Kimley-Horn

Kimley-Horn and Associates, Inc.

HOV Conceptual Design Study

INTERIM REPORT #2

South Dade, Palmetto and East-West Expressways
DADE COUNTY, FLORIDA

Prepared for
FLORIDA DEPARTMENT OF TRANSPORTATION

Kimley-Horn

DADE COUNTY EXPRESSWAY
HOV STUDY

INTERIM REPORT #2

Prepared for:
Florida Department of Transportation

Prepared by:
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CHAPTER IV - ALTERNATIVES

TRANSIT SERVICES

Development of transit service alternatives and options was to a great extent dependent on the results of Dade County's Network 86 Study which was ongoing at the time of this HOV study. Although no written reports were available at the time of the preparation of this report, verbal communication and coordination with staff at Metro Dade County Transportation Administration provided input as to the results of that study, in terms of its affect on the Dade County HOV study. Basically, the objectives of the Network 86 project were to define specific routes and runs that should be eliminated due to lack of patronage, and to determine the reorganization of the bus route system to feed into Metrorail based on the development of a grid bus network system.

As the Network 86 study progressed, it became clear to the MDTA and its consultant that the express routes serving the southwest area of Dade County and that portion of the HOV corridor west of the Palmetto Expressway were less productive in terms of patronage than many of the other routes in the system. In addition, it was determined that the level of service that had been provided was such that an average of approximately 45 percent of the available seats were filled at the maximum load point in the route.

Given the utilization of the express service currently provided, it was decided that all of the existing express routes be replaced by one single express route that would be a combination of two of the existing routes beginning in southwest Dade in the Homestead/Perrine area and continuing to the Miami International Airport area. This new route would be called the Route #38 Airport Express, and would operate in the A.M. and P.M. peak hours. These changes in express bus service in the HOV corridor are to be implemented in November 1985.

In addition to the above mentioned changes in bus service that are currently proposed, other changes in local bus routes will be proposed for Network 86 to feed transit service into Metrorail at the Dadeland North and Dadeland South stations for the transit market area in the southwest portion of the HOV corridor, including the area south of Kendall Drive and west of U.S. 1. In anticipation of the realignment of the transit routes in southwest Dade and the assumption that this market would be served via Metrorail facilities, it was determined that proposed express transit service within the HOV corridor under study should concentrate primarily in the area north of Kendall Drive, west of the Palmetto Expressway, and south of SR 836.

Transit Service Alternatives

Several transit route alternatives within the area defined were evaluated, including supporting park-and-ride facilities. An evaluation of these various alternatives revealed three primary candidates for consideration. These three routes are described below.

Route #1 - Shown in Figure IV-1, would originate at a park-and-ride facility in the Concord Shopping Center located north of Bird Road between 112th and 117th Avenue. It would continue northward on 117th Avenue to Tamiami Trail, then east with a stopover at a park-and-ride facility located at Florida International University, then continue east on Tamiami Trail to SR 826, the Palmetto Expressway. A third park-and-ride facility would be located in the southwest quadrant of Tamiami Trail and SR 826. After a stopover at this park-and-ride facility, the bus would continue in express service northward along the Palmetto Expressway, then east on SR 836 to I-395 exiting at NE 1st Avenue, continuing south to the Metromover transit station located near 1st Avenue and North 5th Street. It is anticipated that a minimum of two runs would be operated over this route with headways of approximately 30 minutes in the morning and afternoon peak hours.

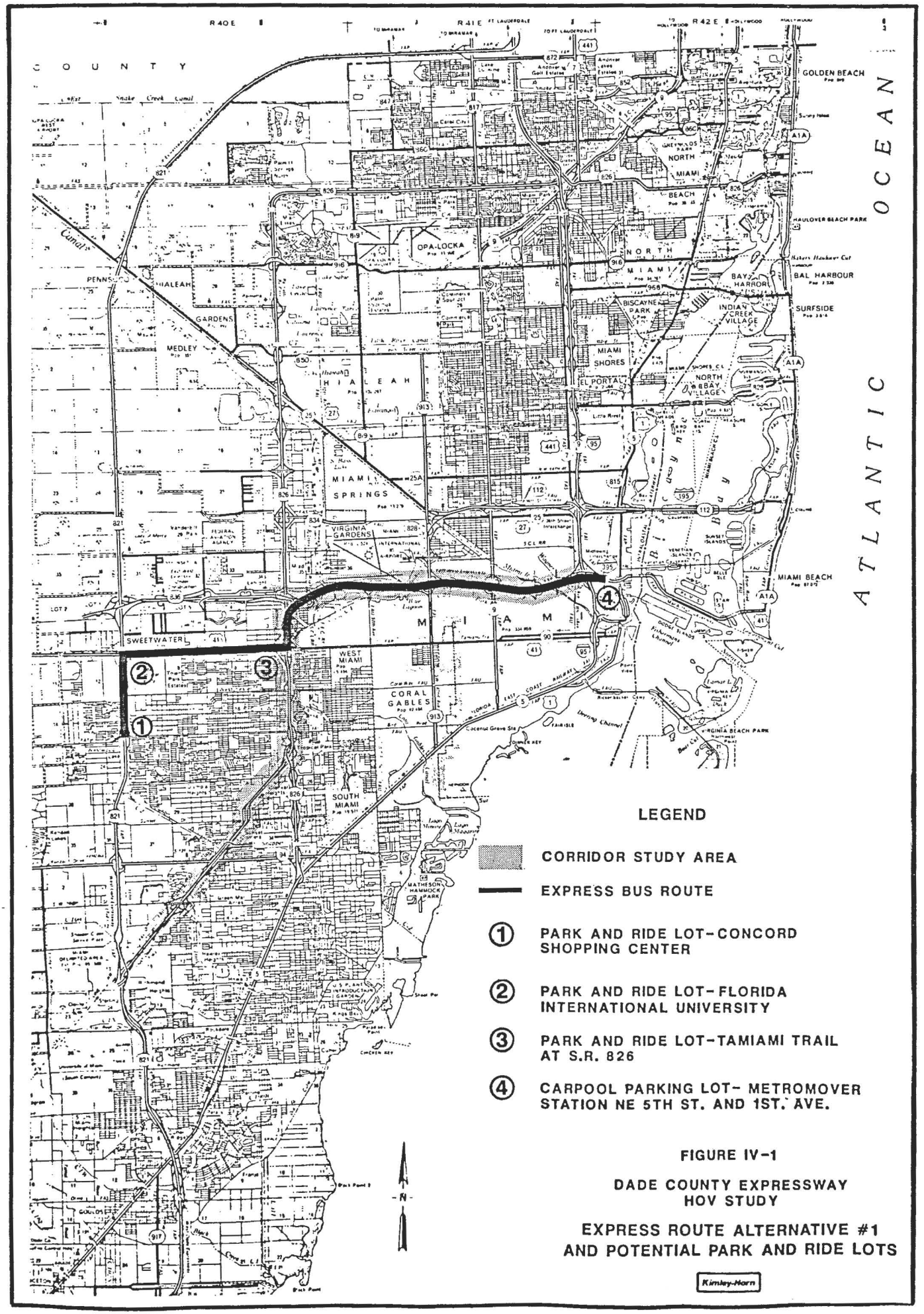

FIGURE IV-1

DADE COUNTY EXPRESSWAY HOV STUDY

EXPRESS ROUTE ALTERNATIVE #1 AND POTENTIAL PARK AND RIDE LOTS

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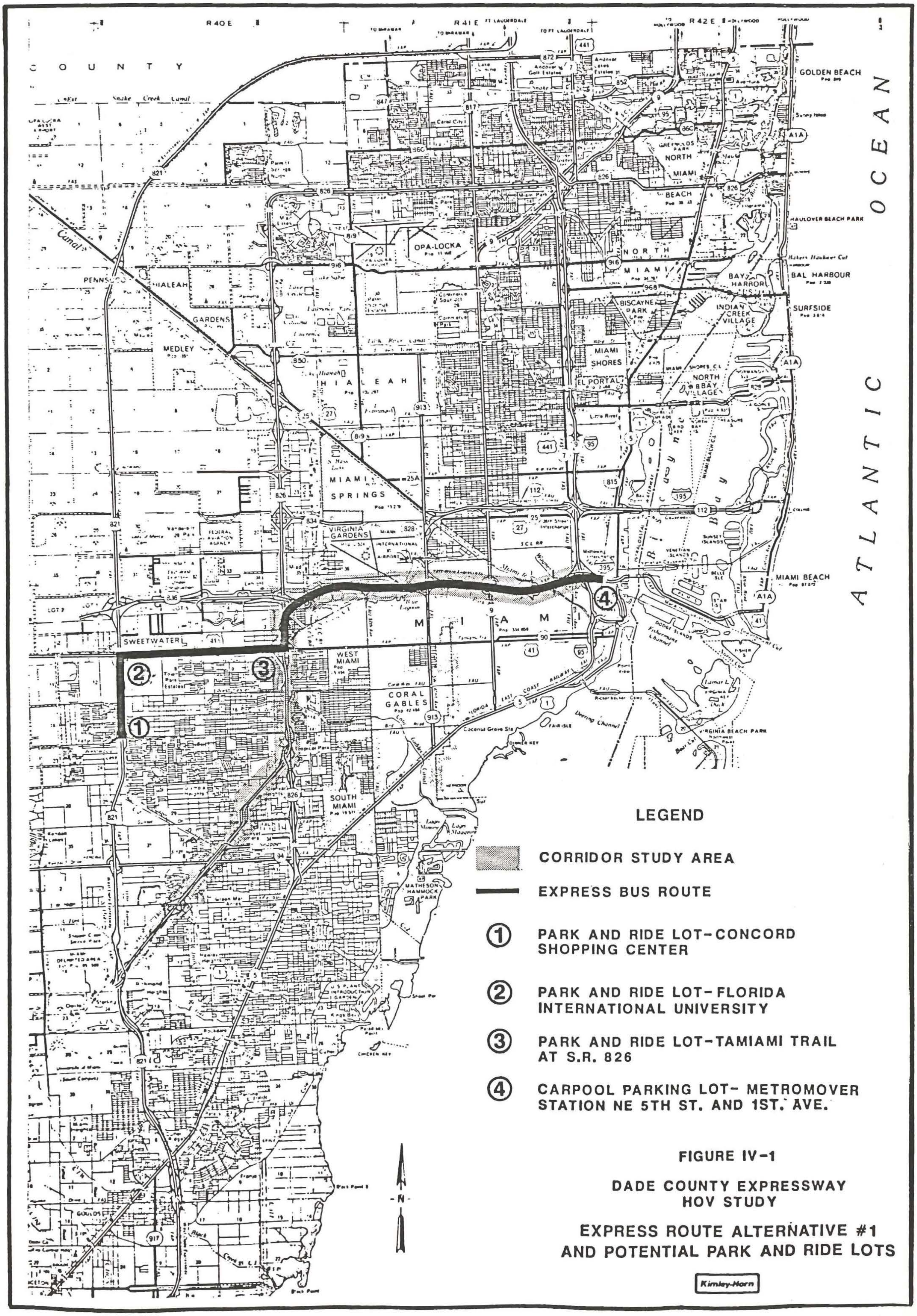

FIGURE IV-1

DADE COUNTY EXPRESSWAY HOV STUDY

EXPRESS ROUTE ALTERNATIVE #1 AND POTENTIAL PARK AND RIDE LOTS

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Route #2 - Shown in Figure IV-2, would originate at a park-and-ride facility located at the Dade County Police Substation just east of 117th Avenue between Sunset Drive and Kendall Drive. The route would then continue north along 117th Avenue to Bird Road, turning east with a stopover at the park-and-ride facility located in the Concord Shopping Center. The route would then continue east to Bird Road and the Palmetto Expressway with a stopover at a third park-and-ride facility located within Tropical Park. The park-and-ride facilities at Concord Shopping Center and Tropical Park are currently used by an existing express bus service. From Tropical Park, Route #2 would continue north on SR 826 Palmetto Expressway to SR 836, then east to I-395 and south on 1st Avenue to the Metromover station near 1st Avenue and North 5th Street.

It is anticipated that three runs would be operated over this route, both in the morning and afternoon, with the additional condition that one of the three runs would make a shortcut stopover into the Civic Center area and a stop at the civic center Metrorail station. This route would serve the hospitals, related medical facilities, and government service buildings in that area.

Route #3 - Shown in Figure IV-3, would originate at the Miller Drive Shopping Center located at Miller Drive and SW 137th Avenue at a park-and-ride facility proposed for that location. The route would then continue north on 137th Avenue to Bird Road, then east to the park-and-ride facility at Concord Shopping Center east of 117th Avenue, then continue east to the park-and-ride facility at Tropical Park. The route would then enter the Palmetto Expressway continuing north to SR 836 and then east via I-395 to North 1st Avenue, with an exit south to 1st Avenue and North 5th Street to tie into the Metromover station located near this point.

It is anticipated that Route #3 would operate with two runs in the morning peak and two runs in the afternoon peak.

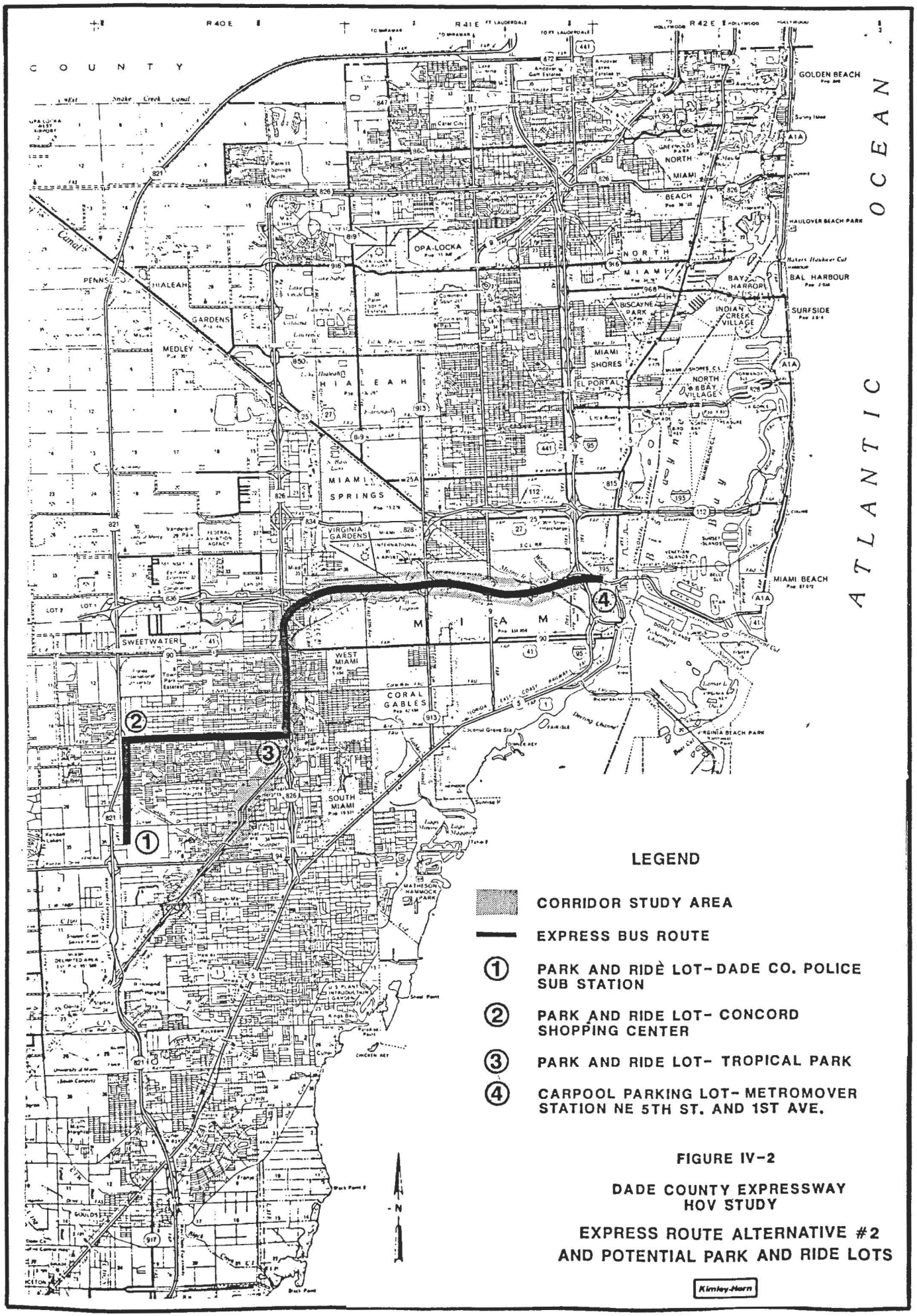

FIGURE IV-2

DADE COUNTY EXPRESSWAY
HOV STUDY

EXPRESS ROUTE ALTERNATIVE #2
AND POTENTIAL PARK AND RIDE LOTS

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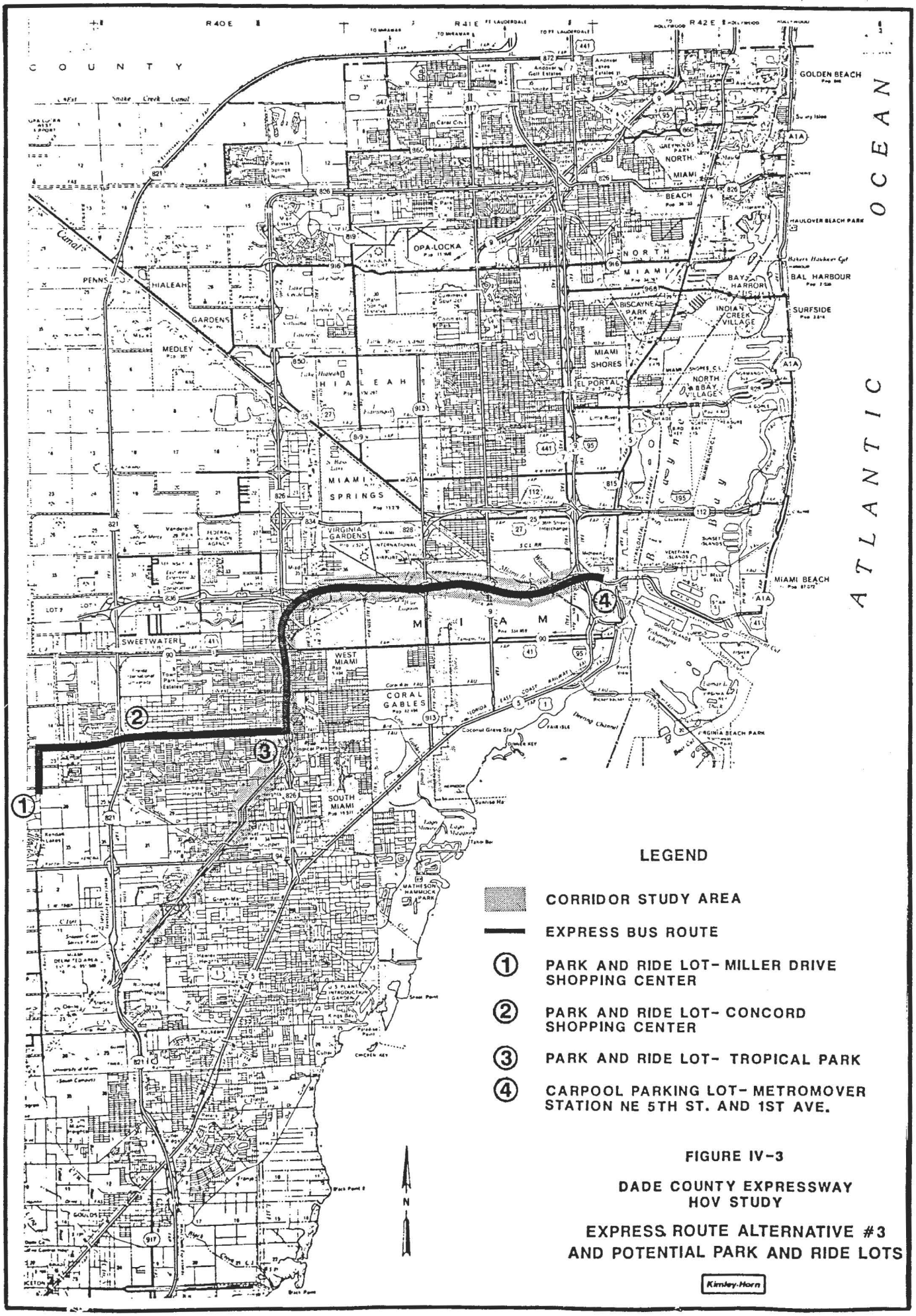

FIGURE IV-3

DADE COUNTY EXPRESSWAY HOV STUDY

EXPRESS ROUTE ALTERNATIVE #3 AND POTENTIAL PARK AND RIDE LOTS

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Consideration was given to development of a feeder and distribution system to serve the express route alternatives described above. However, in view of the realignment of routes with emphasis on connection to Metrorail stations using the grid bus pattern, it was decided that special feeder distribution service for the proposed express routes would not be appropriate. It is anticipated that the proposed express service would be fed primarily by park-and-ride, as well as by some local stops along the route, before the buses entered the HOV system and continued from that point with "closed door" operation to the destination. It should also be noted that the park-and-ride facilities are anticipated to be used at that point by carpoolers and private vehicles, as well as those accessing transit.

Since the Metromover is intended to provide the primary circulation system for the downtown area, it is proposed that each of the routes described above be tied into a Metromover station. It is anticipated that the around-town bus circulation service previously provided downtown would no longer be necessary with Metromover in place and operational. It is proposed that Route #2 described above provide service into the Civic Center area, to the hospitals and government offices and other destination attractions at that location, as well as providing a stop for the Civic Center station of Metrorail.

Transit Service Evaluation

Further evaluation of the alternatives presented above revealed that additional transit service for the corridor is not currently warranted. Using pivot point analysis, the proposed routes were tested against the current CBD route, Route #48 Express. Even giving a travel time bonus for the availability of park-and-ride lots, the only alternative to show an increase in transit patronage, Alternative 2, showed an increase in share mode of only 0.11 percent. This represents an increase in ridership of less than three percent over current patronage of Route #48. This minor increase in ridership is not enough to warrant a change in current Network 86 planning which eliminates express routes along the corridor served by the three alternatives presented.

IDENTIFICATION AND EVALUATION OF PARK-AND-RIDE ALTERNATIVES

For this study, it was assumed that all park-and-ride alternatives would be located adjacent to, or in the immediate vicinity of, proposed express bus routes. Park-and-ride alternatives are shown in Figures IV-1, IV-2 and IV-3. The southwest area bus service, including local and express service in both the south part of the corridor and along SR 874, is being rerouted into the Dadeland North Metrorail station. Therefore, to minimize transit patronage market overlap, the area to be served by park-and-ride lots for the Palmetto Expressway and the East-West Expressway HOV corridors includes the area north of Kendall Drive and west of the Palmetto Expressway. The alternative park-and-ride facilities that have been evaluated are therefore located in Sub-area C, which was determined to be a major contributor to work trips into the downtown area, as identified by the selected link analysis.

To assist with the definition of potential park-and-ride locations, a number of location and evaluation criteria were first defined. The following criteria were used in this evaluation:

- Existing use - This criterion reviewed the current use of the property proposed as a park-and-ride facility. A determination was made from aerial photography, field reviews, and available mapping as to current use of the site. Included were vacant sites, parking lots, buildings, or parks. The ownership of the property, whether private or public, and its relative availability, were also evaluated.

- Visibility - Visibility was defined as the opportunity for the traveling public to see the park-and-ride lot and/or the signing giving direction to the lot. Locations that were adjacent to the bus route and had high visibility were ranked higher than those which, being away from the bus route, would be difficult to see or could not be seen by the public.

- Proximity to a major generator (market area) - This criterion evaluated the character and density of the adjacent development with regard to the residential development and other major generators which would be close to the proposed park-and-ride facility.

- Ease of access - Convenience of access to the site from adjacent roadway networks was considered. Also considered was the opportunity to develop driveways and entranceways to the park-and-ride area, and the ability to provide convenient access to a major street without inducing through traffic into neighborhoods.

- Site development - Evaluated in this area was the existing condition of the site. Vacant sites' paved areas, status of grade conditions, and requirements for providing amenities necessary to use the facility as a park-and-ride lot were considered.

- Environmental effects - This criterion considered potential impacts on the environment, such as impacts on neighborhoods, noise, water quality, or other concerns of an environmental nature.

- Expansion potential - Each candidate park-and-ride site was evaluated for its potential for expansion of parking facilities. Assuming an increase in the demand for park-and-ride, the parking lot's ability to handle additional demand, and the requirements necessary to implement additional park-and-ride space were evaluated.

- Costs - This criteria evaluated several areas of cost including cost of acquisition of the site if it was not publicly owned, cost for development of the site, and cost for the maintenance and operation of the site as would be necessary.

- Implementation timing - The last criterion considered the amount of time that would be anticipated or required for acquisition, either by purchase, by contract or agreement with the owner; the proposed park-and-ride facility, and how this factor might relate to implementation of proposed express bus service.

In addition to consideration of the availability of the park-and-ride facilities for transit patrons, it was assumed that these facilities would be available with free parking as demand required for carpool and other shared-ride activities.

Several locations for possible park-and-ride facilities were reviewed from the aerial photography and from the knowledge of conditions in the field. However, many of these possible park-and-ride facilities were not included for evaluation due to the location with respect to the proposed express transit routes. Only those possible park-and-ride facilities adjacent to or near express transit routes were considered.

The following is a list of candidate locations which could serve potential express transit routes:

- Dade County Police Sub-station on 117th Avenue between Kendall Drive and Sunset Drive - This location is on the east side of 117th Avenue, approximately midway between Kendall Drive and Sunset Drive, and is currently owned by Dade County.

- Miller Drive Shopping Center - This candidate park-and-ride facility is located at 137th Avenue and Miller Drive in the Kendall

Lakes area. This facility would make use of parking available during the day at an existing shopping center. It is anticipated that an agreement could be reached with the shopping center owners to use a portion of the space.

- Concord Shopping Center - This site is located north of Bird Road between 112th Avenue and 117th Avenue, and has been used in the past as a park-and-ride facility for express bus routes. This location could be continued as a park-and-ride facility, depending upon the express bus routes chosen.

- Florida International University - A site on the south side of Tamiami Trail, east of the Homestead Extension to Florida's Turnpike, and within property owned by the Florida International University could be used as a park-and-ride facility.

- Tropical Park - This site is located just south of Bird Road and immediately west of SR 826. It has also been used previously as a park-and-ride facility and has available parking space.

- Southwest corner of Tamiami Trail and SR 826 - This candidate site is currently a vacant lot located just south of Tamiami Trail. There is currently some commercial activity on the corner facing Tamiami Trail, but a vacant lot in the rear could serve as a park-and-ride lot.

Evaluation of the candidate park-and-ride sites was accomplished via a straightforward scoring process using a one-to-ten score, with one being the lowest possible score and ten being the highest or best possible score. Each candidate site was evaluated for each of the criteria defined above and given a score based on how well each criteria was satisfied by that particular site. Scoring for the candidates

remaining under consideration ranged from 30 to 62 (Table IV-1). Given the scores assigned to the various possible locations, it was determined that only those sites with a score of 30 or higher would be retained. It was also decided that park-and-ride lots should be no closer than two miles apart, thus providing reasonable driving distances while minimizing costs involved. The locations of these recommended park-and-ride sites are presented on the figures portraying the candidate express bus routes which were described in the previous section.

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TABLE IV-1
PARK AND RIDE LOT EVALUATION
(Part I)

Location	EVALUATION CRITERIA				
	Existing Use	Visibility	Proximity to Major Generator	Ease of Access	Site Development
Dade County Police sub-station on 117th Ave. between Kendall & Sunset Dr.	7	3	5	5	4
Miller Drive shopping center at 137th Ave. & Miller Drive	5	5	5	6	7
Concord Shopping Center at 117th Avenue & Bird Road	5	6	6	6	7
Florida International University at 117th Ave./Tamiami Trail	7	7	7	7	4
Tamiami Park & Bird Road	8	6	5	6	8
SW corner of Tamiami Trail & SR 826 (vacant lot)	4	4	5	4	4

SCORE: 1 - 10

1 - Very poor

10 - Excellent

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TABLE IV-1
PARK AND RIDE LOT EVALUATION
(Part II)

	EVALUATION CRITERIA (Continued)				
Location	Environmental Effects	Expansion Potential	Costs	Implementation Timing	Total Score
Dade County Police sub-station on 117th Ave. between Kendall & Sunset Dr.	5	7	5	5	46
Miller Drive shopping center at 137th Ave. & Miller Drive	6	5	7	6	52
Concord Shopping Center at 117th Avenue & Bird Road	6	6	7	7	56
Florida International University at 117th Ave./Tamiami Trail	5	7	5	5	54
Tamiami Park & Bird Road	7	7	7	8	62
SW corner of Tamiami Trail & SR 826 (vacant lot)	5	6	2	3	37

SCORE: 1 - 10

1 - Very poor

10 - Excellent

RIDESHARING PROGRAM OPTIONS

As described in Interim Report #1, Chapters 2 and 3, ridesharing in Dade County is no longer at the relatively high levels of the 1970's. The same factors which have led to reduction in ridesharing in Dade County, such as stable gasoline prices, availability of downtown parking, and an out-of-date share-a-ride computer data base, will be impediments to a rejuvenation of ridesharing activities. Further, of these three impediments, only one, the computer data base, could be shifted in a direction favorable to ridesharing without significant adverse public impact. For this reason, rejuvenation of ridesharing activities will require not only prudent use of available resources, but also innovation and imagination.

To make ridesharing a significant factor in Dade County, two major problems need to be addressed and solved. First, the ridesharing data base must be updated prior to the implementation of any marketing efforts. Without this reliable data base, initial public response might be met with unreliable information, leading to rapid erosion of any new ridesharing interest. Second, interest must be generated among Dade County commuters to participate in ridesharing programs.

Ridesharing Data Base

To update the data base, it is suggested that an extremely simple and quick remedy be used: consider all information more than two years old to be unreliable and remove it from the active data base. The remaining data base should then be checked for validity. This action will remove the majority of the current ridesharing base; however, it is still recommended for several reasons. The time and resources required to purge the entire data base of outdated information would be substantial. These resources would be better used in updating the remaining data base and creating interest in ridesharing. Given the mobility of society, time, and the recent low visibility of ridesharing, it is very probable that the overwhelming

majority of the older data base is, in fact, out of date. Finally, members of the older data base who are still interested in ridesharing would no doubt want a new match list and would be submitting their information again to obtain a match list.

Public Perception of Ridesharing

The recommended procedures outlined above for updating the data base are well defined goals which can be achieved with currently available resources. However, without the creation of a new group of people wishing to carpool, the impact of an updated data base will have little effect on Dade County ridesharing. Creating a desire to rideshare is required. As stated previously, the factors which led to the ridesharing boom of the late 1970's/early 1980's are no longer sufficient motivation for ridesharing. An examination of possible public perceptions of the advantages and disadvantages of ridesharing is called for. Advantages might include:

- Time saving by using HOV facilities
- Monetary savings on gasoline, parking, and tolls
- Availability of vehicle for other family members at home
- Eliminating need for second automobile

Disadvantages might include:

- Inconvenience
- No perceived travel time advantage on current HOV facilities
- Personal importance of solitude to and from work
- Variance of working hours
- Non-availability of the car during the day

It can be seen that disadvantages of ridesharing currently far outweigh advantages. This is reflected in current ridesharing use. Given these facts, and the current low use of ridesharing, a major new effort to promote ridesharing is not warranted; however, a trial program, using current levels of manpower and resources should be implemented.

Recommendations

The following steps are recommended:

1. Purge data base as described above; validate remaining data concurrently with the steps outlined below.

2. Contact local law enforcement agencies and request that special attention be given to enforcement efforts on current HOV facilities.

3. Contact local radio stations which do traffic reports during A.M. and P.M. peak hours and request that conditions specifically for HOV lanes be included in the traffic reports. Also request that enforcement efforts on the HOV lanes be noted during the traffic reports.

4. Contact all local news media to request interviews on the ridesharing effort. One particularly effective interview would feature the ridesharing coordinator as a talk show guest during the A.M./P.M. peak.

5. Request/follow-up on previous requests with local media to run ridesharing public service announcements.

The potential value of media involvement cannot be over-emphasized. It represents the major viable alternative in promoting ridesharing. If the initial program proves successful, producing new ridesharing public service announcements using local celebrities would be beneficial. If, after a reasonable trial period it does not appear that ridesharing is becoming a viable option, consideration should be given to concluding the program and using ridesharing resources elsewhere.

DESCRIPTION OF HOV PREFERENTIAL TREATMENT ALTERNATIVES

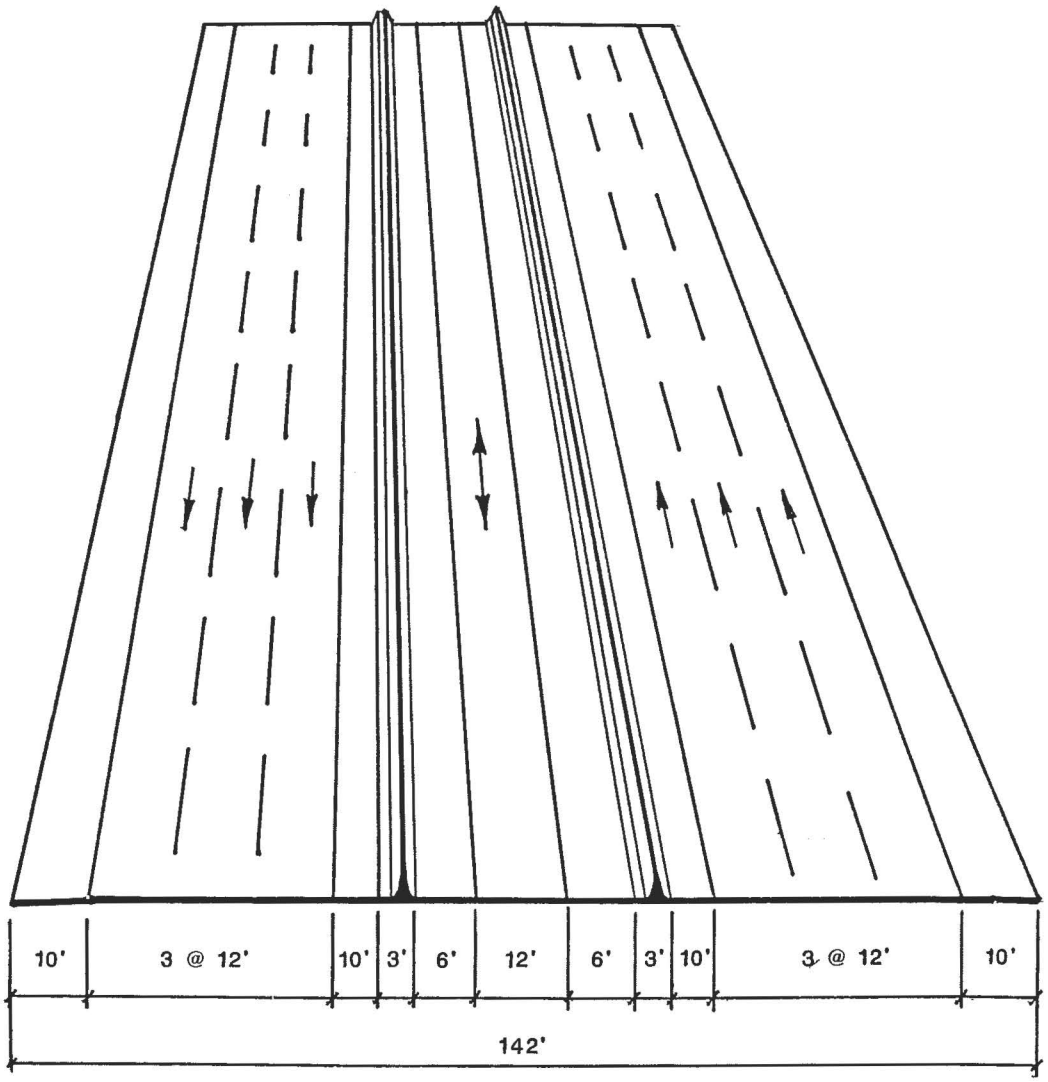
All of the HOV treatments described below are theoretically possible in the "could be built" sense for all sections considered in the Dade County Expressway HOV study. The basic operating characteristics, advantages, and disadvantages of each type of HOV alternative are described below. How well the operating characteristics of each alternative serve the needs of the study corridor will be one of the primary bases for alternative selection.

Exclusive HOV-Way

Exclusive HOV roadway has the highest potential capacity of any of the HOV alternatives considered. When operated as an exclusive busway, capacities can exceed 20,000 persons per lane. However, exclusive HOV-ways usually consist of mixed HOV traffic, and this is the only option considered for the study.

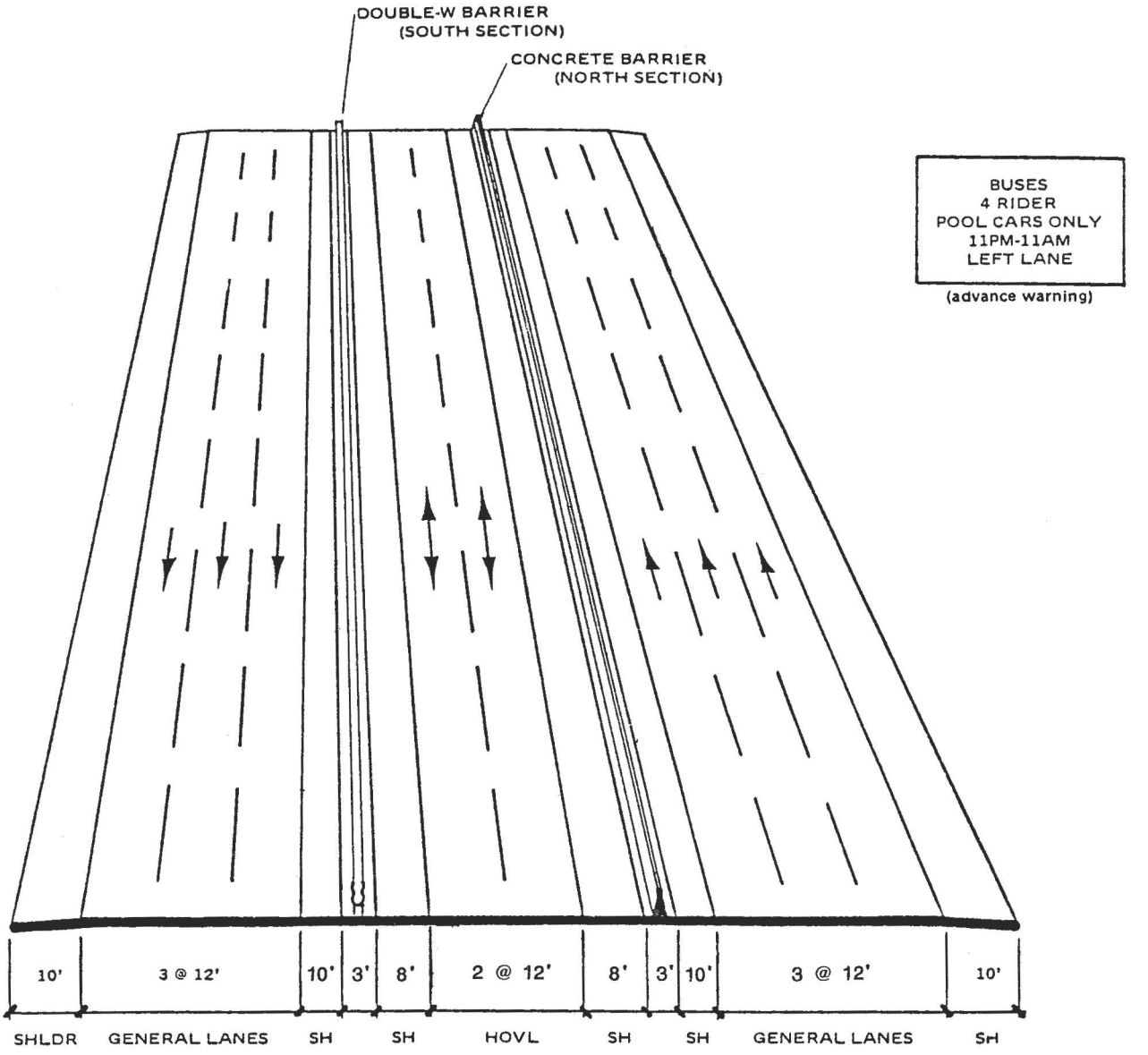
An exclusive HOV-way is operated on right-of-way separate from non-HOV traffic. This right-of-way is usually located between the two flows of non-HOV traffic, and is separated from non-HOV traffic by New Jersey-type barriers. Access to the exclusive HOV-way is provided through cuts in the barriers, exclusive ramps, or a combination of barrier cuts and exclusive ramps.

Exclusive HOV-ways may be either one-lane reversible, two-lane reversible, or two-lane, two-way. Two-lane, two-way operation is applicable only in areas where peak period traffic is evenly split. Due to the high speeds involved and the fact that little or no barrier exists between opposing lanes, two-lane, two-way operation is not well suited to non-professional drivers, and is not considered for this study. Examples of one-lane reversible and two-lane reversible HOV-ways are shown in Figures IV-4 and IV-5.



1-LANE REVERSIBLE HOV-WAY

FIGURE IV-4



METRIC CONVERSION
1 in = 2.54 cm
1 ft = 0.3 m
1 mi = 1.61 km

AASHTO DESIGN FACTORS

ALIGNMENT: linear
VERTICAL SIGHT DISTANCE: good
POSTED SPEED: 55 mph
ROADSIDE HAZARDS: none
OTHER HAZARDS: crossover for general traffic southbound

MUTCD DESIGN FACTORS

LANE-USE CONTROL SIGNALS: none
ADVANCED WARNING SIGNS: non-standard
RESTRICTED LANE SIGNS: none
END OF HOVL SIGNS: none
DIAMOND SYMBOL: none
HOVL DELINEATION: barrier walls

SHIRLEY HIGHWAY, FAIRFAX COUNTY, VIRGINIA

FIGURE IV-5

Exclusive HOV-ways have a very high advantage over other HOV operations in HOV travel time and passenger through-put capacity. Other advantages include:

- Ease of enforcement, especially if exclusive HOV ramps are the sole access/egress method
- Positive perception of HOV travel time advantage, high public visibility
- Little or no adverse impact on non-HOV traffic
- Long project life

The primary disadvantage of exclusive HOV-ways is cost. Just as the passenger-carrying potential of exclusive HOV-ways is the highest of any alternative, so is the capital cost. Other disadvantages include:

- Moderately high operating costs
- Relatively long implementation time
- Access/egress problems if exclusive ramps are not provided

Operational differences between one and two-lane reversible HOV-ways are relatively minor. The principle advantages of one-lane reversible HOV-way over two-lane reversible HOV-way are:

- Lower cost
- Less right-of-way required

The principle advantages of two-lane HOV-way over one-lane HOV-way are:

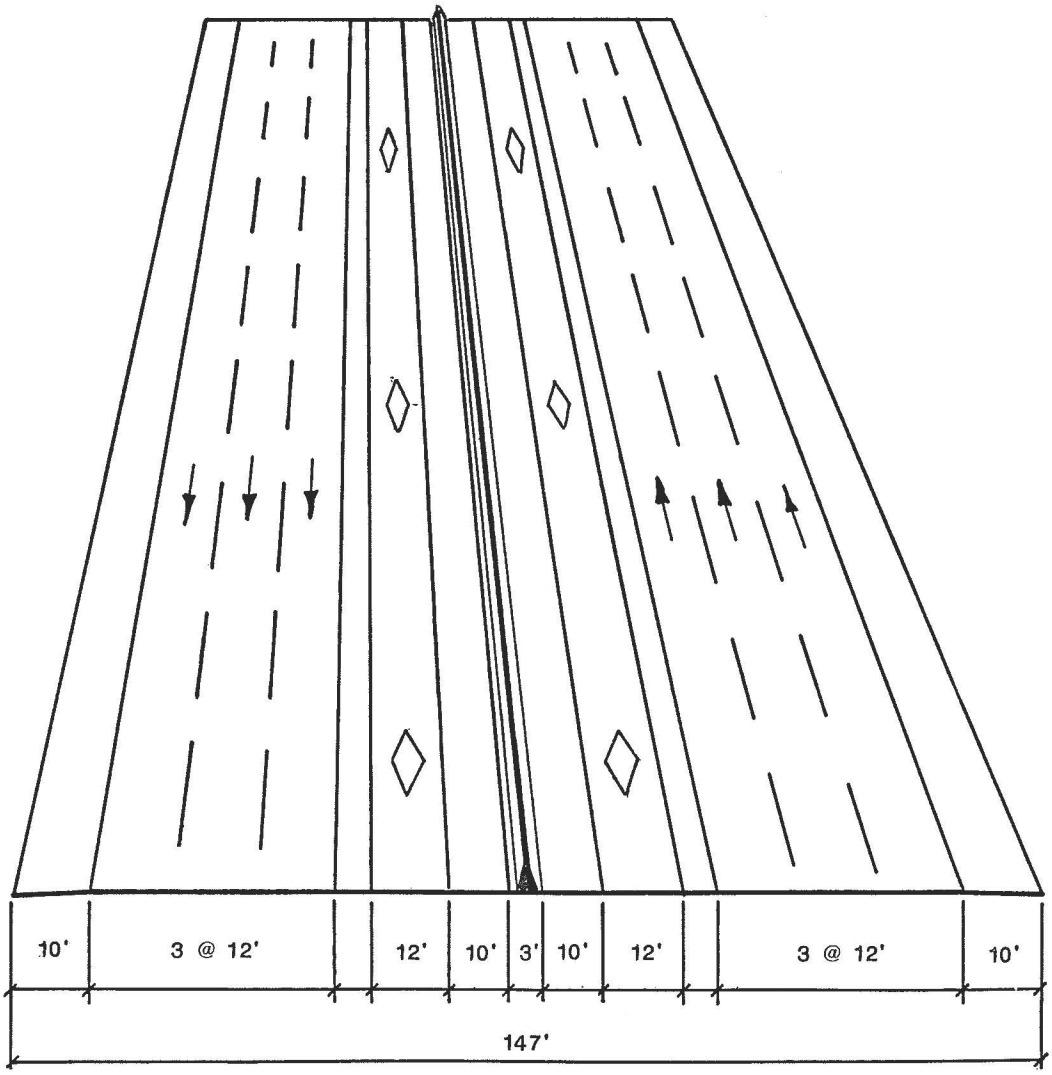
- o Approximately double the capacity of one-lane HOV-way
- o Lower cost per lane due to the relatively low marginal cost of second lane
- o Less right-of-way per lane required

Concurrent Flow HOV Lane

Concurrent flow HOV lanes involve the use of one or more (usually one) lane in the direction of normal traffic flow. Either an inside or an outside lane may be used. No physical separation exists between HOV and non-HOV traffic, although a 4-foot buffer lane is sometimes employed in addition to signing and marking techniques to designate the lane for HOV traffic. The concurrent flow HOV concept is shown in Figure IV-6. Concurrent flow HOV lanes are classified as add-a-lane and take-a-lane. Add-a-lane involves the construction of a new lane solely for HOV traffic whereas take-a-lane involves converting an existing non-HOV lane to HOV operation. Take-a-lane has two major advantages over add-a-lane:

- o Low capital cost
- o Short implementation time

The major disadvantage of take-a-lane versus add-a-lane is its negative impact on non-HOV traffic. Take-a-lane can only be implemented in areas where no traffic congestion exists and no congestion among non-HOV traffic will exist upon implementation of the HOV lane. The effects of violating this premise were seen in Boston where the Southeast Expressway Concurrent Flow HOV lane had to be abandoned little more than two weeks after HOV restrictions enforcement began. The closure of the Boston HOV lane was almost entirely due to the public outcry over the deterioration of non-HOV traffic flow.



CONCURRENT-FLOW
HOV CONCEPT

FIGURE IV-6

Add-a-lane advantages over take-a-lane include:

- o Greater total person through-put
- o Little or no impact on non-HOV traffic
- o Greater opportunity to provide proper geometric configurations

Versus other HOV alternatives, concurrent flow HOV lane advantages include:

- o Good HOV travel time advantage
- o Low cost if take-a-lane is feasible
- o Little effect on non-HOV traffic if add-a-lane is used
- o Good passenger through-put capacity, especially if add-a-lane is used
- o Short implementation time if take-a-lane is used
- o Low operating costs
- o Good HOV access/egress, especially if outside lane is used for HOV lane

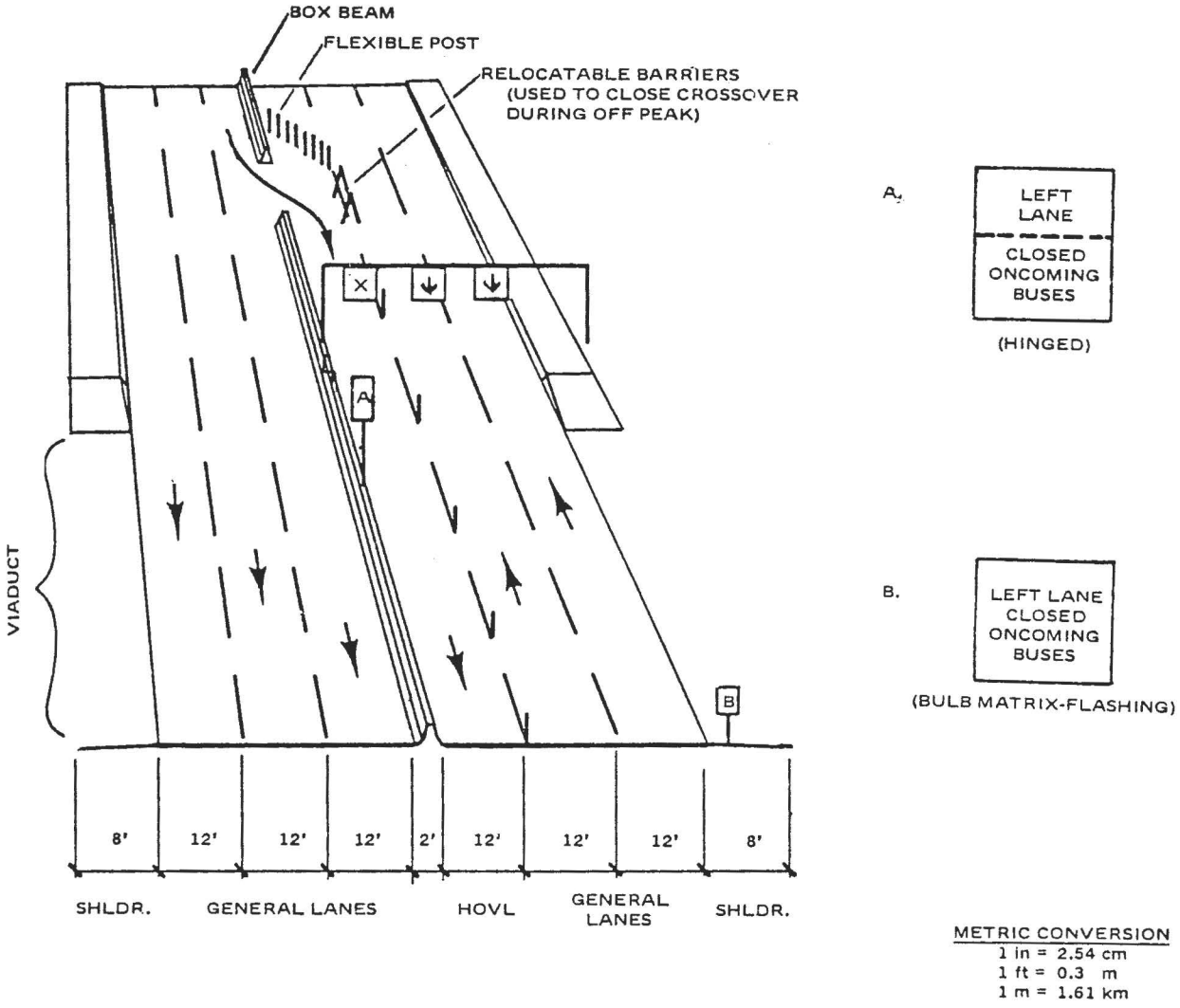
Concurrent flow HOV lane disadvantages versus other HOV concepts include:

- o Moderately high cost for add-a-lane concept
- o High negative impact on non-HOV traffic if take-a-lane is used
- o Long implementation time if add-a-lane is used
- o Potentially poor HOV access/egress if inside lane is used
- o Potential enforcement difficulties

Contra-flow HOV Lane

Contra-flow HOV lanes involve moving HOV's into what is normally the inside lane for traffic flowing in the opposite direction. The HOV's are moved across the median and into the opposing lane through median cuts or via exclusive HOV ramps. HOV traffic is separated from opposing traffic by either plastic pylons set into a

metal socket as shown in Figure IV-7 or, in areas with very large capacity excess in the non-peak direction, by closing the adjacent lane in the opposing direction as shown in Figure IV-8.



METRIC CONVERSION
1 in = 2.54 cm
1 ft = 0.3 m
1 m = 1.61 km

AASHTO DESIGN FACTORS

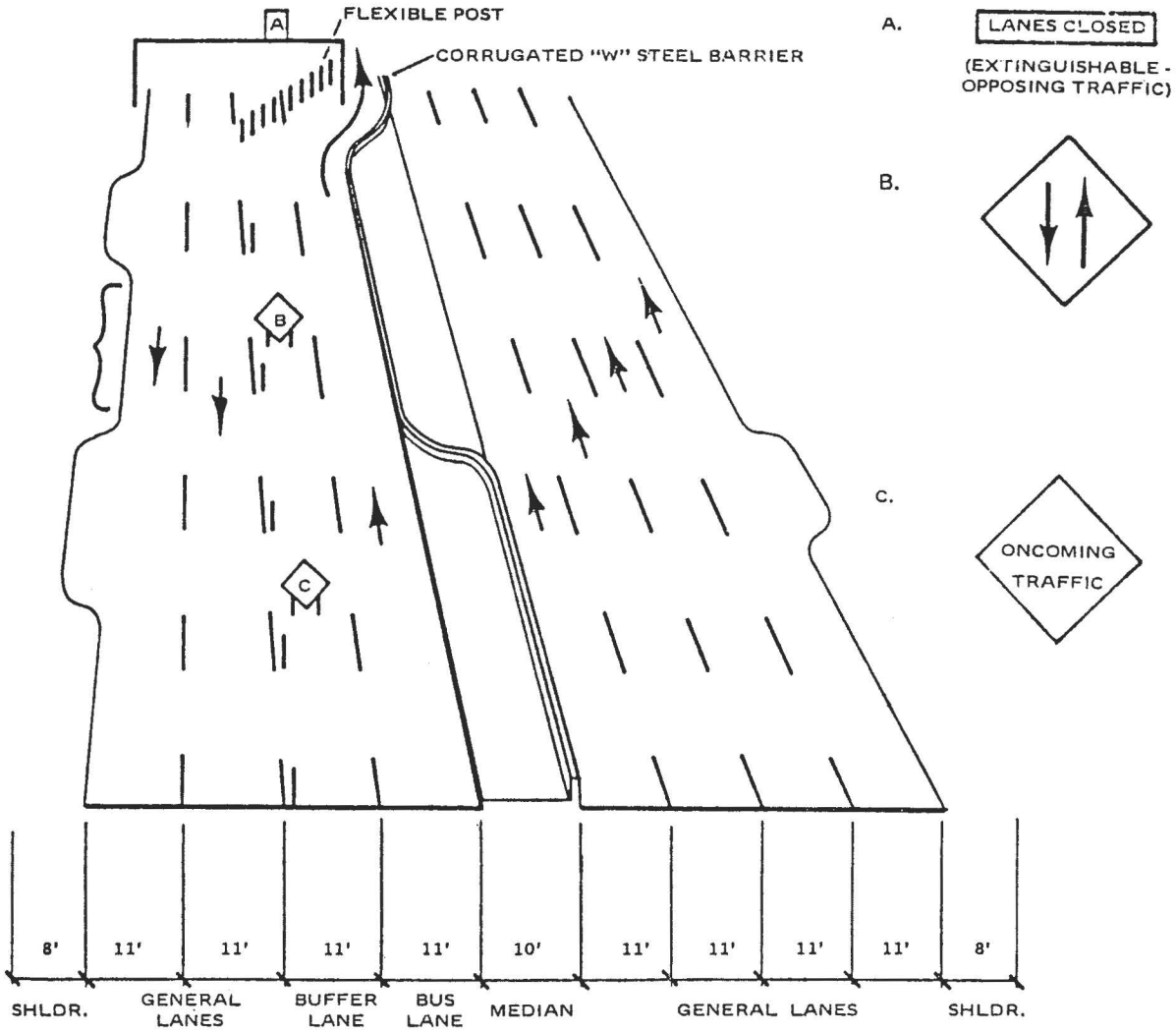
ALIGNMENT: linear
VERTICAL SIGHT DISTANCE: good
POSTED SPEED: 40-50 mph inbound; 35 mph HOVL and outbound
ROADSIDE HAZARDS: none
OTHER HAZARDS: no shoulder over viaduct

MUTCD DESIGN FACTORS

LANE-USE CONTROL SIGNALS: red 'x' and green arrows
ADVANCED WARNING SIGNS: non-standard
RESTRICTED LANE SIGNS: non-standard
END OF HOVL SIGNS: none
DIAMOND SYMBOL: none
HOVL DELINEATION: double 4" yellow line and flexible posts (40' intervals)

LONG ISLAND EXPRESSWAY, NEW YORK CITY, NEW YORK

FIGURE IV-7



METRIC CONVERSION
1 in = 2.54 cm
1 ft = 0.3 m
1 m = 1.61 km

AASHTO DESIGN FACTORS

ALIGNMENT: hilly topography
VERTICAL SIGHT DISTANCE: minor deficiencies, tunnel
POSTED SPEED: 55 mph general, 40 mph HOVL
ROADSIDE HAZARDS: hillsides
OTHER HAZARDS: limited shoulders

MUTCD DESIGN FACTORS

LANE-USE CONTROL SIGNALS: blank-out "lane(s) closed"
ADVANCED WARNING SIGNS: non-standard
RESTRICTED LANE SIGNS: non-standard
END OF HOVL SIGNS: none
DIAMOND SYMBOL: none
HOVL DELINEATION: 4" white skip line, flexible posts in buffer lane

ROUTE 101 (CONTRAFLOW LANE), MARIN COUNTY, CALIFORNIA

FIGURE IV-8

Using either system, the contra-flow signage and barriers have to be placed/removed each time the system is open/closed. To avoid negative impacts on non-HOV traffic when implementing contra-flow operations, directional splits should be greater than 2/3 - 1/3 in the peak direction. Contra-flow can be implemented as a take-a-lane or add-a-lane concept. Advantages of take-a-lane/add-a-lane concepts are similar to those described for concurrent flow scenarios.

In general, contra-flow advantages include:

- o Low cost if take-a-lane option is used
- o High passenger capacity, especially if add-a-lane is used
- o Little or no impact on peak direction non-HOV traffic
- o Good transit time
- o Easily enforced
- o Short implementation time if take-a-lane is used

Contra-flow disadvantages include:

- o Exclusion of carpool or any other non-professionally driven vehicles
- o Very high operating costs
- o Moderately high capital cost if add-a-lane is used
- o Poor access and egress for HOV vehicles if exclusive ramps are not used
- o Possible poor public perception of safety

Exclusive HOV Ramps

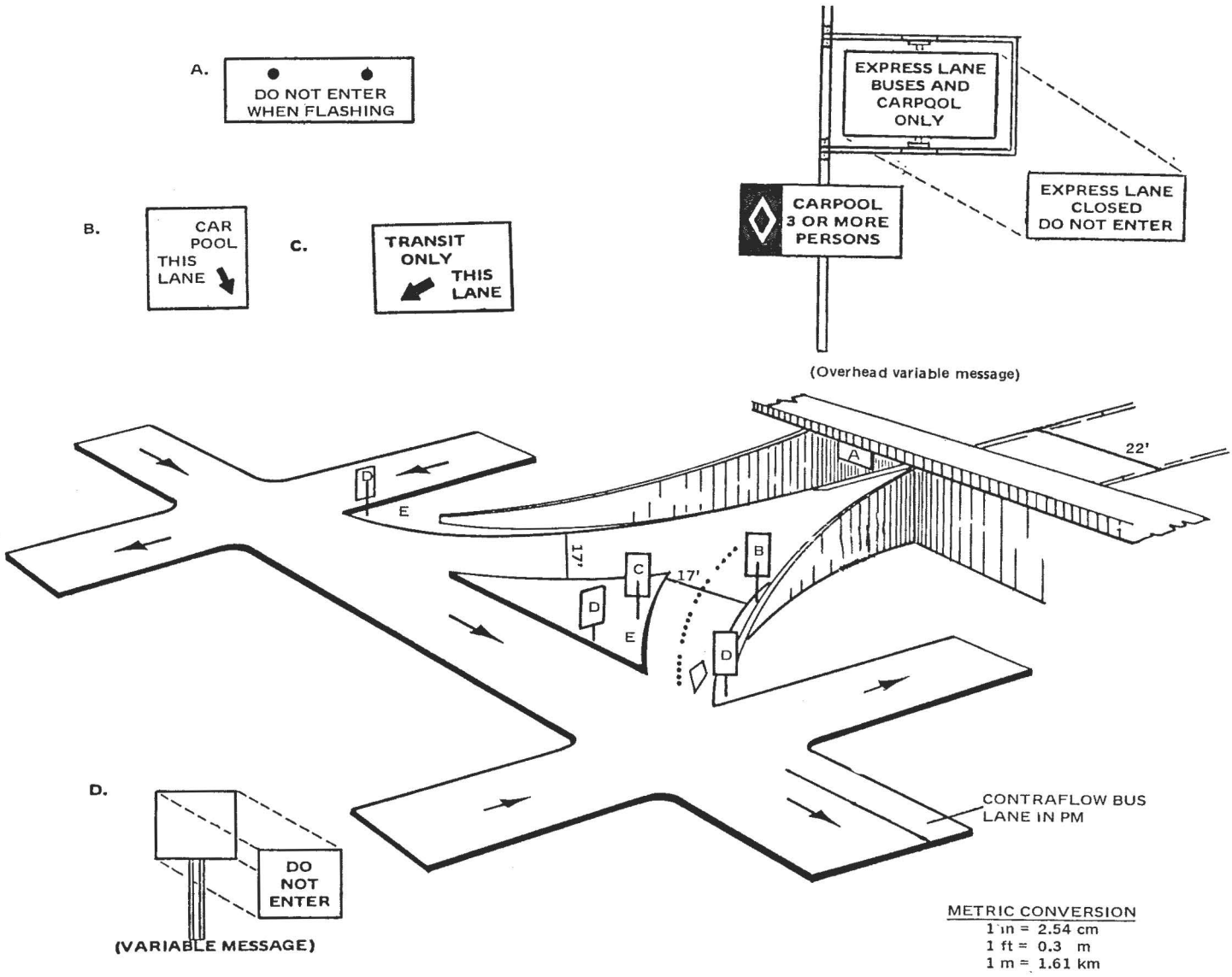
Exclusive HOV ramps can be used along to provide HOV's with a method to bypass queues forming at non-HOV ramps for movement onto mixed-mode facilities, or for direct access onto exclusive HOV lanes, contra-flow HOV lanes, and inside concurrent flow HOV lanes. An example of an exclusive HOV ramp onto an exclusive HOV-way is shown in Figure IV-9.

Advantages of HOV ramps include:

- Relatively low cost
- Relatively low implementation time
- Little or no impact on non-HOV traffic

Disadvantages include:

- Relatively little HOV travel time advantage



METRIC CONVERSION
1 in = 2.54 cm
1 ft = 0.3 m
1 m = 1.61 km

AASHTO DESIGN FACTORS

ALIGNMENT: curved
VERTICAL SIGHT DISTANCE: poor
POSTED SPEED: none
ROADSIDE HAZARDS: no shoulders
OTHER HAZARDS: tunnel

MUTCD DESIGN FACTORS

LANE-USE CONTROL SIGNALS: flashing signals and signs
ADVANCED WARNING SIGNS: none
RESTRICTED LANE SIGNS: non-standard
END OF HOVL SIGNS: none
DIAMOND SYMBOL: one symbol
HOVL DELINEATION: none

INTERSTATE 5 EXCLUSIVE RAMP, SEATTLE, WASHINGTON

FIGURE IV-9

Ramp Metering Bypass

The ramp metering bypass for HOV vehicles is used in conjunction with an expressway ramp metering system (described below). The bypass allows HOV vehicles to bypass the queue formed by the metering process. The concept is shown in Figure IV-10.

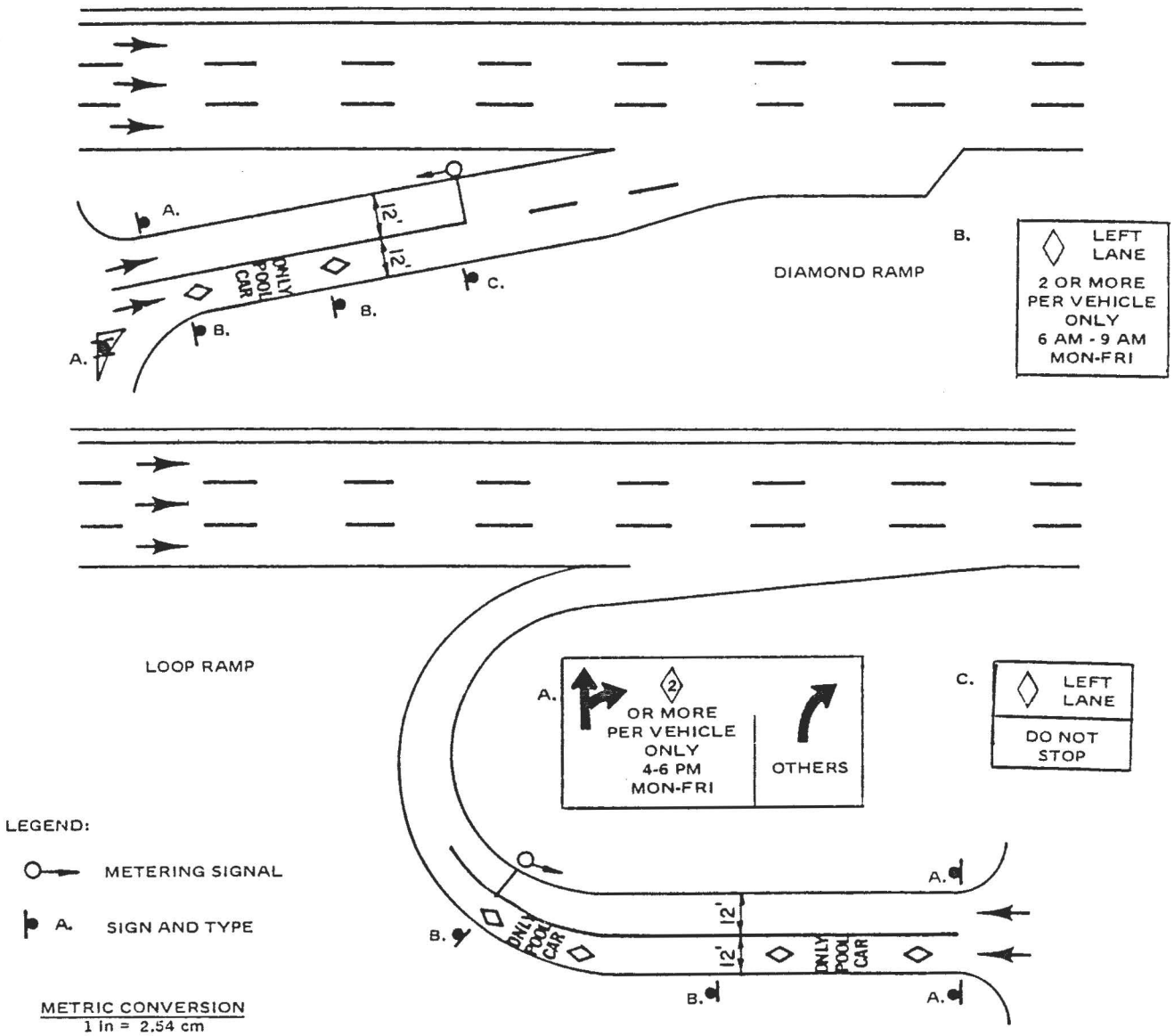
Ramp metering is a system used to control the volume of traffic entering the expressway, thereby controlling traffic density and maintaining an acceptable level of service. The metering is accomplished by use of a traffic signal on the entrance ramp. The signal can be computer controlled or pre-timed.

Under computer control, the computer is connected to a sensor system which relays information on real time expressway conditions. Cars are allowed onto the expressway as allowed by real time conditions. Pre-timed ramp metering allows cars to enter the expressway at certain pre-set intervals. Specific intervals for the pre-timed method are determined empirically.

With ramp metering upstream of congested areas, problems arise in the non-congested areas of the expressway, which must also be metered for the system to operate properly. Drivers in non-congested areas are often confused and annoyed that they are being detained accessing an apparently non-congested expressway.

Advantages of ramp metering bypass include:

- Relatively low cost if pre-timed signals are used
- Relatively low implementation time
- Better levels of expressway service



AASHTO DESIGN FACTORS

ALIGNMENT: varies
VERTICAL SIGHT DISTANCE: good
POSTED SPEED: none
ROADSIDE HAZARDS: none
OTHER HAZARDS: sharp curb radii and no shoulders

MUTCD DESIGN FACTORS

LANE-USE CONTROL SIGNALS: ramp meter
ADVANCED WARNING SIGNS: non-standard
RESTRICTED LANE SIGNS: standard
END OF HOVL SIGNS: none
DIAMOND SYMBOL: standard
HOVL DELINEATION: solid white line

RAMP METERING BYPASS RAMPS, LOS ANGELES, CALIFORNIA

FIGURE IV-10

Disadvantages include:

- o Very poor public acceptance, especially in outlying areas
- o Little HOV time advantage
- o Relatively high cost if computer control is used
- o Poor record of performance

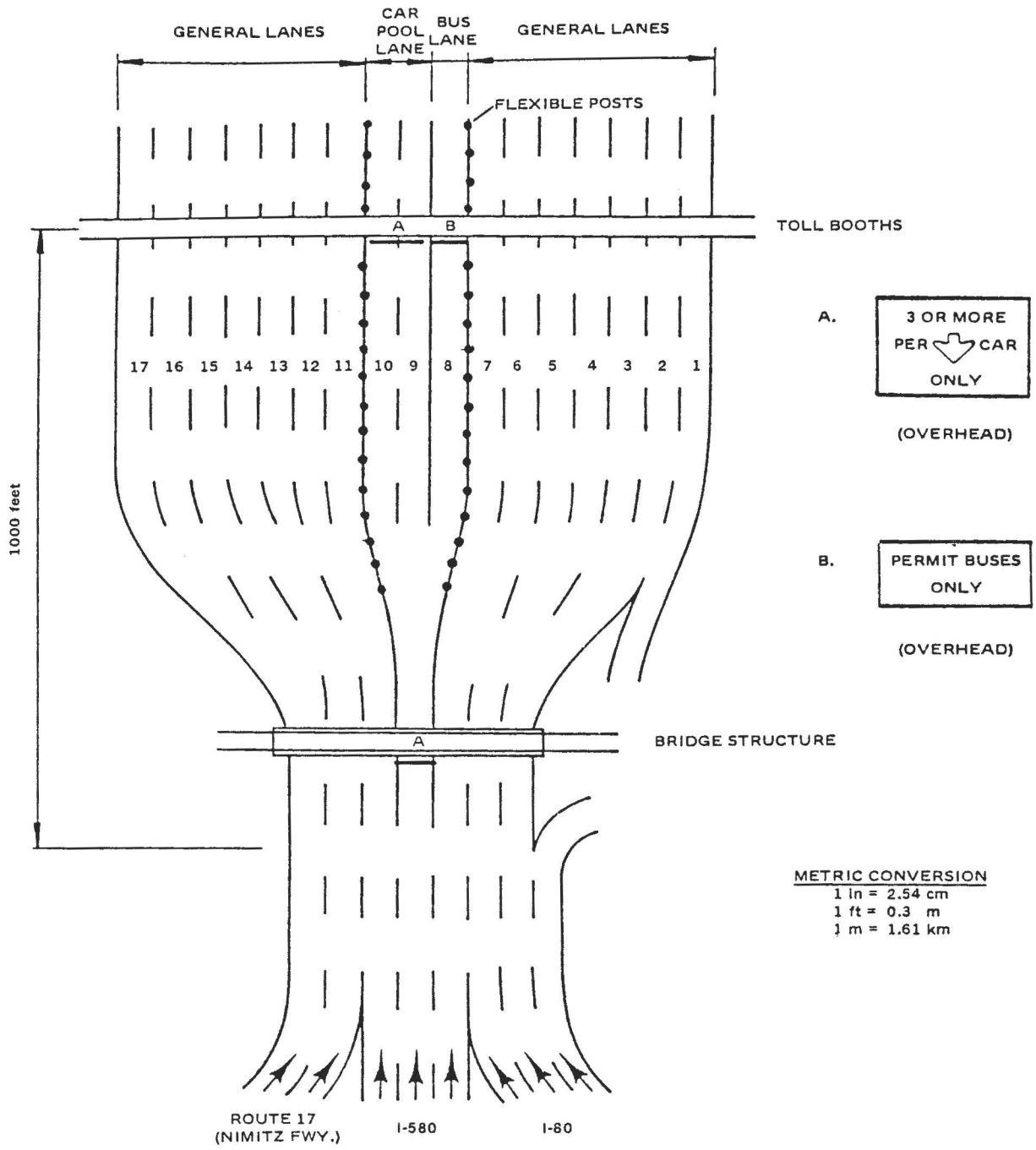
Toll Bypass/Preferential Lane

Toll bypass is a simple concept granting HOV vehicles preferential treatment in the toll plaza. The concept is shown in Figure IV-11. Advantages of toll bypass/preferential lane include:

- o Low cost
- o Low implementation time

Disadvantages include:

- o Possible negative impact on non-HOV traffic
- o Little HOV travel time advantage



AASHTO DESIGN FACTORS

ALIGNMENT: s-curve through toll plaza
VERTICAL SIGHT DISTANCE: good
POSTED SPEED: 35 mph
ROADSIDE HAZARDS: none
OTHER HAZARDS: lane expansion (7 to 17) and reduction (17 to 5)

MUTCD DESIGN FACTORS

LANE-USE CONTROL SIGNALS: ramp metering of general lanes
ADVANCED WARNING SIGNS: non-standard
RESTRICTED LANE SIGNS: non-standard
END OF HOVL SIGNS: none
DIAMOND SYMBOL: none
HOVL DELINEATION: solid white line with flexible posts

SAN FRANCISCO-OAKLAND BAY BRIDGE TOLL PLAZA, OAKLAND, CALIFORNIA

FIGURE IV-11

Add-a-lane

The add-a-lane concept is unique in this study, as it is not directed specifically at HOV traffic. The concept involves adding one or more lanes in one or both directions. The lane(s) would be available to all traffic. This concept is used in situations where HOV volumes do not support exclusive HOV facilities.

Advantages of add-a-lane include:

- o High public acceptability
- o Positive impact on non-HOV traffic
- o Increased capacity

Disadvantages include:

- o Relatively high cost
- o Relatively long implementation time
- o Negative HOV travel time advantage

Reversible Lane Flyover Queue Jumper

A reversible lane flyover can be used for queue bypass at a heavily traveled interchange. It can only be used at a location where another ramp exists to provide access for the movement the flyover normally serves. This situation exists at the SR 826/836 interchange. Left-hand entrances/exits are normally a detriment to freeway operation; however, in this case they increase the concept's viability by allowing access to either side of the median at both ends of the flyover.

Advantages of the reversible lane flyover queue jump include:

- Low implementation time
- Relatively low capital cost

Disadvantages include:

- Low HOV travel time advantage
- Possible safety problems
- Relatively high operating costs

SKETCH PLANNING AND PRELIMINARY SCREENING

The preliminary screening process allows for the evaluation of many more alternatives than could be evaluated if all alternatives were subjected to the full evaluation process.

While the "value matrix" employed in the preliminary screening does rank each alternative, it is not the purpose of this method to achieve a final absolute ranking of alternatives, but rather to separate the "better" alternatives from the "poorer" alternatives. In this way, it is possible to focus all resources for final analysis on the "better" alternatives, resulting in a finer evaluation of the "better" alternatives than would be achieved if all alternatives were carried through to the final evaluation process.

Application of Quantitative Analysis Matrix

In constructing a value matrix, the X and Y axes are assigned to either the measures of effectiveness (MOE's) or the alternatives. The MOE's are gleaned from project goals, objectives and evaluation criteria. Each cell of the matrix should correspond to one alternative and one MOE.

The quantitative approach utilizes numerical values to measure the effectiveness of a particular alternative. The selected alternative is the one incorporating the highest numerical "score." The quantitative approach incorporates the "value matrix," shown on Figure IV-12. The following is an explanation of how the value evaluation methodology was applied:

- Objectives and evaluation criteria were weighted. To do this, the evaluation criteria were first ranked and rated. The results of the individual evaluations were summed and transformed into weights

by averaging the rankings and ratings and then normalizing so that the sum of the weights equaled 100.0.

- Subjectively rate the plan: For qualitative criteria, the plans were subjectively rated on their ability to satisfy the particular criteria.

- The plans were rated on their satisfaction of the criteria as measured by the various qualitative and quantitative data, as shown in Figure IV-13. The plans were rated on a scale ranging from one through five, where five represents the most desirable condition.

- Compute the plan scores: The score for each plan was computed by summing the ratings for the various criteria multiplied by their respective weights.

Of course, prior to the final evaluation, the candidates must be screened in order to ensure satisfaction of minimum constraints.

HOV ALTERNATIVES

	TRAFFIC AND HOV SERVICE 60 PERCENT					SOCIAL/ENVIORMENTAL 10 PERCENT			ECONOMIC 30 PERCENT					
	GEN. TRAFFIC IMPACT (PUBLIC ACCEPT)	HOV PATRONAGE	HOV TRANSIT TIME ADVANTAGE	TOTAL PASSENGER THROUGH-PUT	ENFORCE-ABILITY	SAFETY	SOCIO/ECON. IMPACT	ENVIRON. AIR/NOISE/ WATER	IMPLEMENT TIME	CAPITAL COST	OPERATING COST	PROJECT LIFE	COST WITH RESPECT TO PROJECT LIFE	TOTALS
(WEIGHTING PERCENTAGES)	20.00	10.00	10.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	10.00	100.00
EXCLUSIVE HOV WAY 2-LANE REVERSIBLE 836 WEST OF LE JEUNE	1.00	0.50	0.50	0.50	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	4.35
EXCLUSIVE HOV WAY 2-LANE REVERSIBLE 826	1.00	0.50	0.50	0.50	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	4.35
EXCLUSIVE HOV WAY 2-LANE REVERSIBLE 836 EAST OF LE JEUNE	1.00	0.50	0.50	0.50	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	4.35
CONCURRENT FLOW ADD-A-LANE SR 836 WEST OF LE JEUNE	1.00	0.50	0.50	0.50	0.15	0.15	0.25	0.20	0.05	0.05	0.25	0.25	0.30	4.15
EXCLUSIVE HOV WAY 1-LANE REVERSIBLE 826	1.00	0.40	0.50	0.40	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	4.15
EXCLUSIVE HOV WAY 1-LANE REVERSIBLE 836 EAST OF LE JEUNE	1.00	0.40	0.50	0.40	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	4.15
EXCLUSIVE HOV WAY 1-LANE REVERSIBLE 836 WEST OF LE JEUNE	1.00	0.40	0.50	0.40	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	4.15
CONCURRENT FLOW ADD-A-LANE SR 836 EAST OF LE JEUNE	1.00	0.50	0.50	0.50	0.15	0.15	0.25	0.20	0.05	0.05	0.25	0.25	0.30	4.15
CONCURRENT FLOW ADD-A-LANE SR 826	1.00	0.40	0.40	0.40	0.15	0.20	0.25	0.20	0.05	0.05	0.25	0.25	0.30	3.90
TOLL BYPASS SR 836 EAST OF LE JEUNE	1.00	0.30	0.30	0.20	0.15	0.20	0.25	0.25	0.20	0.25	0.20	0.20	0.40	3.90
EXCLUSIVE HOV RAMPS SR 836 WEST OF LE JEUNE	1.00	0.30	0.30	0.20	0.10	0.20	0.10	0.15	0.20	0.25	0.20	0.20	0.40	3.60
QUEUE JUMP REVERSIBLE LANE FLYOVER AT SR 826/836	0.80	0.40	0.30	0.40	0.10	0.15	0.25	0.25	0.25	0.25	0.05	0.10	0.30	3.60
ADD-A-LANE SR 836 WEST OF LE JEUNE	1.00	0.10	0.10	0.50	0.25	0.25	0.25	0.25	0.05	0.05	0.25	0.25	0.30	3.60
EXCLUSIVE HOV RAMPS SR 826	1.00	0.30	0.30	0.20	0.10	0.20	0.10	0.15	0.20	0.25	0.20	0.20	0.40	3.60
ADD-A-LANE SR 826	1.00	0.10	0.10	0.50	0.25	0.25	0.25	0.25	0.05	0.05	0.25	0.25	0.30	3.60
EXCLUSIVE HOV RAMPS SR 836 EAST OF LE JEUNE	1.00	0.30	0.30	0.20	0.10	0.20	0.10	0.15	0.20	0.25	0.20	0.20	0.40	3.60
ADD-A-LANE SR 836 EAST OF LE JEUNE	1.00	0.10	0.10	0.50	0.25	0.25	0.25	0.25	0.05	0.05	0.25	0.25	0.30	3.60
QUEUE JUMP RAMP METERING BYPASS SR 836 WEST OF LE JEUNE	1.00	0.30	0.30	0.20	0.05	0.15	0.25	0.25	0.25	0.25	0.15	0.10	0.30	3.55
QUEUE JUMP RAMP METERING BYPASS SR 836 EAST OF LE JEUNE	1.00	0.30	0.30	0.20	0.05	0.15	0.25	0.25	0.25	0.25	0.15	0.10	0.30	3.55
QUEUE JUMP RAMP METERING BYPASS SR 826	1.00	0.30	0.30	0.20	0.05	0.15	0.25	0.25	0.25	0.25	0.15	0.10	0.30	3.55
CONTRAFLOW ADD-A-LANE SR 836 EAST OF LE JEUNE	0.80	0.40	0.40	0.40	0.25	0.05	0.25	0.20	0.05	0.05	0.05	0.25	0.20	3.35
CONCURRENT FLOW ADD-A-LANE SR 874 4-LANE SEGMENTS	1.00	0.20	0.20	0.20	0.15	0.25	0.25	0.20	0.05	0.05	0.25	0.25	0.30	3.35
CONTRAFLOW ADD-A-LANE SR 836 WEST OF LE JEUNE	0.80	0.40	0.40	0.40	0.25	0.05	0.25	0.20	0.05	0.05	0.05	0.25	0.20	3.35
CONTRAFLOW ADD-A-LANE SR 826	0.80	0.40	0.40	0.40	0.25	0.05	0.25	0.20	0.05	0.05	0.05	0.25	0.20	3.35
ADD-A-LANE SR 874 8-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.25	0.25	0.25	0.25	0.05	0.05	0.25	0.25	0.30	3.20
CONCURRENT FLOW TAKE-A-LANE SR 874 8-LANE SEGMENTS	0.80	0.10	0.10	0.10	0.15	0.20	0.25	0.20	0.25	0.25	0.25	0.15	0.40	3.20
ADD-A-LANE SR 874 4-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.25	0.25	0.25	0.25	0.05	0.05	0.25	0.25	0.30	3.20
EXCLUSIVE HOV WAY 1-LANE REVERSIBLE 874 4-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	3.15
EXCLUSIVE HOV WAY 1-LANE REVERSIBLE 874 8-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	3.15
EXCLUSIVE HOV WAY 2-LANE REVERSIBLE 874 8-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	3.15
EXCLUSIVE HOV WAY 2-LANE REVERSIBLE 874 4-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.25	0.25	0.25	0.25	0.05	0.05	0.20	0.25	0.30	3.15
EXCLUSIVE HOV RAMPS SR 874 8-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.10	0.20	0.10	0.15	0.20	0.25	0.20	0.20	0.40	3.10
EXCLUSIVE HOV RAMPS SR 874 4-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.10	0.20	0.10	0.15	0.20	0.25	0.20	0.20	0.40	3.10
QUEUE JUMP RAMP METERING BYPASS SR 874 8-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.05	0.15	0.25	0.25	0.25	0.25	0.15	0.10	0.30	3.05
CONCURRENT FLOW ADD-A-LANE SR 874 8-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.15	0.25	0.25	0.20	0.05	0.05	0.25	0.25	0.30	3.05
QUEUE JUMP RAMP METERING BYPASS SR 874 4-LANE SEGMENTS	1.00	0.10	0.10	0.10	0.05	0.15	0.25	0.25	0.25	0.25	0.15	0.10	0.30	3.05
CONTRAFLOW TAKE-A-LANE SR 874 8-LANE SEGMENTS	0.80	0.10	0.10	0.10	0.25	0.05	0.25	0.20	0.25	0.25	0.05	0.05	0.30	2.75
CONTRAFLOW ADD-A-LANE SR 874 4-LANE SEGMENTS	0.80	0.10	0.10	0.20	0.25	0.05	0.25	0.20	0.05	0.05	0.05	0.25	0.20	2.55
CONTRAFLOW TAKE-A-LANE SR 836 EAST OF LE JEUNE RD AM ONLY	0.20	0.20	0.20	0.10	0.25	0.05	0.25	0.20	0.25	0.25	0.05	0.25	0.20	2.45
CONTRAFLOW ADD-A-LANE SR 874 8-LANE SEGMENTS	0.60	0.10	0.10	0.10	0.25	0.05	0.25	0.20	0.05	0.05	0.05	0.25	0.20	2.25
CONTRAFLOW TAKE-A-LANE SR 836 WEST OF LE JEUNE RD AM ONLY	0.20	0.20	0.20	0.10	0.25	0.05	0.25	0.20	0.25	0.25	0.05	0.05	0.20	2.25

FIGURE IV-12

HOV ALTERNATIVES

	TRAFFIC AND HOV SERVICE						SOCIAL/ENVIRONMENTAL		ECONOMIC				
	55						15		30				
	General Traffic Impact (public accept-ability)	HOV Patronage	HOV Transit Time Advantage	(Net increase) Total Passenger Through-put	Enforce-ability	Safety	Socio-economic Impact	Environ-mental, air/ noise/water	Implemen-tation Time Required	Cost		Life Expectancy	Cost w/respect to Life Expectancy
										Capital	Operating		
	15	10	10	10	5	5	7	8	5	5	5	5	10
Concurrent flow take-a-lane SR 874 8-lane segments	4	1	1	1	3	4	5	4	5	5	5	3	4
Concurrent flow add-a-lane SR 874 8-lane segments	5	1	1	1	3	5	5	4	1	1	5	5	3
Concurrent flow add-a-lane SR 874 4-lane segments	5	2	2	2	3	5	5	4	1	1	5	5	3
Concurrent flow add-a-lane SR 826	5	4	4	4	3	4	5	4	1	1	5	5	3
Concurrent flow add-a-lane SR 836 west of Le Jeune Road	5	5	5	5	3	3	5	4	1	1	5	5	3
Concurrent flow add-a-lane SR 836 east of Le Jeune Road	5	5	5	5	3	3	5	4	1	1	5	5	3

the greater the speed differential the higher the safety problem

FIGURE IV-13

Each of the above steps was performed by each member of the Kimley-Horn study team. The resulting individual matrices were then totaled and averaged on a cell-by-cell basis using a computerized spreadsheet program. The final matrix shown in Figure IV-12 is the final, composite matrix produced by the consulting team.

The major disadvantages associated with the quantitative evaluation approach involve the rigidity and lack of discretionary decision-making inherent in any "scoring" technique. Minority views and disaggregate value systems are also precluded from being displayed within the context of the evaluation matrix.

Principal advantages include a higher degree of technical acceptability, and an inherent demand on decision-makers to grapple with difficult value judgments in a productive and quantitative manner. The process also has a higher probability of producing a single recommendation. However, unanimous agreement on the final recommendation is by no means guaranteed.

Definition of Criteria

For clarity, the evaluation criteria listed in HOV Conceptual Design Study, Interim Report #1, have been combined into three major areas for use in the value matrix. These areas are: Traffic and HOV Service, Social/Environmental, and Economic. These areas were broken down as described below.

Traffic and HOV Services

General Traffic Impact/Public Acceptability - Impact on the general traffic flow and the public's perception of this impact are evaluated. An example of a highly ranked alternative would be a project which gives an impression of high HOV

advantage in regards to travel time, but has little or no negative impact on non-HOV traffic. Also included in this category are intangibles such as public perception of the benefit of a certain alternative.

HOV Patronage - A measure of an alternative's ability to attract additional patronage to HOV. A highly ranked alternative would have a high perception of reduced travel time, comfort, and convenience.

HOV transit Time Advantage - An evaluation considering only the time advantage an alternative would grant HOV vehicles over non-HOV vehicles.

Total Passenger Through-put - The corridor's total ability to carry passengers, both HOV and non-HOV, is evaluated here. A highly ranked alternative would create significant HOV traffic and have little negative effect on non-HOV traffic.

Enforceability - An evaluation of both the ease and practicality of enforcement of an alternative.

Safety - A measure of an alternative's relative safeness.

Social/Environmental

Socio-economic Impact - An evaluation of impact on surrounding neighborhoods and businesses along and near the termini of the corridor.

Environmental - The environmental impact of various alternatives is evaluated. A highly ranked alternative would have little negative impact in all areas and possibly beneficial impact in some areas.

Economic

Implementation Time Required - A measurement of the relative time required to place an alternative into operation. A highly ranked alternative would require little implementation time.

Capital Cost - The cost of placing an alternative into operation. Costs such as construction, resigning, or remarking lanes are evaluated by this criteria.

Operating Cost - An evaluation of costs once the facility is open. These costs would include changing signs and barriers for reversible lane operation, maintenance of the facility, and enforcement. For both capital and operating cost, a low cost would lead to a high ranking.

Life Expectancy - An evaluation of an alternative's useful life. Useful life is the time the alternative can provide an acceptable level of service. A highly ranked alternative would have a long life expectancy.

Cost with Respect to Life Expectancy - A project's total cost, including both capital and operating costs, is evaluated with respect to the project's useful life by this criteria.

Weighting of Evaluation Criteria

As previously stated, criteria were grouped into three major subareas: traffic and HOV service, social/environmental, and economic. Each subgroup was weighted; then the particular criteria within the subgroup were weighted.

Traffic and HOV service is the most heavily weighted of the three subgroups. This is due to the subgroup's major effect on the overall success of the project. This

subgroup measures of an alternative's ability to provide the necessary service, and the public's reaction to, and willingness to cooperate with, a proposed alternative. Within the traffic and HOV service subgroup, general traffic impact as it relates to public acceptability was given the highest weighting. This high weighting is due to the fact that a negative general traffic impact, with the corresponding low public acceptability is, in most cases, enough to fail an HOV project. This high weighting of general traffic impact justifiably forces options which rate poorly or even marginally in this area to be superior in all other areas to merit further consideration.

HOV patronage, HOV transit time advantage, and total passenger through-put measure an alternative's ability to operate efficiently. For this reason, a relatively high rating of ten percent each, or thirty percent total, is given to these criteria. While not as critical as general traffic impact, this high combined rating assures that only options capable of fulfilling HOV needs will be considered for further study.

Enforceability is given a weighting of five percent, the weight most often given an alternative. While important, enforceability is an issue for alternatives with a high enough public acceptability that the number of violations does not overwhelm enforcement efforts.

Safety is given the weighting of five percent, since all of the HOV alternatives proposed, if operated properly, historically have acceptable levels of safety performance.

The social/environmental subgroup has the weighting of ten percent, the lowest total weighting of any subgroup. This is not an indication of lack of concern for this vital area, but rather a reflection of existing corridor conditions, and the types of projects being considered. As an urban corridor already being impacted by major expressways, and in one section by an international airport, impact on the

environment will be minimal, and in many cases, positive. Also, as most alternatives confine themselves to existing right-of-way, little socio/economic impact will be produced.

The criteria within the economic subgroup are viewed primarily as project constraints, and the subgroup carries an approximately average weighting of thirty percent. While a particular alternative may do poorly in one or possibly two criteria and still pass initial screening, higher priced alternatives with marginal operational characteristics will be screened out.

The alternatives ranked highest during the preliminary screening process are shown in Table IV-2 and Table IV-3.

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TABLE IV-2

HIGHEST RANKED HOV ALTERNATIVES
STATE ROAD 836

SCORE	ALTERNATIVE
Capital Intensive Alternatives	
4.35	Exclusive HOV-Way Two-lane Reversible
4.15	Exclusive HOV-Way One-lane Reversible
4.15	Concurrent Flow HOV Add-a-lane
3.60	Add-a-lane
Low Capital Alternatives	
3.90	Toll Bypass
3.60	Exclusive HOV Ramps
3.55	Queue Jump Ramp Metering Bypass

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TABLE IV-3

HIGHEST RANKED HOV ALTERNATIVES
STATE ROAD 826

SCORE	ALTERNATIVE
Capital Intensive Alternatives	
4.35	Exclusive HOV-Way Two-lane Reversible
4.15	Exclusive HOV-Way One-lane Reversible
3.90	Concurrent Flow HOV Add-a-lane
3.60	Add-a-lane
Low Capital Alternatives	
3.60	Exclusive HOV Ramps
3.60	Queue Jump Reversible Lane Flyover at SR 826/836
3.55	Queue Jump Ramp Metering Bypass

TSM IMPROVEMENTS

In addition to HOV concepts, some of which may require up to ten years to implement, general traffic, TSM-type improvements are also considered as conditions along the corridor can be expected to deteriorate substantially prior to the implementation of long-range improvements.

At present, two major problem areas exist on the corridor, the SR 826/836 interchange during the A.M. peak, and the westbound lanes of SR 836 in the vicinity of the Le Jeune Road interchange during the P.M. peak. Improvement in these two areas could help prevent major deterioration of traffic flow prior to the construction and implementation of long-range improvements.

To recap materials presented in Chapter III of Interim Report #1, the problem in both areas stems from turbulence in the traffic flow created by merging and weaving traffic. The problem near the SR 826/836 interchange is due to the rapid drop from five to three eastbound lanes which takes place near the SR 836/Milam Dairy Road interchange. The problem for the westbound traffic occurs at the Le Jeune Road interchange and is caused by the large influx of traffic from Le Jeune Road (more than 1,800 vehicles in the peak hour), and a right lane drop for SR 836 through traffic. From counts done by Kimley-Horn, SR 836 carries only 980 vehicles per lane into the interchange, and only 1,225 vehicles per lane out of the interchange in the peak hour. Assuming ideal situations, level of service through this interchange should be "A" to "B"; however, the intersection falls into forced flow, Level of Service "F", during the P.M. peak hour.

It is felt that both these problem areas can be substantially relieved by the extension of lanes which are currently being dropped. This will allow smoother traffic flow by providing additional space for merging and weaving maneuvers.

Specific design of these segments will be accomplished in the final report; however, preliminary examination of these sections indicates that the lane for each location will have to be extended by 2,500 feet. It should be noted that all construction costs for these improvements will be almost completely salvagable during the construction of any new lane additions.

CHAPTER V - EVALUATION OF ALTERNATIVES

Pivot Point Analysis

Pivot point analysis was heavily used to assist in alternatives evaluation. First developed for the Federal Energy Administration in November, 1976, by Cambridge Systematics, Inc., pivot point analysis has been widely used to predict changes in modal split brought about by changes in transportation facilities and/or policies. Pivot point analysis is based on changes in "utility" for various modal choices. Changes in utility are most sensitive to changes in travel time, both in vehicle and out of vehicle, and changes in out of pocket travel costs. Base input for pivot point is broken up into four different categories:

- Average household data
- Peak hour (or base work) trip modal shares
- Average trip length
- Average daily vehicle miles of travel

Average carpool size is also input as base data.

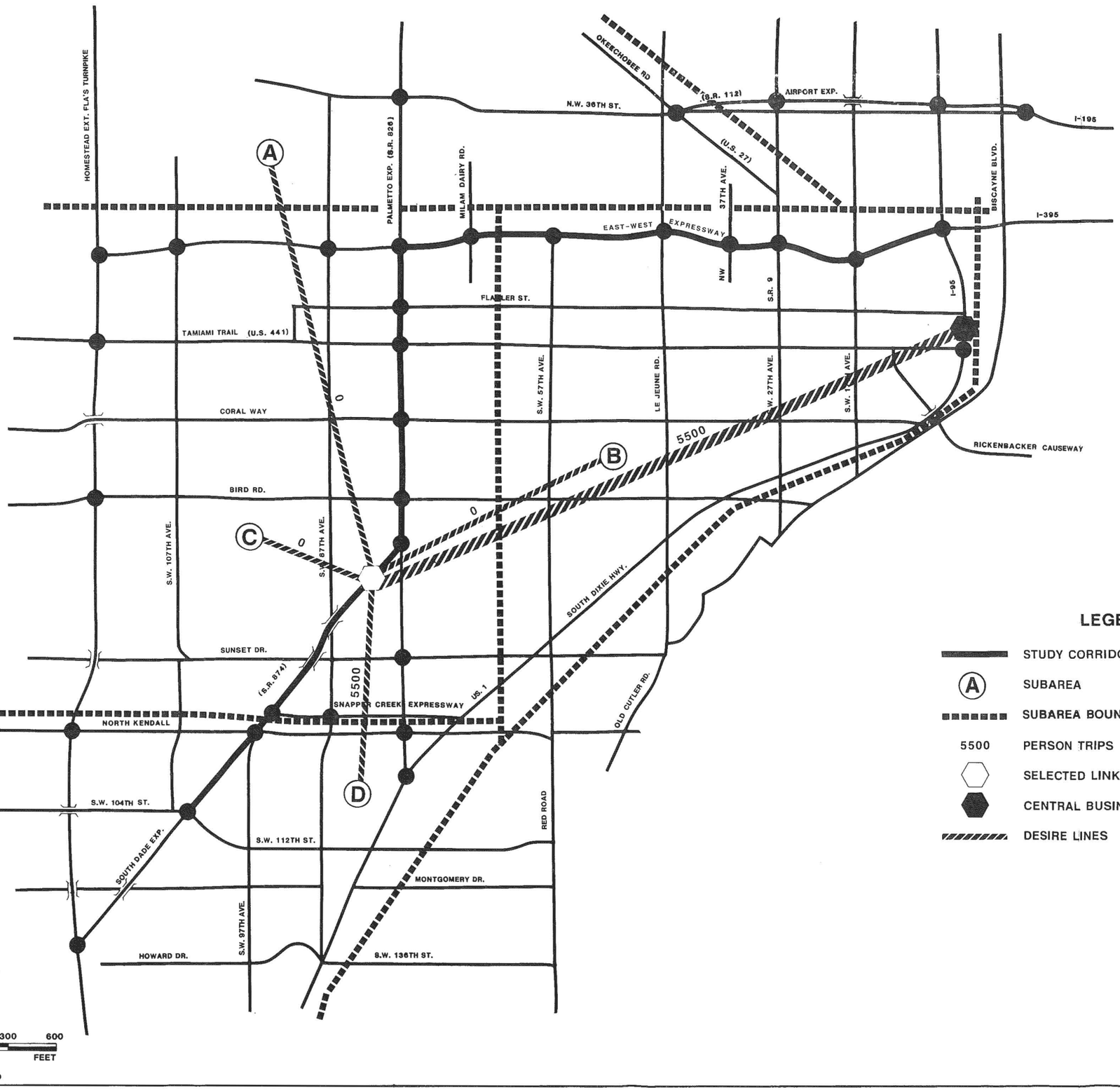
Average household data includes annual household income, number of workers per household, and the number of daily non-work trips per household. Annual income for the study area was taken as an un-weighted average of the corridor subarea incomes as presented in Interim Report #1. Number of workers per household was obtained from the Florida Statistical Abstract. Number of daily non-work auto trips was taken from ITE generation rates for residential areas. The distribution of trips to home-based non-work was performed based on information contained in National Cooperative Highway Research Program Report 187, "Quick-response Urban Travel Estimation Techniques and Transferable Parameters." Peak hour trip modal shares

were obtained from auto occupancy counts performed by Kimley-Horn and presented in Interim Report #1, from the latest ridership counts from Metro-Dade Transportation Administration, and from information contained in the Florida Statistical Abstract. All information for modal shares compared favorably with modal shares for work trips from the 1980 census contained in the Florida Statistical Abstract. Average trip length for work trips is represented by a trip from the study area to the CBD.

Utilizing the FDOT's computer in Tallahassee, the Urban Transportation Planning System (UTPS) model was run for selected link analysis by Kimley-Horn for the 2005 Dade County Transportation Network. By using selected link analysis, it was possible to produce desire lines from each subarea to the CBD. Desire lines are shown for three selected links on Figures V-1, V-2, and V-3. The desire lines shown represent, in person trips, the demand for travel from each study subarea to the central business district and the immediate surrounding area, via the link indicated.

By examination of other possible links from the study subareas to the CBD, it has been determined that desire lines shown via the SR 836 selected link represent the total desire for travel via the study corridor to the CBD from all study areas. Trip lengths along the corridor from each subarea centroid were determined. The average trip length chosen is an average of the trip lengths from each subarea, weighted to represent each subarea's use of the corridor for CBD access. Trip lengths for home-based, non-work purposes are based on an examination of total vehicle miles of travel from the UTPS runs in light of the work trip length. The last input category, average daily vehicle miles of travel, represents mathematical deductions from other inputs. Average carpool size is based on auto occupancy counts performed by Kimley-Horn.

Assumptions for changes to in vehicle travel time (IVTT), out of vehicle travel time (OVTT), and out of pocket travel costs (OPTC), are as described below for the various scenarios. A sample of the pivot point analysis spreadsheet is shown in Figure V-4.



4313.10

LEGEND

- STUDY CORRIDOR
- (A) SUBAREA
- SUBAREA BOUNDARIES
- 5500 PERSON TRIPS
- SELECTED LINK
- CENTRAL BUSINESS DISTRICT
- DESIRE LINES

FIGURE V-1

DADE COUNTY EXPRESSWAY HOV STUDY

2005 DESIRE LINES VIA S.R.874

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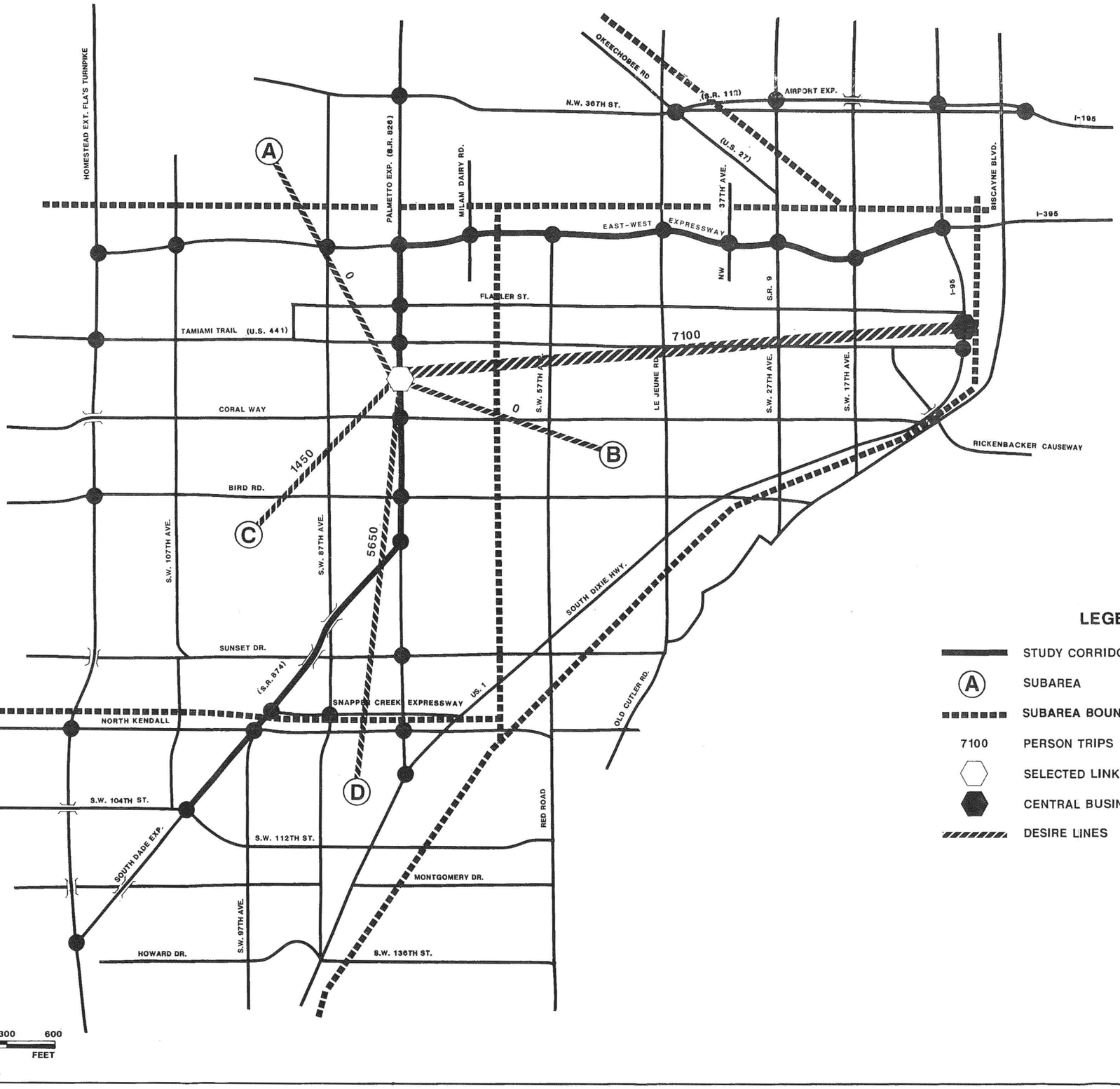

LEGEND

- STUDY CORRIDOR
- (A) SUBAREA
- SUBAREA BOUNDARIES
- 7100 PERSON TRIPS
- SELECTED LINK
- CENTRAL BUSINESS DISTRICT
- DESIRE LINES

FIGURE V-2

DADE COUNTY EXPRESSWAY HOV STUDY

2005 DESIRE LINES VIA S.R.826

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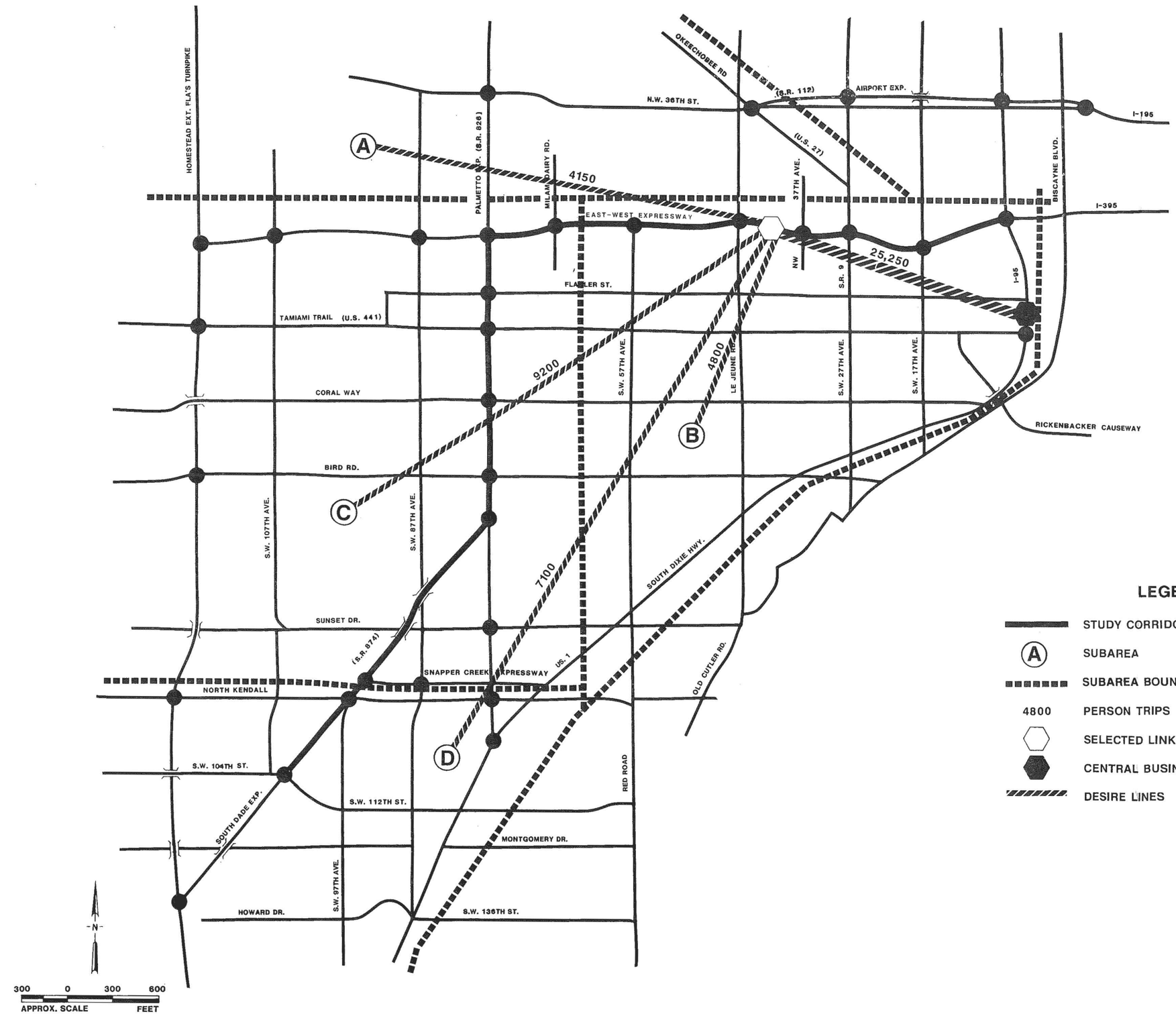

4313.10

LEGEND

- STUDY CORRIDOR
- (A) SUBAREA
- SUBAREA BOUNDARIES
- 4800 PERSON TRIPS
- SELECTED LINK
- CENTRAL BUSINESS DISTRICT
- DESIRE LINES

FIGURE V-3

DADE COUNTY EXPRESSWAY HOV STUDY

2005 DESIRE LINES VIA S.R.836

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POLICY:

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP
MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00			
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
						TOTAL CHANGE	0.00			

SHARED RIDE

								CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.00			=	0.00		
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00		
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00	
	+	0.29	*	0.00			=	0.00		
						TOTAL CHANGE	0.00			

TRANSIT

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00			
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
						TOTAL CHANGE	0.00			

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	100.00	=	63.90	0.00	0.00
SHARED RIDE	24.30	*	1.00	=	24.30	/	100.00	=	24.30	0.00	0.00
TRANSIT	5.30	*	1.00	=	5.30	/	100.00	=	5.30	0.00	0.00
OTHER	6.50	*	1.00	=	6.50	/	100.00	=	6.50	0.00	0.00
				TOTAL	100.00						

PIVOT POINT SPREADSHEET

FIGURE V-4

HIGH CAPITAL COST ALTERNATIVE

Three high cost alternatives survived the initial value matrix: add-a-lane (non-HOV), concurrent flow HOV add-a-lane, and exclusive HOV-way (one and two lane).

Single lane add-a-lane was dropped after further evaluation. Multiple lane additions, especially on SR 826, will need to be made to accommodate future demand. Further, UTPS traffic projections for the corridor for 2005 indicate increases in traffic which will be difficult, if not impossible, to manage without greater emphasis on the use of transit and high occupancy vehicles. The ADT on SR 836 east of Le Jeune Road is predicted to be 185,000 by 2005 and 310,000 on SR 826, compared to 110,900 and 130,700 respectively in 1984. As the add-a-lane concept does not encourage more efficient use of the corridor, and its ultimate passenger through-put capabilities are less than those of the HOV alternatives, single lane add-a-lane was not given further consideration. Discussion of add-a-lane is found in later sections.

The most highly ranked of all alternatives in the value matrix, exclusive HOV-way, both two-lane and one-lane, was dropped from consideration after pivot point analysis. Among the factors considered during pivot point analysis was the inability of exclusive HOV-ways to allow for numerous ingress/egress points. This produces a situation in which travel speeds may be increased, but total travel times are not proportionately reduced, due to the lack of numerous exits. For this reason, terminal time penalties of two and three minutes were included for pivot point analysis. Exclusive HOV-way is best suited for use in areas with fairly large, intense, and concentrated CBD's. This allows for remote collection of vehicles destined for the CBD, and direct movement of these vehicles into the CBD with a minimum of ingress/egress points.

The large number of attractions along the SR 826/SR 836 corridor is a major deterrent to selection of exclusive HOV. Study of the UTPS 2005 desire lines

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TABLE V-1
PIVOT POINT RESULTS

Non-HOV Running Speed	HOV-Way 3 Min. Terminal Penalty 55 MPH Running Speed	HOV-way 2 Min. Terminal Penalty 55 MPH Running Speed	Concurrent Flow HOV-Lane 50 MPH Running Speed
30	27.43 (5.81)	27.71 (5.87)	27.85 (5.90)
25	28.99 (6.14)	29.28 (6.20)	29.42 (6.23)
20	31.70 (6.65)	31.70 (6.72)	31.84 (6.75)
15	35.58 (7.54)	35.88 (7.60)	36.04 (7.63)
10	44.20 (9.37)	44.51 (9.43)	44.66 (9.46)

Shared Ride Share in percentage of total daily person trips
(Transit Share) in percentage of total daily person trips

provides further indication that a significant portion of corridor usage is directed to areas other than the CBD and the area immediately around the CBD. Results of the pivot point comparison, showing the percentage or "share" of the traveling population selecting either the shared ride or the transit mode for tested scenarios, appear in Table 1. Complete pivot point results appear in Appendix A.

Given the much higher cost of exclusive HOV-way over concurrent flow add-a-lane, and the greater benefits of concurrent flow HOV lanes in this specific application, exclusive HOV-ways were removed from consideration, and concurrent flow HOV add-a-lane was chosen as the best high price alternative.

After choosing concurrent flow add-a-lane, it was necessary to decide whether to use interior or exterior lanes for HOV's. Interior concurrent flow lanes were chosen for several reasons. Most importantly, interior lanes can easily be coordinated with a widened flyover at the SR 826/SR 836 interchange. Also, enforcement efforts on inside HOV lanes are more effective than on outside lanes, where non-HOV traffic must use the HOV lane to enter/exit the expressway. Finally, if future conditions warrant, interior concurrent flow HOV lanes can be converted to a concurrent flow lane for normal HOV traffic, and a contra-flow lane for bus use as shown in Figure V-5.

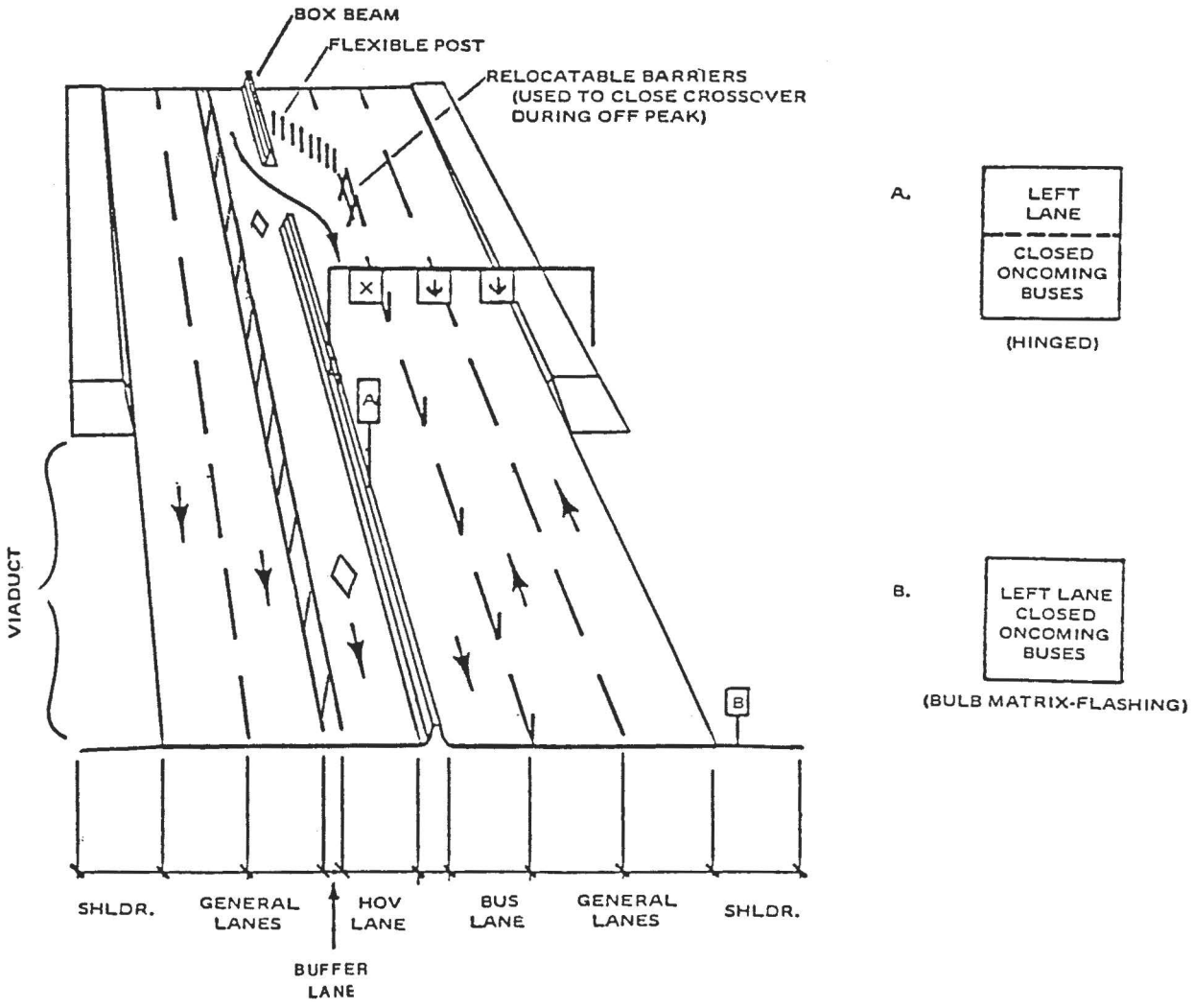
BOX BEAM
FLEXIBLE POST
RELOCATABLE BARRIERS
(USED TO CLOSE CROSSOVER
DURING OFF PEAK)
VIADUCT
A
B
SHLDR.
GENERAL LANES
HOV LANE
BUS LANE
GENERAL LANES
SHLDR.
BUFFER LANE
A.
LEFT LANE
CLOSED ONCOMING BUSES
(HINGED)
B.
LEFT LANE CLOSED ONCOMING BUSES
(BULB MATRIX-FLASHING)

FIGURE V-5

LOW CAPITAL ALTERNATIVE

Two major low capital alternatives remained after initial value matrix evaluation. These were queue jump ramp metering bypass and exclusive HOV ramps. In addition, two minor alternatives, queue jump reversible lane flyover at the SR 826/SR 836 interchange and toll bypass, also remained.

Queue jump reversible flyover at the SR 826/SR 836, as a stand alone option, was dropped after further evaluation. Pivot point analysis for this alternative showed an increase of the ridesharing modal share of only 1.3 percent of the traveling population. The high operating cost, high capital cost, small HOV time saving, and negative impact on non-HOV traffic outweighs the small travel time savings gained and small modal shift achieved. However, after widening, the ease with which the flyover allows concurrent flow HOV lane placement through the interchange without major interchange redesign makes it attractive for incorporation into the concurrent flow HOV lane scenario.

Toll bypass on SR 836 is not a viable alternative, not because of operational or conceptual reasons, but rather due to the terms of the bond issuance for SR 836. Inquiries to the Florida Department of Transportation have revealed that the bond issuance will not allow any vehicles, with the exception of FDOT maintenance crews performing maintenance specifically on SR 836, to pass without toll payment. The terms of the issuance are specific and allow no leeway.

It would be possible to implement exclusive lanes for HOV vehicles. Due to the relatively high volume of two-person vehicles, it would be difficult, if not impossible, to set aside enough toll lanes for two or more passenger vehicles without a serious negative impact on non-HOV traffic. For this reason, it is suggested that any exclusive toll lanes for HOV traffic be designated for three or more occupants only. In terms of modal shift, the effect on this implementation alone would be negligible; however, it will be a highly visible HOV effort, possibly assisting with the efforts of the ridesharing coordinator.

Capital costs for exclusive HOV toll lanes will be minimal, consisting mainly of minor signing and lane marking costs. Operational costs will consist of enforcement costs, and it is anticipated that present enforcement efforts for the toll facility, possibly supplemented by occasional specific enforcement, will be adequate. Operational costs will therefore be minimal. Both costs and tangible benefits for exclusive HOV toll booths will be minimal, making exclusive HOV toll booths primarily a policy decision.

Of the two major low capital alternatives remaining, queue jump ramp metering bypass, and exclusive HOV ramps, queue jump ramp metering bypass was retained, and exclusive HOV ramps were eliminated after further study. Results of the pivot point analysis appear in Table V-2.

Queues for non-HOV vehicles would be similar in both scenarios: HOV's could be assisted by this scenario no more than once per trip. Both HOV and non-HOV vehicles would, however, benefit from improved level of service on the expressway from the ramp metering process. For the pivot point analysis, the assumption was made for non-HOV vehicles that the time savings of improved service would balance out the time spent waiting in the queue. The effect of this better level of service on HOV vehicles would be to double the time savings over the queue jump alone. It must be remembered that if an HOV ramp is not conveniently located for a particular HOV vehicle, there will be no help for that particular vehicle. It is therefore necessary, if this scenario is to work, for there to be as many HOV preferential ramps as possible. Many more locations exist where queue jump ramp metering bypass could be implemented than where exclusive HOV ramps could be built. Also, for pre-timed ramp metering, costs per ramp are only a small fraction of the cost of new ramp construction. This allows for many more ramps to provide HOV preference for the same cost. Finally, while public acceptance of queue jump ramp metering bypass has been low in the past, it is felt that acceptability will be better than for exclusive HOV ramps, as many of the new ramps would have a high negative impact on residential areas.

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TABLE V-2
PIVOT POINT ANALYSIS
LOW CAPITAL ALTERNATIVES

Non-HOV Queue (Minutes)	Exclusive HOV Ramp	Queue Jump Ramp Metering Bypass
1	25.04 (5.31)	25.36 (5.37)
2	25.30 (5.36)	25.89 (5.49)
3	25.57 (5.42)	26.43 (5.60)
4	25.83 (5.47)	26.97 (5.71)
5	26.10 (5.53)	27.52 (5.83)

Shared Ride Share in percentage of total daily person trips
(Transit Share) in percentage of total daily person trips

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CALCULATION OF ANNUALIZED COSTS

Concurrent Flow HOV Lane

Capital Cost

After an examination of construction costs in Dade County, including consultation with the FDOT, the following costs for construction of a concurrent flow HOV lane were assumed:

o At grade widening	$1.45 million per lane mile
o Bridge widening	$70 per square foot
o Bridge widening (Miami River)	$100 per square foot
o Bridge widening (SR 826/836)	$80 per square foot

The corridor will require the following construction:

o At grade widening	18.14 lane miles
o Bridge widening	4,345 linear feet
o Bridge widening (Miami River)	3,060 linear feet
o Bridge widening (SR 826/836)	1,150 linear feet
o Partial reconstruction of the Le Jeune Road interchange	

Total cost for construction of concurrent flow HOV lanes (millions of dollars):

o At grade widening	$26.30
o Bridge widening	10.95
o Bridge widening (Miami River)	11.02
o Bridge widening (SR 826/836)	3.31
o Le Jeune construction	2.00
	$53.58
o Contingency (15%)	8.04
	$61.62
o Engineering Construction/management (15%)	9.24
TOTAL	$70.86

The total shown considers widening of the existing cross-section by a total of 36 feet, broken down as two 12-foot lanes, two 4-foot buffer zones, and widening of both inside shoulders of two feet. Construction costs include:

- All materials and labor
- Grading
- Drainage
- Maintenance of traffic
- Lighting
- Signing and marking
- Resurfacing of adjacent lanes

Assuming a four percent discount rate, a 25 percent salvage value, and a useful life of twenty years, the annualized cost of concurrent flow add-a-lane is $3,911,000.

Operating Cost

Operating costs are primarily confined to general maintenance costs. This cost is estimated to be $3,000 per lane mile per year. Total operating cost per year for the corridor would therefore be $32,100.

Total Annual Cost

Total annual cost is $3,911,000 plus $32,100 = $3,943,100 (SAY $3,945,000).

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Queue Jump Ramp Metering Bypass

Capital Cost

To determine capital costs of queue jump ramp metering bypass, two assumptions were made concerning average operating characteristics. First, it was assumed that the maximum difference in queue waiting period which would be tolerated by the non-HOV traveler is two minutes; second, that cars could be metered onto the expressway at a rate of one per ramp every five seconds. For these assumptions, bypass storage must be provided for 24 vehicles. Providing 25 feet of storage for each non-HOV vehicle requires 600 feet of storage.

Based on a study of construction costs for the area, a cost of $20.21 per square foot has been determined for storage area construction and $50,000 per ramp for traffic signalization. Cost per ramp would be as follows:

600-foot storage lane	7,200 square feet
100-foot lead in taper	600 square feet
TOTAL	7,800 square feet

7,800 square feet X $20.21 =	$157,638
Signal (1)	50,000
	$207,638

The following entrances would be signalized:

- Northbound SR 874 at SW 104th — 2 ramps
- Northbound SR 826 at Bird Road — 2 ramps
- Northbound SR 826 at Coral Way — 1 ramp
- Northbound SR 826 at Tamiami Trail — 2 ramps
- Northbound SR 826 at Flagler Street — 1 ramp

o Eastbound SR 836 at Milam Dairy Road	1 ramp
o Eastbound SR 836 at Red Road	1 ramp
o Westbound SR 836 at Le Jeune Road	2 ramps
o Westbound SR 836 at SW 27th Street	2 ramps
o Westbound SR 836 at SW 17th Street	2 ramps
TOTAL	16 ramps

Total capital costs:

16 ramps X 207,638 =	(SAY)	$ 3,322,000
15% contingency	(SAY)	498,000
		$ 3,820,000
15% Engineering construction/management	(SAY)	573,000
TOTAL		$ 4,393,000

Assuming a discount rate to be four percent, the project life to be five years, and the salvage value to be 25 percent of original cost, annualized capital cost will be $740,000.

Operating Cost

Operating costs will primarily be maintenance costs for the system, and are predicted to be $50,000 annually for the system.

Total Annual Cost

Total annual costs for queue jump ramp metering bypass are predicted to be $740,000 plus $50,000 = $790,000.

TSM

Capital Cost

To implement the described TSM improvements, the following construction will be necessary:

o At grade widening	.78 miles
o Bridge widening	1,150 linear feet

Construction costs will be:

o At grade widening	$1.13 million
o Bridge widening	$0.97 million
TOTAL	$2.10 million

Construction costs include:

- o All materials and labor
- o Grading
- o Drainage
- o Maintenance of traffic
- o Signing and marking

Operating Cost

Operating costs will primarily be maintenance costs for the system, and are predicted to be $3,000 annually ($3,000 per lane mile per year) for the system.

Total Annual Cost

Assuming a ten-year project life, a four percent discount rate, and a ninety percent salvage value, annualized cost of construction is $25,891 (SAY $26,000). Adding operating costs, the total annual cost is $29,000.

BENEFIT/COST RATIOS

Benefit/cost ratios were calculated based on annualized benefits from travel time savings, and changes in vehicle miles of travel. These two variables included the majority of significant user benefits in the corridor. While this approach does not include all user benefits, if a proposed project can be justified using these criteria only, a comprehensive benefit/cost analysis is not necessary. Similarly, if a project performs extremely poorly in this type of analysis, further detailed analysis is not warranted. In studies similar in nature to this one, this approach has been accepted by the FHWA [1].

The 1977 Manual on User Benefit Analysis of Highway and Bus-Transit Improvements, published by the American Association of State Highway and Transportation Officials, lists the 1975 running cost for passenger cars traveling at a uniform speed of 30 MPH (30 MPH was chosen as it is the speed for capacity flow) on a level roadway section at $70.06 per 1,000 vehicle miles or $0.07 per vehicle mile. To adjust this cost to 1985 dollars, an updating multiplier formula based on the increase in cost from 1975 to 1985 for gasoline, motor oil, tires, auto repairs and maintenance, and new automobiles according to the Consumer Price Index was used. The updating multiplier used was based on the updating multiplier formula developed for the general and level roadway section condition.

Using the April 1985 Consumer Price Index, an updating multiplier of 1.942 was obtained and applied to the 1975 running cost of $0.07 per vehicle mile to produce a 1985 running cost of $0.136 per vehicle mile. By the same method, a running cost of $0.169 per vehicle mile on arterials was determined.

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[1] IH45 Justification Study, Texas State Department of Highways and Public Transportation, Jan. 1983.

Concurrent Flow HOV Add-a-lane Benefit/Cost Ratio

For calculation of the concurrent flow benefit/cost ratio, it is assumed that all excess capacity created on expressway segments by the addition of an HOV lane will be replaced by latent demand present from commuters currently using arterial routes up to the level of person throughput which could be obtained if all lanes, including the constructed HOV lane, were operated in mixed mode. Given the tremendous demand which will be generated in the future, this is not unreasonable. The savings will be calculated based upon the total reduction in vehicle miles of travel and, for vehicle miles of travel diverted from the arterial, differences in travel costs for expressway versus arterial travel.

The study corridor is 10.7 miles long. A review of corridor travel patterns showed the average trip will use 75 percent of the corridor, or eight miles, and will travel an additional four miles outside the corridor for a total trip length of 12 miles. Assuming four peak hours per day, 260 days per year, the total number of peak hours per year will be 1,040.

The ultimate capacity of a freeway lane is 2,000 vehicles per lane per hour. Therefore, the addition of one lane can increase vehicular volume by no more than 2,000 vehicles per hour. Savings due to vehicle transfer from arterial to expressway segments may therefore be shown as:

2,000 vehicles/hour X 1,040 hours X 8 miles = 16,640,000 vehicle miles

Multiplying by the difference between freeway and arterial operation in per mile travel costs ($0.033), savings are:

16,640,000 X $0.033 = $549,120

Further cost savings will be realized by reduction in vehicle miles of travel brought about by the shift in travel mode. From pivot point analysis, ride-alone modal share would drop from 63.90% to 60.14%. Transit would pick up 14.5% of this drop, and shared ride would pick up 85.5%. Pre-HOV corridor vehicle miles of travel is calculated:

10,000 vehicles/hour X 1,040 hours X 12 miles = 124,800,000 vehicle miles

Drive-alone vehicle miles of travel will be reduced by 4,430,400 vehicle miles. As this represents drive-alone vehicle miles of travel, 4,430,400 vehicle miles also represents 4,430,000 person miles. As person miles of travel remains constant, transit and shared ride vehicle miles must increase. From the split given above, transit will gain 642,350 passenger miles, and shared ride will gain 3,743,350 passenger miles. Using an occupancy factor of 30 persons per bus, and 2.14 per shared ride, this equates to an increase of 21,400 transit miles and 1,749,200 shared ride auto miles. Using a transit per mile cost of $3.05 (cost per mile includes deadhead miles, revenue miles, and hourly operating cost; cost was calculated on historical information obtained from MDTA) and a weighted auto per mile cost of $0.147, savings due to modal shift total:

4,430,000 X $0.147	=	$ 651,200
1,749,000 X $0.147	=	251,100
21,400 X $3.05	=	65,270
TOTAL		$ 334,830

Total savings from changes in auto operating cost is:

	$ 334,830
	549,120
	$ 883,950
(SAY)	$ 885,000

By the midpoint of the project life of concurrent flow add-a-lane (2005), projections from UTPS runs indicate that demand for the use of the SR 826/836 corridor will exceed the capacity of the corridor. Studies indicate that drivers will not tolerate average freeway running speeds under arterial running speeds without diverting from the freeway system. This speed is assumed to be 15 miles per hour. Non-HOV lanes are assumed to operate at this speed. Under the demand scenario for 2005, it will be assumed that the HOV lane will be operated at capacity at a speed of 30 miles per hour. This condition can be maintained by controlling the number of occupants required to qualify for use of the HOV lane.

For calculations of benefits from travel time savings, it will be conservatively assumed that HOV vehicles will maintain the average occupancy of 2.14 persons per vehicle, and that transit will have little impact. Under these flow conditions, an HOV will save two minutes for every mile of corridor use. For an average corridor trip of eight miles, sixteen minutes will be saved. The AASHTO Manual on User Benefit Analysis gives a value of $3.90 an hour in 1977 dollars for savings of this magnitude. Updating by the consumer price index this translates to $7.60 in 1985 dollars. Total annual savings for the corridor will be $9,021,000.

Total annual savings is therefore:

$$\begin{array}{r} \$9,021,000 \\ 885,000 \\ \hline \$9,906,000 \end{array}$$

Benefit cost ratio for concurrent flow HOV lanes is $9,906,000/$3,945,000 = 2.51.

Queue Jump Ramp Metering Bypass Benefit/Cost Ratio

Queue jump ramp metering bypass could be implemented within two to three years, and would have a design life, without major renovation, of approximately five years. For this reason, benefits are based on traffic projections for 1990. Averaging demand for SR 826 and SR 836, total hourly demand would be 6,500 vehicles per hour. Annual peak hour vehicle miles of travel through the corridor is:

6,500 X 12 X 1,040 = 70,574,000 vehicle miles

Drive-alone annual vehicle miles of travel during the peak hours prior to HOV improvements is:

70,574,000 X .6390 = 45,100,000

After installation of ramp metering bypass, the ride-alone share is predicted to drop to 63.38 percent. Drive-alone mileage would be:

70,574,000 X .6338 = 44,730,000

The drop in drive-alone vehicle miles of travel would be:

45,100,000 - 44,730,000 = 370,000 vehicle miles

Pivot point analysis indicates that transit will pick up 17.6 percent of the necessary person miles of travel and shared ride will pick up 82.4 percent of the person miles of travel.

Assuming an occupancy per transit vehicle of thirty and 2.14 for shared ride vehicles, the shared ride vehicle miles of travel would increase by 142,500 miles and transit mileage would increase by 2,200 miles.

Savings due to the change in modal share would be:

370,000	X	$0.147	=	$ 54,390	
- 142,500	X	$0.147	=	20,950	
- 2,200	X	$3.05	=	6,710	
TOTAL				$ 26,730	(SAY $27,000)

In calculating benefits due to time savings, it is assumed that queue time disbenefits to non-HOV vehicles will be balanced by time benefits to HOV users. This assumption is based on the realization that queues presently exist on corridor ramps. As a maximum designed differential in on-ramp queue times is two minutes, non-HOV travel times will only be affected by two minutes minus the present queue time. HOV's vehicles will, however, enjoy the full two-minute benefit. Therefore, while there are more non-HOV vehicles than HOV vehicles, the changes in person time should cancel.

Changes in the traffic flow will be brought about by the ramp metering which will be beneficial in terms of time savings to all drivers using the corridor. While exact values are difficult to predict, a savings of one minute for the corridor trip is reasonable. Therefore, the total man-hour savings annually for the corridor will be 112,700 hours.

The AASHTO Manual gives an hourly value for time savings of this magnitude of $0.48. Equating to 1985 dollars using the consumer price index, this equates to $0.932. Total annual savings due to time savings is therefore $105,000.

Total annual savings from queue jump ramp metering bypass is:

	$105,000
	27,000
TOTAL	$132,000

Benefit cost ratio is:

$132,000/$790,000 = .167

Queue jump ramp metering bypass cannot, therefore, be justified on the basis of benefit cost analysis.

TSM Benefit/Cost Ratio

Savings from travel time will be calculated based on raising the running speeds for the congested segments to the running speed of the surrounding segments.

For Le Jeune Road in the P.M. peak, the average speed of the congested segments is 20.5 miles per hour. Average speed of the adjoining segments is 45.0 miles per hour. Length of the congested segments is 4.24 miles.

For the SR 826/836 interchange, the average speed of the congested segments is 23.6 miles per hour. Average speed for the adjoining segments is 43.7 miles per hour. Length of the congested segments is 1.19 miles.

As demand already exceeds capacity for these sections, maximum theoretical volume under current flow conditions will be used as input for determining total savings in person-hours.

For the Le Jeune Road segment, per vehicle time savings after the improvement will be 6.75 minutes. Total potential vehicle throughput is 4,800 vehicles, which is equivalent to 5,520 persons. Total annual time savings is 322,920 person-hours. For this magnitude of time savings, a value of $4.66 per hour is given by the AASHTO Manual on User Benefit Analysis. Total savings for this section annually is $1,504,807 (SAY $1,500,000).

For the SR 826/836 interchange segment, per vehicle time savings after the improvement will be 1.39 minutes. Total potential vehicle throughput is 3,600 vehicles per hour or 4,140 persons. For this magnitude of time savings, a value of $0.932 per person-hour is recommended. Total savings for this section annually is $46,481 (SAY $46,500).

Total savings for the TSM improvement is:

	$1,500,000
	46,500
TOTAL	$1,546,500

Benefit cost ratio is:

$1,546,500/$26,000 = 59.5

RECOMMENDATIONS

Concurrent Flow Add-a-lane

Concurrent flow HOV add-a-lane is recommended as the preferred HOV scenario for conceptual design. The primary reasons for selection of this alternative are:

- o High passenger throughput capacity to help meet future corridor needs.
- o Good benefit/cost ratio
- o Excellent public acceptability
- o Meets corridor demand for numerous access/egress points

It should be noted that it may be necessary to construct additional general traffic lanes in the corridor, especially along SR 826, to meet expected future demand. Should this be deemed necessary by the FDOT, it is highly recommended that HOV construction be done concurrently to minimize traffic disruption.

Queue Jump Ramp Metering Bypass

The implementation of queue jump ramp metering bypass is not recommended. The primary reasons for rejection of this alternative are:

- o Poor benefit/cost ratio
- o Little HOV travel time savings
- o Little projected modal shift

Exclusive Toll Lanes

The implementation of exclusive toll lanes is recommended. As previously stated, immediate direct benefits from exclusive toll lanes will not be readily apparent; however, exclusive toll lanes will provide higher visibility for HOV, providing incentive for current and future ridesharing efforts.

TSM Improvements

Implementation of the described TSM improvements are recommended. Primary reasons for this recommendation are:

- Excellent benefit/cost ratio
- Excellent public acceptability
- Excellent project salvage value when concurrent flow add-a-lane is constructed

Transit Services

At present, no changes in transit services, other than those outlined in Network 86, are recommended. Upon completion of the concurrent flow HOV add-a-lane (anticipated in 1995), transit service for the corridor is recommended. Details of this service will be outlined in the final report.

Kimley-Horn

APPENDIX A

POLICY: PIVOT POINT SPREADSHEET - DADE COUNTY HOV STUDY

AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	0.00

SHARED RIDE

					CHANGE IN IVTT			
	CHANGE IN UTILITY=	-0.02	*	0.00			=	0.00
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00
	+		0.29	*	0.10		=	0.03
						TOTAL CHANGE		0.03

TRANSIT

								CHANGE IN IVTT	
		CHANGE IN UTILITY=	-0.02	*	0.00	=		0.00
+	-0.16	/	15.70	*	0.00	=		0.00
+	-29.00	/	22900.00	*	0.00	=		0.00
							TOTAL CHANGE	0.00

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 100.72	=	63.45	-0.45	-0.71
SHARED RIDE	24.30	*	1.03	=	25.02	/ 100.72	=	24.84	0.54	2.19
TRANSIT	5.30	*	1.00	=	5.30	/ 100.72	=	5.26	-0.04	-0.71
OTHER	6.50	*	1.00	=	6.50	/ 100.72	=	6.45	-0.05	-0.71
				TOTAL	100.72					

POLICY: EXCLUSIVE TOLL LANES FOR HOVs

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.25	0.00	0.00	-1.00	0.00	12.50	0.10	-1.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.25	=	.00				
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
					TOTAL CHANGE		.00			

SHARED RIDE

								CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-1.00			=	0.02		
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00		
+	-29.00	/	22900.00	*	12.50	/ 2.14	=	-0.01		
	+	0.29	*	0.10			=	0.03		
						TOTAL CHANGE		0.04		

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-1.00	=	0.02				
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
					TOTAL CHANGE		0.02			

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.66	/ 100.75	=	63.19	-0.71	-1.12
SHARED RIDE	24.30	*	1.04	=	25.21	/ 100.75	=	25.02	0.72	2.92
TRANSIT	5.30	*	1.02	=	5.38	/ 100.75	=	5.34	0.04	0.76
OTHER	6.50	*	1.00	=	6.50	/ 100.75	=	6.45	-0.05	-0.74
				TOTAL	100.75					

POLICY: TRANSIT ALTERNATIVE #1 WITH 2 MINUTE BONUS FOR PARK AND RIDE LOT AVAILABILITY

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	0.00	0.00	0.00	0.10	-2.00	-2.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00			
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
						TOTAL CHANGE	0.00		

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.00			=	0.00	
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00	
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00	
	+	0.29	*	0.10			=	0.03	
						TOTAL CHANGE	0.03		

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-2.00	=	0.03		
+	-0.16	/	15.70	*	-2.00	=	0.00	
+	-29.00	/	22900.00	*	0.00	=	0.00	
					TOTAL CHANGE	0.03		

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 100.88	=	63.34	-0.56	-0.87
SHARED RIDE	24.30	*	1.03	=	25.02	/ 100.88	=	24.80	0.50	2.03
TRANSIT	5.30	*	1.03	=	5.46	/ 100.88	=	5.41	0.11	2.13
OTHER	6.50	*	1.00	=	6.50	/ 100.88	=	6.44	-0.06	-0.87
				TOTAL	100.88					

POLICY: TRANSIT ALTERNATIVE #2 WITH 2 MINUTE BONUS FOR PARK AND RIDE LOT AVAILABILITY

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA DPTC	DELTA IVTT	DELTA OVTT	DELTA DPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA DPTC
	0.00	0.00	0.00	0.00	0.00	0.00	0.10	1.10	-2.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		0.00

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.00				=	0.00
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
	+	0.29	*	0.10				=	0.03
							TOTAL CHANGE		0.03

TRANSIT

	CHANGE IN UTILITY=	-0.02	*				1.10	=	-0.02
+	-0.16	/	15.70	*			-2.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		-0.02

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 100.63	=	63.50	-0.40	-0.63
SHARED RIDE	24.30	*	1.03	=	25.02	/ 100.63	=	24.86	0.56	2.27
TRANSIT	5.30	*	0.98	=	5.21	/ 100.63	=	5.18	-0.12	-2.28
OTHER	6.50	*	1.00	=	6.50	/ 100.63	=	6.46	-0.04	-0.63
				TOTAL	100.63					

POLICY: TRANSIT ALTERNATIVE #3 WITH 2 MINUTE BONUS FOR PARK AND RIDE LOT AVAILABILITY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.90	-2.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*				*	0.00	=	0.00
+		-0.16	/	15.70			*	0.00	=	0.00
+		-29.00	/	22900.00			*	0.00	=	0.00
								TOTAL CHANGE		0.00

SHARED RIDE

								CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*				*		=	0.00
+		-0.16	/	15.70			*	CPOOL SIZ	=	0.00
+		-29.00	/	22900.00			*	0.00 / 2.14	=	0.00
	+	0.29	*	0.10					=	0.03
								TOTAL CHANGE		0.03

TRANSIT

CHANGE IN UTILITY=		-0.02	*				*	0.90	=	-0.01
+		-0.16	/	15.70			*	-2.00	=	0.00
+		-29.00	/	22900.00			*	0.00	=	0.00
								TOTAL CHANGE		-0.01

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 100.64	=	63.49	-0.41	-0.64
SHARED RIDE	24.30	*	1.03	=	25.02	/ 100.64	=	24.85	0.55	2.26
TRANSIT	5.30	*	0.99	=	5.23	/ 100.64	=	5.20	-0.10	-1.99
OTHER	6.50	*	1.00	=	6.50	/ 100.64	=	6.46	-0.04	-0.64
				TOTAL	100.64					

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 30 MPH NON-HOV SPEED, 3 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-9.70	0.00	0.00	0.10	-9.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00					
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
						TOTAL CHANGE	0.00			

SHARED RIDE

								CHANGE IN IVTT		
CHANGE IN UTILITY=	-0.02	*	-9.70			=	0.15			
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00		
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00	
		+	0.29	*	0.10			=	0.03	
							TOTAL CHANGE	0.17		

TRANSIT

								CHANGE IN IVTT		
CHANGE IN UTILITY=	-0.02	*	-9.70	=	0.15					
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
						TOTAL CHANGE	0.15			

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	105.46	=	60.59	-3.31	-5.32
SHARED RIDE	24.30	*	1.19	=	28.93	/	105.46	=	27.43	3.13	12.12
TRANSIT	5.30	*	1.16	=	6.13	/	105.46	=	5.81	0.51	9.22
OTHER	6.50	*	1.00	=	6.50	/	105.46	=	6.16	-0.34	-5.32
				TOTAL	105.46						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 30 MPH NON-HOV SPEED, 2 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-10.70	0.00	0.00	0.10	-10.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*			0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		0.00

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-10.70				=	0.16
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
	+	0.29	*	0.10				=	0.03
							TOTAL CHANGE		0.19

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-10.70	=	0.16		
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
					TOTAL CHANGE		0.16		

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	105.99	=	60.29	-3.61	-5.82
SHARED RIDE	24.30	*	1.21	=	29.37	/	105.99	=	27.71	3.41	13.11
TRANSIT	5.30	*	1.17	=	6.22	/	105.99	=	5.87	0.57	10.22
OTHER	6.50	*	1.00	=	6.50	/	105.99	=	6.13	-0.37	-5.82
				TOTAL	105.99						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED. 25 MPH NON-HOV SPEED. 3 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-15.30	0.00	0.00	0.10	-15.30	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		0.00

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-15.30				=	0.23
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
							TOTAL CHANGE		0.26

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-15.30	=	0.23
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
					TOTAL CHANGE		0.23

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	108.54	=	58.87	-5.03	-8.19
SHARED RIDE	24.30	*	1.29	=	31.47	/	108.54	=	28.99	4.69	17.61
TRANSIT	5.30	*	1.26	=	6.67	/	108.54	=	6.14	0.84	14.73
OTHER	6.50	*	1.00	=	6.50	/	108.54	=	5.99	-0.51	-8.19
				TOTAL	108.54						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 25 MPH NON-HOV SPEED, 2 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-16.30	0.00	0.00	0.10	-16.30	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE	0.00

SHARED RIDE

							CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*	-16.30				=	0.24
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
								TOTAL CHANGE	0.27

TRANSIT

CHANGE IN UTILITY=		-0.02	*	-16.30	=	0.24
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	0.24

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	109.11	=	58.56	-5.34	-8.71
SHARED RIDE	24.30	*	1.31	=	31.94	/	109.11	=	29.28	4.98	18.58
TRANSIT	5.30	*	1.28	=	6.77	/	109.11	=	6.20	0.90	15.70
OTHER	6.50	*	1.00	=	6.50	/	109.11	=	5.96	-0.54	-8.71
				TOTAL	109.11						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED. 20 MPH NON-HOV SPEED. 3 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-23.70	0.00	0.00	0.10	-23.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		0.00

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-23.70				=	0.36
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
							TOTAL CHANGE		0.38

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-23.70	=	0.36			
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
					TOTAL CHANGE		0.36		

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	113.66	=	56.22	-7.68	-12.78
SHARED RIDE	24.30	*	1.47	=	35.69	/	113.66	=	31.41	7.11	25.51
TRANSIT	5.30	*	1.43	=	7.56	/	113.66	=	6.65	1.35	22.65
OTHER	6.50	*	1.00	=	6.50	/	113.66	=	5.72	-0.78	-12.78
				TOTAL	113.66						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 20 MPH NON-HOV SPEED, 2 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-24.70	0.00	0.00	0.10	-24.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=		-0.02	*			0.00	=	0.00
+		-0.16	/	15.70	*			0.00	=	0.00
+		-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE		0.00

SHARED RIDE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=		-0.02	*			-24.70	=	0.37
+		-0.16	/	15.70	*			0.00	=	0.00
+		-29.00	/	22900.00	*			0.00	=	0.00
	+			0.29	*			0.10	=	0.03
								TOTAL CHANGE		0.40

TRANSIT

		CHANGE IN UTILITY=		-0.02	*			-24.70	=	0.37
+		-0.16	/	15.70	*			0.00	=	0.00
+		-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE		0.37

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	114.31	=	55.90	-8.00	-13.35
SHARED RIDE	24.30	*	1.49	=	36.23	/	114.31	=	31.70	7.40	26.42
TRANSIT	5.30	*	1.45	=	7.68	/	114.31	=	6.72	1.42	23.57
OTHER	6.50	*	1.00	=	6.50	/	114.31	=	5.69	-0.81	-13.35
				TOTAL	114.31						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 15 MPH NON-HOV SPEED, 3 MIN. TERMINAL TIME PENALTY

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-37.70	0.00	0.00	0.10	-37.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00			
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
						TOTAL CHANGE	0.00		

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-37.70			=	0.57	
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00	
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00	
		+	0.29	*	0.10		=	0.03	
						TOTAL CHANGE		0.59	

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-37.70	=	0.57			
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
					TOTAL CHANGE		0.57		

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 123.76	=	51.63	-12.27	-21.24
SHARED RIDE	24.30	*	1.81	=	44.03	/ 123.76	=	35.58	11.28	37.67
TRANSIT	5.30	*	1.76	=	9.33	/ 123.76	=	7.54	2.24	34.87
OTHER	6.50	*	1.00	=	6.50	/ 123.76	=	5.25	-1.25	-21.24
				TOTAL	123.76					

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 15 MPH NON-HOV SPEED, 2 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-38.70	0.00	0.00	0.10	-38.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
	+	-0.16	/	15.70	*			0.00	=	0.00
	+	-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE		0.00

SHARED RIDE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*				-38.70	=	0.58
	+	-0.16	/	15.70	*			0.00	=	0.00
	+	-29.00	/	22900.00	*			0.00	=	0.00
			+	0.29	*			0.10	=	0.03
								TOTAL CHANGE		0.61

TRANSIT

		CHANGE IN UTILITY=	-0.02	*				-38.70	=	0.58
	+	-0.16	/	15.70	*			0.00	=	0.00
	+	-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE		0.58

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL			REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	124.57	=	51.30	-12.60	-21.88
SHARED RIDE	24.30	*	1.84	=	44.70	/	124.57	=	35.88	11.58	38.49
TRANSIT	5.30	*	1.79	=	9.47	/	124.57	=	7.60	2.30	35.69
OTHER	6.50	*	1.00	=	6.50	/	124.57	=	5.22	-1.28	-21.88
				TOTAL	124.57						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 10 MPH NON-HOV SPEED, 3 MIN. TERMINAL TIME PENALTY

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-65.70	0.00	0.00	0.10	-65.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*					0.00	=	0.00
+		-0.16	/	15.70	*			0.00	=	0.00
+		-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE		0.00

SHARED RIDE

								CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*	-65.70					=	0.99
+	-0.16	/	15.70	*	0.00		CPOOL SIZ		=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14		=	0.00
		+	0.29	*	0.10				=	0.03
								TOTAL CHANGE		1.01

TRANSIT

CHANGE IN UTILITY=		-0.02	*	-65.70	=	0.99				
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
						TOTAL CHANGE	0.99			

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	151.62	=	42.15	-21.75	-41.03
SHARED RIDE	24.30	*	2.76	=	67.02	/	151.62	=	44.20	19.90	58.11
TRANSIT	5.30	*	2.68	=	14.20	/	151.62	=	9.37	4.07	55.44
OTHER	6.50	*	1.00	=	6.50	/	151.62	=	4.29	-2.21	-41.03
				TOTAL	151.62						

POLICY: EXCLUSIVE HOV WAY ASSUMING 55 MPH HOV SPEED, 10 MPH NON-HOV SPEED, 2 MIN. TERMINAL TIME PENALTY

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-66.70	0.00	0.00	0.10	-66.70	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
			CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00
	+	-0.16	/	15.70	*	0.00	=	0.00
	+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE		0.00

SHARED RIDE

						CHANGE IN IVTT			
		CHANGE IN UTILITY=	-0.02	*	-66.70			=	1.00
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
							TOTAL CHANGE		1.03

TRANSIT

			CHANGE IN UTILITY=	-0.02	*	-66.70	=	1.00
	+	-0.16	/	15.70	*	0.00	=	0.00
	+	-29.00	/	22900.00	*	0.00	=	0.00
							TOTAL CHANGE	1.00

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	152.85	=	41.81	-22.09	-41.80
SHARED RIDE	24.30	*	2.80	=	68.03	/	152.85	=	44.51	20.21	58.74
TRANSIT	5.30	*	2.72	=	14.41	/	152.85	=	9.43	4.13	56.08
OTHER	6.50	*	1.00	=	6.50	/	152.85	=	4.25	-2.25	-41.80
				TOTAL	152.85						

POLICY: CONCURRENT FLOW HOV LANE AT 50 MPH. NON-HOV TRAFFIC AT 30

AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-11.20	0.00	0.00	0.10	-11.20	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
			CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00
	+	-0.16	/	15.70	*	0.00	=	0.00
	+	-29.00	/	22900.00	*	0.00	=	0.00
							TOTAL CHANGE	0.00

SHARED RIDE

						CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-11.20		=	0.17
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00
		+	0.29	*	0.10		=	0.03
							TOTAL CHANGE	0.20

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-11.20	=	0.17
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	0.17

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 106.26	=	60.14	-3.76	-6.07
SHARED RIDE	24.30	*	1.22	=	29.59	/ 106.26	=	27.85	3.55	13.61
TRANSIT	5.30	*	1.18	=	6.27	/ 106.26	=	5.90	0.60	10.72
OTHER	6.50	*	1.00	=	6.50	/ 106.26	=	6.12	-0.38	-6.07
				TOTAL	106.26					

POLICY: CONCURRENT FLOW HOV LANE AT 50 MPH, NON-HOV TRAFFIC AT 25

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-16.80	0.00	0.00	0.10	-16.80	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*				0.00	=	0.00
+	-29.00	/	22900.00	*				0.00	=	0.00
							TOTAL CHANGE			0.00

SHARED RIDE

							CHANGE IN IVTT		
CHANGE IN UTILITY=		-0.02	*	-16.80				=	0.25
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
							TOTAL CHANGE		0.28

TRANSIT

CHANGE IN UTILITY=		-0.02	*	-16.80	=	0.25
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
					TOTAL CHANGE		0.25

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	109.40	=	58.41	-5.49	-8.98
SHARED RIDE	24.30	*	1.32	=	32.18	/	109.40	=	29.42	5.12	19.06
TRANSIT	5.30	*	1.29	=	6.82	/	109.40	=	6.23	0.93	16.18
OTHER	6.50	*	1.00	=	6.50	/	109.40	=	5.94	-0.56	-8.98
				TOTAL	109.40						

POLICY: CONCURRENT FLOW HOV LANE AT 50 MPH, NON-HOV TRAFFIC AT 20

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.90	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA DPTC	DELTA IVTT	DELTA OVTT	DELTA DPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA DPTC
	0.00	0.00	0.00	-25.20	0.00	0.00	0.10	-25.20	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00				
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
						TOTAL CHANGE	0.00		

SHARED RIDE

					CHANGE IN IVTT				
CHANGE IN UTILITY=	-0.02	*	-25.20			=	0.38		
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00	
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10		=	0.03	
						TOTAL CHANGE	0.41		

TRANSIT

CHANGE IN UTILITY=	-0.02	*	-25.20	=	0.38				
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
					TOTAL CHANGE	0.38			

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	114.64	=	55.74	-8.16	-13.64
SHARED RIDE	24.30	*	1.50	=	36.51	/	114.64	=	31.84	7.54	26.87
TRANSIT	5.30	*	1.46	=	7.73	/	114.64	=	6.75	1.45	24.02
OTHER	6.50	*	1.00	=	6.50	/	114.64	=	5.67	-0.83	-13.64
				TOTAL	114.64						

POLICY: CONCURRENT FLOW HOV LANE AT 50 MPH. NON-HOV TRAFFIC AT 15

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-39.20	0.00	0.00	0.10	-39.20	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*				0.00	=	0.00
+	-29.00	/	22900.00	*				0.00	=	0.00
								TOTAL CHANGE		0.00

SHARED RIDE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-39.20				=	0.59
+	-0.16	/	15.70	*	0.00			CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/		2.14	=	0.00
		+	0.29	*	0.10				=	0.03
								TOTAL CHANGE		0.62

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-39.20	=	0.59			
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
						TOTAL CHANGE	0.59			

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	124.98	=	51.13	-12.77	-22.21
SHARED RIDE	24.30	*	1.85	=	45.04	/	124.98	=	36.04	11.74	38.90
TRANSIT	5.30	*	1.80	=	9.54	/	124.98	=	7.63	2.33	36.10
OTHER	6.50	*	1.00	=	6.50	/	124.98	=	5.20	-1.30	-22.21
				TOTAL	124.98						

POLICY: CONCURRENT FLOW HOV LANE AT 50 MPH, NON-HOV TRAFFIC AT 10

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-67.20	0.00	0.00	0.10	-67.20	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
			CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00		
	+	-0.16	/	15.70	*	0.00	=	0.00		
	+	-29.00	/	22900.00	*	0.00	=	0.00		
							TOTAL CHANGE	0.00		

SHARED RIDE

						CHANGE IN IVTT			
		CHANGE IN UTILITY=	-0.02	*	-67.20		=	1.01	
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00	
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00	
		+	0.29	*	0.10		=	0.03	
						TOTAL CHANGE		1.04	

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-67.20	=	1.01		
+	-0.16	/	15.70	*	0.00	=	0.00	
+	-29.00	/	22900.00	*	0.00	=	0.00	
					TOTAL CHANGE		1.01	

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 153.47	=	41.64	-22.26	-42.19
SHARED RIDE	24.30	*	2.82	=	68.54	/ 153.47	=	44.66	20.36	59.06
TRANSIT	5.30	*	2.74	=	14.52	/ 153.47	=	9.46	4.16	56.40
OTHER	6.50	*	1.00	=	6.50	/ 153.47	=	4.24	-2.26	-42.19
				TOTAL	153.47					

POLICY: RAMP METERING BYPASS. 1 MINUTE QUEUE

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-2.00	0.00	0.00	0.10	-2.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
	+	-0.16	/	15.70	*			0.00	=	0.00
	+	-29.00	/	22900.00	*			0.00	=	0.00
								TOTAL CHANGE		0.00

SHARED RIDE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*		-2.00			=	0.03
	+	-0.16	/	15.70	*		0.00	CPOOL SIZ	=	0.00
	+	-29.00	/	22900.00	*		0.00	/ 2.14	=	0.00
			+	0.29	*		0.10		=	0.03
								TOTAL CHANGE		0.06

TRANSIT

		CHANGE IN UTILITY=	-0.02	*		-2.00	=	0.03		
	+	-0.16	/	15.70	*		0.00	=	0.00	
	+	-29.00	/	22900.00	*		0.00	=	0.00	
							TOTAL CHANGE		0.03	

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 101.64	=	62.87	-1.03	-1.62
SHARED RIDE	24.30	*	1.06	=	25.78	/ 101.64	=	25.36	1.06	4.27
TRANSIT	5.30	*	1.03	=	5.46	/ 101.64	=	5.37	0.07	1.38
OTHER	6.50	*	1.00	=	6.50	/ 101.64	=	6.40	-0.10	-1.62
				TOTAL	101.64					

POLICY: RAMP METERING BYPASS, 2 MINUTE QUEUE

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-4.00	0.00	0.00	0.10	-4.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*				0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		0.00

SHARED RIDE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-4.00				=	0.06
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
	+	0.29	*	0.10				=	0.03
							TOTAL CHANGE		0.09

TRANSIT

	CHANGE IN UTILITY=	-0.02	*				-4.00	=	0.06
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
							TOTAL CHANGE		0.06

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	102.59	=	62.29	-1.61	-2.56
SHARED RIDE	24.30	*	1.09	=	26.56	/	102.59	=	25.89	1.59	6.34
TRANSIT	5.30	*	1.06	=	5.63	/	102.59	=	5.49	0.19	3.44
OTHER	6.50	*	1.00	=	6.50	/	102.59	=	6.34	-0.16	-2.56
				TOTAL	102.59						

POLICY: RAMP METERING BYPASS. 3 MINUTE QUEUE

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.00	0.00	0.00	-6.00	0.00	0.00	0.10	-6.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*				*	0.00	=	0.00
+	-0.16	/	15.70	*				0.00	=	0.00
+	-29.00	/	22900.00	*				0.00	=	0.00
									TOTAL CHANGE	0.00

SHARED RIDE

							CHANGE IN IVTT			
	CHANGE IN UTILITY=	-0.02	*	-6.00					=	0.09
+	-0.16	/	15.70	*	0.00			CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00	
	+	0.29	*	0.10				=	0.03	
								TOTAL CHANGE	0.12	

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-6.00	=	0.09				
+	-0.16	/	15.70	*	0.00	=	0.00			
+	-29.00	/	22900.00	*	0.00	=	0.00			
							TOTAL CHANGE	0.09		

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	103.57	=	61.70	-2.20	-3.51
SHARED RIDE	24.30	*	1.13	=	27.37	/	103.57	=	26.43	2.13	8.39
TRANSIT	5.30	*	1.09	=	5.80	/	103.57	=	5.60	0.30	5.49
OTHER	6.50	*	1.00	=	6.50	/	103.57	=	6.28	-0.22	-3.51
				TOTAL	103.57						

POLICY: RAMP METERING BYPASS, 4 MINUTE QUEUE

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA DPTC	DELTA IVTT	DELTA OVTT	DELTA DPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA DPTC
	0.00	0.00	0.00	-8.00	0.00	0.00	0.10	-8.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*			0.00	=	0.00
+	-0.16	/	15.70	*			0.00	=	0.00
+	-29.00	/	22900.00	*			0.00	=	0.00
						TOTAL CHANGE			0.00

SHARED RIDE

							CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-8.00			=	0.12
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
						TOTAL CHANGE			0.15

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-8.00			=	0.12
+	-0.16	/	15.70	*	0.00			=	0.00
+	-29.00	/	22900.00	*	0.00			=	0.00
						TOTAL CHANGE			0.12

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/	104.58	=	61.10	-2.80	-4.48
SHARED RIDE	24.30	*	1.16	=	28.20	/	104.58	=	26.97	2.67	10.41
TRANSIT	5.30	*	1.13	=	5.98	/	104.58	=	5.71	0.41	7.52
OTHER	6.50	*	1.00	=	6.50	/	104.58	=	6.22	-0.28	-4.48
				TOTAL	104.58						

POLICY: RAMP METERING BYPASS, 5 MINUTE QUEUE

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA DPTC	DELTA IVTT	DELTA OVTT	DELTA DPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA DPTC
	0.00	0.00	0.00	-10.00	0.00	0.00	0.10	-10.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

							CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	0.00	=	0.00			
+	-0.16	/	15.70	*	0.00	=	0.00		
+	-29.00	/	22900.00	*	0.00	=	0.00		
						TOTAL CHANGE	0.00		

SHARED RIDE

						CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-10.00			=	0.15
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00
	+	0.29	*	0.10			=	0.03
						TOTAL CHANGE		0.18

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-10.00	=	0.15		
+	-0.16	/	15.70	*	0.00	=	0.00	
+	-29.00	/	22900.00	*	0.00	=	0.00	
					TOTAL CHANGE		0.15	

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.90	/ 105.62	=	60.50	-3.40	-5.47
SHARED RIDE	24.30	*	1.20	=	29.06	/ 105.62	=	27.52	3.22	12.42
TRANSIT	5.30	*	1.16	=	6.16	/ 105.62	=	5.83	0.53	9.52
OTHER	6.50	*	1.00	=	6.50	/ 105.62	=	6.15	-0.35	-5.47
				TOTAL	105.62					

POLICY: EXCLUSIVE HOV RAMP. 1 MINUTE QUEUE ON NON-HOV RAMPS

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	-0.25	0.00	0.00	-1.00	0.00	0.00	0.10	-1.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-0.25	=	.00
	+	-0.16	/	15.70	*	0.00	=	0.00
	+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE		.00

SHARED RIDE

						CHANGE IN IVTT		
	CHANGE IN UTILITY=	-0.02	*	-1.00			=	0.02
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00
	+		0.29	*	0.10		=	0.03
						TOTAL CHANGE		0.04

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-1.00	=	0.02
	+	-0.16	/	15.70	*	0.00	=	0.00
	+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE		0.02

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	64.14	/ 101.41	=	63.25	-0.65	-1.03
SHARED RIDE	24.30	*	1.04	=	25.39	/ 101.41	=	25.04	0.74	3.00
TRANSIT	5.30	*	1.02	=	5.38	/ 101.41	=	5.31	0.01	0.10
OTHER	6.50	*	1.00	=	6.50	/ 101.41	=	6.41	-0.09	-1.40
				TOTAL	101.41					

POLICY: EXCLUSIVE HOV RAMP, 2 MINUTE QUEUE ON NON-HOV RAMPS

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	-0.25	0.00	0.00	-2.00	0.00	0.00	0.10	-2.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-0.25	=	.00
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	.00

SHARED RIDE

					CHANGE IN IVTT			
	CHANGE IN UTILITY=	-0.02	*	-2.00			=	0.03
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00
	+		0.29	*	0.10		=	0.03
						TOTAL CHANGE		0.06

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-2.00	=	0.03
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	0.03

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	64.14	/	101.88	=	62.96	-0.94	-1.49
SHARED RIDE	24.30	*	1.06	=	25.78	/	101.88	=	25.30	1.00	4.04
TRANSIT	5.30	*	1.03	=	5.46	/	101.88	=	5.36	0.06	1.14
OTHER	6.50	*	1.00	=	6.50	/	101.88	=	6.38	-0.12	-1.86
				TOTAL	101.88						

POLICY: EXCLUSIVE HOV RAMP, 3 MINUTE QUEUE ON NON-HOV RAMPS

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	-0.25	0.00	0.00	-3.00	0.00	0.00	0.10	-3.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-0.25	=	.00
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00

TOTAL CHANGE .00

SHARED RIDE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-3.00			=	0.05
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03

TOTAL CHANGE 0.07

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-3.00	=	0.05
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00

TOTAL CHANGE 0.05

REVISED MODAL SHARE

	BASE MODAL SHARE					/	TOTAL	=	REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	64.14	/	102.35	=	62.67	-1.23	-1.95
SHARED RIDE	24.30	*	1.08	=	26.17	/	102.35	=	25.57	1.27	5.08
TRANSIT	5.30	*	1.05	=	5.54	/	102.35	=	5.42	0.12	2.18
OTHER	6.50	*	1.00	=	6.50	/	102.35	=	6.35	-0.15	-2.32

TOTAL 102.35

POLICY: EXCLUSIVE HOV RAMP, 4 MINUTE QUEUE ON NON-HOV RAMPS

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	-0.25	0.00	0.00	-4.00	0.00	0.00	0.10	-4.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-0.25	=	.00
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	.00

SHARED RIDE

					CHANGE IN IVTT			
	CHANGE IN UTILITY=	-0.02	*	-4.00			=	0.06
+	-0.16	/	15.70	*	0.00	CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/ 2.14	=	0.00
	+	0.29	*	0.10			=	0.03
						TOTAL CHANGE		0.09

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-4.00	=	0.06
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	0.06

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	64.14	/	102.83	=	62.38	-1.52	-2.42
SHARED RIDE	24.30	*	1.09	=	26.56	/	102.83	=	25.83	1.53	6.11
TRANSIT	5.30	*	1.06	=	5.63	/	102.83	=	5.47	0.17	3.21
OTHER	6.50	*	1.00	=	6.50	/	102.83	=	6.32	-0.18	-2.79
				TOTAL	102.83						

POLICY: EXCLUSIVE HOV RAMP, 5 MINUTE QUEUE ON NON-HOV RAMPS

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA DPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA DPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA DPTC
	-0.25	0.00	0.00	-5.00	0.00	0.00	0.10	-5.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-0.25	=	.00
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00

TOTAL CHANGE .00

SHARED RIDE

								CHANGE IN IVTT			
		CHANGE IN UTILITY=	-0.02	*	-5.00			=	0.08
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03

TOTAL CHANGE 0.10

TRANSIT

	CHANGE IN UTILITY=	-0.02	*	-5.00	=	0.08
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00

TOTAL CHANGE 0.08

REVISED MODAL SHARE

	BASE MODAL SHARE						TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	64.14	/	103.32	=	62.08	-1.82	-2.89
SHARED RIDE	24.30	*	1.11	=	26.96	/	103.32	=	26.10	1.80	7.13
TRANSIT	5.30	*	1.08	=	5.71	/	103.32	=	5.53	0.23	4.24
OTHER	6.50	*	1.00	=	6.50	/	103.32	=	6.29	-0.21	-3.26

TOTAL 103.32

POLICY: TOLL BYPASS

POPULATION SUBGROUP	AVG HOUSEHOLD DATA: PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	PEAK HOUR TRIP MODAL SHARES: DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	AVG TRIP LENGTH: WORK (ONE WAY)	NWK (ONE WAY)	AVERAGE DAILY VMT: WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

POPULATION SUBGROUP	DRIVE ALONE: DELTA IVTT	DELTA OVTT	DELTA OPTC	SHARED RIDE: DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	TRANSIT: DELTA IVTT	DELTA OVTT	DELTA OPTC
	0.25	0.00	0.00	-1.00	0.00	12.50	0.10	-1.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP
MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=		-0.02	*		0.25	=	.00
+		-0.16	/	15.70	*		0.00	=	0.00
+		-29.00	/	22900.00	*		0.00	=	0.00
							TOTAL CHANGE		.00

SHARED RIDE

						CHANGE IN IVTT			
	CHANGE IN UTILITY=		-0.02	*		-1.00			=	0.02
+	-0.16	/	15.70	*		0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*		12.50	/	2.14	=	-0.01
		+	0.29	*		0.10			=	0.03
								TOTAL CHANGE		0.04

TRANSIT

		CHANGE IN UTILITY=		-0.02	*	-1.00	=		0.02
+		-0.16	/	15.70	*	0.00	=		0.00
+		-29.00	/	22900.00	*	0.00	=		0.00
							TOTAL CHANGE		0.02

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	1.00	=	63.66	/ 100.75	=	63.19	-0.71	-1.12
SHARED RIDE	24.30	*	1.04	=	25.21	/ 100.75	=	25.02	0.72	2.92
TRANSIT	5.30	*	1.02	=	5.38	/ 100.75	=	5.34	0.04	0.76
OTHER	6.50	*	1.00	=	6.50	/ 100.75	=	6.45	-0.05	-0.74
				TOTAL	100.75					

POLICY: QUEUE JUMP REVERSIBLE LANE FLYOVER

	AVG HOUSEHOLD DATA				PEAK HOUR TRIP MODAL SHARES					AVG TRIP LENGTH		AVERAGE DAILY VMT	
POPULATION SUBGROUP	PCT OF TOTAL POP	ANNUAL INCOME	# OF WORKERS	# OF NWK AUTO TRPS	DRIVE ALONE	SHARED RIDE	TRANSIT	OTHER	AVG CAR-POOL SIZE	WORK (ONE WAY)	NWK (ONE WAY)	WORK	NWK
	100.00	22900.00	1.10	5.90	63.90	24.30	5.30	6.50	2.14	15.70	3.00	37.60	38.40

	DRIVE ALONE			SHARED RIDE				TRANSIT		
POPULATION SUBGROUP	DELTA IVTT	DELTA OVTT	DELTA OPTC	DELTA IVTT	DELTA OVTT	DELTA OPTC	CARPOOL PROMO	DELTA IVTT	DELTA OVTT	DELTA OPTC
	1.00	0.00	0.00	-2.00	0.00	0.00	0.10	-2.00	0.00	0.00

ESTIMATION OF REVISED WORK-TRIP MODAL SHARES

1. CHANGE IN UTILITY FOR EACH MODE

DRIVE ALONE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	1.00	=	-0.02
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	-0.02

SHARED RIDE

								CHANGE IN IVTT		
		CHANGE IN UTILITY=	-0.02	*	-2.00			=	0.03
+	-0.16	/	15.70	*	0.00		CPOOL SIZ	=	0.00
+	-29.00	/	22900.00	*	0.00	/	2.14	=	0.00
		+	0.29	*	0.10			=	0.03
							TOTAL CHANGE		0.06

TRANSIT

		CHANGE IN UTILITY=	-0.02	*	-2.00	=	0.03
+	-0.16	/	15.70	*	0.00	=	0.00
+	-29.00	/	22900.00	*	0.00	=	0.00
						TOTAL CHANGE	0.03

REVISED MODAL SHARE

	BASE MODAL SHARE					TOTAL		REVISED SHARE	SHARE CHANGE	PCT CHANGE
DRIVE ALONE	63.90	*	0.99	=	62.95	/	100.69	=	62.52	-1.38	-2.18
SHARED RIDE	24.30	*	1.06	=	25.78	/	100.69	=	25.60	1.30	5.21
TRANSIT	5.30	*	1.03	=	5.46	/	100.69	=	5.42	0.12	2.32
OTHER	6.50	*	1.00	=	6.50	/	100.69	=	6.46	-0.04	-0.68
				TOTAL	100.69						