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 247856

Report No: Monograph
Period Covered:
Publication Date: 4/00/75 **Pagination:** 155p
Figures: Figs. **Tables:** Tabs. **Photos:** Phots.

Publisher/Corporate Author 1:
Department of the Environment, England
2 Marsham Street
London SW1P 3EB, England

Available from:
Department of the Environment, England
2 Marsham Street
London SW1P 3EB, England

Order Number:

Abstract Information
Abstract: This report describes the findings of a study designed to examine the effect and relative merits of alternative systems of restraint. Five basic systems of restraint have been studied using the city of coventry as an example. The methods are: parking control, supplementary licensing, **road pricing,** cordon pricing and physical restraint. The effects and implications of restraint policies are divided into six aspects, each was studied by a specialist group. The six aspects were: the practicability of the restraint option, the costs and problems of implementation, the environmental effects, land use effects, the distribution of costs and benefits and the legislative implications and requirements. Throughout the study a TRRL based traffic model has been used to estimate the traffic changes which restraint might be expected to bring about. It is concluded that, in Coventry, which has little "through" traffic, comprehensive parking control would give reasonable restraint with low costs up to the mid 1980's. However, each city requires separate consideration and the study showed that there was inadequate knowledge of the restraining effect of **congestion** itself, and the likely response of travellers to restraint changes. (TRRL)

Miscellaneous Information:
IRRD Document Number i8IRRD 247856

TRIS accession number: 133710 *TRIS files:* UMTRIS. U.
HRIS. H 7604.
IRRD. I.

TRIS Record Flag: 2

Title: CAR FEES IN THE CITY OF STOCKHOLM. AN ECONOMIC STUDY OF A LICENCE FEE AS A MEANS TO LIMITATION OF CAR TRAFFIC IN THE CITY OF STOCKHOLM
Foreign Title: BILAVGIFT: STOCKHOLMS INNERSTAD. EN SAMHAELLSEKONOMISK STUDIE AV LICENSAVTIFT SOM MEDEL FOER BEGRAENSNING AV BILTRAFIKEN I STOCKHOLMS INNERSTAD
Foreign Language: Swedish

Author(s):
Jansson, K

Publication Information:
Source of Document: National Swedish Road & Traffic Research Institute Transport and Road Research Laboratory
Source Data: IRRD-216970

Volume: **Number:** 20
Publication Date: 0/00/75 **Pagination:** 34 pp
Figures: 2 Fig. **Tables:** 5 Tab. **Photos:**

Publisher/Corporate Author 1:
Stockholms Laens Landstings Kellektivtrafik
Fack
Stockholm 22, Sweden

Abstract Information
Abstract: An excessive number of cars in towns gives rise to environmental damage and **congestion.** Of the possible physical restrictions such as traffic planning measures, introduction of bus lanes, parking fees, better public transport and a licence system during rush periods, this report discusses the one mentioned last. The analysis suggests that the net overall economic gains of such a system would range between skr. 0.2 and 1.5M annually. Reduction of traffic would also have favourable environmental effects, and total gains would thus be greater if this plus the improvement in road safety were considered. Licence revenue can be redistributed between groups of road users or between modes. The effects of a licence system over the whole day should be investigated, and the effects of changes in traffic conditions should also be examined. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD-216970

TRIS accession number: 139130 *TRIS files:* HRIS. H 7701.
IRRD. I.

TRIS Record Flag: 1

Title: INTERNATIONAL SYMPOSIUM ON MAN AND TRANSPORT. SESSION 1
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 219757

Publication Title: International Symposium on Man and Transport
Publication Date: 0/00/00 **Pagination:**
Figures: Figs. **Tables:** Tabs. **Photos:**

Publisher/Corporate Author 1:
Asahi Shimbun
Chiyodo-Ku
Tokyo, Japan

Abstract Information
Abstract: The following papers were presented at session 1: Detailed pricing of urban transportation services: The essential key to efficient urban transportation, Vickrey, W; No future for cars in the city - cars may annihilate cities and human kind, Shimizu, K; Air quality and urban mobility. A case for reducing the movement of automobiles in Los Angeles, Burco, RA; Automobiles in urban areas, Hirao, O; Why big cities in the world are trying to reduce automobile traffic, Schreiber, H; What mates cities in the world minimize the movement of autos?, Nordqvist, S. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 219757

TRIS accession number: 125225 *TRIS files:* HRIS. H 7601.
IRRD. I.

TRIS Record Flag: 2

Title: TRAFFIC MANAGEMENT. ENVIRONMENTAL MANAGEMENT (PAPERS D1 TO D7)
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 212286

Report No: No. P/71 Conf Paper
Period Covered:
Publication Date: 0/00/00 **Pagination:**
Figures: Figs. **Tables:** Tabs. **Photos:**
References: Refs. **Appendices:**

Publisher/Corporate Author 1:
Planning and Transport Res and Computation Co Ltd
167 Oxford Street
London W1, England

Abstract Information
Abstract: The theme "Environmental Management" Contrains the following papers: Environmental Management and Traffic Restraint, Collins, MS; Environment and Traffic Management, Dimond, JE; Camden Square - A Case History, Davis, CJ and Taylor, JC; Noise and Traffic Management: A Preliminary Study of the Effectiveness of Various Traffic Management Techniques in Reducing Noise Levels in Urban Streets, Gilbert, D; Controlling Traffic Noise, Harland, DG; The Significance of Change, Waller, RA and Thomas, RJ; Public Participation in Environmental Management, Corfin, IM. For the covering abstract of the proceedings, see IRRD Abstract No. 212285. For abstract of the paper by Harland, DG, see IRRD Abstract No. 212287. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 212286

TRIS accession number: 262009 *TRIS files:* HRIS. H 7404.

TRIS Record Flag: 2

Title: LEGAL ISSUES SURROUNDING ROADWAY PRICING ON CITY STREETS AND BRIDGES
Foreign Language:

Author(s):
Coit, RJ

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 494
Publication Date: 0/00/74 **Pagination:** pp 1-10
Figures: 1 Fig. **Tables:** **Photos:**
References: 32 Ref. **Appendices:**

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: Economists and transportation planners have been talking for years about **congestion** pricing of roads and bridges, primarily to ration traffic and secondarily to produce revenue. Most of the research in this field has centered on the technological options for carrying out pricing schemes and their effect on the motoring public. Little has been said about the legal issues of **congestion** pricing-federal statutes, court decisions, state statutes, and local ordinances. This paper focuses on the legal issues of two schemes: placing a commuter tax on central city streets and adjusting bridge tolls to meet **congestion** pricing goals. It suggests that, in spite of federal regulations, substantial power to implement **congestion** pricing lines unused.

Miscellaneous Information:
HRIS Accession Number: 1P15238538

TRIS accession number: 262012 *TRIS files:* HRIS. H 7404.

TRIS Record Flag: 2

Title: COLLECTION PROBLEMS AND THE PROMISE OF SELF-CANCELING TICKETS
Foreign Language:

Author(s):
Myers, S

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 494
Publication Date: 0/00/74 **Pagination:** pp 21-24

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: This paper discusses collecting motor vehicle user charges by time-calibrated self-canceling tickets (timer-tickets). In a designated area, a timer-ticket, about the size of a 3- by 5-in. (76- by 127-mm) card, would be displayed on the windshield of an automobile to show whether the driver paid for the vehicle to be in the area. The timer-ticket, when bent or scratched, changes color to red. This shows that the ticket has been activated. It also starts a chemical reaction that, after a preset time, results in a second color change, to blue. This shows that time is up. The ticket has canceled itself. The paper emphasizes that the administrative simplicity and the ease of sale of timer-tickets would be profitable to local governments. It also discusses the categories in which timer-tickets may be used: overnight parking, historic area parking, toll collecting, and **congestion** pricing.

Miscellaneous Information:
HRIS Accession Number: 1P15238541

TRIS accession number: 263917 *TRIS files:* HRIS. H 7501.

TRIS Record Flag: 2

Title: **CONGESTION** PRICING: A RESEARCH SUMMARY
Foreign Language:

Author(s):
Kulash, D

Publication Information:
Report No: URI 83000
Period Covered:
Publication Date: 7/00/74 **Pagination:** 33 pp

Publisher/Corporate Author 1:
Urban Institute
2100 M Street, NW
Washington, DC 20037

Available from:
Urban Institute
2100 M Street, NW
Washington, DC 20037
Order Number:

Abstract Information
Abstract: Theoretical research on alternative methods of marginal cost applied to street traffic has indicated that net benefits would accrue through imposition of roadway prices. Limited experience with small steps in this direction has shown that the motorists are sluggish in responding to price changes, and that very large price changes would be needed to be effective. Local policy-makers have been reluctant to charge for road use for a number of reasons. Some form of experimentation with novel price changes is needed to generate the necessary information. Among the various avenues through which such experimentation might be pursued, designing and ultimately implementing a demonstration project appears to be the most promising way to evaluate the impacts of roadway pricing policies.

Miscellaneous Information:
HRIS Accession Number: 1P53241345

TRIS accession number: 497211 *TRIS files:* HRIS. H.

TRIS Record Flag: 3

Title: ON ROAD **CONGESTION** THEORY
Foreign Language:

Author(s):
McGilivray, RG

Publication Information:
Report No: UI 1212-8-1
Period Covered:
Publication Date: 3/00/74 **Pagination:** 19p
ISBN: 87766-118-9 **ISSN:**

Publisher/Corporate Author 1:
Urban Institute
2100 M Street, NW
Washington, DC 20037

Available from:
Urban Institute
2100 M Street, NW
Washington, DC 20037
Order Number: URI 69000

Abstract Information
Abstract: This paper draws together a number of theoretical matters pertaining to the problem of **road pricing**. It contains contributions on a new way to think about peak load pricing and on the road system as a Samuelsonian public good, which may also be subject to an indivisibility constraint for investment and sharply decreasing returns to utilization in the short run.

TRIS accession number: 497212 *TRIS files:* HRIS. H.

TRIS Record Flag: 3

Title: LEGAL ISSUES SURROUNDING ROADWAY PRICING ON CITY STREETS AND BRIDGES
Foreign Language:

Author(s):
Colt, RJ

Publication Information:
Report No: UI 1212-6
Period Covered:
Publication Date: 7/00/74 **Pagination:** 30p
ISBN: 87766-123-5 **ISSN:**

Publisher/Corporate Author 1:
Urban Institute
2100 M Street, NW
Washington, DC 20037

Available from:
Urban Institute
2100 M Street, NW
Washington, DC 20037
Order Number: URI 81000

Abstract Information

Abstract: Economists and transportation planners have been talking for years about **congestion pricing** of roads and bridges, primarily to ration traffic and incidentally as a revenue producer. Most of the research in this field, however, has centered on the likely effects of pricing on the motoring public, and on the technological options of putting such schemes into effect. Little has been said to date concerning the legal issues involved in **congestion pricing,** the federal statutes, court decisions, state statutes and local ordinances. This paper will foucus on the legal issues of two particular schemes: placing of a commuter tax on central city streets, and adjusting bridge tolls to meet **congestion pricing** goals. It suggests that in spite of a variety of federal regulations, substantial power to implement **congestion pricing** lies unused at the local level.

TRIS accession number: 084323 *TRIS files:* HRIS. H 7502.

TRIS Record Flag: 2

Title: PRICING AND VALUATION OF TRANSPORT FACILITIES IN THE PRESENCE OF **CONGESTION**
Foreign Language:

Author(s):
Anderson, FJ
Bonsor, NC

Publication Information:
Publication Title: Economica
Volume: 41 **Number:** 164
Publication Date: 11/00/74 **Pagination:** pp 424-431

Publisher/Corporate Author 1:
London School of Economics and Political Science
Houghton Street, Aldwych England
London WC2 2AE, England

Abstract Information
Abstract: A brief survey of the problem of **congestion** costs in transport pricing and valuation shows there is need for explicit treatment along with the implications of **congestion** for short-run comparative static results and for investment decisions in transport capacity. This paper attempts to expand the treatment of transport **congestion** in these directions within the context of traditional microeconomic theory, paying particular attention to the impact of **congestion** on the magnitude of the consumers' surplus generated by a single imperfectly competitive transport mode. The conventional (uncongested) short-run comparative static responses of price and quantity in the presence of an unambiguous shift in the demand for services should be treated with caution when **congestion** is present. Optimal changes in price and quantity may occur in opposite directions.

TRIS accession number: 096737 *TRIS files:* HRIS. H 7504.
IRRD. I.

TRIS Record Flag: 2

Title: TRAVEL-ACTUATED CHARGING: A NEW TECHNIQUE FOR **ROAD PRICING**
Foreign Language:

Author(s):
Edholm, S
Kolsrud, B

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 211622

Publication Title: Traffic Engineering and Control
Volume: 15 **Number:** 16/1
Publication Date: 8/09/74 **Pagination:** pp 739-743
Figures: 6 Fig. **Tables:** 1 Tab. **Photos:**
References: 2 Ref. **Appendices:**

Publisher/Corporate Author 1:
Printerhall Limited
29 Newman Street
London W1P 3PE, England

Abstract Information
Abstract: This article presents a new solution to the technical problem of reducing traffic **congestion by road pricing,** i.e. charging the driver according to his produced marginal social costs. The traffic-actuated charging system proposed by the authors is based on the characteristic features of the journey's time-distance relationship in congested traffic. Only on-vehicle equipment is needed, and it can be used also for other charges, e.g. ordinary charges per unit distance travelled, charges for high speeds, and parking charges. /Author/TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 211622

TRIS accession number: 097681 *TRIS files:* UMTRIS. U.
HRIS. H 7504.
IRRD. I.

TRIS Record Flag: 2

Title: LONDON IN THE 1970'S. THE BRITISH ROAD FEDERATIONS REPLY TO THE GLC GREEN PAPER TRAFFIC AND ENVIRONMENT
Foreign Language:

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 212152

Report No: R&D Rpt.
Period Covered:
Publication Date: 0/00/00 **Pagination:** 9 pp
Figures: **Tables:** 2 Tab. **Photos:**

Publisher/Corporate Author 1:
British Road Federation
26 Manchester Square
London W1, England

Abstract Information
Abstract: This document is a reply to the G.L.C.'s green paper-traffic and the Environment. It begins by examining the balance, between the demand for movement and the supply of facilities to enable movement to take place. It notes that there is A lack of emphasis on road-building in transport policy. There is a general discussion of potential methods of restraint on traffic flow and speeds, and the bulk of the report compares the different methods. These methods include parking controls, supplementary licencing and **road pricing.** The extent of on- and off-street parking is indicated and estimates of its potential contribution to reducing **congestion** are given. Supplementary licencing is evaluated with particular reference to goods vehicle movements and work journeys. Administrative problems are suggested and the effects on the economic and social life of the city noted. **Road pricing** is limited by it being a national development. Shorter sections on traffic management, buses and heavy lorries examine the potential improvement in flow, safety and the general environment but note that drawbacks exist with each policy. Conclusions emphasize the need for road building and accept that extensions of parking control and the banning of through heavy lorries are feasible and desirable. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 212152

TRIS accession number: 099142 *TRIS files:* HRIS. H 7504.
IRRD. I.

TRIS Record Flag: 2

Title: TRAFFIC RESTRAINT AS A TRANSPORT PLANNING POLICY 1: A FRAMEWORK FOR ANALYSIS
Foreign Language:

Author(s):
Wigan, MR

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 212049

Publication Title: Environment and Planning
Volume: 6 **Number:** 5
Publication Date: 0/00/74 **Pagination:** pp 565-601
Figures: 16 Fig. **Tables:** **Photos:**
References: 20 Ref. **Appendices:**

Publisher/Corporate Author 1:
Pion Limited
207 Brondesburg Park
London NW2 5JN, England

Abstract Information
Abstract: This paper summarises the program of work carried out at TRRL up to 1971 on traffic restraint treated as a policy for transport planning. The special techniques required were developed and are described here. The theoretical framework within which local traffic effects can be treated at a strategic level is developed using marginal cost **road pricing** as an example, and the necessarily stringent pricing establishing the convergence, stability, and repeatability of the results is described for a practical algorithm which can readily be used in other transport planning program systems. The application of these techniques to analyse the comparative effects of different traffic restraint policies, and the variations on the techniques required to handle several groups of travellers who react differently to restraint measures, are the subject of companion papers to appear later in this journal. (a). See also IRRD abstract no. 212050 for part 2. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 212049

TRIS accession number: 262012 *TRIS files:* HRIS. H 7404.

TRIS Record Flag: 2

Title: COLLECTION PROBLEMS AND THE PROMISE OF SELF-CANCELING TICKETS
Foreign Language:

Author(s):
Myers, S

Publication Information:
Publication Title: Transportation Research Record
Volume: **Number:** 494
Publication Date: 0/00/74 **Pagination:** pp 21-24

Publisher/Corporate Author 1:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418
Order Number:

Abstract Information
Abstract: This paper discusses collecting motor vehicle user charges by time-calibrated self-canceling tickets (timer-tickets). In a designated area, a timer-ticket, about the size of a 3- by 5-in. (76- by 127-mm) card, would be displayed on the windshield of an automobile to show whether the driver paid for the vehicle to be in the area. The timer-ticket, when bent or scratched, changes color to red. This shows that the ticket has been activated. It also starts a chemical reaction that, after a preset time, results in a second color change, to blue. This shows that time is up. The ticket has canceled itself. The paper emphasizes that the administrative simplicity and the ease of sale of timer-tickets would be profitable to local governments. It also discusses the categories in which timer-tickets may be used: overnight parking, historic area parking, toll collecting, and **congestion pricing**.

Miscellaneous Information:
HRIS Accession Number: 1P15238541

TRIS accession number: 263917 *TRIS files:* HRIS. H 7501.

TRIS Record Flag: 2

Title: **CONGESTION PRICING**: A RESEARCH SUMMARY
Foreign Language:

Author(s):
Kulash, D

Publication Information:
Report No: URI 83000
Period Covered:
Publication Date: 7/00/74 **Pagination:** 33 pp

Publisher/Corporate Author 1:
Urban Institute
2100 M Street, NW
Washington, DC 20037

Available from:
Urban Institute
2100 M Street, NW
Washington, DC 20037
Order Number:

Abstract Information
Abstract: Theoretical research on alternative methods of marginal cost applied to street traffic has indicated that net benefits would accrue through imposition of roadway prices. Limited experience with small steps in this direction has shown that the motorists are sluggish in responding to price changes, and that very large price changes would be needed to be effective. Local policy-makers have been reluctant to charge for road use for a number of reasons. Some form of experimentation with novel price changes is needed to generate the necessary information. Among the various avenues through which such experimentation might be pursued, designing and ultimately implementing a demonstration project appears to be the most promising way to evaluate the impacts of roadway pricing policies.

Miscellaneous Information:
HRIS Accession Number: 1P53241345

TRIS accession number: 125034 *TRIS files:* UMTRIS. U.
HRIS. H 7601.
IRRD. I.

TRIS Record Flag: 2

Title: IMPLEMENTATION AND ENFORCEMENT OF RESTRAINTS
Foreign Language:

Author(s):
Moseley, GW

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 212309

Report No: Textbook
Period Covered:
Publication Date: 0/00/74 **Pagination:** pp 119-122

Publisher/Corporate Author 1:
David and Charles (Holdings) Limited
South Devon House
Newton Abbot, Devonshire, England

Abstract Information
Abstract: The assumption of the need for constraints underlies discussion of **congestion** in cities, but local authorities appear reluctant to extend restriction for fear of alienating the public. The main instrument of restraint is likely to be intensification of existing parking control and pricing. Enforcement is a separate and major problem with existing methods and new techniques of restraint offer little scope for reducing the difficulties of enforcement. Land use planning can be important, but the most effective and acceptable policy is likely to be a combination of constraints and incentives (particularly in the form of improved public transport). The number of the covering abstract of the textbook is irrd abstract no 212297. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 212309

TRIS accession number: 125036 *TRIS files:* HRIS. H 7601.
IRRD. I.

TRIS Record Flag: 2

Title: **CONGESTION** CONTROL IN LONDON
Foreign Language:

Author(s):
Bayliss, D

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 212307

Report No: Textbook
Period Covered:
Publication Date: 0/00/74 **Pagination:** pp 110-113

Publisher/Corporate Author 1:
David and Charles (Holdings) Limited
South Devon House
Newton Abbot, Devonshire, England

Abstract Information
Abstract: Traffic pressures on road systems have been increasing steadily and are greatest in town centres and urban areas in general. Policies adopted in London to moderate traffic **congestion** by control of parking provision are outlined. It is argued however that parking control alone is unlikely to be sufficient to deal with the problem of traffic **congestion** in town centres. Supplementary licences and **road pricing** are discussed as alternatives but it is pointed out that both have unsolved problems. It is concluded that the long term solution may require a combination of policies and that in the short term a programme of **congestion** management may be the best alternative. The number of the covering abstract of the textbook is irrd abstract no 212297. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 212307

TRIS accession number: 125078 *TRIS files:* UMTRIS. U.
HRIS. H 7504.
IRRD. I.

TRIS Record Flag: 2

Title: THE EFFICIENT AND ECONOMIC USE OF EXISTING URBAN ROAD NETWORKS HAVING REGARD TO CONSIDERATION OF THE ENVIRONMENT
Foreign Language:

Author(s):
Collins, MS

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 212669

Publication Title: Institution of Municipal Engineers, Journal of
Volume: 101 **Number:** 10
Publication Date: 10/00/74 **Pagination:** pp 262-268
Figures: 1 Fig. **Tables:** **Photos:**
References: 19 Ref. **Appendices:**

Publisher/Corporate Author 1:
Institution of Municipal Engineers
25 Eccleston Square
London SW1 V1NX, England

Abstract Information
Abstract: This thesis examines the implications of **congestion** and the means by which it may be avoided. It begins by examining current urban transport planning philosophy, which the author writes is derived largely from the buchanan report. The focus is on methods of influencing demand and the advantages and disadvantages of each are examined in turn. These include permits and licences, **road pricing,** parking control, and improving public transport along with land use controls. Concluding that none of these will be practical or effective the author suggests that the results of unplanned restraint or **congestion** should be explored. A theory of **congestion** is given which includes personal characteristics, activities, trip characteristics, the subjective assessment of **congestion** and costs and benefits. A number of options that individuals may take to avoid **congestion** follow from this and these are listed. Decision levels are identified and the interrelationships between the options explored in detail with an assessment of the ability to control the options added. A section on implications examines the effects of altering design standards from peak to average daily flow and the potential of environmental management. The author argues that the latter type of scheme has been unsuccessful for a variety of reasons. Research is suggested so that the implications and characteristics of **congestion** may be better understood. The author concludes that a problem which is national and social in nature is being tackled with solutions which are local and technical. /TRRL/

Miscellaneous Information:
IRRD Document Number i8IRRD 212669

TRIS accession number: 224528 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: OPTIMAL **ROAD PRICING** FOR AIR POLLUTION CONTROL
Foreign Language:

Author(s):
Cesario, FJ

Publication Information:
Volume: 30 **Number:**
Publication Date: 0/00/73 **Pagination:** pp 97-110

Publisher/Corporate Author 1:
Regional Science Association Papers

Abstract Information
Abstract: THIS PAPER CONSIDERS THE PROBLEM OF ESTABLISHING THE APPROPRIATE (SOCIAL) CHARGES OR TOLLS TO BE LEVIED ON EACH HIGHWAY USER. A POLLUTION MODEL BASED ON A MARGINAL COST PRICING CONCEPT IS DEVELOPED THAT BUILDS ON (AND THEN CONVENIENTLY DISCARDS) THE WALTERS MODEL FOR **CONGESTION.** EXAMPLES DEMONSTRATE THE USE OF THE MODEL AND GENERAL PRINCIPLES THEREOF IN EXAMINING PRICING POLICIES FOR DIFFERENT SITUATIONS WHICH CAN ARISE IN PRACTICE. IN THE FIRST EXAMPLE IT WAS DEMONSTRATED THAT IT IS REASONABLE TO IMPOSE DIFFERENTIAL PRICES FOR TRAVEL ON ROAD LINKS WHICH WERE OF THE SAME LENGTHS (AND ALIKE IN EVERY OTHER PHYSICAL RESPECT) DUE TO DIFFERENTIALS IN THE INCIDENCE OF SOCIAL POLLUTION COSTS ALONG THE ROADS. IN THE SECOND EXAMPLE, IT WAS SHOWN THAT PRICES SHOULD BE HIGHER IN HIGHLY DENSE URBAN AREAS TO DIVERT TRAFFIC TO LONGER ROUTES PASSING THROUGH LIGHTLY POPULATED AREAS. THE IMPORTANCE OF EXAMINING POPULATION DENSITY PATTERNS ON A CASE-BY-CASE BASIS WAS DEMONSTRATED.

Miscellaneous Information:
HRIS Accession Number: 1P52234227

TRIS accession number: 202468 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: PRICING, METERING, AND EFFICIENTLY USING URBAN TRANSPORTATION FACILITIES
Foreign Language:

Author(s):
Vickrey, W

Publication Information:
Publication Title: Highway Research Record, Hwy Res Board
Volume: **Number:** 476
Publication Date: 0/00/73 **Pagination:** pp 36-48
Figures: 3 Fig **Tables:** 2 Tab **Photos:**
References: 2 Ref **Appendices:**

Abstract Information
Abstract: THIS ANALYSIS IS INTENDED TO DEMONSTRATE THAT ROADWAY PRICING NEED NOT, AND INDEED SHOULD NOT, BE VIEWED PRIMARILY AS A MATTER OF REDRESSING A BALANCE BETWEEN THE PRIVATE AUTOMOBILE AND OTHER FORMS OF TRANSPORTATION, ESPECIALLY TRANSIT. **ROAD PRICING,** PROPERLY APPLIED, CAN IN THE MOST SEVERELY CONGESTED SITUATIONS LEAD TO GREAT IMPROVEMENT IN THE EFFICIENCY WITH WHICH THE ROADWAYS ARE USED AND EVEN, IN SOME CASES, TO A REDUCED RELIANCE ON TRANSIT. WHERE HEAVY INVESTMENT IN SEPARATE-RIGHT-OF-WAY TRANSIT FACILITIES IS UNDER CONSIDERATION, ROADWAY PRICING MAY WELL TIP THE BALANCE IN FAVOR OF LESS, NOT MORE, INVESTMENT IN TRANSIT SERVICES. ROADWAY PRICING IS NOT, THEREFORE, MAINLY AN ISSUE IN THE BATTLE BETWEEN AUTOMOBILE INTERESTS AND TRANSIT INTERESTS, IN WHICH THE INSTITUTION OF ROADWAY PRICING WOULD BE REGARDED AS A VICTORY FOR TRANSIT AND A DEFEAT FOR THE AUTOMOBILE. RATHER, ROADWAY PRICING HAS A GREAT DEAL TO OFFER ALL OF THE PARTIES INVOLVED AND SHOULD BE CONSIDERED NOT A DEFEAT FOR ANYONE BUT A VICTORY FOR THE CAUSE OF RATIONAL AND EFFICIENT URBAN TRANSPORTATION. /AUTHOR/

Miscellaneous Information:
HRIS Accession Number: 1P15235832

TRIS accession number: 226876 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: A COMPARATIVE NETWORK SIMULATION OF DIFFERENT METHODS OF TRAFFIC RESTRAINT
Foreign Language:

Author(s):
Wigan, MR
Bamford, TJ

Publication Information:
Source of Document: Transport & Road Research Lab /UK/

Report No: R+d Rept
Period Covered:
Publication Date: 0/00/73 **Pagination:** 40 pp
Figures: 20 Fig **Tables:** 5 Tab **Photos:**
References: 7 Ref **Appendices:**

Publisher/Corporate Author 1:
Transport & Road Research Lab /UK/

Abstract Information
Abstract: THE CONCEPT OF A PRICING SYSTEM AS A MEANS OF CONTROLLING **CONGESTION** HAS OFTEN BEEN PROPOSED. THIS REPORT DESCRIBES THE SIMULATION OF THREE PRACTICAL METHODS OF IMPLEMENTING **ROAD PRICING**. THESE ARE PARKING CHARGES, A CORDON OF CHARGES ABOUT A NETWORK CENTRE, AND PRICING POINT SYSTEMS. THE EFFECTS OF EACH SCHEME ARE COMPARED WITH THOSE PREDICTED FOR A MARGINAL SOCIAL COST PRICING SYSTEM, AND AN ASSESSMENT OF THE CAPACITY OF THE ROAD NETWORK WITH AND WITHOUT A VARIETY OF RESTRAINT SCHEMES IS ALSO OBTAINED. THE MAIN FEATURES OF THE ANALYSIS CAN BE SUMMARISED AS:- 1. THE MAXIMUM BENEFITS DERIVED BY EACH OF THE THREE PRACTICAL SCHEMES ARE REMARKABLY SIMILAR AND ARE ABOUT 60 PER CENT OF THE BEST POSSIBLE BENEFIT. 2. THE AREA AVER WHICH THE RESTRAINT SCHEME APPLIES IS OF CRITICAL IMPORTANCE, AND IF THIS INCLUDES MOST OF THE CONGESTED PARTS OF THE NETWORK, THERE IS LITTLE ADVANTAGE IN EXTENDING CONTROL OVER A YET WIDER AREA. 3. PARKING SCHEMES SHOW A FAIR DEGREE OF TOLERANCE TO THE ACTUAL CHARGES SELECTED BUT WOULD HAVE TO BE EFFECTIVELY ENFORCED TO OBTAIN EQUIVALENT RESULTS TO OTHER SCHEMES. 4. RESTRAINT POLICIES ARE NEEDED TO OBTAIN THE FULL BENEFIT FROM THE UPRATING OF THE RING ROAD TO MOTORWAY STANDARDS. (A)
Supplementary notes: Rept No LR 566

Miscellaneous Information:
HRIS Accession Number: 3C53235665

File Reference: IRRD 206 635

TRIS accession number: 265573 *TRIS files:* HRIS. H 7503.
IRRD. I.

TRIS Record Flag: 2

Title: ECONOMIC ASPECTS OF URBAN FREEWAYS
Foreign Language:

Author(s):
Thompson, KE

Publication Information:
Source of Document: Transport and Road Research Laboratory
Source Data: IRRD 209904

Publication Title: Texas University, Austin
Volume: 45 **Number:** 12
Publication Date: 12/00/73 **Pagination:** pp 7-9

Abstract Information
Abstract: The author defines the economic aspects of urban motorways and discusses the way a particular course of action is chosen. Particular reference is made to the part played by the market economy and by political processes. Proposals for improving present strategies are put forward. A study is made of the analytical processes that have been used and in particular cost-benefit analysis. The various criticisms that have been raised with respect to the analtyical techniques used in transport investment analysis are discussed. It is suggested that as experience is gained with such methods their reliability will improve. The next part of the paper is concerned with the particular features of motorways and their economic aspects. Particular reference is made to relieving **congestion** in the urban travel environment and to methods of pricing travel. It is suggested that the economic principle to be used should be that each user pays an amount equal to the total value of community savings if the particular trip were not made, including the cost of maintenance, traffic control and saving to other users in operating costs, time and accidents.

Miscellaneous Information:
IRRD Document Number i8IRRD 209904

TRIS accession number: 228476 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: AN EQUILIBRIUM MODEL OF BUS AND CAR TRAVEL OVER A ROAD NETWORK
Foreign Language:

Author(s):
Wigan, MR
Bamford, TJ

Publication Information:
Source of Document: Transport & Road Research Lab /UK/

Report No: R & D Rept
Period Covered:
Publication Date: 0/00/73 **Pagination:** 43 pp
Figures: 19 Fig **Tables:** 8 Tab **Photos:**
References: 13 Ref **Appendices:**

Publisher/Corporate Author 1:
Transport & Road Research Lab /UK/

Abstract Information
Abstract: A NEW MODEL OF TRAFFIC FLOW AND TRAVEL DEMAND OVER A CONGESTED NETWORK IS DESCRIBED. ALL ROADS ARE SUBJECT TO DIFFERENT SPEED AND FLOW RELATIONS, AND THE TRAVELERS BY BUS AND CAR ARE ABLE TO TAKE ADVANTAGE OF ANY BETTER ROUTES FOR THEIR JOURNEY THAT THEY CAN FIND. THE PATTERN OF TRAVEL MOVEMENTS PRODUCED BY THIS PROCESS IS AN EQUILIBRIUM DISTRIBUTION WHERE ANY CHANGE IN COST, SPEED, OR TIME OVER ANY PART OF THE NETWORK WILL AFFECT THE WHOLE SYSTEM AND THE DEMAND FOR TRAVEL BETWEEN ALL THE POINTS ON THE NETWORK. A TECHNIQUE OF GENERAL APPLICABILITY HAS BEEN FOUND TO DETERMINE THESE PATTERNS OF FLOW AND DEMAND WITH A HIGH DEGREE OF CONSISTENCY FOR EVEN VERY SMALL CHANGES, OR OTHER CHANGES APPLIED: IT IS ALSO SHOWN THAT THE MORE CONVENTIONAL SEQUENCE OF GRAVITY MODEL ASSIGNMENT OF FLOW, WHICH PRODUCES STABLE RESULTS AFTER SEVERAL REPETITIONS, CAN PRODUCE INCORRECT RESULTS. THE TECHNIQUE IS PRESENTED THROUGH THE EXAMPLE OF **ROAD PRICING** APPLIED TO ROAD MOVEMENTS OVER A NETWORK: THE IMPORTANCE OF OBTAINING A UNIQUE EQUILIBRIUM, THE ASSIGNMENT IMPROVEMENTS, AND THE EFFECTS ON CAR AND BUS DEMAND AND MOVEMENTS ARE ALL DEMONSTRATED. (A).
Supplementary notes: TRRL REPT LR 559

Miscellaneous Information:
HRIS Accession Number: 2C55236000

File Reference: IRRD 206 649

TRIS accession number: 242591 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: URBAN TRANSPORTATION **CONGESTION**: SOLUTION BY RESTRAINT
Foreign Language:

Author(s):
Heggie, IE

Publication Information:
Volume: 9 **Number:** 2
Publication Date: 0/00/73 **Pagination:** pp 99-117

Publisher/Corporate Author 1:
Logistics & Transp Review /Canada/

Abstract Information
Abstract: THIS PAPER DESCRIBES THE PROBLEMS OF URBAN **CONGESTION** AND DISCUSSES SOME POSSIBLE SOLUTIONS. IT SETS OUT SEVERAL THEORETICAL MODELS OF URBAN TRAVEL BEHAVIOR AND SHOWS WHAT EFFECT **ROAD PRICING,** OR A POLICY OF TRAFFIC RESTRAINT, IS LIKELY TO HAVE ON THE OVERALL LEVEL OF TRAFFIC, MODAL CHOICE, AND SYSTEM COSTS. IT THEN ARGUES IN FAVOR OF TRAFFIC RESTRAINT - BASED ON PARKING CHARGES - AS THE MOST EFFICIENT OVERALL SOLUTION AND PROVIDES SOME QUANTITATIVE EVIDENCE OF THE EFFECT OF SUCH CHARGES ON TRAVEL BEHAVIOR IN THE U.K. TO BE A PREFERRED SOLUTION A POLICY OF TRAFFIC RESTRAINT MUST SHOW A POSITIVE PRESENT VALUE OVER OTHER ALTERNATIVE IMPROVEMENTS, WHICH MUST INCLUDE NEW INVESTMENT AS WELL AS THE "DO NOTHING" ALTERNATIVE. /DOT/

Miscellaneous Information:
HRIS Accession Number: 1P84231714

TRIS accession number: 228406 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: URBAN ROAD **CONGESTION** IN PERSPECTIVE
Foreign Language:

Author(s):
Rahmann, WM

Publication Information:
Publication Title: Australian Road Research Board Conference Proc
Volume: 6 **Number:** Pt2
Report No: Paper No 905
Period Covered:
Publication Date: 0/00/72 **Pagination:** pp 368-90

Publisher/Corporate Author 1:
Australian Road Research Board
500 Burwood Road
Vermont South, Victoria 3133, Australia

Abstract Information
Abstract: IN THE ABSENCE OF **CONGESTION ROAD PRICING,** THE EQUILIBRATING MECHANISM THAT EMERGES IN THE CITY IS CONGESTED PEAK HOUR OPERATION ON THE ROAD SYSTEM. THIS SURROGATE PRICE MECHANISM IS AN ESSENTIAL FEATURE OF THE DYNAMIC SYSTEM AND SHOULD BE RECOGNIZED AND INCLUDED IN THE PLANNING LOGIC. IT IS AN ASPECT OF SYSTEM FUNCTIONING AND NOT EVIDENCE OF SYSTEM FAILURE. ACCEPTANCE OF THIS PHILOSOPHY MODIFIES SOME OF THE TRADITIONAL ARTICLES OF FAITH IN URBAN TRAFFIC ENGINEERING AND ROAD PLANNING. MOST OF THE DESIGN TOOLS NECESSARY TO INCLUDE THE CONCEPT IN THE PLANNING LOGIC ALREADY EXIST. THEIR USE WILL RESULT IN MORE APPROPRIATE EXPENDITURE OF SCARCE RESOURCES, AND A GREATER LIKELIHOOD OF PLANNERS BEING ABLE TO PREDICT THE OUTCOME OF THEIR PROPOSALS. /AUTHOR/

Miscellaneous Information:
HRIS Accession Number: 1P55232430

TRIS accession number: 265540 *TRIS files:* HRIS. H 7502.

TRIS Record Flag: 2

Title: TECHNICAL METHODS FOR **ROAD PRICING**
Foreign Title: TEKNISKA METODER FOR AVGIFTSUTTAG I VAGTRAFIKEN
Foreign Language: Swedish

Author(s):
Edholm, S
Kolsrud, B

Publication Information:
Source of Document: Society of Automotive Engineers
Source Data: IRRD 209688

Volume: **Number:** 7
Report No: R&D Rept.
Period Covered:
Publication Date: 0/00/72 **Pagination:** 91 pp
Figures: 16 Fig. **Tables:** 34 Tab. **Photos:**

Publisher/Corporate Author 1:
National Swedish Road Research Institute
Drottning Kristinas Vag 25
11428 Stockholm O, Sweden

Abstract Information
Abstract: THIS REPORT COMPRISES A REVIEW OF VARIOUS TECHNICAL METHODS FOR **ROAD PRICING** AND A MORE DETAILED PRESENTATION OF A **ROAD PRICING** METHOD BASED ON CONTINOUS MEASUREMENT OF DRIVING-TIME AND DISTANCE. THE GENERAL PRINCIPLES FOR **ROAD PRICING** ARE OUTLINED AND THE ENGLISH ROAD-PRICING THEORY AND DIRECT METHODS FOR CHARGING (ON-VEHICLE AND OFF-VEHICLE METHODS) ARE STUDIED. THE METHODS DEVELOPED IN ENGLAND COULD BE USED ONLY FOR CHARGING OF TRAFFIC **CONGESTION** AND PARKING. THE METHOD PRESENTED BY THE AUTHORS IN THIS REPORT, BASED ON THE DISTANCE-TIME RELATION, COULD BE USED ALSO FOR OTHER TRAFFIC FEES E.G. A ROAD DISTANCE FEE DEPENDING ON VEHICLE TYPE AND LOAD, A FEE DEPENDING ON THE SPEED AND FOR EXCEEDING SPEED LIMITS. THIS METHOD IS AN ON-VEHICLE METHOD I.E. THE COUNTING IS CARRIED OUT IN A METER ON THE VEHICLE, RECEIVING SIGNALS FROM A LOOP BURIED IN THE ROAD SURFACE AT CERTAIN PRICING POINTS. A METER FOR **ROAD PRICING** ACCORDING TO THE DISTANCE-TIME METHOD IS EXEMPLIFIED IN THE REPORT. AN IDEAL COST FUNCTION APPLICABLE ON THIS METHOD IS DERIVED. THIS FUNCTION IS MODIFIED TO A PRACTICAL COST FUNCTION WHICH WAS USED WHEN TESTING THE METHOD IN THE STOCKHOLM TRAFFIC. A SERIES OF TEST RESULTS ARE ALSO INCLUDED.

Miscellaneous Information:
IRRD Document Number i8IRRD 209688

TRIS accession number: 226595 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: INTERNATIONAL COOPERATION IN TRAFFIC RESEARCH: RELIEF OF INNER-CITY TRAFFIC **CONGESTION**
Foreign Language:

Author(s):
Horn, BE

Publication Information:
Publication Title: Traffic Engineering, Inst Traffic Engr
Volume: 43 **Number:** 2
Publication Date: 11/00/72 **Pagination:** pp 32-38
Figures: 1 Fig **Tables:** 3 Tab **Photos:**
References: 11 Ref **Appendices:**

Abstract Information
Abstract: AS A PART OF THE ROAD RESEARCH PROGRAM OF THE ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, A SYSTEMATIC APPRAISAL OF TRAFFIC **CONGESTION** COUNTERMEASURES HAS BEEN CARRIED OUT. TWENTY-ONE NATIONS PARTICIPATE IN THIS OECD PROGRAM. THE PRESENT ARTICLE IS BASED ON THE RESULTS OF STUDIES UNDERTAKEN SINCE 1968 BY THE OECD TRAFFIC GROUPS OF EXPERTS AND ILLUSTRATES THE OPTIONS AND SOLUTIONS FOR RELIEVING INNER-CITY TRAFFIC **CONGESTION** AND IMPROVING URBAN CONDITIONS BY AN ARRAY OF INDIVIDUAL MEASURES AND TECHNIQUES, SUCH AS URBAN PLANNING, TRAFFIC MANAGEMENT, PUBLIC TRANSPORT, NEW TECHNOLOGY, AND TRAFFIC RESTRAINT. THE REPORT CONSIDERS FIRST HOW NETWORK AND TRAFFIC PLANNING CAN DECREASE PRIVATE TRAFFIC DEMAND IN CITY CENTERS AND IMPROVE THE EFFICIENCY OF PUBLIC TRANSPORT IN URBAN AREAS. IT DESCRIBES POSSIBLE WAYS OF IMPROVING TRAFFIC FLOW ON URBAN FREEWAYS AND TRAFFIC CORRIDORS BY THE USE OF ELECTRONIC AIDS, AND THE RESEARCH CONDUCTED ON OPTIMIZING STREET NETWORKS BY THE APPLICATION OF AREA TRAFFIC SCHEMES UNDER CENTRAL CONTROL. IT ALSO EMPHASIZES THE NECESSITY FOR AN OVERALL CONCEPT OF TRAFFIC OPERATION AT SITES OF TEMPORARY OBSTRUCTION SUCH AS THOSE CAUSED BY CONSTRUCTION WORKS. THE THIRD SECTION OF THE ARTICLE DEALS WITH THE OPTIMIZATION OF BUS OPERATION AND EXAMINES NEW SYSTEMS AND NEW TECHNOLOGY REGARDING INFRASTRUCTURE, VEHICLES, AND OPERATION. THE LAST PART OF THE REPORT CONTAINS A REVIEW OF PRIVATE TRAFFIC RESTRAINT MEASURES IN URBAN AREAS, IN PARTICULAR, PARKING CONTROL AND **ROAD PRICING.** IT IS SUGGESTED THAT FURTHER RESEARCH ON **ROAD PRICING** SHOULD BE CARRIED OUT WITH PARTICULAR EMPHASIS ON THE MANY ECONOMIC AND SOCIAL PROBLEMS INVOLVED.

Miscellaneous Information:
HRIS Accession Number: 1P53228360

TRIS accession number: 202504 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: THEORY AND PRACTICE OF **ROAD PRICING**
Foreign Language:

Author(s):
Willeke, R
Baum, H

Publication Information:
Source of Document: Transport & Road Research Lab /UK/

Volume: 43 **Number:** 2
Publication Date: 0/00/72 **Pagination:** pp 63-85
Figures: **Tables:** 5 Tab **Photos:**
References: Refs **Appendices:**

Publisher/Corporate Author 1:
Zeit Verkehrswissenschaft /Germany/

Abstract Information
Abstract: THE POSSIBILITIES AND LIMITS OF THE **ROAD PRICING** SYSTEM WITHIN THE FEDERAL REPUBLIC OF GERMANY ARE DISCUSSED. A REDUCED STANDARD MODEL FOR DETERMINING ROAD USAGE FEES IS PRESENTED WHICH LEADS TO A MARKET BALANCE WHILE TAKING ACCOUNT OF THE FLEXIBILITY OF PRICES. **CONGESTION** PRICES OF 10 PFENNINGS PER KILOMETER FOR MOVING TRAFFIC AND 50 PFENNINGS PER HOUR FOR PARKED VEHICLES ARE DERIVED FROM THIS MODEL. /TRRL/

Miscellaneous Information:
HRIS Accession Number: 2C15300082

File Reference: IRRD 300 082

TRIS accession number: 242811 *TRIS files:* HRIS. H.

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Title: ISSUES OF URBAN TRAFFIC POLICY
Foreign Language:

Author(s):
Baxter, JH

Publication Information:
Source of Document: Transport & Road Research Lab /UK/

Volume: **Number:** 6
Report No: Paper
Period Covered:
Publication Date: 0/00/71 **Pagination:** 6 pp

Publisher/Corporate Author 1:
Department of The Environment /UK/

Abstract Information
Abstract: AFTER REVIEWING CURRENT TRENDS IN TRAFFIC AND TRANSPORT POLICIES, THE AUTHOR DISCUSSES THE USE OF COMPREHENSIVE PARKING CONTROL AND **ROAD PRICING** AS PRACTICABLE MEANS OF REDUCING TRAFFIC **CONGESTION** IN THE CENTER OF CITIES. THE FOLLOWING ISSUES ARE DISCUSSED: THE ROLE OF THE CENTRAL GOVERNMENT AS REGARDS LOCAL AND REGIONAL TRAFFIC ISSUES, CONTROL OVER SPEED LIMITS, TRAFFIC SIGN CRITERIA, LAW ON ACCESS, PROVISION OF FINANCIAL SUPPORT, OFFER OF GUIDANCE AND EXPERTISE, AND PROMOTION OF RESEARCH AND DEVELOPMENT. /TRRL/

Miscellaneous Information:
HRIS Accession Number: 3C84300633

TRIS accession number: 263193 *TRIS files:* HRIS. H 7501.

TRIS Record Flag: 4

Title: ROADS-USER CHARGES
Foreign Language:

Publication Information:
Report No: Bibliog
Period Covered:
Publication Date: 0/00/71 **Pagination:**
References: 79 Ref. **Appendices:**

Publisher/Corporate Author 1:
Northwestern University, Evanston
Transportation Center Library
Evanston, IL

Abstract Information
Abstract: The Northwestern University library compiled a bibliography of 79 references to United States and foreign publications pertaining to **road pricing.** Such areas as taxation, traffic restraint, and **congestion** are explore.

Miscellaneous Information:
HRIS Accession Number: 3B15235834

TRIS accession number: 202410 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: **ROAD PRICING**
Foreign Language:

Author(s):
Oestre, S

Publication Information:
Source of Document: Transport & Road Research Lab /UK/

Publication Title: Samferdsel, Inst Transport Economy /Nor
Volume: 3 **Number:** 9
Publication Date: 10/00/71 **Pagination:** pp 15-7
Figures: 2 Fig **Tables:** **Photos:**
References: 5 Ref **Appendices:**

Abstract Information
Abstract: THE AUTHOR DESCRIBES IN SOME DETAIL THE THEORY OF **ROAD PRICING** AS PRESENTED BY THE SMEED COMMITTEE IN GREAT BRITAIN AND PRESENTS FOUR MAJOR OBJECTIONS TO THIS THEORY: (1) THE FACT THAT THE COST OF INTRODUCING THE SYSTEM BOTH AS REGARDS RECORDING INSTRUMENTS AND ADMINISTRATION HAS NOT BEEN CONSIDERED NOR THE EFFECTS ON THE EXISTING PUBLIC TRANSPORT SYSTEM; (2) THE ECONOMIC EFFECT ON DIFFERENT GROUPS OF ROAD USERS; COLLECTED FEES MUST BE EMPLOYED TO ENSURE FAIR TREATMENT OF ALL ROAD USERS, THOSE WHO USED THE ROADS BEFORE AND THOSE WHO USED THE ROADS AFTER THE SYSTEM HAS BEEN INTRODUCED. IT IS ARGUED THAT TRAFFIC **CONGESTION** IS NOT NECESSARILY ONLY A RESULT OF A DIFICIENT PRICE POLICY BUT ALSO A FUNCTION OF ROAD CAPACITY. ATTENTION IS DRAWN TO THE FACT THAT THE **ROAD PRICING** SYSTEM CONSTITUTES ONLY A PARTIAL SOLUTION AND MUST BE CONSIDERED AS A PARTICULAR CASE OF THE MORE GENERAL PROBLEM OF FINDING THE OPTIMUM TRAFFIC DISTRIBUTION BETWEEN DIFFERENT MODES OF TRANSPORT.

Miscellaneous Information:
HRIS Accession Number: 3C15234872

File Reference: IRRD 202 167

TRIS accession number: 201811 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: TRAFFIC **CONGESTION** AS A SOURCE OF REVENUE
Foreign Language:

Author(s):
Roth, GJ

Publication Information:
Publication Title: Traffic Quart Eno Fdn Hwy Traffic Contr
Publication Date: 4/00/70 **Pagination:**

Abstract Information
Abstract: A NUMBER OF STUDIES PUBLISHED RECENTLY HAVE SUGGESTED THAT IT WOULD BE APPROPRIATE TO DEAL WITH TRAFFIC **CONGESTION** BY USING THE PRICE MECHANISM TO DISCOURAGE THE USE OF CONGESTED ROADS AND TO ENCOURAGE THE USE OF UNCONGESTED ONES. THE OBJECTS OF THIS ARTICLE ARE TO REVIEW VERY BRIEFLY THE PRINCIPLES UNDERLYING THE IDEA OF "**ROAD PRICING**"; TO TOUCH UPON SOME OF THE METHODS PROPOSED FOR IMPLEMENTATION; AND TO FOCUS ON AN AREA THAT HAS RECEIVED COMPARATIVELY LITTLE ATTENTION: THE DISPOSAL OF THE REVENUES OBTAINED. AN EXAMINATION IS MADE OF THE COSTS PAYABLE BY ROAD USERS, THE COSTS PAYABLE BY THE HIGHWAY AUTHORITY, AND THE IMPLICATIONS OF THE INVESTMENT RULE, TO SHOW HOW THESE PRINCIPLES CAN BE APPLIED TO RUNNING CITY ROADS ON A SELF-FINANCING BASIS.
Supplementary notes: Vol 24, No 2, PP 175-189

Miscellaneous Information:
HRIS Accession Number: 1P15210896

TRIS accession number: 201723 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: OPTIMAL **CONGESTION** TOLLS FOR CAR COMMUTERS
Foreign Language:

Author(s):
Jansson, JO

Publication Information:
Publication Title: Journal of Transport Economics and Policy
Publication Date: 9/00/69 **Pagination:**

Publisher/Corporate Author 1:
London School of Economics and Political Science
Houghton Street, Aldwych
London WC2A 2AE, England

Abstract Information
Abstract: THE THEORY OF **CONGESTION** TOLLS (OR **ROAD PRICING**) IS THAT THE TOLL SHOULD EQUAL THE DIFFERENCE BETWEEN SOCIAL MARGINAL COST AND PRIVATE COST FOR THE FLOW WHICH WILL PREVAIL AFTER THE INTRODUCTION OF THE TOLL. THE DEDUCTION OF THE COST FUNCTION HAS NORMALLY FOLLOWED THE CONVENTIONAL LINES OF GENERAL COST THEORY. THIS, HOWEVER, DOES NOT HOLD GOOD AT ONE IMPORTANT POINT, VIZ., WHEN IT IS ASSUMED THAT THE PRODUCTION FUNCTION HAS TO BE DEFINED FOR A GIVEN UNIT OF TIME. IN GENERAL THE INCREMENTAL COST OF AN INCREASE IN OUTPUT WILL, IN THE SHORT RUN, BE LESS WHEN IT IS POSSIBLE TO EXTEND THE PERIOD OF PRODUCTION - A MORE EFFICIENT FACTOR COMBINATION CAN BE MAINTAINED - THAN WHEN, AS IN THE NORMAL CASE, THE ADDITIONAL OUTPUT HAS TO BE PRODUCED WITHIN A FIXED PERIOD OF PRODUCTION. IN THE THEORY OF **CONGESTION** TOLLS IT IS ASSUMED THAT THE PERIOD OF PRODUCTION IS FIXED. IF THIS IS NOT A REALISTIC ASSUMPTION FOR THE PRODUCTION OF TRIPS BETWEEN HOME AND WORK, **CONGESTION** TOLLS FOR CAR COMMUTERS CALCULATED BY THE METHOD NOW USED WILL BE TOO HIGH. /AUTHOR/
Supplementary notes: Vol 3, No 3, PP 300-305

Miscellaneous Information:
HRIS Accession Number: 1P15207913

TRIS accession number: 202427 *TRIS files:* HRIS. H.

TRIS Record Flag: 2

Title: **ROAD PRICING**: THE ECONOMIC AND TECHNICAL POSSIBILITIES (THE SMEED REPORT)
Foreign Language:

Publication Information:
Publication Date: 0/00/64 **Pagination:** 44 pp
References: 31 Ref **Appendices:**

Publisher/Corporate Author 1:
Her Majesty's Stationery Office /Upu

Abstract Information
Abstract: A STUDY WAS MADE OF THE TECHNICAL FEASIBILITY OF VARIOUS METHODS FOR IMPROVING THE PRICING SYSTEM RELATING TO THE USE OF ROADS, AND OF RELEVANT ECONOMIC CONSIDERATIONS. THE SOCIAL AND POLITICAL ASPECTS OF THE SUBJECT WERE EXTRICATED INSOFAR AS POSSIBLE FROM THE TECHNICAL AND ECONOMIC ISSUES. THE FOLLOWING CONCLUSIONS WERE REACHED: (1) DEFICIENCIES EXIST IN THE PRESENT METHODS OF TAXATION, NOTABLY THEIR INABILITY TO RESTRAIN PEOPLE FROM MAKING JOURNEYS WHICH IMPOSE HIGH COSTS ON OTHER PEOPLE. ROAD CHARGES COULD USEFULLY TAKE MORE ACCOUNT THAN THEY DO OF THE LARGE DIFFERENCES THAT EXIST IN **CONGESTION** COSTS BETWEEN ONE JOURNEY AND ANOTHER. (2) LITTLE ADVANTAGE WAS FOUND IN THE DIFFERENTIAL FUEL TAX, WHICH COULD NOT BE RELATED AT ALL CLOSELY TO **CONGESTION** COSTS, AND THE POLL TAX ON EMPLOYEES IN CONGESTED AREAS, WHICH--WHATEVER ITS MERIT IN OTHER FIELDS--WOULD HAVE LITTLE EFFECT ON ROAD **CONGESTION**. (3) THE PARKING TAX COULD BRING SIGNIFICANT BENEFITS, IN SPITE OF ITS INEQUITABLE RESULTS AND ITS UNDERSIRABLE EFFECTS IN ENCOURAGING NON-PARKING TRAFFIC AND PENALIZING LOCAL TRAFFIC. PREFERABLE TO A PARKING TAX MIGHT BE A SYSTEM OF DAILY LICENSES, WHICH WOULD EMBRACE ALL TRAFFIC IN THE AREAS CONCERNED BUT WOULD IN TURN GIVE RISE TO DIFFICULT BOUNDARY PROBLEMS. (4) CONSIDERABLY SUPERIOR RESULTS ARE POTENTIALLY OBTAINABLE FROM DIRECT PRICING SYSTEMS. BY CHARGING MORE WHEN COSTS ARE HIGH AND LESS WHEN COSTS ARE LOW, IT IS ESTIMATED THAT A PRACTICABLE SYSTEM IN URBAN AREAS COULD YIELD ECONOMIC BENEFITS FROM REDUCED **CONGESTION** OF 100 MILLION TO 150 MILLION POUNDS A YEAR UNDER PRESENT TRAFFIC CONDITIONS; AND THIS ESTIMATE EXCLUDES SOME IMPORTANT ITEMS WHICH CANNOT BE MEASURED. (5) SIX METER SYSTEMS (TWO MANUAL AND FOUR AUTOMATIC) WERE DESCRIBED WHICH, WITH DEVELOPMENT, COULD PROBABLY BE MADE EFFECTIVE. SOME OF THE SIX METER SYSTEMS SHOW PROMISE OF SATISFYING A LIST OF 17 REQUIREMENTS WHICH WERE CONSIDERED DESIRABLE FOR A **ROAD PRICING** SYSTEM. THE MAIN CONCLUSION, THEREFORE, IS THAT THERE IS EVERY POSSIBILITY THAT AT LEAST ONE OF THESE PROPOSALS COULD BE DEVELOPED INTO AN EFFICIENT CHARGING SYSTEM AND COULD YIELD SUBSTANTIAL BENEFITS ON CONGESTED ROADS. A NUMBER OF OTHER ALLIED SUBJECTS WERE RECOMMENDED FOR FUTURE INVESTIGATION.
Supplementary notes: 3 APP

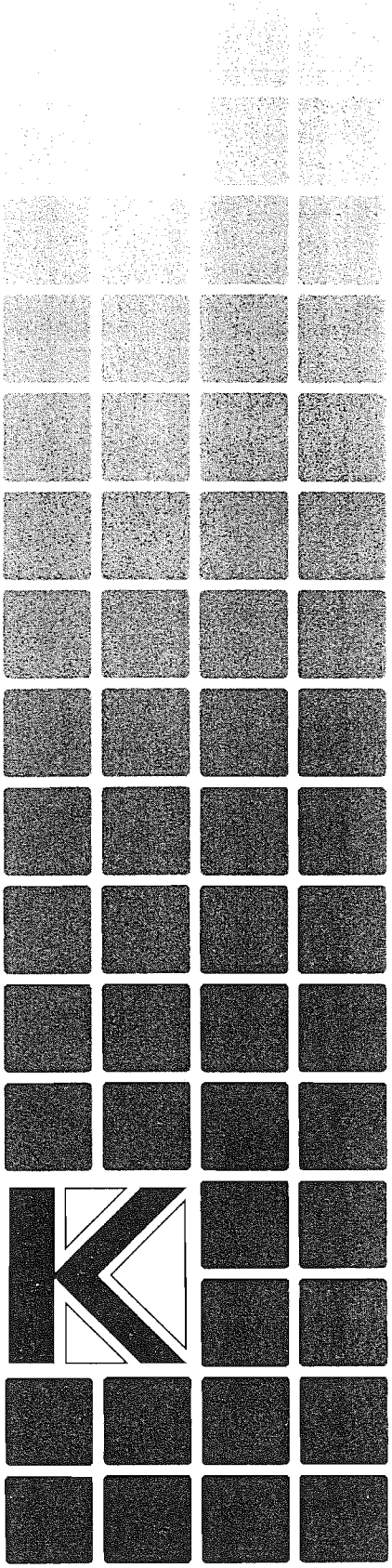
Miscellaneous Information:
HRIS Accession Number: 3P15235251

APPENDIX B

CONGESTION PRICING PROGRAMS

Congestion Pricing Programs

Kimley-Horn and Associates, Inc.



KITTELSON & ASSOCIATES, INC.
Transportation Planning/Traffic Engineering

January 1994

Congestion Pricing Programs

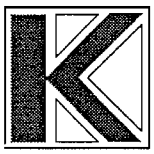
for:

Kimley-Horn and Associates, Inc.
5100 Northwest 33rd Avenue
Fort Lauderdale, Florida 33309
tel: (305) 739-2233
fax: (305) 739-2247

by:

Kittelson & Associates, Inc.
610 S.W. Alder Street, Suite 700
Portland, Oregon 97205
tel: (503) 228-5230
fax: (503) 273-8169

January 1994



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INTRODUCTION

In many urban areas, traffic congestion is increasing at an alarming rate. According to a recent Institute of Transportation Engineers (ITE) survey, it is the number one concern in many urban areas. Traffic congestion is predicted to worsen, but recent legislation enacted by Congress (the Clear Air Act Amendment of 1990) will limit the number of lane-miles of roadway facilities that can be constructed in most urban areas. The increasing traffic congestion affects the economic welfare of our local and national economy by increasing the cost to do business. Many hours are wasted because of time spent inefficiently waiting in traffic. A main cause of traffic congestion can be linked to American desires and driving patterns. For many urban freeway facilities, the average vehicle occupancy rate is barely above 1.0.

One strategy to reduce urban congestion that has gained recent attention is congestion pricing. Congestion pricing is a demand management strategy that promotes efficiency in the transportation system. The objective of congestion pricing is to shift some trips to off-peak periods, higher-occupancy vehicles, or routes away from congested facilities. Congestion pricing offers an opportunity to reduce traffic congestion by influencing public attitude using financial/market incentives to ride share, divert trips to alternative routes, or travel during off-peak hours. Depending on the location, duration, and extent of the congestion problem, pricing can be applied to a network of expressways, to expressways and principal arterials within a congested travel corridor, to selected segments of an expressway, to congested bridge and tunnel crossings, and/or to the surface street system within a congested zone.

Dade County, Florida is considering congestion pricing as an element of a road pricing program. As part of a road pricing feasibility study, an initial task was to identify existing congestion pricing programs and interview staff involved in those programs. The search for congestion pricing programs was not limited to just the United States, but included cities worldwide. This study of existing congestion pricing programs provides a basis for Dade County to identify issues such as past and present objectives and strategies, lessons learned, funding sources, and revenue allocation.

The original objective was to gather information from at least six congestion pricing programs; however, there are not six existing congestion pricing programs. To satisfy the task objective, the study scope was modified to include past, present, and planned congestion pricing projects. By expanding the scope of the task, six programs were carefully identified for study: (1) Hong Kong (past); (2) Singapore (present); (3) Oslo, Norway (present); (4) Bergen, Norway (present); (5) San Francisco, California (future); and (6) Orange County, California (future).

In 1975, Singapore initiated the world's first congestion pricing program by implementing their Area Licensing Scheme. This aggressive program focused on reducing peak period road traffic within the regulated area by 25 to 30 percent. This program achieved its objective by reducing vehicular traffic in the city core by almost 50 percent. The ALS requires vehicles entering the restricted zone to display a dated license plate on the front windshield. Guards posted at overhead gantries at 33 entry points into the city check vehicles for proper permits.

In January 1994, the ALS was expanded to include tolls for the period between the morning and evening peak periods. Reduced tolls were charged during the off peak hours. In addition, the ALS is in the process of upgrading the toll collection system to an automated system. The system should be automated by 1997.

In 1983, Hong Kong initiated a two-year electronic road pricing experiment. At 18 locations in central Hong Kong, 2,600 vehicles were monitored with automated vehicle identification equipment. The system operated using five different time periods throughout a 12-hour day. The experiment was a technical success. By 1985, the number of private cars had been reduced by 50 percent of the total vehicle population (fleet). In addition, the automatic vehicle identification equipment was 99 percent accurate in identifying individual vehicles. However, the program was met with great public opposition and lacked political support. The two year experiment was abolished in 1985. Since then, Hong Kong has been following the success of Singapore's and their movement toward widespread electronic toll collection and will possibly re-implement road pricing in the future. Hong Kong is currently using electronic toll collection to collect tolls for the Aberdeen and Cross Harbour Tunnels.

Bergen, Norway identified road pricing as a viable means to collect much needed but unavailable funding for infrastructure improvements. In 1986, Bergen installed toll cordons around the city. Five years later, Oslo, Norway began a similar program. Both cities operate a congestion priced toll collection system for the sole purpose of raising revenue for new road projects and public transportation. Approximately 80 percent of total revenue is used to fund road construction and improvements, with the remaining 20 percent used to fund bus lanes and improve public transportation. Both Norwegian cities have had great success with their congestion pricing programs.

Congestion pricing programs are also being planned and developed here in the United States. In Orange County, California, the State Route 91 (SR 91) project will be the first congestion pricing facility in the United States with an operational facility planned to open in late 1995. The SR 91 program is a privately funded project consisting of two new lanes in each direction constructed in the median of the existing SR 91. The four new lanes will be operated as express lanes for high-occupancy vehicles. Single-occupant vehicles will be permitted to use the new lanes for a price based on the level of congestion. Construction on the express lanes began in 1993 and will be completed in late 1995. The SR 91 will use 100-percent automated vehicle identification and electronic toll collection technology. The total estimated project cost to add four express lanes to the median of the 10-mile segment is approximately $125 million, including design, environmental studies, construction costs, contingencies, and financing costs. Legislative authority was given by California's Assembly Bill 680, which permitted the California Department of Transportation to grant franchises for the development of privately financed toll roads.

The federal government, through Intermodal Surface Transportation Efficiency Act (ISTEA) is pushing forward with a congestion pricing pilot program. The San Francisco-Oakland Bay Bridge project will receive up to $25 million per year from 1992 through 1997 to carry out the requirements of the program. The toll revenues and other local funding sources will be used to fund increased transit services in the corridor. A portion of the revenues may be used to reduce fares on the local transit system. Analysis of the proposed program indicates that it should have favorable effects on traffic demand and air quality. The date for project implementation has not been established.

In general, data from the interviews indicate that the key to implementing a successful congestion pricing program is early planning with clearly stated objectives and clear allocation of revenues. Most congestion pricing projects began with manual toll collection but soon installed some type of electronic toll collection (ETC) system. Singapore is the only existing system that does not utilize ETC; however, installation of such a system is planned.

Organization of Report

This report documents the results of telephone interviews conducted with each agency. Telephone interviews were used to obtain first-hand information about each of the six previously identified congestion pricing programs. The telephone interview material was supplemented with information gained through other sources, such as published and unpublished research reports and telephone and personal contacts with knowledgeable individuals. This was particularly necessary for such programs as Hong Kong because the Secretary of Transport at the time of the project is no longer in that position.

Each telephone interview focused on several predetermined questions to allow direct comparison of the programs. The predetermined interview questions are listed below.

Background Information

- Location of the congestion pricing program, including city, state, and country
- Population of area, including the population of the city proper and the metropolitan area

Implementation and Operation

- Objective of program, e.g., fund raiser, congestion mitigation, pollution control
- Type of road pricing: Area or corridor priced
- Date of program implementation
- Time of day tolls are charged, including any differential pricing policy
- Tolls charged--Who is charged (carpool, bus, taxis, etc.) and how much
- Manner in which tolls are collected: Automated Vehicle Identification (AVI) or permit (manual)
- Method of enforcement for toll collection

Legislative Authority--Who provides the legal authority to toll roadways

Operating Authority--Name of operating agency, key officers, and telephone numbers

Changes Since Beginning--Includes changes in tolls and collection periods

Results/Impacts

- Changes in traffic volumes since program was implemented

Community Support--Level of community support and acceptance

Problems with the Program

What is Good about the Program

Cost to Implement/Revenue Yield/Allocation of Funds

Equity Problems--How are they dealt with, e.g., rebates to low income groups

Alleged environmental benefits

Measured elasticities

Future/Planned Activity--Trial period, changes, planned expansion

SINGAPORE

Background Information

Singapore, an island nation of approximately 640 square kilometers, is the world's foremost example of congestion pricing. In 1973, the population was 1.58 million; by 1991, the population had grown to 3 million. From 1962 to 1973, auto ownership grew at an annual rate of 8.8 percent. In 1975, the country had an auto ownership to population ratio of 1.16, which was projected to grow 300 to 400 percent by 1992. As a result of increased auto ownership, the city suffered from severe congestion during the morning and evening.

The city of Singapore is the main center of employment of Singapore, with approximately 70 percent of the jobs concentrated within a 8 kilometer (3 mile) radius of the city. A large portion (84 percent) of the population live in highrise apartments located across bay waters. A network of high-speed expressways connect the city with the outlying residential housing across the bay.

Implementation and Operation

In June 1975, Singapore implemented the Area Licensing Scheme (ALS) to reduce vehicle congestion by slowing the growth of car ownership and encouraging the use of public transportation. The road pricing program was packaged with staggered work hours, increased vehicle taxation, land use planning policies, higher parking fees, and an investment in park-and-ride facilities. The intent was to reduce peak hour road traffic in the regulated area by 25 to 30 percent.

Originally, vehicles were charged tolls from 7:30 to 10:15 a.m. only. In 1989, the ALS included an evening toll period between 4:30 and 6:30 p.m. Under the ALS, all cars, taxis, commercial-goods vehicles, and non-scheduled buses entering the restricted zone to pay S$3.00 (US$1.25). Motorcycles pay S$1 (US$0.50) and private company/corporate cars pay S$6.00 (US$2.50). There are 33 restricted entry points along the outskirts of the central business district (CBD).

On January 3, 1994, the Singapore ALS was expanded to an all-day tolling structure. The morning and evening restricted time periods remained unchanged; however, the mid-day period is now included in the restricted time period. All vehicles with a whole-day license (WDL) that enter the restricted zone must pay the toll discussed in the previous paragraph. Vehicles with a part-day license (PDL) may enter the restricted zone from 10:15 a.m. to 4:30 p.m. for a reduced toll. With a PDL

private vehicles pay S$2.00, motorcycles pay S$0.70, and private company vehicles pay S$4.00. The extended restricted zone toll was introduced in an effort to reduce mid-day congestion in the CBD.

Vehicles entering the restricted zone are required to display a dated license plate on the windshield. Participants purchase a daily or monthly license from kiosks or post offices located just outside the restricted zone and the permit allows unlimited entry into the restricted zone. Guards are posted at each of the entry points (gantries) and heavy fines are imposed on motorists who enter the zone without a permit.

Legislative Authority

The ALS is part of a comprehensive package (see section on Implementation and Operation) of traffic restraint measures adopted by the Singapore government.

Operating Authority

The Area Licensing Scheme operates under the authority of the Roads and Transportation Division within the Public Works Department. The contact is:

Mr. A.P. Gopinath Menon
Chief Transportation Engineer
Roads and Transportation Division for Public Works
Ministry of National Development
5 Maxwell Road, #13-00
National Development Building
Singapore
Zip Code 0106
Tel: (65) 3225535
Fax: (65) 3225569

The ALS operates under the umbrella authority of the Ministry of National Development.

Major Changes Since Beginning

There have been a number of changes in the ALS over the 17 years that the ALS has been in operation. Below is a listing of the major changes that have occurred since the ALS began in 1975.

August 1975

- The toll exemption for taxis was rescinded.
- Because commuters had altered their driving patterns to arrive at the restricted zone after 9:00 a.m., the restricted period was extended to 10:00 a.m. This extension caused the number of vehicles entering the CBD to decreased by 45 percent. Private car use decreased by 75 percent and the average travel speed increased by 22 percent, from 27 km/hr (17 mi/hr) to 44 km/hr (27 mi/hr).
- The daily license fee for automobiles was lowered from S$4.80 to S$3.00 (US$2.00 and US$1.25, respectively).
- Motorcycles tolls were increased to S$1.20 (US$ 0.50) per day.

June 1989

- The objective of the ALS was changed from discouraging vehicle use for commuting to using the ALS as a traffic management tool to curtail congestion.
- All vehicles were charged tolls except emergency vehicles and public buses.
- The morning restricted period was extended to 10:15 a.m. and an afternoon restricted period, from 4:30 to 6:30 p.m. was initiated.
- Ten gantries were added.

January 1994

- The ALS expanded to include the mid-day period from 10:15 a.m. to 4:30 p.m.

ALS Results/Impacts

Upon implementation of ALS during the morning restricted hours in 1975, the inbound traffic decreased by 44 percent. In 1975, car pooling accounted for 23 percent of all car trips; by November 1978, the number of trips made in car pools increased to 53 percent.

While much of the reduction in traffic volume came from people switching modes of transportation or changing their travel patterns, a considerable portion also came from traffic being diverted to circumference routes. There was a substantial increase in traffic on the roads surrounding the congestion priced area during morning rush hour. This problem was relieved by altering the physical traffic management systems to give priority to vehicles on the ring road at the expense of those on the outskirts of the system.

The ALS affected the traffic patterns by reducing automobile traffic by 75 percent within the first month and decreased all vehicle traffic by 50 percent. Outlying parking lots that had been constructed for transit commuters were deemed unsuccessful almost from inception, with only 4 percent of the parking spaces used in the first year and a half. The shuttle service was also a failure, with ridership well below the capacity of the bus system.

Community Support (Public Opinion)

There has not been much public opposition to the ALS, which is viewed as another form of taxation. The ALS was one of many pricing policies used to alter driver behavior, including increased automobile, fuel, and parking taxes.

Problems with the Program

Problems encountered with the Singapore ALS have been associated with drivers adjusting their travel patterns to arrive immediately before or after the restricted time.

Immediately after the implementation of the Whole-Day road pricing policy, outlet centers that sell daily and monthly permits encountered very long queues from first-time patrons of the restricted zoned roadways during the restricted hours of operation (mid-day roadway users). Evidently, a large number of vehicle users entered the CBD during unrestricted hours of operation to avoid the toll period. Now those vehicle users are required to purchase a license to enter the CBD any time between 7:30 a.m. and 6:30 p.m.

What is Good about the Program

Vehicle traffic in Singapore has been significantly reduced. The World Bank (1) predicted that without the ALS package of traffic management measures, there would have been bumper-to-bumper traffic conditions throughout the restricted zone by 1982. Deferred or canceled investment for roads amounts to a savings to society of approximately S$1.5 billion (US$600 million).

(1) Hau, T.D., Congestion Charging Mechanisms for Roads, Working Paper Series 1071, The World Bank, Washington, D.C., 1992.

The ALS has been shown to be an effective means of controlling urban traffic congestion when used as part of an overall transportation strategy. The all-day road pricing policy in the restricted zone can be considered a prelude to what may happen in the future. The Transport Ministry is considering tolling all vehicles on all roadways throughout Singapore. However, if the ALS is expanded to all roadways, the owners of vehicles may see a lowered road tax. Vehicle owners currently pay a large road tax every six months. The road tax is based on the cubic capacity of the vehicle; the bigger the vehicle, the higher the tax.

Cost to Implement the Program/Revenue Yield/Allocation of Funds Received

The capital cost of the ALS was S$6.6 million (US$2.8 million) in 1975, which included parking structures. The recurrent cost from 1975 through 1989 was S$1.0 million (US$0.4 million), which includes about 40 gantry attendants for enforcement purposes. Monthly operating costs averaged S$59,000 (US$24,000) from 1975 to 1985. Increasing the restricted period to include the evening rush hour and adding more overhead gantries increased the average monthly operating cost to S$295,000 (US$118,000).

Monthly revenues from the sale of ALS licenses averaged S$472,000 (US$190,000) for the last four months of 1975. In 1992, the annual revenue from license sales was S$38 million (US$15 million). All revenue collected by the ALS is given directly to the Central Revenue Fund, which receives all revenue from all sources.

Affected Population Groups

An estimated 60 percent of all work trips do not pass through the restricted zone and are not affected by the tolls. Car users who did enter the restricted area had higher operating costs and reduced trips by 10 percent. Most households that did not own cars continued as before; however, a significant net travel time savings occurred, presumably as a result of reduced congestion.

In Singapore, only one family in ten owns a car. In fact, one must "bid" against others for the right to purchase a car. For this reason, the overall effect on the population has been minimal.

One predominant reason that car ownership is low in Singapore (in addition to a high taxes associated with owning and operating vehicles) is the superb network of public transport now in operation throughout Singapore. Since the ALS was first implemented in 1975, more than S$2.5 billion (US$1

billion) dollars has been put into infrastructure improvements. An estimated 66 percent of commuters use public transportation.

Effect on Pollution

There have been no reported measured impacts on pollution since the ALS began in 1975. The Ministry of Environment monitors air quality, similar to the United States Environmental Protection Agency. Air quality standards implemented for Singapore since the ALS began have not yet been achieved.

Future/Planned Activity

Singapore is in the process of upgrading their labor-intensive system to an electronic congestion pricing system. The new system is scheduled to be in operation by 1997. The initial goal is to turn the 33 manually controlled gantry points into electronically controlled entry points. The government's intent is to use a sophisticated electronic congestion pricing system to control vehicle use at specific locations during periods of congestion.

HONG KONG

Background Information

In 1982, the Transport Branch of the Government of Hong Kong was faced with an imminent traffic congestion crisis. Hong Kong's urban core is the most densely populated area in the world, with almost 4 million people living in the 40 square kilometers surrounding the harbour. The number of registered vehicles had increased from 125,000 in 1971 to 330,000 in 1981, at a growth rate of 8.4 percent. Today, the annual increase in registered vehicles is approximately 10 percent. By 1981, the number of registered vehicles per kilometer of road space had reached 282, the highest in the world. In contrast, the Transport Branch calculated that, as a result of financial and topographic constraints, road capacity was only increasing at a rate of 3 percent per year.

In November 1982, the government of Hong Kong initiated a feasibility study of electronic road pricing in Hong Kong City. The study predicted that electronic road pricing would reduce peak-period traffic, increase off-peak travel, and decrease car ownership, all by 20 percent. The study concluded that road pricing would reduce congestion more than the electronic license plate program; however, road pricing would cost more and produce less revenue.

Implementation and Operation

In March 1983, the government of Hong Kong decided to begin a 2-year electronic road pricing experiment. The experiment consisted of equipping 2,600 vehicles with an electronic numbered plate mounted beneath the car. At 18 locations in central Hong Kong, sensing loops were buried under the road surface; the loops were connected to a roadside computer, which was connected by telephone lines to a central computer. Based on information sent to the computer and information stored in the central computer, a monthly bill could be sent to the automobile owner.

The program's objective was to demonstrate how driver behavior and associated travel patterns could be affected through road pricing and to experiment with electronic toll collection technology.

The road pricing system operated during five time periods throughout a 12-hour day, from 7 a.m. to 7 p.m.. These were the morning peak, the afternoon peak, two shoulder peak periods (time prior to morning and afternoon peak), and the interpeak (off-peak). Shoulder peak charging,

immediately before and after the morning and afternoon peaks, was designed to deal with the boundary problems encountered in the Singapore ALS by smoothing out the traffic. Vehicles traveling during shoulder peak periods were charged one-half of the peak charge. There was no charge for travel during the off-peak period from dusk until dawn. A fee of HK$7 each [US$0.90] was charged for vehicles crossing a cordon line which encircles the CBD.

In order to ensure compliance with the scheme, closed circuit cameras were installed at certain roadside computer locations. If an automobile passed over the sensing unit but registered either no signal or an invalid signal, the camera could be activated to photograph the auto's license plate.

Legislative Authority

The Hong Kong Government, specifically the Transport Branch of the Executive Council, authorized the electronic road pricing scheme in Hong Kong.

Operating Authority

The Hong Kong electronic road pricing scheme operated under the authority of the Transport Branch, which is the highest policy-making group within the Executive Council. The Transport Secretary at the time of implementation was Alan Scott. The current contacts are:

Mr. Michael Man-Kin Leung, Secretary for Transport
Government Secretarist
Lower Albert Road
Hong Kong
Tel: (852) 810-2451
Fax: (852) 868-4643

Mr. John Telford
Deputy Secretary for Transport, Transport Management
Government Secretarist
Lower Alvert Road
Hong Kong
Tel: (852) 810-2078
Fax: (852) 868-4643

Distinct Changes Made Since Start

A comprehensive transport study (2) showed that 75 percent of the total road space was used by only 25 percent of the total passengers. The majority of the road space was taken by private cars and taxis. To reduce vehicle traffic, the government tripled annual license fees on private cars to HK$3600 (US$462), and doubled initial registration taxes on private cars and motorcycles to 70 to 90 percent of a vehicle's import price. The existing duty on gasoline was also doubled to HK$1.40 (US$0.18) a liter. After a short evaluation period, the tax and fee increase policy was deemed to be inequitable and ineffective. The policy was abandoned and the Hong Kong government began to explore electronic road pricing (ERP).

ERP Results/Impacts

For the two years the ERP system was in operation (1983 to 1985), vehicle ownership for private and public use decreased dramatically. By 1985, the number of private cars decreased by 50 percent of the total vehicle fleet. Private car use declined by 10 percent (note that less than 10 percent of the households had access to a private car). The number of commercial vehicles remained unchanged. Some people began to register small trucks and vans as commercial vehicles to avoid the taxes. Some of the hardest hit by the tax increases were the least affluent car owners, who tended not to drive their cars downtown to work.

Community Support (Public Opinion)

The electronic road pricing program was met with considerable opposition from the press, private car owners, and politicians. The program was abandoned in response to public outcry and rejection by Hong Kong's district governing boards.

Problems with the Program

Two reasons why the Hong Kong ERP failed are: poor timing (considering Hong Kong's overriding concern about its upcoming transition in 1997 from a British Territory to an autonomous zone within the People's Republic of China), and poor community and political involvement in implementing the program. At the time of implementation, the Transport Branch did not attempt to involve the government or the community in planning and implementing road pricing policies. In addition, the

(2) Hau, T.D., Congestion Charging Mechanisms for Roads, Working Paper Series 1071, The World Bank, Washington, D.C., 1992.

Transport Branch limited the amount of information available to the public concerning electronic road pricing. Transpotech, a consulting firm owned by the British government, was hired to perform the analysis of the program; however, only a brief summary of the program data and results was made available to the public.

What was good about the program?

The program was a technical success. The original specifications called for a vehicle identification technology that was 99 percent accurate. Tests found that 99.7 percent of all vehicle crossings were accurately recorded and the roadside computers were operational more than 99 percent of the time.

Implementation Costs/Revenue Yield/Allocation of Funds

The experiment cost HK$5 million (US$650,000), which included design and testing of road pricing hardware, an analysis of traffic demand, and a policy analysis of alternatives.

In 1985, the total capital cost for the proposed system was estimated to be HK$240 million (US$31 million).

Equity, Environmental Impacts, and Elasticities

This information was not readily available through the telephone interview.

Future/Planned Activities

In early 1992, the Government of Hong Kong began testing state-of-the-art AVI technology (Amtech one-way, radio-frequency-based communications systems and PREMED stored-communications systems) for electronic toll collection at the Aberdeen and Cross Harbour Tunnels; with full commercial operation planned at some future date. The only obstacles that currently exist are legislative changes that must be made to the tunnel ordinances and by-laws.

Hong Kong still has a very congested roadway system. Transport Branch staff are watching Singapore's efforts with AVI systems very closely.

BERGEN, NORWAY

Background Information

In the 1970s and 1980s, many cities throughout Norway were highly congested; however, the cost to improve roadways systems in Bergen was much higher than the funding allocated by the Norwegian Parliament. If the city relied on public funds, it would have taken about 30 years to construct necessary road improvements and additions. Instead, in 1985, Bergen entered into an agreement with the government: Through a special grant, the national government provides matching funds for net revenue from Bergen's toll ring. This arrangement allowed the funds available for construction to double over the 15 years starting in 1985.

Implementation and Operation

In January 1986, six toll gates were installed around the city center of Bergen. Tolls were set at a fixed price from 6 a.m. to 10 p.m. on weekdays. Seasonal passes are offered at a reduced price. Toll rates are listed in Table 1.

Table 1. Bergen Toll Ring Charges

	Light Vehicles	Heavy Vehicles
Pass, Annual	NOK[1] 1,100.00	2,200.00
Pass, Semi-annual	NOK 575.00	1,150.00
Pass, Monthly	NOK 100.00	200.00
Pre-paid Ticket	NOK 4.50	9.00
Single Ticket	NOK 5.00	10.00

[1] NOK denotes Norwegian kroner (US$1.00 = NOK$6.30)

Only motorists driving to the city center are charged. Two of the toll gates have four lanes and the rest have two lanes. Scheduled busses are exempt from tolls to enter the city. Motorists can purchase passes in advance. Vehicles with a valid pass on the windshield can pass through reserved lanes at the toll booths without stopping. The system also has manually operated toll lanes for motorists who pay on a trip basis. These lanes have a capacity of 600 to 700 vehicles an hour.

To ensure compliance, license plates of the vehicles passing through the lanes reserved for pass holders are videotaped during a randomly selected time period at a randomly selected toll gate. The recorded license numbers are compared to a database containing valid license plate numbers for pass holders. Violators are charged NOK$200 (US$32.00). Norwegian law only permits four hours of video surveillance taped data. The video technology used is noted as being exceptional because a fraction of a second worth of license plate number image is recorded and stored; thus, allowing the license numbers of most of the vehicles that pass through the toll facility in a day to be recorded.

Legislative and Operational Authority

The Bergen Toll Rings were approved by the Norwegian Parliament. The local highway agency, Bergen Public Roads Administration, submitted a proposal to the Norwegian Highway Agency to enter into a cooperative venture to levy tolls, with net revenue to be matched by the national government.

Operation of the Bergen cordon toll scheme is overseen by:

Mr. Eilif Backer-Røed
Daniel Hansensgae 9
Bro-og Tunnelselskapet A/S
P.O. Box 4311 Nygârdstangen
5028 Bergen
Tel: (47) 55-320710
Fax: (47) 55-313412

Planning for the Bergen Toll Ring is under the direction of:

Mr. Arild Eggen

Hordaland vegkontoret
Postboks 3645
5033 Fyllingsdalen
Tel: (47) 55-173000
Fax: (47) 55-168715

Changes made Since Beginning

Originally, in 1986, all toll collection was made manual; however, within the first year of operation, automatic toll collection was implemented.

Cost to Implement/Revenue Yield/Allocation of Funds

The capital cost of the system (including the construction of tollgates, consultant fees, equipment and the publicity campaign) was NOK12.8 million in 1986 (US$2.58 million). Operating costs, including the toll operators' salaries, amount to NOK7.2 million per year (US$1.45 million). The gross revenue totalled NOK55 million in 1986 (US$11.10 million).

All revenues generated by the Bergen Toll Ring are matched by the central government. Eighty percent of the funds received is earmarked for road construction and improvements. Twenty percent is used for improvements to bus lanes and to improve public transit. Even bikeways are constructed with the toll ring revenues.

Result/Impacts

The impact of the toll ring in Bergen was small. A survey of approximately 2,000 vehicles was performed by the Institute of Transport Economics in 1985, and repeated in 1986. The data indicated that motorists with seasonal passes behaved differently than those who paid tolls on a trip basis. Table 2 shows that there was a significantly higher decrease in trips for vehicles paying per trip than for vehicles paying with a seasonal pass. For vehicles paying with seasonal passes, there was not a significant percent change in commuting pattern. After implementation of the toll ring, the total number of vehicles entering the city center decreased by 10 percent during the restricted period. The survey found that the average level of car occupancy did not change and that there was little change in trip timing.

Table 2. Percentage Change in Number of Trips

	Cars with Seasonal Pass	Cars Paying Per Trip
6:00 am - 9:00 am	-0.3	-40.8
9:00 am - 5:00 pm	12.2	21.1
5:00 pm - 10:00 pm	2.1	-35.2

In a survey conducted by the Institute of Transport Economics, Norwegian Centre for Transport Research, the effects of the toll ring were:

(a) Changes in route choice were negligible because the topography allows almost no detours.
(b) There was an internal adjustment for households with seasonal passes that have more than one car, resulting in more car trips because there is no additional toll for additional trips.
(c) It is unclear whether a change in mode choice from car to public transport took place.
(d) Through traffic declined by 6 to 7 percent;
(e) car occupancy seems to have increased slightly; and
(f) changes in trip timing are observed at the end of the charging period but the effect is not significant.

Problems

The toll ring was introduced and negotiated over such a long period of time that there are no significant problems with the toll scheme.

What's Good about the Program?

The success of the Bergen Toll Rings (and Oslo's, discussed next) resulted from the 10 years of carefully negotiated agreements between all agencies involved and careful community involvement. The program was carefully developed and introduced, before it was implemented.

The toll is relatively small compared to parking and gasoline taxes. The public does not strongly object to paying the toll because they understand that the revenues are returned through infrastructure improvements.

Public/Business Support

Public support is very positive because the toll facilities provide funding for much-needed road improvements in about half the time that it would otherwise have taken. Businesses have responded positively because the roads are improved for their transportation needs.

Future

Plans are being considered to introduce a second toll ring between the outer toll ring and the city core. The inner toll ring would improve equity in the tolls collected. Vehicles traveling through the entire distance would still pay the current toll; however, vehicles traveling for a short distance within the outer toll ring would only pay tolls relative to the shorter distance travelled.

OSLO, NORWAY

Background Information

As in Bergen, traffic in Oslo, Norway was congested and funds allocated by the central government were too limited for effective road expansion. Oslo considered a toll ring because of the success of Bergen's program. The transportation package for the development of a toll ring and new highways and bridges was jointly funded by the government and toll revenues.

Implementation and Operation

In February 1990, a toll ring consisting of 18 gates was installed on all access roads into the city. Only motorists going into the CBD are charged tolls. Major access roads into the CBD have five to six lanes, while smaller access roads have two to three lanes. More than 200,000 vehicles pass through the toll ring daily. In 1990, an all-electronic control and payment system was installed. The system, which is based on surface acoustical wave technology, uses a passive vehicle tag that requires no batteries. Currently the Oslo system charges NOK10 (US$1.60) 24-hours a day and is used only for seasonal pass holders; although the system does have the ability to track variable charges.

Compliance is enforced by taking videographs of all vehicles that pass through the tolls gates and issuing a penalty by mail of NOK250 (US$16.89) to violators.

Legal Authority

As in Bergen, the Oslo Toll Rings were approved by the Norwegian Parliament. The local highway agency, Oslo Public Roads Administration, submitted a proposal to the Norwegian Highway Agency to enter into a cooperative venture to levy tolls with resulting net revenue to be matched by the central government.

Operating Authority

The Oslo Toll Rings are operated under the local authority of the Public Roads Administration Office of the County of Oslo. The contact is:

Mr. Trond Bjørgan
Chief County Roads Officer
Public Roads Administration, County of Oslo
P.O. Box 8037 DEP
Tel: (47) 22-575500
Fax: (47) 22-575599

Tolls are collected by the private company Fjell-Linjen A/S. Contact:

Mr. Lars Lind
Fjell-Linjen A/S
St. Olavsgt 28
0166 Oslo 1, Norway
Tel: (47) 22-115420
Fax: (47) 22-115430

Changes Since Beginning Operation

The Oslo Toll Ring was designed with the Bergen Toll Ring as an example. Unlike the Bergen Toll Ring, the Oslo Toll Ring has used automatic toll collection from implementation. There have been no significant changes since the program began.

Results/Impacts

The effects of the Oslo toll ring have yet to be studied. In 1992, the Institute of Transport Studies began a comprehensive impact study of the Oslo Toll Ring. Preliminary estimates suggest that the decrease in traffic is less than 5 percent.

Community Support

As in Bergen, the public does not object to the toll ring because it will result in roads being improved much sooner than would otherwise be possible.

What is Good about the Program?

The Bergen and Oslo toll rings have raised revenues for roadway improvements without significantly affecting travel behavior.

Cost to Implement/Revenue Yield/Allocation of Funds

The original cost of the system was about NOK$10 billion (US$1.59 billion), plus NOK$230 million (US$36.76 million) for the toll gates.

The Oslo Toll Ring was formed for the purpose of financing both roads and public transit in Oslo, with 80 percent earmarked for road improvements and construction and 20 percent for public transit, including busways.

Annual revenues are estimated at NOK$600 million (US$95.89 million). Operating costs are 10 to 12 percent of revenues.

Future/Planned Activities

The Oslo Toll Ring will continue to operate until the year 2005, when the 15 year funding requirements will be met.

ORANGE COUNTY, CALIFORNIA

Background

State Route 91 in Orange County, California serves as an integral part of Southern California's transportation network and is a major commuter route between residential and employment centers in Orange, Riverside, and San Bernadino counties. The SR 91 is the only major highway connecting Orange and Riverside Counties. Over the past 10 years, the existing 8 and 10-lane freeway has experienced a compounded traffic growth rate of 8.4 percent per year. The SR 91 facility currently carries 188,000 vehicles daily (average daily traffic). It has been estimated that by 2010, the daily traffic count will reach 320,000 vehicles.

Implementation and Operation

The proposed toll facility will have two lanes of traffic in each direction constructed in the median of the existing SR 91. The four new lanes will be operated as express lanes. Vehicles with three or more occupants--only about 4 percent of the total customer base--will be allowed to use the express lanes at no cost. Single-occupant vehicles will be permitted to use the express lanes for a toll ranging between 25 cents during the off-peak up to $2 during the peak-hour.

The project will be operated using an electronic toll collection (ETC) and enforcement system in coordination with an automated electronic traffic management system (TMS). The TMS will monitor traffic conditions on the conventional mixed traffic lanes of SR 91 and will feed that information to the ETC. The ETC will charge tolls dynamically, with the amount of toll being determined by the level of congestion on the parallel facility. As traffic becomes more congested, the tolls charged to use the express lane will increase. Thus, the price for premium service will depend on how much better that service is than the free service. The toll charged will also be based on the level of service in the express lanes so that a high level of service is maintained in those lanes. If the traffic in the express lanes is too great to permit a high level of service, the tolls on the express lanes will be raised until the traffic volume diminishes sufficiently to restore the desired high service level. The success of this project will depend on the successful integration of the ETC and the TMS, as well as on careful planning of operations and attention to development strategy, particularly the issues discussed previously.

Financing is through a group of lenders--Citi-Corp, Banque Nationale de Paris, and Societe Generale. Equity partners are construction conglomerate Peter Kiewit Sons' Inc., of Omaha, Nebraska; Cofiroute Corp., the Los Angeles-based subsidiary of the large French toll-road builder; and Granite Construction Inc., of Watsonville, California.

Toll Collection and Enforcement

The SR 91 project will employ 100 percent AVI and ETC technology. MFS Network Technologies has been selected to install the electronic toll tag management (ETTM) system. The SR 91 project will be one of the first all-AVI toll roads in the United States. Significant elements of the SR 91 ETTM system include:

- A video enforcement system that automatically captures a video image of violating vehicles' license plates and superimposes relevant information on the image for possible citation processing.
- A fiber optic communication network that provides the "backbone" linking all video, voice, and data systems.
- Variable message signs located significantly before the entrance to the toll lanes, advising motorists of traffic conditions ahead in time to change lanes safely.
- Vehicle detection and video surveillance coupled to a traffic management system. In-road vehicle detection placed every 1/4 mile will sense traffic conditions. Upon detecting abnormal conditions, the video surveillance system, which will provide video coverage of the entire roadway, will activate a corresponding set of surveillance cameras that will transmit a real-time video of the area in question.
- A command and control center computing system will provide for the management of revenue, traffic, maintenance, operations and customer service of the toll road.
- A specially designed mobile communication system will link toll road operations to the California Highway Patrol and the California Department of Transportation (Caltrans).

Users of SR 91 toll lanes are expected to pass through at least two toll collection areas using the AVI electronic toll collection system identified previously. Traffic entering the toll lanes will have been provided advance traffic information as well as other appropriate user information via overhead signs.

Legislative Authority

The SR91 Express Lane project is part of a demonstration program authorized by Assembly Bill 680. Caltrans has granted four franchises for development of privately financed tollroads. The private tollroad is being developed by California Private Transportation Corporation (CPTC).

Operating Authority

As previously mentioned, the CPTC will operate and maintain the toll expressway. The managing director of CPTC and project contact is:

Gerald S. Pfeffer
Executive Vice President
Kiewit Infrastructure Ventures
Omaha, Nebraska
Tel: (402) 342-2052

Community Support

The SR-91 project is expected to increase the average travel speed of the corridor, thus reducing travel time. Estimates of 1997 travel time savings are predicted to be as high as 40 minutes. In addition, because the project is privately funded, state and local funds are available for use in other corridors to improve transportation facilities, including funding for HOV lanes, that might not otherwise be financed.

Cost to Implement

The total estimated project cost to add four express lanes to the median of the 10-mile segment of the existing SR 91 is approximately $125 million, including design, environmental, construction, contingencies and financing costs. Construction of the project started early in 1993. Construction contracts specify a 36-month schedule.

Allocation of Funds

The SR project is privately funded, therefore, the revenue supports the operation and maintenance of the toll facility and profits are returned to the investors. The state has limited CPTC to a 17 percent return on investment. However, if CPTC can reduce overhead and increase ridership, they can earn up to 23 percent if they split the additional revenue with the two counties.

SAN FRANCISCO, CALIFORNIA

Background Information

The San Francisco-Oakland Bay Bridge currently serves more than 250,000 vehicles a day. Twenty tollbooths collect tolls in the westbound (San Francisco) direction only during the peak period (5 a.m. to 10 a.m. and 3 p.m. to 6 p.m.). Four of the twenty toll booths revert to carpool lanes during the morning and afternoon peak-periods, allowing free passage to cars carrying three or more occupants.

On May 29 and November 24, 1992, the Federal Highway Administration placed an announcement in the Federal Register soliciting proposals from state and local governments for participation in the Congestion Pricing Pilot Program. The congestion pricing program is the result of recent legislation (Section 1012(b) of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991) which directs the Secretary of Transportation to solicit the participation of state and local governments and public authorities in congestion pricing pilot projects.

The Interagency Review Group (comprised of representatives of the FHWA, the Office of the Secretary of Transportation, the Federal Transit Administration, the Environmental Protection Agency, and the Department of Energy) evaluated proposals for congestion pricing projects, which were submitted for inclusion in the FHWA congestion pricing pilot program. The solicitation period closed on January 25, 1993. Proposals for participation were received from 16 urban areas in 9 states. In summer 1993, the San Francisco-Oakland Bay Bridge was chosen as an initial pilot project. Other locations are still being evaluated.

In general, the San Francisco-Oakland Bay Bridge demonstration project calls for replacing the existing, fixed tolls on the Bay Bridge with a variable toll structure. Non-carpools will pay a higher toll to cross the bridge during the congested peak periods, while carpools and vanpools of three or more occupants will continue to travel across the bridge free. Ridesharing programs will be upgraded by providing additional bus, ferry and BART service. Revenues raised from the higher bridge tolls will be applied towards expanding options to driving alone in the corridor.

Legislative Authority

Under this program, the Secretary of Transportation (U.S. Department of Transportation's Federal Highway Administration) will enter into cooperative agreements with Caltrans and the Metropolitan Transportation Commission (MTC) to establish, maintain, and monitor the congestion pricing pilot project.

Implementation and Operation

Implementation of congestion pricing on the Bay Bridge will be carried out in three phases. In the first phase, a preferred congestion pricing strategy will be developed through a participatory process involving several cycles of strategy development, analysis, and review by the sponsors, affected interests, and focus groups. The second phase will be project implementation. During specific peak traffic periods, non-HOVs will pay an increased toll to travel on the Bay Bridge. Simultaneously, improvements to supporting and parallel transit services and rideshare programs will be made. The third phase will involve detailed monitoring and evaluation of the demonstration program results.

The objectives of the congestion pricing program are:

- To reduce daily, recurring peak period congestion
- To influence travel behavior by charging a price that reflects the full social costs of driving alone
- To improve regional mobility by using the majority of the revenues raised to improve corridor transit options
- To improve air quality by reducing localized carbon monoxide concentrations and regional ozone levels
- To conserve energy by reducing fuel consumption
- To avoid unfairly affecting economically disadvantaged or disabled groups
- To provide real-world data on drivers' responses to congestion pricing and experience on how to design, implement, and run a congestion pricing program
- To familiarize the American public and elected officials with the concept of congestion pricing in a politically and technical feasible form
- To link congestion pricing to AVI technology

A Task Force has been formed to facilitate the implementation of congestion pricing on the Bay Bridge. The Bay Area Congestion Pricing Task Force is a diverse group of government, business, environmental, and public interest organizations. Members of the Task Force include:

Metropolitan Transportation Commission--The regional transportation planning and financing agency for the nine-county San Francisco-Oakland Bay Area. The MTC is the designated metropolitan planning organization (MPO) for the region and is responsible for the allocation of bridge toll revenues for many of the toll revenue funding programs.

Bay Area Air Quality Management District--The regional agency for the nine- county Bay Area that regulates sources of air pollution. The District is responsible for implementing state and federal air pollution control laws regionally.

Bay Area Council--A business-sponsored organization that is involved in public policy issues affecting the San Francisco Bay region.

Bay Area Economic Forum--A public/private partnership established by the Association of Bay Area Governments and the Bay Area Council to address issues affecting the economic vitality of the San Francisco Bay Region.

California Department of Transportation (Caltrans)--The state transportation agency for constructing, maintaining, and operating California's highways and bridges.

Environmental Defense Fund--A national non-profit organization that links science, economics, and law to create innovative, economically viable solutions to environmental problems.

Santa Clara County Manufacturing Group--A coalition of companies that work together with public and private organizations to promote the economic environment and enhance the quality of life in Santa Clara County.

The Sierra Club--An international environmental organization that works through a network of volunteers on transportation and other environmental issues.

Union of Concerned Scientists--A national organization of scientists and other citizens dedicated to advancing responsible public policies in areas where technology plays a critical role.

Operating Authority

The Bay Bridge congestion pricing project operates under the authority of the Federal Highway Administration. Contacts for this project are:

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Funding

The total cost of the project is estimated at $28.9 million. Of this amount, $22.8 million would be funded through ISTEA, $5.6 million by toll revenues generated from congestion pricing and $293,800 by staff support from members of the Task Force.

A maximum of $25 million is authorized per year from 1992 through 1997 to be made available to carry out the requirements of the program.

Allocation of Funds

The revenues raised through toll revenues and other local sources are anticipated to fund transit services. Transit services that may increase could be: Transbay Bus service; ferry service; Bay Area Rapid Transit (BART) service; and Peninsula and East Bay Transit Feeder and Distribution Services. A portion of the revenues may be used to reduce fares for Transbay Transit riders.

As mentioned previously, the third phase of this project is monitoring and evaluation of the congestion pricing project. Funding will be used to augment existing traffic monitoring activities carried out by Caltrans to ensure that the full scope and impact of congestion pricing is measured.

Required Legislative Action

The actual toll structure for the Bay Area toll bridges (excluding the Golden Gate bridge) is established by the Metropolitan Transportation Commission, with concurrence by the California Transportation Commission. The maximum toll levels and uses of toll revenues are set by the California State Legislature.

In 1977 and again in 1988, the State Legislature authorized toll increases to $1 and allowed the MTC to use these new toll revenues for highway and transit capital improvements. For the congestion pricing program, tolls higher than $1 are anticipated; therefore, the Task Force pursued a state bill in the 1993 State Legislation session to authorize a congestion pricing demonstration project on the Bay Bridge.

Toll Collection

Caltrans recently released a Request for Proposal for Electronic Toll Collection (ETC) using Automatic Vehicle Identification (AVI) technology. The Bay Bridge is anticipated to have the ETC technology fully operational by summer 1995. While tolls for the FHWA demonstration project will initially be collected at the existing 20 toll booths, AVI technology will ultimately be used to collect the tolls.

Enforcement

The California Highway Patrol currently enforces toll compliance on the Bay Bridge. The existing enforcement program will be expanded as part of the demonstration project. Patrol units will monitor the toll plaza approximately 4 hours per day on alternating days. In addition to monitoring the HOV

lanes and toll booths, patrol units will also monitor the approaches to the toll plaza immediately before the end of the peak periods and issue citations to vehicles attempting to wait out the peak toll (this latter issue is being investigated for legal authority).

Anticipated Tolls

The exact peak period toll to be collected will be determined in the planning phase of the project. Currently, Greig Harvey with Deakin, Harvey, Skabardonis is working with the Task Force in determining the optimal toll. Preliminary analysis indicates that a toll of $4.00 Westbound only would clear congestion and produce substantial revenues.

APPENDIX C

ELIGIBLE FACILITY SHEETS

FACILITY:	Florida Turnpike and HEFT
LIMITS:	Broward County line to I-95 (Turnpike) and to Cutler Ridge (HEFT)
FACILITY TYPE:	Four and six lane toll expressways
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for the construction of new lanes. Capital and operating assistance for IVHS projects, such as Sunpass.
ADVANTAGES:	Revenue and congestion management. Management of peak volumes volumes entering the Golden Glades interchange.
DISADVANTAGES:	
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	SR 874 (Don Shula Expressway)
LIMITS:	HEFT to SR 826 (Palmetto Expressway)
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding a HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	SR 874 (Don Shula Expressway) Extension
LIMITS:	HEFT to SW 137 Avenue
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding a HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	SR 112 (Airport Expressway)
LIMITS:	I-95 to Miami International Airport
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	SR 112 (Airport Expressway) Extension
LIMITS:	Miami International Airport to HEFT
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	SR 836 (Dolphin Expressway)
LIMITS:	I-95 to SR 826 (Palmetto Expressway)
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	SR 836 (Dolphin Expressway) Extension
LIMITS:	SR 826 (Palmetto Expressway) to HEFT
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	Gratigny Parkway
LIMITS:	SR 826 (Palmetto Expressway) to Douglas Road
FACILITY TYPE:	Six lane toll expressway
PRICING STRATEGY:	Add real time congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital assistance for the extension of the parkway east to I-95. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding a HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Moderate
COMMENTS:	

FACILITY:	Broad Causeway (123rd Street Causeway)
LIMITS:	Biscayne Boulevard to Harding Avenue
FACILITY TYPE:	Existing tolled causeway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Aggressive
COMMENTS:	

FACILITY:	Venetian Causeway
LIMITS:	Biscayne Boulevard to Alton Road
FACILITY TYPE:	Existing tolled causeway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor. Capital and operating assistance for fixed guideway projects in the east-west corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Aggressive
COMMENTS:	

FACILITY:	Rickenbacker Causeway
LIMITS:	Brickell Avenue to Virginia Key
FACILITY TYPE:	Existing tolled causeway
PRICING STRATEGY:	Weekend congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Moderate
COMMENTS:	Special discounts to residents and resident workers should stay in effect.

FACILITY:	William Lehman Causeway
LIMITS:	US 1 to Ocean Boulevard
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	Peak period-only congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance would be very difficult
CATEGORY:	Aggressive
COMMENTS:	Residents should be allowed to travel free.

FACILITY:	William Lehman Causeway
LIMITS:	US 1 to Ocean Boulevard
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance would be very difficult
CATEGORY:	Ultra Aggressive
COMMENTS:	Residents should be allowed to travel free. A candidate for elimination.

FACILITY:	Sunny Isles Causeway
LIMITS:	US 1 to Ocean Boulevard
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	Peak period-only congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance would be very difficult
CATEGORY:	Aggressive
COMMENTS:	Residents should be allowed to travel free. A candidate for elimination.

FACILITY:	Sunny Isles Causeway
LIMITS:	US 1 to Ocean Boulevard
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance would be very difficult
CATEGORY:	Ultra Aggressive
COMMENTS:	Residents should be allowed to travel free. A candidate for elimination.

FACILITY:	North Bay Causeway
LIMITS:	US 1 to Harding Avenue
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	Peak period-only congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance would be very difficult
CATEGORY:	Aggressive
COMMENTS:	Residents should be allowed to travel free.

FACILITY:	North Bay Causeway
LIMITS:	US 1 to Harding Avenue
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance would be very difficult
CATEGORY:	Ultra Aggressive
COMMENTS:	Residents should be allowed to travel free. A candidate for elimination.

FACILITY:	McArthur Causeway and I-395
LIMITS:	U.S. 1 to Alton Road
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	Peak period-only congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor. Capital and operating assistance for fixed guideway along the east-west corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Very Aggressive
COMMENTS:	Residents should be allowed to travel free

FACILITY:	McArthur Causeway and I-395
LIMITS:	US 1 to Alton Road
FACILITY TYPE:	Existing toll-free causeway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS (especially ETTM) projects. Capital and operating assistance for express bus service along the corridor. Capital and operating assistance for fixed guideway along the east-west corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Very Aggressive
COMMENTS:	Residents should be allowed to travel free.

FACILITY:	Port of Miami Bridge
LIMITS:	U.S. 1 to Port of Miami
FACILITY TYPE:	Existing toll-free Bridge
PRICING STRATEGY:	Peak period-only congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects (especially for seamless airport to cruise transfers). Capital and operating assistance for fixed guideway along the east-west corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Very Aggressive
COMMENTS:	

FACILITY:	Port of Miami Bridge
LIMITS:	US 1 to Port of Miami
FACILITY TYPE:	Existing toll-free bridge
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects (especially for seamless airport to cruise transfers). Capital and operating assistance for fixed guideway along the east-west corridor.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Ultra Aggressive
COMMENTS:	A candidate for elimination

FACILITY:	I-195 and Julia Tuttle Causeway
LIMITS:	I-95 to SR A1A
FACILITY TYPE:	Six lane non-toll expressway
PRICING STRATEGY:	HOVL pricing - add a lane
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding and/or taking an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Very Aggressive
COMMENTS:	

FACILITY:	I-195 and Julia Tuttle Causeway
LIMITS:	I-95 to SR A1A
FACILITY TYPE:	Six lane non-toll expressway
PRICING STRATEGY:	HOVL pricing - take a lane
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding and/or taking an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Very Aggressive
COMMENTS:	

FACILITY:	I-195 and Julia Tuttle Causeway
LIMITS:	I-95 to SR A1A
FACILITY TYPE:	Six lane non-toll expressway
PRICING STRATEGY:	Peak hour-only congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding and/or taking an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Very Aggressive
COMMENTS:	

FACILITY:	I-195 and Julia Tuttle Causeway
LIMITS:	I-95 to SR A1A
FACILITY TYPE:	Six lane non-toll expressway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for IVHS projects. Capital and operating assistance for fixed guideway transit along the east-west corridor, and for the multi-modal terminal. Capital and operating assistance for express bus service along the corridor. Capital assistance for adding and/or taking an HOV lane.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Very Aggressive
COMMENTS:	Peak hour-only pricing is more acceptable

FACILITY:	I-95
PROJECT LIMITS:	Broward County line to downtown Miami
FACILITY TYPE:	Eight and ten lane expressway, including two existing HOV lanes
PRICING STRATEGY:	HOVL Pricing - Take a lane (Existing HOVL's plus take 2 lanes
USES OF FUNDS:	Capital expenses for the conversion of one regular lane to an HOV lane. Capital and operating assistance for the construction of a new HOV lane. Capital and operating assistance for the FEC busway or HOV way from 203rd Street to downtown Miami. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Moderately Aggressive
COMMENTS:	

FACILITY:	I-95
PROJECT LIMITS:	Broward County line to downtown Miami
FACILITY TYPE:	Eight and ten lane expressway, including two existing HOV lanes
PRICING STRATEGY:	Peak period only congestion pricing
USES OF FUNDS:	Capital expenses for the conversion of one regular lane to an HOV lane. Capital and operating assistance for the construction of a new HOV lane. Capital and operating assistance for the FEC busway or HOV way from 203rd Street to downtown Miami. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Aggressive
COMMENTS:	

FACILITY:	I-95
PROJECT LIMITS:	Broward County line to downtown Miami
FACILITY TYPE:	Eight and ten lane expressway, including two existing HOV lanes
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital expenses for the conversion of one regular lane to an HOV lane. Capital and operating assistance for the construction of a new HOV lane. Capital and operating assistance for the FEC busway or HOV way from 203rd Street to downtown Miami. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Very Aggressive
COMMENTS:	

FACILITY:	SR 826 (Palmetto Expressway)
PROJECT LIMITS:	Golden Glades interchange to US 1
FACILITY TYPE:	Six lane expressway
PRICING STRATEGY:	HOVL Pricing - Add a lane
USES OF FUNDS:	Capital assistance for the construction of a new HOV lane. Capital and operating assistance for north-south corridor mobility (Central Parkway, Tri-rail, multi-modal facility, FEC corridor). Capital and operating assistance for express buses along the corridor. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Conservative
COMMENTS:	

FACILITY:	SR 826 (Palmetto Expressway)
PROJECT LIMITS:	Golden Glades interchange to US 1
FACILITY TYPE:	Six lane expressway
PRICING STRATEGY:	HOVL Pricing - Take one lane, add one lane
USES OF FUNDS:	Capital expenses for the conversion of one regular lane to an HOV lane. Capital assistance for the construction of a new HOV lane. Capital and operating assistance for north-south corridor mobility (Central Parkway, Tri-rail, multi-modal facility, FEC corridor). Capital and operating assistance for express buses along the corridor. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Moderately Aggressive
COMMENTS:	

FACILITY:	SR 826 (Palmetto Expressway)
PROJECT LIMITS:	Golden Glades interchange to US 1
FACILITY TYPE:	Six lane expressway
PRICING STRATEGY:	Peak period only congestion pricing
USES OF FUNDS:	Capital and operating assistance for north-south corridor mobility (Central Parkway, Tri-rail, multi-modal facility, FEC corridor). Capital and operating assistance for express buses along the corridor. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Aggressive
COMMENTS:	

FACILITY:	SR 826 (Palmetto Expressway)
PROJECT LIMITS:	Golden Glades interchange to US 1
FACILITY TYPE:	Six lane expressway
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital expenses for the conversion of one regular lane to an HOV lane. Capital assistance for the construction of a new HOV lane. Capital and operating assistance for north-south corridor mobility (Central Parkway, Tri-rail, multi-modal facility, FEC corridor). Capital and operating assistance for express buses along the corridor. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Very Aggressive
COMMENTS:	

FACILITY:	SR 878 (Snapper Creek Parkway)
LIMITS:	SR 874 (Don Shula Expressway) to US 1
FACILITY TYPE:	Six lane existing toll expressway
PRICING STRATEGY:	Peak period-only westbound toll, collected at the SR 874 tollbooths. AM-only eastbound toll to reduce congestion on US 1
USES OF FUNDS:	Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	
CATEGORY:	Aggressive
COMMENTS:	Very low volumes, and no independant tolls are feasible. Candidate for elimination. Tolls can be collected on SR 874.

FACILITY:	SR 7/ U.S. 441
PROJECT LIMITS:	NW 183rd Street to Golden Glades interchange
FACILITY TYPE:	Existing arterial street
PRICING STRATEGY:	AM Peak period-only southbound congestion pricing
USES OF FUNDS:	Capital expenses for the conversion of one regular I-95 lane to an HOV lane. Capital and operating assistance for the FEC busway or HOV way from 203rd Street to downtown Miami. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail, Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Aggressive
COMMENTS:	Effective strategy to reduce congestion at the Golden Glades interchange during the AM peak period

FACILITY:	NE 167th Street/SR 826 (east of Golden Glades)
PROJECT LIMITS:	N. Miami Avenue to Golden Glades interchange
FACILITY TYPE:	Existing arterial street
PRICING STRATEGY:	AM Peak period-only westbound congestion pricing
USES OF FUNDS:	Capital expenses for the conversion of one regular I-95 lane to an HOV lane. Capital and operating assistance for the FEC busway or HOV way from 203rd Street to downtown Miami. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail, Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by the "uses"
CATEGORY:	Aggressive
COMMENTS:	Effective strategy to reduce congestion at the Golden Glades interchange during the AM peak period

FACILITY:	Miami International Airport (MIA) access road
PROJECT LIMITS:	SR 112 airport interchange to MIA
FACILITY TYPE:	Six lane expressway
PRICING STRATEGY:	Peak period congestion pricing
USES OF FUNDS:	Capital and operating assistance for MIA roads, traffic, and parking projects.
ADVANTAGES:	Revenue and congestion management. Collects revenues from airport users that do not use parking facilities.
DISADVANTAGES:	Physical layout and operation
CATEGORY:	Aggressive
COMMENTS:	Revenues should only be used for MIA projects.

FACILITY:	Okechobee Road (US 27)
PROJECT LIMITS:	HEFT to SR 826 (Palmetto Expressway)
FACILITY TYPE:	Existing arterial street
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Upgrade existing facility to an expressway. Capital and operating assistance for an express busway along the northwest corridor. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Very Aggressive
COMMENTS:	Upgrade to expressway status

FACILITY:	Okechobee Road (US 27)
PROJECT LIMITS:	SR 826 (Palmetto Expressway) to SR 112 (Airport Expressway)
FACILITY TYPE:	Existing arterial street
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Upgrade existing facility to an expressway. Capital and operating assistance for an express busway along the northwest corridor. Capital and operating assistance for the Central Parkway corridor, including the multi-modal facility, and Tri-rail. Capital and operating assistance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance will be very difficult
CATEGORY:	Ultra aggressive
COMMENTS:	Candidate for elimination

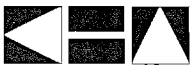
FACILITY:	Central Parkway
PROJECT LIMITS:	Golden Glades interchange to SR 112
FACILITY TYPE:	Proposed multi-lane expressway (with tolls)
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for the construction of multi-modal assets in the CSX corridor including the Tri-Rail and the HSR. Capital and operating assistance for the FEC busway or HOV way from 203rd Street to downtown Miami. Capital and operating assistance for the north-south corridor, including the multi-modal facility, and Tri-rail. Capital and operating assistance for IVHS projects in the corridor.
ADVANTAGES:	Revenue and congestion management Significant congestion relief for I-95
DISADVANTAGES:	Community impacts
CATEGORY:	Very Aggressive
COMMENTS:	Should provide considerable relief to I-95 congestion.

FACILITY:	US 1 / South Dixie Highway
PROJECT LIMITS:	US 41 to Cutler Ridge
FACILITY TYPE:	Six lane divided arterial
PRICING STRATEGY:	Peak period pricing only
USES OF FUNDS:	Capital and operating assistance for the construction and operation of the FEC busway from Dadeland South to Cutler Ridge. Capital and operating assistance for Metrorail, including possible fare reductions during peak periods to encourage transit ridership, and along Metrorail extension corridor south of Dadeland South. Capital and operating assitance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public resistance mollified to some extent by "uses"
CATEGORY:	Very Aggressive
COMMENTS:	Transit interests should support this

FACILITY:	US 1 / South Dixie Highway
PROJECT LIMITS:	US 41 to Cutler Ridge
FACILITY TYPE:	Six lane divided arterial
PRICING STRATEGY:	HOVL Pricing - Take a lane
USES OF FUNDS:	Capital expenses for the conversion of one regular lane to an HOV lane. Capital and operating assistance for the construction and operation of the FEC busway from Dadeland South to Cutler Ridge. Capital and operating assistance for Metrorail, including possible fare reductions during peak periods to encourage transit ridership, and along Metrorail extension corridor south of Dadeland South. Capital and operating assitance for IVHS projects.
ADVANTAGES:	Congestion management
DISADVANTAGES:	
CATEGORY:	Very Aggressive
COMMENTS:	Candidate for elimination - low income yield

FACILITY:	US 1 / South Dixie Highway
PROJECT LIMITS:	US 41 to Cutler Ridge
FACILITY TYPE:	Six lane divided arterial
PRICING STRATEGY:	24-hour congestion pricing
USES OF FUNDS:	Capital and operating assistance for the construction and operation of the FEC busway from Dadeland South to Cutler Ridge. Capital and operating assistance for Metrorail, including possible fare reductions during peak periods to encourage transit ridership, and along Metrorail extension corridor south of Dadeland South. Capital and operating assitance for IVHS projects.
ADVANTAGES:	Revenue and congestion management
DISADVANTAGES:	Public acceptance mollified to some extent by "uses"
CATEGORY:	Ultra Aggressive
COMMENTS:	Candidate for elimination

FACILITY:	FEC Busway on US 1 / South Dixie Highway
PROJECT LIMITS:	Palmetto Expressway to HEFT
FACILITY TYPE:	Six lane divided arterial
PRICING STRATEGY:	HOVL Pricing - Add a lane (convert busway to HOV-way)
USES OF FUNDS:	Capital expenses for the addition of and HOV way along the FEC corridor. Capital and operating assistance for the construction and operation of the FEC busway from Dadeland South to Cutler Ridge. Capital and operating assistance for Metrorail, including possible fare reductions during peak periods to encourage transit ridership, and along Metrorail extension corridor south of Dadeland South. Capital and operating assitance for IVHS projects.
ADVANTAGES:	Revenue and congestion management. Appearance of better utilization of "empty" busway. Could provide more "feed" to Metrorail's Dadeland stations.
DISADVANTAGES:	Public acceptance mollified to some extent by "uses". Discontinuous facility from Dadeland north to downtown. Intersections could be difficult to manage.
CATEGORY:	Aggressive
COMMENTS:	Selling of surplus capacity and conversion of the FEC Busway to an HOV-way could alleviate traffic congestion on US 1.



Kimley-Horn
and Associates, Inc.

APPENDIX D

ROAD PRICING POLICY QUESTIONNAIRE

NAME_____

METROPOLITAN DADE COUNTY CONGESTION PRICING QUESTIONNAIRE					
	Strongly Favor	Favor	No Opinion	Oppose	Strongly Oppose
1. The existing tollrates on Dade County's expressway are very low (less than 4 cents/mile) in most cases. The national average is typically 6 to 7 cents/mile. Would you favor raising the tolls to this level for existing tolled expressways?					
Would you favor raising tolls to 10 to 12 cents/mile (current market rate for newly constructed urban expressways) if the revenues could be used to finance substantial expressway extensions and transit improvements?					
2. The old LeJeune Douglas Expressway, sometimes referred to as the "Central Parkway" between the Golden Glades Interchange and SR112/Airport Expressway, could possibly be built as a tollway in the CSX corridor. This project might displace up to 25 to 30 industrial buildings and require double-decking of the CSX/Tri-rail tracks in a portion south of the Hialeah yards. Could you support a project like this?					
Would you support privatization of a project like this, if it could be delivered more rapidly by private sector?					
3. A new expressway in the Okeechobee Road corridor has been proposed. How do you feel about constructing the section between SR826 and the HEFT?					
How about constructing the section between SR112 and SR826?					
4. The Rickenbacker Causeway's current toll for non-residents is $1.00. Even at this rate, congestion is almost unbearable on holidays and weekends. Would you favor a congestion toll rate of $1.50 during peak weekend periods?					
Would you favor a congestion toll rate of $2.00 during peak weekend periods?					
Would you favor a congestion toll rate of $2.50 during peak weekend periods?					

	Strongly Favor	Favor	No Opinion	Oppose	Strongly Oppose
5. Two lanes are being added to the Palmetto Expressway over the next several years. Would you favor designating these added lanes as HOV lanes for HOV's with 3 or more passengers?					
Would you favor "selling" the surplus capacity in the HOV lanes to HOV2's at a discount (say 50% to 80%)?					
Would you favor "selling" the surplus capacity in the HOV lanes to SOV's at a premium rate (20 cents to 25 cents/mile)? NOTE: The pricing system would have to be fully automated using AVI systems. Only AVI-equipped cars could use the lane. The AVI card would "transpond" the vehicle's occupancy data. Selective enforcement would be used. The pricing rate would be high enough to maximize utilization of the HOVL without compromising 50 mph+ service during peak periods.					
6. How do you feel about imposing a toll on the Snapper Creek Expressway?					
7. How do you feel about imposing tolls on all of Dade County's "free" causeways, but exempting Beach residents? Imposing tolls at 50 cents/vehicle per direction (current rate on Broad/Venetian)?					
Imposing tolls at $1.00/vehicle per direction?					
Imposing tolls during peak hours only at 50 cents/vehicle per direction?					
Imposing tolls during peak hours only at $1.00/vehicle per direction?					
8. How do you feel about imposing a peak period only toll on South Dixie Highway with revenues dedicated to improving Metrorail service in the corridor (including free Metrorail service during peak hours) using AVI systems with no manned toll booths?					
9. How do you feel about imposing tolls on I-195/Julia Tuttle Causeway and on I-395/McArthur Causeway to help support the financing of the East-West transit line? Would you support tolls during peak-hours only?					
Would you support a 24-hour toll?					
Would you support a 50-cent toll?					
Would you support a $1.00 toll?					

	Strongly Favor	Favor	No Opinion	Oppose	Strongly Oppose
10. How do you feel about constructing the FEC busway as a 3-lane reversible HOV-way and "selling" the surplus capacity to LOV's (HOV2s) and SOV's?					
11. Would you favor converting an existing general-use lane on I-95, or another expressway to an HOV lane and "selling" the surplus capacity to SOV's and LOV's (HOV2's)?					
Would you favor this if the impact on the remaining general-use lanes was relatively small but still noticeable?					
12. Would you favor the above "take-a-lane" strategy on I-95, if the Central Parkway were opened at the same time, to relieve congestion on I-95's general lanes?					
13. Would you favor tolls on existing free expressways if there was a way to compensate the poor, who could not otherwise afford the toll?					
14. Would you favor placing a *peak period only* toll on a congested "free" expressway, like the Palmetto Expressway and/or I-95?					
15. Would you favor this if it materially improved congestion and air quality?					
16. Would you favor this if it created a strong enough revenue stream to capitalize the extension of the Metrorail system?					
17. Would you favor a *24-hour toll* on the Palmetto Expressway and I-95 if it accomplished all of the above?					
18. A ramp metering system is being planned for I-95. Some of these ramp meters will feature bypass lanes for buses and carpools. These bypass lanes could also be tolled in the same manner as HOV lane pricing: HOV3's go free; HOV2's pay 50% to 80% of the fare; and SOV's would pay a premium (say 50 cents) or congestion toll (say $1.00) to bypass the traffic queue at the ramp meter. Would you support this?					

APPENDIX E

REVENUE MODEL OUTPUTS

METRO DADE ROAD PRICING STUDY

ELASTICITY / REVENUE ANALYSIS

		PROJECT DATA						
Project Facility	Pricing Strategy	Miles	O & M Costs/Mile	Total $ O & M Costs/Yr	O & M Costs Growth Rate	Capital Costs/Mile	Total Capital Cost ($M)	Earliest Opening Year
Broad Cswy	24 - Hour Congestion Pricing	0.9	N/A	1,533,448	3.0%	1,000,000	0.90	1997
Central Parkway	24 - Hour Congestion Pricing	9.3	100,000	930,000	3.0%	25,000,000	232.50	2000
Florida Turnpike and HEFT	24 - Hour Congestion Pricing	40.2	100,000	4,020,000	3.0%	1,000,000	40.20	1997
Gratigny Parkway	24 - Hour Congestion Pricing	7.8	100,000	780,000	3.0%	1,000,000	7.80	1997
I-195 & Julia Tuttle Cswy	PPO Congestion Pricing	4.0	N/A	550,681	3.0%	1,000,000	4.00	1997
	24 - Hour Congestion Pricing	4.0	N/A	6,883,513	3.0%	1,000,000	4.00	1997
I-395 & MacArthur Cswy	PPO Congestion Pricing	3.4	N/A	369,100	3.0%	1,000,000	3.40	1997
	24 - Hour Congestion Pricing	3.4	N/A	4,613,755	3.0%	1,000,000	3.40	1997
I-95	HOVL Pricing - Take a lane	17.0	100,000	1,700,000	3.0%	1,000,000	17.00	1997
	PPO Congestion Pricing	17.0	100,000	1,700,000	3.0%	1,000,000	17.00	1997
	24 - Hour Congestion Pricing	17.0	100,000	1,700,000	3.0%	1,000,000	17.00	1997
MIA	24 - Hour Congestion Pricing	2.1	100,000	210,000	3.0%	1,000,000	2.10	1997
NE 167 St / SR 826	PPO WB Congestion Pricing	0.1	50,000	5,000	3.0%	500,000	0.05	1997
North Bay Cswy	PPO Congestion Pricing	2.1	N/A	213,898	3.0%	1,000,000	2.10	1997
	24 - Hour Congestion Pricing	2.1	N/A	2,673,728	3.0%	1,000,000	2.10	1997
Okeechobee Rd NW of SR 826	24 - Hour Congestion Pricing	5.4	100,000	540,000	3.0%	1,000,000	5.40	1997
Okeechobee Rd SE of SR 826	24 - Hour Congestion Pricing	5.2	100,000	520,000	3.0%	1,000,000	5.20	1997
Port of Miami Bridge	PPO Congestion Pricing	0.5	300,000	12,000	3.0%	1,000,000	0.50	1997
	24 - Hour Congestion Pricing	0.5	300,000	150,000	3.0%	1,000,000	0.50	1997
Rickenbacker Cswy	Weekend Premium Cngstn Pricing	3.0	N/A	1,013,012	3.0%	1,000,000	3.00	1997
SR 112 / Airport Expwy	24 - Hour Congestion Pricing	4.0	100,000	400,000	3.0%	1,000,000	4.00	1997
SR 112 / Airport Expwy Ext	24 - Hour Congestion Pricing	8.2	100,000	820,000	3.0%	26,439,000	216.80	2000
SR 7 / US 441	PPO SB Congestion Pricing	0.1	50,000	5,000	3.0%	1,000,000	0.10	1997
SR 826 / Palmetto Exwy	HOVL Pricing - Add a lane	23.0	100,000	2,300,000	3.0%	6,590,000	151.57	1998
	HOVL Pricing - Add + take a lane	23.0	100,000	2,300,000	3.0%	7,590,000	174.57	1998
	PPO Congestion Pricing	23.0	100,000	2,300,000	3.0%	1,000,000	23.00	1997
	24 - Hour Congestion Pricing	23.0	100,000	2,300,000	3.0%	1,000,000	23.00	1997
SR 836 / Dolphin Expwy	24 - Hour Congestion Pricing	12.0	100,000	1,200,000	3.0%	1,000,000	12.00	1997
SR 836 / Dolphin Expwy Ext	24 - Hour Congestion Pricing	1.0	100,000	100,000	3.0%	50,836,000	50.84	2000
SR 874 / Don Shula	24 - Hour Congestion Pricing	7.0	100,000	700,000	3.0%	1,000,000	7.00	1997
SR 874 / Don Shula Ext	24 - Hour Congestion Pricing	1.4	100,000	140,000	3.0%	35,462,000	49.65	2000
SR 878 / Snapper Creek	PPO WB - Congestion Pricing	2.7	50,000	135,000	3.0%	500,000	1.35	1997
Sunny Isles Cswy	PPO Congestion Pricing	0.1	N/A	140,586	3.0%	1,000,000	0.10	1997
	24 - Hour Congestion Pricing	0.1	N/A	1,757,328	3.0%	1,000,000	0.10	1997
US 1 / Biscayne Blvd	HOVL Pricing - Add lanes (+Busway)	13.4	100,000	1,340,000	3.0%	7,521,000	100.78	1998
US 1 / S Dixie Hwy	HOVL Pricing - Take a lane	7.9	100,000	790,000	3.0%	5,019,000	39.65	1997
	PPO Congestion Pricing	7.9	100,000	790,000	3.0%	5,019,000	39.65	1997
Venctian Cswy	24 - Hour Congestion Pricing	2.6	N/A	2,115,666	3.0%	1,000,000	2.60	1997
William Lehman Cswy	PPO Congestion Pricing	0.3	N/A	343,267	3.0%	1,000,000	0.30	1997
	24 - Hour Congestion Pricing	0.3	N/A	4,290,840	3.0%	1,000,000	0.30	1997

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METRO DADE ROAD PRICING STUDY

ELASTICITY / REVENUE ANALYSIS

Project Facility	Pricing Strategy	TRAFFIC DATA						
		-E + C Unrestricted VMT (MVM)	Toll Restrained VMT	No. of Hours in Peak Period (1995)	No. of Hours in Peak Period (2020)	VMT Growth Rate (Yrs 1-20)	VMT Growth Rate (Yrs 20-30)	VMT Growth Rate (Yrs 30-40)
Broad Cswy	24 - Hour Congestion Pricing	0.0190	0.0171	810	1,590	0.19%	0.19%	0.19%
Central Parkway	24 - Hour Congestion Pricing	0.6265	0.6265	810	1,590	0.20%	0.20%	0.20%
Florida Turnpike and HEFT	24 - Hour Congestion Pricing	1.9770	1.3839	810	1,590	1.25%	1.25%	1.25%
Gratigny Parkway	24 - Hour Congestion Pricing	0.2471	0.2471	810	1,590	0.75%	0.75%	0.75%
I-195 & Julia Tuttle Cswy	PPO Congestion Pricing	0.4515	0.2257	810	1,590	0.12%	0.12%	0.12%
	24 - Hour Congestion Pricing	0.4515	0.2483	810	1,590	0.12%	0.12%	0.12%
I-395 & MacArthur Cswy	PPO Congestion Pricing	0.3353	0.3018	810	1,590	0.31%	0.31%	0.31%
	24 - Hour Congestion Pricing	0.3353	0.3018	810	1,590	0.31%	0.31%	0.31%
I-95	HOVL Pricing - Take a lane	3.5926	3.5926	830	1,610	0.28%	0.28%	0.28%
	PPO Congestion Pricing	3.5926	1.7963	830	1,610	0.28%	0.28%	0.28%
	24 - Hour Congestion Pricing	3.5926	1.9759	830	1,610	0.28%	0.28%	0.28%
MIA	24 - Hour Congestion Pricing	0.0402	0.0362	810	1,590	0.10%	0.10%	0.10%
NE 167 St / SR 826	PPO WB Congestion Pricing	0.0037	0.0019	810	1,590	0.36%	0.36%	0.36%
North Bay Cswy	PPO Congestion Pricing	0.1217	0.1095	810	1,590	0.15%	0.15%	0.15%
	24 - Hour Congestion Pricing	0.1217	0.1095	810	1,590	0.15%	0.15%	0.15%
Okeechobee Rd NW of SR 826	24 - Hour Congestion Pricing	0.0910	0.0910	810	1,590	1.00%	1.00%	1.00%
Okeechobee Rd SE of SR 826	24 - Hour Congestion Pricing	0.1852	0.1852	810	1,590	0.50%	0.50%	0.50%
Port of Miami Bridge	PPO Congestion Pricing	0.0159	0.0143	810	1,590	0.31%	0.31%	0.31%
	24 - Hour Congestion Pricing	0.0159	0.0143	810	1,590	0.31%	0.31%	0.31%
Rickenbacker Cswy	Weekend Premium Cngstn Pricing	0.0761	0.0761	446	654	0.40%	0.40%	0.40%
SR 112 / Airport Expwy	24 - Hour Congestion Pricing	0.5572	0.3900	810	1,590	0.23%	0.23%	0.23%
SR 112 / Airport Expwy Ext	24 - Hour Congestion Pricing	0.3629	0.1996	810	1,590	1.06%	1.06%	1.06%
SR 7 / US 441	PPO SB Congestion Pricing	0.0065	0.0033	810	1,590	0.10%	0.10%	0.10%
SR 826 / Palmetto Exwy	HOVL Pricing - Add a lane	3.6234	3.6234	810	1,590	2.10%	2.10%	2.10%
	HOVL Pricing - Add + take a lane	3.6234	3.6234	810	1,590	2.10%	2.10%	2.10%
	PPO Congestion Pricing	3.6234	1.8117	810	1,590	0.10%	0.10%	0.10%
	24 - Hour Congestion Pricing	3.6234	1.9929	810	1,590	0.10%	0.10%	0.10%
SR 836 / Dolphin Expwy	24 - Hour Congestion Pricing	1.6560	1.1592	810	1,590	0.75%	0.75%	0.75%
SR 836 / Dolphin Expwy Ext	24 - Hour Congestion Pricing	0.0523	0.0287	810	1,590	0.03%	0.03%	0.03%
SR 874 / Don Shula	24 - Hour Congestion Pricing	0.8011	0.5607	810	1,590	0.34%	0.34%	0.34%
SR 874 / Don Shula Ext	24 - Hour Congestion Pricing	0.1104	0.0607	810	1,590	2.26%	2.26%	2.26%
SR 878 / Snapper Creek	PPO WB - Congestion Pricing	0.0736	0.0736	810	1,590	1.33%	1.33%	1.33%
Sunny Isles Cswy	PPO Congestion Pricing	0.0024	0.0022	810	1,590	0.49%	0.49%	0.49%
	24 - Hour Congestion Pricing	0.0024	0.0022	810	1,590	0.49%	0.49%	0.49%
US 1 / Biscayne Blvd	HOVL Pricing - Add lanes (+Busway)	0.7091	0.7091	810	1,590	2.27%	2.27%	2.27%
US 1 / S Dixie Hwy	HOVL Pricing - Take a lane	0.4247	0.4247	810	1,590	1.01%	1.01%	1.01%
	PPO Congestion Pricing	0.4247	0.3397	810	1,590	1.01%	1.01%	1.01%
Venetian Cswy	24 - Hour Congestion Pricing	0.0811	0.0730	810	1,590	0.34%	0.34%	0.34%
William Lehman Cswy	PPO Congestion Pricing	0.0178	0.0160	810	1,590	0.19%	0.19%	0.19%
	24 - Hour Congestion Pricing	0.0178	0.0160	810	1,590	0.19%	0.19%	0.19%

METRO DADE ROAD PRICING STUDY

ELASTICITY / REVENUE ANALYSIS

		PRICING / ELASTICITY DATA						
Project Facility	Pricing Strategy	Pricing Rate (cents/mile)	Premium Rate (cents/mile)	% Daily Diversion	% PPO Diversion	Toll Growth Rate (Yrs 1-20)	Toll Growth Rate (Yrs 20-40)	Toll Growth Rate (Yrs 40-50)
Broad Cswy	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
Central Parkway	24 - Hour Congestion Pricing	12	25	0.00%	N/A	4%	3%	2%
Florida Turnpike and HEFT	24 - Hour Congestion Pricing	12	25	30.00%	N/A	4%	3%	2%
Gratigny Parkway	24 - Hour Congestion Pricing	12	25	0.00%	N/A	4%	3%	2%
I-195 & Julia Tuttle Cswy	PPO Congestion Pricing	12	25	N/A	50.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	45.00%	N/A	4%	3%	2%
I-395 & MacArthur Cswy	PPO Congestion Pricing	12	25	N/A	10.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
I-95	HOVL Pricing - Take a lane	12	25	N/A	30.00%	5%	3%	2%
	PPO Congestion Pricing	12	25	N/A	50.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	45.00%	N/A	4%	3%	2%
MIA	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
NE 167 St / SR 826	PPO WB Congestion Pricing	12	25	N/A	50.00%	4%	3%	2%
North Bay Cswy	PPO Congestion Pricing	12	25	N/A	10.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
Okeechobee Rd NW of SR 826	24 - Hour Congestion Pricing	12	25	0.00%	N/A	4%	3%	2%
Okeechobee Rd SE of SR 826	24 - Hour Congestion Pricing	12	25	0.00%	N/A	4%	3%	2%
Port of Miami Bridge	PPO Congestion Pricing	12	25	N/A	10.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
Rickenbacker Cswy	Weekend Premium Cngstn Pricing	12	25	N/A	10.00%	4%	3%	2%
SR 112 / Airport Expwy	24 - Hour Congestion Pricing	12	25	30.00%	N/A	4%	3%	2%
SR 112 / Airport Expwy Ext	24 - Hour Congestion Pricing	12	25	45.00%	N/A	4%	3%	2%
SR 7 / US 441	PPO SB Congestion Pricing	12	25	N/A	50.00%	4%	3%	2%
SR 826 / Palmetto Exwy	HOVL Pricing - Add a lane	12	25	N/A	30.00%	5%	3%	2%
	HOVL Pricing - Add + take a lane	12	25	N/A	30.00%	5%	3%	2%
	PPO Congestion Pricing	12	25	N/A	50.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	45.00%	N/A	4%	3%	2%
SR 836 / Dolphin Expwy	24 - Hour Congestion Pricing	12	25	30.00%	N/A	4%	3%	2%
SR 836 / Dolphin Expwy Ext	24 - Hour Congestion Pricing	12	25	45.00%	N/A	4%	3%	2%
SR 874 / Don Shula	24 - Hour Congestion Pricing	12	25	30.00%	N/A	4%	3%	2%
SR 874 / Don Shula Ext	24 - Hour Congestion Pricing	12	25	45.00%	N/A	4%	3%	2%
SR 878 / Snapper Creek	PPO WB - Congestion Pricing	12	25	30.00%	N/A	4%	3%	2%
Sunny Isles Cswy	PPO Congestion Pricing	12	25	N/A	10.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
US 1 / Biscayne Blvd	HOVL Pricing - Add lanes (+Busway)	12	25	N/A	30.00%	5%	3%	2%
US 1 / S Dixie Hwy	HOVL Pricing - Take a lane	12	25	N/A	30.00%	5%	3%	2%
	PPO Congestion Pricing	12	25	N/A	20.00%	4%	3%	2%
Venetian Cswy	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%
William Lehman Cswy	PPO Congestion Pricing	12	25	N/A	10.00%	4%	3%	2%
	24 - Hour Congestion Pricing	12	25	10.00%	N/A	4%	3%	2%

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METRO DADE ROAD PRICING STUDY

ELASTICITY / REVENUE ANALYSIS

Project Facility	Pricing Strategy	FINANCIAL DATA				
		% Discount Rate	Annual Revenue (M$) (Yr 1)	Annual Revenue (M$) (Yr 20)	Annual Revenue (M$) (Yr 30)	Annual Revenue (M$) (Yr 40)
Broad Cswy	24 - Hour Congestion Pricing	8.0%	5.15	11.26	20.49	30.98
Central Parkway	24 - Hour Congestion Pricing	8.0%	42.33	92.64	168.73	255.32
Florida Turnpike and HEFT	24 - Hour Congestion Pricing	8.0%	93.51	249.27	553.01	1,019.31
Gratigny Parkway	24 - Hour Congestion Pricing	8.0%	16.70	40.58	82.08	137.94
I-195 & Julia Tuttle Cswy	PPO Congestion Pricing	8.0%	1.48	3.19	5.72	8.52
	24 - Hour Congestion Pricing	8.0%	23.13	49.82	89.33	133.07
I-395 & MacArthur Cswy	PPO Congestion Pricing	8.0%	1.37	3.07	5.71	8.82
	24 - Hour Congestion Pricing	8.0%	21.46	47.96	89.17	137.76
I-95	HOVL Pricing - Take a lane	8.0%	11.72	31.20	57.64	88.48
	PPO Congestion Pricing	8.0%	22.23	49.35	91.18	139.96
	24 - Hour Congestion Pricing	8.0%	133.51	296.38	547.57	840.48
MIA	24 - Hour Congestion Pricing	8.0%	2.44	5.25	9.40	13.96
NE 167 St / SR 826	PPO WB Congestion Pricing	8.0%	0.02	0.04	0.07	0.11
North Bay Cswy	PPO Congestion Pricing	8.0%	0.57	1.25	2.25	3.38
	24 - Hour Congestion Pricing	8.0%	8.98	19.49	35.19	52.78
Okeechobee Rd NW of SR 826	24 - Hour Congestion Pricing	8.0%	6.15	15.65	33.14	58.33
Okeechobee Rd SE of SR 826	24 - Hour Congestion Pricing	8.0%	12.52	28.99	55.88	89.51
Port of Miami Bridge	PPO Congestion Pricing	8.0%	0.50	1.11	2.06	3.19
	24 - Hour Congestion Pricing	8.0%	7.76	17.34	32.26	49.85
Rickenbacker Cswy	Weekend Premium Cngstn Pricing	8.0%	1.85	4.20	7.94	12.47
SR 112 / Airport Expwy	24 - Hour Congestion Pricing	8.0%	26.35	58.02	106.31	161.83
SR 112 / Airport Expwy Ext	24 - Hour Congestion Pricing	8.0%	13.49	34.74	74.48	132.65
SR 7 / US 441	PPO SB Congestion Pricing	8.0%	0.03	0.06	0.11	0.17
SR 826 / Palmetto Exwy	HOVL Pricing - Add a lane	8.0%	6.97	26.15	68.04	147.10
	HOVL Pricing - Add + take a lane	8.0%	16.26	60.99	158.72	343.14
	PPO Congestion Pricing	8.0%	21.88	46.98	83.96	124.64
	24 - Hour Congestion Pricing	8.0%	134.66	289.12	516.64	766.99
SR 836 / Dolphin Expwy	24 - Hour Congestion Pricing	8.0%	78.32	190.20	384.40	645.45
SR 836 / Dolphin Expwy Ext	24 - Hour Congestion Pricing	8.0%	1.94	4.12	7.26	10.65
SR 874 / Don Shula	24 - Hour Congestion Pricing	8.0%	37.89	85.19	159.40	247.80
SR 874 / Don Shula Ext	24 - Hour Congestion Pricing	8.0%	4.10	13.22	35.46	78.99
SR 878 / Snapper Creek	PPO WB - Congestion Pricing	8.0%	0.67	1.80	4.06	7.60
Sunny Isles Cswy	PPO Congestion Pricing	8.0%	0.38	0.87	1.68	2.68
	24 - Hour Congestion Pricing	8.0%	5.90	13.65	26.24	41.94
US 1 / Biscayne Blvd	HOVL Pricing - Add lanes (+Busway)	8.0%	4.96	19.19	51.54	114.98
US 1 / S Dixie Hwy	HOVL Pricing - Take a lane	8.0%	2.92	8.93	18.96	33.44
	PPO Congestion Pricing	8.0%	4.10	10.47	22.22	39.19
Venetian Cswy	24 - Hour Congestion Pricing	8.0%	6.58	14.79	27.67	42.99
William Lehman Cswy	PPO Congestion Pricing	8.0%	0.92	2.01	3.66	5.53
	24 - Hour Congestion Pricing	8.0%	14.42	31.48	57.21	86.38

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METRO DADE ROAD PRICING STUDY

ELASTICITY / REVENUE ANALYSIS

Project Facility	Pricing Strategy	FINANCIAL DATA					
		Costs ($M) Yr 1-20	Costs ($M) Yr 20-30	Costs ($M) Yr 30-40	Net Revenue (M$) Yr 1-20	Net Revenue (M$) Yr 20-30	Net Revenue (M$) Yr 30-40
Broad Cswy	24 - Hour Congestion Pricing	3.3	3.9	4.9	8.0	16.6	26.1
Central Parkway	24 - Hour Congestion Pricing	157.4	78.9	2.9	(64.8)	89.8	252.4
Florida Turnpike and HEFT	24 - Hour Congestion Pricing	34.0	22.7	12.7	215.3	530.3	1,006.6
Gratigny Parkway	24 - Hour Congestion Pricing	6.6	4.4	2.5	34.0	77.7	135.5
I-195 & Julia Tuttle Cswy	PPO Congestion Pricing	3.6	2.6	1.7	(0.5)	3.1	6.8
	24 - Hour Congestion Pricing	14.8	17.5	21.8	35.1	71.8	111.3
I-395 & MacArthur Cswy	PPO Congestion Pricing	2.9	2.0	1.2	0.1	3.7	7.6
	24 - Hour Congestion Pricing	10.4	12.0	14.6	37.6	77.2	123.2
I-95	HOVL Pricing - Take a lane	14.4	9.6	5.4	16.8	48.0	83.1
	PPO Congestion Pricing	14.4	9.6	5.4	35.0	81.6	134.6
	24 - Hour Congestion Pricing	14.4	9.6	5.4	282.0	537.9	835.1
MIA	24 - Hour Congestion Pricing	1.8	1.2	0.7	3.5	8.2	13.3
NE 167 St / SR 826	PPO WB Congestion Pricing	0.0	0.0	0.0	(0.0)	0.0	0.1
North Bay Cswy	PPO Congestion Pricing	1.8	1.2	0.7	(0.5)	1.1	2.7
	24 - Hour Congestion Pricing	6.1	7.0	8.5	13.4	28.2	44.3
Okeechobee Rd NW of SR 826	24 - Hour Congestion Pricing	4.6	3.1	1.7	11.1	30.1	56.6
Okeechobee Rd SE of SR 826	24 - Hour Congestion Pricing	4.4	2.9	1.6	24.6	52.9	87.9
Port of Miami Bridge	PPO Congestion Pricing	0.4	0.2	0.0	0.8	1.9	3.2
	24 - Hour Congestion Pricing	0.6	0.5	0.5	16.7	31.7	49.4
Rickenbacker Cswy	Weekend Premium Cngstn Pricing	3.8	3.4	3.2	0.4	4.6	9.3
SR 112 / Airport Expwy	24 - Hour Congestion Pricing	3.4	2.3	1.3	54.6	104.0	160.6
SR 112 / Airport Expwy Ext	24 - Hour Congestion Pricing	146.7	73.5	2.6	(112.0)	1.0	130.1
SR 7 / US 441	PPO SB Congestion Pricing	0.1	0.0	0.0	(0.0)	0.1	0.2
SR 826 / Palmetto Exwy	HOVL Pricing - Add a lane	105.6	55.4	7.3	(79.4)	12.6	139.8
	HOVL Pricing - Add + take a lane	121.0	63.0	7.3	(60.0)	95.7	335.9
	PPO Congestion Pricing	19.4	13.0	7.3	27.5	70.9	117.4
	24 - Hour Congestion Pricing	19.4	13.0	7.3	269.7	503.6	759.7
SR 836 / Dolphin Expwy	24 - Hour Congestion Pricing	10.1	6.8	3.8	180.1	377.6	641.6
SR 836 / Dolphin Expwy Ext	24 - Hour Congestion Pricing	34.2	17.0	0.3	(30.1)	(9.7)	10.3
SR 874 / Don Shula	24 - Hour Congestion Pricing	5.9	4.0	2.2	79.3	155.4	245.6
SR 874 / Don Shula Ext	24 - Hour Congestion Pricing	33.5	16.7	0.4	(20.3)	18.7	78.5
SR 878 / Snapper Creek	PPO WB - Congestion Pricing	1.1	0.8	0.4	0.7	3.3	7.2
Sunny Isles Cswy	PPO Congestion Pricing	0.3	0.4	0.4	0.6	1.3	2.2
	24 - Hour Congestion Pricing	3.1	4.2	5.6	10.5	22.1	36.4
US 1 / Biscayne Blvd	HOVL Pricing - Add lanes (+Busway)	69.9	36.4	4.2	(50.7)	15.1	110.7
US 1 / S Dixie Hwy	HOVL Pricing - Take a lane	28.0	14.9	2.5	(19.0)	4.0	30.9
	PPO Congestion Pricing	28.0	14.9	2.5	(17.5)	7.3	36.7
Venetian Cswy	24 - Hour Congestion Pricing	5.5	5.8	6.7	9.3	21.8	36.3
William Lehman Cswy	PPO Congestion Pricing	0.8	0.9	1.1	1.2	2.8	4.4
	24 - Hour Congestion Pricing	7.7	10.2	13.6	23.8	47.0	72.8

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Broad Causeway - 24 Hr CP					Central Parkway - 24 Hr CP					Florida TP & HEFT - 24 Hr CP				
Project A		Cap Cost	0.90	M$	Project B		Cap Cost	250.00	M$	Project C		Cap Cost	40.20	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	1	5.152	1.533	3.619	1997	1	0.000	0.000	0.000	1997	1	93.512	4.020	89.492
1998	1	5.369	1.579	3.789	1998	1	0.000	0.000	0.000	1998	1	97.442	4.141	93.301
1999	1	5.595	1.627	3.968	1999	1	0.000	0.000	0.000	1999	1	101.536	4.265	97.271
2000	1	5.830	1.676	4.154	2000	1	41.251	1.000	40.251	2000	1	105.803	4.393	101.410
2001	1	6.075	1.726	4.349	2001	1	42.985	1.030	41.955	2001	1	110.249	4.525	105.724
2002	1	6.330	1.778	4.552	2002	1	44.791	1.061	43.730	2002	1	114.882	4.660	110.221
2003	1	6.596	1.831	4.765	2003	1	46.673	1.093	45.581	2003	1	119.709	4.800	114.909
2004	1	6.873	1.886	4.987	2004	1	48.635	1.126	47.509	2004	1	124.739	4.944	119.795
2005	1	7.162	1.943	5.219	2005	1	50.678	1.159	49.519	2005	1	129.981	5.092	124.889
2006	1	7.463	2.001	5.462	2006	1	52.808	1.194	51.614	2006	1	135.443	5.245	130.198
2007	1	7.776	2.061	5.716	2007	1	55.027	1.230	53.797	2007	1	141.135	5.403	135.732
2008	1	8.103	2.123	5.980	2008	1	57.339	1.267	56.073	2008	1	147.065	5.565	141.501
2009	1	8.444	2.186	6.257	2009	1	59.749	1.305	58.444	2009	1	153.245	5.732	147.514
2010	1	8.798	2.252	6.546	2010	1	62.260	1.344	60.916	2010	1	159.685	5.904	153.781
2011	1	9.168	2.319	6.849	2011	1	64.876	1.384	63.492	2011	1	166.395	6.081	160.314
2012	1	9.553	2.389	7.164	2012	1	67.602	1.426	66.176	2012	1	173.387	6.263	167.124
2013	1	9.955	2.461	7.494	2013	1	70.443	1.469	68.974	2013	1	180.673	6.451	174.222
2014	1	10.373	2.535	7.839	2014	1	73.403	1.513	71.890	2014	1	188.265	6.644	181.621
2015	1	10.809	2.611	8.198	2015	1	76.487	1.558	74.929	2015	1	196.176	6.844	189.333
2016	1	11.263	2.689	8.574	2016	1	79.701	1.605	78.097	2016	1	204.420	7.049	197.371
2017	1	11.737	2.770	8.967	2017	1	83.050	1.653	81.398	2017	1	213.010	7.261	205.749
2018	1	12.230	2.853	9.377	2018	1	86.540	1.702	84.838	2018	1	221.961	7.478	214.483
2019	1	12.744	2.938	9.805	2019	1	90.177	1.754	88.423	2019	1	231.288	7.703	223.585
2020	1	13.151	3.026	10.125	2020	1	93.063	1.806	91.257	2020	1	238.690	7.934	230.756
2021	1	13.572	3.117	10.455	2021	1	96.041	1.860	94.181	2021	1	246.328	8.172	238.157
2022	1	14.007	3.211	10.796	2022	1	99.114	1.916	97.198	2022	1	254.211	8.417	245.794
2023	1	14.455	3.307	11.148	2023	1	102.286	1.974	100.313	2023	1	262.347	8.669	253.677
2024	1	14.918	3.406	11.511	2024	1	105.560	2.033	103.527	2024	1	270.742	8.930	261.813
2025	1	15.395	3.508	11.886	2025	1	108.938	2.094	106.844	2025	1	279.406	9.197	270.209
2026	1	15.888	3.614	12.274	2026	1	112.424	2.157	110.267	2026	1	288.348	9.473	278.875
2027	1	16.396	3.722	12.674	2027	1	116.022	2.221	113.800	2027	1	297.576	9.758	287.818
2028	1	16.921	3.834	13.087	2028	1	119.735	2.288	117.447	2028	1	307.099	10.050	297.048
2029	1	17.462	3.949	13.513	2029	1	123.566	2.357	121.210	2029	1	316.926	10.352	306.575
2030	1	18.021	4.067	13.954	2030	1	127.521	2.427	125.094	2030	1	327.069	10.662	316.406
2031	1	18.598	4.189	14.409	2031	1	131.602	2.500	129.102	2031	1	337.536	10.982	326.553
2032	1	19.193	4.315	14.878	2032	1	135.813	2.575	133.238	2032	1	348.337	11.312	337.026
2033	1	19.807	4.444	15.363	2033	1	140.160	2.652	137.507	2033	1	359.485	11.651	347.834
2034	1	20.441	4.578	15.863	2034	1	144.645	2.732	141.913	2034	1	370.989	12.001	358.988
2035	1	21.095	4.715	16.380	2035	1	149.274	2.814	146.460	2035	1	382.861	12.361	370.501
2036	1	21.770	4.856	16.914	2036	1	154.051	2.898	151.153	2036	1	395.114	12.731	382.382
2037	1	22.467	5.002	17.465	2037	1	158.981	2.985	155.996	2037	1	407.758	13.113	394.645
2038	1	23.186	5.152	18.034	2038	1	164.068	3.075	160.994	2038	1	420.807	13.507	407.300
2039	1	23.928	5.307	18.621	2039	1	169.319	3.167	166.152	2039	1	434.274	13.912	420.362
2040	1	24.454	5.466	18.988	2040	1	173.041	3.262	169.779	2040	1	443.820	14.329	429.491
2041	1	24.991	5.630	19.361	2041	1	176.845	3.360	173.485	2041	1	453.576	14.759	438.817
2042	1	25.541	5.799	19.742	2042	1	180.732	3.461	177.272	2042	1	463.547	15.202	448.345
2043	1	26.102	5.973	20.129	2043	1	184.705	3.565	181.141	2043	1	473.737	15.658	458.079
2044	1	26.676	6.152	20.524	2044	1	188.766	3.671	185.094	2044	1	484.151	16.128	468.023
2045	1	27.262	6.337	20.926	2045	1	192.915	3.782	189.134	2045	1	494.794	16.612	478.182
2046	1	27.862	6.527	21.335	2046	1	197.156	3.895	193.261	2046	1	505.671	17.110	488.561
2047	1	28.474	6.722	21.752	2047	1	201.490	4.012	197.478	2047	1	516.787	17.623	499.163
2048	1	29.100	6.924	22.176	2048	1	205.919	4.132	201.787	2048	1	528.147	18.152	509.995
2049	1	29.740	7.132	22.608	2049	1	210.446	4.256	206.190	2049	1	539.757	18.697	521.060
2050	1	30.394	7.346	23.048	2050	1	215.072	4.384	210.688	2050	1	551.622	19.257	532.365
Totals		854.7	201.1		Totals		5,933.7	117.2		Totals		15,511.5	527.2	
Averages		15.8	3.7		Averages		109.9	2.2		Averages		287.3	9.8	

Gratigny Parkway - 24 Hr CP					I-195/JT - HOLV Add					I-195/JT - HOLV Take				
Project D		Cap Cost	7.80	M$	Project E		Cap Cost	26.36	M$	Project F		Cap Cost	4.00	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	1	10.322	0.780	9.542	1997	1	0.000	0.000	0.000	1997	2	1.327	0.551	0.776
1998	1	10.756	0.803	9.952	1998	1	1.327	0.551	0.776	1998	2	1.383	0.567	0.815
1999	1	11.208	0.828	10.380	1999	1	1.383	0.567	0.815	1999	2	1.441	0.584	0.857
2000	1	11.679	0.852	10.826	2000	1	1.441	0.584	0.857	2000	2	1.501	0.602	0.900
2001	1	12.169	0.878	11.292	2001	1	1.501	0.602	0.900	2001	2	1.383	0.567	0.815
2002	1	12.681	0.904	11.777	2002	1	1.564	0.620	0.945	2002	2	1.441	0.584	0.857
2003	1	13.214	0.931	12.282	2003	1	1.630	0.638	0.992	2003	2	1.501	0.602	0.900
2004	1	13.769	0.959	12.810	2004	1	1.699	0.658	1.041	2004	2	1.564	0.620	0.945
2005	1	14.348	0.988	13.360	2005	1	1.770	0.677	1.093	2005	2	1.630	0.638	0.992
2006	1	14.950	1.018	13.933	2006	1	1.844	0.698	1.147	2006	2	1.699	0.658	1.041
2007	1	15.579	1.048	14.530	2007	1	1.922	0.719	1.203	2007	2	1.770	0.677	1.093
2008	1	16.233	1.080	15.154	2008	1	2.003	0.740	1.263	2008	2	1.844	0.698	1.147
2009	1	16.916	1.112	15.803	2009	1	2.087	0.762	1.325	2009	2	1.922	0.719	1.203
2010	1	17.626	1.145	16.481	2010	1	2.175	0.785	1.389	2010	2	2.003	0.740	1.263
2011	1	18.367	1.180	17.187	2011	1	2.266	0.809	1.457	2011	2	2.087	0.762	1.325
2012	1	19.139	1.215	17.924	2012	1	2.361	0.833	1.528	2012	2	2.175	0.785	1.389
2013	1	19.943	1.252	18.691	2013	1	2.460	0.858	1.602	2013	2	2.266	0.809	1.457
2014	1	20.781	1.289	19.492	2014	1	2.564	0.884	1.680	2014	2	2.361	0.833	1.528
2015	1	21.654	1.328	20.326	2015	1	2.671	0.910	1.761	2015	2	2.460	0.858	1.602
2016	1	22.564	1.368	21.197	2016	1	2.784	0.937	1.846	2016	2	2.564	0.884	1.680
2017	1	23.512	1.409	22.104	2017	1	2.901	0.966	1.935	2017	2	2.671	0.910	1.761
2018	1	24.501	1.451	23.049	2018	1	3.023	0.995	2.028	2018	2	2.784	0.937	1.846
2019	1	25.530	1.495	24.035	2019	1	3.150	1.024	2.125	2019	2	2.901	0.966	1.935
2020	1	26.347	1.539	24.808	2020	1	3.250	1.055	2.195	2020	2	2.994	0.995	1.999
2021	1	27.190	1.586	25.605	2021	1	3.354	1.087	2.268	2021	2	3.089	1.024	2.065
2022	1	28.060	1.633	26.427	2022	1	3.462	1.119	2.342	2022	2	3.188	1.055	2.133
2023	1	28.958	1.682	27.276	2023	1	3.573	1.153	2.420	2023	2	3.290	1.087	2.203
2024	1	29.885	1.733	28.152	2024	1	3.687	1.188	2.499	2024	2	3.396	1.119	2.276
2025	1	30.841	1.785	29.057	2025	1	3.805	1.223	2.582	2025	2	3.504	1.153	2.351
2026	1	31.828	1.838	29.990	2026	1	3.927	1.260	2.667	2026	2	3.616	1.188	2.429
2027	1	32.847	1.893	30.954	2027	1	4.052	1.298	2.755	2027	2	3.732	1.223	2.509
2028	1	33.898	1.950	31.948	2028	1	4.182	1.337	2.845	2028	2	3.852	1.260	2.592
2029	1	34.983	2.009	32.974	2029	1	4.316	1.377	2.939	2029	2	3.975	1.298	2.677
2030	1	36.103	2.069	34.034	2030	1	4.454	1.418	3.036	2030	2	4.102	1.337	2.765
2031	1	37.258	2.131	35.127	2031	1	4.596	1.461	3.136	2031	2	4.233	1.377	2.856
2032	1	38.450	2.195	36.255	2032	1	4.744	1.504	3.239	2032	2	4.369	1.418	2.951
2033	1	39.681	2.261	37.420	2033	1	4.895	1.550	3.346	2033	2	4.509	1.461	3.048
2034	1	40.951	2.328	38.622	2034	1	5.052	1.596	3.456	2034	2	4.653	1.504	3.148
2035	1	42.261	2.398	39.863	2035	1	5.214	1.644	3.570	2035	2	4.802	1.550	3.252
2036	1	43.613	2.470	41.143	2036	1	5.381	1.693	3.687	2036	2	4.955	1.596	3.359
2037	1	45.009	2.544	42.465	2037	1	5.553	1.744	3.809	2037	2	5.114	1.644	3.470
2038	1	46.450	2.621	43.829	2038	1	5.730	1.796	3.934	2038	2	5.278	1.693	3.584
2039	1	47.936	2.699	45.237	2039	1	5.914	1.850	4.064	2039	2	5.446	1.744	3.702
2040	1	48.990	2.780	46.209	2040	1	6.044	1.906	4.138	2040	2	5.566	1.796	3.770
2041	1	50.067	2.864	47.203	2041	1	6.177	1.963	4.214	2041	2	5.689	1.850	3.838
2042	1	51.167	2.950	48.218	2042	1	6.312	2.022	4.291	2042	2	5.814	1.906	3.908
2043	1	52.292	3.038	49.254	2043	1	6.451	2.082	4.369	2043	2	5.941	1.963	3.979
2044	1	53.442	3.129	50.312	2044	1	6.593	2.145	4.448	2044	2	6.072	2.022	4.050
2045	1	54.616	3.223	51.393	2045	1	6.738	2.209	4.529	2045	2	6.206	2.082	4.123
2046	1	55.817	3.320	52.497	2046	1	6.886	2.276	4.611	2046	2	6.342	2.145	4.197
2047	1	57.044	3.419	53.625	2047	1	7.037	2.344	4.694	2047	2	6.481	2.209	4.272
2048	1	58.298	3.522	54.776	2048	1	7.192	2.414	4.778	2048	2	6.624	2.276	4.348
2049	1	59.579	3.628	55.952	2049	1	7.350	2.487	4.864	2049	2	6.769	2.344	4.426
2050	1	60.889	3.737	57.153	2050	1	7.512	2.561	4.951	2050	2	6.918	2.414	4.504
Totals		1,712.2	102.3		Totals		210.0	69.6		Totals		195.2	66.3	
Averages		31.7	1.9		Averages		3.9	1.3		Averages		3.6	1.2	

I-195/JT - PPO CP Project G		Cap Cost		4.00 M$	I-195/JT - 24 Hr CP Project H		Cap Cost		4.00 M$	I-395/MacArthur - PPO CP Project I		Cap Cost		3.40 M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	1.480	0.551	0.930	1997	4	23.129	6.884	16.245	1997	3	1.374	0.369	1.005
1998	3	1.542	0.567	0.975	1998	4	24.100	7.090	17.010	1998	3	1.431	0.380	1.051
1999	3	1.607	0.584	1.023	1999	4	25.113	7.303	17.811	1999	3	1.492	0.392	1.100
2000	3	1.675	0.602	1.073	2000	4	26.169	7.522	18.647	2000	3	1.554	0.403	1.151
2001	3	1.745	0.620	1.125	2001	4	27.268	7.747	19.521	2001	3	1.620	0.415	1.204
2002	3	1.818	0.638	1.180	2002	4	28.414	7.980	20.434	2002	3	1.688	0.428	1.260
2003	3	1.895	0.658	1.237	2003	4	29.608	8.219	21.389	2003	3	1.759	0.441	1.318
2004	3	1.975	0.677	1.297	2004	4	30.852	8.466	22.386	2004	3	1.832	0.454	1.379
2005	3	2.058	0.698	1.360	2005	4	32.149	8.720	23.429	2005	3	1.909	0.468	1.442
2006	3	2.144	0.719	1.425	2006	4	33.500	8.981	24.518	2006	3	1.990	0.482	1.508
2007	3	2.234	0.740	1.494	2007	4	34.907	9.251	25.656	2007	3	2.073	0.496	1.577
2008	3	2.328	0.762	1.566	2008	4	36.374	9.528	26.846	2008	3	2.160	0.511	1.650
2009	3	2.426	0.785	1.641	2009	4	37.903	9.814	28.088	2009	3	2.251	0.526	1.725
2010	3	2.528	0.809	1.719	2010	4	39.495	10.109	29.387	2010	3	2.346	0.542	1.804
2011	3	2.634	0.833	1.801	2011	4	41.155	10.412	30.743	2011	3	2.444	0.558	1.886
2012	3	2.745	0.858	1.887	2012	4	42.884	10.724	32.160	2012	3	2.547	0.575	1.972
2013	3	2.860	0.884	1.976	2013	4	44.686	11.046	33.640	2013	3	2.654	0.592	2.062
2014	3	2.980	0.910	2.070	2014	4	46.564	11.377	35.187	2014	3	2.766	0.610	2.156
2015	3	3.105	0.937	2.168	2015	4	48.521	11.719	36.802	2015	3	2.882	0.628	2.254
2016	3	3.236	0.966	2.270	2016	4	50.560	12.070	38.490	2016	3	3.003	0.647	2.356
2017	3	3.372	0.995	2.377	2017	4	52.684	12.432	40.252	2017	3	3.129	0.667	2.463
2018	3	3.513	1.024	2.489	2018	4	54.898	12.805	42.093	2018	3	3.261	0.687	2.574
2019	3	3.661	1.055	2.606	2019	4	57.205	13.190	44.016	2019	3	3.398	0.707	2.690
2020	3	3.778	1.087	2.691	2020	4	59.036	13.585	45.451	2020	3	3.506	0.728	2.778
2021	3	3.899	1.119	2.780	2021	4	60.925	13.993	46.932	2021	3	3.619	0.750	2.868
2022	3	4.024	1.153	2.871	2022	4	62.875	14.413	48.462	2022	3	3.734	0.773	2.962
2023	3	4.153	1.188	2.965	2023	4	64.887	14.845	50.042	2023	3	3.854	0.796	3.058
2024	3	4.286	1.223	3.062	2024	4	66.963	15.290	51.673	2024	3	3.977	0.820	3.157
2025	3	4.423	1.260	3.163	2025	4	69.106	15.749	53.357	2025	3	4.105	0.844	3.260
2026	3	4.564	1.298	3.267	2026	4	71.318	16.221	55.096	2026	3	4.236	0.870	3.366
2027	3	4.710	1.337	3.374	2027	4	73.600	16.708	56.892	2027	3	4.372	0.896	3.476
2028	3	4.861	1.377	3.484	2028	4	75.956	17.209	58.746	2028	3	4.511	0.923	3.589
2029	3	5.017	1.418	3.599	2029	4	78.386	17.726	60.661	2029	3	4.656	0.950	3.705
2030	3	5.177	1.461	3.717	2030	4	80.895	18.257	62.637	2030	3	4.805	0.979	3.826
2031	3	5.343	1.504	3.839	2031	4	83.484	18.805	64.679	2031	3	4.959	1.008	3.950
2032	3	5.514	1.550	3.964	2032	4	86.155	19.369	66.786	2032	3	5.117	1.039	4.079
2033	3	5.690	1.596	4.094	2033	4	88.912	19.950	68.962	2033	3	5.281	1.070	4.211
2034	3	5.872	1.644	4.229	2034	4	91.758	20.549	71.209	2034	3	5.450	1.102	4.348
2035	3	6.060	1.693	4.367	2035	4	94.694	21.165	73.529	2035	3	5.624	1.135	4.490
2036	3	6.254	1.744	4.510	2036	4	97.725	21.800	75.924	2036	3	5.804	1.169	4.635
2037	3	6.455	1.796	4.658	2037	4	100.852	22.454	78.398	2037	3	5.990	1.204	4.786
2038	3	6.661	1.850	4.811	2038	4	104.079	23.128	80.952	2038	3	6.182	1.240	4.942
2039	3	6.874	1.906	4.969	2039	4	107.410	23.822	83.588	2039	3	6.380	1.277	5.102
2040	3	7.025	1.963	5.062	2040	4	109.771	24.536	85.235	2040	3	6.520	1.316	5.204
2041	3	7.180	2.022	5.158	2041	4	112.184	25.272	86.912	2041	3	6.663	1.355	5.308
2042	3	7.338	2.082	5.255	2042	4	114.650	26.031	88.620	2042	3	6.810	1.396	5.414
2043	3	7.499	2.145	5.354	2043	4	117.171	26.812	90.359	2043	3	6.959	1.438	5.522
2044	3	7.664	2.209	5.454	2044	4	119.746	27.616	92.131	2044	3	7.112	1.481	5.632
2045	3	7.832	2.276	5.557	2045	4	122.379	28.444	93.934	2045	3	7.269	1.525	5.744
2046	3	8.004	2.344	5.661	2046	4	125.069	29.298	95.771	2046	3	7.429	1.571	5.858
2047	3	8.180	2.414	5.766	2047	4	127.818	30.177	97.642	2047	3	7.592	1.618	5.974
2048	3	8.360	2.487	5.874	2048	4	130.628	31.082	99.546	2048	3	7.759	1.667	6.092
2049	3	8.544	2.561	5.983	2049	4	133.500	32.014	101.485	2049	3	7.929	1.717	6.213
2050	3	8.732	2.638	6.094	2050	4	136.434	32.975	103.459	2050	3	8.104	1.768	6.335
Totals		245.5	72.2		Totals		3,836.5	902.7		Totals		227.9	48.4	
Averages		4.5	1.3		Averages		71.0	16.7		Averages		4.2	0.9	

I-395/MacArthur - 24 Hr CP					I-95 - HOVL Take					I-95 - PPO CP				
Project	J	Cap Cost		3.40 M$	Project	K	Cap Cost		17.00 M$	Project	L	Cap Cost		12.00 M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	4	21.465	4.614	16.851	1997	2	11.718	1.700	10.018	1997	3	22.233	1.700	20.533
1998	4	22.367	4.752	17.614	1998	2	12.211	1.751	10.460	1998	3	23.167	1.751	21.416
1999	4	23.306	4.895	18.412	1999	2	12.724	1.804	10.920	1999	3	24.140	1.804	22.337
2000	4	24.286	5.042	19.244	2000	2	13.258	1.858	11.401	2000	3	25.155	1.858	23.297
2001	4	25.306	5.193	20.114	2001	2	13.816	1.913	11.902	2001	3	26.212	1.913	24.298
2002	4	26.370	5.349	21.021	2002	2	14.396	1.971	12.425	2002	3	27.313	1.971	25.342
2003	4	27.478	5.509	21.969	2003	2	15.001	2.030	12.971	2003	3	28.461	2.030	26.431
2004	4	28.633	5.674	22.958	2004	2	15.631	2.091	13.541	2004	3	29.657	2.091	27.566
2005	4	29.836	5.845	23.991	2005	2	16.288	2.154	14.135	2005	3	30.903	2.154	28.750
2006	4	31.089	6.020	25.070	2006	2	16.973	2.218	14.755	2006	3	32.202	2.218	29.984
2007	4	32.396	6.201	26.195	2007	2	17.686	2.285	15.401	2007	3	33.555	2.285	31.270
2008	4	33.757	6.387	27.371	2008	2	18.429	2.353	16.076	2008	3	34.965	2.353	32.612
2009	4	35.176	6.578	28.598	2009	2	19.204	2.424	16.780	2009	3	36.434	2.424	34.010
2010	4	36.654	6.775	29.878	2010	2	20.011	2.497	17.514	2010	3	37.965	2.497	35.469
2011	4	38.194	6.979	31.215	2011	2	20.851	2.571	18.280	2011	3	39.560	2.571	36.989
2012	4	39.799	7.188	32.611	2012	2	21.728	2.649	19.079	2012	3	41.223	2.649	38.574
2013	4	41.471	7.404	34.068	2013	2	22.641	2.728	19.913	2013	3	42.955	2.728	40.227
2014	4	43.214	7.626	35.588	2014	2	23.592	2.810	20.782	2014	3	44.760	2.810	41.950
2015	4	45.030	7.855	37.175	2015	2	24.583	2.894	21.689	2015	3	46.641	2.894	43.747
2016	4	46.922	8.090	38.832	2016	2	25.616	2.981	22.636	2016	3	48.601	2.981	45.620
2017	4	48.894	8.333	40.561	2017	2	26.693	3.070	23.623	2017	3	50.643	3.070	47.573
2018	4	50.949	8.583	42.366	2018	2	27.815	3.163	24.652	2018	3	52.771	3.163	49.609
2019	4	53.090	8.840	44.249	2019	2	28.983	3.257	25.726	2019	3	54.989	3.257	51.731
2020	4	54.789	9.106	45.683	2020	2	29.911	3.355	26.556	2020	3	56.749	3.355	53.393
2021	4	56.542	9.379	47.163	2021	2	30.868	3.456	27.412	2021	3	58.565	3.456	55.109
2022	4	58.351	9.660	48.691	2022	2	31.856	3.559	28.297	2022	3	60.439	3.559	56.879
2023	4	60.219	9.950	50.269	2023	2	32.875	3.666	29.209	2023	3	62.373	3.666	58.707
2024	4	62.146	10.248	51.897	2024	2	33.927	3.776	30.151	2024	3	64.369	3.776	60.593
2025	4	64.135	10.556	53.579	2025	2	35.013	3.889	31.124	2025	3	66.429	3.889	62.540
2026	4	66.187	10.873	55.314	2026	2	36.134	4.006	32.128	2026	3	68.555	4.006	64.549
2027	4	68.305	11.199	57.106	2027	2	37.290	4.126	33.164	2027	3	70.749	4.126	66.622
2028	4	70.491	11.535	58.956	2028	2	38.483	4.250	34.233	2028	3	73.013	4.250	68.763
2029	4	72.747	11.881	60.866	2029	2	39.715	4.378	35.337	2029	3	75.349	4.378	70.972
2030	4	75.075	12.237	62.838	2030	2	40.986	4.509	36.477	2030	3	77.761	4.509	73.252
2031	4	77.477	12.604	64.873	2031	2	42.298	4.644	37.653	2031	3	80.249	4.644	75.605
2032	4	79.957	12.982	66.974	2032	2	43.651	4.784	38.868	2032	3	82.817	4.784	78.034
2033	4	82.516	13.372	69.144	2033	2	45.048	4.927	40.121	2033	3	85.468	4.927	80.541
2034	4	85.156	13.773	71.383	2034	2	46.490	5.075	41.415	2034	3	88.203	5.075	83.128
2035	4	87.881	14.186	73.695	2035	2	47.977	5.227	42.750	2035	3	91.025	5.227	85.798
2036	4	90.694	14.612	76.082	2036	2	49.513	5.384	44.129	2036	3	93.938	5.384	88.554
2037	4	93.596	15.050	78.546	2037	2	51.097	5.545	45.552	2037	3	96.945	5.545	91.399
2038	4	96.591	15.502	81.090	2038	2	52.733	5.712	47.021	2038	3	100.047	5.712	94.335
2039	4	99.683	15.967	83.716	2039	2	54.420	5.883	48.537	2039	3	103.249	5.883	97.366
2040	4	101.874	16.446	85.428	2040	2	55.616	6.060	49.557	2040	3	105.518	6.060	99.459
2041	4	104.113	16.939	87.174	2041	2	56.839	6.241	50.598	2041	3	107.838	6.241	101.596
2042	4	106.402	17.447	88.955	2042	2	58.088	6.429	51.660	2042	3	110.209	6.429	103.780
2043	4	108.741	17.971	90.770	2043	2	59.365	6.622	52.744	2043	3	112.631	6.622	106.010
2044	4	111.131	18.510	92.621	2044	2	60.670	6.820	53.850	2044	3	115.107	6.820	108.287
2045	4	113.574	19.065	94.509	2045	2	62.004	7.025	54.979	2045	3	117.637	7.025	110.613
2046	4	116.071	19.637	96.434	2046	2	63.367	7.236	56.131	2046	3	120.223	7.236	112.988
2047	4	118.622	20.226	98.396	2047	2	64.760	7.453	57.307	2047	3	122.866	7.453	115.414
2048	4	121.230	20.833	100.397	2048	2	66.184	7.676	58.507	2048	3	125.567	7.676	117.891
2049	4	123.895	21.458	102.437	2049	2	67.638	7.907	59.732	2049	3	128.327	7.907	120.421
2050	4	126.619	22.102	104.517	2050	2	69.125	8.144	60.982	2050	3	131.148	8.144	123.005
Totals		3,560.5	605.0		Totals		1,943.8	222.9		Totals		3,687.9	222.9	
Averages		65.9	11.2		Averages		36.0	4.1		Averages		68.3	4.1	

I-95 - 24 Hr CP					MIA - 24 Hr CP					NE 167/SR 826 - PPO WB CP				
Project	M	Cap Cost	17.00	M$	Project	N	Cap Cost	2.10	M$	Project	O	Cap Cost	0.05	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	4	133.512	1.700	131.812	1997	2	2.445	0.210	2.235	1997	2	0.017	0.005	0.012
1998	4	139.123	1.751	137.372	1998	2	2.547	0.216	2.331	1998	2	0.018	0.005	0.013
1999	4	144.969	1.804	143.165	1999	2	2.654	0.223	2.431	1999	2	0.018	0.005	0.013
2000	4	151.061	1.858	149.203	2000	2	2.766	0.229	2.536	2000	2	0.019	0.005	0.014
2001	4	157.408	1.913	155.495	2001	2	2.882	0.236	2.646	2001	2	0.020	0.006	0.014
2002	4	164.023	1.971	162.052	2002	2	3.003	0.243	2.760	2002	2	0.021	0.006	0.015
2003	4	170.915	2.030	168.885	2003	2	3.129	0.251	2.879	2003	2	0.022	0.006	0.016
2004	4	178.097	2.091	176.007	2004	2	3.261	0.258	3.003	2004	2	0.023	0.006	0.016
2005	4	185.581	2.154	183.428	2005	2	3.398	0.266	3.132	2005	2	0.024	0.006	0.017
2006	4	193.380	2.218	191.162	2006	2	3.541	0.274	3.267	2006	2	0.025	0.007	0.018
2007	4	201.506	2.285	199.221	2007	2	3.689	0.282	3.407	2007	2	0.026	0.007	0.019
2008	4	209.973	2.353	207.620	2008	2	3.844	0.291	3.554	2008	2	0.027	0.007	0.020
2009	4	218.797	2.424	216.373	2009	2	4.006	0.299	3.707	2009	2	0.028	0.007	0.021
2010	4	227.991	2.497	225.494	2010	2	4.174	0.308	3.866	2010	2	0.029	0.007	0.022
2011	4	237.571	2.571	235.000	2011	2	4.350	0.318	4.032	2011	2	0.030	0.008	0.023
2012	4	247.554	2.649	244.906	2012	2	4.533	0.327	4.205	2012	2	0.031	0.008	0.024
2013	4	257.957	2.728	255.229	2013	2	4.723	0.337	4.386	2013	2	0.033	0.008	0.025
2014	4	268.797	2.810	265.987	2014	2	4.921	0.347	4.574	2014	2	0.034	0.008	0.026
2015	4	280.092	2.894	277.198	2015	2	5.128	0.358	4.771	2015	2	0.036	0.009	0.027
2016	4	291.862	2.981	288.881	2016	2	5.344	0.368	4.976	2016	2	0.037	0.009	0.028
2017	4	304.126	3.070	301.056	2017	2	5.568	0.379	5.189	2017	2	0.039	0.009	0.030
2018	4	316.906	3.163	313.744	2018	2	5.802	0.391	5.412	2018	2	0.040	0.009	0.031
2019	4	330.223	3.257	326.966	2019	2	6.046	0.402	5.644	2019	2	0.042	0.010	0.032
2020	4	340.791	3.355	337.436	2020	2	6.240	0.414	5.825	2020	2	0.043	0.010	0.033
2021	4	351.697	3.456	348.241	2021	2	6.439	0.427	6.012	2021	2	0.045	0.010	0.035
2022	4	362.952	3.559	359.392	2022	2	6.645	0.440	6.206	2022	2	0.046	0.010	0.036
2023	4	374.567	3.666	370.901	2023	2	6.858	0.453	6.405	2023	2	0.048	0.011	0.037
2024	4	386.554	3.776	382.777	2024	2	7.077	0.466	6.611	2024	2	0.049	0.011	0.038
2025	4	398.924	3.889	395.035	2025	2	7.304	0.480	6.824	2025	2	0.051	0.011	0.039
2026	4	411.690	4.006	407.684	2026	2	7.538	0.495	7.043	2026	2	0.052	0.012	0.041
2027	4	424.865	4.126	420.739	2027	2	7.779	0.510	7.269	2027	2	0.054	0.012	0.042
2028	4	438.462	4.250	434.212	2028	2	8.028	0.525	7.503	2028	2	0.056	0.013	0.043
2029	4	452.493	4.378	448.116	2029	2	8.285	0.541	7.744	2029	2	0.058	0.013	0.045
2030	4	466.974	4.509	462.465	2030	2	8.550	0.557	7.993	2030	2	0.059	0.013	0.046
2031	4	481.918	4.644	477.274	2031	2	8.824	0.574	8.250	2031	2	0.061	0.014	0.048
2032	4	497.340	4.784	492.557	2032	2	9.106	0.591	8.515	2032	2	0.063	0.014	0.049
2033	4	513.256	4.927	508.329	2033	2	9.397	0.609	8.789	2033	2	0.065	0.014	0.051
2034	4	529.682	5.075	524.607	2034	2	9.698	0.627	9.071	2034	2	0.067	0.015	0.052
2035	4	546.632	5.227	541.405	2035	2	10.008	0.646	9.363	2035	2	0.069	0.015	0.054
2036	4	564.126	5.384	558.742	2036	2	10.329	0.665	9.664	2036	2	0.072	0.016	0.056
2037	4	582.179	5.545	576.633	2037	2	10.659	0.685	9.974	2037	2	0.074	0.016	0.058
2038	4	600.810	5.712	595.098	2038	2	11.000	0.706	10.295	2038	2	0.076	0.017	0.060
2039	4	620.037	5.883	614.153	2039	2	11.352	0.727	10.626	2039	2	0.079	0.017	0.062
2040	4	633.667	6.060	627.607	2040	2	11.602	0.749	10.853	2040	2	0.081	0.018	0.063
2041	4	647.596	6.241	641.355	2041	2	11.857	0.771	11.086	2041	2	0.082	0.018	0.064
2042	4	661.832	6.429	655.403	2042	2	12.118	0.794	11.323	2042	2	0.084	0.019	0.065
2043	4	676.381	6.622	669.759	2043	2	12.384	0.818	11.566	2043	2	0.086	0.019	0.066
2044	4	691.249	6.820	684.429	2044	2	12.656	0.842	11.814	2044	2	0.088	0.020	0.068
2045	4	706.445	7.025	699.420	2045	2	12.934	0.868	12.067	2045	2	0.090	0.021	0.069
2046	4	721.974	7.236	714.738	2046	2	13.219	0.894	12.325	2046	2	0.092	0.021	0.070
2047	4	737.845	7.453	730.392	2047	2	13.509	0.921	12.589	2047	2	0.094	0.022	0.072
2048	4	754.064	7.676	746.388	2048	2	13.806	0.948	12.858	2048	2	0.096	0.023	0.073
2049	4	770.641	7.907	762.734	2049	2	14.110	0.977	13.133	2049	2	0.098	0.023	0.075
2050	4	787.581	8.144	779.438	2050	2	14.420	1.006	13.414	2050	2	0.100	0.024	0.076
Totals		22,146.6	222.9		Totals		405.5	27.5		Totals		2.8	0.7	
Averages		410.1	4.1		Averages		7.5	0.5		Averages		0.1	0.0	

N Bay Cswy - PPO CP					N Bay Cswy - 24 Hr CP					Okee. NW of 826 - 24 Hr CP				
Project	P	Cap Cost	2.10	M$	Project	Q	Cap Cost	2.10	M$	Project	R	Cap Cost	5.40	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	0.575	0.214	0.361	1997	4	8.984	2.674	6.310	1997	4	3.546	0.540	3.006
1998	3	0.599	0.220	0.379	1998	4	9.361	2.754	6.607	1998	4	3.695	0.556	3.139
1999	3	0.624	0.227	0.397	1999	4	9.755	2.837	6.918	1999	4	3.850	0.573	3.277
2000	3	0.651	0.234	0.417	2000	4	10.165	2.922	7.243	2000	4	4.012	0.590	3.422
2001	3	0.678	0.241	0.437	2001	4	10.592	3.009	7.582	2001	4	4.181	0.608	3.573
2002	3	0.706	0.248	0.458	2002	4	11.037	3.100	7.937	2002	4	4.356	0.626	3.730
2003	3	0.736	0.255	0.481	2003	4	11.500	3.193	8.308	2003	4	4.539	0.645	3.895
2004	3	0.767	0.263	0.504	2004	4	11.984	3.288	8.695	2004	4	4.730	0.664	4.066
2005	3	0.799	0.271	0.528	2005	4	12.487	3.387	9.100	2005	4	4.929	0.684	4.245
2006	3	0.833	0.279	0.554	2006	4	13.012	3.489	9.523	2006	4	5.136	0.705	4.431
2007	3	0.868	0.287	0.580	2007	4	13.559	3.593	9.966	2007	4	5.352	0.726	4.626
2008	3	0.904	0.296	0.608	2008	4	14.129	3.701	10.428	2008	4	5.577	0.747	4.829
2009	3	0.942	0.305	0.637	2009	4	14.722	3.812	10.910	2009	4	5.811	0.770	5.041
2010	3	0.982	0.314	0.668	2010	4	15.341	3.926	11.415	2010	4	6.055	0.793	5.262
2011	3	1.023	0.324	0.700	2011	4	15.986	4.044	11.941	2011	4	6.310	0.817	5.493
2012	3	1.066	0.333	0.733	2012	4	16.657	4.166	12.492	2012	4	6.575	0.841	5.733
2013	3	1.111	0.343	0.768	2013	4	17.357	4.291	13.067	2013	4	6.851	0.867	5.984
2014	3	1.158	0.354	0.804	2014	4	18.087	4.419	13.667	2014	4	7.139	0.893	6.246
2015	3	1.206	0.364	0.842	2015	4	18.847	4.552	14.295	2015	4	7.439	0.919	6.520
2016	3	1.257	0.375	0.882	2016	4	19.639	4.688	14.950	2016	4	7.751	0.947	6.805
2017	3	1.310	0.386	0.923	2017	4	20.464	4.829	15.635	2017	4	8.077	0.975	7.102
2018	3	1.365	0.398	0.967	2018	4	21.324	4.974	16.350	2018	4	8.417	1.005	7.412
2019	3	1.422	0.410	1.012	2019	4	22.220	5.123	17.097	2019	4	8.770	1.035	7.736
2020	3	1.468	0.422	1.045	2020	4	22.931	5.277	17.654	2020	4	9.051	1.066	7.985
2021	3	1.515	0.435	1.080	2021	4	23.665	5.435	18.230	2021	4	9.341	1.098	8.243
2022	3	1.563	0.448	1.115	2022	4	24.422	5.598	18.824	2022	4	9.640	1.131	8.509
2023	3	1.613	0.461	1.152	2023	4	25.204	5.766	19.438	2023	4	9.948	1.165	8.783
2024	3	1.665	0.475	1.190	2024	4	26.010	5.939	20.071	2024	4	10.266	1.199	9.067
2025	3	1.718	0.489	1.229	2025	4	26.843	6.117	20.725	2025	4	10.595	1.235	9.359
2026	3	1.773	0.504	1.269	2026	4	27.702	6.301	21.401	2026	4	10.934	1.273	9.661
2027	3	1.830	0.519	1.310	2027	4	28.588	6.490	22.098	2027	4	11.284	1.311	9.973
2028	3	1.888	0.535	1.353	2028	4	29.503	6.685	22.819	2028	4	11.645	1.350	10.295
2029	3	1.949	0.551	1.398	2029	4	30.447	6.885	23.562	2029	4	12.018	1.391	10.627
2030	3	2.011	0.567	1.444	2030	4	31.422	7.092	24.330	2030	4	12.402	1.432	10.970
2031	3	2.075	0.584	1.491	2031	4	32.427	7.304	25.123	2031	4	12.799	1.475	11.324
2032	3	2.142	0.602	1.540	2032	4	33.465	7.524	25.941	2032	4	13.209	1.519	11.689
2033	3	2.210	0.620	1.590	2033	4	34.536	7.749	26.787	2033	4	13.631	1.565	12.066
2034	3	2.281	0.639	1.642	2034	4	35.641	7.982	27.659	2034	4	14.068	1.612	12.456
2035	3	2.354	0.658	1.696	2035	4	36.782	8.221	28.560	2035	4	14.518	1.660	12.858
2036	3	2.429	0.677	1.752	2036	4	37.959	8.468	29.491	2036	4	14.982	1.710	13.272
2037	3	2.507	0.698	1.809	2037	4	39.173	8.722	30.452	2037	4	15.462	1.762	13.700
2038	3	2.587	0.719	1.869	2038	4	40.427	8.983	31.444	2038	4	15.957	1.814	14.142
2039	3	2.670	0.740	1.930	2039	4	41.721	9.253	32.468	2039	4	16.467	1.869	14.599
2040	3	2.729	0.762	1.966	2040	4	42.638	9.531	33.107	2040	4	16.829	1.925	14.905
2041	3	2.789	0.785	2.003	2041	4	43.575	9.816	33.759	2041	4	17.199	1.983	15.217
2042	3	2.850	0.809	2.041	2042	4	44.533	10.111	34.422	2042	4	17.577	2.042	15.535
2043	3	2.913	0.833	2.080	2043	4	45.512	10.414	35.098	2043	4	17.964	2.103	15.861
2044	3	2.977	0.858	2.119	2044	4	46.512	10.727	35.786	2044	4	18.359	2.166	16.192
2045	3	3.042	0.884	2.158	2045	4	47.535	11.049	36.486	2045	4	18.762	2.231	16.531
2046	3	3.109	0.910	2.199	2046	4	48.580	11.380	37.200	2046	4	19.175	2.298	16.876
2047	3	3.177	0.938	2.240	2047	4	49.648	11.721	37.926	2047	4	19.596	2.367	17.229
2048	3	3.247	0.966	2.281	2048	4	50.739	12.073	38.666	2048	4	20.027	2.438	17.589
2049	3	3.319	0.995	2.324	2049	4	51.855	12.435	39.419	2049	4	20.467	2.511	17.956
2050	3	3.392	1.025	2.367	2050	4	52.994	12.808	40.186	2050	4	20.917	2.587	18.330
Totals		95.4	28.1		Totals		1,490.2	350.6		Totals		588.2	70.8	
Averages		1.8	0.5		Averages		27.6	6.5		Averages		10.9	1.3	

Rick. Cswy - Weekend Premium CP Project W		Cap Cost	3.00 M$		SR 112 - 24 Hr CP Project X		Cap Cost	4.00 M$		SR 112 Ext - 24 Hr CP Project Y		Cap Cost	216.80 M$	
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	1	6.388	1.013	5.375	1997	1	26.355	0.400	25.955	1997	1	13.488	0.820	12.668
1998	1	6.656	1.043	5.613	1998	1	27.462	0.412	27.050	1998	1	14.054	0.845	13.210
1999	1	6.936	1.075	5.861	1999	1	28.616	0.424	28.192	1999	1	14.645	0.870	13.775
2000	1	7.227	1.107	6.120	2000	1	29.818	0.437	29.381	2000	1	15.260	0.896	14.364
2001	1	7.531	1.140	6.391	2001	1	31.071	0.450	30.621	2001	1	15.902	0.923	14.979
2002	1	7.848	1.174	6.673	2002	1	32.377	0.464	31.913	2002	1	16.570	0.951	15.619
2003	1	8.177	1.210	6.968	2003	1	33.738	0.478	33.260	2003	1	17.266	0.979	16.287
2004	1	8.521	1.246	7.275	2004	1	35.155	0.492	34.663	2004	1	17.992	1.008	16.983
2005	1	8.879	1.283	7.596	2005	1	36.633	0.507	36.126	2005	1	18.748	1.039	17.709
2006	1	9.252	1.322	7.930	2006	1	38.172	0.522	37.650	2006	1	19.536	1.070	18.466
2007	1	9.641	1.361	8.280	2007	1	39.776	0.538	39.238	2007	1	20.356	1.102	19.254
2008	1	10.046	1.402	8.644	2008	1	41.448	0.554	40.894	2008	1	21.212	1.135	20.077
2009	1	10.468	1.444	9.024	2009	1	43.189	0.570	42.619	2009	1	22.103	1.169	20.934
2010	1	10.908	1.488	9.420	2010	1	45.004	0.587	44.417	2010	1	23.032	1.204	21.828
2011	1	11.367	1.532	9.834	2011	1	46.895	0.605	46.290	2011	1	24.000	1.240	22.759
2012	1	11.844	1.578	10.266	2012	1	48.866	0.623	48.243	2012	1	25.008	1.278	23.731
2013	1	12.342	1.626	10.716	2013	1	50.919	0.642	50.277	2013	1	26.059	1.316	24.743
2014	1	12.860	1.674	11.186	2014	1	53.059	0.661	52.398	2014	1	27.154	1.355	25.799
2015	1	13.401	1.725	11.676	2015	1	55.289	0.681	54.608	2015	1	28.295	1.396	26.899
2016	1	13.964	1.776	12.188	2016	1	57.612	0.701	56.910	2016	1	29.484	1.438	28.046
2017	1	14.551	1.830	12.721	2017	1	60.033	0.722	59.310	2017	1	30.723	1.481	29.242
2018	1	15.162	1.885	13.278	2018	1	62.555	0.744	61.811	2018	1	32.014	1.525	30.489
2019	1	15.799	1.941	13.858	2019	1	65.184	0.766	64.418	2019	1	33.360	1.571	31.788
2020	1	16.305	1.999	14.306	2020	1	67.270	0.789	66.481	2020	1	34.427	1.618	32.809
2021	1	16.827	2.059	14.768	2021	1	69.423	0.813	68.610	2021	1	35.529	1.667	33.862
2022	1	17.365	2.121	15.244	2022	1	71.645	0.838	70.807	2022	1	36.666	1.717	34.949
2023	1	17.921	2.185	15.736	2023	1	73.937	0.863	73.075	2023	1	37.839	1.768	36.071
2024	1	18.495	2.250	16.244	2024	1	76.303	0.889	75.415	2024	1	39.050	1.821	37.229
2025	1	19.086	2.318	16.769	2025	1	78.745	0.915	77.830	2025	1	40.300	1.876	38.424
2026	1	19.697	2.387	17.310	2026	1	81.265	0.943	80.323	2026	1	41.590	1.932	39.657
2027	1	20.328	2.459	17.869	2027	1	83.866	0.971	82.895	2027	1	42.921	1.990	40.930
2028	1	20.978	2.533	18.445	2028	1	86.550	1.000	85.550	2028	1	44.294	2.050	42.244
2029	1	21.649	2.609	19.041	2029	1	89.320	1.030	88.289	2029	1	45.712	2.112	43.600
2030	1	22.342	2.687	19.655	2030	1	92.178	1.061	91.117	2030	1	47.174	2.175	45.000
2031	1	23.057	2.767	20.290	2031	1	95.128	1.093	94.035	2031	1	48.684	2.240	46.444
2032	1	23.795	2.850	20.945	2032	1	98.172	1.126	97.047	2032	1	50.242	2.307	47.935
2033	1	24.557	2.936	21.621	2033	1	101.314	1.159	100.154	2033	1	51.850	2.377	49.473
2034	1	25.342	3.024	22.318	2034	1	104.556	1.194	103.362	2034	1	53.509	2.448	51.061
2035	1	26.153	3.115	23.039	2035	1	107.902	1.230	106.672	2035	1	55.222	2.521	52.700
2036	1	26.990	3.208	23.782	2036	1	111.355	1.267	110.088	2036	1	56.989	2.597	54.392
2037	1	27.854	3.304	24.550	2037	1	114.919	1.305	113.614	2037	1	58.813	2.675	56.138
2038	1	28.746	3.404	25.342	2038	1	118.596	1.344	117.252	2038	1	60.695	2.755	57.940
2039	1	29.665	3.506	26.160	2039	1	122.392	1.384	121.007	2039	1	62.637	2.838	59.799
2040	1	30.318	3.611	26.707	2040	1	125.082	1.426	123.656	2040	1	64.014	2.923	61.091
2041	1	30.984	3.719	27.265	2041	1	127.832	1.469	126.363	2041	1	65.421	3.011	62.411
2042	1	31.665	3.831	27.834	2042	1	130.642	1.513	129.129	2042	1	66.859	3.101	63.758
2043	1	32.361	3.946	28.415	2043	1	133.514	1.558	131.956	2043	1	68.329	3.194	65.135
2044	1	33.073	4.064	29.008	2044	1	136.449	1.605	134.844	2044	1	69.831	3.290	66.541
2045	1	33.800	4.186	29.614	2045	1	139.448	1.653	137.795	2045	1	71.366	3.388	67.978
2046	1	34.543	4.312	30.231	2046	1	142.513	1.702	140.811	2046	1	72.935	3.490	69.445
2047	1	35.302	4.441	30.861	2047	1	145.646	1.754	143.893	2047	1	74.538	3.595	70.943
2048	1	36.078	4.574	31.504	2048	1	148.848	1.806	147.042	2048	1	76.177	3.703	72.474
2049	1	36.871	4.711	32.160	2049	1	152.120	1.860	150.260	2049	1	77.851	3.814	74.038
2050	1	37.682	4.853	32.829	2050	1	155.464	1.916	153.548	2050	1	79.563	3.928	75.635
Totals		1,059.6	132.8		Totals		4,371.6	52.5		Totals		2,237.3	107.5	
Averages		19.6	2.5		Averages		81.0	1.0		Averages		41.4	2.0	

Okee. SE of 826 - 24 Hr CP					Port of Miami Brg. - PPO CP					Port of Miami Brg. - 24 Hr CP				
Project	S	Cap Cost	5.20	M$	Project	T	Cap Cost	0.50	M$	Project	U	Cap Cost	0.50	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	5	7.005	0.520	6.485	1997	3	0.497	0.012	0.485	1997	4	7.761	0.150	7.611
1998	5	7.299	0.536	6.764	1998	3	0.518	0.012	0.505	1998	4	8.087	0.155	7.933
1999	5	7.606	0.552	7.054	1999	3	0.539	0.013	0.527	1999	4	8.427	0.159	8.268
2000	5	7.926	0.568	7.358	2000	3	0.562	0.013	0.549	2000	4	8.781	0.164	8.618
2001	5	8.259	0.585	7.674	2001	3	0.586	0.014	0.572	2001	4	9.150	0.169	8.982
2002	5	8.606	0.603	8.003	2002	3	0.610	0.014	0.596	2002	4	9.535	0.174	9.361
2003	5	8.967	0.621	8.347	2003	3	0.636	0.014	0.622	2003	4	9.936	0.179	9.757
2004	5	9.344	0.640	8.705	2004	3	0.663	0.015	0.648	2004	4	10.353	0.184	10.169
2005	5	9.737	0.659	9.078	2005	3	0.690	0.015	0.675	2005	4	10.788	0.190	10.598
2006	5	10.146	0.678	9.468	2006	3	0.719	0.016	0.704	2006	4	11.242	0.196	11.046
2007	5	10.572	0.699	9.874	2007	3	0.750	0.016	0.734	2007	4	11.714	0.202	11.512
2008	5	11.017	0.720	10.297	2008	3	0.781	0.017	0.765	2008	4	12.206	0.208	11.999
2009	5	11.480	0.741	10.738	2009	3	0.814	0.017	0.797	2009	4	12.719	0.214	12.505
2010	5	11.962	0.764	11.198	2010	3	0.848	0.018	0.831	2010	4	13.254	0.220	13.033
2011	5	12.465	0.787	11.678	2011	3	0.884	0.018	0.866	2011	4	13.811	0.227	13.584
2012	5	12.989	0.810	12.178	2012	3	0.921	0.019	0.902	2012	4	14.391	0.234	14.157
2013	5	13.534	0.834	12.700	2013	3	0.960	0.019	0.940	2013	4	14.996	0.241	14.755
2014	5	14.103	0.859	13.244	2014	3	1.000	0.020	0.980	2014	4	15.626	0.248	15.378
2015	5	14.696	0.885	13.810	2015	3	1.042	0.020	1.022	2015	4	16.282	0.255	16.027
2016	5	15.313	0.912	14.401	2016	3	1.086	0.021	1.065	2016	4	16.967	0.263	16.703
2017	5	15.957	0.939	15.018	2017	3	1.131	0.022	1.110	2017	4	17.679	0.271	17.409
2018	5	16.627	0.967	15.660	2018	3	1.179	0.022	1.157	2018	4	18.422	0.279	18.143
2019	5	17.326	0.996	16.330	2019	3	1.229	0.023	1.206	2019	4	19.197	0.287	18.909
2020	5	17.880	1.026	16.854	2020	3	1.268	0.024	1.244	2020	4	19.811	0.296	19.515
2021	5	18.453	1.057	17.396	2021	3	1.308	0.024	1.284	2021	4	20.445	0.305	20.140
2022	5	19.043	1.089	17.954	2022	3	1.350	0.025	1.325	2022	4	21.099	0.314	20.785
2023	5	19.653	1.121	18.531	2023	3	1.394	0.026	1.368	2023	4	21.774	0.323	21.451
2024	5	20.281	1.155	19.126	2024	3	1.438	0.027	1.411	2024	4	22.471	0.333	22.138
2025	5	20.931	1.190	19.741	2025	3	1.484	0.027	1.457	2025	4	23.190	0.343	22.847
2026	5	21.600	1.225	20.375	2026	3	1.532	0.028	1.503	2026	4	23.932	0.353	23.579
2027	5	22.292	1.262	21.029	2027	3	1.581	0.029	1.552	2027	4	24.698	0.364	24.334
2028	5	23.005	1.300	21.705	2028	3	1.631	0.030	1.601	2028	4	25.489	0.375	25.114
2029	5	23.741	1.339	22.402	2029	3	1.683	0.031	1.653	2029	4	26.304	0.386	25.918
2030	5	24.501	1.379	23.122	2030	3	1.737	0.032	1.706	2030	4	27.146	0.398	26.748
2031	5	25.285	1.421	23.864	2031	3	1.793	0.033	1.760	2031	4	28.015	0.410	27.605
2032	5	26.094	1.463	24.631	2032	3	1.850	0.034	1.817	2032	4	28.911	0.422	28.489
2033	5	26.929	1.507	25.422	2033	3	1.910	0.035	1.875	2033	4	29.837	0.435	29.402
2034	5	27.791	1.552	26.239	2034	3	1.971	0.036	1.935	2034	4	30.791	0.448	30.344
2035	5	28.680	1.599	27.081	2035	3	2.034	0.037	1.997	2035	4	31.777	0.461	31.316
2036	5	29.598	1.647	27.951	2036	3	2.099	0.038	2.061	2036	4	32.794	0.475	32.319
2037	5	30.545	1.696	28.849	2037	3	2.166	0.039	2.127	2037	4	33.843	0.489	33.354
2038	5	31.523	1.747	29.776	2038	3	2.235	0.040	2.195	2038	4	34.926	0.504	34.422
2039	5	32.532	1.800	30.732	2039	3	2.307	0.042	2.265	2039	4	36.044	0.519	35.525
2040	5	33.247	1.854	31.393	2040	3	2.358	0.043	2.315	2040	4	36.836	0.535	36.302
2041	5	33.978	1.909	32.069	2041	3	2.409	0.044	2.365	2041	4	37.646	0.551	37.095
2042	5	34.725	1.966	32.758	2042	3	2.462	0.045	2.417	2042	4	38.474	0.567	37.906
2043	5	35.488	2.025	33.463	2043	3	2.516	0.047	2.470	2043	4	39.319	0.584	38.735
2044	5	36.268	2.086	34.182	2044	3	2.572	0.048	2.524	2044	4	40.184	0.602	39.582
2045	5	37.065	2.149	34.917	2045	3	2.628	0.050	2.579	2045	4	41.067	0.620	40.447
2046	5	37.880	2.213	35.667	2046	3	2.686	0.051	2.635	2046	4	41.970	0.638	41.331
2047	5	38.713	2.280	36.433	2047	3	2.745	0.053	2.693	2047	4	42.892	0.658	42.235
2048	5	39.564	2.348	37.216	2048	3	2.805	0.054	2.751	2048	4	43.835	0.677	43.158
2049	5	40.434	2.418	38.015	2049	3	2.867	0.056	2.811	2049	4	44.799	0.698	44.101
2050	5	41.322	2.491	38.831	2050	3	2.930	0.057	2.873	2050	4	45.784	0.719	45.065
Totals		1,162.0	68.2		Totals		82.4	1.6		Totals		1,287.4	19.7	
Averages		21.5	1.3		Averages		1.5	0.0		Averages		23.8	0.4	

SR 7/US 441 - PPG SB CP				
Project: Z		Cap Cost:	0.10	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	2	0.030	0.005	0.025
1998	2	0.031	0.005	0.026
1999	2	0.032	0.005	0.027
2000	2	0.033	0.005	0.028
2001	2	0.035	0.006	0.029
2002	2	0.036	0.006	0.031
2003	2	0.038	0.006	0.032
2004	2	0.039	0.006	0.033
2005	2	0.041	0.006	0.035
2006	2	0.043	0.007	0.036
2007	2	0.045	0.007	0.038
2008	2	0.047	0.007	0.040
2009	2	0.048	0.007	0.041
2010	2	0.051	0.007	0.043
2011	2	0.053	0.008	0.045
2012	2	0.055	0.008	0.047
2013	2	0.057	0.008	0.049
2014	2	0.060	0.008	0.051
2015	2	0.062	0.009	0.054
2016	2	0.065	0.009	0.056
2017	2	0.067	0.009	0.058
2018	2	0.070	0.009	0.061
2019	2	0.073	0.010	0.064
2020	2	0.075	0.010	0.066
2021	2	0.078	0.010	0.068
2022	2	0.080	0.010	0.070
2023	2	0.083	0.011	0.072
2024	2	0.086	0.011	0.075
2025	2	0.088	0.011	0.077
2026	2	0.091	0.012	0.079
2027	2	0.094	0.012	0.082
2028	2	0.097	0.013	0.085
2029	2	0.100	0.013	0.087
2030	2	0.103	0.013	0.090
2031	2	0.107	0.014	0.093
2032	2	0.110	0.014	0.096
2033	2	0.114	0.014	0.099
2034	2	0.117	0.015	0.102
2035	2	0.121	0.015	0.106
2036	2	0.125	0.016	0.109
2037	2	0.129	0.016	0.113
2038	2	0.133	0.017	0.116
2039	2	0.137	0.017	0.120
2040	2	0.140	0.018	0.123
2041	2	0.143	0.018	0.125
2042	2	0.147	0.019	0.128
2043	2	0.150	0.019	0.130
2044	2	0.153	0.020	0.133
2045	2	0.156	0.021	0.136
2046	2	0.160	0.021	0.139
2047	2	0.163	0.022	0.142
2048	2	0.167	0.023	0.144
2049	2	0.171	0.023	0.147
2050	2	0.174	0.024	0.151
Totals		4.9	0.7	
Averages		0.1	0.0	

SR 826/Palmetto - HOVL Add				
Project: AA		Cap Cost:	151.57	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	1	0.000	0.000	0.000
1998	1	6.972	2.300	4.672
1999	1	7.265	2.369	4.896
2000	1	7.571	2.440	5.131
2001	1	7.889	2.513	5.375
2002	1	8.220	2.589	5.632
2003	1	8.566	2.666	5.899
2004	1	8.926	2.746	6.179
2005	1	9.301	2.829	6.472
2006	1	9.691	2.914	6.778
2007	1	10.099	3.001	7.098
2008	1	10.523	3.091	7.432
2009	1	10.965	3.184	7.782
2010	1	11.426	3.279	8.147
2011	1	11.906	3.378	8.529
2012	1	12.406	3.479	8.928
2013	1	12.928	3.583	9.344
2014	1	13.471	3.691	9.780
2015	1	14.037	3.802	10.236
2016	1	14.627	3.916	10.711
2017	1	15.242	4.033	11.209
2018	1	15.882	4.154	11.728
2019	1	16.549	4.279	12.271
2020	1	17.079	4.407	12.672
2021	1	17.626	4.539	13.086
2022	1	18.190	4.675	13.514
2023	1	18.772	4.816	13.956
2024	1	19.373	4.960	14.412
2025	1	19.993	5.109	14.884
2026	1	20.632	5.262	15.370
2027	1	21.293	5.420	15.873
2028	1	21.974	5.583	16.391
2029	1	22.677	5.750	16.927
2030	1	23.403	5.923	17.480
2031	1	24.152	6.100	18.052
2032	1	24.925	6.283	18.641
2033	1	25.722	6.472	19.251
2034	1	26.546	6.666	19.880
2035	1	27.395	6.866	20.529
2036	1	28.272	7.072	21.200
2037	1	29.177	7.284	21.892
2038	1	30.110	7.503	22.608
2039	1	31.074	7.728	23.346
2040	1	31.757	7.960	23.797
2041	1	32.455	8.198	24.257
2042	1	33.168	8.444	24.724
2043	1	33.898	8.698	25.200
2044	1	34.643	8.959	25.684
2045	1	35.404	9.227	26.177
2046	1	36.183	9.504	26.678
2047	1	36.978	9.789	27.189
2048	1	37.791	10.083	27.708
2049	1	38.622	10.385	28.236
2050	1	39.471	10.697	28.773
Totals		1,103.2	290.6	
Averages		20.4	5.4	

SR 826/Palmetto - HOVL Add +Take				
Project: AB		Cap Cost:	174.57	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	2	0.000	0.000	0.000
1998	2	16.264	2.300	13.964
1999	2	16.947	2.369	14.578
2000	2	17.660	2.440	15.220
2001	2	18.402	2.513	15.888
2002	2	19.175	2.589	16.586
2003	2	19.981	2.666	17.314
2004	2	20.820	2.746	18.074
2005	2	21.695	2.829	18.867
2006	2	22.607	2.914	19.693
2007	2	23.557	3.001	20.556
2008	2	24.547	3.091	21.456
2009	2	25.578	3.184	22.394
2010	2	26.653	3.279	23.374
2011	2	27.773	3.378	24.395
2012	2	28.940	3.479	25.461
2013	2	30.156	3.583	26.573
2014	2	31.423	3.691	27.733
2015	2	32.744	3.802	28.942
2016	2	34.120	3.916	30.204
2017	2	35.554	4.033	31.521
2018	2	37.048	4.154	32.894
2019	2	38.604	4.279	34.326
2020	2	39.840	4.407	35.433
2021	2	41.115	4.539	36.576
2022	2	42.431	4.675	37.755
2023	2	43.788	4.816	38.973
2024	2	45.190	4.960	40.230
2025	2	46.636	5.109	41.527
2026	2	48.128	5.262	42.866
2027	2	49.668	5.420	44.248
2028	2	51.258	5.583	45.675
2029	2	52.898	5.750	47.148
2030	2	54.591	5.923	48.668
2031	2	56.338	6.100	50.238
2032	2	58.141	6.283	51.858
2033	2	60.002	6.472	53.530
2034	2	61.922	6.666	55.256
2035	2	63.904	6.866	57.037
2036	2	65.949	7.072	58.877
2037	2	68.059	7.284	60.775
2038	2	70.237	7.503	62.734
2039	2	72.485	7.728	64.757
2040	2	74.078	7.960	66.119
2041	2	75.707	8.198	67.508
2042	2	77.371	8.444	68.926
2043	2	79.072	8.698	70.374
2044	2	80.810	8.959	71.851
2045	2	82.586	9.227	73.359
2046	2	84.402	9.504	74.897
2047	2	86.257	9.789	76.468
2048	2	88.153	10.083	78.070
2049	2	90.091	10.385	79.706
2050	2	92.071	10.697	81.374
Totals		2,573.4	290.6	
Averages		47.7	5.4	

SR 826/Palmetto - PPO CP					SR 826/Palmetto - 24-Hr CP					SR 836/Dolphin Xwy - 24 Hr CP				
Project	AC	Cap Cost	23.00	M$	Project	AD	Cap Cost	23.00	M$	Project	AE	Cap Cost	12.00	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	21.883	2.300	19.583	1997	4	134.659	2.300	132.359	1997	1	78.325	1.200	77.125
1998	3	22.803	2.369	20.434	1998	4	140.317	2.369	137.948	1998	1	81.616	1.236	80.380
1999	3	23.761	2.440	21.321	1999	4	146.214	2.440	143.773	1999	1	85.046	1.273	83.773
2000	3	24.759	2.513	22.246	2000	4	152.358	2.513	149.844	2000	1	88.619	1.311	87.308
2001	3	25.800	2.589	23.211	2001	4	158.760	2.589	156.171	2001	1	92.343	1.351	90.993
2002	3	26.884	2.666	24.218	2002	4	165.431	2.666	162.765	2002	1	96.224	1.391	94.833
2003	3	28.014	2.746	25.267	2003	4	172.383	2.746	169.637	2003	1	100.267	1.433	98.834
2004	3	29.191	2.829	26.362	2004	4	179.627	2.829	176.798	2004	1	104.481	1.476	103.005
2005	3	30.417	2.914	27.504	2005	4	187.175	2.914	184.261	2005	1	108.871	1.520	107.351
2006	3	31.696	3.001	28.695	2006	4	195.040	3.001	192.039	2006	1	113.446	1.566	111.880
2007	3	33.027	3.091	29.936	2007	4	203.236	3.091	200.145	2007	1	118.213	1.613	116.600
2008	3	34.415	3.184	31.232	2008	4	211.776	3.184	208.593	2008	1	123.181	1.661	121.520
2009	3	35.861	3.279	32.582	2009	4	220.675	3.279	217.396	2009	1	128.357	1.711	126.646
2010	3	37.368	3.378	33.991	2010	4	229.948	3.378	226.571	2010	1	133.751	1.762	131.988
2011	3	38.939	3.479	35.460	2011	4	239.611	3.479	236.132	2011	1	139.371	1.815	137.556
2012	3	40.575	3.583	36.992	2012	4	249.680	3.583	246.097	2012	1	145.227	1.870	143.358
2013	3	42.280	3.691	38.589	2013	4	260.172	3.691	256.481	2013	1	151.330	1.926	149.404
2014	3	44.057	3.802	40.255	2014	4	271.105	3.802	267.303	2014	1	157.689	1.983	155.706
2015	3	45.908	3.916	41.992	2015	4	282.497	3.916	278.581	2015	1	164.316	2.043	162.273
2016	3	47.837	4.033	43.804	2016	4	294.368	4.033	290.335	2016	1	171.220	2.104	169.116
2017	3	49.847	4.154	45.693	2017	4	306.737	4.154	302.583	2017	1	178.415	2.167	176.248
2018	3	51.942	4.279	47.663	2018	4	319.627	4.279	315.348	2018	1	185.912	2.232	183.680
2019	3	54.125	4.407	49.718	2019	4	333.058	4.407	328.651	2019	1	193.725	2.299	191.425
2020	3	55.857	4.539	51.317	2020	4	343.717	4.539	339.177	2020	1	199.924	2.368	197.556
2021	3	57.644	4.675	52.969	2021	4	354.716	4.675	350.041	2021	1	206.322	2.439	203.883
2022	3	59.489	4.816	54.673	2022	4	366.068	4.816	361.252	2022	1	212.925	2.513	210.412
2023	3	61.393	4.960	56.433	2023	4	377.783	4.960	372.823	2023	1	219.739	2.588	217.151
2024	3	63.357	5.109	58.248	2024	4	389.873	5.109	384.764	2024	1	226.771	2.666	224.106
2025	3	65.385	5.262	60.123	2025	4	402.349	5.262	397.087	2025	1	234.028	2.746	231.283
2026	3	67.477	5.420	62.057	2026	4	415.225	5.420	409.805	2026	1	241.518	2.828	238.690
2027	3	69.637	5.583	64.054	2027	4	428.513	5.583	422.930	2027	1	249.247	2.913	246.334
2028	3	71.865	5.750	66.115	2028	4	442.226	5.750	436.476	2028	1	257.223	3.000	254.223
2029	3	74.165	5.923	68.242	2029	4	456.379	5.923	450.456	2029	1	265.455	3.090	262.364
2030	3	76.539	6.100	70.438	2030	4	470.984	6.100	464.883	2030	1	273.950	3.183	270.767
2031	3	78.988	6.283	72.705	2031	4	486.056	6.283	479.773	2031	1	282.717	3.278	279.438
2032	3	81.516	6.472	75.044	2032	4	501.611	6.472	495.139	2032	1	291.764	3.377	288.387
2033	3	84.124	6.666	77.458	2033	4	517.663	6.666	510.997	2033	1	301.101	3.478	297.623
2034	3	86.816	6.866	79.950	2034	4	534.229	6.866	527.363	2034	1	310.737	3.582	307.155
2035	3	89.595	7.072	82.523	2035	4	551.326	7.072	544.254	2035	1	320.681	3.690	316.991
2036	3	92.462	7.284	85.178	2036	4	568.969	7.284	561.685	2036	1	330.943	3.800	327.143
2037	3	95.421	7.503	87.918	2037	4	587.177	7.503	579.675	2037	1	341.534	3.914	337.620
2038	3	98.475	7.728	90.747	2038	4	605.968	7.728	598.240	2038	1	352.464	4.032	348.432
2039	3	101.626	7.960	93.666	2039	4	625.360	7.960	617.401	2039	1	363.744	4.153	359.591
2040	3	103.860	8.198	95.662	2040	4	639.107	8.198	630.909	2040	1	371.740	4.277	367.462
2041	3	106.143	8.444	97.699	2041	4	653.156	8.444	644.712	2041	1	379.911	4.406	375.506
2042	3	108.476	8.698	99.779	2042	4	667.514	8.698	658.817	2042	1	388.263	4.538	383.725
2043	3	110.861	8.959	101.902	2043	4	682.188	8.959	673.229	2043	1	396.798	4.674	392.124
2044	3	113.298	9.227	104.071	2044	4	697.184	9.227	687.957	2044	1	405.520	4.814	400.706
2045	3	115.788	9.504	106.284	2045	4	712.510	9.504	703.006	2045	1	414.435	4.959	409.476
2046	3	118.334	9.789	108.544	2046	4	728.173	9.789	718.384	2046	1	423.545	5.107	418.438
2047	3	120.935	10.083	110.852	2047	4	744.180	10.083	734.097	2047	1	432.856	5.261	427.595
2048	3	123.594	10.385	113.208	2048	4	760.539	10.385	750.153	2048	1	442.371	5.419	436.952
2049	3	126.310	10.697	115.613	2049	4	777.257	10.697	766.560	2049	1	452.095	5.581	446.514
2050	3	129.087	11.018	118.069	2050	4	794.343	11.018	783.326	2050	1	462.033	5.748	456.285
Totals		3,629.9	301.6		Totals		22,336.8	301.6		Totals		12,992.3	157.4	
Averages		67.2	5.6		Averages		413.6	5.6		Averages		240.6	2.9	

SR 836/Dolphin Xwy Ext - 24 Hr CP					SR 874/Don Shula Xwy - 24 Hr CP					SR 874/Don Shula Xwy Ext - 24 Hr CP				
Project AF		Cap Cost	50.84	M$	Project AG		Cap Cost	7.00	M$	Project AH		Cap Cost	49.65	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	1	0.000	0.000	0.000	1997	1	37.889	0.700	37.189	1997	1	0.000	0.000	0.000
1998	1	0.000	0.000	0.000	1998	1	39.481	0.721	38.760	1998	1	0.000	0.000	0.000
1999	1	0.000	0.000	0.000	1999	1	41.140	0.743	40.398	1999	1	0.000	0.000	0.000
2000	1	1.942	0.100	1.842	2000	1	42.869	0.765	42.104	2000	1	4.103	0.140	3.963
2001	1	2.024	0.103	1.921	2001	1	44.671	0.788	43.883	2001	1	4.276	0.144	4.132
2002	1	2.109	0.106	2.003	2002	1	46.548	0.811	45.736	2002	1	4.455	0.149	4.307
2003	1	2.198	0.109	2.088	2003	1	48.504	0.836	47.668	2003	1	4.643	0.153	4.490
2004	1	2.290	0.113	2.177	2004	1	50.542	0.861	49.681	2004	1	4.838	0.158	4.680
2005	1	2.386	0.116	2.270	2005	1	52.666	0.887	51.779	2005	1	5.041	0.162	4.879
2006	1	2.486	0.119	2.367	2006	1	54.879	0.913	53.965	2006	1	5.253	0.167	5.086
2007	1	2.591	0.123	2.468	2007	1	57.185	0.941	56.244	2007	1	5.474	0.172	5.301
2008	1	2.700	0.127	2.573	2008	1	59.588	0.969	58.619	2008	1	5.704	0.177	5.526
2009	1	2.813	0.130	2.683	2009	1	62.092	0.998	61.094	2009	1	5.943	0.183	5.761
2010	1	2.931	0.134	2.797	2010	1	64.701	1.028	63.673	2010	1	6.193	0.188	6.005
2011	1	3.055	0.138	2.916	2011	1	67.420	1.059	66.361	2011	1	6.453	0.194	6.260
2012	1	3.183	0.143	3.040	2012	1	70.253	1.091	69.162	2012	1	6.724	0.200	6.525
2013	1	3.317	0.147	3.170	2013	1	73.205	1.123	72.082	2013	1	7.007	0.206	6.801
2014	1	3.456	0.151	3.305	2014	1	76.281	1.157	75.124	2014	1	7.301	0.212	7.090
2015	1	3.601	0.156	3.446	2015	1	79.487	1.192	78.295	2015	1	7.608	0.218	7.390
2016	1	3.753	0.160	3.592	2016	1	82.827	1.227	81.599	2016	1	7.928	0.225	7.703
2017	1	3.910	0.165	3.745	2017	1	86.307	1.264	85.043	2017	1	8.261	0.231	8.030
2018	1	4.075	0.170	3.904	2018	1	89.934	1.302	88.632	2018	1	8.608	0.238	8.370
2019	1	4.246	0.175	4.071	2019	1	93.713	1.341	92.372	2019	1	8.970	0.245	8.725
2020	1	4.382	0.181	4.201	2020	1	96.712	1.382	95.331	2020	1	9.257	0.253	9.004
2021	1	4.522	0.186	4.336	2021	1	99.807	1.423	98.384	2021	1	9.553	0.260	9.293
2022	1	4.667	0.192	4.475	2022	1	103.001	1.466	101.535	2022	1	9.859	0.268	9.591
2023	1	4.816	0.197	4.619	2023	1	106.297	1.510	104.788	2023	1	10.175	0.276	9.898
2024	1	4.970	0.203	4.767	2024	1	109.699	1.555	108.144	2024	1	10.500	0.285	10.216
2025	1	5.129	0.209	4.920	2025	1	113.210	1.602	111.608	2025	1	10.836	0.293	10.543
2026	1	5.293	0.216	5.078	2026	1	116.833	1.650	115.183	2026	1	11.183	0.302	10.881
2027	1	5.463	0.222	5.241	2027	1	120.571	1.699	118.872	2027	1	11.541	0.311	11.230
2028	1	5.638	0.229	5.409	2028	1	124.430	1.750	122.680	2028	1	11.910	0.320	11.590
2029	1	5.818	0.236	5.582	2029	1	128.412	1.803	126.609	2029	1	12.291	0.330	11.961
2030	1	6.004	0.243	5.761	2030	1	132.521	1.857	130.665	2030	1	12.685	0.340	12.345
2031	1	6.196	0.250	5.946	2031	1	136.762	1.912	134.850	2031	1	13.091	0.350	12.741
2032	1	6.395	0.258	6.137	2032	1	141.139	1.970	139.169	2032	1	13.510	0.361	13.149
2033	1	6.599	0.265	6.334	2033	1	145.656	2.029	143.627	2033	1	13.942	0.371	13.571
2034	1	6.810	0.273	6.537	2034	1	150.317	2.090	148.227	2034	1	14.388	0.382	14.006
2035	1	7.028	0.281	6.747	2035	1	155.127	2.152	152.975	2035	1	14.849	0.394	14.455
2036	1	7.253	0.290	6.963	2036	1	160.092	2.217	157.875	2036	1	15.324	0.406	14.918
2037	1	7.485	0.299	7.187	2037	1	165.215	2.283	162.932	2037	1	15.814	0.418	15.396
2038	1	7.725	0.307	7.417	2038	1	170.502	2.352	168.150	2038	1	16.320	0.430	15.890
2039	1	7.972	0.317	7.655	2039	1	175.959	2.422	173.536	2039	1	16.842	0.443	16.399
2040	1	8.147	0.326	7.821	2040	1	179.827	2.495	177.331	2040	1	17.213	0.457	16.756
2041	1	8.327	0.336	7.991	2041	1	183.780	2.570	181.210	2041	1	17.591	0.470	17.121
2042	1	8.510	0.346	8.163	2042	1	187.820	2.647	185.172	2042	1	17.978	0.484	17.493
2043	1	8.697	0.356	8.340	2043	1	191.948	2.727	189.222	2043	1	18.373	0.499	17.874
2044	1	8.888	0.367	8.521	2044	1	196.168	2.808	193.359	2044	1	18.777	0.514	18.263
2045	1	9.083	0.378	8.705	2045	1	200.480	2.893	197.587	2045	1	19.190	0.529	18.660
2046	1	9.283	0.390	8.893	2046	1	204.887	2.979	201.908	2046	1	19.611	0.545	19.066
2047	1	9.487	0.401	9.086	2047	1	209.391	3.069	206.322	2047	1	20.043	0.562	19.481
2048	1	9.695	0.413	9.282	2048	1	213.994	3.161	210.833	2048	1	20.483	0.579	19.905
2049	1	9.909	0.426	9.483	2049	1	218.698	3.256	215.442	2049	1	20.933	0.596	20.338
2050	1	10.126	0.438	9.688	2050	1	223.506	3.353	220.152	2050	1	21.394	0.614	20.780
Totals		279.4	11.7		Totals		6,284.9	91.8		Totals		590.2	16.4	
Averages		5.2	0.2		Averages		116.4	1.7		Averages		10.9	0.3	

SR 878/Snapper Creek - PPO WB CP				
Project: AI		Cap Cost:	1.35	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	0.667	0.135	0.532
1998	3	0.695	0.139	0.556
1999	3	0.724	0.143	0.581
2000	3	0.754	0.148	0.607
2001	3	0.786	0.152	0.634
2002	3	0.819	0.157	0.662
2003	3	0.853	0.161	0.692
2004	3	0.889	0.166	0.723
2005	3	0.927	0.171	0.756
2006	3	0.966	0.176	0.789
2007	3	1.006	0.181	0.825
2008	3	1.048	0.187	0.862
2009	3	1.092	0.192	0.900
2010	3	1.138	0.198	0.940
2011	3	1.186	0.204	0.982
2012	3	1.236	0.210	1.026
2013	3	1.288	0.217	1.071
2014	3	1.342	0.223	1.119
2015	3	1.398	0.230	1.169
2016	3	1.457	0.237	1.221
2017	3	1.518	0.244	1.275
2018	3	1.582	0.251	1.331
2019	3	1.649	0.259	1.390
2020	3	1.702	0.266	1.435
2021	3	1.756	0.274	1.482
2022	3	1.812	0.283	1.530
2023	3	1.870	0.291	1.579
2024	3	1.930	0.300	1.630
2025	3	1.992	0.309	1.683
2026	3	2.056	0.318	1.737
2027	3	2.121	0.328	1.794
2028	3	2.189	0.338	1.852
2029	3	2.259	0.348	1.912
2030	3	2.332	0.358	1.974
2031	3	2.406	0.369	2.037
2032	3	2.483	0.380	2.103
2033	3	2.563	0.391	2.171
2034	3	2.645	0.403	2.242
2035	3	2.729	0.415	2.314
2036	3	2.817	0.428	2.389
2037	3	2.907	0.440	2.466
2038	3	3.000	0.454	2.546
2039	3	3.096	0.467	2.629
2040	3	3.164	0.481	2.683
2041	3	3.233	0.496	2.738
2042	3	3.305	0.511	2.794
2043	3	3.377	0.526	2.851
2044	3	3.451	0.542	2.910
2045	3	3.527	0.558	2.969
2046	3	3.605	0.575	3.030
2047	3	3.684	0.592	3.092
2048	3	3.765	0.610	3.155
2049	3	3.848	0.628	3.220
2050	3	3.932	0.647	3.286
Totals		110.6	17.7	
Averages		2.0	0.3	

Sunny Isles Cswy - PPO CP				
Project: AJ		Cap Cost:	0.10	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	0.378	0.141	0.237
1998	3	0.394	0.145	0.249
1999	3	0.410	0.149	0.261
2000	3	0.428	0.154	0.274
2001	3	0.446	0.158	0.287
2002	3	0.464	0.163	0.301
2003	3	0.484	0.168	0.316
2004	3	0.504	0.173	0.331
2005	3	0.525	0.178	0.347
2006	3	0.547	0.183	0.364
2007	3	0.570	0.189	0.381
2008	3	0.594	0.195	0.400
2009	3	0.619	0.200	0.419
2010	3	0.645	0.206	0.439
2011	3	0.672	0.213	0.460
2012	3	0.701	0.219	0.482
2013	3	0.730	0.226	0.505
2014	3	0.761	0.232	0.528
2015	3	0.793	0.239	0.553
2016	3	0.826	0.247	0.580
2017	3	0.861	0.254	0.607
2018	3	0.897	0.262	0.635
2019	3	0.935	0.269	0.665
2020	3	0.965	0.277	0.687
2021	3	0.995	0.286	0.710
2022	3	1.027	0.294	0.733
2023	3	1.060	0.303	0.757
2024	3	1.094	0.312	0.782
2025	3	1.129	0.322	0.807
2026	3	1.165	0.331	0.834
2027	3	1.203	0.341	0.861
2028	3	1.241	0.351	0.890
2029	3	1.281	0.362	0.919
2030	3	1.322	0.373	0.949
2031	3	1.364	0.384	0.980
2032	3	1.408	0.396	1.012
2033	3	1.453	0.407	1.045
2034	3	1.499	0.420	1.080
2035	3	1.547	0.432	1.115
2036	3	1.597	0.445	1.151
2037	3	1.648	0.459	1.189
2038	3	1.701	0.472	1.228
2039	3	1.755	0.487	1.268
2040	3	1.794	0.501	1.292
2041	3	1.833	0.516	1.317
2042	3	1.873	0.532	1.342
2043	3	1.914	0.548	1.367
2044	3	1.957	0.564	1.393
2045	3	2.000	0.581	1.419
2046	3	2.043	0.598	1.445
2047	3	2.088	0.616	1.472
2048	3	2.134	0.635	1.500
2049	3	2.181	0.654	1.527
2050	3	2.229	0.673	1.556
Totals		62.7	18.4	
Averages		1.2	0.3	

Sunny Isles Cswy - 24 Hr CP				
Project: AK		Cap Cost:	0.10	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	4	5.905	1.757	4.147
1998	4	6.153	1.810	4.343
1999	4	6.411	1.864	4.547
2000	4	6.681	1.920	4.760
2001	4	6.961	1.978	4.984
2002	4	7.254	2.037	5.217
2003	4	7.559	2.098	5.460
2004	4	7.876	2.161	5.715
2005	4	8.207	2.226	5.981
2006	4	8.552	2.293	6.259
2007	4	8.912	2.362	6.550
2008	4	9.286	2.433	6.854
2009	4	9.676	2.506	7.171
2010	4	10.083	2.581	7.502
2011	4	10.507	2.658	7.849
2012	4	10.948	2.738	8.210
2013	4	11.408	2.820	8.588
2014	4	11.888	2.905	8.983
2015	4	12.387	2.992	9.395
2016	4	12.908	3.081	9.826
2017	4	13.450	3.174	10.276
2018	4	14.015	3.269	10.746
2019	4	14.604	3.367	11.237
2020	4	15.072	3.468	11.603
2021	4	15.554	3.572	11.982
2022	4	16.052	3.679	12.372
2023	4	16.565	3.790	12.775
2024	4	17.095	3.904	13.192
2025	4	17.643	4.021	13.622
2026	4	18.207	4.141	14.066
2027	4	18.790	4.265	14.524
2028	4	19.391	4.393	14.998
2029	4	20.012	4.525	15.486
2030	4	20.652	4.661	15.991
2031	4	21.313	4.801	16.512
2032	4	21.995	4.945	17.050
2033	4	22.699	5.093	17.606
2034	4	23.425	5.246	18.179
2035	4	24.175	5.403	18.772
2036	4	24.949	5.566	19.383
2037	4	25.747	5.732	20.015
2038	4	26.571	5.904	20.667
2039	4	27.421	6.082	21.340
2040	4	28.024	6.264	21.760
2041	4	28.640	6.452	22.188
2042	4	29.270	6.646	22.624
2043	4	29.913	6.845	23.068
2044	4	30.571	7.050	23.520
2045	4	31.243	7.262	23.981
2046	4	31.930	7.480	24.450
2047	4	32.631	7.704	24.927
2048	4	33.349	7.935	25.414
2049	4	34.082	8.173	25.909
2050	4	34.831	8.418	26.413
Totals		979.4	230.5	
Averages		18.1	4.3	

US 1/Biscayne Bl - HOV Add Busway					US 1/S Dixie - HOVL Take					US 1/S Dixie - PPO CP				
Project	AL	Cap Cost	100.78	M$	Project	AM	Cap Cost	39.65	M$	Project	AN	Cap Cost	39.65	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)	YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	0.000	0.000	0.000	1997	2	2.920	0.790	2.130	1997	4	4.103	0.790	3.313
1998	3	4.960	1.340	3.620	1998	2	3.042	0.814	2.229	1998	4	4.276	0.814	3.462
1999	3	5.168	1.380	3.788	1999	2	3.170	0.838	2.332	1999	4	4.456	0.838	3.617
2000	3	5.385	1.422	3.963	2000	2	3.303	0.863	2.440	2000	4	4.643	0.863	3.779
2001	3	5.611	1.464	4.147	2001	2	3.442	0.889	2.553	2001	4	4.838	0.889	3.949
2002	3	5.847	1.508	4.339	2002	2	3.587	0.916	2.671	2002	4	5.041	0.916	4.125
2003	3	6.093	1.553	4.539	2003	2	3.738	0.943	2.794	2003	4	5.253	0.943	4.310
2004	3	6.349	1.600	4.749	2004	2	3.895	0.972	2.923	2004	4	5.474	0.972	4.502
2005	3	6.616	1.648	4.968	2005	2	4.058	1.001	3.058	2005	4	5.704	1.001	4.703
2006	3	6.894	1.697	5.196	2006	2	4.229	1.031	3.198	2006	4	5.943	1.031	4.913
2007	3	7.183	1.748	5.435	2007	2	4.407	1.062	3.345	2007	4	6.193	1.062	5.131
2008	3	7.485	1.801	5.684	2008	2	4.592	1.094	3.498	2008	4	6.453	1.094	5.360
2009	3	7.800	1.855	5.945	2009	2	4.785	1.126	3.658	2009	4	6.725	1.126	5.598
2010	3	8.128	1.911	6.217	2010	2	4.986	1.160	3.826	2010	4	7.007	1.160	5.847
2011	3	8.469	1.968	6.501	2011	2	5.195	1.195	4.000	2011	4	7.302	1.195	6.107
2012	3	8.825	2.027	6.798	2012	2	5.414	1.231	4.183	2012	4	7.608	1.231	6.378
2013	3	9.196	2.088	7.108	2013	2	5.641	1.268	4.373	2013	4	7.928	1.268	6.660
2014	3	9.582	2.150	7.432	2014	2	5.878	1.306	4.572	2014	4	8.261	1.306	6.956
2015	3	9.985	2.215	7.770	2015	2	6.125	1.345	4.780	2015	4	8.608	1.345	7.264
2016	3	10.404	2.281	8.123	2016	2	6.382	1.385	4.997	2016	4	8.970	1.385	7.585
2017	3	10.842	2.350	8.492	2017	2	6.651	1.427	5.224	2017	4	9.347	1.427	7.920
2018	3	11.297	2.420	8.877	2018	2	6.930	1.470	5.461	2018	4	9.740	1.470	8.270
2019	3	11.772	2.493	9.279	2019	2	7.221	1.514	5.708	2019	4	10.149	1.514	8.635
2020	3	12.149	2.568	9.581	2020	2	7.452	1.559	5.893	2020	4	10.474	1.559	8.915
2021	3	12.537	2.645	9.893	2021	2	7.691	1.606	6.085	2021	4	10.809	1.606	9.203
2022	3	12.939	2.724	10.215	2022	2	7.937	1.654	6.283	2022	4	11.155	1.654	9.501
2023	3	13.353	2.806	10.547	2023	2	8.191	1.704	6.487	2023	4	11.512	1.704	9.808
2024	3	13.780	2.890	10.890	2024	2	8.453	1.755	6.698	2024	4	11.880	1.755	10.126
2025	3	14.221	2.977	11.244	2025	2	8.724	1.807	6.916	2025	4	12.261	1.807	10.453
2026	3	14.676	3.066	11.610	2026	2	9.003	1.862	7.141	2026	4	12.653	1.862	10.791
2027	3	15.146	3.158	11.988	2027	2	9.291	1.918	7.373	2027	4	13.058	1.918	11.140
2028	3	15.630	3.253	12.378	2028	2	9.588	1.975	7.613	2028	4	13.476	1.975	11.501
2029	3	16.131	3.350	12.781	2029	2	9.895	2.034	7.861	2029	4	13.907	2.034	11.873
2030	3	16.647	3.451	13.196	2030	2	10.212	2.095	8.117	2030	4	14.352	2.095	12.257
2031	3	17.180	3.554	13.625	2031	2	10.539	2.158	8.380	2031	4	14.811	2.158	12.653
2032	3	17.729	3.661	14.069	2032	2	10.876	2.223	8.653	2032	4	15.285	2.223	13.062
2033	3	18.297	3.771	14.526	2033	2	11.224	2.290	8.934	2033	4	15.775	2.290	13.485
2034	3	18.882	3.884	14.999	2034	2	11.583	2.358	9.225	2034	4	16.279	2.358	13.921
2035	3	19.487	4.000	15.486	2035	2	11.954	2.429	9.525	2035	4	16.800	2.429	14.371
2036	3	20.110	4.120	15.990	2036	2	12.336	2.502	9.834	2036	4	17.338	2.502	14.836
2037	3	20.754	4.244	16.510	2037	2	12.731	2.577	10.154	2037	4	17.893	2.577	15.316
2038	3	21.418	4.371	17.047	2038	2	13.139	2.654	10.484	2038	4	18.465	2.654	15.811
2039	3	22.103	4.502	17.601	2039	2	13.559	2.734	10.825	2039	4	19.056	2.734	16.322
2040	3	22.589	4.637	17.952	2040	2	13.857	2.816	11.041	2040	4	19.475	2.816	16.659
2041	3	23.086	4.776	18.309	2041	2	14.162	2.900	11.261	2041	4	19.903	2.900	17.003
2042	3	23.593	4.920	18.674	2042	2	14.473	2.987	11.486	2042	4	20.341	2.987	17.353
2043	3	24.112	5.067	19.045	2043	2	14.791	3.077	11.714	2043	4	20.788	3.077	17.711
2044	3	24.642	5.219	19.423	2044	2	15.116	3.169	11.947	2044	4	21.245	3.169	18.076
2045	3	25.184	5.376	19.808	2045	2	15.449	3.264	12.184	2045	4	21.712	3.264	18.448
2046	3	25.737	5.537	20.200	2046	2	15.788	3.362	12.426	2046	4	22.189	3.362	18.827
2047	3	26.303	5.703	20.600	2047	2	16.135	3.463	12.672	2047	4	22.677	3.463	19.214
2048	3	26.881	5.874	21.007	2048	2	16.490	3.567	12.923	2048	4	23.176	3.567	19.608
2049	3	27.472	6.051	21.421	2049	2	16.853	3.674	13.178	2049	4	23.685	3.674	20.011
2050	3	28.076	6.232	21.844	2050	2	17.223	3.784	13.439	2050	4	24.206	3.784	20.421
Totals		784.7	169.3		Totals		484.3	103.6		Totals		680.7	103.6	
Averages		14.5	3.1		Averages		9.0	1.9		Averages		12.6	1.9	

Venetian Cswy - 24 Hr CP				
Project AQ		Cap Cost	2.60	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	1	6.582	2.116	4.466
1998	1	6.859	2.179	4.680
1999	1	7.147	2.245	4.902
2000	1	7.447	2.312	5.135
2001	1	7.760	2.381	5.379
2002	1	8.086	2.453	5.634
2003	1	8.426	2.526	5.900
2004	1	8.780	2.602	6.178
2005	1	9.149	2.680	6.469
2006	1	9.533	2.760	6.773
2007	1	9.934	2.843	7.091
2008	1	10.352	2.929	7.423
2009	1	10.787	3.016	7.770
2010	1	11.240	3.107	8.133
2011	1	11.712	3.200	8.512
2012	1	12.204	3.296	8.908
2013	1	12.717	3.395	9.322
2014	1	13.252	3.497	9.755
2015	1	13.808	3.602	10.207
2016	1	14.389	3.710	10.679
2017	1	14.993	3.821	11.172
2018	1	15.623	3.936	11.688
2019	1	16.280	4.054	12.226
2020	1	16.801	4.175	12.625
2021	1	17.338	4.301	13.038
2022	1	17.893	4.430	13.464
2023	1	18.466	4.563	13.903
2024	1	19.057	4.700	14.357
2025	1	19.667	4.840	14.826
2026	1	20.296	4.986	15.310
2027	1	20.946	5.135	15.810
2028	1	21.616	5.289	16.327
2029	1	22.308	5.448	16.860
2030	1	23.022	5.611	17.410
2031	1	23.758	5.780	17.978
2032	1	24.519	5.953	18.565
2033	1	25.303	6.132	19.171
2034	1	26.113	6.316	19.797
2035	1	26.949	6.505	20.443
2036	1	27.811	6.700	21.111
2037	1	28.701	6.901	21.800
2038	1	29.620	7.108	22.511
2039	1	30.567	7.322	23.246
2040	1	31.239	7.541	23.698
2041	1	31.926	7.768	24.159
2042	1	32.628	8.001	24.627
2043	1	33.345	8.241	25.105
2044	1	34.078	8.488	25.590
2045	1	34.827	8.742	26.085
2046	1	35.593	9.005	26.588
2047	1	36.375	9.275	27.100
2048	1	37.175	9.553	27.622
2049	1	37.992	9.840	28.152
2050	1	38.827	10.135	28.692
Totals		1,091.8	277.4	
Averages		20.2	5.1	

Wm Lehman Cswy - PPO CP				
Project AP		Cap Cost	0.30	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	3	0.923	0.343	0.579
1998	3	0.961	0.354	0.608
1999	3	1.002	0.364	0.638
2000	3	1.044	0.375	0.669
2001	3	1.088	0.386	0.701
2002	3	1.134	0.398	0.736
2003	3	1.181	0.410	0.771
2004	3	1.231	0.422	0.809
2005	3	1.283	0.435	0.848
2006	3	1.336	0.448	0.889
2007	3	1.393	0.461	0.931
2008	3	1.451	0.475	0.976
2009	3	1.512	0.489	1.023
2010	3	1.576	0.504	1.072
2011	3	1.642	0.519	1.123
2012	3	1.711	0.535	1.176
2013	3	1.783	0.551	1.232
2014	3	1.858	0.567	1.290
2015	3	1.936	0.584	1.351
2016	3	2.017	0.602	1.415
2017	3	2.102	0.620	1.482
2018	3	2.190	0.639	1.552
2019	3	2.282	0.658	1.624
2020	3	2.355	0.677	1.678
2021	3	2.431	0.698	1.733
2022	3	2.508	0.719	1.790
2023	3	2.589	0.740	1.848
2024	3	2.671	0.762	1.909
2025	3	2.757	0.785	1.972
2026	3	2.845	0.809	2.036
2027	3	2.936	0.833	2.103
2028	3	3.030	0.858	2.172
2029	3	3.127	0.884	2.243
2030	3	3.227	0.910	2.317
2031	3	3.331	0.938	2.393
2032	3	3.437	0.966	2.471
2033	3	3.547	0.995	2.552
2034	3	3.661	1.025	2.636
2035	3	3.778	1.055	2.722
2036	3	3.899	1.087	2.812
2037	3	4.023	1.120	2.904
2038	3	4.152	1.153	2.999
2039	3	4.285	1.188	3.097
2040	3	4.379	1.224	3.156
2041	3	4.476	1.260	3.215
2042	3	4.574	1.298	3.276
2043	3	4.674	1.337	3.337
2044	3	4.777	1.377	3.400
2045	3	4.882	1.418	3.464
2046	3	4.990	1.461	3.529
2047	3	5.099	1.505	3.594
2048	3	5.211	1.550	3.661
2049	3	5.326	1.596	3.729
2050	3	5.443	1.644	3.799
Totals		153.1	45.0	
Averages		2.8	0.8	

Wm Lehman Cswy - 24 Hr CP				
Project AQ		Cap Cost	0.30	M$
YEAR	PLAN	Revenue ($M)	O & M (M$)	Net Rev (M$)
1997	4	14.417	4.291	10.126
1998	4	15.023	4.420	10.603
1999	4	15.654	4.552	11.102
2000	4	16.312	4.689	11.623
2001	4	16.998	4.829	12.168
2002	4	17.712	4.974	12.738
2003	4	18.456	5.123	13.333
2004	4	19.232	5.277	13.955
2005	4	20.040	5.436	14.604
2006	4	20.882	5.599	15.283
2007	4	21.759	5.767	15.993
2008	4	22.674	5.940	16.734
2009	4	23.627	6.118	17.509
2010	4	24.619	6.301	18.318
2011	4	25.654	6.490	19.164
2012	4	26.732	6.685	20.047
2013	4	27.855	6.886	20.970
2014	4	29.026	7.092	21.934
2015	4	30.246	7.305	22.941
2016	4	31.516	7.524	23.992
2017	4	32.841	7.750	25.091
2018	4	34.221	7.982	26.239
2019	4	35.659	8.222	27.437
2020	4	36.800	8.468	28.332
2021	4	37.978	8.722	29.255
2022	4	39.193	8.984	30.209
2023	4	40.447	9.254	31.194
2024	4	41.742	9.531	32.210
2025	4	43.077	9.817	33.260
2026	4	44.456	10.112	34.344
2027	4	45.879	10.415	35.464
2028	4	47.347	10.727	36.619
2029	4	48.862	11.049	37.813
2030	4	50.426	11.381	39.045
2031	4	52.040	11.722	40.317
2032	4	53.705	12.074	41.631
2033	4	55.424	12.436	42.988
2034	4	57.197	12.809	44.388
2035	4	59.028	13.193	45.834
2036	4	60.917	13.589	47.327
2037	4	62.866	13.997	48.869
2038	4	64.878	14.417	50.461
2039	4	66.954	14.849	52.105
2040	4	68.426	15.295	53.131
2041	4	69.930	15.754	54.177
2042	4	71.467	16.226	55.241
2043	4	73.038	16.713	56.325
2044	4	74.644	17.214	57.430
2045	4	76.285	17.731	58.554
2046	4	77.962	18.263	59.699
2047	4	79.676	18.811	60.865
2048	4	81.427	19.375	62.052
2049	4	83.217	19.956	63.261
2050	4	85.046	20.555	64.491
Totals		2,391.5	562.7	
Averages		44.3	10.4	

Kimley-Horn
and Associates, Inc.

APPENDIX F

DIVERSION ANALYSIS

DIVERSION ANALYSIS

This appendix to the Metro-Dade Road Pricing Plan documents a diversion analysis conducted by Kimley-Horn and Associates, Inc., to determine the impacts that the moderate road pricing plan may have on Metro-Dade County's arterial roadway network.

The process used to conduct the diversion analysis was as follows:

1. The Southeast Regional Planning Model (SERPM) was run for the *Existing + Committed* (E+C) network for the year 2000. Tolls on all existing toll roads were kept at their current (1994) levels.

2. The SERPM was run for the moderate road pricing package contained in the Metro-Dade Road Pricing Plan- Draft Final report (incorporating the comments of the Steering Committee meeting of 5/31/1994). Two facilities were added to the E+C network. These were the Central Parkway and the Gratigny Parkway extension east to I-95.

   In addition, currently untolled freeways that were coded as toll facilities for the analysis were I-95, and the Palmetto Expressway (SR 826). Tolls on these, as well as existing toll facilities were coded at a rate of 12 cents per mile.

3. The results of the two SERPM runs were plotted, and two north-south and three east-west "screen lines" were drawn. The total number of vehicles crossing the screen lines was calculated to assess whether the model runs were reasonable . The results of the "screen line test" are shown below:

Screen Line Number	Total - E+C Network	Total - Moderate Plan	Difference
N-S Number 1	623,300	602,100	3.40%
N-S Number 2	624,400	610,600	2.21%
E-W Number 1	648,000	648,600	0.09%
E-W Number 2	629,500	618,500	1.75%
E-W Number 3	464,400	455,600	1.89%

   All the "screen lines" have comparable traffic volumes crossing them, an indication of reasonable and sound model runs.

4. Parallel arterial facilities were identified for I-95, SR 826, SR 836, and the Central Parkway based on the volume of diverted trips that were loaded on these arterials by the model. The alternate facilities are listed below:

Freeway	Alternate Facilities
I-95	NW 7th Avenue, Miami Avenue
SR 826	Combination of Miami Gardens Drive, Red Road, Milam Dairy Road, and NW 87th Avenue
SR 836	Flagler Street, Tamiami Trail, NW 7th Street
Central Parkway	NW 27th Avenue, Le Jeune / Douglas corridor.

Volumes were tabulated for the above three expressways, as well as for their respective parallel facilities. The volumes for the E+C network were compared to the volumes for the Moderate Plan network to determine the amount of traffic diversion caused by the implementation of the recommended road pricing plan.

5. The before- and after- volumes were then compared to the Level of Service (LOS) thresholds in the FDOT Level of Service Manual. The tables used are attached, and represent the Generalized Annual Average Daily Volumes for Florida's Urbanized Areas. Group B was used for arterial streets, and Group 1 was used for the freeways. The LOS was determined for before and after conditions for several segments, both along the freeways, and the parallel arterial streets. The results are shown in Table 1.

RESULTS AND CONCLUSION

This diversion analysis indicates that the addition of tolls (as identified in the moderate road pricing plan) to currently untolled facilities produces significant diversions of traffic to parallel arterial streets. It also indicates that the amount of diversion varies substantially from facility to facility, anywhere from 20% to 70 %, largely based upon the alternative routes available. In the case of I-95 and the Palmetto Expressway, the addition of the Central Parkway creates fairly large amounts of diversion.

It can be seen from Table 1 that the LOS on the parallel arterial facilities on almost all the segments analyzed does not exceed LOS D. There are only three segments where the LOS falls to F after the tolls are imposed, according to the model results and the FDOT generalized capacity tables. There is a significant amount of unused capacity on arterial streets that is more efficiently utilized once these tolls are imposed.

TABLE 1
DIVERSION ANALYSIS

Analysis Corridor		Volume (100's)			LOS / Capacity		Volume (100's)			LOS / Capacity		Volume (100's)			LOS / Capacity	
From	To	Before	After	% Change	Before	After	Before	After	% Change	Before	After	Before	After	% Change	Before	After
I-95 Corridor		**I-95**					**NW 7 Ave**					**Miami Ave**				
Broward County	Golden Glades	1,314	1,033	-21%	D	C	N/A	N/A				N/A	N/A			
Golden Glades	Gratigny Pkwy	1,610	551	-66%	D	A	136	465	242%	B	C	19	35	84%	B	B
Gratigny Pkwy	NW 79 St	1,856	627	-66%	F	A	194	439	126%	B	C	71	148	108%	B/B*	D/B*
NW 79 St	SR 112 / 36 St	1,784	781	-56%	E	B	170	252	48%	B	B	120	261	118%	B	C
SR 112 / 36 St	SR 836	1,777	1,007	-43%	E	C	119	225	89%	B	B	38	87	129%	B	B
SR 826 Corridor		**SR 826 (Palmetto Expy)**					**Miami Gardens Dr/Red Rd/Milam Dairy Rd/NW 87 St**									
Golden Glades	NW 27 Ave	853	314	-63%	C	A	155	215	39%	B	B					
NW 27 Ave	NW 57 Ave	825	268	-68%	C	A	121	204	69%	B	B					
NW 57 Ave	Gratigny Pkwy	773	303	-61%	C	A	199	247	24%	B	B					
Gratigny Pkwy	US 27	1,362	766	-44%	F/D*	C/B*	251	283	13%	B	C					
US 27	SR 112 / 36 St	1,632	1,098	-33%	F	C	164	367	124%	B	F					
SR 112 / 36 St	SR 836	1,810	1,260	-30%	F	D	241	348	44%	B	B					
SR 836	SR 874	1,955	1,477	-24%	F	E	252	367	46%	B/B*	F/B*					
SR 874	US 1	681	380	-44%	D	B	168	253	51%	B	B					
Central Parkway Corridor		**Central Parkway**					**NW 27 Ave**					**Le Jeune / Douglas Road**				
Golden Glades	Gratigny Pkwy	N/A	850		N/A	C	293	334	14%	B	B	375	336	-10%	B	B
Gratigny Pkwy	NW 79 St	N/A	873		N/A	D	305	328	8%	C/B*	D/B*	349	318	-9%	B/F*	B/C*
NW 79 St	SR 112 / 36 St	N/A	814		N/A	C	300	299	-0%	C	C	125	80	-36%	B	B
SR 836 Corridor		**SR 836 (Dolphin Expwy)**					**Flagler St**					**Tamiami Trail**				
HEFT	SR 826	769	443	-42%	C	B	210	281	34%	B	B	199	348	75%	B	B
SR 826	Le Jeune Rd	1,648	1,095	-34%	F/F*	C/E*	230	321	40%	B	D	269	359	33%	C	F
Le Jeune Rd	I-95	1,072	771	-28%	E	C	168	283	68%	B/B*	C/B*	175	274	57%	B/B*	B/C*
		SR 836 (Dolphin Expwy) (con't)					**NW 7 St**									
SR 826	Le Jeune Rd	1,648	1,095	-34%	F/F*	C/E*	82	244	198%	B	B					
Le Jeune Rd	I-95	1,072	771	-28%	E	C	138	259	88%	B/B*	B/C*					

Notes:
LOS based on FDOT LOS Manual, Gp B for arterial streets
* - Change in the typical section results in two LOS measurements on these segments

It must be noted that this analysis is based on daily conditions due to model limitations. The peak hour conditions are expected to be more severe on the arterial streets, since currently, there are already some capacity problems on these facilities. However, given the tools that are currently available to model the network, a computer-based peak hour diversion analysis is currently not possible.

To conclude, a moderate road pricing plan such as the one recommended in this study can more effectively utilize the available infrastructure, and at the same time generate revenue for improvements to transit and other transportation facilities. The amount of daily traffic diversion to the arterial streets is not considered to be a major problem, and serves to balance the use of both the freeway and the arterial network.

Peak hour conditions remain a concern due to the present inability to model peak hour conditions. However, as noted earlier, road pricing policies can be used to determine the resulting operating conditions that occur. In general, the amount of diversion desired can be managed by the toll rate that is in effect during the peak hours. The different congestion pricing doctrines could result in different peak hour conditions, such as:

- Implementation of premium toll rates on freeways, producing optimal freeway flow conditions, but resulting in higher diversion to the arterial network.

- Maintaining the status quo (no freeway tolls), or implementing very low tolls, producing very little diversion to the arterial network, but continuing the low LOS operating conditions on the freeways.

- Both freeways and arterials operate in an optimized manner, with the most efficient toll rates being used. Congestion pricing can be used as an effective management tool, and the ability to control the toll rates on a real-time basis in the future will further enhance this tool.