

task 11

**CITY OF KEY WEST
TRUMAN ANNEX DIVERSION
STUDY
EVALUATION OF POTENTIAL
DIVERSION ROUTES AND
OPERATIONAL IMPROVEMENTS**

Prepared for:
CITY OF KEY WEST

Prepared by:
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KISINGER CAMPO AND ASSOCIATES, CORP**

November 1996

**CITY OF KEY WEST
TRUMAN ANNEX DIVERSION STUDY
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AND OPERATIONAL IMPROVEMENTS**

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
INTRODUCTION	3
BACKGROUND	6
PROPOSED DIVERSION PLANS	9
Diversion Plan 1	9
Diversion Plan 2	9
Diversion Plan Cost Estimates	11
EVALUATION CRITERIA	12
Consistency with Comprehensive Plan	12
Traffic Volume Reductions	13
Level of Service Impacts	15
Proximity to Parking Supplies	17
Evaluation	18
OPERATIONAL DEFICIENCIES AND REMEDIES	19
Roadway Deficiencies	19
Intersection Deficiencies	22
RECOMMENDED IMPLEMENTATION TIMING	25
Near-Term Improvements	25
Long-Term Improvements	26

LIST OF FIGURES

Figure 1, Study Area Roadway Network	5
Figure 2, Activity Centers and 1996 Existing Daily Traffic Volumes	7
Figure 3, Proposed Diversion Plans	10
Figure 4, 1996 Existing Operational Deficiencies	20

Figure 5, Sample Eaton Street and Caroline Street One-Way Pair
Traffic Calming Plan 28

Figure 6, Traffic Calming Measures 29

LIST OF APPENDICES

Appendix A, Diversion Analysis A-1

Appendix B, Level of Service Analysis B-1

Appendix C, Traffic Calming Measures C-1

CITY OF KEY WEST
TRUMAN ANNEX DIVERSION STUDY
EVALUATION OF POTENTIAL DIVERSION ROUTES
AND OPERATIONAL IMPROVEMENTS

EXECUTIVE SUMMARY

The City of Key West Comprehensive Plan proposes two groups of improvements to divert traffic away from North Roosevelt Boulevard and Truman Avenue via alternative routes that would not be seriously affected by increased traffic. Diversion Plan 1 would reroute traffic via North Roosevelt Boulevard, Palm Avenue, Eaton Street, and Caroline Street to Whitehead Street. Diversion Plan 2 would reroute traffic via Flagler Avenue, White Street, South Street, and United Street to Whitehead Street. The total cost of the components of Diversion Plan 1 is estimated to be \$1,864,000. The total cost of the components of Diversion Plan 2 is estimated to be \$896,000. Both totals include \$587,000 for improvements to the First Street/Bertha Street/Flagler Avenue intersection and to Flagler Avenue east of that intersection.

The two proposed diversion plans were analyzed in terms of their ability to reduce traffic volumes on North Roosevelt Boulevard and Truman Avenue and to bring traffic within proximity of available parking supplies while minimizing adverse traffic and land use compatibility impacts. Since accurate data relating the number of first time visitors to the number of informed motorists are not available, the analysis of the traffic volume reduction criterion was based entirely on the behavior of informed motorists.

Diversion Plan 1, although good at bringing traffic to parking supplies and minimizing traffic and land use compatibility impacts, would be relatively ineffectual at reducing traffic volumes on Truman Avenue and would not reduce traffic volumes on North Roosevelt Boulevard at all.

Diversion Plan 2, would also be good at bringing traffic to parking supplies and would be slightly better than Diversion Plan 1 at reducing traffic volumes on North Roosevelt Boulevard and Truman Avenue, but would be less effective than Diversion Plan 1 at minimizing traffic impacts along the

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Truman Annex Diversion Study
Evaluation of Potential Diversion Routes
and Operational Improvements
November 21, 1996

diversion route. Also, to whatever extent Diversion Plan 2 would be successful at shifting traffic away from North Roosevelt Boulevard and Truman Avenue, it would be detrimental in terms of compatibility with the Comprehensive Plan.

Thus, the analysis does not provide clear-cut evidence that either proposed diversion plan would be successful. However, if sufficient first time visitors susceptible to direction by signage are present in Key West, then traffic volume reductions could improve to the point that Diversion Plan 1 and/or Diversion Plan 2 become viable.

Based on the findings of this study, several components of the proposed diversion plans and other identified operational improvements are recommended for near-term implementation. Specifically, four near-term improvements, one of which is a component of Diversion Plan 1, and two of which should be considered components of both Diversion Plan 1 and Diversion Plan 2, are recommended. The four near-term improvements, totaling \$777,000, include: traffic signal timing modifications at the Kennedy Drive/Flagler Avenue intersection; the creation of a one-way pair with north- and westbound traffic on Palm Avenue and south- and eastbound traffic on Eisenhower Drive; realignment of the First Street/Bertha Street/Flagler Avenue intersection; and Flagler Avenue roadway widening to four lanes along the first 300 feet of Flagler Avenue east of First Street.

Finally, two long-term improvements are identified. Implementation of a Caroline Street/Eaton Street one-way pair would serve to remedy poor intersection or roadway levels of service along Eaton Street (although these are not forecast through 2005), or, in combination with traffic calming measures, as an element of a pedestrian- and bicycle-friendly streetscape. Traffic signal interconnection along North Roosevelt Boulevard between First Street and Kennedy Drive is recommended for consideration in the North Roosevelt Boulevard Preliminary Design and Engineering (PD&E) study for which funding is currently being sought by FDOT.

INTRODUCTION

This report summarizes an evaluation of potential diversion routes and other operational improvements conducted by Tindale-Oliver and Associates, Inc., (TOA) in conjunction with Kisinger Campo and Associates (KCA) according to the Truman Annex Traffic Diversion Study Task Four scope of services. The three-fold purpose of this evaluation is to:

1. Evaluate the potential of diversion routes proposed in the City of Key West Comprehensive Plan to divert traffic away from North Roosevelt Boulevard and Truman Avenue;
2. Recommend operational improvements at locations where existing deficiencies have been identified; and
3. Recommend diversion plan components and operational improvements for near-term and long-term implementation.

Supporting materials are contained in the technical memoranda summarizing earlier Truman Annex Diversion Study tasks, also prepared by TOA/KCA. These memoranda include: *Existing Conditions Analysis* (Task One), *Origin and Destination Survey Analysis* (Task Two), and *Parking and Park 'n' Ride Program Recommendations* (Task Three).

The Task Four scope of services identifies a need for evaluation of two diversion plans proposed in the *City of Key West Comprehensive Plan: Data Inventory and Analysis* (Comprehensive Plan, City of Key West, July 1993). These diversion plans are groups of improvements that would encourage alternate routing of cross-island traffic, especially traffic between US 1 on the east and the Old Town area on the west, that is currently using North Roosevelt Boulevard and Truman Avenue. Figure 1, Study Area Roadway Network, shows the study area roadway network and the general location of the diversion plans.

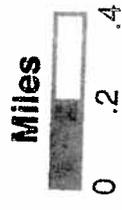
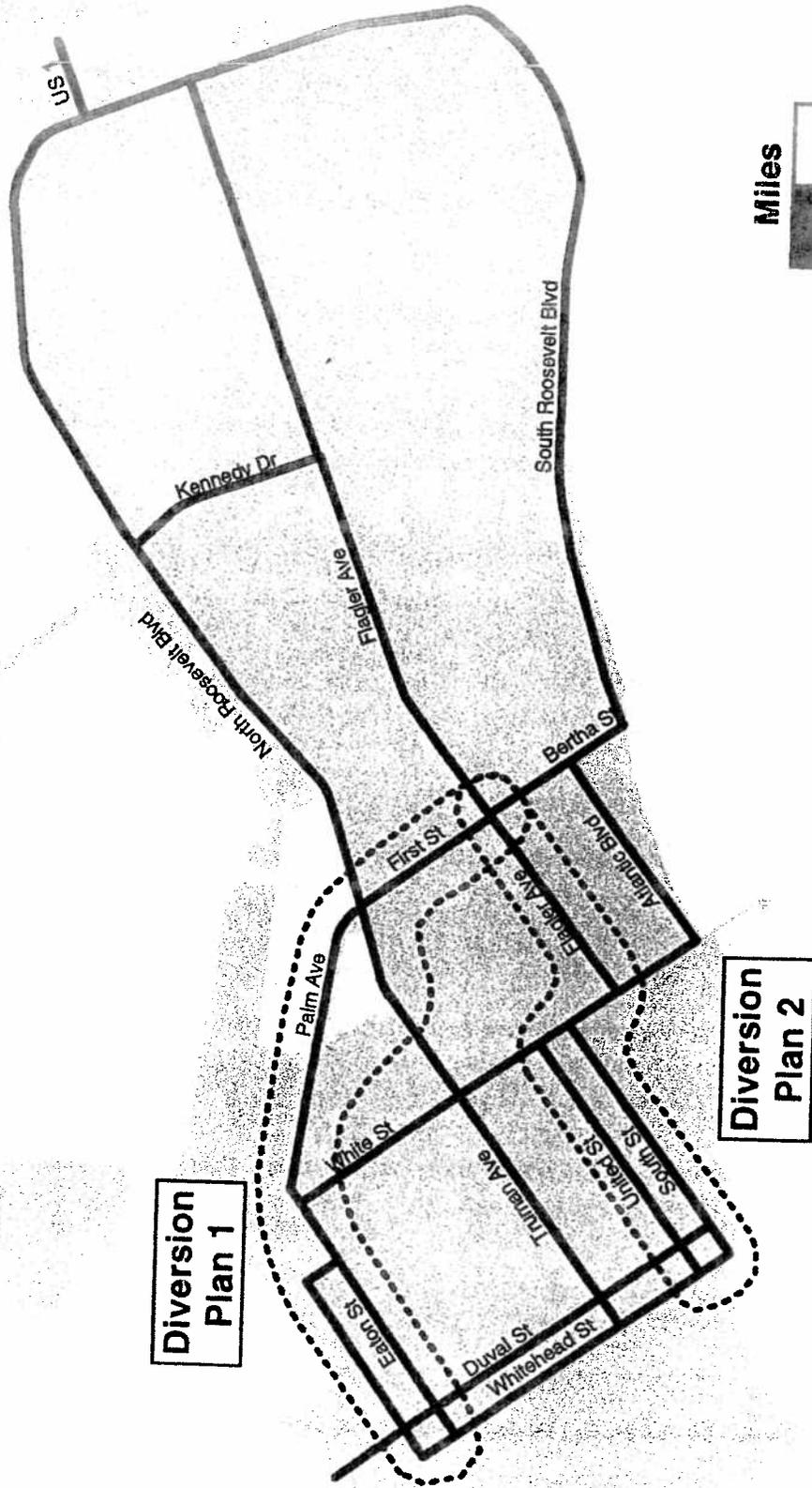
Diversion Plan 1 would seek to reroute some traffic via North Roosevelt Boulevard, Palm Avenue, Eaton Street, and Caroline Street to Whitehead Street. Diversion Plan 2 would seek to reroute some traffic via Flagler Avenue, White Street, South Street, and United Street to Whitehead Street.

This report also summarizes an analysis of roadway and intersection operational deficiencies that were identified in the Task One report, *Existing Conditions Analysis*. Based on the analysis of the

two proposed diversion plans and the existing operational deficiencies, components of the diversion plans and identified operational improvements are recommended for near-term and long-term implementation.

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Figure 1
City of Key West Diversion Study
Study Area Roadway Network

Legend
— Study Roadways
--- General Location of Diversion Plan Improvements

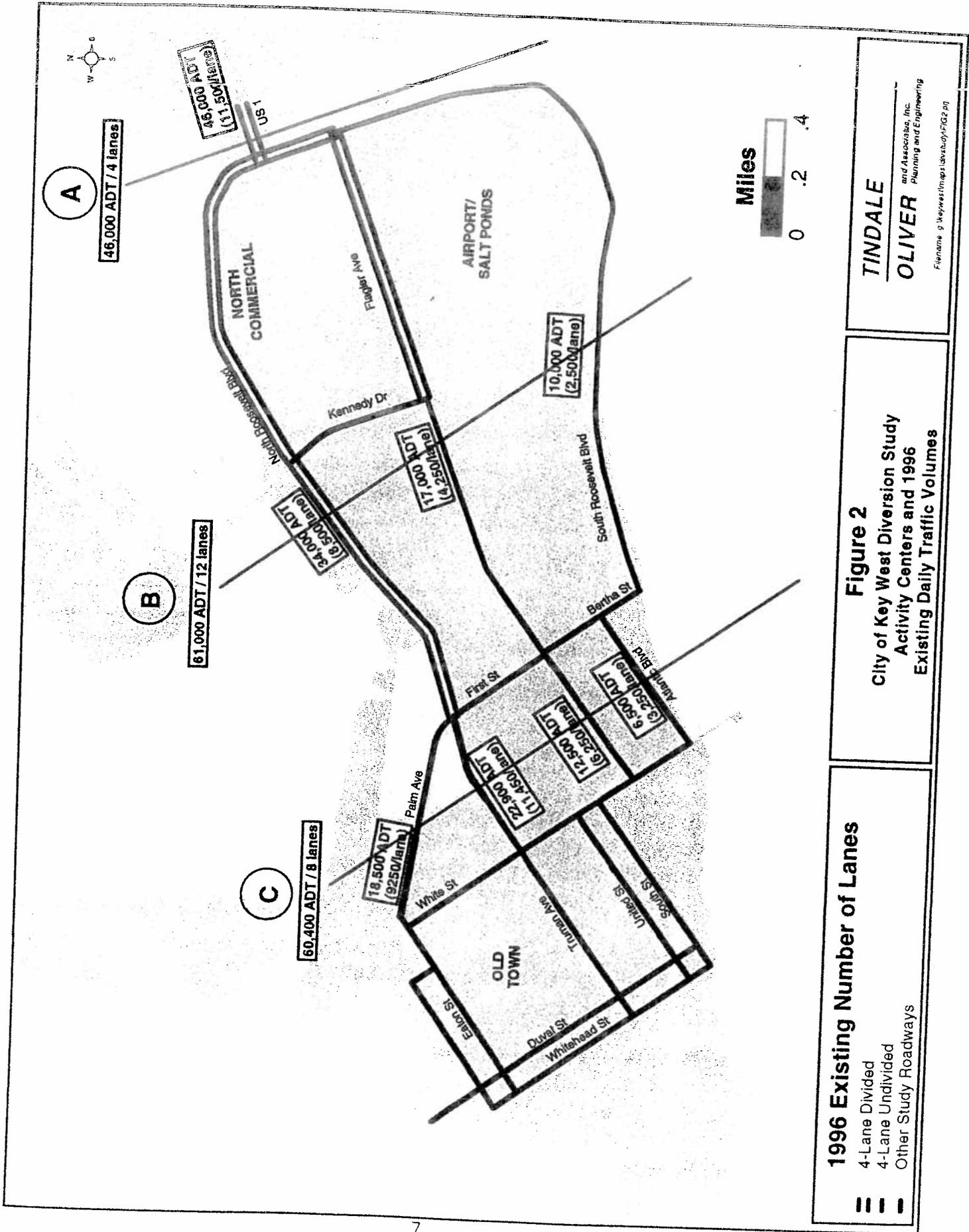
BACKGROUND

The City of Key West is an island community about four miles long in the east-west direction and about one mile wide in the north-south direction. The City's permanent (residents who live in Key West at least 3 months per year) population is about 26,500, including about 6,000 military personnel. During the Spring peak tourist season, the permanent population increases to about 40,000.

Vehicular access to and from neighboring islands and mainland Florida is provided only by US 1, which crosses a bridge at the east end of the island. The major activity centers are located at the west end of the island in an area known as Old Town, where primarily tourist-oriented activities take place, and in the eastern half of the island in an area referred to in the Comprehensive Plan as the North Commercial planning area, in the vicinity of the Kennedy Drive/North Roosevelt Boulevard intersection, where other shopping opportunities are concentrated. Key West International Airport, associated hotel uses, and undevelopable salt marshes are located south of Flagler Avenue in the eastern half of the island. Residential uses are fairly uniformly distributed throughout the remainder of the island. The general location of activity centers and existing daily traffic volumes on major east-west roadways are shown in Figure 2, Activity Centers and 1996 Existing Daily Traffic Volumes.

In addition to the about 46,000 vehicles per day arriving in or leaving Key West via US 1 (Figure 2, screen line A), there is significant intra-island travel between the east end and west end. East-west travel east of First Street is provided by three 4-lane facilities. North Roosevelt Boulevard is a 4-lane divided arterial east of First Street and is a 4-lane undivided arterial from First Street west to Eisenhower Drive. North Roosevelt Boulevard carries about 34,000 vehicles per day (vpd). Flagler Avenue is a 4-lane divided arterial east of Kennedy Drive and is a 4-lane undivided arterial from 300-feet east of First Street east to Kennedy Drive. Flagler Avenue carries about 17,000 vpd. South Roosevelt Boulevard is a 4-lane arterial its entire length and is a 4-lane divided arterial between Flagler Avenue and US 1. South Roosevelt Boulevard carries about 10,000 vpd.

East-west travel west of First Street is provided by four 2-lane facilities. Truman Avenue and Palm Avenue, at 22,900 vpd and 18,500 vpd, respectively, carry most of the North Roosevelt Boulevard



1996 Existing Number of Lanes

- == 4-Lane Divided
- 4-Lane Undivided
- - - Other Study Roadways

Figure 2
 City of Key West Diversion Study
 Activity Centers and 1996
 Existing Daily Traffic Volumes

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traffic plus some of the traffic from Flagler Avenue and South Roosevelt Boulevard. Flagler Avenue and Atlantic Avenue, at 12,500 vpd and 6,500 vpd, respectively, carry the remainder of the east-west traffic.

East of First Street, a traffic volume of 61,000 vpd is carried by 12 travel lanes (Figure 2, screen line B), while west of First Street roughly the same traffic volume is carried by 8 lanes (Figure 2, screen line C). Together, Truman Avenue and Palm Avenue carry over 10,000 vpd per lane. Flagler Avenue, west of First Street, and Atlantic Avenue carry less than 5,000 vpd per lane. The Comprehensive Plan suggests that the solution to these inequities is to "spread out traffic by improving the signage directing motorists to alternative routes, such as Flagler Avenue and South Roosevelt Boulevard." Specifically, two diversion plans are proposed in the Comprehensive Plan.

PROPOSED DIVERSION PLANS

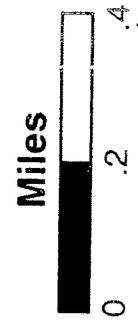
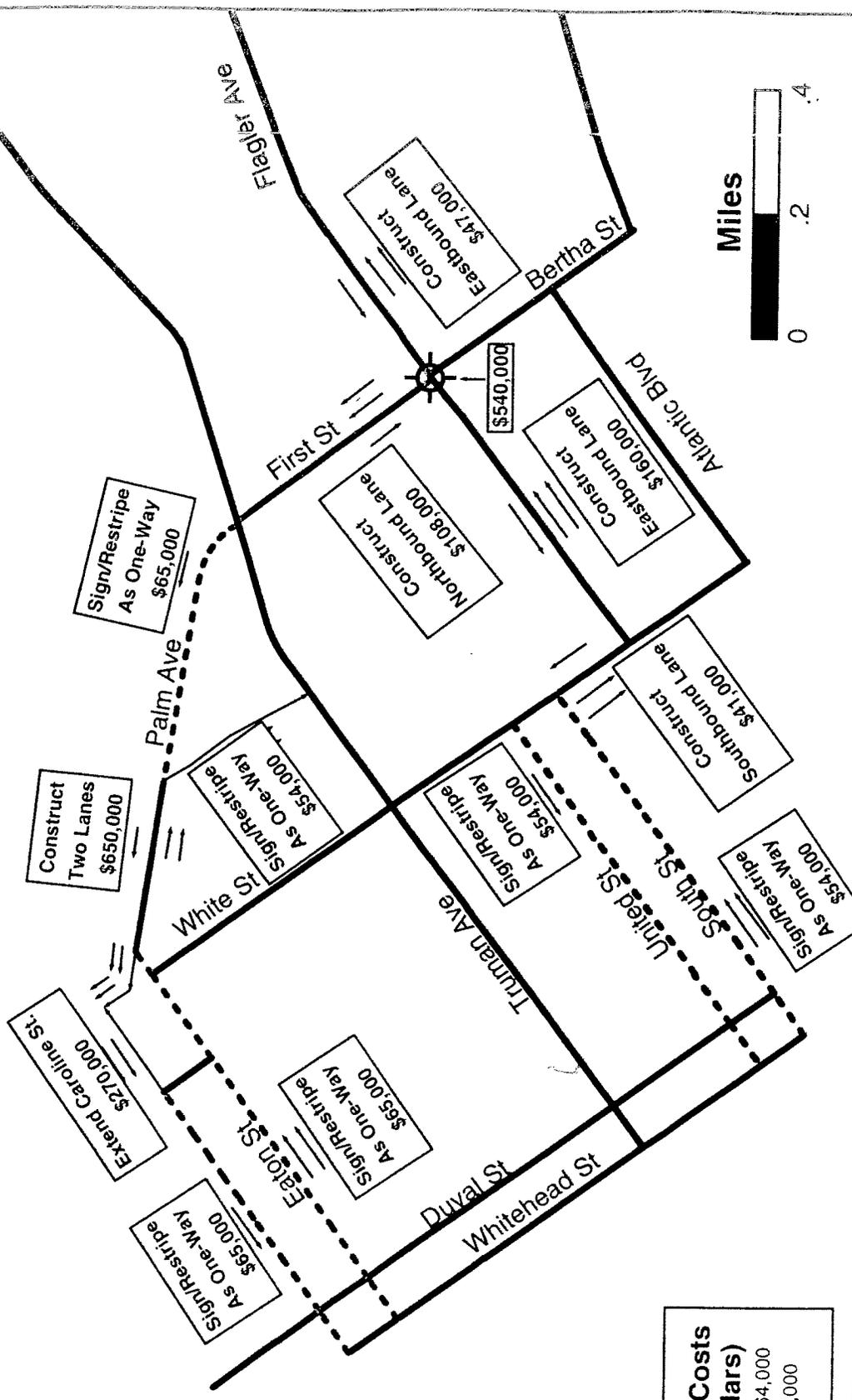
The City of Key West Comprehensive Plan proposes several specific transportation system improvements to divert traffic away from North Roosevelt Boulevard and Truman Avenue to alternative routes that would not be seriously affected by increased traffic, including Flagler Avenue, South Roosevelt Boulevard, and Palm Avenue. For evaluation purposes, the improvements were grouped into two Diversion Plans, as shown in Figure 3, Proposed Diversion Plans.

Diversion Plan 1

The primary components of Diversion Plan 1 include creating a one-way pair in the northern half of Old Town, constructing an extension of Palm Avenue with a four-lane section, and creating a second one-way pair to avoid the need for widening the Garrison Bight bridge. These improvements are focused on diverting traffic away from Truman Avenue to Palm Avenue. Secondary components of Diversion Plan 1 include constructing a second northbound lane on First Street between Flagler Avenue and North Roosevelt Boulevard, constructing a second eastbound lane on Flagler Avenue between First Street and Fifth Street, constructing intersection improvements at the Palm Avenue/North Roosevelt Boulevard and White Street/Eaton Street intersection, and reconstructing the First Street/Bertha Street/Flagler Avenue intersection. These improvements would increase the attractiveness of Flagler Avenue as a route to the northern half of Old Town.

Diversion Plan 2

Diversion Plan 2 includes creating a one-way pair in the southern half of Old Town, constructing a second southbound lane on White Street between South Street and Flagler Avenue, and constructing a second eastbound lane on Flagler Avenue between White Street and Fifth Street. These improvements are aimed at increasing the attractiveness of Flagler Avenue and South Roosevelt Boulevard as routes to Old Town. Note that constructing a second eastbound lane on Flagler Avenue between First Street and Fifth Street is a component of both diversion plans.



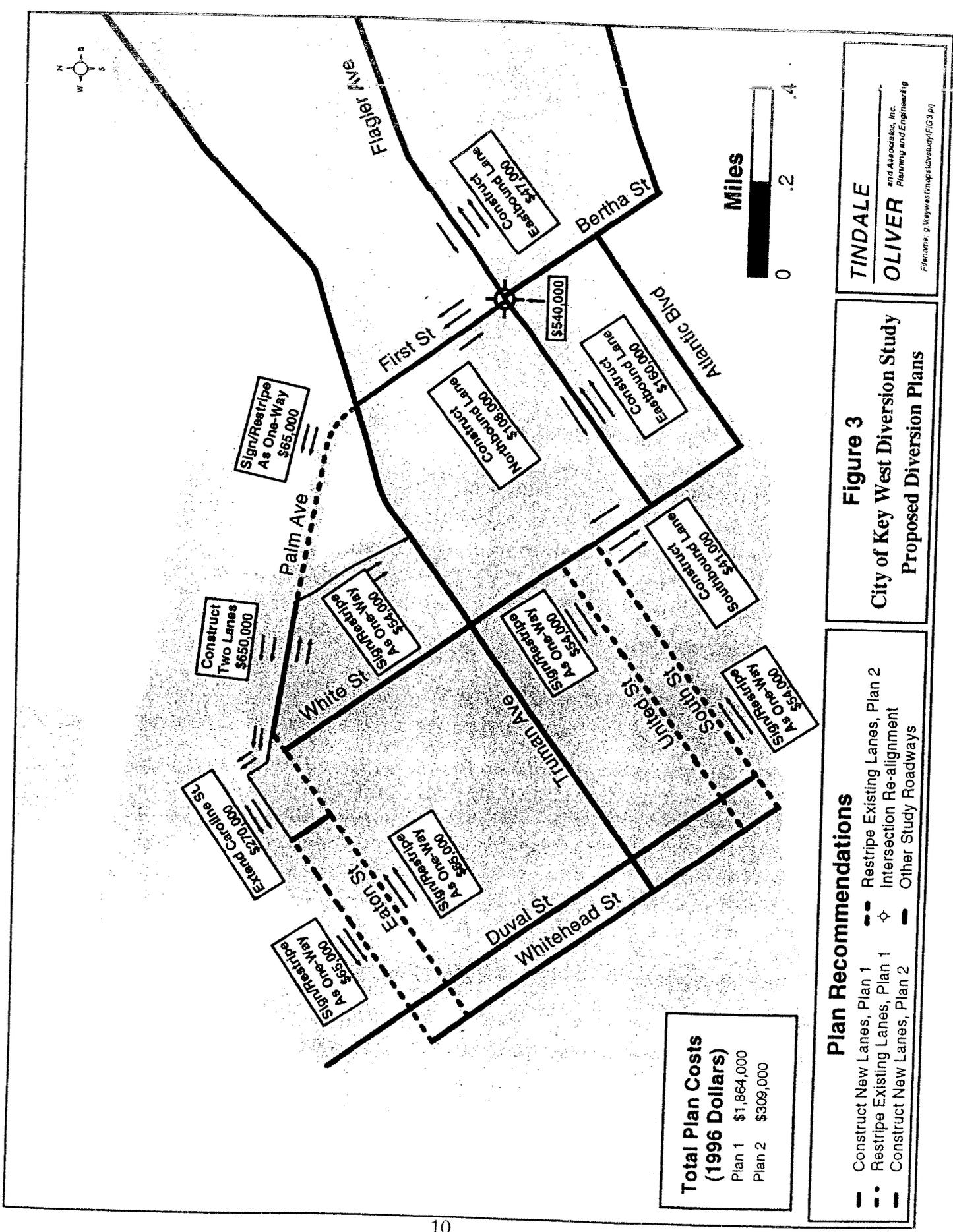
**Total Plan Costs
(1996 Dollars)**

Plan 1	\$1,864,000
Plan 2	\$309,000

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Figure 3
 City of Key West Diversion Study
 Proposed Diversion Plans

- Plan Recommendations**
- Construct New Lanes, Plan 1
 - - - Restripe Existing Lanes, Plan 1
 - Construct New Lanes, Plan 2
 - - - Restripe Existing Lanes, Plan 2
 - ◇ Intersection Re-alignment
 - - - Other Study Roadways



**Total Plan Costs
(1996 Dollars)**

Plan 1	\$1,864,000
Plan 2	\$309,000

- Plan Recommendations**
- Construct New Lanes, Plan 1
 - - - Restripe Existing Lanes, Plan 2
 - · - · - Restripe Existing Lanes, Plan 1
 - ◇ Intersection Re-alignment
 - - - Construct New Lanes, Plan 2
 - - - Other Study Roadways

Figure 3
City of Key West Diversion Study
Proposed Diversion Plans

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Diversion Plan Cost Estimates

The City of Key West Comprehensive Plan includes cost estimates for most of the components of the two diversion plans. The estimates are presumably in 1993 dollars, and were inflated to 1996 dollars for using the Florida Department of Transportation construction cost index. Cost estimates for constructing a new travel lane on White Street between South Street and Flagler Avenue and on Flagler Avenue between First Street and Fifth Street are not included in the Comprehensive Plan, but were derived from the Comprehensive Plan estimates based on length of the new lane. Total cost for the components of Diversion Plan 1 is estimated to be \$1,864,000 (1996). Total cost for the components of Diversion Plan 2 is \$309,000 (1996). If the cost of constructing a second eastbound lane on Flagler Avenue between First Street and Fifth Street and the cost of intersection realignment at the First Street/Bertha Street/Flagler Avenue intersection are included in Diversion Plan 2 instead of Diversion Plan 1, then total cost for the components of Diversion Plan 1 becomes \$1,277,000 (1996) and the total cost for the components of Diversion Plan 2 becomes \$896,000 (1996).

EVALUATION CRITERIA

The ability of each proposed diversion plan to reduce traffic on North Roosevelt Boulevard and Truman Avenue while minimizing adverse impacts was determined by analyzing the two diversion plans in terms of four criteria:

1. Consistency with the City of Key West Comprehensive Plan;
2. Potential to reduce traffic volumes on North Roosevelt Boulevard between US 1 and First Street and on Truman Avenue between First Street and Whitehead Street;
3. Impact on diversion route roadway and intersection future levels of service; and
4. Proximity to existing and future parking supplies.

Consistency with Comprehensive Plan

The Comprehensive Plan provides details on the location and zoning of developable land in Key West and stresses the importance of improving the quality of traffic flow while attempting to maintain the island's unique character. Ideally, a diversion plan would improve access to existing or proposed development while remaining compatible with the character of the neighborhood through which diverted traffic would travel.

Unfortunately, while it is clear that a freeway is inconsistent with a neighborhood of single-family residences, there is no widely-accepted quantitative method of addressing consistency with neighborhood character. Therefore, the primary consideration in evaluating the diversion plans was based on a qualitative assessment of the relationship between traffic volume/travel speed and the zoned residential density and commercial intensity, together represented by a rough estimate of composite floor-area ratio (FAR) in the vicinity of the proposed diversion routes.

A secondary consideration, closely linked to consistency with neighborhood character, is the ability of the proposed diversion plan to get traffic to and from those areas of the island where the greatest growth is anticipated. The Comprehensive Plan identifies the Airport/Salt Ponds, Old Town, and North Commercial areas as the areas with greatest developable uplands. The Airport/Salt Ponds

area, with about 61 acres of developable uplands, is primarily zoned for low- and medium-density residential uses. The North Commercial area, with about 35 acres of developable uplands located along North Roosevelt Boulevard, is anticipated to accommodate growth in general commercial retail sales and services. The Old Town area with about 41 acres of developable uplands, mostly in Truman Annex, is anticipated to accommodate planned mixed-use development.

Diversion Plan 1 would increase the capacities of Caroline Street, Eaton Street, Palm Avenue, and Eisenhower Drive, either through construction of new travel lanes or through re-signing two-way streets as one-way streets. This increased capacity would tend to attract traffic away from Truman Avenue into and through areas zoned for public services and neighborhood and general commercial uses with a residential/commercial composite FAR of approximately 2.0. Diversion Plan 1 would provide a more direct connection between planned growth areas in the North Commercial and Old Town areas. For these reasons, Diversion Plan 1 would be good in terms of consistency with neighborhood character.

Diversion Plan 2 would increase the capacities of United Street, South Street, White Street, and Flagler Avenue, again through construction of new travel lanes or the creation of one-way streets. This increased capacity would tend to increase traffic volumes or travel speeds through areas zoned for single-family and high-density residential and for transient, limited, and neighborhood commercial uses with a FAR of less than 1.5. Diversion Plan 2 would direct traffic into Old Town south of the area where greatest growth is anticipated. For these reasons, Diversion Plan 2 would be poor in terms of consistency with neighborhood character.

Traffic Volume Reductions

Traffic volumes in Key West are comprised of vehicles driven by motorists visiting Key West for the first time and vehicles driven by informed motorists who have the opportunity to select their travel route based on previous Key West driving experience. First time visitors may be susceptible to the influence of signage directing them to a particular route, while informed motorists, as a whole, select their route to minimize travel time and/or travel distance. Since accurate data relating the number of first time visitors to the number of informed motorists are not available, the analysis of

the traffic volume reduction criterion was based entirely on the behavior of informed motorists. To the extent that first time visitors susceptible to direction by signage are present in Key West, the calculated traffic volume reductions may be increased.

A diversion plan's ability to reduce traffic volumes is directly related to its ability to make the diversion route more attractive than the original route. Attractiveness is measured by a combination of travel time and travel distance; the route with the smaller combination of travel time and travel distance is the more attractive route. A longer route could be more attractive if the travel time is less. A diversion procedure developed by the California Division of Highways provides a method for estimating the attractiveness of a diversion route compared to an original route based on travel time and distance savings on the diversion route (see Appendix A).

For this analysis, round trip travel times along each route were estimated from no-load travel times using a formula based on the volume-to-capacity ratio of the facilities making up the route. This model was calibrated using the results of the *Key West Travel Time and Delay Study* (FDOT, District VI, 1993). Round trips were analyzed between two test points—one on US 1, east of North Roosevelt Boulevard, and another at the Duval Street/Eaton Street intersection, estimated to be the centroid of Old Town activity.

The improvements comprising Diversion Plan 1 would result in a round trip travel time savings of 1.6 minutes over travel time along the same route without the improvements, increasing total travel time savings over the Truman Avenue/Duval Street route from 7.0 minutes to 8.6 minutes. The additional travel time savings resulting from implementing Diversion Plan 1 would likely result in a shift of about 2% of traffic from the Truman Avenue/Duval Street route to the diversion route. In other words, an additional 2% of trips that begin or end at uses for which the Duval Street/Eaton Street intersection location is representative, that are currently using either Truman Avenue or Palm Avenue, and that begin or end at any point along North Roosevelt Boulevard would find the diversion route more attractive. Diversion Plan 1 would not reduce traffic volumes on North Roosevelt Boulevard. Given the minimal improvement in attractiveness of the diversion route, Diversion Plan 1 would be poor in terms of ability to reduce traffic volumes on Truman Avenue.

The improvements comprising Diversion Plan 2 would result in a round trip travel time savings of 1.0 minutes over travel time along the same route without the improvements, increasing total travel time savings over the North Roosevelt Boulevard/Truman Avenue route from 2.8 minutes to 3.8 minutes. The additional travel time savings resulting from implementing Diversion Plan 2 would likely result in a shift of about 6% of traffic from the North Roosevelt Boulevard/Truman Avenue route to the diversion route. The diversion route is slightly more attractive for trips currently beginning or ending at any point south and east of the First Street/Bertha Street/Flagler Avenue intersection and traveling along White Street, Truman Avenue, and Duval Street to any point represented by the Duval Street/Eaton Street intersection location. About 9% of these trips could be expected to shift to the diversion route. Given the relative attractiveness of the diversion route, Diversion Plan 2 would be fair in terms of ability to reduce traffic volumes on North Roosevelt Boulevard and Truman Avenue.

Level of Service Impacts

The effectiveness of any proposed plan to divert traffic away from one street must be assessed in terms of the impact of the diverted traffic on the roadways to which it is diverted. Both Diversion Plan 1 and Diversion Plan 2, would result in traffic volume reductions on Truman Avenue by increasing the capacity of alternate routes. Capacity increases, in general, are accompanied by increased levels of service. In cases where capacity increases improve the attractiveness of a route, traffic volumes will, over time increase to some equilibrium point with localized level of service only slightly better than before the capacity increases, reflecting the overall increase in the capacity of the entire transportation system.

Other factors, including the capacity of adjacent facilities before and after the improvements and localized intersection improvements make the problem of assessing the system-wide impacts of local capacity changes very difficult, one usually addressed with complex computer models that are beyond the scope of this study. Therefore, the level of service impacts of the proposed diversion plans are addressed qualitatively.

Diversion Plan 1 includes intersection improvements at the First Street/Bertha Street/Flagler Avenue, Palm Avenue/North Roosevelt Boulevard, and White Street/Eaton Street intersections. These intersections currently experience peak period traffic volumes beyond their capacity (LOS F) and the improvements are considered needed and would be of immediate benefit (operational deficiencies and remedies are further discussed in a later section).

Diversion Plan 1 would also include capacity improvements on Caroline Street, Eaton Street, and Palm Avenue. Capacities on Caroline Street and Eaton Street would be increased through the creation of a one-way pair. Traffic volumes on the two streets would become more equal. Roadway levels of service, which are currently LOS B on Caroline Street and LOS D on Eaton Street, with implementation of a one-way pair would become LOS C on both streets.

The capacity on Palm Avenue, west of Eisenhower Drive, would be increased by constructing two new travel lanes. The new travel lanes would almost double the capacity of this roadway segment. Since traffic volumes would likely be limited by the capacity of adjacent facilities, Palm Avenue, west of Eisenhower Drive, is anticipated to continue to operate at LOS C or better under Diversion Plan 1.

Capacities on Truman Avenue and Palm Avenue, east of Eisenhower Drive, would be increased through the creation of a one-way pair, with eastbound Palm Avenue traffic diverted to Truman Avenue via Eisenhower Drive. Traffic volumes on Palm Avenue and Truman Avenue would become more equal, with the levels of service on Palm Avenue worsening somewhat and the level of service on Truman Avenue slightly improving. Eisenhower Drive would experience the greatest level of service decline associated with Diversion Plan 1. Roadway levels of service on the Palm/Eisenhower/Truman one-way pair would likely be LOS D/E. Given the overall level of service improvements, Diversion Plan 1 would be good in terms of the impact of diverted traffic on roadways to which it is diverted.

Diversion Plan 2 would result in capacity increases on United Street and South Street through the creation of a one-way pair, and on White Street and Flagler Avenue through the construction of new travel lanes. These new travel lanes would be oriented to increase the capacity for motorists leaving Old Town only. The combination of these improvements is anticipated to result in a very slight

increase in roadway levels of service along the diversion route. Given the overall very slight level of service improvements, Diversion Plan 2 would be fair in terms of the impact of diverted traffic on roadways to which it is diverted.

Proximity to Parking Supplies

The proposed diversion plans were also evaluated in terms of their ability to bring traffic within proximity of available parking supplies. Evaluation of this criterion was based on data contained in *Parking and Park 'n' Ride Recommendations* (Parking Recommendations, TOA/KCA, 1996). That study details existing parking supply and parking utilization during periods of peak off-season parking demand.

For this evaluation, Diversion Plan 1 is considered to bring traffic within the proximity of Old Town parking areas 1, 2, 3, and 4, as defined in *Parking Recommendations*. These four parking areas provide a total of 5,159 on-street and off-street parking spaces. During periods of peak off-season parking demand, 40% of these spaces are used, leaving 2,704 unoccupied spaces.

Additionally, Diversion Plan 1 brings traffic directly to the new 300-space Grinnell Street parking facility not included in the parking data. This facility gives Diversion Plan 1 excellent potential to serve transit. Given the overall availability of parking and the excellent access to the Grinnell Street parking facility, Diversion Plan 1 would be good in terms of ability to bring traffic within the proximity of parking supplies.

Diversion Plan 2 is considered to bring traffic within the proximity of Old Town parking areas 7, 8, and 10, as defined in *Parking Recommendations*. These three parking areas provide a total of 6,724 on-street and off-street parking spaces. During periods of peak off-season parking demand, 36% of these spaces are used, leaving 4,308 unoccupied spaces. Given the level of available parking, Diversion Plan 2 would be good in terms of ability to bring traffic within the proximity of parking supplies.

Evaluation

The two proposed diversion plans were analyzed in terms of their ability to reduce traffic volumes on North Roosevelt Boulevard and Truman Avenue and bring traffic within proximity of available parking supplies while minimizing adverse traffic and land use compatibility impacts.

Diversion Plan 1, although good at bringing traffic to parking supplies and minimizing traffic and land use compatibility impacts, would be relatively ineffectual at reducing traffic volumes on Truman Avenue and would not reduce traffic volumes on North Roosevelt Boulevard at all. This, together with the \$1,864,000 estimated cost, gives Diversion Plan 1 a very high cost-to-benefit ratio.

Diversion Plan 2, would also be good at bringing traffic to parking supplies and would be slightly better than Diversion Plan 1 at reducing traffic volumes on North Roosevelt Boulevard and Truman Avenue, but would be less effective than Diversion Plan 1 at minimizing traffic impacts along the diversion route. Also, to whatever extent Diversion Plan 2 would be successful at shifting traffic away from North Roosevelt Boulevard and Truman Avenue, it would be detrimental in terms of compatibility with the Comprehensive Plan. This, together with the \$896,000 estimated cost (with Flagler Avenue and First Street/Bertha Street/Flagler Avenue intersection improvements), gives Diversion Plan 2 a similarly high cost-to-benefit ratio.

If sufficient first time visitors susceptible to direction by signage are present in Key West, then traffic volume reductions could improve to the point that Diversion Plan 1 and/or Diversion Plan 2 become viable. However, the analysis based on the behavior of informed motorists alone does not provide clear-cut evidence that either proposed diversion plan would be successful.

OPERATIONAL DEFICIENCIES AND REMEDIES

In addition to the groups of proposed improvements making up the diversion plans already discussed, several spot improvements were analyzed (see Appendix B) for their ability to remedy the specific operational deficiencies identified in the Task One report, *Existing Conditions Analysis*. That report summarized calculated roadway and intersection levels of service. For this analysis, deficiencies are limited to those roadways and intersections identified as having calculated levels of service of LOS F, indicating extreme congestion and long delays. The identified LOS F facilities, shown in Figure 4, 1996 Existing Operational Deficiencies, include:

Roadways

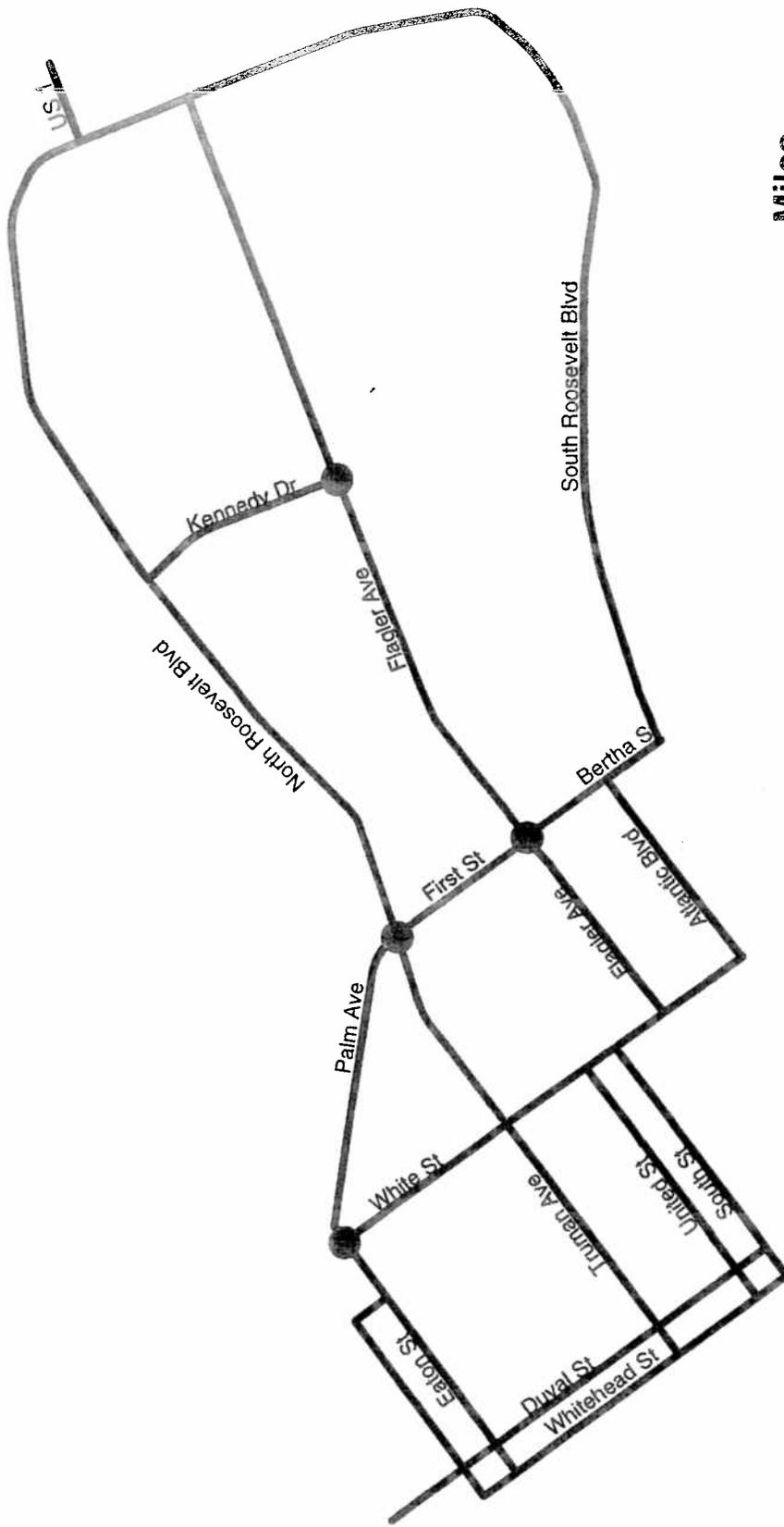
Truman Avenue/North Roosevelt Boulevard from White Street to Kennedy Drive
Flagler Avenue from First Street to Kennedy Drive
First Street/Bertha Street from North Roosevelt Boulevard to Atlantic Boulevard

Intersections

White Street/Eaton Street
First Street/North Roosevelt Boulevard
First Street/Bertha Street/Flagler Avenue
Kennedy Drive/Flagler Avenue

Roadway Deficiencies

Roadway levels of service were calculated using procedures that are consistent with those specified for use by Florida Department of Transportation (FDOT). The FDOT procedures calculate roadway levels of service based on peak-direction traffic volumes during the 100th highest hour of the year (K_{100}). Level of service values calculated using the FDOT procedures range from LOS A, indicating minimal congestion and delay, to LOS F, indicating extreme congestion and long delays. The level of service values are assigned based on average travel speed along the entire roadway segment, including intersection stopped-time delay. Using these procedures, calculated levels of service of LOS F were identified on three roadway segments.



Level of Service

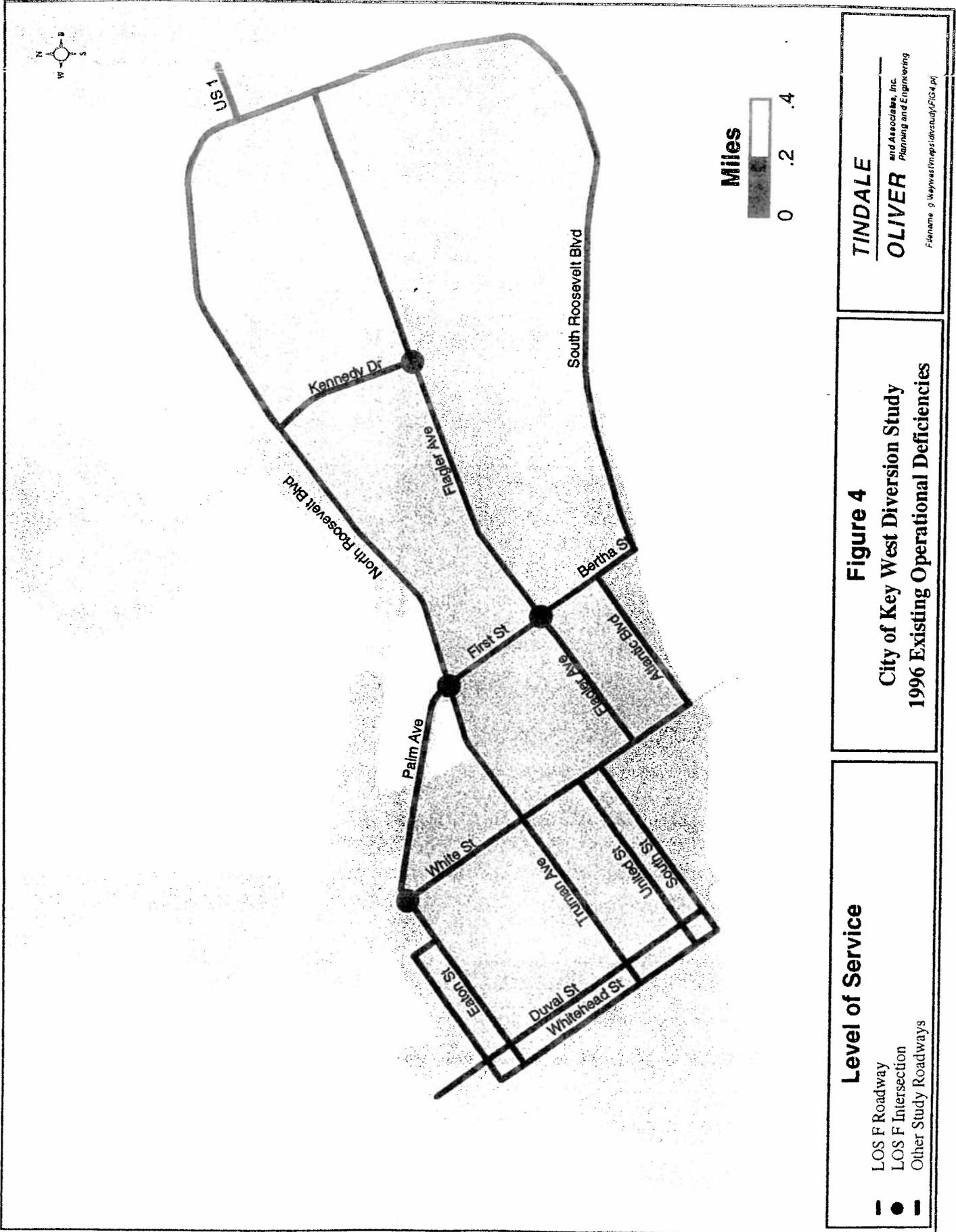
- LOS F Roadway
- LOS F Intersection
- Other Study Roadways

Figure 4
City of Key West Diversion Study
1996 Existing Operational Deficiencies

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Figure 4
City of Key West Diversion Study
1996 Existing Operational Deficiencies

Level of Service

- LOS F Roadway
- LOS F Intersection
- Other Study Roadways

Truman Avenue/North Roosevelt Boulevard. This roadway, known as Truman Avenue, west of Palm Avenue/First Street, and as North Roosevelt Boulevard, east of Palm Avenue/First Street, was identified as having calculated peak-direction K_{100} levels of service of LOS F for the aggregate roadway from White Street to Kennedy Drive.

On the 2-lane segment of Truman Avenue from White Street to Eisenhower Drive, the calculated LOS F condition results from using a traffic count obtained on the 4-lane segment of Truman Avenue east of Eisenhower Drive. A level of service of LOS D, based on adjusted volumes and other parameters, is more representative of existing conditions and is consistent with Truman Avenue levels of service west of White Street.

On the 4-lane segment of Truman Avenue from Eisenhower Drive to Palm Avenue/First Street, the calculated LOS F results from delays on the eastbound approach to the intersection with Palm Avenue/First Street. Without significant improvements at that intersection (see Intersection Deficiencies), Truman Avenue from Eisenhower Drive to Palm Avenue/First Street will likely remain at LOS F in the PM peak hour peak direction.

North Roosevelt Boulevard, from Palm Avenue/First Street to Kennedy Drive, involves travel through several signalized intersections. Although eastbound approach delays at these intersections indicate LOS D or better, the traffic signals do bring most traffic to a stop, reducing average travel speed along the roadway. Signal interconnection would allow more traffic to arrive at the intersections during a green light. Roadway level of service along this segment of North Roosevelt Boulevard, with signal interconnection, could improve to LOS D, or better.

Flagler Avenue. This roadway was identified as having calculated peak-direction K_{100} levels of service of LOS F for the aggregate roadway from First Street to Kennedy Drive.

The level of service for Flagler Avenue from First Street to Fifth Street was calculated based on a 2-lane section. However, Flagler Avenue widens to four lanes about 300-feet east of First Street and is four lanes at the west leg of the Fifth Street/Flagler Avenue intersection. A level of service of LOS C/D, based on parameters closer to the Fifth Street/Flagler Avenue intersection, may be a better indicator of roadway level of service for this roadway segment.

The calculated roadway level of service of LOS F for Flagler Avenue from Fifth Street to Kennedy Drive is largely the result of the LOS F condition at the eastbound approach to the Kennedy Drive/Flagler Avenue intersection. Signal timing improvements (discussed under Intersection Deficiencies) at this intersection would likely improve roadway levels of service for this segment of Flagler Avenue to LOS C or better.

First Street/Bertha Street. This roadway, known as First Street, north of Flagler Avenue, and as Bertha Street, south Flagler Avenue, was identified as having calculated peak-direction K_{100} levels of service of LOS F from North Roosevelt Boulevard to Atlantic Boulevard. The peak direction north of Flagler Avenue is southbound and the peak direction south of Flagler Avenue is northbound. Therefore the calculated roadway level of service on First Street/Bertha Street is largely dependent on the northbound and southbound approach levels of service at the First Street/Bertha Street/Flagler Avenue intersection. Intersection re-alignment (discussed under Intersection Deficiencies) and resultant intersection level of service improvements at this intersection would likely improve roadway levels of service for First Street/Bertha Street to LOS C or better.

Intersection Deficiencies

Intersection levels of service were calculated using procedures outlined in *Highway Capacity Manual* (HCM, Transportation Research Board Special Report 209,). These procedures calculate intersection levels of service based on traffic volumes entering the intersection during the peak 15 minutes of the analysis hour, in this case the highest traffic volume hour during the PM peak period. The level of service values are assigned based on the calculated average delay per vehicle. Using these procedures, calculated levels of service of LOS F were identified at four study area intersections.

White Street/Eaton Street. This intersection was identified as having a calculated PM peak period intersection level of service of LOS F based on the findings of a traffic study prepared for the Key West Bight development using traffic data collected during a construction closure of Truman Avenue. Subsequent calculations based on more representative traffic volumes show that this intersection is operating at LOS B and is, therefore, not an existing operational deficiency.

First Street/North Roosevelt Boulevard. Although a calculated overall intersection level of service of LOS D was identified at this intersection, it was listed as an operational deficiency by reason of the calculated level of service of LOS F for the northbound approach. The northbound level of service could be improved at the expense of the other approaches by modifying signal timing to allow more green time for the northbound approach. However, since northbound traffic represents only about 8% of total traffic entering the intersection, and since the calculated average delay per northbound vehicle is near the LOS E/LOS F threshold, no modifications are recommended at this time.

If continued monitoring shows worsening conditions, then signing and restriping Palm Avenue and Eisenhower Drive to operate as a one-way pair (a component of Diversion Plan 1) would remove the large southbound left-turn movement from the Palm Avenue/North Roosevelt Boulevard intersection, improving intersection operations to LOS B and also improving Truman Avenue roadway levels of service. Minor modifications to the Eisenhower Drive/Truman Avenue intersection would allow continued LOS B operations at that intersection.

First Street/Bertha Street/Flagler Avenue. The geometry at this intersection, in particular the offset of the north and south legs, has been identified as a bottleneck to traffic flow in previous traffic studies. Realignment of this intersection was identified in the Comprehensive Plan as a recommended improvement. The intersection was identified as having a PM peak period level of service of LOS F. Realignment, and the signal timing modifications that would be possible after realignment, would improve intersection levels of service to LOS C, or better, would lessen the potential for head-on crashes between northbound and southbound left turns, and would improve PM peak direction roadway levels of service on First Street and Bertha Street.

Kennedy Drive/Flagler Avenue. This intersection was identified as having calculated a PM peak period level of service of LOS F. Existing operations are poor at this intersection primarily because the signal timing favors north-south travel, comprised of about 470 approaching vehicles, with about 70% of total green time. East-west travel, including the equivalent of about 950 vehicles, receives only 30% of total green time. Modifying the signal timing to allow green time proportionate to approaching traffic volumes would improve the intersection level of service to LOS B and would

improve the Flagler Avenue peak direction roadway level of service to LOS C, or better, as already described.

RECOMMENDED IMPLEMENTATION TIMING

Based on the findings of this study, several components of the proposed diversion plans and other identified operational improvements are recommended for near-term or long-term implementation.

Near-Term Improvements

Near-term improvements would provide a significant and immediate level of service increase. Four near-term improvements, one of which is a component of Diversion Plan 1, and two of which should be considered components of both Diversion Plan 1 and Diversion Plan 2, were identified. The estimated total cost of the four near-term improvements is \$777,000.

Kennedy Drive/Flagler Avenue. Although not a part of either proposed diversion plan, modifying the traffic signal timing at this intersection would provide immediate Kennedy Drive/Flagler Avenue intersection and Flagler Avenue roadway level of service improvements. At an estimated cost of less than \$1,000, this improvement is recommended for immediate implementation.

Palm Avenue/Eisenhower Drive. The creation of a one-way pair with north- and westbound traffic on Palm Avenue and south- and eastbound traffic on Eisenhower Drive would remove the large southbound left-turn movement from the Palm Avenue/North Roosevelt Boulevard intersection, improving intersection levels of service at that intersection and peak direction roadway levels of service on Truman Avenue. By improving northbound levels of service on First Street, and by improving Palm Avenue as an exit route from Old Town, this improvement alone could be as effective as Diversion Plan 1 at shifting traffic volumes away from Truman Avenue. At an estimated cost of about \$125,000, this improvement is considered one of the most cost-effective improvements reviewed in this study and is recommended for immediate implementation.

First Street/Bertha Street/Flagler Avenue. First Street/Bertha Street roadway realignment and traffic signal phasing and timing modifications would provide First Street/Bertha Street/Flagler Avenue intersection and First Street/Bertha Street roadway level of service improvements and would lessen the potential for head-on crashes between northbound and southbound left turns. This improvement is a component of both proposed diversion plans and has been repeatedly identified

as a needed improvement in traffic studies. Although one of the most expensive improvements reviewed in this study, at \$540,000, this intersection's status as one of the major island crossroads and the importance of this improvement as part of any plan to divert traffic away from North Roosevelt Boulevard and Truman Avenue lead to the recommendation that design of this improvement and right-of-way acquisition should begin immediately with construction following.

Flagler Avenue. Roadway widening of the first 300 feet east of First Street to four lanes to match the existing four-lane section is recommended to improve roadway levels of service on Flagler Avenue. Roadway design should be coordinated with First Street/Bertha Street/Flagler Avenue intersection realignment. Widening this segment of Flagler Avenue to three lanes, with two eastbound lanes and one westbound lane, is a component of both proposed diversion plans. Widening to four lanes is recommended to accommodate AM peak direction traffic (westbound) and to allow improved flow into and out of the First Street/Bertha Street/Flagler Avenue intersection. The cost of widening Flagler Avenue to four lanes is estimated to be \$94,000. This improvement should be implemented in conjunction with First Street/Bertha Street/Flagler Avenue intersection realignment.

Long-Term Improvements

Long-term improvements include projects which, if implemented immediately, would not provide a significant level of service increase, or which do not address an existing operational deficiency, or which depend on the completion of additional studies or the implementation of other improvements. Three types of long-term improvements were identified, creation of one-way pairs, interconnection of traffic signals, and implementation of traffic calming measures.

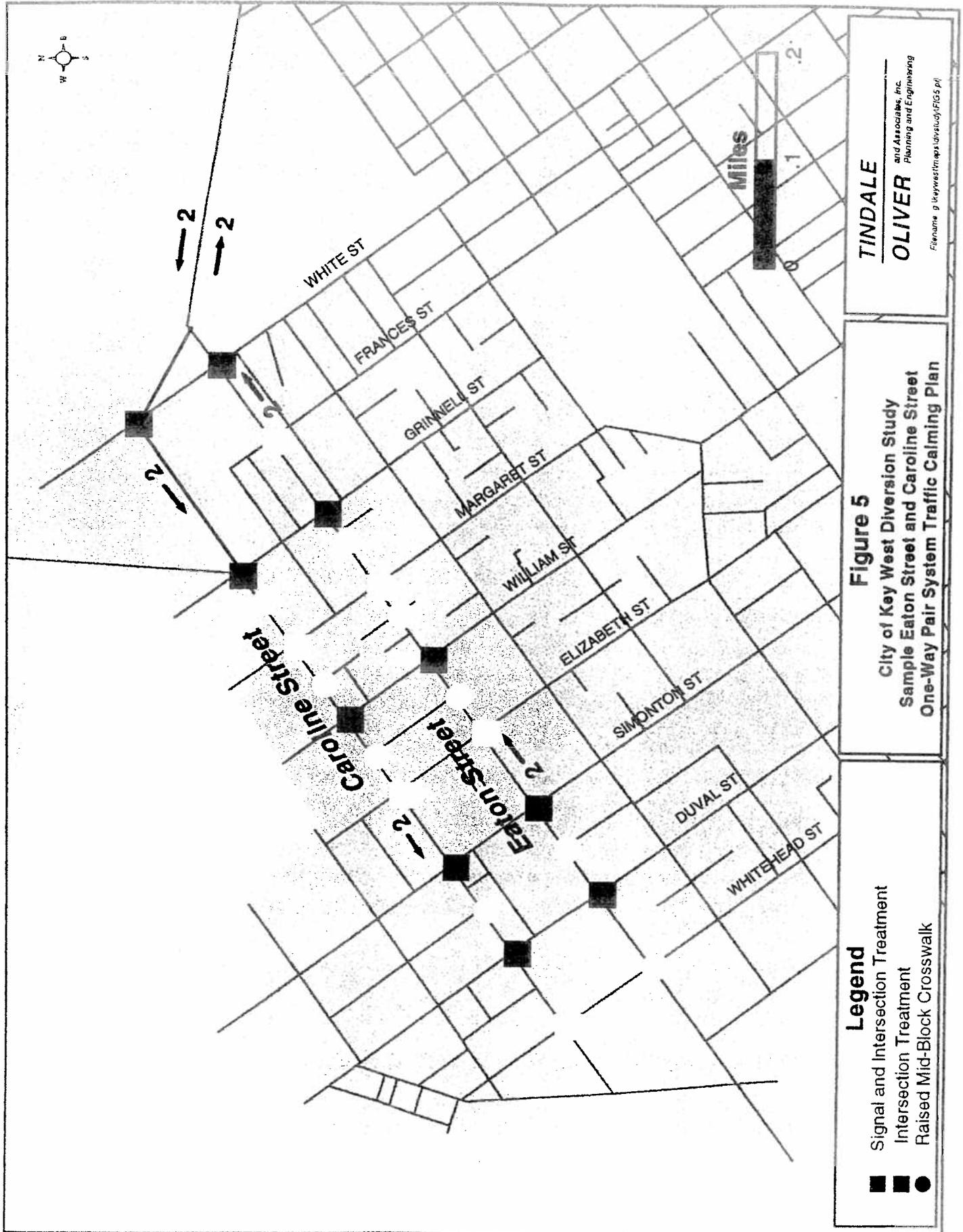
Caroline Street/Eaton Street. In addition to the Palm Avenue/Eisenhower Drive one-way pair recommended for near-term implementation, the creation of a one-way pair with westbound traffic on Caroline Street and eastbound traffic on Eaton Street is recommended for consideration over the long-term. This one-way pair is a component of Diversion Plan 1 and would improve traffic flow in northern Old Town by eliminating some of the conflicting mid-block and intersection turning movements. The reduction in conflicting turning movements at intersections could result in a

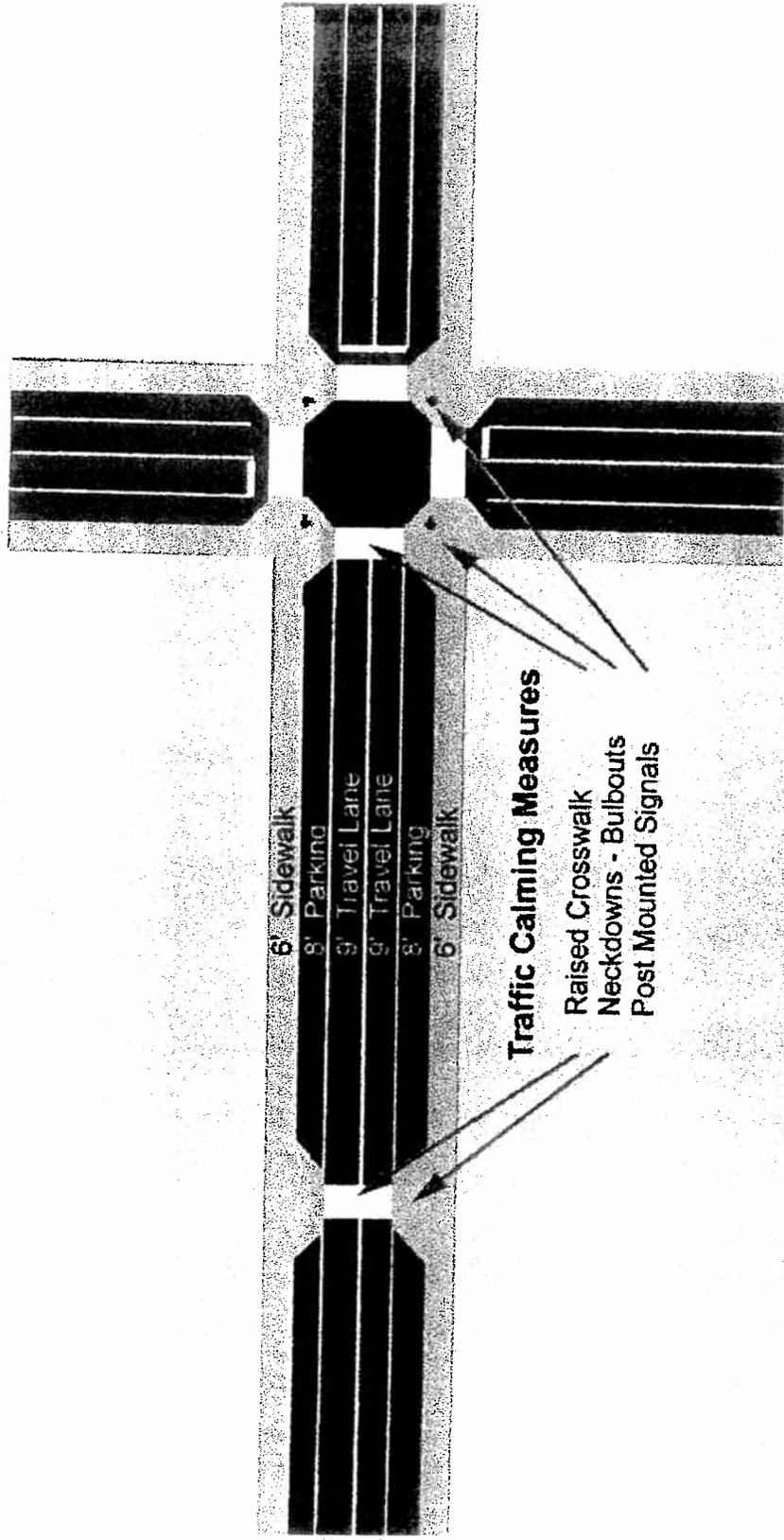
reduction in the number of crashes and shorter mid-block and intersection delays. Shorter delays, in turn, would lead to increased average travel speeds, but not necessarily increased running speeds. If the one-way pair results in increased running speeds, then traffic calming measures could be implemented (see Appendix C).

Traffic calming measures are roadway design features that attempt to reduce the ability of motorists to travel at unlawful or unsafe speeds, while maintaining good average travel speeds. Traffic calming measures can also create a streetscape that is safer for and more conducive to non-motorized travel. The design of traffic calming measures should take into account the unique needs of a particular roadway and community. The City of Key West Engineering and Planning Departments should review and recommend the appropriate measures to protect the interest of all roadway users, whether they travel by motor vehicle, bicycle, or foot. Figure 5, Sample Eaton Street and Caroline Street One-Way Pair System Traffic Calming Plan, and Figure 6, Traffic Calming Measures, present traffic calming options that would be typical of a one-way pair with significant pedestrian volumes.

Creation of a Caroline Street/Eaton Street one-way pair would tend to equalize traffic volumes on the two streets, reducing volumes on Eaton Street and increasing volumes on Caroline Street. Implementation of a Caroline Street/Eaton Street one-way pair could occur either as a remedy to poor intersection or roadway levels of service along Eaton Street, or, in combination with traffic calming measures, as an element of a pedestrian- and bicycle-friendly streetscape.

North Roosevelt Boulevard. Traffic signal interconnection was identified as a means of improving roadway levels of service along North Roosevelt Boulevard between First Street and Kennedy Drive. The progression of platoons of vehicles through a series of green traffic signals can improve average travel speeds without increasing maximum running speeds by coordinating traffic signals to turn green consistent to the desired maximum travel speed of approaching traffic. Interconnected traffic signals also increase acceptable gaps for side-street traffic and pedestrians, reduce noise, vehicle emissions, and energy consumption associated with idling and acceleration. This improvement is recommended as a study alternative for the North Roosevelt Boulevard Preliminary Design and Engineering (PD&E) study for which funding is currently being sought by FDOT.





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Figure 6
 City of Key West Diversion Study
 Traffic Calming Measures

APPENDIX A
DIVERSION ANALYSIS

APPENDIX A
DIVERSION ANALYSIS

Free-flow travel times along the existing routes and proposed diversion routes were calculated from the roadway lengths and posted speed limits summarized in the *Existing Conditions* technical memorandum. The free-flow travel times were then adjusted using the traditional Bureau of Public Roads formula with an additional term to represent intersection delay. The resulting formula is:

$$\text{Adjusted Travel Time} = T_o(1+0.15(v/c)^4+0.64(v/c)^2+0.04 \text{ minutes})$$

where: T_o = free-flow travel time, and
 v/c = volume-to-physical capacity ratio.

The adjusted travel times calculated using this formula relate to an average travel speed of 14.5 miles per hour (mph) for a cross-island trip from the Whitehead Street/Fleming Street intersection to the North Roosevelt Boulevard/US 1 intersection via Whitehead Street, Truman Avenue, and North Roosevelt Boulevard. This average travel speed closely matches the same route average travel speed of 14.7 mph reported in *Key West Travel Time and Delay Study* (FDOT, District VI, 1993).

Travel times along Truman Avenue and Duval Street were compared to travel times along the proposed diversion routes, with and without the proposed diversion plan improvements. Together with the travel distance along these routes, the travel times were used to determine the percentage increase in travel along the diversion routes with the diversion plan improvements using a procedure developed by the California Division of Highways, summarized by the following formula:

$$p = (50(d+0.5t)/((d-0.5t)^2+4.5))^{0.5}$$

where: p = the additional percentage of traffic (over 50%) likely to use the diversion route;
 d = the distance saved along the diversion route; and
 t = the time saved along the diversion route.

The following pages summarize the diversion analysis.

FLORIDA



DEPARTMENT OF TRANSPORTATION
DISTRICT VI

Key West
Travel Time and Delay Study

Technical Report

October, 1993

State Project No. 99006-1513
WPI No. 6590024



Walter H. Keller, Inc.
Consulting Engineers & Planners
10211 W. Sample Road, Suite 204
Coral Springs, Florida 33065-9740
(305) 755-3822

Table 5 - Travel Time and Delay Runs LOS Results

	February			March			April		
	Avg Travel Speed	LOS	Avg Run Speed	Avg Travel Speed	LOS	Avg Run Speed	Avg Travel Speed	LOS	Avg Run Speed
US 1									
SB - SR A1A to Fleming	16.0	D	24.2	15.0	D	24.0	16.3	D	24.1
SR A1A to Eisenhower	23.1	C	32.0	23.1	C	29.5	22.8	C	30.0
Eisenhower to Fleming	10.0	E	16.5	8.9	F	17.6	10.6	E	17.5
NB - Fleming to SR A1A	13.5	E	24.2	13.4	E	22.4	14.2	D	22.6
Fleming to Eisenhower	10.5	E	19.6	9.4	F	17.8	9.7	F	17.5
Eisenhower to SR A1A	15.9	D	27.6	17.2	D	25.8	18.7	C	26.7

Source: Walter H.Keller, Inc.

Note: Travel time and delay in Class II only.

$$\bar{x} = 14.733$$

An additional analysis was also performed to evaluate the impacts of using the Transitioning Class II and the Urban Class III designations. Table 6 indicates the Level of Service changes for different class designations. Note, only the segment between Eisenhower Drive and Fleming Street are under consideration as Class III. All other segments would be Transitioning Class II.

Table 6 - LOS Impacts with Class II Vs. Class III

	Average Speed			Transition Class II			Urban Class III		
	Feb	Mar	Apr	Feb	Mar	Apr	Feb	Mar	Apr
SB - Eisenhower to Fleming	10.0	8.9	10.6	E	F	E	D	E	D
NB - Fleming to Eisenhower	10.5	9.4	9.7	E	F	F	D	D	D

Source: Walter H.Keller, Inc.

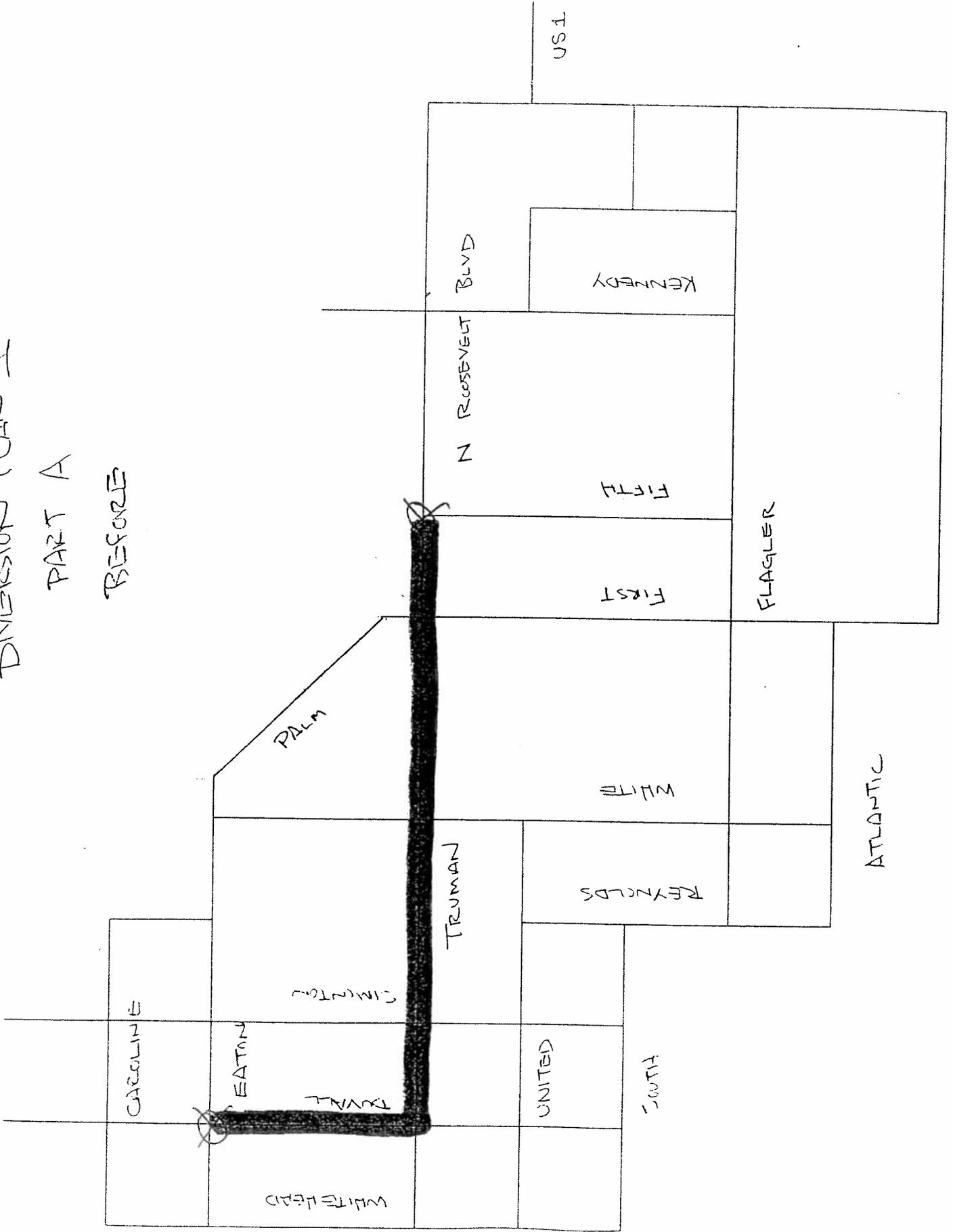
Note: All other segments are Class II Transitional.

Truman Annex Diversion Study						Calibration		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459			
1010030	0.34	25	0.442	0.816	0.9857			
1010040	0.15	25	0.5	0.36	0.5634			
1020020	0.1	30	0.89	0.2	0.7658			
1020030	0.34	30	0.562	0.68	0.9323			
1020040	0.17	30	0.877	0.34	0.9024			
1030010	0.45	30	0.878	0.9	1.5136			
1030020	0.34	30	0.83	0.68	1.2093			
1030030	0.38	30	0.5	0.76	0.9671			
1040010	0.08	30	0.577	0.16	0.4157	1	0.41573	0.08
1040020	0.1	30	0.733	0.2	0.5925	1	0.59253	0.1
1040030	0.19	30	0.74	0.38	0.7876	1	0.78756	0.19
1040040	0.32	30	0.654	0.64	0.9713	1	0.9713	0.32
1040050	0.23	30	1.646	0.46	2.7404	1	2.74045	0.23
1040060	0.31	30	0.975	0.62	1.3524	1	1.35244	0.31
1050010	0.23	40	0.835	0.345	0.8564	1	0.85638	0.23
1050020	0.08	45	0.835	0.1067	0.6007	1	0.60067	0.08
1050030	0.5	45	1.2	0.6667	1.8356	1	1.83563	0.5
1050040	0.27	45	1.097	0.36	1.2484	1	1.24838	0.27
1050050	1.23	45	0.635	1.64	1.9781	1	1.97806	1.23
1060020	0.1	25	0.269	0.24	0.3265			
1060030	0.28	30	0.318	0.56	0.6656			
1060040	0.23	25	0.609	0.552	0.8408			
1070020	0.1	25	0.405	0.24	0.3859			
1070030	0.28	25	0.752	0.672	1.1062			
1070040	0.23	25	0.436	0.552	0.7167			
1080020	0.54	25	0.834	1.296	1.8752			
1080030	0.29	40	1.254	0.435	1.6428			
1080040	0.71	45	1.101	0.9467	1.9711			
1080050	0.85	45	0.237	1.1333	1.2098			
1080060	0.13	45	0.608	0.1733	0.4535			
1100040	0.28	45	0.253	0.3733	0.4545			
2020010	0.09	30	0.2	0.18	0.2456			
2020020	0.23	25	0.789	0.552	1.0225			
2020030	0.23	25	0.865	0.552	1.1172	1	1.11722	0.23
2020040	0.08	25	0.869	0.192	0.7317	1	0.73173	0.08
2020050	0.1	25	0.766	0.24	0.6679	1	0.66792	0.1
2020060	0.08	25	0.712	0.192	0.5638	1	0.56385	0.08
2020070	0.1	25	0.49	0.24	0.4357			
2060020	0.14	25	0.54	0.336	0.5669			
2060025	0.09	25	0.54	0.216	0.4454			
2060030	0.23	25	0.546	0.552	0.7902			
2065010	0.33	30	0.5	0.66	0.8662			
2070010	0.39	40	1.061	0.585	1.4567			
						14.5455	16.5	4
						Speed (mph)	T route (Minutes)	Distance (miles)

DIVERSION PLAN 1

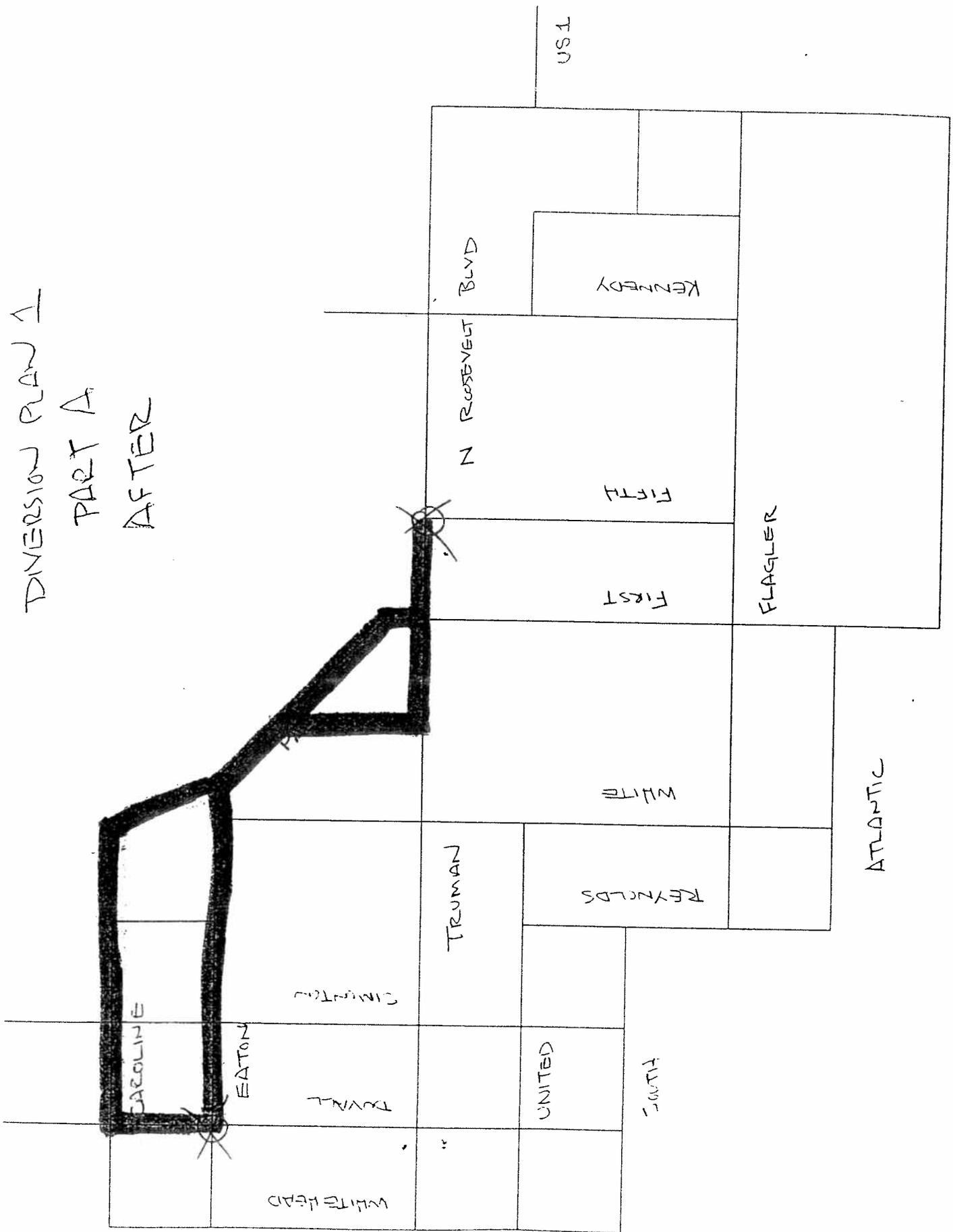
PART A

BEFORE



S ROOSEVELT BLVD

DIVERSION PLAN 1
 PART A
 AFTER



S ROOSEVELT BLVD

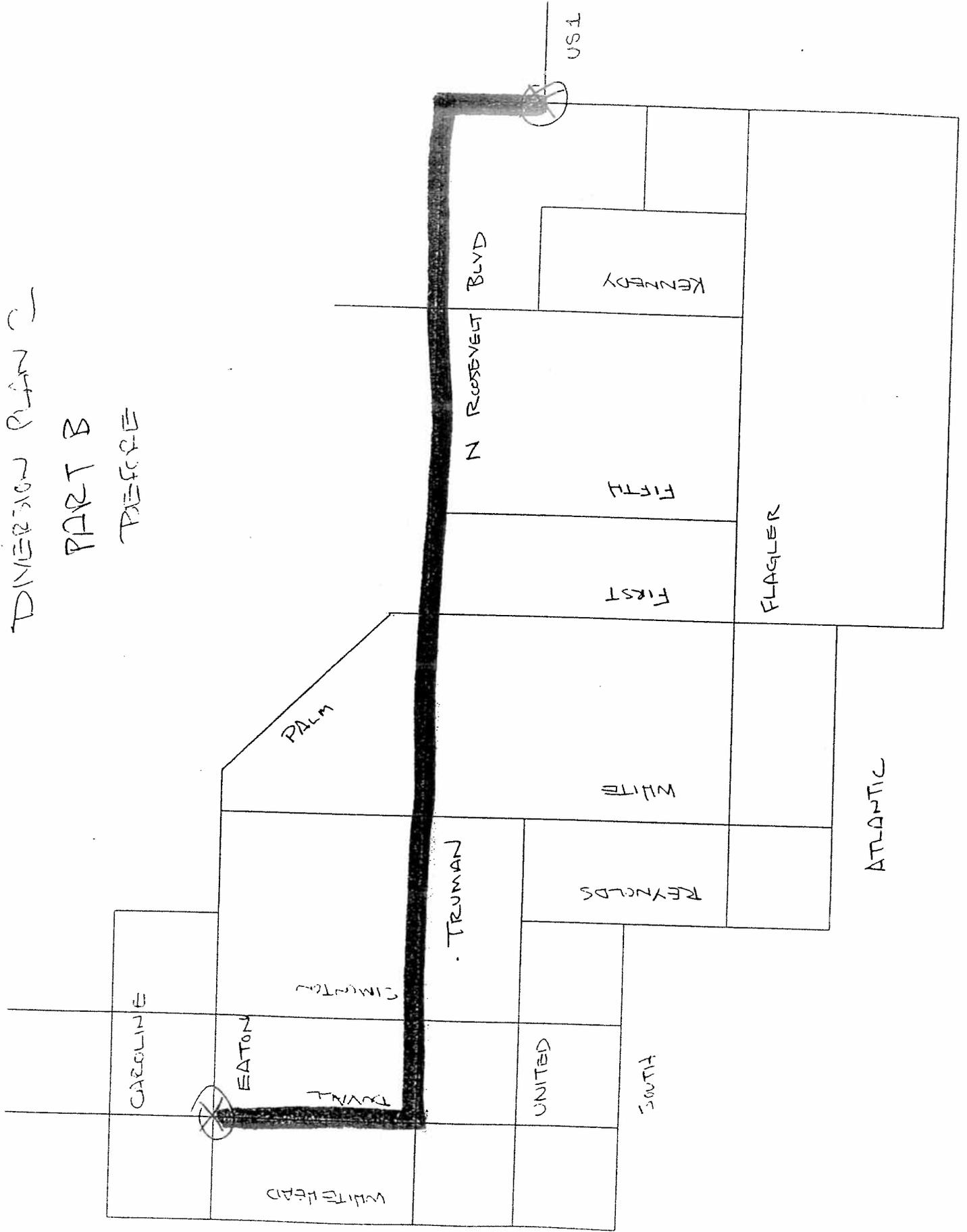
Truman Annex Diversion Study						Existing Route Before			Diversion Plan 1, Part A Before		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459						
1010030	0.34	25	0.442	0.816	0.9857				1	0.34591	0.1
1010040	0.15	25	0.5	0.36	0.5634				1	0.9857	0.34
1020020	0.1	30	0.89	0.2	0.7658				1	0.56338	0.15
1020030	0.34	30	0.562	0.68	0.9323				1	0.76577	0.1
1020040	0.17	30	0.877	0.34	0.9024				1	0.93232	0.34
1030010	0.45	30	0.878	0.9	1.5136				1	0.90241	0.17
1030020	0.34	30	0.83	0.68	1.2093				1	1.51359	0.45
1030030	0.38	30	0.5	0.76	0.9671				2	2.41861	0.68
1040010	0.08	30	0.577	0.16	0.4157				1	0.96713	0.38
1040020	0.1	30	0.733	0.2	0.5925	2	1.18505	0.2			
1040030	0.19	30	0.74	0.38	0.7876	2	1.57511	0.38			
1040040	0.32	30	0.654	0.64	0.9713	2	1.9426	0.64			
1040050	0.23	30	1.646	0.46	2.7404	2	5.4809	0.46			
1040060	0.31	30	0.975	0.62	1.3524	2	2.70489	0.62			
1050010	0.23	40	0.835	0.345	0.8564	2	1.71276	0.46	1	1.35244	0.31
1050020	0.08	45	0.835	0.1067	0.6007	2	1.20134	0.16	2	1.71276	0.46
1050030	0.5	45	1.2	0.6667	1.8356				2	1.20134	0.16
1050040	0.27	45	1.097	0.36	1.2484						
1050050	1.23	45	0.635	1.64	1.9781						
1060020	0.1	25	0.269	0.24	0.3265						
1060030	0.28	30	0.318	0.56	0.6656						
1060040	0.23	25	0.609	0.552	0.8408						
1070020	0.1	25	0.405	0.24	0.3859						
1070030	0.28	25	0.752	0.672	1.1062						
1070040	0.23	25	0.436	0.552	0.7167						
1080020	0.54	25	0.834	1.296	1.8752						
1080030	0.29	40	1.254	0.435	1.6428						
1080040	0.71	45	1.101	0.9467	1.9711						
1080050	0.85	45	0.237	1.1333	1.2098						
1080060	0.13	45	0.608	0.1733	0.4535						
1100040	0.28	45	0.253	0.3733	0.4545						
2020010	0.09	30	0.2	0.18	0.2456						
2020020	0.23	25	0.789	0.552	1.0225						
2020030	0.23	25	0.865	0.552	1.1172	2	2.23444	0.46			
2020040	0.08	25	0.869	0.192	0.7317	2	1.46345	0.16			
2020050	0.1	25	0.766	0.24	0.6679	2	1.33584	0.2			
2020060	0.08	25	0.712	0.192	0.5638	2	1.12769	0.16			
2020070	0.1	25	0.49	0.24	0.4357						
2060020	0.14	25	0.54	0.336	0.5669				1	0.43574	0.1
2060025	0.09	25	0.54	0.216	0.4454						
2060030	0.23	25	0.546	0.552	0.7902						
2065010	0.33	30	0.5	0.66	0.8662						
2070010	0.39	40	1.061	0.585	1.4567				1	0.86619	0.33
						10.6	22	3.9	16.4	15	4.1
						Speed (mph)	T route (Minutes)	Distance (miles)	Speed (mph)	T route (Minutes)	Distance (miles)

Time Savings = 7
Distance Savings = -0.2
Potential Shift = 39%

Truman Annex Diversion Study						Existing Route Before			Diversion Plan 1, Part A After		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459				1	0.28826	0.1
1010030	0.34	25	0.442	0.816	0.9857				1	0.82142	0.34
1010040	0.15	25	0.5	0.36	0.5634				1	0.46948	0.15
1020020	0.1	30	0.89	0.2	0.7658				1	0.63814	0.1
1020030	0.34	30	0.562	0.68	0.9323				1	0.77693	0.34
1020040	0.17	30	0.877	0.34	0.9024				1	0.75201	0.17
1030010	0.45	30	0.878	0.9	1.5136				1	1.26133	0.45
1030020	0.34	30	0.83	0.68	1.2093				2	2.41861	0.68
1030030	0.38	30	0.5	0.76	0.9671				1	0.80594	0.38
1040010	0.08	30	0.577	0.16	0.4157						
1040020	0.1	30	0.733	0.2	0.5925	2	1.18505	0.2			
1040030	0.19	30	0.74	0.38	0.7876	2	1.57511	0.38			
1040040	0.32	30	0.654	0.64	0.9713	2	1.9426	0.64			
1040050	0.23	30	1.646	0.46	2.7404	2	5.4809	0.46			
1040060	0.31	30	0.975	0.62	1.3524	2	2.70489	0.62	1	1.12704	0.31
1050010	0.23	40	0.835	0.345	0.8564	2	1.71276	0.46	2	1.71276	0.46
1050020	0.08	45	0.835	0.1067	0.6007	2	1.20134	0.16	2	1.20134	0.16
1050030	0.5	45	1.2	0.6667	1.8356						
1050040	0.27	45	1.097	0.36	1.2484						
1050050	1.23	45	0.635	1.64	1.9781						
1060020	0.1	25	0.269	0.24	0.3265						
1060030	0.28	30	0.318	0.56	0.6656						
1060040	0.23	25	0.609	0.552	0.8408						
1070020	0.1	25	0.405	0.24	0.3859						
1070030	0.28	25	0.752	0.672	1.1062						
1070040	0.23	25	0.436	0.552	0.7167						
1080020	0.54	25	0.834	1.296	1.8752						
1080030	0.29	40	1.254	0.435	1.6428						
1080040	0.71	45	1.101	0.9467	1.9711						
1080050	0.85	45	0.237	1.1333	1.2098						
1080060	0.13	45	0.608	0.1733	0.4535						
1100040	0.28	45	0.253	0.3733	0.4545						
2020010	0.09	30	0.2	0.18	0.2456						
2020020	0.23	25	0.789	0.552	1.0225						
2020030	0.23	25	0.865	0.552	1.1172	2	2.23444	0.46			
2020040	0.08	25	0.869	0.192	0.7317	2	1.46345	0.16			
2020050	0.1	25	0.766	0.24	0.6679	2	1.33584	0.2			
2020060	0.08	25	0.712	0.192	0.5638	2	1.12769	0.16			
2020070	0.1	25	0.49	0.24	0.4357				1	0.36312	0.1
2060020	0.14	25	0.54	0.336	0.5669						
2060025	0.09	25	0.54	0.216	0.4454						
2060030	0.23	25	0.546	0.552	0.7902						
2065010	0.33	30	0.5	0.66	0.8662				1	0.72182	0.33
2070010	0.39	40	1.061	0.585	1.4567						
						10.6	22	3.9	18.4	13.4	4.1
						Speed (mph)	T route (Minutes)	Distance (miles)	Speed (mph)	T route (Minutes)	Distance (miles)

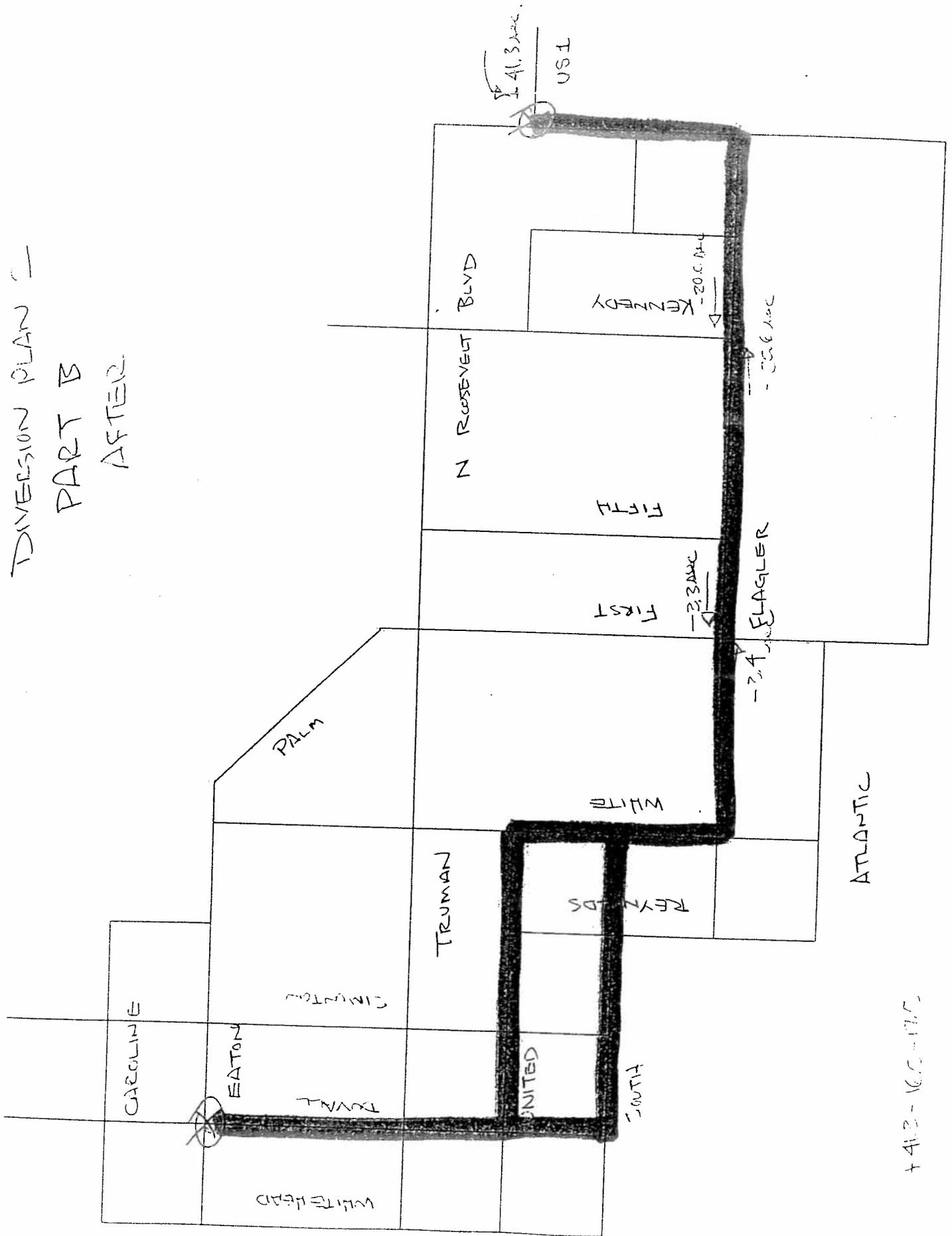
Time Savings = 8.6
Distance Savings = -0.2
Potential Shift = 41%

DIVISION PLAN C
PART B
PRELIM



C O O L L E C T

DIVERSION PLAN I
PART B
AFTER



41.3 - 16.5 - 17.5

S ROOSEVELT BLVD

Truman Annex Diversion Study						Existing Route Before			Diversion Plan 2, Part B Before		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459						
1010030	0.34	25	0.442	0.816	0.9857						
1010040	0.15	25	0.5	0.36	0.5634						
1020020	0.1	30	0.89	0.2	0.7658						
1020030	0.34	30	0.562	0.68	0.9323						
1020040	0.17	30	0.877	0.34	0.9024						
1030010	0.45	30	0.878	0.9	1.5136						
1030020	0.34	30	0.83	0.68	1.2093						
1030030	0.38	30	0.5	0.76	0.9671						
1040010	0.08	30	0.577	0.16	0.4157						
1040020	0.1	30	0.733	0.2	0.5925	2	1.18505	0.2			
1040030	0.19	30	0.74	0.38	0.7876	2	1.57511	0.38			
1040040	0.32	30	0.654	0.64	0.9713	2	1.9426	0.64			
1040050	0.23	30	1.646	0.46	2.7404	2	5.4809	0.46			
1040060	0.31	30	0.975	0.62	1.3524	2	2.70489	0.62			
1050010	0.23	40	0.835	0.345	0.8564	2	1.71276	0.46			
1050020	0.08	45	0.835	0.1067	0.6007	2	1.20134	0.16			
1050030	0.5	45	1.2	0.6667	1.8356	2	3.67125	1			
1050040	0.27	45	1.097	0.36	1.2484	2	2.49677	0.54			
1050050	1.23	45	0.635	1.64	1.9781	2	3.95612	2.46			
1060020	0.1	25	0.269	0.24	0.3265						
1060030	0.28	30	0.318	0.56	0.6656				1	0.3265	0.1
1060040	0.23	25	0.609	0.552	0.8408				1	0.66558	0.28
1070020	0.1	25	0.405	0.24	0.3859				1	0.84075	0.23
1070030	0.28	25	0.752	0.672	1.1062				1	0.38594	0.1
1070040	0.23	25	0.436	0.552	0.7167				1	1.10616	0.28
1080020	0.54	25	0.834	1.296	1.8752				1	0.71665	0.23
1080030	0.29	40	1.254	0.435	1.6428				2	3.75041	1.08
1080040	0.71	45	1.101	0.9467	1.9711				2	3.28552	0.58
1080050	0.85	45	0.237	1.1333	1.2098				2	3.94227	1.42
1080060	0.13	45	0.608	0.1733	0.4535				2	2.41964	1.7
1100040	0.28	45	0.253	0.3733	0.4545				2	0.90694	0.26
2020010	0.09	30	0.2	0.18	0.2456				2	0.90906	0.56
2020020	0.23	25	0.789	0.552	1.0225				1	0.24564	0.09
2020030	0.23	25	0.865	0.552	1.1172	2	2.23444	0.46	2	2.045	0.46
2020040	0.08	25	0.869	0.192	0.7317	2	1.46345	0.16	2	2.23444	0.46
2020050	0.1	25	0.766	0.24	0.6679	2	1.33584	0.2	2	1.46345	0.16
2020060	0.08	25	0.712	0.192	0.5638	2	1.12769	0.16	2	1.33584	0.2
2020070	0.1	25	0.49	0.24	0.4357				2	1.12769	0.16
2060020	0.14	25	0.54	0.336	0.5669						
2060025	0.09	25	0.54	0.216	0.4454				2	1.13382	0.28
2060030	0.23	25	0.546	0.552	0.7902				1	0.44538	0.09
2065010	0.33	30	0.5	0.66	0.8662						
2070010	0.39	40	1.061	0.585	1.4567						
						14.8	32.1	7.9	17.8	29.3	8.7
						Speed (mph)	T route (Minutes)	Distance (miles)	Speed (mph)	T route (Minutes)	Distance (miles)
						Time Savings =		2.8			
						Distance Savings =		-0.8			
						Potential Shift =		10%			

Truman Annex Diversion Study

Truman Annex Diversion Study						Existing Route Before			Diversion Plan 2, Part B After		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459						
1010030	0.34	25	0.442	0.816	0.9857						
1010040	0.15	25	0.5	0.36	0.5634						
1020020	0.1	30	0.89	0.2	0.7658						
1020030	0.34	30	0.562	0.68	0.9323						
1020040	0.17	30	0.877	0.34	0.9024						
1030010	0.45	30	0.878	0.9	1.5136						
1030020	0.34	30	0.83	0.68	1.2093						
1030030	0.38	30	0.5	0.76	0.9671						
1040010	0.08	30	0.577	0.16	0.4157						
1040020	0.1	30	0.733	0.2	0.5925	2	1.18505	0.2			
1040030	0.19	30	0.74	0.38	0.7876	2	1.57511	0.38			
1040040	0.32	30	0.654	0.64	0.9713	2	1.9426	0.64			
1040050	0.23	30	1.646	0.46	2.7404	2	5.4809	0.46			
1040060	0.31	30	0.975	0.62	1.3524	2	2.70489	0.62			
1050010	0.23	40	0.835	0.345	0.8564	2	1.71276	0.46			
1050020	0.08	45	0.835	0.1067	0.6007	2	1.20134	0.16			
1050030	0.5	45	1.2	0.6667	1.8356	2	3.67125	1			
1050040	0.27	45	1.097	0.36	1.2484	2	2.49677	0.54			
1050050	1.23	45	0.635	1.64	1.9781	2	3.95612	2.46			
1060020	0.1	25	0.269	0.24	0.3265						
1060030	0.28	30	0.318	0.56	0.6656				1	0.27208	0.1
1060040	0.23	25	0.609	0.552	0.8408				1	0.55465	0.28
1070020	0.1	25	0.405	0.24	0.3859				1	0.70063	0.23
1070030	0.28	25	0.752	0.672	1.1062				1	0.32162	0.1
1070040	0.23	25	0.436	0.552	0.7167				1	0.9218	0.28
1080020	0.54	25	0.834	1.296	1.8752				1	0.59721	0.23
1080030	0.29	40	1.254	0.435	1.6428				2	3.75041	1.08
1080040	0.71	45	1.101	0.9467	1.9711				2	3.28552	0.58
1080050	0.85	45	0.237	1.1333	1.2098				2	3.94227	1.42
1080060	0.13	45	0.608	0.1733	0.4535				2	2.41964	1.7
1100040	0.28	45	0.253	0.3733	0.4545				2	0.90694	0.26
2020010	0.09	30	0.2	0.18	0.2456				2	0.90906	0.56
2020020	0.23	25	0.789	0.552	1.0225				1	0.2047	0.09
2020030	0.23	25	0.865	0.552	1.1172	2	2.23444	0.46	2	2.045	0.46
2020040	0.08	25	0.869	0.192	0.7317	2	1.46345	0.16	2	2.23444	0.46
2020050	0.1	25	0.766	0.24	0.6679	2	1.33584	0.2	2	1.46345	0.16
2020060	0.08	25	0.712	0.192	0.5638	2	1.12769	0.16	2	1.33584	0.2
2020070	0.1	25	0.49	0.24	0.4357				2	1.12769	0.16
2060020	0.14	25	0.54	0.336	0.5669						
2060025	0.09	25	0.54	0.216	0.4454				2	1.13382	0.28
2060030	0.23	25	0.546	0.552	0.7902				1	0.37115	0.09
2065010	0.33	30	0.5	0.66	0.8662						
2070010	0.39	40	1.061	0.585	1.4567						

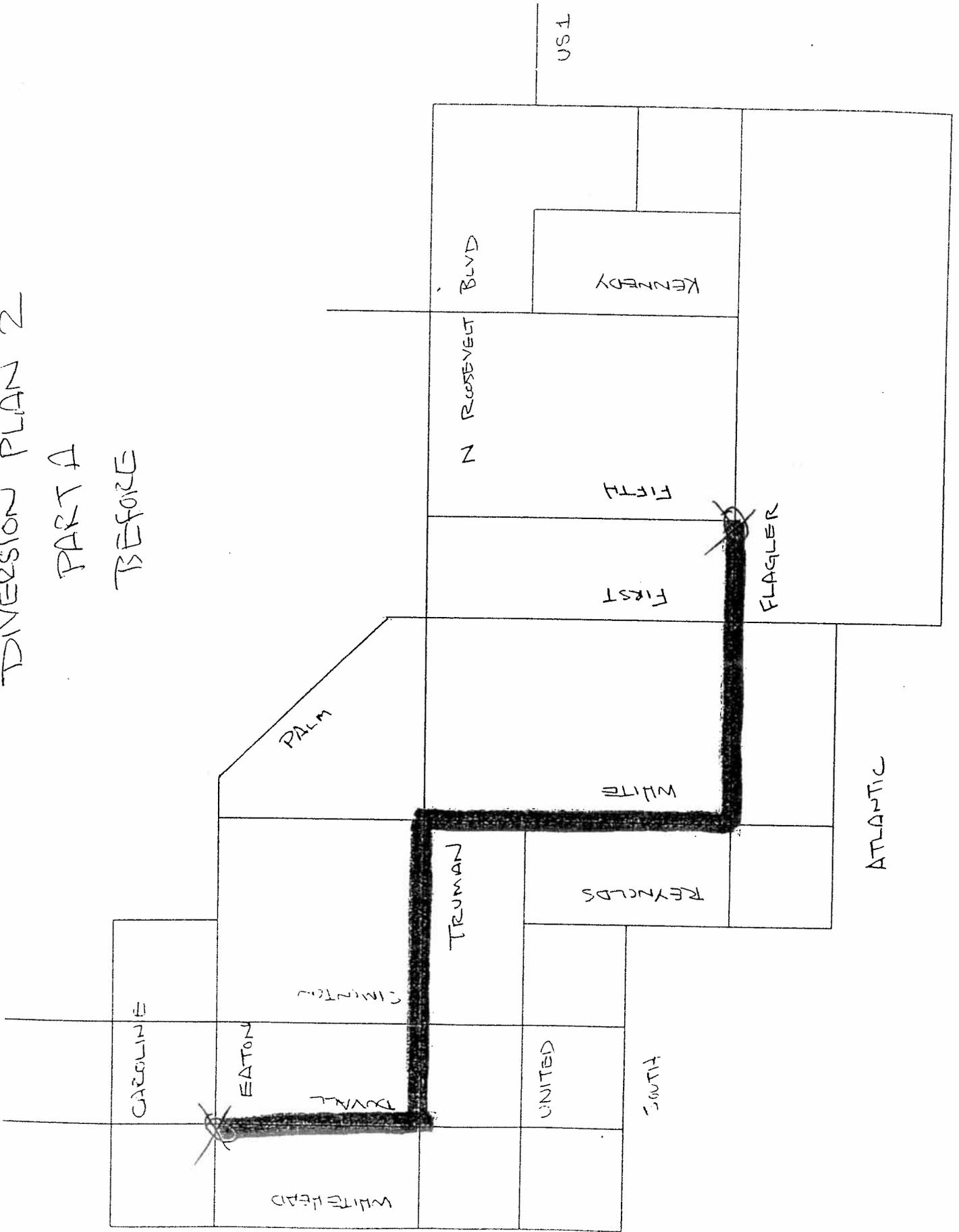
14.8	32.1	7.9	18.4	28.3	8.7
Speed (mph)	T route (Minutes)	Distance (miles)	Speed (mph)	T route (Minutes)	Distance (miles)

Time Savings = 3.8
 Distance Savings = -0.8
 Potential Shift = 16%

DIVERSION PLAN 2

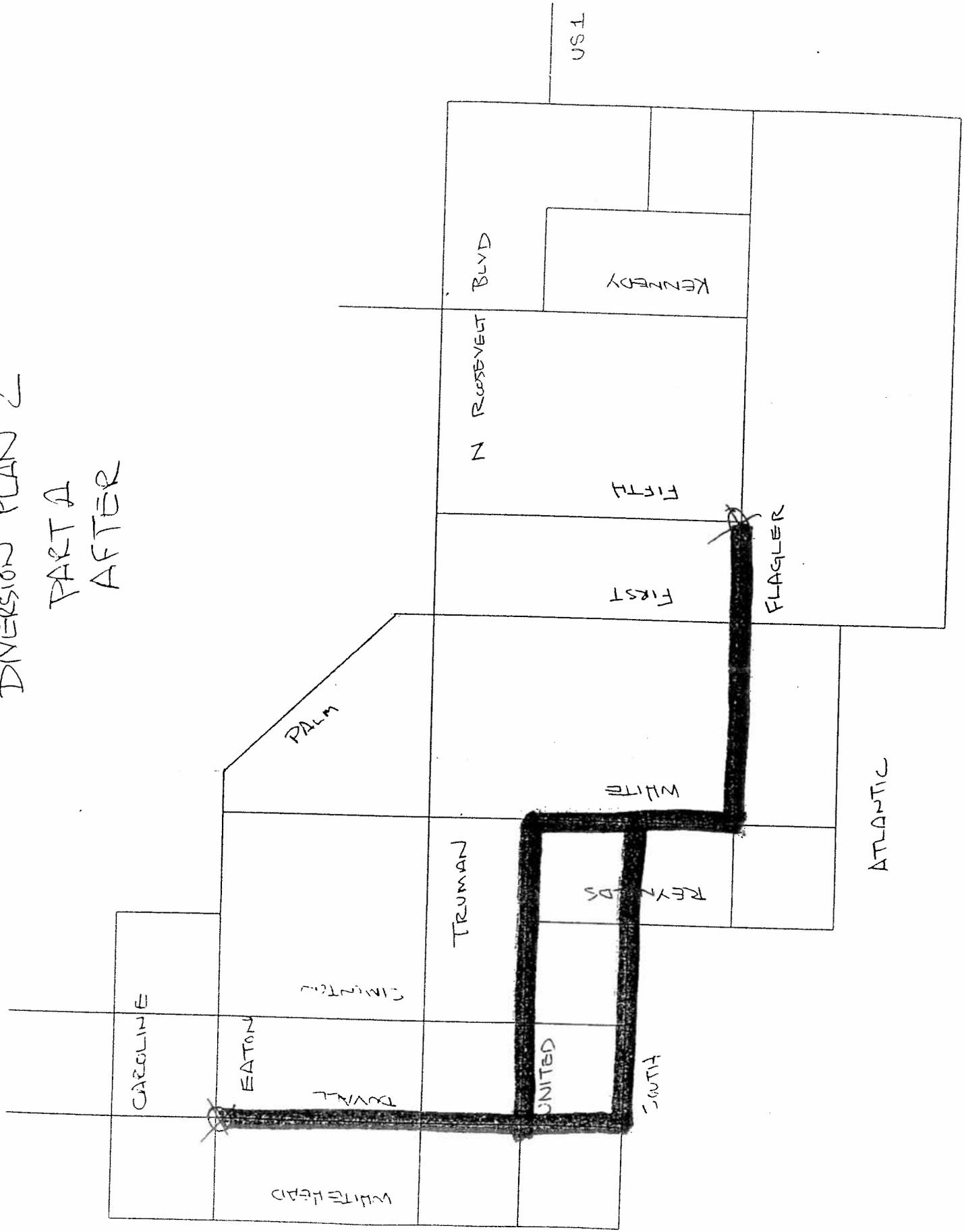
PART A

BEFORE



S ROOSEVELT BLVD

DIVERSION PLAN 2
PART A
AFTER



S ROOSEVELT BLVD

Truman Annex Diversion Study						Existing Route Before			Diversion Plan 2, Part A Before		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459						
1010030	0.34	25	0.442	0.816	0.9857						
1010040	0.15	25	0.5	0.36	0.5634						
1020020	0.1	30	0.89	0.2	0.7658						
1020030	0.34	30	0.562	0.68	0.9323						
1020040	0.17	30	0.877	0.34	0.9024						
1030010	0.45	30	0.878	0.9	1.5136						
1030020	0.34	30	0.83	0.68	1.2093						
1030030	0.38	30	0.5	0.76	0.9671						
1040010	0.08	30	0.577	0.16	0.4157						
1040020	0.1	30	0.733	0.2	0.5925	2	1.18505	0.2			
1040030	0.19	30	0.74	0.38	0.7876	2	1.57511	0.38			
1040040	0.32	30	0.654	0.64	0.9713	2	1.9426	0.64			
1040050	0.23	30	1.646	0.46	2.7404						
1040060	0.31	30	0.975	0.62	1.3524						
1050010	0.23	40	0.835	0.345	0.8564						
1050020	0.08	45	0.835	0.1067	0.6007						
1050030	0.5	45	1.2	0.6667	1.8356						
1050040	0.27	45	1.097	0.36	1.2484						
1050050	1.23	45	0.635	1.64	1.9781						
1060020	0.1	25	0.269	0.24	0.3265						
1060030	0.28	30	0.318	0.56	0.6656				1	0.3265	0.1
1060040	0.23	25	0.609	0.552	0.8408				1	0.66558	0.28
1070020	0.1	25	0.405	0.24	0.3859				1	0.84075	0.23
1070030	0.28	25	0.752	0.672	1.1062				1	0.38594	0.1
1070040	0.23	25	0.436	0.552	0.7167				1	1.10616	0.28
1080020	0.54	25	0.834	1.296	1.8752	2	3.75041	1.08	1	0.71665	0.23
1080030	0.29	40	1.254	0.435	1.6428	2	3.28552	0.58	2	3.75041	1.08
1080040	0.71	45	1.101	0.9467	1.9711				2	3.28552	0.58
1080050	0.85	45	0.237	1.1333	1.2098						
1080060	0.13	45	0.608	0.1733	0.4535						
1100040	0.28	45	0.253	0.3733	0.4545						
2020010	0.09	30	0.2	0.18	0.2456						
2020020	0.23	25	0.789	0.552	1.0225				1	0.24564	0.09
2020030	0.23	25	0.865	0.552	1.1172	2	2.23444	0.46	2	2.045	0.46
2020040	0.08	25	0.869	0.192	0.7317	2	1.46345	0.16	2	2.23444	0.46
2020050	0.1	25	0.766	0.24	0.6679	2	1.33584	0.2	2	1.46345	0.16
2020060	0.08	25	0.712	0.192	0.5638	2	1.12769	0.16	2	1.33584	0.2
2020070	0.1	25	0.49	0.24	0.4357				2	1.12769	0.16
2060020	0.14	25	0.54	0.336	0.5669	2	1.13382	0.28			
2060025	0.09	25	0.54	0.216	0.4454	2	0.89076	0.18	2	1.13382	0.28
2060030	0.23	25	0.546	0.552	0.7902	2	1.58031	0.46	1	0.44538	0.09
2065010	0.33	30	0.5	0.66	0.8662						
2070010	0.39	40	1.061	0.585	1.4567						

13.4	21.5	4.8	13.6	21.1	4.8
Speed (mph)	T route (Minutes)	Distance (miles)	Speed (mph)	T route (Minutes)	Distance (miles)

Time Savings = 0.4
Distance Savings = 0
Potential Shift = 5%

Truman Annex Diversion Study						Existing Route Before			Diversion Plan 2, Part A After		
Link ID	Length (miles)	Speed (mph)	Exist V:P Cap	T naught (Minutes)	T exist (Minutes)	Links in Route	T route (Minutes)	Distance (miles)	Links in Route	T route (Minutes)	Distance (miles)
1010020	0.1	25	0.32	0.24	0.3459						
1010030	0.34	25	0.442	0.816	0.9857						
1010040	0.15	25	0.5	0.36	0.5634						
1020020	0.1	30	0.89	0.2	0.7658						
1020030	0.34	30	0.562	0.68	0.9323						
1020040	0.17	30	0.877	0.34	0.9024						
1030010	0.45	30	0.878	0.9	1.5136						
1030020	0.34	30	0.83	0.68	1.2093						
1030030	0.38	30	0.5	0.76	0.9671						
1040010	0.08	30	0.577	0.16	0.4157						
1040020	0.1	30	0.733	0.2	0.5925						
1040030	0.19	30	0.74	0.38	0.7876	2	1.18505	0.2			
1040040	0.32	30	0.654	0.64	0.9713	2	1.57511	0.38			
1040050	0.23	30	1.646	0.46	2.7404	2	1.9426	0.64			
1040060	0.31	30	0.975	0.62	1.3524						
1050010	0.23	40	0.835	0.345	0.8564						
1050020	0.08	45	0.835	0.1067	0.6007						
1050030	0.5	45	1.2	0.6667	1.8356						
1050040	0.27	45	1.097	0.36	1.2484						
1050050	1.23	45	0.635	1.64	1.9781						
1060020	0.1	25	0.269	0.24	0.3265						
1060030	0.28	30	0.318	0.56	0.6656				1	0.27208	0.1
1060040	0.23	25	0.609	0.552	0.8408				1	0.55465	0.28
1070020	0.1	25	0.405	0.24	0.3859				1	0.70063	0.23
1070030	0.28	25	0.752	0.672	1.1062				1	0.32162	0.1
1070040	0.23	25	0.436	0.552	0.7167				1	0.9218	0.28
1080020	0.54	25	0.834	1.296	1.8752	2	3.75041	1.08	1	0.59721	0.23
1080030	0.29	40	1.254	0.435	1.6428	2	3.28552	0.58	2	3.75041	1.08
1080040	0.71	45	1.101	0.9467	1.9711				2	3.28552	0.58
1080050	0.85	45	0.237	1.1333	1.2098						
1080060	0.13	45	0.608	0.1733	0.4535						
1100040	0.28	45	0.253	0.3733	0.4545						
2020010	0.09	30	0.2	0.18	0.2456						
2020020	0.23	25	0.789	0.552	1.0225				1	0.2047	0.09
2020030	0.23	25	0.865	0.552	1.1172				2	2.045	0.46
2020040	0.08	25	0.869	0.192	0.7317	2	2.23444	0.46	2	2.23444	0.46
2020050	0.1	25	0.766	0.24	0.6679	2	1.46345	0.16	2	1.46345	0.16
2020060	0.08	25	0.712	0.192	0.5638	2	1.33584	0.2	2	1.33584	0.2
2020070	0.1	25	0.49	0.24	0.4357	2	1.12769	0.16	2	1.12769	0.16
2060020	0.14	25	0.54	0.336	0.5669	2	1.13382	0.28	2	1.13382	0.28
2060025	0.09	25	0.54	0.216	0.4454	2	0.89076	0.18	1	0.37115	0.09
2060030	0.23	25	0.546	0.552	0.7902	2	1.58031	0.46			
2065010	0.33	30	0.5	0.66	0.8662						
2070010	0.39	40	1.061	0.585	1.4567						
						13.4	21.5	4.8	14.2	20.3	4.8
						Speed (mph)	T route (Minutes)	Distance (miles)	Speed (mph)	T route (Minutes)	Distance (miles)
						Time Savings =			1.2		
						Distance Savings =			0		
						Potential Shift =			14%		

APPENDIX B
LEVEL OF SERVICE ANALYSIS

Eaton Street and Caroline Street Corridor LOS
1996 Volumes, Bi-Directional

Filenames

Mrn:	G:\KEYWESTDIVER.S04\EATOCARO\MRNB1.DBF	November 19, 1996
Analysis:	G:\KEYWESTDIVER.S04\EATOCARO\B1_96.DBF	November 19, 1996

Filedates

Date:	19-Nov-96
Time:	14:06:13

Id	Seg No.	On Street	From	To	Length	Lanes	Type	Perf_Sid	CS1	CS2	CAFT	No_sig	D_Fac	K100	Fyolim	Source	AADT
					Art Class	Sat Flow	PHF	%Turns	Area	Spd Limit	Arr Type	%No Pass	Ctrl Type	Sr Cyl	Len	Sr G.C	G:C Ratio
					Peak Vol	Vmt	VHT	Psmult	SvcCap	PCap	V:S CAP	V:P CAP	Spd1	Los1	Agg Seg #	Agg Spd	Agg Los
1010010	0	Caroline St	Whitehead St	Duval St	0.08	2	U	D	90002	0	5	1	0.568	0.088	30	TOA	2514
					0	1700	0.910	0	1	25	3	0	3	0.700			0.700
					221	18	0.0	1.00	1903	2095	0.116	0.105	0.00	A	0	0.00	A
1010020	0	Caroline St	Duval St	Simonton St	0.10	2	U	D	90003	0	5	1	0.568	0.088	30	TOA	3601
					0	1700	0.910	0	1	25	3	0	3	0.330			0.330
					317	32	0.0	1.00	883	988	0.359	0.320	0.00	B	0	0.00	B
1010030	0	Caroline St	Simonton St	Grinnell St	0.34	2	U	D	90005	0	5	1	0.568	0.088	30	TOA	4440
					0	1700	0.910	0	1	25	3	0	3	0.330			0.330
					391	133	0.0	1.00	883	988	0.442	0.395	0.00	B	0	0.00	B
1020010	1	Eaton St	Whitehead St	Duval St	0.08	2	U	D	90008	0	2	1	0.568	0.088	30	TOA	5071
					3	1750	0.900	0	1	30	3	0	3	NoSig			0.700
					446	36	2.2	1.00	1812	2157	0.246	0.206	16.36	C	1	12.95	D
1020020	1	Eaton St	Duval St	Simonton St	0.10	2	U	D	90011	0	2	1	0.568	0.088	30	TOA	10910
					3	1750	0.900	0	1	30	3	0	3	0.350			0.350
					960	96	18.7	1.00	736	1078	1.304	0.890	5.13	F	1	12.95	D
1020030	1	Eaton St	Simonton St	Grinnell St	0.34	2	U	D	90012	90041	2	1	0.568	0.088	30	TOA	10502
					3	1750	0.870	0	1	30	3	0	3	0.533			0.533
					924	314	13.8	1.00	1586	1642	0.583	0.562	22.75	B	1	12.95	D
1020040	1	Eaton St	Grinnell St	White St	0.17	2	U	D	90042	0	2	1	0.568	0.088	30	TOA	10514
					3	1750	0.950	0	2	30	3	0	3	0.635			0.635
					1717	292	22.3	1.00	1887	1956	0.910	0.877	13.09	C	1	12.95	D

Eaton Street and Caroline Street Corridor LOS
1996 Volumes, One-Way Traffic

FileNames

Mrm: G:\KEYWEST\DIVER.S04\EATOCAROWMRNO.DBF
 Analysis: G:\KEYWEST\DIVER.S04\EATOCAROIO96.DBF

FileDates

November 19, 1996
 November 19, 1996

Date: 19-Nov-96
 Time: 12:53:08

id	Seg No.	On Street	From	To	Length	Lanes	Type	Perf_Std	CS1	CS2	CAFT	No_sig	FyYbim	Source	ADT
					Art Class	Sat Flow	PHF	%Turns	Area	Spd Limit	Arr Type	%No Pass	Sr Len	Sr G.C	G.C Ratio
					Peak Vol	Vmt	VHT	Psmult	SvcCap	PCap	V:S CAP	V:P CAP	Agg Seg #	Agg Spd	Agg LOS
1010010W	98	Caroline St	Whitehead St	Duval St	0.08	2	0	D	0	0	2	1	1.000	0.088	5015
					3	1750	0.910	0	1	25	4	0	30	14.01	0.700
					441	35	2.5	1.00	2152	2450	0.205	0.180	98	14.01	C
1010020W	98	Caroline St	Duval St	Simonton St	0.10	2	0	D	0	0	2	1	1.000	0.088	8072
					3	1750	0.910	0	1	25	4	0	60	14.01	0.500
					710	71	6.2	1.00	1423	1750	0.499	0.405	98	14.01	C
1010030W	98	Caroline St	Simonton St	William St	0.17	2	0	D	0	0	2	1	1.000	0.088	8327
					3	1750	0.910	0	1	25	4	0	60	14.01	0.500
					733	125	8.0	1.00	1619	1750	0.453	0.418	98	14.01	C
1010040W	98	Caroline St	William St	Grinnell St	0.16	2	0	D	0	0	2	1	1.000	0.088	8654
					3	1750	0.910	0	1	25	4	0	60	14.01	0.500
					850	136	9.1	1.00	1606	1750	0.529	0.485	98	14.01	C
1010050W	98	Caroline St	Grinnell St	White St	0.17	2	0	D	0	0	2	1	1.000	0.088	15147
					3	1750	0.910	0	1	25	4	0	60	14.01	0.500
					1333	227	16.6	1.00	1619	1750	0.823	0.761	98	14.01	C
1020010E	99	Eaton St	Whitehead St	Duval St	0.08	2	0	D	0	0	2	1	1.000	0.088	15147
					3	1750	0.900	0	1	30	4	0	60	14.01	0.500
					231	18	1.5	1.00	1348	1750	0.171	0.132	99	17.29	C
1020020E	99	Eaton St	Duval St	Simonton St	0.10	2	0	D	0	0	2	1	1.000	0.088	15147
					3	1750	0.900	0	1	30	4	0	60	14.01	0.500
					577	58	4.3	1.00	1481	1750	0.389	0.329	99	17.29	C
1020030E	99	Eaton St	Simonton St	William St	0.17	2	0	D	0	0	2	1	1.000	0.088	6396
					3	1750	0.870	0	1	30	4	0	60	14.01	0.500
					563	96	5.3	1.00	1567	1750	0.359	0.321	99	17.29	C
1020040E	99	Eaton St	William St	Grinnell St	0.17	2	0	D	0	0	2	1	1.000	0.088	6396
					3	1750	0.950	0	2	30	4	0	60	14.01	0.500
					718	122	6.9	1.00	1712	1750	0.420	0.410	99	17.29	C

Id	Seg No.	On Street	From	To	Length	Lanes	Type	Perf_Sid	CS1	CS2	CAFT	No_sig	D_Fac	K100	Fywhlm	Source	AA DT
					Art Class	Sat Flow	PHF	%Turns	Area	Spd Limit	Arr Type	%No Pass	Ctrf Type	Sr Cyc Len	Cyc Len	Sr G:C	G:C Ratio
					Peak Vol	Vmt	VHT	Psmult	SvcCap	PCap	V:S CAP	V:P CAP	Spd1	Los1	Agg Seg #	Agg Spd	Agg Lg
1020050E	99	Eaton St	Grinnell St	White St	0.17	2	0	D	0	0	2	1	1.000	0.088			1109
					3	1750	0.950	0	2	30	4	0	1		60		0.60
					977	166	8.6	1.00	2077	2100	0.470	0.465	19.30	B	99	17.29	

Eaton Street and Caroline Street Corridor LOS
Estimated 2000 Volumes, One-Way Traffic

Filenames

Mrm: G:\KEYWESTDIVER.S04\EATOCAROIMRNO.DBF
Analysis: G:\KEYWESTDIVER.S04\EATOCAROI000.DBF

Filedates

November 19, 1996
November 19, 1996

Date: 19-Nov-96
Time: 12:58:17

Id	Seg No.	On Street	From	To	Length	Lanes	Type	Perf_Sid	CS1	CS2	CAFT	No_sig	D_Fac	FyVolm	Source	AADT	
					Art Class	Sat Flow	PHF	%Turns	Area	Spd Limit	Arr Type	%No Pass	Chf Type	Sr Cyclic Len	Sr Cyclic	G:C Ratio	
					Peak Vol	Vmt	VHT	Psmult	SvcCap	PCap	V:S CAP	V:P CAP	Spd1	Los1	Agg Seg #	Agg Spd	Agg Loe
1010010W	98	Caroline St	Whitehead St	Duval St	0.08	2	O	D	0	0	2	1	1.000	0.088	30	13.76	C
					3	1750	0.910	0	1	25	4	0	1	1.000	0.088	13.85	0.185
					455	36	2.6	1.00	2152	2450	0.211	0.185	13.85	C	98	13.76	0.700
1010020W	98	Caroline St	Duval St	Simonton St	0.10	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.910	0	1	25	4	0	1	1.000	0.088	11.23	0.418
					732	73	6.5	1.00	1423	1750	0.515	0.418	11.23	D	98	13.76	0.500
1010030W	98	Caroline St	Simonton St	William St	0.17	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.910	0	1	25	4	0	1	1.000	0.088	15.42	0.431
					755	128	8.3	1.00	1619	1750	0.467	0.431	15.42	C	98	13.76	0.500
1010040W	98	Caroline St	William St	Grinnell St	0.16	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.910	0	1	25	4	0	1	1.000	0.088	14.89	0.500
					876	140	9.4	1.00	1606	1750	0.545	0.500	14.89	C	98	13.76	0.500
1010050W	98	Caroline St	Grinnell St	White St	0.17	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.910	0	1	25	4	0	1	1.000	0.088	13.30	0.785
					1374	234	17.6	1.00	1619	1750	0.849	0.785	13.30	C	98	13.76	0.500
1020010E	99	Eaton St	Whitehead St	Duval St	0.08	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.900	0	1	30	4	0	1	1.000	0.088	11.88	0.136
					238	19	1.6	1.00	1348	1750	0.177	0.136	11.88	D	99	17.17	0.500
1020020E	99	Eaton St	Duval St	Simonton St	0.10	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.900	0	1	30	4	0	1	1.000	0.088	13.11	0.339
					594	59	4.5	1.00	1481	1750	0.401	0.339	13.11	C	99	17.17	0.500
1020030E	99	Eaton St	Simonton St	William St	0.17	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.870	0	1	30	4	0	1	1.000	0.088	18.00	0.331
					580	99	5.5	1.00	1567	1750	0.370	0.331	18.00	C	99	17.17	0.500
1020040E	99	Eaton St	William St	Grinnell St	0.17	2	O	D	0	0	2	1	1.000	0.088	60	13.76	C
					3	1750	0.950	0	2	30	4	0	1	1.000	0.088	17.75	0.423
					741	126	7.1	1.00	1712	1750	0.433	0.423	17.75	C	99	17.17	0.500

id	Seg No.	On Street	From	To	Length	Lanes	Type	Perf_Std	CS1	CS2	CAFT	No_sig	D_Fac	K100	Fyvolm	Source	AAAT
					Art Class	Sat Flow	PHF	%Turns	Area	Spd Limit	Arr Type	%No Pass	Sr Cyl	Los1	Cyc Len	Sr G:C	G:C Rat
					Peak Vol	Vmt	VHT	Psmult	SvcCap	PCap	V:S CAP	V:P CAP	Spd1	Los1	Agg Seg #	Agg Spd	Agg Lc
1020050E	99	Eaton St	Grinnell St	White St	0.17	2	0	D	0	0	2	1	1.000	0.088			1144
					3	1750	0.950	0	2	30	4	0	1		60		0.60
					1007	171	8.9	1.00	2077	2100	0.485	0.479	19.21	B	99	17.17	

Eaton Street and Caroline Street Corridor LOS
 Estimated 2005 Volumes, One-Way Traffic

Filenames

Mfn: G:\KEYWEST\DIVER.S04\EATOCAROIMRNO.DBF
 Analysis: G:\KEYWEST\DIVER.S04\EATOCAROI005.DBF

Filedates

November 19, 1996
 November 19, 1996

Date: 19-Nov-96
 Time: 13:05:32

Id	Seg No.	On Street	From	To	Length Art Class Peak Vol	Lanes Sat Flow Vmt	Type PHF VHT	Perf_Sid %Turns Psmult	CS1 Area SvcCap	CS2 Spd Limit V:SCAP	CAFT Arr Type V:S CAP	No_sig %No Pass V:P CAP	D_Fac Type Sr Spd1	K100 Cyc Len Los1	Fyvolm Cyc Len Agg Seg #	Source Sr G:C G:C Ratio	AADT Agg Lo	
																		D
1010010W	98	Caroline St	Whitehead St	Duval St	0.08	2	0	0	0	0	2	0	1	1.000	0.088	537	0.70	0.500
					3	1750	0.910	0	1	25	4	0	0	1	0.088	30	98	13.59
					473	38	2.7	1.00	2152	2450	0.220	0.193	14.07	C				
1010020W	98	Caroline St	Duval St	Simonton St	0.10	2	0	0	0	0	2	1	1.000	0.088	864	0.50	0.500	
					3	1750	0.910	0	1	25	4	0	0	1	0.088	60	98	13.59
					761	76	6.7	1.00	1423	1750	0.535	0.434	11.34	D				
1010030W	98	Caroline St	Simonton St	William St	0.17	2	0	0	0	0	2	1	1.000	0.088	891	0.50	0.500	
					3	1750	0.910	0	1	25	4	0	0	1	0.088	60	98	13.59
					785	133	8.6	1.00	1619	1750	0.485	0.448	15.47	C				
1010040W	98	Caroline St	William St	Grinnell St	0.16	2	0	0	0	0	2	1	1.000	0.088	1033	0.50	0.500	
					3	1750	0.910	0	1	25	4	0	0	1	0.088	60	98	13.59
					910	146	9.9	1.00	1606	1750	0.567	0.520	14.75	C				
1010050W	98	Caroline St	Grinnell St	White St	0.17	2	0	0	0	0	2	1	1.000	0.088	1622	0.50	0.500	
					3	1750	0.910	0	1	25	4	0	0	1	0.088	60	98	13.59
					1428	243	18.9	1.00	1619	1750	0.862	0.816	12.86	D				
1020010E	99	Eaton St	Whitehead St	Duval St	0.08	2	0	0	0	0	2	1	1.000	0.088	2809	0.500	0.500	
					3	1750	0.900	0	1	30	4	0	0	1	0.088	60	99	17.18
					247	20	1.6	1.00	1348	1750	0.183	0.141	12.50	D				
1020020E	99	Eaton St	Duval St	Simonton St	0.10	2	0	0	0	0	2	1	1.000	0.088	7017	0.500	0.500	
					3	1750	0.900	0	1	30	4	0	0	1	0.088	60	99	17.18
					617	62	4.7	1.00	1481	1750	0.417	0.352	13.19	C				
1020030E	99	Eaton St	Simonton St	William St	0.17	2	0	0	0	0	2	1	1.000	0.088	6850	0.500	0.500	
					3	1750	0.870	0	1	30	4	0	0	1	0.088	60	99	17.18
					603	102	5.7	1.00	1567	1750	0.385	0.344	17.89	C				
1020040E	99	Eaton St	William St	Grinnell St	0.17	2	0	0	0	0	2	1	1.000	0.088	8742	0.500	0.500	
					3	1750	0.950	0	2	30	4	0	0	1	0.088	60	99	17.18
					769	131	7.4	1.00	1712	1750	0.449	0.439	17.70	C				

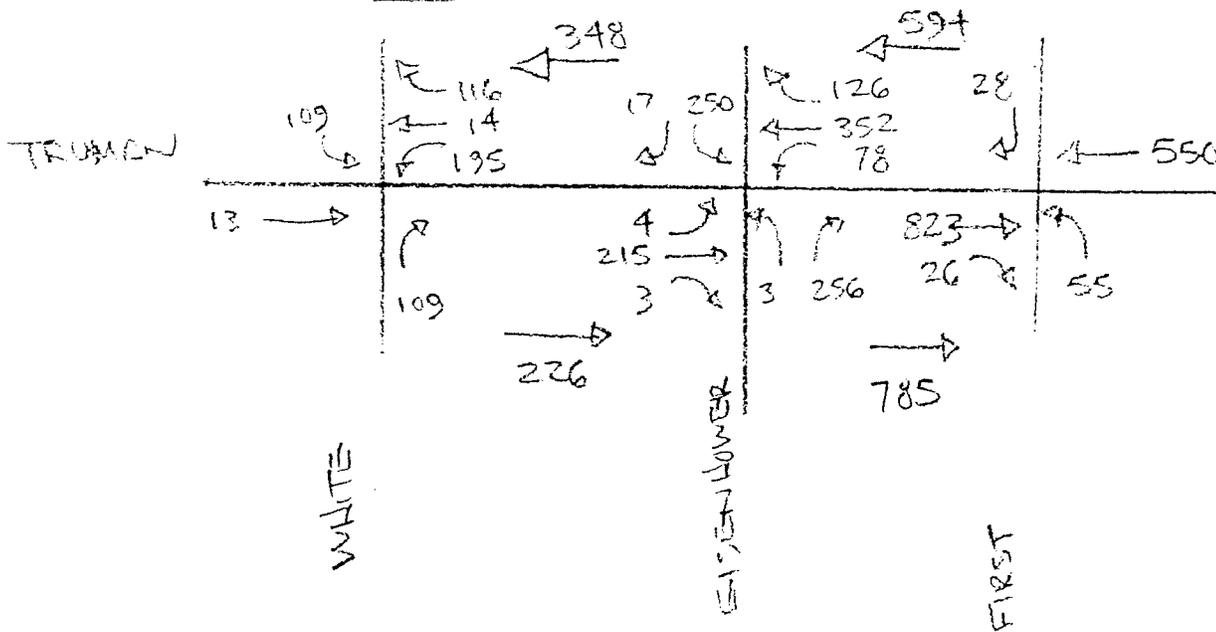
TINDALE-OLIVER & ASSOCIATES

1000 North Ashley Drive
 Suite 316
 TAMPA, FLORIDA 33602
 (813) 224-8862

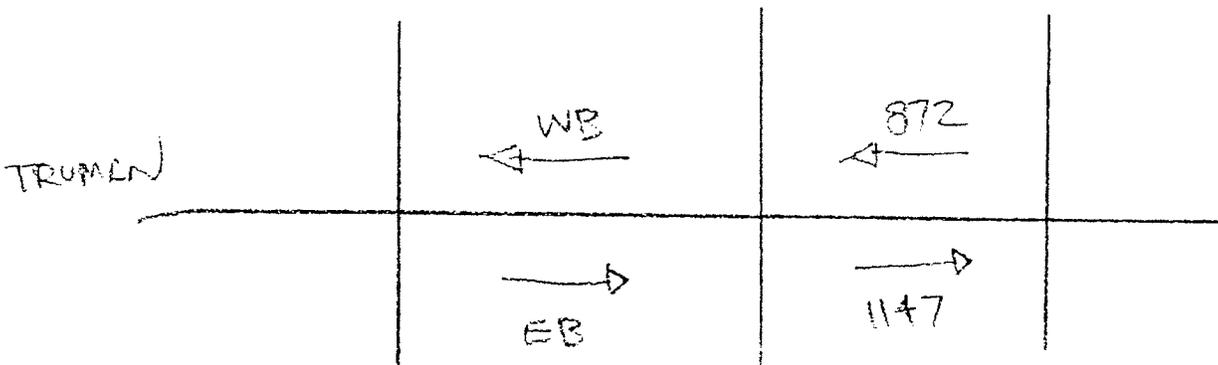
JOB KEY WEST DIVERSION
 SHEET NO. _____ OF _____
 CALCULATED BY TOC DATE 11-12-06
 CHECKED BY _____ DATE _____
 SCALE 0.5309:1

TRUMAN AVENUE - WHITE STREET TO BISHOPFLOWER ROAD
 DETOUR ADJUSTED PEAK HOUR VOLUMES

● DETOUR UN-ADJUSTED VOLUMES



● DETOUR ADJUSTED



$$WB = 348 \left(\frac{872}{594} \right) = \underline{\underline{511}}$$

$$EB = 511 \left(\frac{1147}{872} \right) = \underline{\underline{672}}$$

ART-PLAN 2.0

Arterial Level of Service Estimating Software
Based on Chapter 11 of the 1994 Highway Capacity Manual Update

Florida Department of Transportation August 1995

DESCRIPTION

Road Name: **Truman Avenue**
From: **White Street**
To: **Eisenhower Drive**
Peak Direction: **EB**
Off-peak Direction: **WB**
Study Time Period: **PM PEAK**
Analysis Date: **12 November 1996**
User Notes: **Existing Conditons**

TRAFFIC CHARACTERISTICS

AADT: 13,443
K FACTOR: 0.088
D FACTOR: 0.568
PHF: 0.860
ADJ. SATURATION FLOW RATE: 1,750
% TURNS FROM EXCLUSIVE LANES: 0

ROADWAY CHARACTERISTICS

THRU-LANES PEAK DIRECTION: 1
THRU LANES OFF-PEAK DIRECTION: 1
URBAN, TRANSITIONING, OR
RURAL DEVELOPED (U/T/R): U
ARTERIAL CLASS: 3 (1, 2, or 3)
FREE FLOW SPEED (mph): 30 (35, 30, or 25)
For Arterial Type and Class: Use Free flow speed of:
Rural 55, 50, 45, 40 or 35
Transitioning, Class 1 55, 50, 45, 40 or 35
Urban, Class 1 45, 40 or 35
Urban or Transitioning, Class 2 40, 35, 30 or 25
Urban, Class 3 35, 30 or 25

SIGNALIZATION CHARACTERISTICS

ARRIVAL TYPE PEAK DIRECTION: 3
ARRIVAL TYPE OFF-PEAK DIRECTION: 3
TYPE SIGNAL SYSTEM: S
P=PRETIMED
S=SEMIACTUATED
A=ACTUATED
SYSTEM CYCLE LENGTH: 74
WEIGHTED THRU MOVEMENT q/C: 0.49

EB PEAK DIRECTION'S SPECIFIC INPUTS									
LINK	LINK	PEAK HOUR VOLUME	% TURNS	LANES	CYCLE	EFFECTIVE	DISTANCE	LINK	ARRIVAL
	AADT (1 if unavail.) (0 if unused)		FROM EXCLUS.		LENGTH SIGNALS	g/C SIGNALS	BETWEEN SIGNALS (Enter in Miles or Feet)		
1-2	1	672	0	1	74	0.49	0.23	1,214	3
2-3	0	0							
3-4	0	0							
4-5	0	0							
5-6	0	0							
6-7	0	0							
7-8	0	0							
8-9	0	0							
9-10	0	0							
10-11	0	0							
11-12	0	0							
12-13	0	0							
13-14	0	0							
14-15	0	0							
15-16	0	0							
16-17	0	0							
17-18	0	0							
18-19	0	0							
19-20	0	0							

EB PEAK DIRECTION RESULTS							
LINK	NOTES	THROUGH	STOPPED		INTERSECTION	SPEED	ARTERIAL
	or FROM/TO	MOVEMENT FLOW RATE	v/c RATIO	DELAY	APPROACH LOS	(MPH)	LINK LOS
1-2		781	0.92	24.1	C	13.3	C
2-3		0					
3-4		0					
4-5		0					
5-6		0					
6-7		0					
7-8		0					
8-9		0					
9-10		0					
10-11		0					
11-12		0					
12-13		0					
13-14		0					
14-15		0					
15-16		0					
16-17		0					
17-18		0					
18-19		0					
19-20		0					
EB		Arterial Speed =		13.3 mph			
		LOS =		C			

WB OFF-PEAK DIRECTION'S SPECIFIC INPUTS							
LINK	PEAK HOUR VOLUME	% TURNS		CYCLE LENGTH SIGNALS 19-1	EFFECTIVE g/C SIGNALS 19-1	LENGTH (FT)	ARRIVAL TYPE
		FROM EXCLUS. LANES	LANES				
20-19	0						
19-18	0						
18-17	0						
17-16	0						
16-15	0						
15-14	0						
14-13	0						
13-12	0						
12-11	0						
11-10	0						
10-9	0						
9-8	0						
8-7	0		1				
7-6	0	0					3
6-5	0	0					3
5-4	0	0					3
4-3	0	0					3
3-2	0	0					3
2-1	511	0	1	74	0.51	1,214	3

WB OFF-PEAK DIRECTION RESULTS							
LINK	THROUGH MOVEMENT		STOPPED DELAY	INTERSECTION APPROACH		SPEED (MPH)	ARTERIAL LINK LOS
	FLOW RATE	v/c RATIO		LOS			
20-19	0						
19-18	0						
18-17	0						
17-16	0						
16-15	0						
15-14	0						
14-13	0						
13-12	0						
12-11	0						
11-10	0						
10-9	0						
9-8	0						
8-7	0						
7-6	0						
6-5	0						
5-4	0						
4-3	0						
3-2	0						
2-1	594	0.67	11.6	B		18.0	C
WB	Arterial Speed =		18.0 mph				
	LOS =		C				

ART-PLAN 2.0

Arterial Level of Service Estimating Software
Based on Chapter 11 of the 1994 Highway Capacity Manual Update

Florida Department of Transportation
August 1995

DESCRIPTION

Road Name: **Flagler Avenue**
From: **First Street**
To: **Fifth Street**
Peak Direction: **EB**
Off-peak Direction: **WB**
Study Time Period: **PM PEAK**
Analysis Date: **12 November 1996**
User Notes: **Existing Conditons**

TRAFFIC CHARACTERISTICS

AADT: 19,987
K FACTOR: 0.088
D FACTOR: 0.568
PHF: 0.860
ADJ. SATURATION FLOW RATE: 1,750
% TURNS FROM EXCLUSIVE LANES: 0

ROADWAY CHARACTERISTICS

THRU-LANES PEAK DIRECTION: 2
THRU LANES OFF-PEAK DIRECTION: 1
URBAN, TRANSITIONING, OR
RURAL DEVELOPED (U/T/R): U
ARTERIAL CLASS: 2 (1, 2, or 3)
FREE FLOW SPEED (mph): 40 (40,35,30,25)
For Arterial Type and Class:
Rural 55, 50, 45, 40 or 35
Transitioning, Class 1 55, 50, 45, 40 or 35
Urban, Class 1 45, 40 or 35
Urban or Transitioning, Class 2 40, 35, 30 or 25
Urban, Class 3 35, 30 or 25
Use Free flow speed of:

SIGNALIZATION CHARACTERISTICS

ARRIVAL TYPE PEAK DIRECTION: 3
ARRIVAL TYPE OFF-PEAK DIRECTION: 3
TYPE SIGNAL SYSTEM: S
P=PRETIMED
S=SEMIACTUATED
A=ACTUATED
SYSTEM CYCLE LENGTH: 61
WEIGHTED THRU MOVEMENT q/C: 0.46

EB PEAK DIRECTION'S SPECIFIC INPUTS									
LINK	LINK AADT (1 if unavail.) (0 if unused)	PEAK HOUR VOLUME	% TURNS FROM EXCLUS. LANES	LANES	CYCLE LENGTH SIGNALS 2-20	EFFECTIVE g/C SIGNALS 2-20	DISTANCE BETWEEN SIGNALS (Enter in Miles or Feet)	LINK LENGTH (FT)	ARRIVAL TYPE
1-2	1	999	0	2	61	0.46	0.29	1,531	3
2-3	0	0							
3-4	0	0							
4-5	0	0							
5-6	0	0							
6-7	0	0							
7-8	0	0							
8-9	0	0							
9-10	0	0							
10-11	0	0							
11-12	0	0							
12-13	0	0							
13-14	0	0							
14-15	0	0							
15-16	0	0							
16-17	0	0							
17-18	0	0							
18-19	0	0							
19-20	0	0							

EB PEAK DIRECTION RESULTS							
LINK	NOTES or FROM/TO	THROUGH MOVEMENT FLOW RATE	v/c RATIO	STOPPED DELAY	INTERSECTION APPROACH LOS	SPEED (MPH)	ARTERIAL LINK LOS
1-2		1162	0.73	11.5	B	22.7	C
2-3		0					
3-4		0					
4-5		0					
5-6		0					
6-7		0					
7-8		0					
8-9		0					
9-10		0					
10-11		0					
11-12		0					
12-13		0					
13-14		0					
14-15		0					
15-16		0					
16-17		0					
17-18		0					
18-19		0					
19-20		0					
EB	Arterial Speed =		22.7 mph				
	LOS =		C				

WB OFF-PEAK DIRECTION'S SPECIFIC INPUTS							
LINK	PEAK HOUR VOLUME	% TURNS		CYCLE LENGTH SIGNALS 19-1	EFFECTIVE g/C SIGNALS 19-1	LENGTH (FT)	ARRIVAL TYPE
		FROM EXCLUS. LANES	LANES				
20-19	0						
19-18	0						
18-17	0						
17-16	0						
16-15	0						
15-14	0						
14-13	0						
13-12	0						
12-11	0						
11-10	0						
10-9	0						
9-8	0						
8-7	0						
7-6	0						
6-5	0						
5-4	0						
4-3	0						
3-2	0						
2-1	760	0	1	61	0.51	1,531	3

WB OFF-PEAK DIRECTION RESULTS							
LINK	THROUGH MOVEMENT		STOPPED DELAY	INTERSECTION APPROACH LOS	SPEED (MPH)	ARTERIAL LINK LOS	
	FLOW RATE	v/c RATIO					
20-19	0						
19-18	0						
18-17	0						
17-16	0						
16-15	0						
15-14	0						
14-13	0						
13-12	0						
12-11	0						
11-10	0						
10-9	0						
9-8	0						
8-7	0						
7-6	0						
6-5	0						
5-4	0						
4-3	0						
3-2	0						
2-1	884	0.99	32.2	D	14.3	D	
WB	Arterial Speed =		14.3 mph				
	LOS =		D				

Streets: (N-S) Bertha\First (E-W) Flagler Ave
 Analyst: DAC File Name: B_F_20.HC9
 Area Type: Other 7-12-96 PM Peak
 Comment: (20) 1996 Existing Volumes, Realigned

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	1	<	1	1	<
Volumes	88	98	85	163	89	11	19	449	35	84	383	68
Lane W (ft)	11.0	11.0		8.0	14.0		10.5	10.5		11.0	11.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
NB Left	*				EB Left	*		*
Thru	*				Thru			*
Right	*				Right			*
Peds	*				Peds			*
SB Left	*				WB Left	*		*
Thru	*				Thru			*
Right	*				Right			*
Peds	*				Peds			*
EB Right					NB Right			
WB Right					SB Right			
Green	20.0P				Green	12.0P	30.0P	
Yellow/AR	4.0				Yellow/AR	3.0	3.0	
Cycle Length:	72 secs Phase combination order: #1 #5 #6							

Intersection Performance Summary

Lane	Group:	Adj Sat	v/c	g/C	Delay	LOS	Approach:		
		Cap	Flow	Ratio			Ratio	Delay	LOS
NB	L	338	1159	0.296	0.292	15.2	C	15.8	C
	TR	475	1627	0.438	0.292	16.2	C		
SB	L	203	696	0.911	0.292	46.5	E	34.4	D
	TR	553	1897	0.206	0.292	14.6	B		
EB	L	372	1633	0.059	0.625	5.5	B	17.1	C
	TR	708	1700	0.776	0.417	17.5	C		
WB	L	377	1662	0.252	0.625	6.4	B	14.3	B
	TR	712	1710	0.719	0.417	15.7	C		

Intersection Delay = 18.8 sec/veh Intersection LOS = C
 Lost Time/Cycle, L = 9.0 sec Critical v/c(x) = 0.739

Streets: (N-S) White St (E-W) Eaton St
 Analyst: WER File Name: W_E_15.HCG
 Area Type: Other 7-12-96 PM Peak
 Comment: (15) 1996 Existing Conditions

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	>	1	<	>	1	<	>	1	<	>	1	<
Volumes	115	7	108	1	2	1	3	559	92	78	456	9
PHF or PK15	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Lane Width	12.5			12.0			13.0			16.0		
Grade	0			0			0			0		
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
Parking	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Bus Stops	0			0			0			0		
Con. Peds	0			0			0			0		
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Arr Type	3			3			3			3		
RTOR Vols	0			0			0			0		
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
NB Left	*				EB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds	*				Peds	*		
SB Left	*				WB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds	*				Peds	*		
EB Right					NB Right			
WB Right					SB Right			
Green	15.0P				Green 40.0P			
Yellow/AR	3.0				Yellow/AR 3.0			
Cycle Length: 61 secs Phase combination order: #1 #5								

Intersection Performance Summary

Lane Group	Mvmts	Adj Sat	v/c	g/C	Delay	LOS	Approach:	
							Cap	Flow
NB LTR	367	1491	0.646	0.246	18.4	C	18.4	C
SB LTR	361	1470	0.011	0.246	13.2	B	13.2	B
EB LTR	1076	1641	0.626	0.656	5.5	B	5.5	B
WB LTR	716	1092	0.781	0.656	9.5	B	9.5	B
Intersection Delay = 9.1 sec/veh Intersection LOS = B								
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.744								

Streets: (N-S) Palm Ave and 1st St (E-W) North Roosevelt Blvd
 Analyst: WER File Name: R_P_45X1.HC9
 Area Type: Other 7-10-96 PM Peak
 Comment: (45) 1996 Existing Conditions *1-way pair*

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<				1	2	<		2	1
Volumes	55	122	64				100	823	26		424	685
Lane W (ft)	11.5	11.5					11.0	11.0			11.0	11.0
RTOR Vols			0						0			0
Lost Time	3.00	3.00	0.00				3.00	3.00	3.00		3.00	0.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
NB Left	*				EB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds	*				Peds	*		
SB Left					WB Left	*		
Thru					Thru	*		
Right					Right	*		
Peds	*				Peds	*		
EB Right					NB Right			
WB Right	*				SB Right			
Green	17.0P				Green	25.0P		
Yellow/AR	4.0				Yellow/AR	4.0		
Cycle Length: 50 secs Phase combination order: #1 #5								

Intersection Performance Summary

Lane	Group:	Adj Sat	v/c	g/C	Delay	LOS	Approach:		
		Cap	Flow	Ratio			Ratio	Delay	LOS
NB	L	543	1507	0.118	0.360	8.1	B	8.9	B
	TR	607	1686	0.356	0.360	9.1	B		
EB	L	334	643	0.347	0.520	5.6	B	6.5	B
	TR	1811	3482	0.572	0.520	6.6	B		
WB	T	1819	3498	0.285	0.520	5.2	B	2.2	A
	R	1482	1482	0.538	1.000	0.3	A		

Intersection Delay = 4.7 sec/veh Intersection LOS = A
 Lost Time/Cycle, L = 0.0 sec Critical v/c(x) = 0.538

Streets: (N-S) Eisenhower Dr (E-W) North Roosevelt Blvd
 Analyst: WER File Name: T_E_44X1.HC9
 Area Type: Other 7-10-96 PM Peak
 Comment: (44) 1996 Existing Conditions

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1		1	2	1	<		2	<		1	1
Volumes	3		277	893	70	45		219	3		78	352
Lane W (ft)	11.0		11.0	11.0	11.0			11.0			11.0	11.0
RTOR Vols			0			0					0	0
Lost Time	3.00		0.00	3.00	3.00	3.00		3.00	3.00		3.00	3.00

Signal Operations

Phase Combination 1	2	3	4	5	6	7	8
NB Left	*			EB Left			
Thru	*			Thru	*		
Right	*			Right	*		
Peds	*			Peds	*		
SB Left	*			WB Left	*	*	
Thru	*			Thru	*	*	
Right	*			Right			
Peds	*			Peds	*		
EB Right				NB Right	*		
WB Right				SB Right			
Green	18.0A	6.0A		Green	4.0A	7.0A	
Yellow/AR	4.0	4.0		Yellow/AR	4.0	4.0	
Cycle Length: 51 secs Phase combination order: #1 #2 #5 #6							

Intersection Performance Summary

Lane Group:	Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach:	
								Delay	LOS
NB L	228	1662	0.013	0.137	12.3	B	10.4	B	
NB R	525	1487	0.614	0.353	10.3	B			
SB L	1238	3323	0.864	0.373	14.2	B	13.4	B	
SB TR	611	1641	0.218	0.373	7.1	B			
EB TR	548	3492	0.495	0.157	13.3	B	13.3	B	
WB L	304	1662	0.299	0.314	8.5	B	12.9	B	
WB T	549	1749	0.745	0.314	13.9	B			

Intersection Delay = 12.9 sec/veh Intersection LOS = B

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.698

Streets: (N-S) Kennedy Dr (E-W) Flagler Ave
 Analyst: WER File Name: TEST23.HC9
 Area Type: Other 7-12-96 PM Peak
 Comment: (23) 1996 Existing Conditions

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	2	<
Volumes	26	20	19	195	2	207	152	700	17	46	570	67
Lane W (ft)	11.0	11.5		11.0	11.0		11.0	11.0		11.0	11.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
NB Left	*				EB Left	*	*	
Thru	*				Thru	*		
Right	*				Right	*		
Peds	*				Peds	*		
SB Left	*				WB Left	*	*	
Thru	*				Thru	*		
Right	*				Right	*		
Peds	*				Peds	*		
EB Right					NB Right			
WB Right					SB Right			
Green	17.0P				Green	6.0P 25.0A		
Yellow/AR	4.0				Yellow/AR	4.0 4.0		
Cycle Length: 60 secs Phase combination order: #1 #5 #6								

Intersection Performance Summary

Lane	Group:	Adj Sat	v/c	g/C	Approach:				
					Mvmts	Cap	Flow	Ratio	Ratio
NB	L	205	684	0.146	0.300	11.7	B	11.6	B
	TR	495	1649	0.091	0.300	11.5	B		
SB	L	431	1435	0.516	0.300	14.1	B	14.2	B
	TR	447	1489	0.531	0.300	14.3	B		
EB	L	314	1662	0.551	0.600	6.7	B	9.5	B
	TR	1511	3486	0.566	0.433	10.1	B		
WB	L	314	1662	0.166	0.600	4.6	A	9.3	B
	TR	1492	3443	0.509	0.433	9.6	B		

Intersection Delay = 10.4 sec/veh Intersection LOS = B
 Lost Time/Cycle, L = 9.0 sec Critical v/c(x) = 0.598

APPENDIX C
TRAFFIC CALMING MEASURES

APPENDIX C

INTRODUCTION

Diversion Plan 1 includes the creation of a one-way pair system using Eaton Street for eastbound travel and Caroline Street for westbound travel. The historic nature of the Old Town area in Key West makes it unique, thus attracting pedestrians and bicyclists to frequent the area in high numbers. Hence the design of one-way pairs in the Old Town area must balance the transportation needs of motor vehicles, bicyclists, and pedestrians. The following sections describe the benefits of one - way paired roadways and the use of traffic calming measures to control inappropriate motorist speeds.

ONE - WAY ROADWAYS

One-way pair systems increase the capacity of roadways as a result of reduced medial and intersection conflicts and aid in the more efficient operation of traffic control devices. Travel times are reduced by the reduction in conflicts and delays caused by left turning vehicles. The reduction in conflicting turning movements at intersections also results in a reduction in the number and severity of motor vehicle crashes, thus improving safety.

A possible concern of one-way pairs is the increase in travel speeds which may result increasing the danger to bicyclists and pedestrians. It is important to note however, that much of the reduction in travel time for motorist traveling one-way pair facilities results from a reduction in stopped delay. This reduction in stopped delay increases **average** travel speeds and not necessarily the running speed. Average travel speed decreases as frequency and/or duration of vehicle stoppages occur.

TRAFFIC CALMING MEASURES

Roadway design features can reduce the desire and ability of motorists to travel at unlawful and unsafe speeds, while still maintaining good average travel speeds. Measures undertaken in the design of roadway facilities to control unacceptable driving behaviors are known as "Traffic Calming." Roadway design features which benefit pedestrians include bulbouts, raised crosswalks or raised intersections, fixed-source lighting, and traffic signals. Bicyclists benefit from the control of motor vehicle speeds and from the reduction in vehicular conflicts. Motorists benefit from good average travel

speeds with reduced delays and from the reduction in turning conflicts as the result of the one-way pairing.

The specific design of traffic calming measures should take into account the unique needs of a particular roadway and community. The City of Key West Engineering and Planning Departments should review and recommend the measures appropriate to protect the interest of all roadway users, whether they travel by motor vehicle, bicycle, or foot. Figure C-1, One-Way Pair Traffic Calming Measures and Figure C-2, Sample Eaton Street and Caroline Street One-Way Pair System Traffic Calming Plan, present traffic calming options which would be typical of a one-way pair roadways with significant pedestrian volumes.

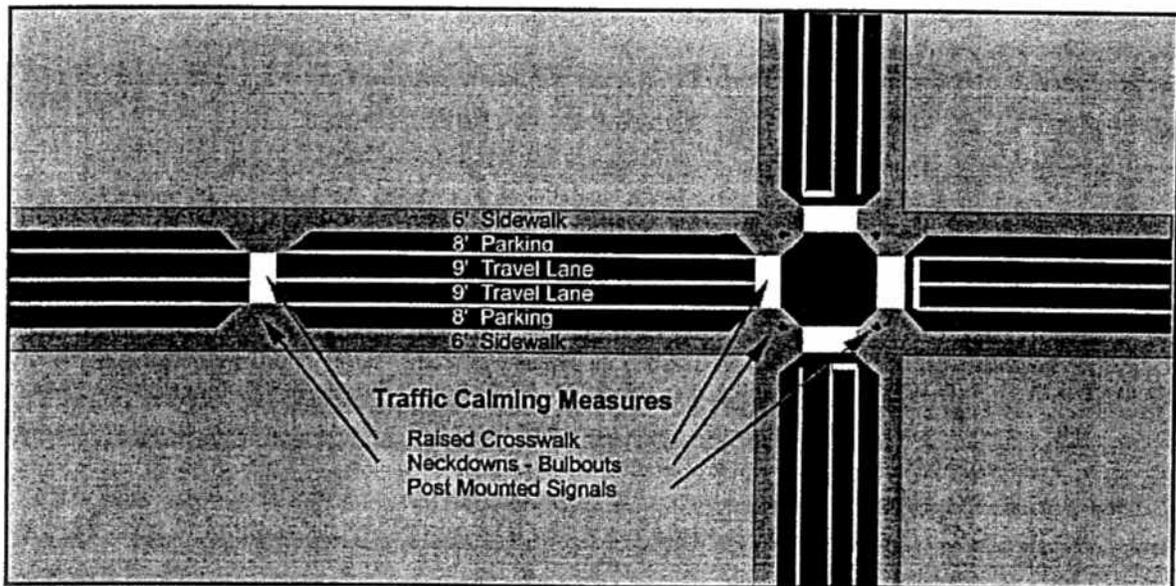
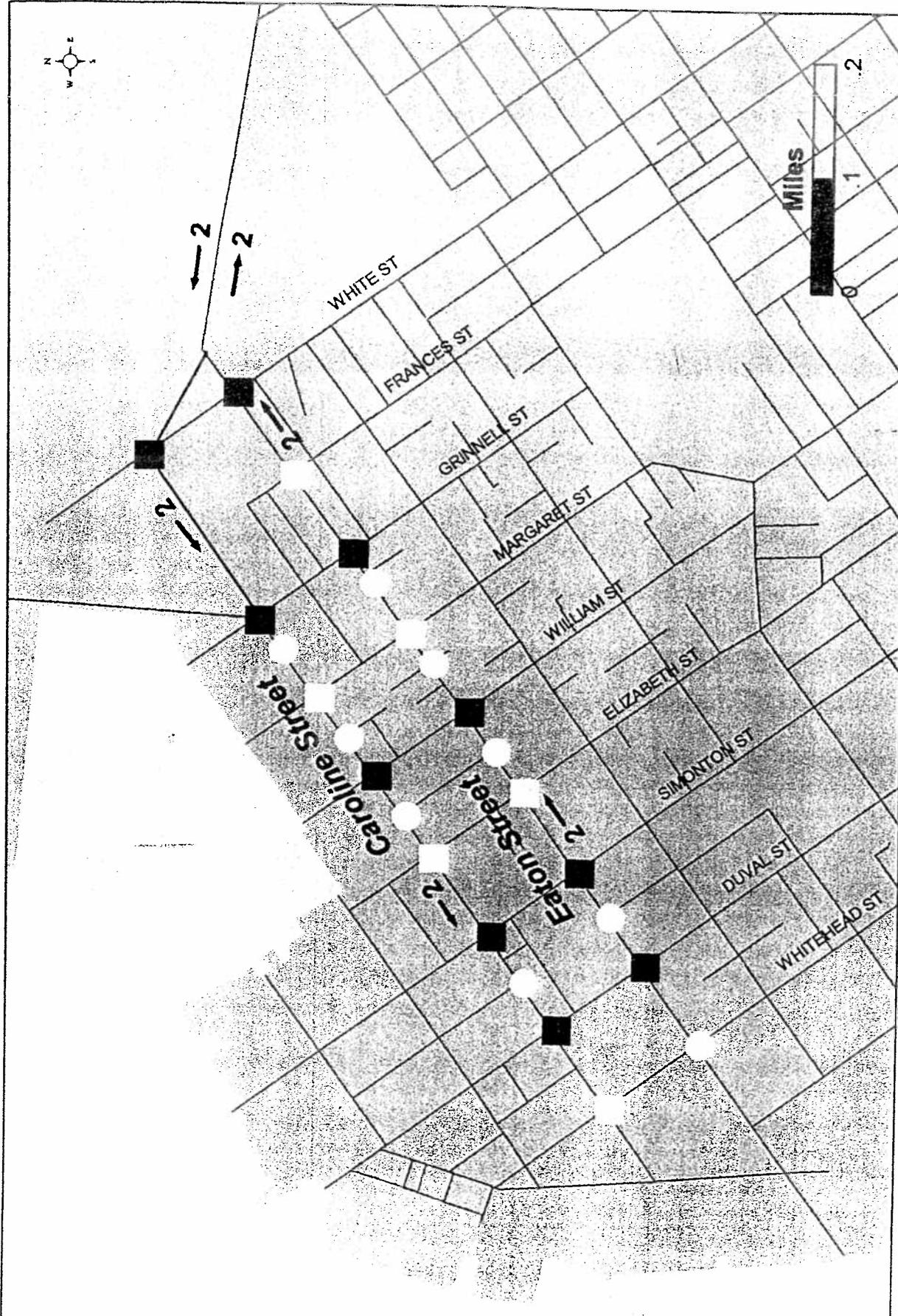


Figure C-1, One-Way Pair Traffic Calming Measures

Figure C-1 illustrates the typical cross section of a traffic calmed one-way street. This cross section includes two 9-foot travel lanes, two 8-foot parking lanes, and two 6-foot sidewalks. These cross section features combined with two 2-foot curb and gutter treatments fit within the total existing 50 feet of right-of-way. The aforementioned typical cross section is similar to the existing conditions on both Eaton Street and Caroline Street. Although not detailed in Figure C-1, the elimination of one parking lane



Legend

- Signal and Intersection Treatment
- Intersection Treatment
- Raised Mid-Block Crosswalk

Figure C-2
 City of Key West Diversion Study
 Sample Eaton Street and Caroline Street
 One-Way Pair System Traffic Calming Plan

TINDALE
OLIVER
 and Associates, Inc.
 Planning and Engineering
 File name: g:\keywest\map\diversion\FIGS 04

would result in an additional 8-feet of usable space. This extra 8 feet could be used for formal bicycle facilities, such as bicycle lanes, and/or increased travel lane widths. Traffic calming features included in Figure C-1 include bulbouts at intersections or neckdowns mid-block, and raised crosswalks on all four approaches to the intersection and at mid-block. Signalized intersections would utilize post mounted traffic signals located within the intersection bulbouts. Figure C-2 illustrates a recommended placement of traffic calming devices along Eaton Street and Caroline Street. The following paragraphs summarize the traffic calming concepts which are illustrated in Figures C-1 and C-2.

One means of improving the average travel speed of motor vehicles while restricting excessive speeds is by traffic signal coordination. The progression of traffic signals can allow groups of vehicles or platoons to move together through a series of green traffic signals. The coordination of closely spaced traffic signals can actually control the maximum speed of motorist if carefully designed. This is accomplished by coordinating the approaching signals to turn green consistent to the desired maximum travel speed, thus a speeding motorist is punished for speeding by receiving a constant interruption of red traffic signals. Only motorists who travel at the desired design speed are rewarded with the favorable progression of green traffic signals. Progressed traffic signals also increase acceptable gaps for mid-block pedestrian crossings while reducing noise, vehicle emissions, and energy consumption.

Figure C-2 illustrates a suggested placement of traffic signals along the Eaton and Caroline Streets one-way pair system. This signal placement recommendation retains signals at existing signalized intersections and adds signals to the intersections of Eaton Street and William Street; Caroline Street and William Street; and Caroline Street and Grinnell Street. As illustrated in Figure C-1, traffic signals along the Eaton Street and Caroline Street one-way pair corridors can continue utilization of the post mounted traffic signal treatment which has been recommended and designed for Duval Street. Post mounted traffic signals are more visible to pedestrians and reduce overhead clutter. Placement of post mounted signals is also enhanced with the construction of the intersection bulbouts which allow the signals to be placed within a more narrow cone of vision for the motorists.

Traffic calming measures are often used to protect pedestrians from excessive motor vehicle speeds. It is appropriate to utilize traffic calming devices along Eaton and Caroline Streets that calm traffic at the most critical locations: where pedestrians cross the street conflicting with motor vehicle traffic. Two types traffic calming measures are located at pedestrian crossing points: intersection bulbouts or mid-block neckdowns, and raised crosswalks.

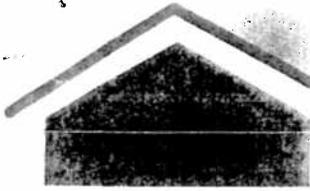
Intersection bulbouts reduce the width of the overall paved surface of the roadway at the intersection to a dimension less than the width of the approaching roadway link. As illustrated in Figure C-1, the width of the roadway at the intersection is reduced by approximately 16 feet or the width of the two parking lanes. Similar to intersection bulbouts, mid-block neckdowns reduce the width of the roadway at the mid-block. The primary benefit of both intersection bulbouts and mid-block neckdowns is the reduction in pedestrian crossing distances they create. For example, in Figure C-1 the bulbouts and neckdowns reduce the pedestrian crossing distances to 18 feet, a significant reduction from the overall roadway width of 34 feet. At intersections bulbouts reduce the crossing distance and hence the exposure to vehicular conflict where these conflicts are most common. Intersection bulbouts have the added benefit of creating a physical barrier to illegal parking surrounding intersections.

The other form of traffic calming measure located at the pedestrian crossing locations are raised crosswalks. Figure C-1 illustrates the location of potential raised crosswalks. Raised crosswalks are either speed tables or speed humps marked as pedestrian crosswalks. Raised crosswalks force motorist to control their speeds at the most critical location, where pedestrians cross the road. Speed tables and speed humps when properly designed can be comfortably navigated by motorists at 20 to 25 miles per hour. Above 25 miles per hour speeding motorist receive a jostle similar to that encountered when passing over a traditional speed bump at an inappropriate speed. At intersections it is possible to raise the entire intersection instead of the placement of four raised crosswalks. Raised intersections are usually more aesthetic, provide smoother travel for motorists, and reduce drainage problems.

IMPLEMENTATION / CONCLUSION

Implementation of traffic calming measures along the Eaton and Caroline Street corridor could occur in a staged approach. In order to implement the one-way pair system, roadway improvements including pavement markings and placement of traffic control devices or signs must be made. The relatively narrow 9 foot travel lane widths will serve as an initial and long term traffic calming measure. Before, concurrent with, or following the implementation of the one-way pairing, minor intersection improvements including construction of intersection bulbouts would enhance pedestrian safety. Bulbouts should be constructed concurrent with the installation of new traffic or improved traffic signals. Mid-block neckdowns should be constructed as needed. If acceptable travel speeds are not observed following the commencement of one-way operations and implementation of the above traffic calming measures, raised crosswalks and/or raised intersections could be constructed.

The implementation of the one-way pairing of Eaton and Caroline Streets presents a positive opportunity to improve the management of traffic in the Old Town area and should reduce the perception of traffic congestion in the area. Balancing the needs of improved motor vehicle capacity with the needs of bicyclists and pedestrians is vital. Traffic calming would be a cost effective long-term control of inappropriate travel speeds by motorists.



Housing Authority of the City of Key West, Florida

1400 Kennedy Drive, Key West, FL 33040
Phone: (305) 296-5621 Fax: (305) 296-0932

Board of Commissioners

Frank Toppino
Bob Dean
Juanita Mingo
John G. Parks, Jr.
Roosevelt Sands, Jr.

Executive Director

J. Manuel Castillo, Sr.

June 29, 2006

John Jones, Assistant City Manager
The City of Key West
P.O. Box 1409
Key West, FL 33041-1409

SUBJECT: Alternate Access to U.S. Coast Guard Base

Dear Mr. Jones:

Your letter dated June 7, 2006 regarding the above subject was presented to and discussed by the Housing Authority Board at their regular meeting of June 10th.

We would like to clarify and correct your statement in said letter that the portion of land in question is platted as a City Right-of-Way by the Monroe County Property Appraiser. The Property Appraiser's office has informed us that the maps attached to your letter are obsolete and determined unusable because of their inaccuracies. The current and correct map from the Property Appraiser is attached. Please note that the property is not a platted right of way but a portion of the property acquired by the Housing Authority as indicated by the deed (copy attached). Please further notice that the paved entrance road to the J. Y. Porter Place Apartments does not run directly into the U.S. Navy and Coast Guard properties.

The Housing Authority has always worked closely with the City to accomplish many beneficial goals for our community. We are very proud and appreciative of this relationship. However, the Housing Authority does not agree that redirecting traffic from a commercial corridor into and through the J.Y. Porter Place residential community, coupled with the cost of performing the tasks indicated in your letter as needed to redirect the traffic, would be in the best interest of the residents or the community.

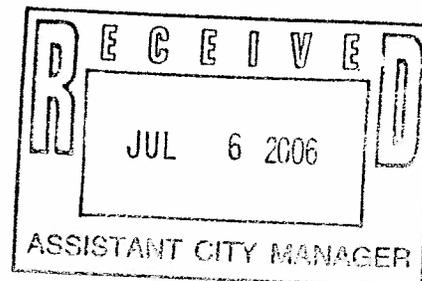
We would be more than happy to schedule a meeting to discuss this issue in more in an effort to assist with this matter

Sincerely,

J. Manuel Castillo, Sr.
Executive Director

pc: Julio Avel – Key West City Manager
Key West City Commission
KWA Board Members
Jack Spottswood, Esq.

Attachments: Current Plat Book Map
Deed



June 7, 2006

Mr. Manuel Castillo
Director - Key West Housing Authority
1400 Kennedy Drive
Key West, FL 33040

Subject: Alternate Access to US Coast Guard Base

Dear Manny,

The U. S. Coast Guard has notified the City of Key West that the US Navy plans to close off the Palm Avenue access to the US Coast Guard Base located on Trumbo Point.

The US Navy uses the old Sea Plane Base primarily for housing, although they do use it for limited storage at the old sea plane hangar and they have to give the City access to the Waste Water Treatment plant on Fleming Key and other access to the Ranger station and the ammo storage area on Fleming Key.

Most of the traffic flow in and out of the Palm Avenue gate is for the US Coast Guard Facility at Trumbo Point. Their estimate is about 500 vehicles a day from small cars to large tractor trailer trucks

I have been meeting with US Coast Guard and US Navy personnel about this situation since receiving notice from the US Coast Guard of their desire to open up the Trumbo road gate as their main entrance.

Mr. Manuel Castillo

June 7, 2006

Page 2

The City was given Trumbo Road as a result of the BRAC Process, but the US Coast Guard has a right to use it for their main entrance with a restriction as to the distance the City has to remain from the US Coast Guard dock adjoining the Key West Bight.

The City presently has a problem with traffic flow at the intersection of Trumbo Road, Grinnell Street and Caroline Street. This will be compounded when the Steam Plant Condos open up. There is also a large amount of pedestrian traffic from the Ferry Terminal. An additional 500 vehicles a day, which will include large tractor trailers from the US Coast Guard Base will compound the problem. Presently all of the school busses have to access these intersections to get into the school board property.

A previous traffic study suggested that Caroline Street be extended thru the KEYS property to White Street to essentially help the traffic flow in this. This is not possible since the Steam Plant Condos have been authorized.

The present access restriction to the School Board property and the City property on Trumbo Road severely restricts the development and value of this waterfront property. If the US Coast Guard opens up their Trumbo Road gate the value and development of the adjoining properties could be compromised.

The limited access to the school board and City property on Trumbo Road via White Street was eliminated by the Key West Housing Authority closing the portion of White Street from Eaton Street adjacent to their Porter Place housing facilities. White Street is platted as City right of way by the Monroe County Property Appraiser and is fifty feet wide and runs directly into the US Navy and US Coast Guard properties from Eaton Street.

The Housing Authority developed a drug rehabilitation facility called Safe Port along the northern portion of White Street just beyond the entrance to the School Board property. They later made it one way and had an exit come out at Eaton Street and Palm Avenue intersection. This has created a safety problem at this intersection.

Safe Port has since been closed and the facility converted back to public housing.

White Street north of Eaton Street was a two way street open for traffic to the general public before Safe Port was developed. School busses and the general public had ingress and egress to the School Board property on the west side of White Street. KEYS accessed their sub-station and their property and residents of Porter Place had safe ingress and egress to their facilities. The traffic light at the intersection at White Street and Eaton Street was installed to control safe access to the area. As mentioned, a traffic study in 1996 recommended using White Street and the access road to the Keys property as a bypass to help the traffic problem on Grinnell and Caroline Streets.

Mr. Manuel Castillo
June 7, 2006
Page 3

We need to work with you and the Housing Authority to convert White Street back to its original two way flow so the US Coast Guard can place a gate at the northern gate to facilitate for the main entrance to the U. S. Coast Guard facility at Trumbo Point.

This will allow for safe egress and ingress to the Housing Authority Porter Place properties, the School Board and City properties and to the US Coast Guard facility.

The City and School Board properties along Trumbo Road will become more valuable because of more access to the waterfront and would not interfere with any future expansion of Porter Place or the School Board properties for affordable housing.

There is a problem with the large electric poles at the intersection of Eaton and White Streets. KEYS has agreed to look into the possibility of modifying them to give a right turn lane from the east on to White Street. This would facilitate the traffic problem in and out of this area. The City will have traffic engineers evaluate the ingress and egress into the Porter Place property for the safety of the residents. New sidewalks and street entrance access to the Porter Place units could be designed and constructed by the City as well as security gates for the complex.

Please give this your immediate attention as the US Coast Guard is anxious for a decision and we also need to work this out with the US Navy.

Sincerely

John Jones, Assistant City Manager

Cc: Julio Avel - Key West City Manager
Frank Toppino – Chairman Key West Housing Authority
City of Key West Commission

Attachments: Plat book copies of area and photos

THIS INDENTURE, Made this 5th day of July, A. D. 1940, BETWEEN Trumbo Properties, Inc., a corporation organized and existing under the laws of the State of Florida, having its principal place of business in the County of Dade and State of Florida, party of the first part, and The Housing Authority of the City of Key West, Florida, a body politic organized and existing under the laws of the State of Florida, of the County of Monroe and State of Florida, party of the second part, WITNESSETH, that the said party of the first part, for and in consideration of the sum of \$10.00 and other good and valuable considerations, to it in hand paid, the receipt whereof is hereby acknowledged, has granted, bargained, sold, aliened, remise, released, conveyed and confirmed, and by these presents doth grant, bargain, sell, alien, remise, release, convey and confirm unto the said party of the second part, and its heirs and assigns forever, all that certain parcel of land lying and being in the County of Monroe and State of Florida, more particularly described as follows:

On the Island of Key West and being a part or parcel of land on what is known as Trumbo but better described by metes and bounds as follows: Beginning at the intersection of the Southwesterly line or side of White Street extended Northwesterly with the Northwesterly line or side of Eaton Street. The bearing of the Northwesterly line or side of Eaton Street is taken as $N56^{\circ}30'E$. From the above said point of beginning run $N56^{\circ}30'E$ along the Northwesterly line or side of Eaton Street a distance of 269.67 feet to its intersection with the Northerly line or side of Palm Avenue; thence at right angles to the Northerly line or side of Palm Avenue and running $N12^{\circ}13'W$ a distance of 540.0 feet; thence at right angles and running $N78^{\circ}24'W$ a distance of 918.9 feet to a point on the Southwesterly line or side of White Street extended; thence running $S33^{\circ}42'E$ along the Southwesterly line or side of White Street extended a distance of 1030.0 feet to the place of beginning. Containing 8.91116 acres more or less. Subject to easment held by City of Key West sewer purposes

12.10

(\$10.70 F.D.T.S. Attached & Cancelled)

TOGETHER with all the tenements, hereditaments and appurtenances, with every privilege, right, title, interest and estate, reversion, remainder and easement thereto belonging or in anywise appertaining; TO HAVE AND TO HOLD the same in fee simple forever.

And the said party of the first part doth covenant with the said party of the second part that it is lawfully seized of the said premises; that they are free of all incumbrances, and that it has good right and lawful authority to sell the same; and the said party of the first part does hereby fully warrant the title to said land, and will defend the same against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said party of the first part has caused these presents to be signed in its name by its President, and its corporate seal to be affixed, attested by its Secretary the day and year above written.

(Corporate Seal)

Attest:

(sd) Christine W. Graham
Secretary

TRUMBO PROPERTIES, INC.

By (sd) T E Price
President.

Signed, Sealed and Delivered in Our Presence:

(sd) W. C. Price

(sd) Daisy H. Gallbreath

STATE OF FLORIDA

COUNTY OF DADE

I HEREBY CERTIFY, That on this 5th day of July, A. D. 1940, before me personally appeared T. E. Price and Christine W. Graham, respectively President and Secretary of Trumbo Properties, Inc., a corporation under the laws of the State of Florida, to me known to be the persons described in and who executed the foregoing conveyance to The Housing Authority of the City of Key West, Florida and severally acknowledged the execution thereof to be their free act

