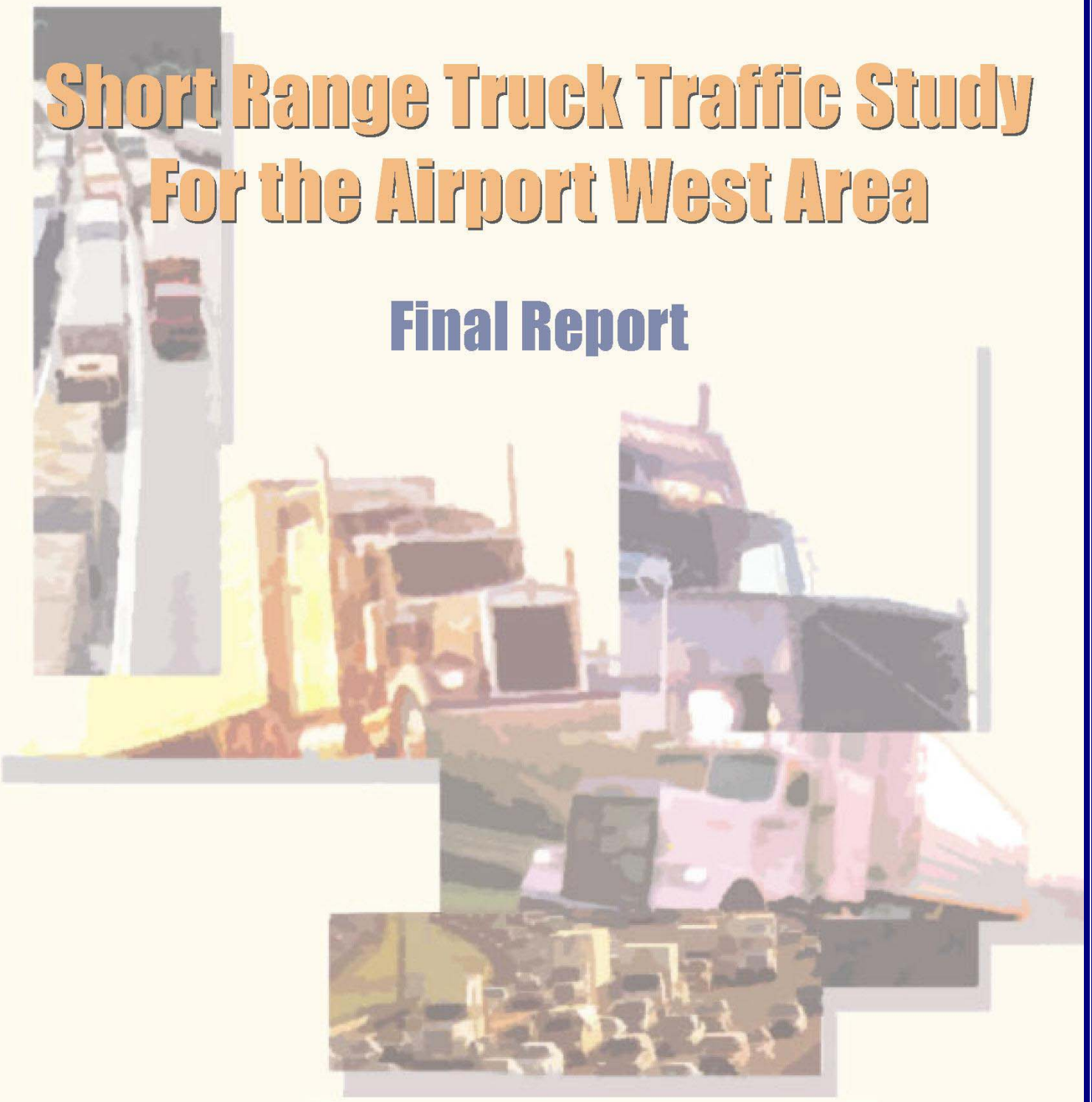
Short Range Truck Traffic Study For the Airport West Area

Final Report



METROPOLITAN PLANNING ORGANIZATION

MPO

MIAMI-DADE

dpa

Short Range Traffic Study For the Airport West Area

Final Report

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July 2002
DPA Project #00169

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1.0 INTRODUCTION

1.1 Study Background and Objectives

Over the past half century, the area west of Miami International Airport (MIA) in Miami-Dade County, Florida, has grown from undeveloped quasi-rural low-density scattered mixed residential, commercial, and industrial use land to one of the mainstay industrial and office employment areas in the County. The area, now popularly known as Airport West, has expanded from the lands immediately adjacent to and west of MIA to encompass an area of more than 30 square miles, now traversed by three major expressways, Florida's Turnpike, the Palmetto Expressway, and SR 836, and a variety of major section and half-section arterials. During the past 50 years, growth has been spectacular. And while industrial and commercial uses have proliferated, and dominate much of the Airport West Area (AWA), commercial office space and retail have also taken hold, and residential development has grown in the north-central sections as well.

Tremendous growth in both residential, employment, and supply travel have accompanied the growth in land use, leading to high levels of peak congestion throughout the AWA, and to significant all-day traffic volumes as well. And the mixes of land uses and different types of transportation needs these land uses generate have created problems for personal and commercial traffic across the AWA. Auto-truck conflicts are worse here than in most other areas of Miami-Dade due to high number of freight industry firms located west of MIA. The location of many shippers, freight forwarders, and warehouses catering to not only domestic goods movement, but to nationally important international trade, puts many trucks on the AWA roads.

That, coupled with the thousands of area workers who daily arrive by car during peak periods, plus the thousands of residents who leave the greater AWA during the peaks to get to jobs outside the area, puts a tremendous strain on the roads of AWA. Many if not most major

thoroughfares are over capacity during peaks, the peaks are spreading, and mid-day congestion levels are high as well. Significant congestion results from trucks using and trying to make their way on roads ill-designed for trucks in general, and especially for the larger, heavy, less-maneuverable vehicles known as 'heavy trucks.'

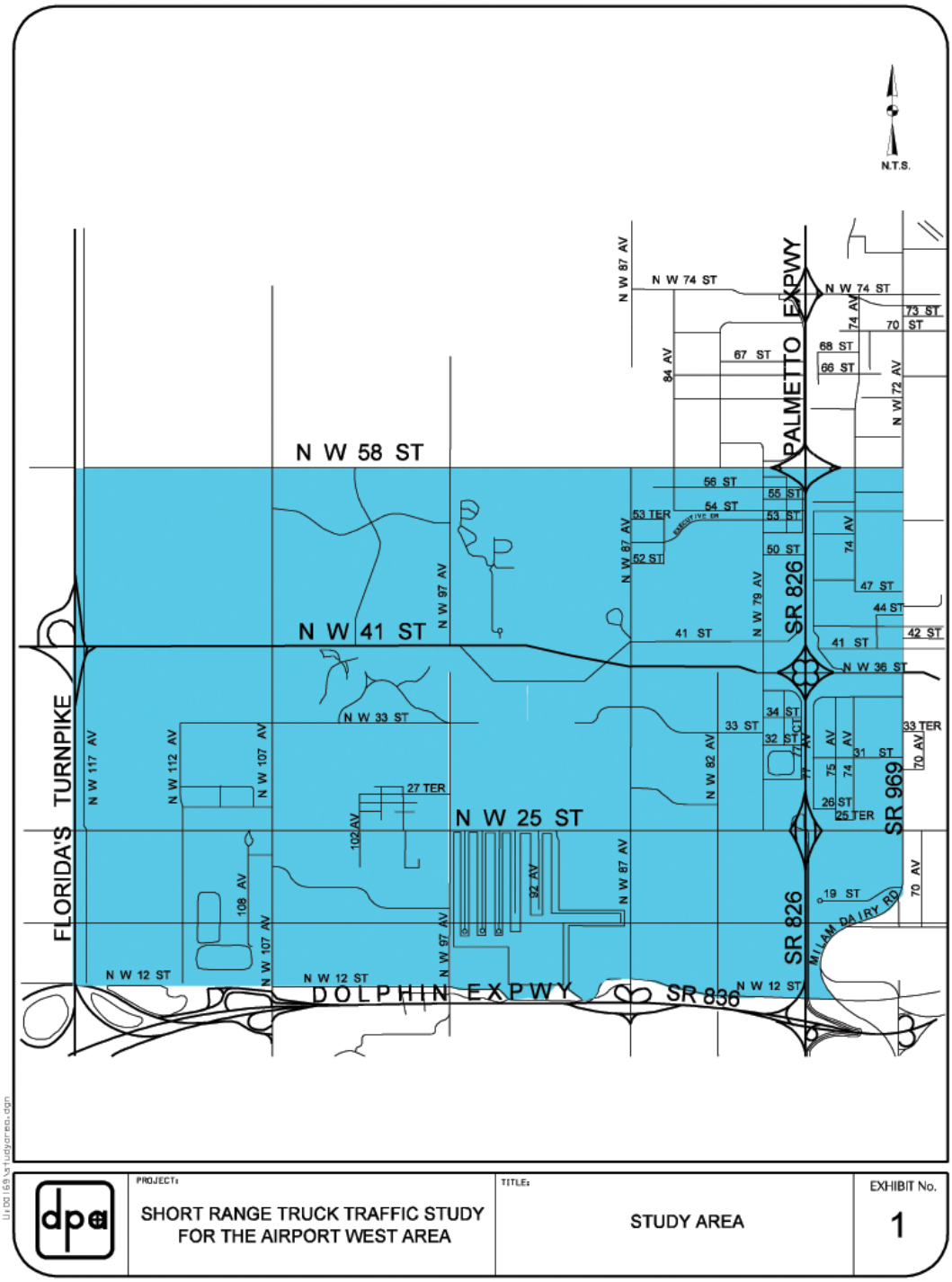
The turning radii at the intersections, length and width of turning lanes, and private driveways are among the factors that increase the potential of traffic crashes and congestion within the area. There have been three previous freight and/or area-oriented studies completed. One was a countywide initial freight movement research effort, the second was an area-specific study that dealt with all vehicle modes, and a third study was limited to a very specific MIA-oriented roadway improvement project.

This study is oriented towards developing recommendations for alleviating localized truck movement problems within the AWA. The AWA as defined for this study is the area generally bounded by NW 58th Street on the north and SR 836 on the south, and runs from NW 72nd Avenue (Milam Dairy Road) on the east to the Turnpike (HEFT) on the west, an area of some 13 square miles. (See Exhibit 1).

The objectives of this study are to develop a set of standards and an implementation plan to better accommodate truck traffic and commercial truckers' needs in the AWA.

1.2 Coordination

A Study Advisory Committee (SAC) was established which included representatives from Airport West Transportation Management Initiative (AWTMI), the MPO, and the consultant team. The SAC assisted in the development of the questionnaire used to obtain user data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N W 58 ST
N W 41 ST
N W 25 ST
N W 12 ST
FLORIDA'S TURNPIKE
DOLPHIN EXPWY
SR 836
PALMETTO EXPWY
SR 826
SR 969
N W 74 ST
N W 87 AV
N W 97 AV
N W 107 AV
N W 117 AV
N W 112 AV
N W 33 ST
N W 36 ST
N W 79 AV
N W 82 AV
N W 72 AV
MILAM DAIRY RD
PROJECT:
SHORT RANGE TRUCK TRAFFIC STUDY
FOR THE AIRPORT WEST AREA
TITLE:
STUDY AREA
EXHIBIT No.
1

regarding types and locations of travel problems in the study area, as well as helping coordinate, disseminate, and monitor the survey. James Murphy from South Florida Commuter Services, who is staff assistant to the AWTMI, greatly facilitated contacts, data collection, and questionnaire distribution efforts as well

In developing approaches to address truck traffic problems in the Study Area, it is important to consider not only current conditions, but those expected to exist in the future as well. By proactively considering anticipated future development and more importantly, the anticipated transportation impacts of that increased development on facilities and on traffic more appropriate improvements can be recommended.

If additional development either requiring truck movements for supplying retail and grocery firms, for example or even more importantly, directly contributing to increasing day-in, day-out truck traffic warehouse and shipping firms, for example, is known, then the need for roadways that can specifically handle trucking can not only be anticipated, but actions taken to increase their suitability for actually dealing with trucks. And it will further underscore the need to better handle those trucks already contributing to area congestion as well.

2.0 DATA DEVELOPMENT

2.1 Existing and Anticipated Short-Term Developments

A list of existing developments in the Study Area was obtained from the Airport West Transportation Management Initiative (AWTMI). The AWTMI is a transportation management association (TMA) created to address and ameliorate traffic problems in a specific area. TMAs are usually public-private cooperative groups; in general, whose members and local and/or state governments cooperatively fund staff to assist the TMA in accomplishing its efforts. James Murphy is staff to the AWTMI, and is an employee of south Florida Commuter Services (SFCS), a state program that helps initiate and nurture TMAs across the state. Mr. Murphy's help was invaluable in coordinating with the AWTMI and its members and in acquiring data describing the area.

The following list, received Mid-March of 2001 from the AWTMI, presents development information pertinent to the Study Area:

- Building development on the SW corner of NW 36 Street and NW 82 Avenue

- Office park development and warehouse development along NW 25 Street from NW 107 Avenue to NW 119 Avenue

- Ground breaking for new developments along NW 41 Street from NW 107 Avenue to the Florida's Turnpike; this area is developing a mixture of mixed-use facilities including pharmacies/shopping centers, gas stations, restaurants, and warehouse distribution centers

- Steady increase of medium and small warehouse facilities along NW 12 Street from NW 87 Avenue to NW 107 Avenue

- The International Corporate Park, located along NW 97 Avenue to NW 107 Avenue and between NW 12 Street and NW 25 Street, has some unoccupied warehouse facilities that are starting to show some new activity from the tenants moving in

2.2 Forecast Long-Term Development

Along with the specifics noted above, there is capacity for continued growth in commercial, retail, office, and residential development in the Study Area. The Miami-Dade Planning Department provides projections to, among others, the Miami-Dade MPO, which develops the Long Range Transportation Plan (LRTP) for the County. The LRTP indicates that over the next 25 years, the Northwest area, which includes the AWA area, will experience an increase of 46% in population, and an increase of 43% in employment.

All increases in growth, both population and employment, point to increasing auto traffic as workers will need to access jobs. But increases in commercial and industrial employment also point to increases in truck traffic as well. Additionally, as more and more of the economy becomes much more service-oriented, there is also expected an accompanying increase in small-to-medium size truck traffic as more plumbers, electricians, and other mobile service and repair workers are needed to handle growth in the other sectors.

Therefore both short-term and long-range growth projections indicate that truck traffic cannot be expected to go away or improve, but that it will continue. And it underscores the importance of addressing ways and means to accommodate trucks in the Airport West Area.

2.3 Previous Studies

While public sector general transportation planning for trucks and freight in general is relatively new, there have been a few local studies performed to explore ways of planning better transportation systems and facilities with trucking and freight and goods movements in mind. Research was conducted to gather data on existing and projected traffic volumes that were specifically pertinent to this study's area of interest, the AWA. Truck volumes, roadway levels of service, assumptions of growth and development, and especially recommendations forwarded from these studies which may have addressed truck-compatible roadway design features and standards were compiled.

One study addressing freight movement in general, and two focusing on freight-oriented transportation improvement in the study area itself, were obtained and reviewed. They were the Miami-Dade County Freight Movement Study, the Travel Demand Study for NE 25th Street, and the Preliminary Engineering Report for NW 25th Street.

The 1996 Freight Movement Study was a general overview of freight and trucking in Miami-Dade County that examined how the County's transportation system was affected by various freight movements, what roads and routes were frequented by trucks, truck volumes on major County highways, and included a review of trucking and roadway conditions and design standards as well.

The NW 25th Street corridor studies evaluated various traffic conditions between NW 67th and 87th Avenues, and specifically examined truck movement demands for SR 826, the Palmetto Expressway, and the MIA West Cargo Area. MIA is one of the world's leading cargo air centers, and alleviating truck movement delays between "Cargo City" and various freight handling concerns in the AWA, among other areas, was a main objective of the efforts. Detailed summaries of the highlights for all three studies are included in Appendix E.

3.0 AREA MARKET RESEARCH AND FINDINGS

An AWTMI contacts census was conducted in April 2001 with the help and guidance of the AWTMI and assistance from the AWA South Florida Commuter Services representative. The survey was first developed by the consultant team and then refined by the SAC in consultation with AWTMI and SFCS.

The survey form was concise, and consisted of only eight questions, along with a brief introduction and optionally volunteered contact information on a single sheet printed front and back. It queried respondents for information considered by the study team as most representative of the types and kinds of problems typically experienced by the AWTMI members, and AWA businesses, suppliers, and visitors. The survey form consisted five multiple-choice questions and three fill-in-the-blank inquiries. All multiple choice questions allowed respondents to add other responses as well except for the time-of-day designation, where the team divided the day into eight typical transportation planning periods and asked the respondent to select the most applicable time frame. A sample instrument is included in Appendix A.

The AWTMI faxed copies of the survey instrument to the businesses on its distribution list; about 100 were transmitted. Detailed documentation of survey responses is presented in Appendix B.

Presented below are the main points inquired about for each question, followed by the most commonly received responses for each question, listed in descending order of frequency.

1) Worst AWA problems affecting the respondent *as drivers* (2 worst per respondent)
   - Congestion, and that which occurs during morning and afternoon rush hours
   - Getting through intersections
   - Sharing the road with large trucks

2) Worst AWA problems affecting respondent's *business* (2 worst per respondent)
   - Congestion, and that which occurs during morning and afternoon rush hours
   - Rush hour deliveries and pickups
   - Turning radii for trucks
   - Lack of parking (unspecified re. for trucks, for workers, or for visitors/patrons)

3) When businesses most use or most need to access to/from roads for shipments/deliveries
   - Mid-afternoon (1-4 PM)
   - Afternoon rush hours (4-6 PM)
   - Mid-morning (9AM – 12 Noon)
   - Morning rush hours(7-9 AM)

[Eight time periods were provided for respondent to select two from]

4) Area roads most often used for business (3 blank fill-in lines provided)
   - NW 25th Street
   - NW 12th Street
   - NW 82nd Avenue
   - NW 36th/41st Street
   - NW 87th Avenue

5) Worst AWA intersections and roads segments (3 blank fill-in lines provided)

- Worst roadways (excluding expressways)
    - Segments of NW 36th/41st Street
    - Segments of NW 25th Street
    - Segments of NW 12th Street
    - Segments of NW 87th Avenue
- Worst Intersections (excluding expressway interchanges)
    - NW 25th Street & 82nd Avenue
    - NW 12th Street & 87th Avenue
    - NW 12th Street & 72nd Avenue
    - NW 41st Street & 87th Avenue
    - NW 25th Street & 87th Avenue
    - NW 25th Street & 72nd Avenue

6) Transportation improvements most desired by respondents (3 blank fill-in lines provided)

- Roadway/segment improvements to NW 12th Street
- Roadway/segment improvements to NW 36th/41st Street
- Roadway/segment improvements to NW 87th Avenue
- Roadway/segment improvements to NW 72nd Avenue

7) Types of trucks used by, or coming to, respondents' businesses (10 types provided)

- Delivery vans (including minivans and SUVs)
- Medium straight trucks/panel vans
- Tractors/semi-trailers
- Light straight trucks./panel vans

8) Main businesses conducted by respondents' firms (12 types and a fill-in blank provided)
   - Wholesaling
   - Freight forwarding
   - Local distribution
   - Warehousing
   - General Office

As noted above, all five non-fill-in-the-blank questions provided a choice of responses, for respondent selection. All inquiries but the times of trucking activity and truck type questions were backed with a blank fill-in line or an "other" line to assure exhaustion of responses. The majority of survey responses for Question 6 indicated a particular roadway segment as opposed to the facility in general, as well as specifying particular intersections.

Appendix A presents the survey form.

4.0 DATA COLLECTION AND ANALYSIS

4.1 Selection of Corridors and Intersections for Observation

Following collection of survey forms and compilation of generally qualitative response data, sites for further specific quantitative traffic data acquisition were selected in consultation with the SAC. Two corridors, one north-south, and one east-west, along with four intersections, were chosen for detailed traffic data collection.

Corridors -The two corridors selected were:

- **NW 36th/41st Street** –between the Turnpike (near 117th Ave) and NW 72nd Avenue
- **NW 87th Avenue** –between NW 12th Street and NW 58th Street

These two corridors were chosen because they are facilities that are well-traveled major arterials, and they are generally recognized as roadways currently experiencing significant traffic problems, and each was pointed out by survey respondents as streets in need of traffic relief. They have higher than typical truck volumes, and each is perhaps the major directional surface thoroughfare in the AWA for east-west travel and north-south movements, respectively. Perhaps most importantly, these two major arterial provide accessibility to the neighboring state highways for truck traffic within the study area.

NW 36th/41st Street is a main east-west corridor connecting Miami International Airport with the SR-826, Palmetto Expressway, itself one of Miami-Dade's heaviest general travel corridors as well as one of the County's major truck volume facilities. NW 36th/41st Street also continues west past SR 826, traversing the AWA until it reaches and accesses the Homestead Extension of the Florida Turnpike (HEFT). While it is a large facility, a six-lane divided highway with turn lanes at most major intersections; it carried approximately 77,500 vehicles per average weekday in 1999/2000 resulting in a typical Level of Service (LOS) of E (information based on data

obtained for the FDOT count station 1173). Currently, there is a ½-mile long segment immediately below to and centered about the SR 826 interchange overpass that remains a 4-lane roadway.

NW 87 Avenue is a north-south corridor connecting SR 836 (Dolphin Expressway) to the NW 36th/41st Street corridor. Between NW 12th Street and NW 36th/41st Streets, it is a six-lane divided roadway with turn lanes at the major intersections and multiple driveways for business entrances. North of NW 36th Street, to NW 58 Street, NW 87 Avenue is a four-lane roadway. Although outside of the study limits, it should also be noted that NW 87 Avenue is proposed to be extended from NW 58th Street north to Okeechobee Road, providing continuity for the northern parts of the western portions of Miami-Dade County. When completed, it will provide a continuous north-south thoroughfare about two miles west of SR 826, the Palmetto, and about 2 miles east of the Turnpike. Because it will be a main roadway paralleling two north-south expressways, it can be foreseen to become an even more important connector facility, carry high volumes of both car and truck traffic to connect to major east-west roadways that in turn connect to the expressway system.

Intersections- The four intersections selected were:

- **NW 36th Street and NW 72nd Avenue**
- **NW 41st Street and NW 107th Avenue**
- **NW 12th Street and NW 87th Avenue**
- **NW 36th Street and NW 87th Avenue**

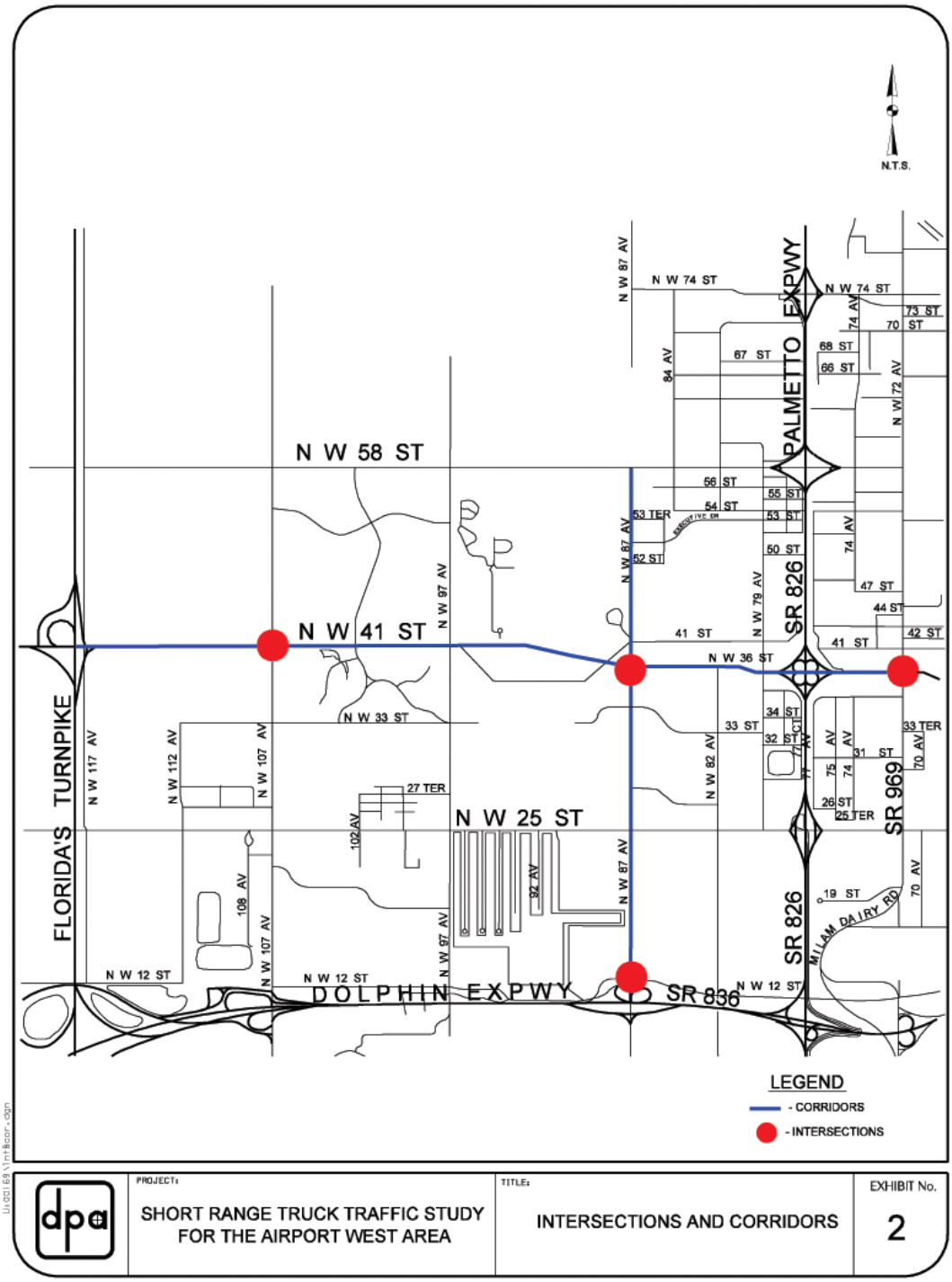
These intersections represent important nodes in the Study Area. The first is the only selection east of the Palmetto Expressway, selected because, along with NW 25th Street, it is one of only two AWA roadways providing relatively convenient access to and from the Airport's cargo

rea's roadways. It is important to maintain throughput on truck routes to help assure area economic productivity.

The intersection of NW 107TH avenue and NW 41st Street was chosen because it not only experiences significant current traffic, but can be anticipated to carry even more in the future as development continues to intensify and growth occurs in currently un- or lightly-developed areas surrounding the site. Growth in the areas around the intersection will be mixed residential, mostly to the east, and commercial/industrial, mostly to the west. The resulting vehicle mixes anticipated to result from such growth lends urgency to prospective improvements considered, as both truckers and commuters need to meet schedules and combat increased travel times to maintain economic health and livability.

The intersection of NW 12th Street and NW 87th Avenue occurs at a complex interchange that connects SR 836 and NW 87th Avenue and a large, growing mixed consumer services and retail area immediately to the north, to retail and residential areas south of SR 836. Large numbers of private vehicles interspersed with a variety of truck traffic supplying the area businesses can be expected to continue, and interchange and intersection problems can be expected to worsen.

Finally, the intersection of NW 87th Avenue and NW 36th/41st Street allows travel between the arguably two most important "internal" AWA roadways. As noted previously, NW 87th Avenue connects heavy industrial uses in the NW 58th Street areas with commercial and resort uses between NW 58th and NW 36th/41st, with largely commercial and service uses south to NW 25th Street, and the consumer retail uses farther south along the corridor. But NW 36th/41st Street is the only east-west facility that connects with interchanges to both the Turnpike and the Palmetto, at either end of the Study Area. As such, the intersection becomes one of the prime nodes of AWA, and improving and maintaining throughput at the location will continue to be important. Exhibit 2 depicts the selected segments and intersections.



	PROJECT:	TITLE:	EXHIBIT No.
dpa	SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	INTERSECTIONS AND CORRIDORS	2

4.2 Traffic Counts

4.2.1 Intersection Counts and Volumes

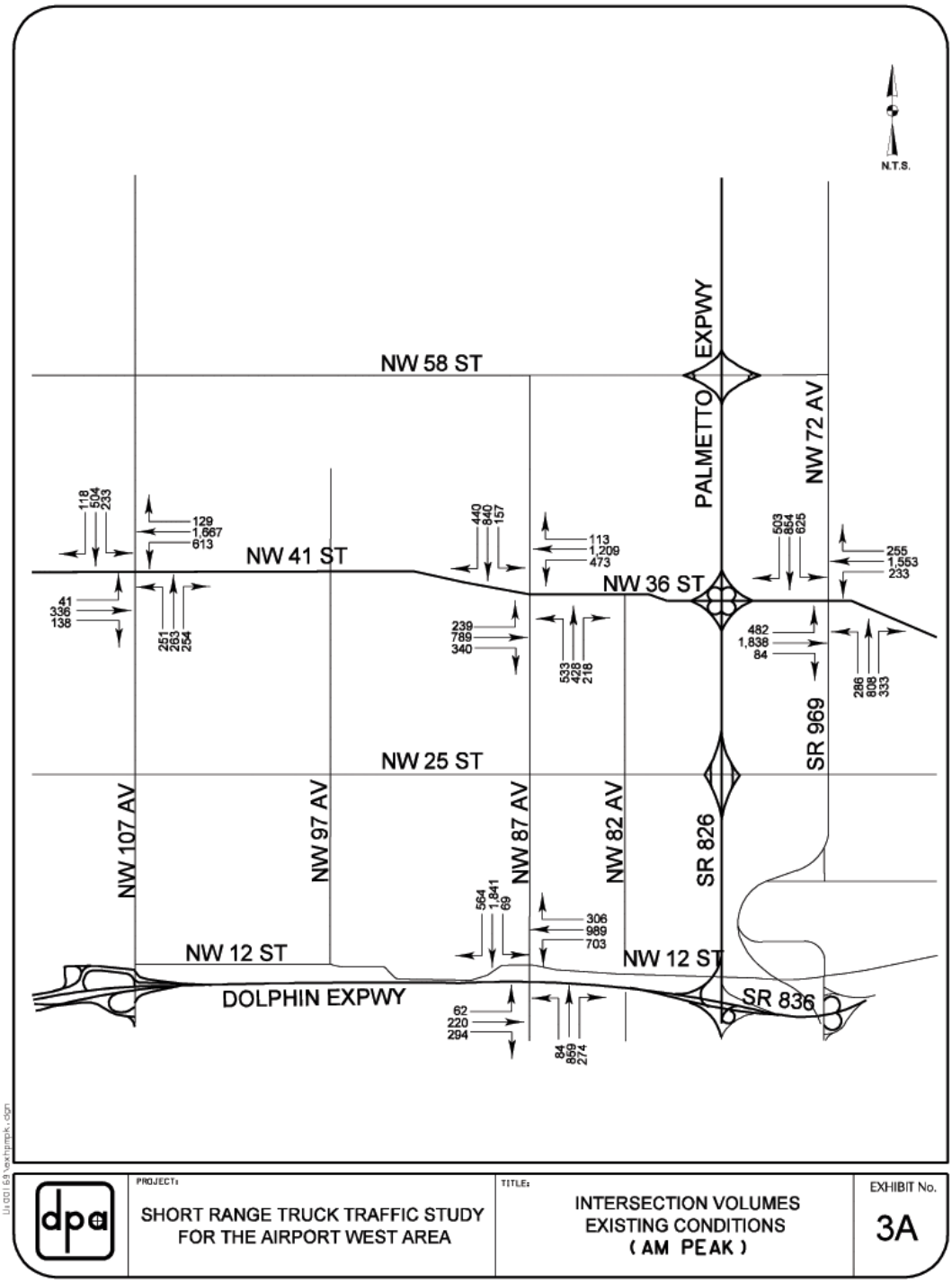
For the four intersections selected for detailed analyses, single day turning movement counts were obtained between Thursday, July 12, 2001 and Thursday, July 19, 2001. The counts were taken from 8:00-9:00 AM, 1:00–2:00 PM and 4:00-5:00 PM for each location. The counts were adjusted by the standard FDOT Weekly Volume Factor.

Intersection volumes are shown in Exhibits 3 A, B, and C. Traffic count summaries and existing signal timing and phasing are also included in Appendix C.

4.2.2 Roadway Counts and Volumes

Roadway counts were determined from the AM, MIDDAY, and PM peak hour turning movement counts. The counts were taken for the two corridors selected for detailed analyses and these corridors were further divided into four segments.

Exhibit 4 depicts the two-way link capacity analysis for the corridors selected.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NW 58 ST
NW 41 ST
NW 36 ST
NW 25 ST
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NW 12 ST
PALMETTO EXPWY
NW 72 AV
SR 969
NW 107 AV
NW 97 AV
NW 87 AV
NW 82 AV
SR 826
DOLPHIN EXPWY
SR 836
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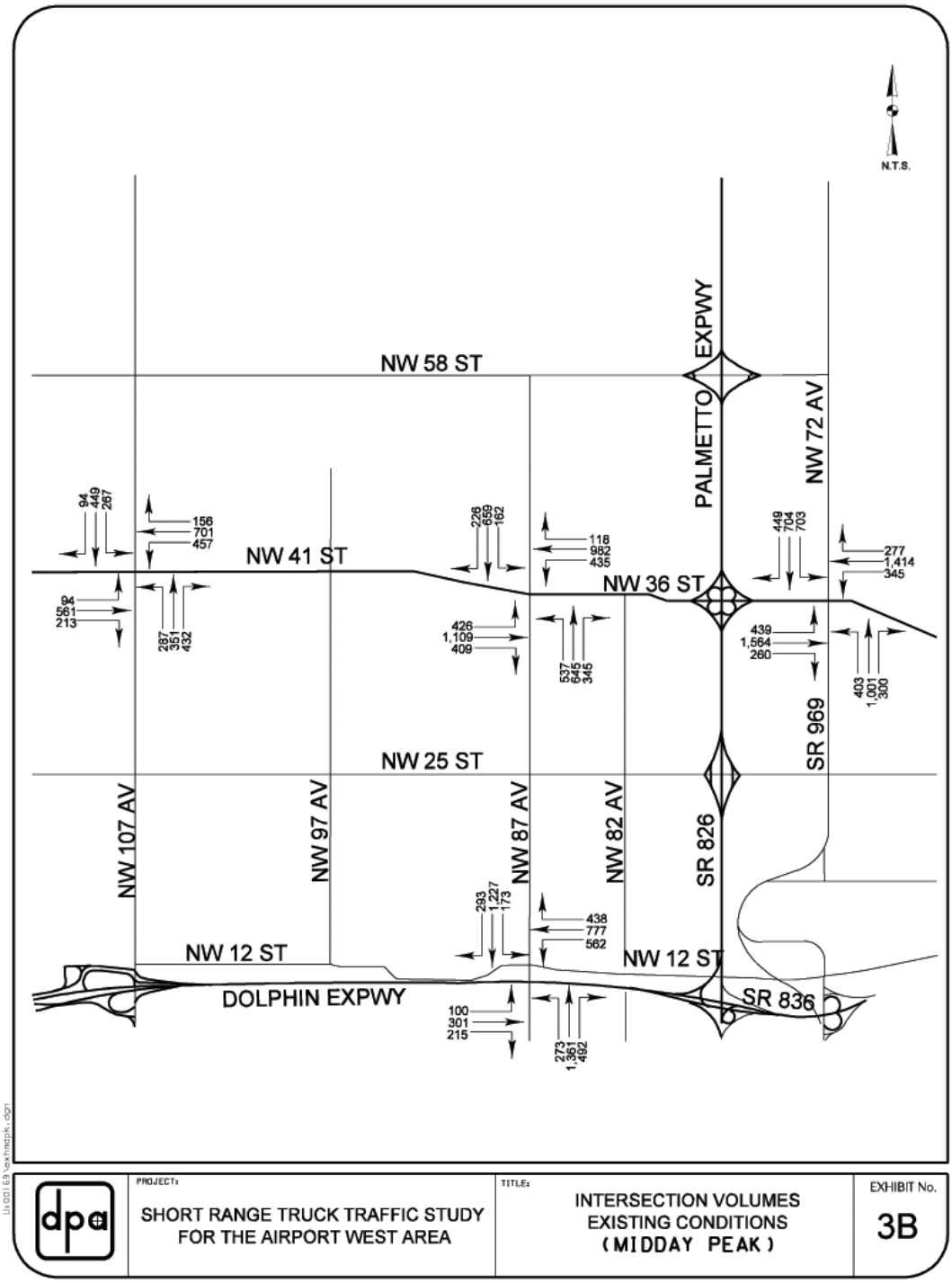
1,553
233
482
1,838
84
286
808
333
564
1,841
69
306
989
703
62
220
294
84
869
274
PROJECT:
SHORT RANGE TRUCK TRAFFIC STUDY
FOR THE AIRPORT WEST AREA
TITLE:
INTERSECTION VOLUMES
EXISTING CONDITIONS
(AM PEAK)
EXHIBIT No.
3A


N.T.S.
NW 58 ST
NW 41 ST
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NW 12 ST
NW 12 ST
DOLPHIN EXPWY
PALMETTO EXPWY
NW 72 AV
SR 969
SR 826
SR 836
NW 107 AV
NW 97 AV
NW 87 AV
NW 82 AV
94
449
287
156
701
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94
561
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1,109
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1,227
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438
777
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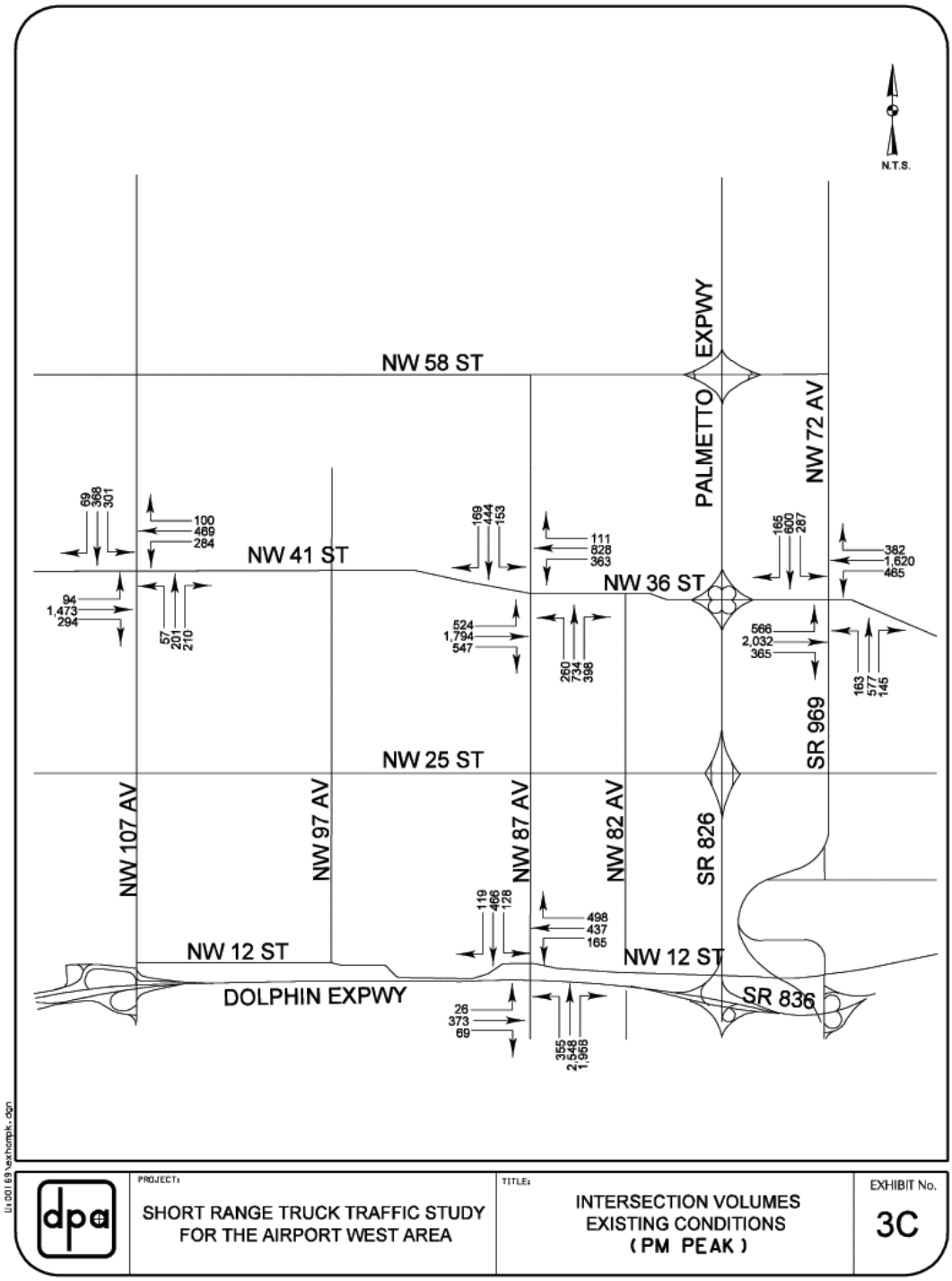
492
PROJECT:
SHORT RANGE TRUCK TRAFFIC STUDY
FOR THE AIRPORT WEST AREA
TITLE:
INTERSECTION VOLUMES
EXISTING CONDITIONS
(MIDDAY PEAK)
EXHIBIT No.
3B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NW 36 ST
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DOLPHIN EXPWY
PALMETTO EXPWY
NW 72 AV
SR 969
SR 826
SR 836
NW 107 AV
NW 97 AV
NW 87 AV
NW 82 AV
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466
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373
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PROJECT:
SHORT RANGE TRUCK TRAFFIC STUDY
FOR THE AIRPORT WEST AREA
TITLE:
INTERSECTION VOLUMES
EXISTING CONDITIONS
(PM PEAK)
EXHIBIT No.
3C

Exhibit 4

Two-Way Link Capacity Analysis

Street	Segment	AM Volume	LOS	MD Volume	LOS	PM Volume	LOS	Capacity @ "E"
NW 36 Street	East of NW 72 Ave	4931	F	4603	E	4837	E	4810 (Class II)
	NW 72 Ave to Palmetto	4911	F	4529	C	4746	E	4890 (Class I)
	Palmetto to NW 87 Ave	3647	D	3151	D	2959	D	4640 (non SR)
	NW 87 Ave to NW 107 Ave	3480	D	3132	D	3391	D	4640 (non SR)
NW 87 Avenue	South of NW 12 St	5561	F	4130	D	4055	D	4810 (Class II)
	NW 12 St to NW 25 St	3785	D	3592	D	3701	D	4640 (non SR)
	NW 25 St to NW 36 St	2746	C	3030	D	2832	D	4640 (non SR)
	North of NW 36 St	2135	D	2236	D	2217	D	3080 (non SR)

* Source: 1998 Level of Service Handbook

4.3 Existing Conditions Intersection Analysis

Following count compilation, existing conditions were established. Intersection level of service analyses were then conducted using Highway Capacity Software (HCS), based on the procedures of the *2000 Highway Capacity Manual* (HCM). The HCM defines six levels of service (LOS), with "A" representing the best operating conditions and LOS "F" representing the worst. Delay is the average travel time experienced by a driver to cross a particular intersection within the time interval being analyzed. HCS indicates the average delay in seconds per vehicle. Note that HCS does not indicate a LOS or a delay time when the volume over capacity ratios exceed 1.20. It should also be noted that for typically configured intersections, HCS generally indicates intersections operating at very poor levels of service.

The analyses are based on the existing lane configuration and traffic signal timing/phasing. Analysis results are summarized in Exhibit 5; analysis worksheets are also included in Appendix C.

Exhibit 5

Existing Conditions Intersection Analysis

INTERSECTION	LOS / DELAY (seconds/vehicle)		
	AM	MID-DAY	PM
NW 36 Street /NW 72 Avenue	F (160)	*	F (341)
NW 36 Street /NW 87 Avenue	F (458)	F (155)	F (109)
NW 41 Street /NW 107 Avenue	F (125)	F (204)	F (448)
NW 12 Street/NW 87 Avenue	*	*	*

Source: DPA
*** v/c and delay results are greater than HCS threshold (1.20).**

The intersection analyses-were used to establish the existing capacity of the study intersections, the intersections' operational characteristics, and to identify problems and deficiencies. These were used as bases for developing possible corridor solutions later in the study. Note that the shortest wait time was 109 seconds, or about one and three-quarters minutes to make it through an intersection. More importantly, it should be noted that at a minimum, two minutes were needed in <u>all</u> other cases studied, and that depending upon the time of day and intersection selected, between about 5 minutes 40 seconds and 7 minutes and 40 seconds were needed to clear the intersections studied. Clearly, these numbers indicate the rather long delays experienced by drivers in the area; just as clearly, all intersections studied operated at failing levels of service.

Not so obvious, perhaps, is that delays like these affect our economy as well. Each delay adds costs to the transportation of materials, goods, and even services, as we are thus paying additional labor and operating costs, and travel charges, all accruing as trucks wait to get through stacked intersections and congested roadways. Rising costs decrease competitive advantages, so it behooves the County to seek ways to alleviate these excessive congested situations, especially in areas like Airport West, where many freight firms are located and trucking is a major way of life. Delays and congestion in truck-prevalent areas are frequently due to problems associated with trying to drive trucks on roadways ill-suited for their use. Developing approaches to reduce car-truck conflicts, and to ease truck movements in AWA can provide real benefits to not only the AWA itself, but to the greater Miami-Dade and South Florida community as well.

4.4 Planned and Programmed Improvements

The 2002 Miami-Dade County *Transportation Improvement Program* (TIP) was reviewed to identify programmed or planned significant roadway projects within the study limits of this project. Exhibit 6 lists the projects listed in the TIP scheduled for work within the next 5 years. In addition, the *2025 Long Range Plan* was reviewed for future improvements, including projects which are expected to be developed over the next twenty-plus years arising from the cost-feasible Plan. Exhibit 7 lists the projects listed in the County's Long Range Plan.

Exhibit 6

2002 TIP Improvements

Location	Limits	Improvement
NW 25 Street	NW 87 Ave to SR 826	Add lanes
NW 25 Street	NW 82 Ave to NW 67 Ave	New viaduct
NW 97 Avenue	NW 25 St to NW 41 St	2 to 4 lanes

Interchange improvements are currently in design for the Palmetto Expressway interchange at NW 36th Street. The project proposes to replace the existing full cloverleaf interchange with a partial cloverleaf interchange type A. The northwest and southeast quadrants will have loop on-ramps with outer off-ramps taking the form of a diamond. This allows the vehicles exiting SR 836 to make a left turn onto NW 36th Street and eliminate existing weaving maneuvers. The design improves operations and reduces congestion by eliminating two weaves, and just as importantly, reduces personal vehicle-intimidating car-truck conflicts arising from such weaves at the interchange.

The Priority categories for these improvements are defined in the *2025 Long Range Plan* as follows:

Priority I - projects to be completed and opened by the Year 2010 to respond to the most pressing travel problems (projects listed in the 2002 TIP also fall under this category).

Priority II - projects where development efforts should commence before 2010 and construction to occur between 2010 and 2015.

Priority III - projects where development efforts should commence before 2015 and construction to occur between 2015 and 2020.

Priority IV - projects to be completed before the Year 2025.

Exhibit 7

2025 Long Range Plan Improvements

Priority	Location	Limits	Improvement
I (by 2005)	NW 25 Street	NW 87 Ave to SR 826	Add lanes; Pavement reconstruction
II (2005-2010)	NW 107 Avenue	NW 41 St to NW 25 St	4 to 6 lanes
IV (by 2020)	NW 87 Avenue	NW 36 St to NW 58 St	4 to 6 lanes
IV (by 2020)	NW 25 Street	NW 68 Ave to NW 77 Ave	Viaduct
IV (by 2020) Unfunded	NW 36/41 Street	NW 42 Ave to HEFT	Express Street

4.5 Corridor Field Observations

In order to fully comprehend existing conditions along NW 36 Street and NW 87 Avenue, these observations were collected. These two study corridors previously selected for further work were observed during the AM, MIDDAY, and PM peak periods. During these major daily traffic flow hours, the corridors were observed for operational characteristics, traffic patterns, truck volume, and to characterize the spacing between driveways. Following are selected observations of these "windshield" surveys.

<u>NW 36th Street</u>

- The peak direction is eastbound during the AM and westbound during the PM peak periods; there was no obvious peak direction during the main MIDDAY hour.
- Significant truck traffic was present during ***<u>all</u>*** periods.
- Signal spacing is approximately 2.5 signals per mile.
- Driveways appear to be adequately spaced to not overly impede flows.

NW 87th Avenue

- The peak direction is northbound during the AM and southbound during the PM peak periods; there was no obvious peak direction during the MIDDAY hour.
- Significant truck traffic was present during ***all*** periods.
- Signal spacing is approximately 4 signals per mile.
- Driveways appear to be adequately spaced to not overly impede flows

4.6 Intersection Field Observations

Existing conditions of all four study intersections were observed during the morning, midday and afternoon peak periods. As demonstrated in the intersection analysis, operations are heavy, and all four intersections experience high vehicle throughput volumes and subsequently experience long delays.

5.0 RECOMMENDED CORRIDOR IMPROVEMENTS

For this section of the report, general traffic improvement approaches are noted for both the specific intersections selected, and for the two arterial corridors chosen, as well as a number of general, area wide AWA transportation improvement suggestions. Trucking interests will benefit from these general improvements as well as personal vehicles. Some truck-specific enhancements are noted as well.

AWA transportation network and systems improvement recommendations presented in this report are based upon existing conditions as revealed through State and County data, consultant-collected data, and field observations. It would also be not only beneficial but prudent to perform a series of more detailed analyses throughout Airport West's network using estimates of future year traffic to capture growth and better allocate scarce resources to the most appropriate roadway segments and intersections to reap the maximum benefit from transportation infrastructure investments.

5.1 TRAFFIC OPERATIONS IMPROVEMENTS

A program should be developed to better manage traffic throughput, signalization, and accessibility of the two selected corridors and the four selected intersections to improve specific corridor and intersection capacity, reduce conflicts, and improve or at least ameliorate further degradation of travel speeds.

More generally, a detailed Airport West area wide operations analysis encompassing the AWA travel network of links (facilities) and nodes (intersections) should be conducted to develop an AWA package of mutually supportive improvements. In conjunction with minor capital improvements, these would be expected to maximize the benefits of operations improvements throughout the area:

A. Review and Adjust Signal Timing

A recommended improvement for the intersections specifically investigated is to adjust the timing of the signals controlling traffic flows through them. This will increase the intersection's level of service and reduce some delays. It will also contribute to improving throughput and reducing congestion and consequent delay along each of the intersection's corridors as well.

For example, at the intersection of NW 36th Street and NW 87th Avenue, a truly extraordinarily congested situation exists. The intersection experiences AM and PM peak LOS F, with average delays of 458 seconds during morning rush hours and 109 seconds during the afternoon peak. And testament to the incredibly high volumes of traffic occurring in many areas of Airport West throughout even the middle of the day, a midday delay of 155 seconds, also LOS F, occurs to congest travel and stymie traffic flow as well. By adjusting individual directional movements' component times and revising the multi-phased total cycle length, the intersection will still experience a LOS F, but the time delay will significantly decrease to 338 seconds. Indeed, reductions of 26%, 54%, and 34%, for AM, MIDDAY, and PM peak intersection delay can result from appropriate retiming of the signal. Please refer to Exhibit 8 for more information.

Exhibit 8
NW 36 Street / NW 87 Avenue Directional Movement Adjustments

Peak Time	Existing Delay (seconds/vehicle)	* Future Delay (seconds/vehicle)	Difference	Percent Difference
AM	458	338	120	26%
MD	155	72	83	54%
PM	109	72	37	34%

Note:* Future delays are due to adjusting individual directional movements' component times and revising the multi-phased total cycle length.

A secondary benefit results as well. By reducing delay time on an intersection, the proceeding intersections along a corridor will experience a less significant queue delay. See Exhibit 9 for the intersection analysis with recommended improvements.

Indeed, a review and analysis of all signals within the AWA would be beneficial, and by implementing timing changes, the entire area would be expected to see improvements in vehicle throughput and experience reduced intersection-induced delays. If the analysis and implementation of signalization-related improvements can be done in a coordinated fashion for all AWA intersections, the resulting signal synchronization would be expected to yield even greater overall, synergistic area-wide net traffic flow and congestion-reduction benefits.

Exhibit 9
Intersection Analysis with Signal Timing Improvements

INTERSECTION	WITH EXISTING SIGNAL TIMING LOS (DELAY)[1]			WITH SIGNAL TIMING IMPROVEMENT LOS (DELAY)[1]		
	AM	MD	PM	AM	MID	PM
NW 36 Street /NW 72 Avenue	F (160)	*	F (341)	F (155)	F (372)	F (334)
NW 36 Street /NW 87 Avenue	F (458)	F (155)	F (109)	F (338)	E (72)	E (72)
NW 41 Street /NW 107 Avenue	F (125)	F (204)	F (448)	E (64)	F (93)	E (66)
NW 12 Street/NW 87 Avenue	*	*	*	*	F (145)	F (230)

Source: DPA
[1] Delay in seconds/vehicle
*** v/c and delay results are greater than HCS threshold (1.20).**

B. Elimination or Relocation of Traffic Signals

The two corridors studied, NW 36th/41st Street (east-west) and NW 87th Avenue (north-south), should be further evaluated in much greater detail to determine the need for maintaining all existing traffic signals in their current configurations.

There may be instances where signals may actually be contributing more to congestion rather than alleviating it, others where signals may be located apart from more heavily utilized roadway entry and/or crossing points, and others where, though signals may be needed to manage peak period flows, retiming for off-peak periods may result in better traffic flow and less congestion during midday, evening, and night times.

Ideally, similar analyses should be performed for all corridors within the AWA, and analogous to recommendations for signal timing adjustments, coordinated area-wide approaches would be expected to reap synergistic benefit beyond those achieved solely from site-and/or single corridor-specific improvements.

Guidelines should be developed which set requirements for continuing, periodic evaluation of existing traffic signals, and warrants and needs for installing new AWA signals, and incorporating heavy vehicle-friendly design elements, should be reviewed and possibly revised to meet the needs of the AWA transportation network.

C. Restricting Turning Movements and Reducing Median Openings

Prohibiting turning movements in some intersections (signalized or unsignalized), and revising the typical designs, along with reducing the frequency of median openings have demonstrated to reduce crashes and alleviate congestions.

Left turn maneuvers should be prohibited by construction medians or implementing "no left turn" signs through the study area. This will decrease congestion by minimizing the backup queues caused by shared through left lanes.

A median-opening restricting example would be the elimination of the more closely spaced median openings on NW 36 Street between SR 826 and NW 72 Avenue. The re-evaluation of median openings should be completed with adjustments in left turn bay lengths to better accommodate all vehicles, but especially trucks, whose longer lengths will fill turn bays with fewer vehicles than will autos. This should only be completed after a thorough study of specific roadway segments and the movements associated with each turn bay and intersection are more intensively analyzed.

There is also some current research which indicates that implementing a U-turn bay, or possibly combining a U-turn capability and allowance in a left turn bay with appropriate upstream signal cycling (for proximal signals) can offer traffic flow improvements as well as some intersection relief.

5.2 Physical Improvements

Widening roadways is always an option to increase capacity, and at least temporarily, to improve vehicle throughput, reduce travel times, and relieve congestion. Both corridors studied would benefit from increasing the number of lanes of their respective facilities.

The addition of right turn lanes at high volume traffic intersections and/or driveways is another possible remedial solution; indeed, most physical improvement recommendations will be remedial retrofits. All the intersections selected for more detailed analysis would also benefit from intersection widening in that vehicle movements would be increased and delay significantly reduced; indeed, continuous right turn without stopping on red lights would appreciably alleviate

delay and greatly reduce queues at the most congested. A number of entrances to some of the larger commercial developments can be improved by adding right turn lanes leading to the driveways providing access to the properties, removing slowing and nearly stopped vehicles from the main arterial's travel lanes.

The construction of acceleration/deceleration lanes is another improvement that should also be considered. This is especially beneficial to heavy trucks, which frequently must enter traffic streams at low speeds, thus impeding following platoons of vehicles and introducing or adding to congestion on a facility. One example of a suggested physical improvement that would be beneficial for truck movement is the scheduled interchange improvements for SR 826 at NW 36 Street. These improvements will help relieve truck weaving, particularly because this is one of the problem areas identified in the survey and field verified.
Unfortunately, the combination of a general lack of right-of-way along many corridors and at many intersections in the AWA and the high cost of acquiring it where there remains some land available for purchase, in concert with consequent possible to probable reduction in sidewalk widths and pedestrian amenities, largely precludes adding turning lanes along the study corridors because it is counter-multi-modal, and more importantly, generally not financially feasible.

Nonetheless, it is strongly recommended that any new developments within the study area should incorporate the design standards and criteria described in greater detail in Section 6.0. These include revised specifications for driveway widths and turning radii to allow improved throughput of truck traffic, and the reservation of maximum ROW cross-sections whenever and wherever possible.

5.3 Intelligent Transportation System (ITS) Improvements

Intelligent Transportation Systems (ITS) is a Federal level organization that became official when Congress, in 1991, recognizing the critical need to address our aging transportation network and its pressing challenges, adopted the ITS program. It represents the next step in the evolution of the nation's entire transportation system. ITS can be applied to our vast transportation infrastructure of highways, streets, and bridges, as well as to a growing number of vehicles, including cars, buses, trucks, and trains. These information and communications technologies can also be used to better manage and improve how transportation providers such as governments, transit agencies and truckers offer services to the public.

ITS can provide a means of applying innovative solutions to chronic problems that are difficult to resolve with traditional capital improvement or operations improvement methods. Researchers in Texas have developed a system that detects a truck approaching an intersection which relays signal to a computer using a vehicle classifier. The computer in turn sends a message to the signal controller at the signalized intersection ahead of the truck to take appropriate action, such as delaying a light change from green to red to give the truck time to clear the intersection safely. The researchers found inductive loops connected to a classifier very accurate in detecting and classifying trucks and measuring their speeds, input vital for the success of such a system.

It can be conceived that on intersecting streets with maximal ROW constraints, tight turning radii on 90° intersection facilities, and even generally light traffic loads, heavy trucks and especially tractor-trailers, would experience problems negotiating right turns. In many cases, roadway cross-sections will force drivers to turn wide, and in many instances, bring their cabs into the opposing traffic lanes to negotiate the turn without having the rear of the vehicle climb the curb and run over the sidewalk. If an additional traffic signal were placed perhaps 50’ farther away from the intersection, an oncoming truck making a right turn might be detected as above, triggering the second light to go red while the intersection light remains green long enough to

clear the opposing traffic queue. Then the driver could much more easily and safely veer into the opposing traffic lane to successfully make the turn. Dual benefits might be realized from such an arrangement. First, truck travel would be enhanced. Second, because the truck would no longer be threatening oncoming traffic, nor delaying traffic behind it, nor blocking an intersection waiting for other traffic to clear, traffic flows would tend to be improved as well.

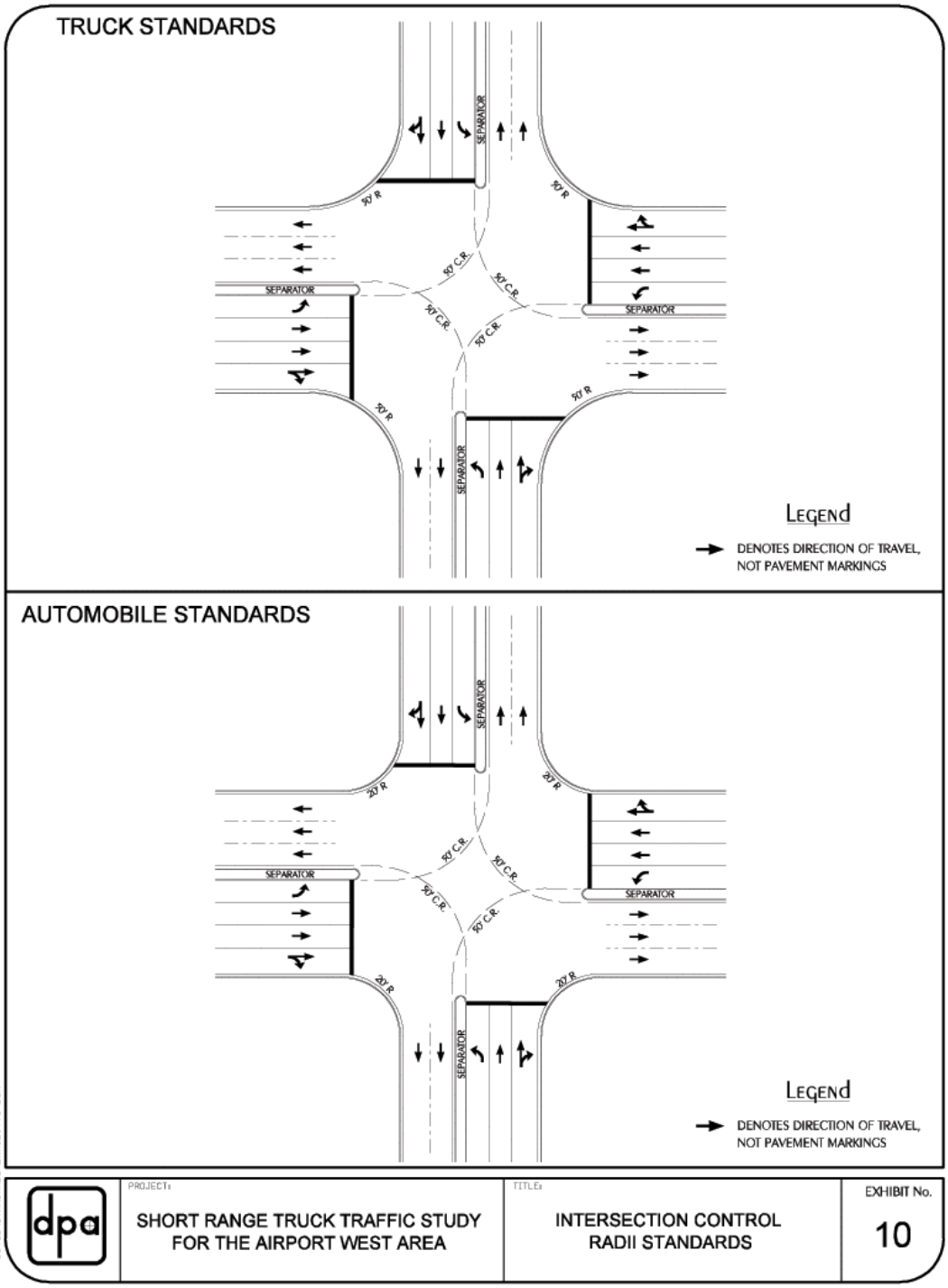
Potential ITS alternatives such as those described above, should be explored and considered to improve personal vehicles, small commercial vehicles, and heavy truck operations in the study corridors and segments within the AWA. While the effectiveness of some of these ITS solutions may be limited during heavy congestion periods, they may produce satisfactory results during off-peak hours. Minimizing the number of stopped or delayed trucks not only lowers traffic delay but also improves safety. And when truck travel patterns are better facilitated by making improvements, including ITS improvements, where trucks most frequently travel or where planners and the industry deem most appropriate, facilities in general, and in particular, pavements, can be remedially strengthened or initially constructed or periodically reconstructed to more demanding specifications to better endure wear and reduce maintenance costs.

6.0 DEVELOPMENT OF REVISED DESIGN STANDARDS

The purpose of design standards is to state general rules for the design of highways and streets. Primarily defining the guidelines designers use for roadway design, along with stating the design requirements. Standards assist in the administration and planning of design formulations. However, one set of standards does not fit all types of designs and as a result, with time, different organization, such as Institute of Transportation Engineers (ITE) and American Association of State Highway and Transportation Officials (AASHTO), have developed standards to meet a series of varying circumstances.

Design standards are updated on a regular basis due to the fact that traffic conditions and design requirements change with time, yet the fact that new design values are presented does not imply that all existing streets and highways are unsafe. In order to determine if any particular area is no longer functioning in a satisfactory manner site investigations and crash histories are analyzed. Such an approach was taken in the AWA area, which resulted in the conclusion that the area is no longer satisfactory due to the increase volume of truck traffic. The design standards that were first applied in the designing of the roadway and intersection cross-sections were initially adequate, however, with time they have become insufficient to deal with the current truck movements in the area.

The exhibits included in Appendix D are a compilation of standards given by ASSHTO. These can be considered suggested standards for traffic design for the roadways in the AWA. The exhibits include typical roadway segments and intersections, typical turn lane requirements, driveway spacing, and types of access to driveways, and cul-de-sacs. These cover most instances of roadway redesign that might be implemented on study area roads and access ways to improve on-street, access to property, and egress from property truck maneuverability issues.


TRUCK STANDARDS
SEPARATOR
90' R
90' C.R.
LEGEND
DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS
AUTOMOBILE STANDARDS
20' R
90' C.R.
LEGEND
DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS
PROJECT:
SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA
TITLE:
INTERSECTION CONTROL RADII STANDARDS
EXHIBIT No.
10

Specific Design Recommendations:

Based on the suggested adjusted standards, room for six-foot paved shoulders are to be incorporated into ROW purchases, integrated into initial future roadway designs, and subsequently constructed on all two-lane, two-way roadways. This feature was developed to provide for emergency stopping only. Emergency stopping on the four-lane and six-lane roadways can be accommodated within the 14-foot curb lane, while still maintaining at least one travel lane open to traffic.

During roadway design phases of highway projects, typical roadway sections do not show location of landscaping, utility corridor(s), or sidewalk(s). The designer should be responsible for the verification of the conditions and requirements for the areas adjacent to the project under design. The minimum width of sidewalks should be 6 feet. The designer should be responsible for complying with Americans with Disability Act (ADA) requirements as well. The roadway system is strongly recommended to be designed without on-street parking. If adequate off-street parking cannot be provided, special 22.5 degree angle parking and recessed parallel parking standards may be utilized for on-street parking design on slower speed, lower traffic classes of streets

A design review process should be implemented to a) recommendations forwarded here be incorporated in to the design criteria used by local city, county, and state agencies for both initial design and retrofit designs, and b) ensure that the absolute minimum requirements for pedestrians and ADA amenities are provided, to make the best use of the roadway. This step should take place especially in areas recognized as vehicle/truck oriented. Taking this approach will maximize vehicle movements and improve congestion while still providing some minima for the infrequent but far more safety-vulnerable non-motorized modes to travel in the immediate vicinity of these high truck volume facilities.

All roadway pavement markings and roadside traffic signs should at a minimum comply with the Manual on Uniform Traffic Control Devices (MUCTD) for Streets and Highways and the Miami-Dade County Public Works Department standards and details for traffic control. All suggested standards are based on criteria in publications by the Miami-Dade County Public Works Department, FDOT, and the American Association of State Highway and Transportation Officials (AASHTO). It is especially important to assure large and heavy truck clearance in both horizontal and vertical dimensions with respect to signals and street signs, both for trucks traveling along the roadways, and for clearances at turning points at intersections and driveways.

7.0 TRANSFERABLE SOLUTIONS

While roadways are generically designed to handle typical mixes of vehicles types, not all vehicles have the same effect on traffic flow. Large trucks, as we know, adversely affect roadway capacity because of their size, their limitations to accelerate, decelerate and maintain speed on grades, and their often extraordinary turning radius requirements. As we have seen, truck traffic percentages of total traffic carried on AWA roads is higher than typical streets, and generic roadway design has been inadequate to handle many situations in the AWA precisely because trucks are so relatively prevalent. The design standards recommended in Section 5 of this report will certainly improve the traffic operations of the study area if and when implemented.

However, as already noted, the continuing growth of AWA, resulting in the now heavily built-up nature of much of the area, provides only limited opportunities for the expansion of the rights-of-way needed to apply the recommended, revised standards and to implement some of the recommended improvements.

This section recommends methods and treatments that will also help alleviate congestion in the AWA. Some of the solutions focus on reducing the number of *passenger* cars using the network during peak period as opposed to accommodating trucks through design, etc. The County's Mobility Management Process (MMP) report prepared by the Miami-Dade MPO was used as a source for some of the recommended solutions. The MMP approaches are classified as short-term and long term, cross-referenced by type of approach, and several recommended applications are presented for each.

Short Term Solutions

Physical Improvements:

* **Intersection Improvements** - a series of treatments directed towards improving traffic flow at intersections:
    - Traffic signs
    - Changes in geometric design
    - Turning lanes
    - Acceleration/Deceleration lanes
    - Traffic islands
    - Grade separation

Operational Improvements:

* **Elimination and Relocation of Traffic Signals** – evaluate traffic signal operation by corridor to determine the need of existing signals
* **Restriction on Turning Movements** – prohibiting turning movements in some intersections thereby eliminating conflicts
* **Access Management** – this program is directed to manage accessibility to arterials in order to improve average travel speed and capacity
* **Incident Management** – this program monitor traffic flow and detect incidents and crashes along the roadway network
* **Signal Re-timing** – improvements to signalized intersections by revising the signal phases.

Travel Behavior Change Improvements:

* **Ridesharing** – a vehicle shared by several person for trips to and from work; implement additional carpools and/or vanpools from employers or groups of employers in the AWA
* **Shuttle Service** – bus or van service that provides transportation between the company's site to a transportation facility. The "*Miami Service Shuttle Report*" prepared by the MPO made recommendations for implementing a shuttle system servicing the Airport West Area.
* **Preferential Parking** – employers provide preferential parking spaces and treatments for car pool and vanpool vehicles –for example, reduced rates and/or providing spaces nearer to building access points or elevators in garages
* **Alternative Work Hours** – this solution spreads the demand for travel at peak periods by allowing or even encouraging workers to begin and leave early before the worst of rush hour traffic, or begin and end later, or even by working 4/10 hour days and not commuting altogether one day a week.
* **Telecommuting** – employees are allowed to work from home, or a closer-to-home specially-equipped remote site using computers and phone lines

Long Term Solutions

* **Road Building/Extension –** fundamental method for adding transportation system connectivity and capacity; normally applied as first course of action over the past century throughout the US and the world; while system attributes may be enhanced, this approach virtually always serves to open new areas to either new development of more intense

development, and eventually acts as a catalyst for adding traffic to roadway systems.

* **Road Widening** – traditional largely uncontroversial method normally applied to improve capacity and vehicle throughput where right-of-way availability permits; improves traffic flow by increasing the width of an existing lane or by adding new lanes. The Long Range Transportation Plan (LRTP) lists the following road widening project within the study limits:
    - Widen NW 58 Street from NW 102 Avenue to NW 107 Avenue from 4 to 6 lanes
    - Widen NW 87 Avenue from NW 36 Street to 58 Street from 4 to 6 lanes
    - Widen NW 107 Avenue from NW 41 Street to 25 Street from 4 to 6 lanes
    - Widen NW 36/41 Street from NW 42 Avenue to HEFT from 4 to 6 lanes
    - New express street, also known as a "super arterial", to include select intersection and segment grade separations, coalescing of driveway openings, reduced side street access points, and ITS improvements. Super arterials provide higher levels of service and greater throughput superior to that of normal, equivalently-sized roadways through synergistic combinations of design, separation, and operational elements augmented by the new technology advances of Intelligent Transportation Systems applications.

Operational Improvements:

- Institute programs of expanded regular periodic traffic counting throughout the AWA, and follow up with expanded, regular programs of signal retiming
- Implement a computer-driven traffic counting and signal synchronization optimization program for application to signalized AWA intersections

Travel Behavior Change Improvements:

- Develop and implement an Airport West Trip Reduction Ordinance (TRO). TRO's revised commuting approaches that constrain the use of single occupant vehicles in certain areas at certain times.

All these physical, operational, or behavior change treatments and approaches implemented over both the short-term and the long-term will multiply serve to facilitate truck movements in the AWA either by directly addressing truck issues, or by addressing the larger, overall area traffic issues which complicate and impede track travel in this increasingly congested area. The best programs will as aggressively as feasible seek to improve truck maneuverability while concomitantly reduce general roadway traffic loads to synergistically improve travel for all in the AWA.

8.0 DEVELOPMENT OF IMPLEMENTATION PLAN

An increase in capacity of the corridors and intersections within the AWA may be achieved by implementing the following recommendations:

- Revising design standards
- Traffic operation improvements, and
- ITS improvements.

The implementation of these recommendations can also lead to fewer number of crashes and an improvement in truck mobility, movements, and maneuverability.

8.1 Implementation Plan

The proposed implementation plan is divided into two tiers. The first tier deals with specific corridor improvements and the second tier with area-wide improvements.

Corridor Improvements

A corridor is defined as a set of essentially parallel transportation facility that serves trips between two designated points. Corridors within the AWA should be evaluated individually based on the following criteria:

- **Truck Traffic and Freight Movement** – The extent of the road segment and / or corridor's use by truck traffic.

- **Congestion** – The extent of congestion during the following periods of the day as measured by actual or estimates LOS: AM Commute Peak, Mid-Morning, Midday Lunch Peak, Mid-Afternoon, PM Commute Peak, Evening Period, Overnight

- **Connectivity** – The importance of the corridor and its connection between locations.

- **Safety** – Number of crashes over the past 5 years. Percent of crashes involving trucks. Types of crashes. Crash trend over the past 5 period.

- **Availability of Right-of-Way** –The presence and width of a right-of-way available to implement some of the recommended physical design standards; opportunity for right-of-way dedication from future developments.

Corridors that qualify for improvements should next be prioritized prior to detailed evaluation. Priority should be given to corridors that have high percentage of trucks and provide connectivity between two important locations. The next priority should be given to corridors that have a congestion problem. The improvements should then be categorized to find the most cost effective way to plan, design and construct the improvements. Once the improvements are categorized, a source of funding must be identified.

Intersection Improvements

All corridors within the AWA should be evaluated individually based on the following criteria:

- **Area-wide Improvements -** Area-wide improvements such as the design standards recommended in Section 6, should be prioritized by the AWTMI in conjunction with the MPO. As with the corridor improvements, area-wide improvements must be categorized and a source of funding identified.

8.2 Funding

In an era of lowered transportation-dedicated revenues and more constrained spending, funding is an absolutely critical element to consider even before implementing any transportation improvement project. There are limited funds for developing and implementing projects, and there is therefore a need to determine which improvements are most cost effective and should receive higher priority. Possible sources of funds include:

- **Federal funds** – In addition to the more regular disbursements of formula-based and Surface Transportation regular highway funding to state and local agencies, the Federal Highway Administration (FHWA) provides funds for demonstration projects, such as congestion relief, rural and urban access projects, multimodal transportation projects and innovative projects using advanced technologies.

- **State funds** – funds can be used for a variety of transportation improvement projects and the funds are generally obtained from four sources:
    - Federal-aid programs
    - State gasoline taxes
    - Revenue bonds and
    - State-legislated appropriations from general funds or special earmarked funds.

- **Local funds** – funds come from bond sales, state gas tax or real-estate property tax and can be used for a variety of transportation projects. However, the needs so exceed the funding available to meet those needs that all but "emergency" distributions are already allocated. To tap into these

monies, projects will in virtually all cases need to be promoted from this process to "regular" funding channels, if that is indeed possible.

- **Dedicated revenue funds** – such as an assessment, tax or fee where the funds are targeted for a specific transportation project. The affected property owners in return for benefits to their property incur the cost. Dedicated funds are found throughout Washington's budget. State and local governments collect taxes and fees for specific purposes and deposits the revenue into the dedicated funds. The money is then spent on designated programs, such as improving local neighborhood lighting or sidewalk repairs. An example of a common strategy to support public transit is to use a local tax, say 1/10 of a percent sales tax, in which the funds go directly to provide transit services. In recent years transit taxes have been approved by voters in Detroit, Michigan, Charlotte, N.C., and Seattle, Washington.

Short-term improvements may be able to be advanced by the use of FDOT's Push Button contracts or following the procedure outlined in the Low Cost Improvement Program for Resourceful Use of Streets and Highway (RUSH). FDOT Push Button contracts apply mainly to corridors or locations that are experiencing safety problems. The Miami Dade County Long-Range Transportation Plan, the LRTP, is the main vehicle for the most significant and costly capital improvements to be nominated, evaluated, selected, and prioritized for implementation. The Transportation Improvement Program (TIP), the 5-year horizon program of projects in phases of actual implementation, most usually brings projects to fruition after they advance from later stages of earlier LRTPs into its first 5-year section, generally congruent with the TIP. These two mainly MPO activities, along with the FDOT Work Program, will be the main mechanisms to initiate the implementation of long-term improvements.

As stated by MPO, it is generally difficult to attain funding for all but "the most critical of projects." Also the various criteria and benchmarks used to ID potential AWA Interstate Maintenance / rehabilitation and freight movement projects need to cover many opportunities for improvements. However, in order for projects to have a chance at attracting funds, the most pressing needs should be selected and promoted at the top of the list, as well as the reason for the selection of these needs. As previously noted, most existing sources for funds have already been allocated as a result of the fact that transportation improvement funding needs far exceed the means available to fund them.

MPO, also comments on earmarking at both the State and Federal levels for local projects. This is another source of funding, for some projects it is neither more nor less probable to obtain funds in this matter than it is from other sources of funding. Most earmarked projects arise from genuine community needs that have been backed by strong community activism and involvement.

9.0 CONCLUSION

The Airport West Area is a rapidly growing industrial area located in Miami-Dade County. The Airport West Transportation Management Initiative (AWTMI), characterized by a large number of trucking companies, provides services to the Miami International Airport (MIA). Due to the growing demand placed by a heavy truck volume within a bounded region, the Airport West Area is not able to accommodate the needs of truck traffic. As a result, this area experiences a high percentage of heavy truck traffic throughout the day.

In order to address the needs and concerns of the trucking community within the study area, a limited and focused survey questionnaire was sent out to truck drivers and businesses. After all the information was gathered and the surveys responses received were accounted for, two corridors were selected for further analysis, NW 41/36 Street between Florida's Turnpike and NW 72 Avenue and NW 87 Avenue between NW 12 Street and NW 58 Street. Within these two corridors, four intersections were chosen for detailed observations NW 36 Street/NW 72 Avenue, NW 36 Street/NW 87 Avenue, NW 41 Street/NW 107 Avenue, and NW 12 Street/NW 87 Avenue.

Information regarding these two corridors and the four intersection were complied. The research consisted of traffic volumes, LOS, truck volumes, accident records involving trucks, assumptions of growth and business development, and recommendations produced in previous studies. The intersection analysis was used to establish the existing capacity and operations of the study intersections as well as identify problems and deficiencies. This was used as a basis for possible corridor solutions.

An immediate improvement to the corridor traffic congestion is adjusting signal timing, eliminating or relocating traffic signals, and placing restrictions on median openings and turning

movements. These changes will improve the LOS and time delay experienced at an intersection. Physical improvements such as the addition of right turn lanes at high traffic intersections and/or driveways may provide another remedial solution. However, the heavily built-up nature of the area provides only limited opportunities for the expansion of the right-of-way needed to implement some these solutions.

Transferable solutions, such as ridesharing, shuttle service, telecommuniting, road widening, and the development of a super arterial are a couple of examples that may be implemented to alleviate the congestion in the AWA. Some of the solutions focus on reducing the number of passenger cars using the network during peak period as opposed to reducing or eliminating trucks.

As part of this study, specific design standards were developed to better accommodate the heavy truck traffic in the Airport West Area. It is recommended, that when designing future improvements in the AWA, these design standards be implemented. These standards could be established as a demonstration project for further evaluation. The implementation of these design standards should be coordinated with FDOT, MDCPWD, and AWTMI.

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Appendix A

Sample Survey

Miami-Dade Metropolitan Planning Organization
Truck Traffic Study

Transportation Survey

Thank you for participating in this survey. The **Miami-Dade MPO** conducts transportation planning for Miami-Dade County. As part of our efforts, we need to know how, where, and when people travel, and how, when, and where freight moves by truck, so we can prepare better, more informed plans that are more responsive to people's needs.

We have joined with ***South Florida Commuter Services*** and the **AWTMI** to gather some travel information for the Airport West area, and to develop ways to better handle traffic, and in particular, truck traffic, in this rapidly growing and increasingly economically important area.

Thank you for your assistance.

TRANSPORTAION INFORMATION

1 - The main business conducted by your firm is:

[ ] **Local distribution** [ ] **Retail** [ ] **Trade Services** (Electrical, Plumbing, etc.)
[ ] **LTL** [ ] **Restaurant** [ ] **Business Services** (RE, Banking, Legal, etc.)
[ ] **Truckload** [ ] **Entertainment** [ ] **Other Services** (Hair Salon, Photography, etc.)
[ ] **Wholesale** [ ] **Warehousing** [ ] **Manufacturing**
[ ] *Other* _____

2- The 2 worst Airport West area problems you feel affect *you as a driver*:

[ ] **Congestion:** ( ) Morning/Arriving ( ) Midday/Noon ( ) Afternoon/Leaving ( ) Evening ( ) Night
[ ] Lack of **Parking** for cars [ ] Getting through **intersections** (i.e., long backups, long waits)
[ ] **Road conditions** (Physical) [ ] Sharing the road with **large trucks**
[ ] *Other* _____

3- The 2 worst Airport West area problems you feel affect *your business*:

[ ] **Congestion** ( ) Morning ( ) Midday/Noon ( ) Afternoon/Leaving Work ( ) Evening ( ) Night
[ ] Turning Radius for **Trucks** ( ) At driveways ( ) At intersections
[ ] Rush hour **deliveries** to/Pickups from your business
[ ] Lack of **Parking** ( ) For trucks ( ) For workers ( ) For patrons and visitors to businesses
[ ] *Other* _____

4- When does your business most use or most need to have access available to and from roadways (for shipments or deliveries)? (Please chose only two)

[ ] Early Morning: 5-7 AM [ ] Morning Rush Hours: 7-9 AM [ ] Mid-Morning: 9 AM- 12 Noon
[ ] Lunchtime
[ ] Mid-Afternoon (1-4 PM) [ ] Afternoon Rush Hours 4-6 PM
[ ] Evening (6-11 PM)
[ ] Overnight (11 PM – 5 AM next day)

5- What area roads does your business typically most often use to conduct business?

1 _____ 3 _____

2 _____

Miami-Dade MPO Truck Traffic Study
Transportation Survey

NOTE: *To identify road segments in the following questions,, please give approximate address, cross streets, or landmarks for location, and please limit the segment to about a ½ mile length or less.*

6- What intersection or road segments present the greatest Airport West area problems?

1 _____

2 _____

3 _____

7- What 3 area transportation improvements would you most like to see?

1 _____

2 _____

3 _____

8- What types of trucks does your business use or get pickups/deliveries by?

[ ] Delivery Vans (& Minivans, SUVs)
[ ] Straight Flatbeds
[ ] Straight Reefers
[ ] Tractors and Semi-Trailers-Single
[ ] Reefers – Semis
[ ] Light Straight Trucks/Panel Vans (4 wheels)
[ ] Medium Straight Trucks/Panel Vans (6 wheels)
[ ] Heavy Straight Trucks/Panel Vans (8+ wheels)
[ ] Tractors and Semi-Trailers – Doubles
[ ] Tankers - Semis

THANK YOU!

We will report the results in the MPO's Airport West Truck Traffic Study, and incorporate the findings in developing recommendations for improvements.

USER CONTACT INFORMATION

This information is OPTIONAL, but will help us with any follow-up

Name: _____ Title: _____

Company: _____

Address: _____ Email: _____

May we call for follow up? [ ] Yes – Telephone: 305 - _____ - _____

[ ] No, please don't ask me for more information

Appendix B

Summary of Survey Responses

Transportation Survey Results Summary

58 Surveys Summarized

1 - The worst Airport West area problems you feel affect you as a driver.

55	Congestion:	38 AM Rush Hr	11 Noon	39 PM Rush Hr	12 Evening
3	Lack of parking for cars				
30	Getting through intersections (i.e., long backups, long waits)				
3	Road conditions (physical)				
12	Sharing the road with large trucks				
3	Other:	1 Ignorant drivers who block cross-roads when stopped			
		1 Every road has construction or buildings being constructed (too many cars, not enough road)			
		1 Gridlock created by slow traffic in fast lanes			

2 - The worst Airport West area problems you feel affect your business.

52	Congestion:	27 AM Rush Hr	15 Noon	37 PM Rush Hr	2 Evening
11	Turning radius for trucks:		6 At driveways	5 At intersections	
19	Rush hour deliveries to/pickups from your business				
10	Lack of parking:	2 For trucks	4 For workers	5 For patrons/visitors to business	
3	Other:	1 Midday trains @ NW 82 Avenue			
		1 Truck congestion problems on NW 8 Street at 7200 - 7300 Block			
		1 Trucks blocking entrance to parking lots			

3 - When does your business most use or most need to have access to and from area roadways?

3 Early AM (5 - 7 AM)	18 AM Rush Hr (7 - 9 AM)	23 Mid-AM (9 AM - noon)	3 Lunchtime
30 Mid-PM (1 - 4 PM)	28 PM Rush Hr (4 - 6 PM)	Evening (6 - 11 PM)	Overnight (11PM - 5 AM)

4 - Which area roads does your business typically use/have used?

1 NW 7 Street	
9 SR836	4 bet NW 87 Avenue & NW 57 Avenue
23 NW 12 Street	10 bet NW 107 Avenue & NW 72 Avenue
2 Perimeter Road	
2 NW 14 Street	1 bet NW 87 Avenue & NW 79 Avenue
36 NW 25 Street	15 bet Turnpike & MIA
1 NW 33 Street	
13 NW 41/36 Street	7 bet Turnpike & NW 72 Avenue
3 NW 58 Street	1 bet NW 87 Avenue & NW 72 Avenue
3 NW 107 Avenue	1 bet SR836 & NW 25 Street
3 NW 97 Avenue	1 bet NW 12 Street & NW 41 Street
12 NW 87 Avenue	3 bet NW 12 Street & NW 58 Street
16 NW 82 Avenue	7 bet NW 12 Street & NW 36 Street
5 NW 79 Avenue	3 bet NW 25 Street & NW 58 Street
5 NW 78 Avenue	2 bet NW 12 Street & NW 15 Street
11 SR826	
1 NW 75 Avenue	

1 NW 74 Avenue

6 NW 72 Avenue

3 bet NW 12 Street & NW 58 Street

5 - What intersections/road segments present the greatest Airport West area problems?

3 SR836 & NW 87 Ave
- 1 red phase takes too long

9 NW 12 St & NW 87 Ave

4 NW 12 St & NW 82 Ave

1 NW 12 St & NW 78 Ave

7 NW 12 St & NW 72 Ave
- 2 turning north to NW 72 Ave

1 NW 12 St & NW 70 Ave

1 NW 12 St & North

1 NW 25 St & NW 107 Ave

5 NW 25 St & NW 87 Ave

12 NW 25 St & NW 82 Ave

3 NW 25 St & NW 79 Ave

14 NW 25 St & SR826

2 NW 25 St & NW 75 Ave

5 NW 25 St& NW 72 Ave

1 NW 33 St & NW 87 Ave

4 SR836
- 1 west from MIA to SR826 north
- 1 merge w/traffic from SR826 N & S & NW 72 Ave

6 NW 12 St
- 1 PM rush hr
- 3 bet NW 87 Ave & NW 72 Ave

1 NW 14 St
- 1 bet NW 87 Ave & NW 79 Ave
- 1 west of NW 87 Ave going east

13 NW 25 St
- 3 bet Turnpike & NW 72 Ave
- 6 bet NW 87 Ave & MIA
- 1 WB from SR826 (most of the day)

14 NW 41/36 St
- 2 towards the Turnpike
- 3 bet Turnpike & SR826
- 7 bet NW 107 Ave & NW 72 Ave
- 1 all traffic east/west in AM & PM

1 NW 58 St
- 1 west of SR826

1 NW 74 St
- 1 west of SR826

6 - What area transportation improvements would you most like to see?

7	SR826	1	widen
		2	improved entrance/exit ramps
7	SR826 & NW 25 St	1	complete interchange project
		1	adjust signal timing on east side of SR826
		1	signal is not properly synchronized going east
		1	longer green phase for traffic turning north
2	SR826 & NW 58 St	1	complete interchange project
1	SR826 & NW 74 St		
3	SR836	1	merge w/traffic from SR826 N & S & NW 72 Ave
		1	improved entrance/exit ramps
1	SR836 & NW 87 Ave	1	reduce congestion at interchange
1	SR836 east with SR826 north		
1	SR826 north intersecting SR836 east		
4	Turnpike	1	bet Dolphin Mall & the toll
		1	merge lanes to ramp
		1	improved entrance/exit ramps
		1	entrance ramps at NW 58 St
10	NW 12 St	7	bet NW 87 Ave & NW 72 Ave
		1	widen northbound turn lanes
		1	longer green phase for traffic going east in PM
1	Perimeter Road	1	widening

7 - What types of trucks does your business use or come to your business regularly?

- 40 Delivery vans, minivans, SUVs
- 20 Tractors, Semi-Trailers-Single
- 20 Light Straight Trucks/Panel Vans (4 wheels)
- 21 Medium Straight Trucks/Panel Vans (6 wheels)
- 14 Heavy Straight Trucks/Panel Vans (8+ wheels)
- 6 Other:
  - 1 Cars
  - 1 Pick-ups
  - 1 Containers
  - 1 Small station wagons/escorts

8 - The main business conducted by your firm is:

- 9 Local distribution
- 4 LTL
- 2 Truckload
- 11 Freight Forwarding
- 13 Other:
  - 1 Government Services
  - 1 Military Operations
  - 3 Law Enforcement
  - 1 General Contractor
  - 1 Transportation
  - 1 Religious Cemetery
- 2 Retail
- 20 Wholesale
- 7 Warehousing
- 3 Manufacturing
- Trade Services (Electrical, Plumbing, Painting, etc.)
- 6 General Office (Real Estate, Banking, Legal, etc.)
- 1 Restaurant
- Entertainment
  - 1 Delivery of mail service - US Postal Service
  - 1 Express Courier
  - 1 Pick-up/delivery of computer work
  - 1 Export - heavy equipment
  - 1 Flower Importer

Appendix C

Existing Traffic Volumes

Traffic Counts
Signal Phasing & Timing
HCS Worksheets

Traffic Counts

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 36 Street & NW 72 Avenue**	**Count Date:**	**07/12/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Thursday**

		NW 72 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
8:00 AM	8:15 AM	45	150	24	219	77	143	24	244	125	508	76	709	99	397	85	581	1,753
8:15 AM	8:30 AM	53	156	40	249	90	149	27	266	124	428	81	633	113	425	95	633	1,781
8:30 AM	8:45 AM	35	119	31	185	48	158	55	261	120	528	120	768	112	475	108	695	1,909
8:45 AM	9:00 AM	28	146	49	223	69	144	57	270	191	548	84	823	136	307	90	533	1,849

AM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 72 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
8:00 AM	9:00 AM	163	577	145	885	287	600	165	1,051	566	2,032	365	2,962	465	1,620	382	2,466	7,365
PEAK HOUR FACTOR					0.88				0.96				0.89				0.88	0.95

Note: 1999 FDOT Seasonal Weekly Volume Factor = 1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 36 Street & NW 72 Avenue**	**Count Date:**	**07/12/01**
Observer:	**DPA**	**Day of Week:**	**Thursday**

		NW 72 AVENUE								NW 36 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
1:00 PM	1:15 PM	81	221	61	363	186	165	121	472	98	327	50	475	90	291	41	422	1,732
1:15 PM	1:30 PM	98	336	72	506	162	196	89	447	69	344	78	491	79	304	50	433	1,877
1:30 PM	1:45 PM	122	226	85	433	166	195	123	484	145	465	74	684	91	378	75	544	2,145
1:45 PM	2:00 PM	98	208	79	385	182	141	112	435	123	413	55	591	82	427	108	617	2,028

MIDDAY PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 72 AVENUE								NW 36 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
1:00 PM	2:00 PM	403	1,001	300	1,704	703	704	449	1,856	439	1,564	260	2,263	345	1,414	277	2,036	7,860
PEAK HOUR FACTOR					0.83				0.95				0.82				0.82	0.91

Note: 1999 FDOT Seasonal Weekly Volume Factor = 1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 36 Street & NW 72 Avenue**	**Count Date:**	**07/12/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Thursday**

		NW 72 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
4:00 PM	4:15 PM	64	220	90	374	100	193	107	400	85	356	13	454	49	401	68	518	1,746
4:15 PM	4:30 PM	65	168	77	310	106	177	147	430	138	482	23	643	61	370	70	501	1,884
4:30 PM	4:45 PM	73	189	92	354	227	284	137	648	113	457	17	587	54	391	59	504	2,093
4:45 PM	5:00 PM	81	223	71	375	186	192	107	485	141	525	30	696	67	376	55	498	2,054

PM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 72 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
4:00 PM	5:00 PM	286	808	333	1,427	625	854	503	1,983	482	1,838	84	2,404	233	1,553	255	2,041	7,855
PEAK HOUR FACTOR					0.94				0.76				0.85				0.98	0.93

Note:	1999	FDOT Seasonal Weekly Volume Factor =	1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 36 Street & NW 87 Avenue**	**Count Date:**	**07/17/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Tuesday**

		NW 87 AVENUE								NW 36 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
8:00 AM	8:15 AM	67	187	92	346	32	101	34	167	117	461	138	716	75	193	32	300	1,529
8:15 AM	8:30 AM	65	206	109	380	40	105	43	188	139	434	131	704	121	197	32	350	1,622
8:30 AM	8:45 AM	63	176	103	342	41	110	36	187	121	450	125	696	85	203	24	312	1,537
8:45 AM	9:00 AM	62	158	90	310	38	124	54	216	142	431	148	721	78	227	22	327	1,574

AM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 87 AVENUE								NW 36 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
8:00 AM	9:00 AM	260	734	398	1,392	153	444	169	766	524	1,794	547	2,865	363	828	111	1,302	6,325
PEAK HOUR FACTOR					0.91				0.88				0.98				0.92	0.97

Note:	1999	FDOT Seasonal Weekly Volume Factor =	1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number**	**00169**
Location:	**NW 36 Street & NW 87 Avenue**	**Count Date:**	**07/17/01**
Observer:	**DPA**	**Day of Week:**	**Tuesday**

		NW 87 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
1:00 PM	1:15 PM	126	174	89	389	60	126	30	216	100	206	62	368	98	258	32	388	1,361
1:15 PM	1:30 PM	139	148	69	356	24	149	54	227	113	284	121	518	116	242	31	389	1,490
1:30 PM	1:45 PM	126	136	87	349	31	218	77	326	109	275	103	487	121	273	23	417	1,579
1:45 PM	2:00 PM	141	181	97	419	45	159	63	267	100	333	119	552	96	199	31	326	1,564

MIDDAY PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 87 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
1:00 PM	2:00 PM	537	645	345	1,528	162	659	226	1,046	426	1,109	409	1,944	435	982	118	1,535	6,054
PEAK HOUR FACTOR					0.90				0.79				0.87				0.91	0.95

Note: 1999 FDOT Seasonal Weekly Volume Factor = 1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 36 Street & NW 87 Avenue**	**Count Date:**	**07/17/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Tuesday**

		NW 87 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
4:00 PM	4:15 PM	151	133	66	350	37	195	105	337	63	217	90	370	101	279	43	423	1,480
4:15 PM	4:30 PM	127	78	30	235	34	202	102	338	69		84	290	155	301	25	481	1,344
4:30 PM	4:45 PM	102	89	44	235	37	220	146	403	56	246	98	400	118	243	21	382	1,420
4:45 PM	5:00 PM	148	124	76		47	215	83	345	49	181	65	295	94	374	23	491	1,479

PM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

		NW 87 AVENUE								NW 36 STREET								
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**		**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
4:00 PM	5:00 PM	533	428	218	1,180	157	840	440	1,437	239	789	340	1,369	473	1,209	113	1,795	5,780
PEAK HOUR FACTOR					0.83				0.88				0.85				0.90	0.97

Note:	1999	FDOT Seasonal Weekly Volume Factor =	1.01	

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 41 Street & NW 107 Avenue**	**Count Date:**	**08/08/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Wednesday**

		NW 41 STREET																
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**		**TOTAL**	**L**	**T**		**TOTAL**	**L**	**T**		**TOTAL**	**TOTAL**
8:00 AM	8:15 AM	6	37	23	66	82	73	27	182	6	213	21	240	54	100	19	173	661
8:15 AM	8:30 AM	15	53	75	143	88	94	12	194	36	438	89	563	79	112	24	215	1,115
8:30 AM	8:45 AM		49	63	130	59	102	18	179	24	363	86	473	78	122	27	227	1,009
8:45 AM	9:00 AM	17	60	47	124	69	95	11	175	27	444	95	566	70	130	29	229	1,094

AM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 41 STREET																
TIME		**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				**GRAND**
INTERVAL		**L**	**T**	**R**	**TOTAL**	**L**	**T**		**TOTAL**	**L**	**T**	**R**	**TOTAL**	**L**	**T**	**R**	**TOTAL**	**TOTAL**
8:00 AM	9:00 AM	57	201	210	468	301	368	69	737	94	1,473	294	1,860	284	469	100	852	3,918
PEAK HOUR FACTOR					0.81				0.94				0.81				0.92	0.87

Note:	1999	FDOT Seasonal Weekly Volume Factor =	1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 41 Street & NW 107 Avenue**	**Count Date:**	
Observer:	**DPA**	**Day of Week:**	**Thursday**

		NW 107 AVENUE								NW 41 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L		R	TOTAL	L		R	TOTAL	L		R	TOTAL	L	T	R	TOTAL	TOTAL
1:00 PM	1:15 PM	47	93	85	225	75	145	31	251	15		44	164	109	205	41	355	995
1:15 PM	1:30 PM	109	102	118	329	93	120	28	241	31	126	53	210	128	185	35	348	1,128
1:30 PM	1:45 PM	63	81	102	246		83	11	133	17	158	54	229	104	123	30	257	865
1:45 PM	2:00 PM	65	72	123		57	97	23	0	30	166	60	256	111	181	48	340	856

MIDDAY PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

		NW 107 AVENUE								NW 41 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
1:00 PM	2:00 PM	287		432	1,071	267	449	94	631	94	561	213	868	457	701	156	1,313	3,882
PEAK HOUR FACTOR					0.81				0.62				0.84				0.92	0.85
Note:	1999	FDOT Seasonal Weekly Volume Factor =					1.01											

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 41 Street & NW 107 Avenue**	**Count Date:**	**07/17/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	

		NW 107 AVENUE								NW 41 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
		L	T	R		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
4:00 PM	4:15 PM	73	66	61	200	70	129	33		11	93	39	143	161	365	29	555	1,130
4:15 PM	4:30 PM	59	56	62	177	53	117	28	198	10	96	42	148	182	475	25		1,205
4:30 PM	4:45 PM	56	51		166	49	126	29	204	14	92	38	144	162	414	34	610	1,124
4:45 PM	5:00 PM	61		69	217	59	127	27	213	6	52	18	76	102	396	40	538	1,044

PM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 107 AVENUE								NW 41 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL		T	R	TOTAL	TOTAL
PM	5:00 PM	251	263	254	768	233	504	118	855	41	336	138	516	613	1,667	129	2,409	4,548
PEAK HOUR FACTOR					0.88				0.91				0.86				0.87	0.93

Note: 1999 FDOT Seasonal Weekly Volume Factor = 1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 12 Street & NW 87 Avenue**	**Count Date:**	**07/18/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Wednesday**

		NW 87 AVENUE								NW 12 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T		TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
8:00 AM	8:15 AM	86	649	443	1,178	34	127	23	184	7	96	16	119	46	103	110	259	1,740
8:15 AM	8:30 AM	86	669	552	1,307	32	112	23	167	1	108	12	121	35	113	128	276	1,871
8:30 AM	8:45 AM	108	664	537	1,309	28	97	39	164	8	100	20	128	48	97	127	272	1,873
8:45 AM	9:00 AM	75	566	426	1,067	34	130	34	198	10	69	21	100	36	124	133	293	1,658

AM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 87 AVENUE								NW 12 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
8:00 AM	9:00 AM	355	2,548	1,958	4,861	128	466	119	713	26	373	69	468	165	437	498	1,100	7,142
PEAK HOUR FACTOR					0.93				0.90				0.91				0.94	0.95

Note:	1999	FDOT Seasonal Weekly Volume Factor =	1.00	

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 12 Street & NW 87 Avenue**	**Count Date:**	**07/18/01**
Observer:		**Day of Week:**	**Wednesday**

		NW 87 AVENUE								NW 12 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
1:00 PM	PM	96	323	107	526	31	297	68	396	24	67	47	138	140	199	149	488	1,548
1:15 PM	1:30 PM	63	363	114	540	41	242	60	343	19	71	52	142	122	200	103	425	1,450
1:30 PM	1:45 PM	54	330	127	511		289	84	429	24	78	50	152	149	176	94	419	1,511
1:45 PM	2:00 PM	57	332	139	528	43	387	78	0	32	82	64	178	145	194	88	427	1,133

MIDDAY PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 87 AVENUE								NW 12 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L		R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
1:00 PM	2:00 PM	273	1,361	492	2,126		1,227	293	1,180	100	301	215	616	562	777	438	1,777	5,698
PEAK HOUR FACTOR					0.97				0.68				0.86				0.90	0.91

Note: 1999 FDOT Seasonal Weekly Volume Factor = 1.01

DAVID PLUMMER & ASSOCIATES, INC.

TURNING MOVEMENT COUNTS

Project Name:	**Short Range Truck Traffic**	**Project Number:**	**00169**
Location:	**NW 12 Street & NW 87 Avenue**	**Count Date:**	**08/08/01**
Observer:	**Precision Engineering & Surveying, INC.**	**Day of Week:**	**Wednesday**

NW 87 AVENUE

TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R		L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
4:00 PM	4:15 PM	21	198	48	267	22	457	137	616	16	52	54	122	157	278	69	504	1,509
4:15 PM	4:30 PM	13	219	67	299		433	154	600		54	59	124	158	247	72	477	1,500
4:30 PM	4:45 PM	26	211	77	314	23	446	161	630		69	87	178	185	254	78	517	1,639
4:45 PM	5:00 PM	23	222	79	324	10	487	106	603	12	43	91	146	196	200	84	480	1,553

PM PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

ANNUAL AVERAGE DAILY TRAFFIC CONDITIONS

		NW 87 AVENUE								NW 12 STREET								
TIME		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				GRAND
INTERVAL		L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
4:00 PM	5:00 PM	84	859	274	1,216	69		564	2,473	62	220	294	576	703	989	306	1,998	6,263
PEAK HOUR FACTOR					0.93				0.97				0.80				0.96	0.95

Note: 1999 FDOT Seasonal Weekly Volume Factor = 1.01

Signal Phasing & Timing

PATTERN SCHEDULE FOR 4887 NW 107 AVE & 41 ST FOR DAY # 4 (SECTION 263)

TIME	PT	OFF	EWW	F	Y	R	SG	Y	R	NW	F	G	Y	R	EWL	Y	S	Y	M	CYC
	MIN:		5	20			8				22	1			5					
0	23	0	5	20	4	2	9	4	2	4	7	1	4	2	8	3	12	7	75	LATE NIT
600	1	5	6	20	4	2	14	4	2	4	12	1	4	2	12	3			90	EARLY MO
700	2	17	42	20	4	2	20	4	2	4	22	1	4	2	20	3			150	AM PEAK
720	3	0	60	20	4	2	26	4	2	4	22	2	4	2	25	3		7	180	MID AM P
900	4	8	20	20	4	2	20	4	2	4	16	1	4	2	18	3			120	POST AM
930	6	8	8	20	4	2	16	4	2	4	18	1	4	2	12	3			100	AVG
1515	9	10	9	20	4	2	17	4	2	4	22	1	4	2	16	3			110	PRE PM P
1600	10	5	20	20	4	2	28	4	2	4	22	9	4	2	26	3			150	PM PEAK
1800	11	8	7	20	4	2	17	4	2	4	21	1	4	2	19	3			110	POST PM
1840	20	8	5	20	4	2	12	4	2	4	14	1	4	2	13	3			90	EVE
2000	22	0	5	20	4	2	11	4	2	4	13	1	4	2	12	3	12	7	87	NITE 0/4
2100	21	0	5	20	4	2	10	4	2	4	11	1	4	2	10	3	12	7	82	NITE 1/3
2330	23	0	5	20	4	2	9	4	2	4	7	1	4	2	8	3	12	7	75	LATE NIT

PATTERN SCHEDULE FOR 4477 GALLOWAY RD & NW 36 ST FOR DAY # 4 (SECTION 257)

TIME	PT	OFF	NSG	G	Y	R	EWM	Y	EWG	Y	R	NSM	Y	S	Y	M	CYC
	MIN:		19				6		11			6					
0	22	0	19	1	4	2	10	4	17	4	2	9	4		7	76	NITE 3/
100	23	0	20	1	4	2	6	4	12	4	2	6	4		6	65	LATE NI
530	20	0	19	1	4	2	11	4	12	4	2	9	4		7	72	LATE NI
600	21	47	19	1	4	2	10	4	12	4	2	8	4			70	EARLY M
630	1	49	19	1	4	2	16	4	20	4	2	14	4			90	PRE AM
700	2	105	27	1	4	2	35	4	60	4	2	17	4			160	AM PEAK
905	5	45	22	1	4	2	23	4	41	4	2	13	4			120	POST AM
1000	8	87	23	1	4	2	18	4	33	4	2	15	4			110	MID DAY
1500	10	89	29	1	4	2	20	4	35	4	2	15	4			120	PRE PM
1520	12	94	30	1	4	2	25	4	36	4	2	18	4			130	EARLY P
1600	14	14	38	1	4	2	32	4	45	4	2	24	4			160	PM PEAK
1800	16	92	29	1	4	2	25	4	41	4	2	22	4		7	138	POST PM
1845	17	42	19	1	4	2	11	4	18	4	2	11	4			80	EVENING
2000	22	0	19	1	4	2	10	4	17	4	2	9	4		7	76	NITE 3/

PATTERN SCHEDULE FOR 4338 GALLOWAY RD & NW 12 ST FOR DAY # 4 (SECTION 212)

TIME	PT	OFF	NSG	G	Y	R	EWL	Y	EWP	G	Y	R	NSL	Y	S	Y	M	CYC
	MIN:		1				5		1				5					
0	19	1	20	4	4	2	5	3	20	1	4	2	6	3		6	74	LATE NIG
500	9	0	20	10	4	2	7	3	15	1	4	2	6	3		7	77	LATE NIG
600	12	12	20	21	4	2	7	3	12	1	4	2	6	3			85	PRE AM
630	2	52	20	60	4	2	8	3	17	1	4	2	6	3			130	EARLY/LA
730	8	55	20	66	4	2	9	3	20	1	4	2	6	3			140	HEAVY AM
800	11	64	20	86	4	2	9	3	20	1	4	2	6	3			160	VERY HEA
900	2	52	20	60	4	2	8	3	17	1	4	2	6	3			130	EARLY/LA
1515	9	10	9	20	4	2	17	4	2	4	22	1	4	2	16	3		110	PRE PM P
1330	10	38	20	22	4	2	20	3	12	1	4	2	7	3				100	MID DAY
1530	4	38	20	22	4	2	20	3	12	1	4	2	7	3				100	MID DAY
1545	7	70	20	42	4	2	33	3	10	1	4	2	6	3	12			130	PM PEAK
1900	4	38	20	22	4	2	20	3	12	1	4	2	7	3				100	MID DAY
2000	14	24	20	21	4	2	12	3	12	1	4	2	6	3				90	POST PM
2200	6	0	20	4	4	2	6	3	10	1	4	2	6	3		7	65	LATE NIG
2300	3	1	20	4	4	2	6	3	10	1	4	2	6	3		7	65	NIGHT 3/

PATTERN SCHEDULE FOR 3163 MILAM DAIRY & NW 36 ST FOR DAY # 4 (SECTION 76)

TIME	PT	OFF	EWG	G	Y	R	NSM	Y	NSG	Y	R	EWM	Y	S	Y	M	CYC	
	MIN:		19				5		10			5						
0	23	0	24	1	4	2	10	4	12	4	2	10	4			7	77	LATE NIT
530	22	0	27	1	4	2	10	4	16	4	2	10	4			7	84	NITE 0/2
600	21	0	38	1	4	2	8	4	16	4	2	7	4				90	PRE AM P
630	20	0	48	1	4	2	17	4	18	4	2	16	4				120	PRE AM P
700	4	0	65	1	4	2	21	4	20	4	2	23	4				150	AM PEAK
810	3	0	62	1	4	2	21	4	29	4	2	27	4				160	AM PEAK
840	2	0	65	1	4	2	24	4	24	4	2	26	4				160	AM PEAK
910	1	0	50	1	4	2	28	4	33	4	2	28	4				160	POST AM
930	5	0	42	1	4	2	26	4	22	4	2	19	4				130	MID MORN
1025	6	0	49	1	4	2	30	4	27	4	2	23	4				150	PRE NOON
1110	7	0	57	1	4	2	36	4	31	4	2	25	4				170	NOON PEA
1300	10	0	60	1	4	2	33	4	31	4	2	25	4				170	POST NOO
1500	13	0	62	1	4	2	34	4	31	4	2	22	4				170	PM PEAK
1600	14	0	53	1	4	2	39	4	44	4	2	23	4				180	PM PEAK
1630	15	0	61	1	4	2	35	4	47	4	2	26	4				190	PM PEAK
1800	16	0	44	1	4	2	21	4	40	4	2	14	4				140	PM PEAK
1830	17	66	39	1	4	2	15	4	23	4	2	12	4				110	EVENING
1900	19	0	29	1	4	2	13	4	17	4	2	10	4				90	LATE EVE
2000	22	0	27	1	4	2	10	4	16	4	2	10	4			7	84	NITE 0/2
2315	23	0	24	1	4	2	10	4	12	4	2	10	4			7	77	LATE NIT

HCS Worksheets

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM pk
Project ID:
E/W St: NW 36 Street

Inter.: NW 72 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 72 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	1	2	3	1	2	3	0	2	2	1
LGConfig	L	T	R	L	T	R	L	TR		L	T	R
Volume	566	2032	365	465	1620	382	163	577	145	287	600	165
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0
RTOR Vol			36			38			0			16

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	27.0	63.0				21.0	29.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	0.0	2.0				0.0	2.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	542	3213	1.10	0.17	277.1	F		
T	1874	4759	1.14	0.39	310.6	F	273.7	F
R	584	1482	0.59	0.39	40.0	D		
Westbound								
L	542	3213	0.90	0.17	88.2	F		
T	1874	4759	0.91	0.39	53.8	D	58.5	E
R	584	1482	0.62	0.39	40.9	D		
Northbound								
L	422	3213	0.41	0.13	64.4	E		
TR	836	4615	0.91	0.18	81.0	F	77.9	E
Southbound								
L	422	3213	0.72	0.13	72.5	E		
T	600	3312	1.05	0.18	202.9	F	146.7	F
R	269	1482	0.58	0.18	63.2	E		

Intersection Delay = 160.0 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/12/2001
Period: MD pk
Project ID:
E/W St: NW 36 Street

Inter.: NW 72 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 72 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	1	2	3	1	2	3	0	2	2	1
LGConfig	L	T	R	L	T	R	L	TR		L	T	R
Volume	439	1564	260	345	1414	277	403	1001	300	703	704	449
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0
RTOR Vol			25			25			0			25

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0	61.0					33.0	31.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	0.0	2.0					0.0	2.0		

Cycle Length: 170.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	473	3213	1.02	0.15	174.9	F		
T	1708	4759	1.01	0.36	104.4	F	111.8	F
R	532	1482	0.48	0.36	43.0	D		
Westbound								
L	473	3213	0.80	0.15	80.4	F		
T	1708	4759	0.91	0.36	60.6	E	61.9	E
R	532	1482	0.52	0.36	43.9	D		
Northbound								
L	624	3213	0.71	0.19	67.9	E		
TR	838	4594	1.71	0.18		F		F
Southbound								
L	624	3213	1.24	0.19	512.8	F		
T	604	3312	1.28	0.18	589.3	F	745.7	F
R	270	1482	1.73	0.18		F		

Intersection Delay = 452.1 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM pk
Project ID:
E/W St: NW 36 Street

Inter.: NW 72 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 72 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	1	2	3	1	2	3	0	2	2	1
LGConfig	L	T	R	L	T	R	L	TR		L	T	R
Volume	482	1838	84	233	1553	255	286	808	333	625	854	503

Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0			12.0	12.0	12.0
RTOR Vol			8			20			0				20

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	26.0	62.0				35.0	47.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	0.0	2.0				0.0	2.0		

Cycle Length: 190.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	444	3242	1.17	0.14	408.1	F		
T	1567	4803	1.26	0.33	539.3	F	497.2	F
R	488	1495	0.17	0.33	45.8	D		
Westbound								
L	444	3242	0.57	0.14	78.4	E		
T	1567	4803	1.07	0.33	198.7	F	167.8	F
R	488	1495	0.52	0.33	52.9	D		
Northbound								
L	597	3242	0.52	0.18	70.6	E		
TR	1136	4593	1.08	0.25	234.6	F	201.7	F
Southbound								
L	597	3242	1.13	0.18	328.0	F		
T	827	3343	1.11	0.25	289.5	F	430.6	F
R	370	1495	1.40	0.25	812.9	F		

Intersection Delay = 341.1 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM pk
Project ID:
E/W St: NW 36 Street

Inter.: NW 87 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	0	2	3	0	2	3	0	2	3	1
LGConfig	L	TR		L	TR		L	TR		L	T	R
Volume	524	1794	547	363	828	111	260	734	398	153	444	169
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			0			0			0			17

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		

	Right		A		Right		A
	Peds				Peds		
WB	Left	A		SB	Left	A	
	Thru		A		Thru		A
	Right		A		Right		A
	Peds				Peds		
NB	Right			EB	Right		
SB	Right			WB	Right		
Green		35.0	60.0			17.0	28.0
Yellow		4.0	4.0			4.0	4.0
All Red		0.0	2.0			0.0	2.0

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	730	3335	0.76	0.22	63.2	E		
TR	1788	4767	1.38	0.38	734.2	F	611.4	F
Westbound								
L	730	3335	0.52	0.22	55.8	E		
TR	1820	4852	0.54	0.38	39.6	D	44.1	D
Northbound								
L	354	3335	0.77	0.11	80.6	F		
TR	819	4680	1.46	0.17	892.7	F	741.0	F
Southbound								
L	354	3335	0.45	0.11	68.1	E		
T	864	4940	0.54	0.17	60.8	E	63.0	E
R	269	1538	0.59	0.17	64.4	E		

Intersection Delay = 457.8 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/17/2001
Period: MD pk
Project ID:
E/W St: NW 36 Street

Inter.: NW 87 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	0	2	3	0	2	3	0	2	3	1
LGConfig	L	TR		L	TR		L	TR		L	T	R
Volume	426	1109	409	435	982	118	537	645	345	162	659	226
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			0			0			0			20

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A				SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				

Green	18.0	33.0	15.0	24.0
Yellow	4.0	4.0	4.0	4.0
All Red	0.0	2.0	0.0	2.0

Cycle Length: 110.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	546	3335	0.82	0.16	54.9	D		
TR	1422	4740	1.12	0.30	272.2	F	224.7	F
Westbound								
L	546	3335	0.84	0.16	56.9	E		
TR	1458	4861	0.79	0.30	38.6	D	43.8	D
Northbound								
L	455	3335	1.24	0.14	502.1	F		
TR	1022	4682	1.02	0.22	120.1	F	254.4	F
Southbound								
L	455	3335	0.38	0.14	43.8	D		
T	1078	4940	0.64	0.22	40.4	D	41.6	D
R	336	1538	0.65	0.22	43.5	D		

Intersection Delay = 155.0 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM pk
Project ID:
E/W St: NW 36 Street

Inter.: NW 87 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	0	2	3	0	2	3	0	2	3	1
LGConfig	L	TR		L	TR		L	TR		L	T	R
Volume	239	789	340	473	1209	113	533	428	218	157	840	440
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			0			0			0			44

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	45.0				24.0	39.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	0.0	2.0				0.0	2.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS

Eastbound								
L	673	3367	0.37	0.20	55.7	E		
TR	1339	4762	0.89	0.28	63.5	E	62.2	E
Westbound								
L	673	3367	0.74	0.20	64.6	E		
TR	1385	4924	1.01	0.28	110.8	F	98.6	F
Northbound								
L	505	3367	1.11	0.15	298.5	F		
TR	1154	4736	0.59	0.24	54.2	D	164.7	F
Southbound								
L	505	3367	0.33	0.15	61.2	E		
T	1216	4988	0.73	0.24	57.9	E	122.3	F
R	379	1553	1.10	0.24	283.2	F		

Intersection Delay = 109.2 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM peak hour
Project ID:
E/W St: NW 41 Street

Inter.: NW 41 St / NW 107 Ave
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 107 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	2	3	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	LT	R	L	LTR	
Volume	94	1473	294	284	469	100	57	201	210	301	368	69
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			0			0			20			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds		X			Peds		X		
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds		X			Peds		X		
NB Right					EB Right				
SB Right					WB Right				
Green	25.0	80.0				26.0	28.0		
Yellow	3.0	4.0				4.0	4.0		
All Red	0.0	2.0				2.0	2.0		

Cycle Length: 180.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	237	1703	0.44	0.14	72.4	E		
TR	2120	4771	0.93	0.44	56.1	E	56.9	E
Westbound								
L	459	3303	0.69	0.14	78.2	E		
TR	2117	4764	0.30	0.44	32.1	C	47.5	D

Northbound								
L	265	1703	0.24	0.16	67.1	E		
LT	530	3406	0.42	0.16	69.2	E	89.1	F
R	237	1524	0.89	0.16	116.6	F		
Southbound								
L	246	1703	1.36	0.14	747.6	F		
LTR	480	3325	1.01	0.14	171.7	F	406.3	F

Intersection Delay = 124.6 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/19/2001
Period: MD peak hour
Project ID:
E/W St: NW 41 Street

Inter.: NW 41 St / NW 107 Ave
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 107 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	2	3	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	LT	R	L	LTR	
Volume	94	561	213	457	701	156	287	351	432	267	449	94
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			0			0			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds		X			Peds	X		
WB Left	A				SB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds		X			Peds	X		
NB Right					EB Right			
SB Right					WB Right			
Green	12.0	28.0			16.0	23.0		
Yellow	3.0	4.0			4.0	4.0		
All Red	0.0	2.0			2.0	2.0		

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	204	1703	0.51	0.12	43.4	D		
TR	1313	4691	0.65	0.28	32.9	C	34.1	C
Westbound								
L	396	3303	1.28	0.12	572.9	F		
TR	1333	4760	0.71	0.28	34.3	C	221.7	F
Northbound								
L	392	1703	0.81	0.23	50.1	D		
LT	783	3406	0.50	0.23	34.0	C	250.4	F
R	351	1524	1.29	0.23	578.5	F		
Southbound								
L	272	1703	1.09	0.16	265.6	F		
LTR	531	3318	1.14	0.16	311.8	F	296.5	F

Intersection Delay = 203.8 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM peak hour
Project ID:
E/W St: NW 41 Street

Inter.: NW 41 St / NW 107 Ave
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 107 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	2	3	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	LT	R	L	LTR	
Volume	41	336	138	613	1667	129	251	263	254	233	504	118
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			0			0			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left		A		
Thru		A				Thru		A		
Right		A				Right		A		
Peds		X				Peds		X		
WB Left	A				SB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds		X				Peds		X		
NB Right					EB	Right				
SB Right					WB	Right				
Green	26.0	40.0					28.0	35.0		
Yellow	3.0	4.0					4.0	4.0		
All Red	0.0	2.0					2.0	2.0		

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	301	1736	0.15	0.17	52.8	D		
TR	1272	4770	0.40	0.27	45.4	D	46.0	D
Westbound								
L	584	3367	1.13	0.17	317.7	F		
TR	1316	4934	1.47	0.27	900.5	F	752.2	F
Northbound								
L	405	1736	0.67	0.23	56.4	E		
LT	810	3471	0.35	0.23	48.3	D	53.9	D
R	362	1553	0.68	0.23	57.6	E		
Southbound								
L	324	1736	0.77	0.19	70.0	E		
LTR	629	3372	1.06	0.19	211.8	F	173.1	F

Intersection Delay = 447.5 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM pk
Project ID:
E/W St: NW 12 Street

Inter.: NW 87 Ave and NW 12 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	2	2	1	1	2	1	1	3	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	26	373	69	165	437	498	355	2548	1958	128	466	119
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			7			25			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	9.0	21.0				6.0	106.0		
Yellow	3.0	4.0				3.0	4.0		
All Red	0.0	2.0				0.0	2.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	99	1752	0.27	0.06	73.9	E		
T	242	1845	1.62	0.13		F	994.5	F
R	206	1568	0.32	0.13	63.9	E		
Westbound								
L	191	3400	0.91	0.06	135.4	F		
T	460	3505	1.00	0.13	153.4	F		F
R	206	1568	2.42	0.13		F		
Northbound								
L	66	1752	5.67	0.04		F		
T	2322	3505	1.16	0.66	311.7	F		F
R	1039	1568	1.96	0.66		F		
Southbound								
L	66	1752	2.05	0.04		F		
TR	3235	4883	0.19	0.66	10.5	B	370.0	F

Intersection Delay = (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/18/2001
Period: MD pk
Project ID:
E/W St: NW 12 Street

Inter.: NW 87 Ave and NW 12 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	2	2	1	1	2	1	1	3	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	100	301	215	562	777	438	273	1361	492	173	1227	293
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			20			25			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	8.0	18.0					6.0	80.0		
Yellow	3.0	4.0					3.0	4.0		
All Red	0.0	2.0					0.0	2.0		

Cycle Length: 130.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	108	1752	1.02	0.06	253.3	F		
T	255	1845	1.30	0.14	621.6	F	410.3	F
R	217	1568	0.99	0.14	164.1	F		
Westbound								
L	209	3400	2.96	0.06		F		
T	485	3505	1.76	0.14		F		F
R	217	1568	2.09	0.14		F		
Northbound								
L	81	1752	3.70	0.05		F		
T	2157	3505	0.69	0.62	17.8	B	659.1	F
R	965	1568	0.53	0.62	14.9	B		
Southbound								
L	81	1752	2.35	0.05		F		
TR	3009	4890	0.56	0.62	14.8	B	271.0	F

Intersection Delay = 987.7 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM pk
Project ID:
E/W St: NW 12 Street

Inter.: NW 87 Ave and NW 12 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	2	2	1	1	2	1	1	3	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	62	220	294	703	989	306	84	859	274	69	1841	564
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	

RTOR Vol	30	30	25	0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	33.0	11.0					6.0	62.0		
Yellow	3.0	4.0					3.0	4.0		
All Red	0.0	2.0					0.0	2.0		

Cycle Length: 130.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	449	1770	0.14	0.25	37.7	D		
T	158	1863	1.47	0.08	936.9	F		F
R	134	1583	2.07	0.08		F		
Westbound								
L	871	3433	0.85	0.25	54.8	D		
T	299	3539	3.48	0.08		F		F
R	134	1583	2.17	0.08		F		
Northbound								
L	82	1770	1.07	0.05	344.0	F		
T	1688	3539	0.54	0.48	24.2	C	46.1	D
R	755	1583	0.35	0.48	21.6	C		
Southbound								
L	82	1770	0.89	0.05	160.1	F		
TR	2340	4906	1.08	0.48	191.2	F	190.4	F

Intersection Delay = (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM pk w/imp
Project ID:
E/W St: NW 36 Street

Inter.: NW 72 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 72 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	1	2	3	1	2	3	0	2	2	1
LGConfig	L	T	R	L	T	R	L	TR		L	T	R
Volume	566	2032	365	465	1620	382	163	577	145	287	600	165
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0
RTOR Vol			36			38			0			16

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	20.0	47.0					11.0	22.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	0.0	2.0					0.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	LOS	Approach Delay	LOS
Eastbound								
L	536	3213	1.11	0.17	280.6	F		
T	1864	4759	1.15	0.39	309.4	F	272.5	F
R	580	1482	0.60	0.39	30.7	C		
Westbound								
L	536	3213	0.91	0.17	75.0	E		
T	1864	4759	0.91	0.39	43.1	D	47.6	D
R	580	1482	0.62	0.39	31.5	C		
Northbound								
L	295	3213	0.58	0.09	55.3	E		
TR	846	4615	0.90	0.18	62.6	E	61.2	E
Southbound								
L	295	3213	1.02	0.09	184.0	F		
T	607	3312	1.04	0.18	169.3	F	155.9	F
R	272	1482	0.58	0.18	47.8	D		

Intersection Delay = 155.1 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/12/2001
Period: MD pk w/imp
Project ID:
E/W St: NW 36 Street

Inter.: NW 72 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 72 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	1	2	3	1	2	3	0	2	2	1
LGConfig	L	T	R	L	T	R	L	TR		L	T	R
Volume	439	1564	260	345	1414	277	403	1001	300	703	704	449
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0
RTOR Vol			25			25			0			25

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru			A	
Right		A				Right			A	
Peds						Peds				
WB Left	A				SB	Left	A	A		
Thru		A				Thru		A	A	
Right		A				Right		A	A	
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	14.0	34.0					15.0	5.0	29.0	
Yellow	4.0	4.0					4.0	3.0	4.0	
All Red	0.0	2.0					0.0	0.0	2.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	375	3213	1.29	0.12	587.4	F		
T	1348	4759	1.28	0.28	544.5	F	500.0	F
R	420	1482	0.61	0.28	40.0	D		
Westbound								
L	375	3213	1.01	0.12	156.5	F		
T	1348	4759	1.15	0.28	327.8	F	262.6	F
R	420	1482	0.66	0.28	41.8	D		
Northbound								
L	402	3213	1.10	0.13	275.8	F		
TR	1110	4594	1.29	0.24	571.6	F	501.6	F
Southbound								
L	643	3213	1.20	0.20	427.9	F		
T	1021	3312	0.76	0.31	40.9	D	213.8	F
R	457	1482	1.02	0.31	146.1	F		

Intersection Delay = 371.7 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM pk w/imp
Project ID:
E/W St: NW 36 Street

Inter.: NW 72 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 72 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	1	2	3	1	2	3	0	2	2	1
LGConfig	L	T	R	L	T	R	L	TR		L	T	R
Volume	482	1838	84	233	1553	255	286	808	333	625	854	503

Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0			12.0	12.0	12.0
RTOR Vol			8			20			0				20

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	21.0	52.0					22.0	45.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	0.0	2.0					0.0	2.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	426	3242	1.22	0.13	480.7	F		
T	1561	4803	1.27	0.32	538.0	F	510.6	F
R	486	1495	0.17	0.32	38.7	D		
Westbound								
L	426	3242	0.59	0.13	67.6	E		
T	1561	4803	1.07	0.32	195.4	F	163.1	F
R	486	1495	0.52	0.32	44.9	D		
Northbound								
L	446	3242	0.69	0.14	70.4	E		
TR	1292	4593	0.95	0.28	76.3	E	75.1	E
Southbound								
L	446	3242	1.51	0.14	993.0	F		
T	940	3343	0.98	0.28	96.6	F	482.3	F
R	420	1495	1.24	0.28	503.2	F		

Intersection Delay = 333.8 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM pk w/imp
Project ID:
E/W St: NW 36 Street

Inter.: NW 87 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	0	2	3	0	2	3	0	2	3	1
LGConfig	L	TR		L	TR		L	TR		L	T	R
Volume	524	1794	547	363	828	111	260	734	398	153	444	169
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			0			0			0			17

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			

```
    Thru                A             |     Thru         A
    Right               A             |     Right        A
    Peds                              |     Peds
WB  Left          A                   | SB  Left   A
    Thru                A             |     Thru         A
    Right               A             |     Right        A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            26.0  62.0                     11.0  26.0
Yellow           4.0   4.0                      4.0   4.0
All Red          0.0   2.0                      0.0   2.0
                                                 Cycle Length: 145.0   secs
_____________________Intersection Performance Summary_____________________________
Appr/   Lane       Adj Sat     Ratios       Lane Group   Approach
Lane    Group     Flow Rate  __________     __________  ___________
Grp     Capacity     (s)     v/c    g/C     Delay LOS   Delay LOS
_____________________________________________________________________________

Eastbound
L        598       3335      0.92   0.18    85.2   F
TR       2038      4767      1.21   0.43    422.8  F    361.0  F

Westbound
L        598       3335      0.64   0.18    57.5   E
TR       2075      4852      0.48   0.43    30.0   C    37.7   D

Northbound
L        253       3335      1.08   0.08    281.2  F
TR       839       4680      1.42   0.18    824.0  F    722.5  F

Southbound
L        253       3335      0.64   0.08    70.4   E
T        886       4940      0.53   0.18    54.5   D    58.4   E
R        276       1538      0.58   0.18    57.6   E
         Intersection Delay = 338.2 (sec/veh)   Intersection LOS = F
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HCS2000: Signalized Intersections Release 4.1

Analyst: DPA                          Inter.: NW 87 Ave and NW 36 St
Agency: Miami, FL                     Area Type: All other areas
Date:   7/17/2001                     Jurisd:
Period: MD pk w/imp                   Year  : 00169
Project ID:
E/W St: NW 36 Street                  N/S St: NW 87 Avenue

_________________________SIGNALIZED INTERSECTION SUMMARY_____________________
            |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
            | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
            |_______________|_______________|_______________|_______________|
No. Lanes   |   2   3   0   |   2   3   0   |   2   3   0   |   2   3   1   |
LGConfig    |   L  TR       |   L  TR       |   L  TR       |   L  T    R   |
Volume      |426  1109 409  |435  982  118  |537  645  345  |162  659  226  |
Lane Width  |12.0 12.0      |12.0 12.0      |12.0 12.0      |12.0 12.0 12.0 |
RTOR Vol    |          0    |          0    |          0    |          20   |
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Duration    1.00      Area Type: All other areas
_____________________________Signal Operations_____________________________
Phase Combination 1     2     3     4 |            5     6     7     8
EB  Left          A                   | NB  Left   A     A
    Thru                A             |     Thru         A     A
    Right               A             |     Right        A     A
    Peds                              |     Peds
WB  Left          A                   | SB  Left   A
    Thru                A             |     Thru               A
    Right               A             |     Right              A
    Peds                              |     Peds
NB  Right                             | EB  Right
```

SB Right				| WB Right			
Green	16.0	36.0			9.0	7.0	18.0
Yellow	4.0	4.0			4.0	4.0	4.0
All Red	0.0	2.0			0.0	0.0	2.0

Cycle Length: 110.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	485	3335	0.92	0.15	78.5	E		
TR	1551	4740	1.03	0.33	118.1	F	109.4	F
Westbound								
L	485	3335	0.94	0.15	87.4	F		
TR	1591	4861	0.73	0.33	34.4	C	49.4	D
Northbound								
L	606	3335	0.93	0.18	73.8	E		
TR	1234	4682	0.84	0.26	44.2	D	54.6	D
Southbound								
L	273	3335	0.63	0.08	53.5	D		
T	808	4940	0.86	0.16	54.9	D	58.9	E
R	252	1538	0.86	0.16	75.7	E		

Intersection Delay = 71.7 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM pk w/imp
Project ID:
E/W St: NW 36 Street

Inter.: NW 87 Ave and NW 36 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	3	0	2	3	0	2	3	0	2	3	1
LGConfig	L	TR		L	TR		L	TR		L	T	R
Volume	239	789	340	473	1209	113	533	428	218	157	840	440
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			0			0			0			44

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				| NB Left	A			
Thru			A		| Thru		A		
Right			A		| Right		A		
Peds					| Peds				
WB Left	A	A			| SB Left	A			
Thru		A	A		| Thru		A		
Right		A	A		| Right		A		
Peds					| Peds				
NB Right					| EB Right				
SB Right					| WB Right				
Green	13.0	5.0	37.0			24.0	36.0		
Yellow	4.0	3.0	4.0			4.0	4.0		
All Red	1.0	1.0	2.0			0.0	2.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane	Lane Group	Adj Sat Flow Rate

Grp	Capacity	(s)	v/c	g/C	Delay	LOS	Delay	LOS
Eastbound								
L	313	3367	0.81	0.09	78.1	E		
TR	1259	4762	0.94	0.26	69.2	E	70.7	E
Westbound								
L	553	3367	0.90	0.16	79.5	E		
TR	1618	4924	0.86	0.33	49.2	D	57.2	E
Northbound								
L	577	3367	0.97	0.17	109.2	F		
TR	1218	4736	0.56	0.26	45.7	D	74.4	E
Southbound								
L	577	3367	0.29	0.17	50.8	D		
T	1283	4988	0.69	0.26	48.5	D	90.0	F
R	399	1553	1.05	0.26	193.3	F		

Intersection Delay = 71.9 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM peak hour w/imp
Project ID:
E/W St: NW 41 Street

Inter.: NW 41 St / NW 107 Ave
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 107 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	2	3	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	LT	R	L	LTR	
Volume	94	1473	294	284	469	100	57	201	210	301	368	69
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			0			0			20			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds		X			Peds		X		
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds		X			Peds		X		
NB Right	A				EB Right				
SB Right					WB Right				
Green	16.0	58.0				31.0	14.0		
Yellow	3.0	4.0				4.0	4.0		
All Red	0.0	2.0				2.0	2.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	195	1703	0.53	0.11	61.3	E		
TR	1977	4771	0.99	0.41	75.5	E	74.8	E
Westbound								
L	377	3303	0.84	0.11	78.2	E		

TR	1974	4764	0.32	0.41	27.8	C	44.6	D
Northbound								
L	170	1703	0.37	0.10	60.3	E		
LT	341	3406	0.65	0.10	65.2	E	56.6	E
R	392	1524	0.54	0.26	46.3	D		
Southbound								
L	377	1703	0.89	0.22	79.7	E		
LTR	736	3325	0.66	0.22	51.9	D	63.3	E

Intersection Delay = 63.9 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/19/2001
Period: MD pk w/imp
Project ID:
E/W St: NW 41 Street

Inter.: NW 41 St / NW 107 Ave
Area Type: All other areas
Jurisd:
Year : 00169
N/S St: NW 107 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	2	3	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	LT	R	L	LTR	
Volume	94	561	213	457	701	156	287	351	432	267	449	94
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			0			0			30			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru			A		Thru		A		
Right			A		Right		A		
Peds			X		Peds		X		
WB Left	A	A			SB Left	A			
Thru		A	A		Thru	A			
Right		A	A		Right	A			
Peds			X		Peds		X		
NB Right					EB Right				
SB Right					WB Right				
Green	11.0	5.0	21.0			22.0	27.0		
Yellow	3.0	3.0	4.0			4.0	4.0		
All Red	0.0	0.0	2.0			2.0	2.0		

Cycle Length: 110.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	170	1703	0.61	0.10	54.0	D		
TR	896	4691	0.96	0.19	75.5	E	73.1	E
Westbound								
L	571	3303	0.89	0.17	63.7	E		
TR	1255	4760	0.76	0.26	40.1	D	48.3	D
Northbound								
L	418	1703	0.76	0.25	47.1	D		
LT	836	3406	0.47	0.25	35.8	D	187.5	F
R	374	1524	1.20	0.25	420.2	F		
Southbound								

L	341	1703	0.87	0.20	68.3	E		
LTR	664	3318	0.91	0.20	63.4	E	65.0	E

Intersection Delay = 92.9 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: PM peak hour w/imp
Project ID:
E/W St: NW 41 Street

Inter.: NW 41 St / NW 107 Ave
Area Type: All other areas
Jurisd:
Year : 00169
N/S St: NW 107 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	2	3	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	LT	R	L	LTR	
Volume	41	336	138	613	1667	129	251	263	254	233	504	118
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			0			0			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru			A		Thru		A		
Right			A		Right		A		
Peds			X		Peds		X		
WB Left	A	A			SB Left	A			
Thru		A	A		Thru	A			
Right		A	A		Right	A			
Peds			X		Peds		X		
NB Right	A	A			EB Right				
SB Right					WB Right				
Green	6.0	30.0	18.0			29.0	24.0		
Yellow	4.0	4.0	4.0			4.0	4.0		
All Red	1.0	1.0	2.0			2.0	2.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	77	1736	0.57	0.04	73.4	E		
TR	636	4770	0.80	0.13	64.4	E	65.1	E
Westbound								
L	1023	3367	0.64	0.30	42.1	D		
TR	1937	4934	1.00	0.39	79.0	E	69.6	E
Northbound								
L	309	1736	0.87	0.18	82.8	F		
LT	617	3471	0.46	0.18	50.2	D	51.4	D
R	817	1553	0.30	0.53	18.2	B		
Southbound								
L	373	1736	0.67	0.21	53.5	D		
LTR	724	3372	0.92	0.21	74.8	E	69.0	E

Intersection Delay = 66.0 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 8/8/2001
Period: AM pk w/imp
Project ID:
E/W St: NW 12 Street

Inter.: NW 87 Ave and NW 12 St
Area Type: All other areas
Jurisd:
Year : 00169

N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	2	2	1	1	2	1	1	3	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	26	373	69	165	437	498	355	2548	1958	128	466	119
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			7			30			30			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A	A	
Right		A				Right		A	A	
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru			A	
Right		A				Right			A	
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right					WB	Right	A			
Green	7.0	19.0					11.0	63.0	11.0	
Yellow	3.0	4.0					3.0	0.0	4.0	
All Red	0.0	2.0					1.0	0.0	2.0	

Cycle Length: 130.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	94	1752	0.29	0.05	60.8	E		
T	270	1845	1.46	0.15	896.3	F	734.4	F
R	434	1568	0.15	0.28	35.6	D		
Westbound								
L	183	3400	0.95	0.05	149.4	F		
T	512	3505	0.90	0.15	77.8	E	195.9	F
R	434	1568	1.14	0.28	322.5	F		
Northbound								
L	148	1752	2.53	0.08		F		
T	1995	3505	1.34	0.57	651.4	F		F
R	1049	1568	1.93	0.67		F		
Southbound								
L	148	1752	0.91	0.08	133.2	F		
TR	413	4883	1.49	0.08	957.3	F	809.1	F

Intersection Delay = (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA
Agency: Miami, FL
Date: 7/18/2001

Inter.: NW 87 Ave and NW 12 St
Area Type: All other areas
Jurisd:

Period: MD pk w/imp Year : 00169
Project ID:
E/W St: NW 12 Street N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	2	2	1	1	2	1	1	3	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	100	301	215	562	777	438	273	1361	492	173	1227	293
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			20			25			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A	A		
Thru			A			Thru		A	A	
Right			A			Right		A	A	
Peds						Peds				
WB Left	A	A			SB	Left	A			
Thru		A	A			Thru			A	
Right		A	A			Right			A	
Peds						Peds				
NB Right	A	A			EB	Right	A	A		
SB Right					WB	Right				
Green	12.0	5.0	23.0				13.0	5.0	45.0	
Yellow	3.0	3.0	4.0				3.0	4.0	4.0	
All Red	0.0	1.0	2.0				0.0	1.0	2.0	

Cycle Length: 130.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	162	1752	0.68	0.09	68.6	E		
T	326	1845	1.02	0.18	168.7	F	106.2	F
R	603	1568	0.35	0.38	28.9	C		
Westbound								
L	523	3400	1.18	0.15	403.0	F		
T	863	3505	0.99	0.25	100.6	F	267.0	F
R	386	1568	1.18	0.25	394.7	F		
Northbound								
L	283	1752	1.06	0.16	231.3	F		
T	1483	3505	1.01	0.42	93.0	F	93.5	F
R	977	1568	0.53	0.62	14.3	B		
Southbound								
L	175	1752	1.09	0.10	297.1	F		
TR	1693	4890	0.99	0.35	74.7	E	97.4	F

Intersection Delay = 145.3 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1

Analyst: DPA Inter.: NW 87 Ave and NW 12 St
Agency: Miami, FL Area Type: All other areas
Date: 8/8/2001 Jurisd:
Period: PM pk w/imp Year : 00169
Project ID:
E/W St: NW 12 Street N/S St: NW 87 Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R

No. Lanes	1	1	1	2	2	1	1	2	1	1	3	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	62	220	294	703	989	306	84	859	274	69	1841	564
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			30			30			25			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru			A			Thru			A	
	Right			A			Right			A	
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A	A			Thru		A	A	
	Right		A	A			Right		A	A	
	Peds						Peds				
NB	Right	A	A			EB	Right	A			
SB	Right					WB	Right	A	A		
Green		8.0	12.0	16.0				8.0	17.0	32.0	
Yellow		3.0	4.0	4.0				3.0	4.0	4.0	
All Red		1.0	2.0	2.0				1.0	2.0	2.0	

Cycle Length: 125.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	113	1770	0.58	0.06	64.1	E		
T	238	1863	0.97	0.13	146.8	F	91.2	F
R	380	1583	0.73	0.24	51.2	D		
Westbound								
L	659	3433	1.12	0.19	294.4	F		
T	963	3539	1.08	0.27	213.0	F	214.3	F
R	874	1583	0.33	0.55	15.6	B		
Northbound								
L	113	1770	0.78	0.06	91.5	F		
T	906	3539	1.00	0.26	104.1	F	85.5	F
R	785	1583	0.33	0.50	19.3	B		
Southbound								
L	411	1770	0.18	0.23	38.7	D		
TR	2159	4906	1.17	0.44	351.5	F	342.8	F

Intersection Delay = 230.1 (sec/veh) Intersection LOS = F

Appendix D

Suggested Traffic Design Standards

Design Standards

Exhibits for Design Standards

Design Standards

This is a summary of information based on the reference materials located in Appendix F.

Because of their size and operating characteristics, trucks can be the control vehicles in roadway design. Characteristics such as offtracking, acceleration, braking performance, driver eye height, and stability have a major impact on design decisions.

Turning Radii and Offtracking

Two factors that affect the maneuverability of large trucks are turning radii and offtracking. Offtracking occurs when the rear wheels of a vehicle do not follow the same path as the front wheels. There are two types of offtracking, low speed and high speed.

In low-speed offtracking, the rear wheels of the truck follow a path inside of the path of the front wheels. Low-speed offtracking is an important consideration in the design of at-grade intersections. High-speed offtracking is the opposite of low-speed offtracking in that the rear wheels of the truck follow a path outside of the path of the front wheels, that is, the rear of the truck moves toward the outside of the curve. High-speed offtracking is important in determining the need for pavement widening on horizontal curves.

Acceleration Characteristics

Truck acceleration characteristics primarily depend on gross vehicle weight, engine horsepower, and the grade of the roadway. Acceleration characteristics of trucks are important in the design of acceleration lanes, climbing lanes, and determining sight distance requirements at stop-controlled intersections and railroad crossings.

Stopping Sight Distance

The distance required to stop a vehicle is a function of the driver, the vehicle, and the pavement. Important driver characteristics include perception-reaction time, driver eye height, and driver experience in emergency braking situations. Important vehicle characteristics include type of brakes (conventional or antilock); brake adjustment (especially critical for trucks), truck load, and tire tread depth. Frictional characteristics of the pavement are also important.

Stopping sight distance is a critical element in the design of vertical curves, horizontal curves, intersections, and location of traffic control devices.

Rollover Stability

Rollover threshold is defined as the maximum lateral acceleration a vehicle can sustain without rolling over. Rollover threshold has a major impact on the design of horizontal curves. A typical passenger car has a rollover threshold of approximately 1.2g. Fully loaded trucks can have a rollover threshold as low as 0.24g. A value of 0.30g has been suggested for use in the design of horizontal curves to accommodate large trucks.

Horizontal Alignment

When designing horizontal curves to accommodate large trucks, it is important to select a realistic design speed and to consider overturning characteristics. On a minimum radius horizontal curve designed in accordance with current ASSHTO criteria, passenger cars will skid off the pavement before it rolls over. On dry pavement, however, a truck with a rollover threshold of 0.30g (a reasonable value for use in highway design) will roll over before it skids on a minimum radius curve. This indicates that in designing horizontal curves on high-speed roadways, it is important to select a realistic design speed to accommodate large trucks. This is especially important for interchange ramps, because trucks with a high center of gravity in certain situations can roll over when exceeding the design speed by as little as 5 mph.

Vertical Alignment

In order to accommodate trucks on crest vertical curves, designers need to consider truck driver eye height and braking system (conventional or antilock) in addition to the variables considered when designing for passenger cars. For the lower truck driver eye height (75 inches), AASHTO criteria would result in shorter vertical curve lengths than those required for trucks with conventional braking systems. With a truck driver eye height of 93-in., however, the AASHTO criteria result in vertical curves that are relatively close to those appropriate for trucks with conventional braking system.

Intersection Design

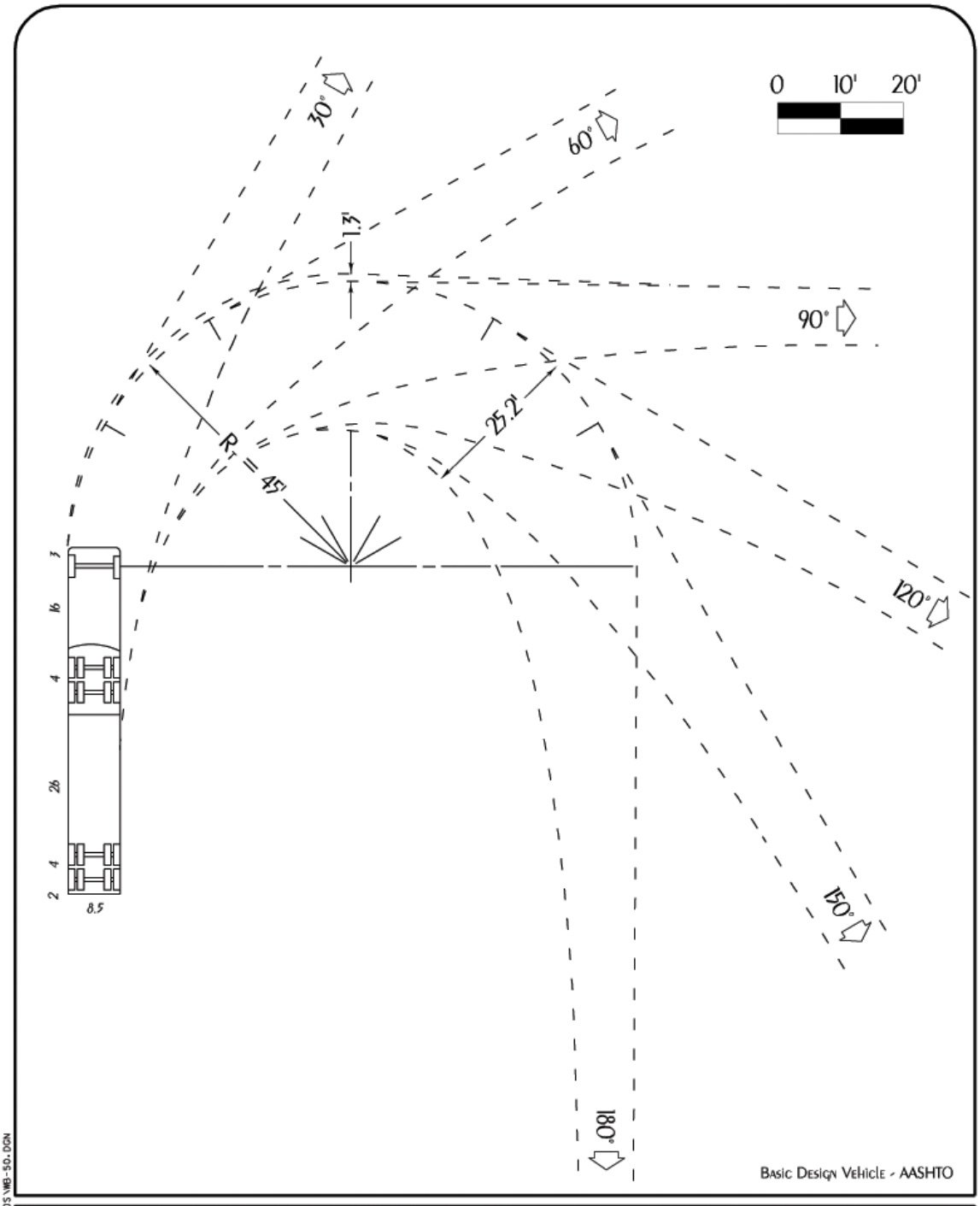
In the design of at-grade intersections to accommodate large trucks, designers need to provide adequate pavement width for turning vehicles and adequate sight distance. In order to provide a curb radius large enough so that trucks can make right turns without encroaching on adjacent lanes, however, the paved area of the intersection may become so large that through drivers might not know where to position their vehicles. If this happens, it is necessary to provide channelizing islands to properly control traffic.

Because of their size and operating characteristics, trucks require longer intersection sight distances than do passenger cars. For example, the required sight distance for a 75-ft truck to make a left turn at a stop-controlled intersection where the design speed of the main roadway is 60 mph is 2,900 ft. It is clear from operational experience, however, that sight distances as long as 2,900 ft. are not necessary for safe operation at intersections. It is unlikely that drivers could accurately judge the location and speed of an oncoming vehicle at a distance of 2,900 ft. Existing procedures for calculating the required sight distance for large trucks at intersections do not realistically represent operations at an intersection.

Sign Placement

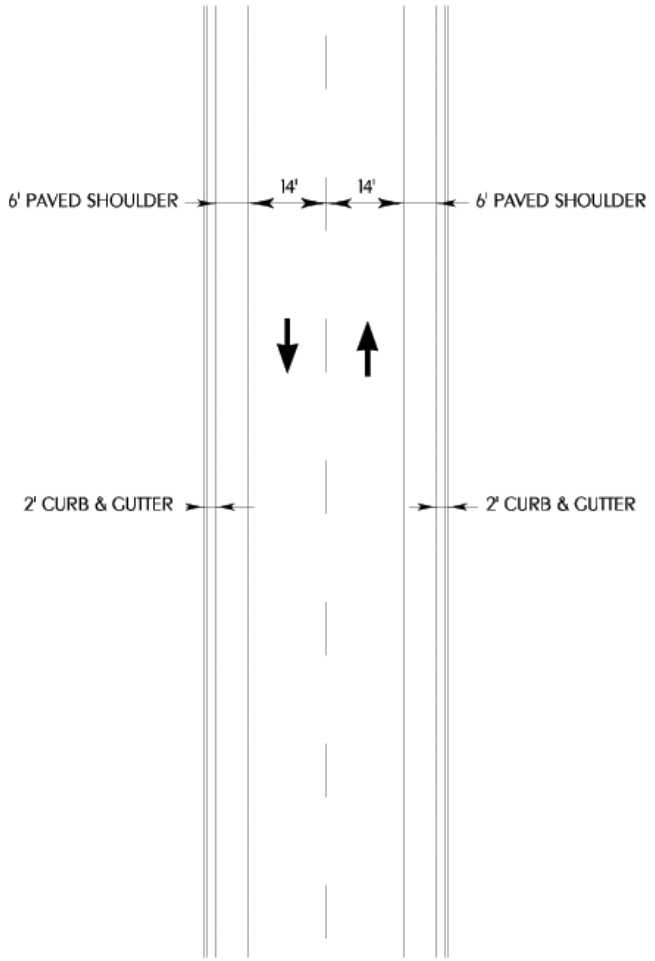
Because of their longer braking distance and lower deceleration capabilities, trucks influence the longitudinal placement of signs. Suggested deceleration distances are based on research that used different assumptions for pavement conditions, driver actions, and deceleration rates. The differences in assumptions need to be resolved before any policy changes based on the research efforts are considered.

Exhibits for Design Standards



00169\STANDARDS\WB-50.DGN

	PROJECT:	TITLE:	EXHIBIT
dpa	SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TURNING PATH TEMPLATE FOR WB-50 TRUCK	1



NOTES

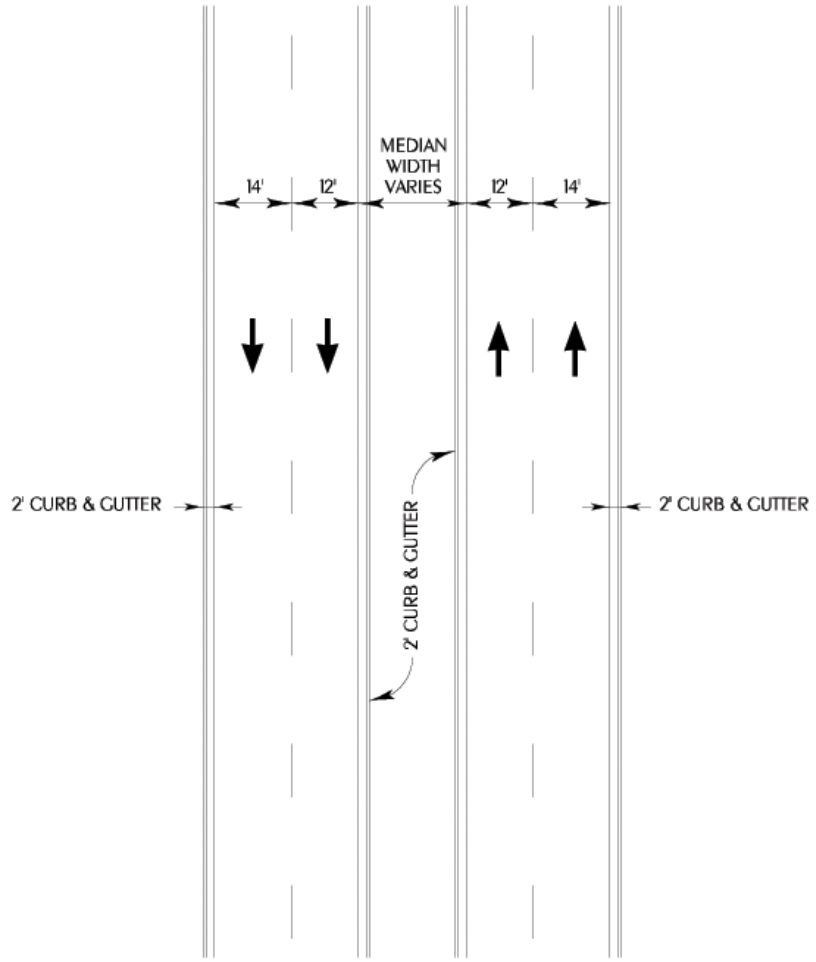
1. WHEN APPROPRIATE, "NO PARKING" SIGNS SHOULD BE INSTALLED
2. 6' SHOULDERS ARE FOR EMERGENCY PULL-OFF AND TEMPORARY STANDING OF VEHICLES WAITING FOR ACCESS TO LOADING FACILITY

LEGEND

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D:\69\STANDARDS\NWIDTH.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL ROADWAY TWO-WAY TWO-LANE UNDIVIDED WITH CURB AND GUTTER	EXHIBIT 2



Notes

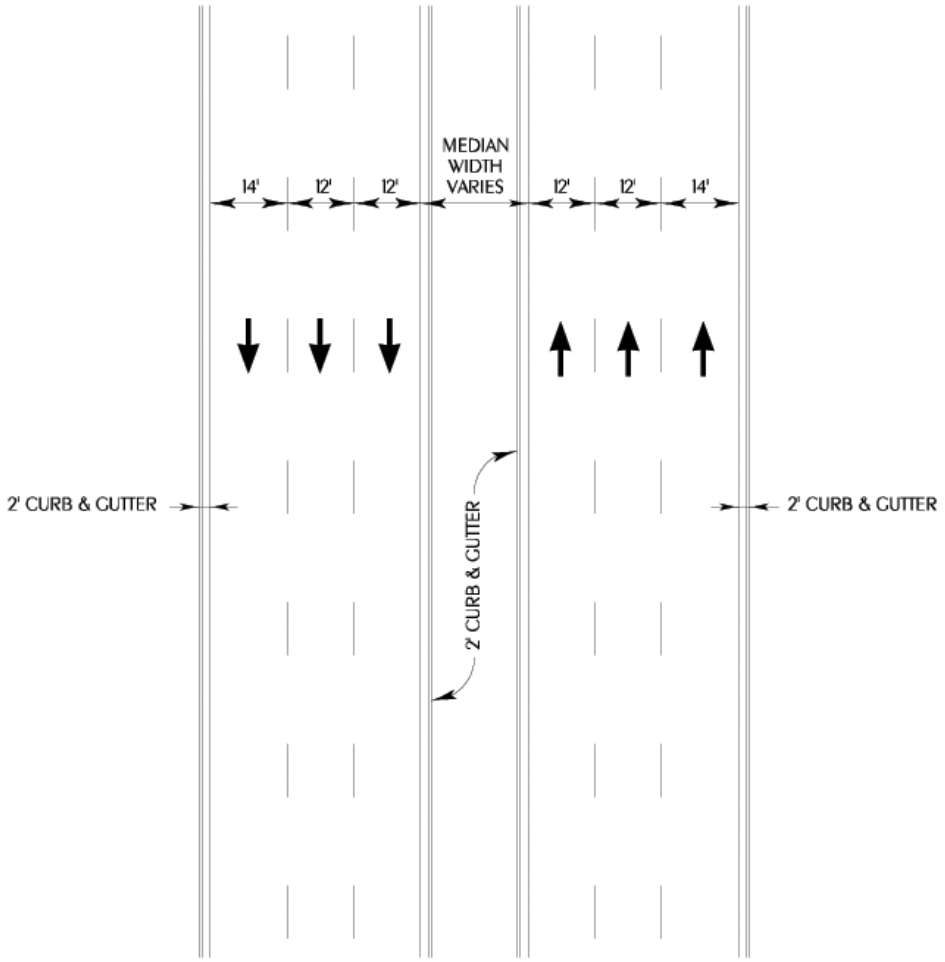
1. ALL ROADWAY DIMENSIONS ARE FROM
   EDGE OF PAVEMENT TO EDGE OF PAVEMENT
2. MINIMUM MEDIAN WIDTHS:
   FOR SINGLE LEFT-TURN LANE IS 19.5 FEET
   FOR DUAL LEFT-TURN LANES IS 31.5 FEET

Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

001691\STANDARDS\LNWIDTH.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL ROADWAY TWO-WAY FOUR-LANE DIVIDED WITH CURB AND GUTTER	EXHIBIT 3



Notes

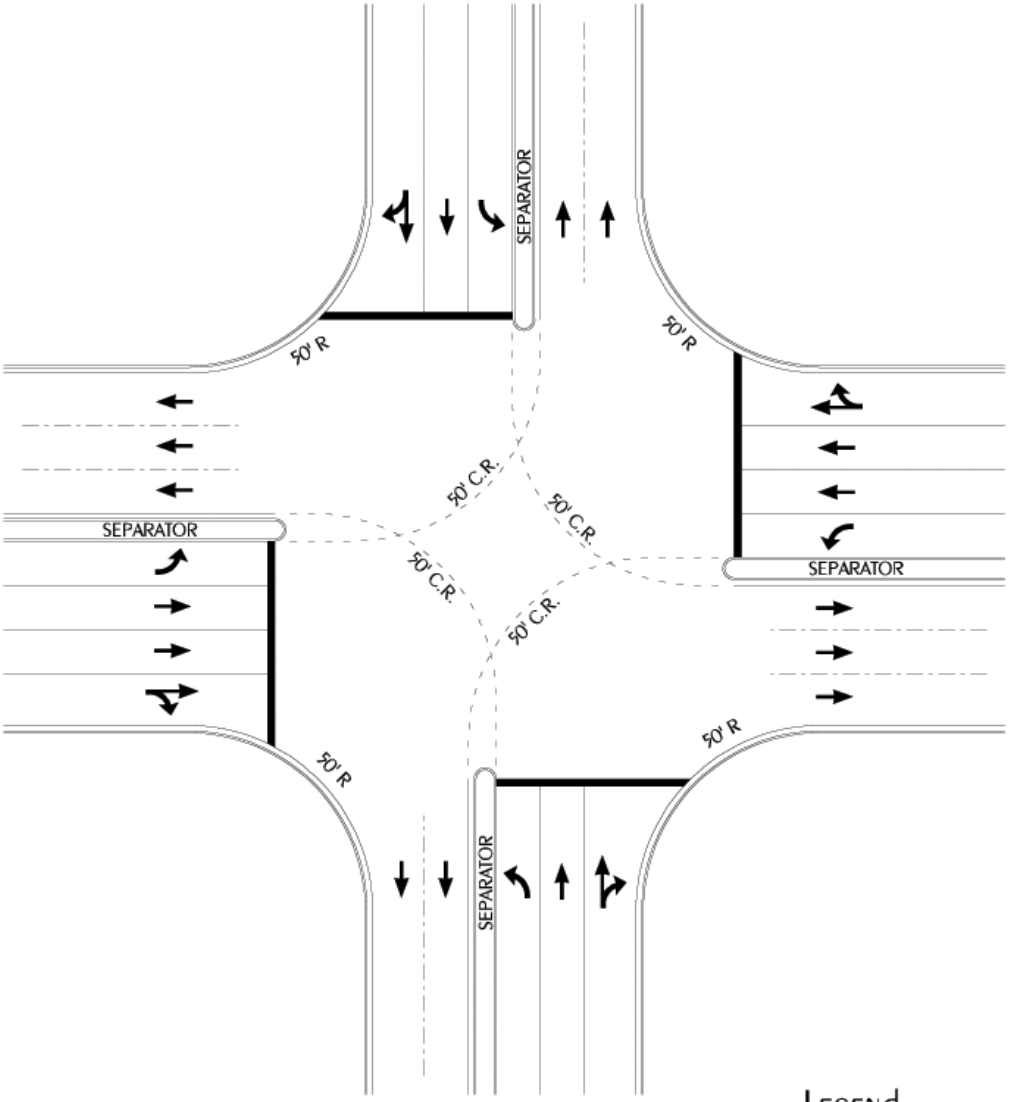
1. ALL ROADWAY DIMENSIONS ARE FROM
   EDGE OF PAVEMENT TO EDGE OF PAVEMENT
2. MINIMUM MEDIAN WIDTHS:
   FOR SINGLE LEFT-TURN LANE IS 19.5 FEET
   FOR DUAL LEFT-TURN LANES IS 31.5 FEET

Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D01691\STANDARDS\LNWIDTH.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL ROADWAY TWO-WAY SIX-LANE DIVIDED WITH CURB AND GUTTER	EXHIBIT 4

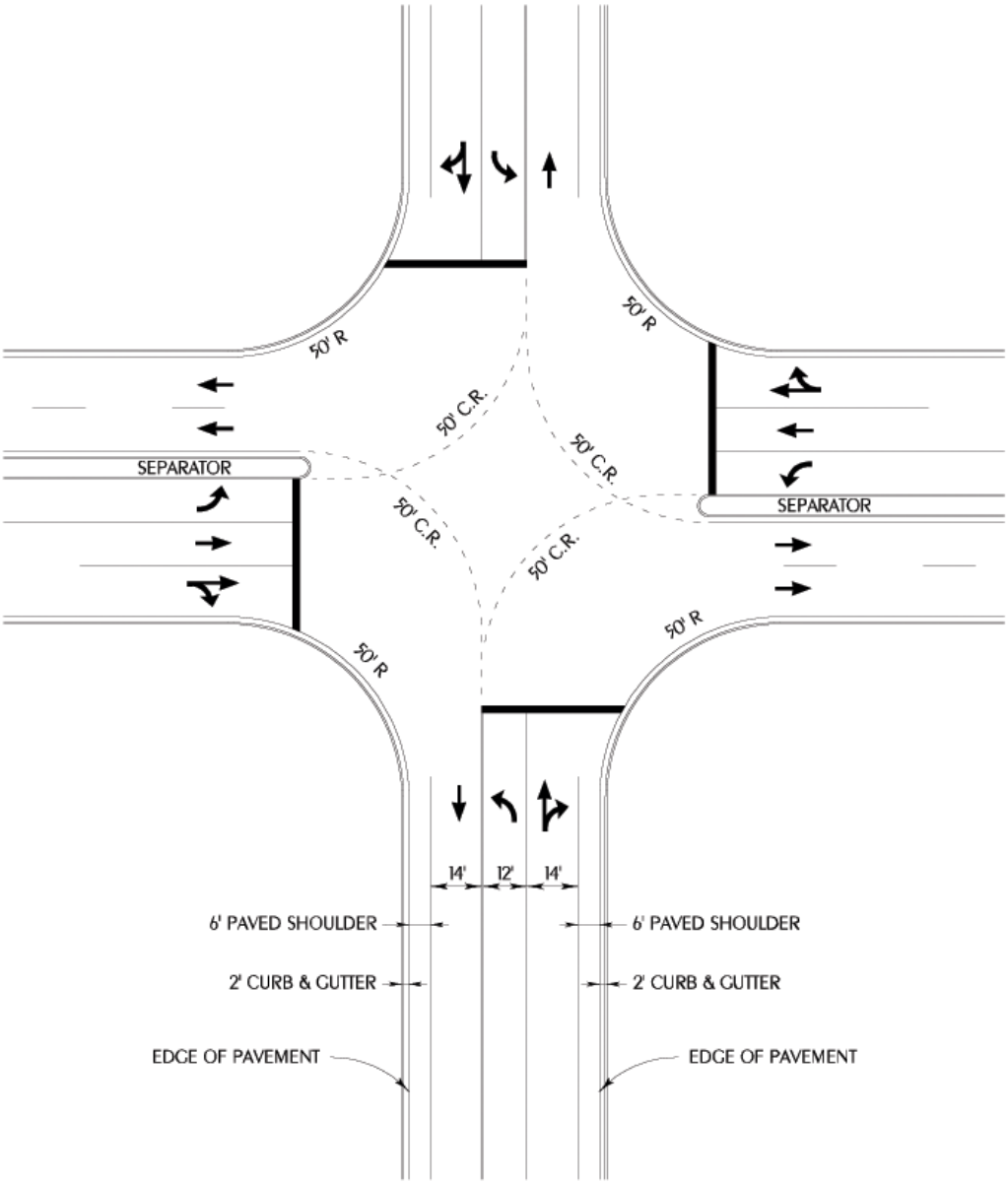


Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D01G9\STANDARDS\RADII.DGN

	PROJECT:	TITLE:	EXHIBIT
dpa	SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	INTERSECTION CONTROL RADII	5



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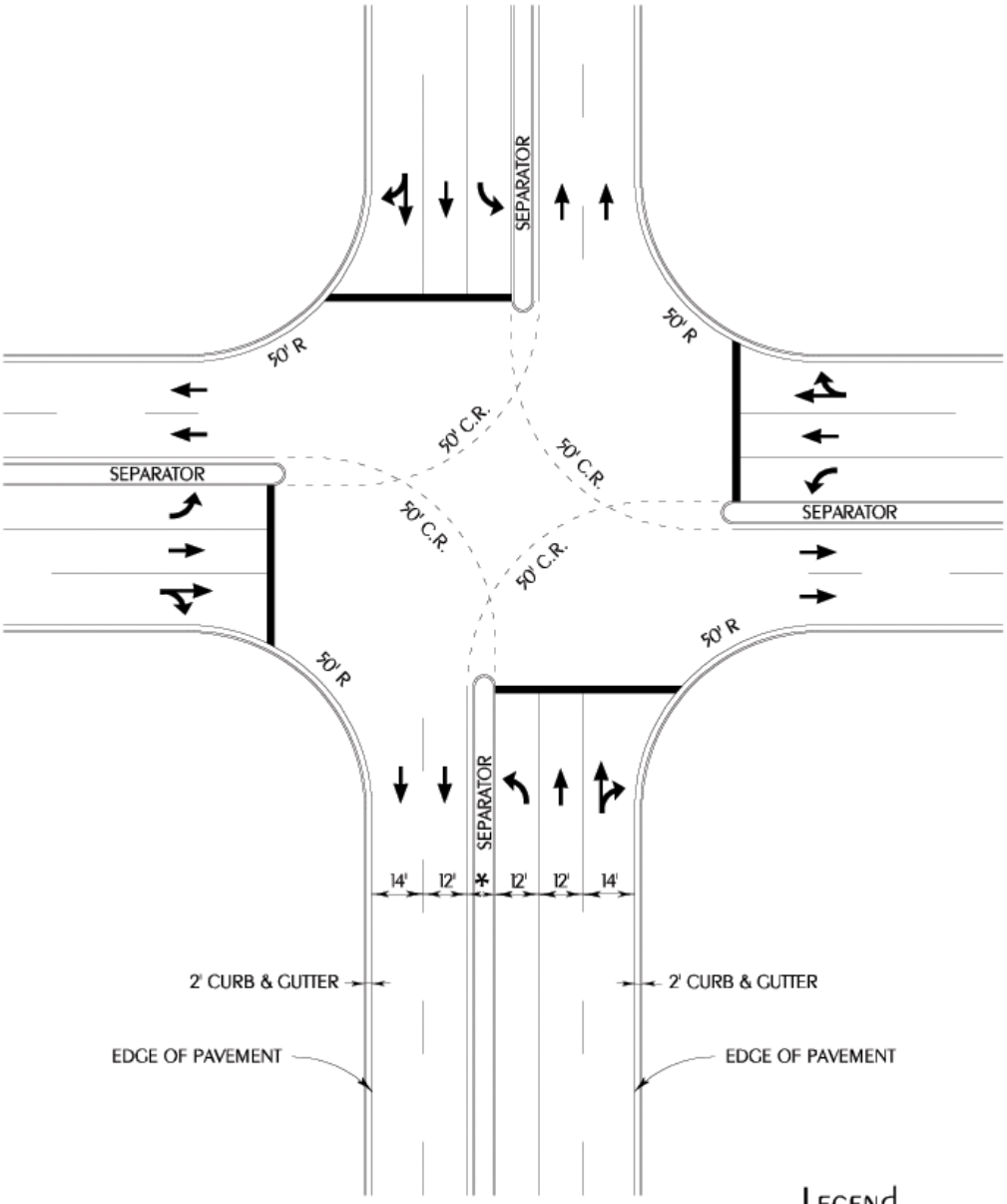
→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D:\691\STANDARDS\INTSEC.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL ROADWAY INTERSECTION TWO-WAY TWO-LANE UNDIVIDED WITH SINGLE LEFT-TURN LANE	EXHIBIT 6



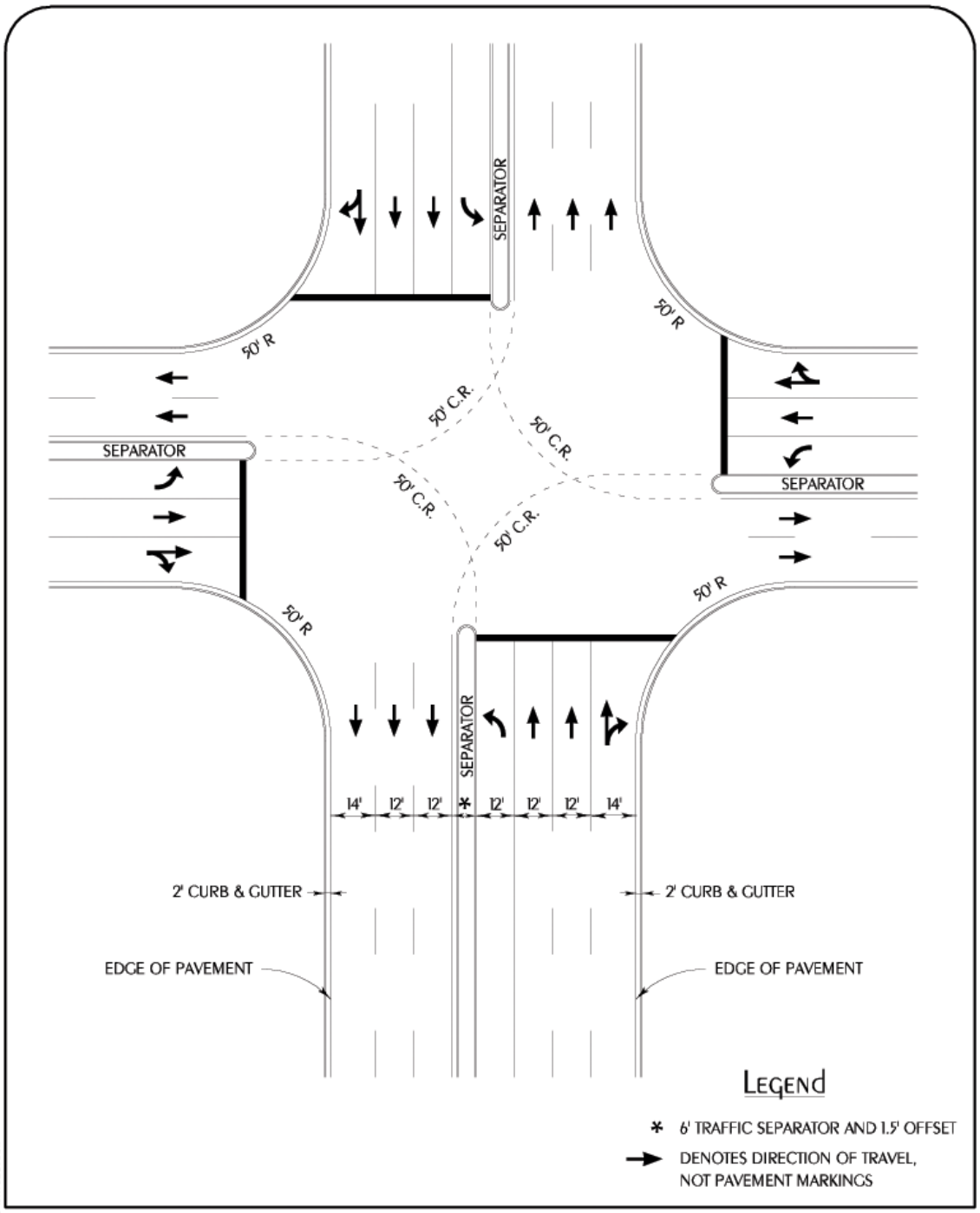
Legend

* 6' TRAFFIC SEPARATOR AND 1.5' OFFSET

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

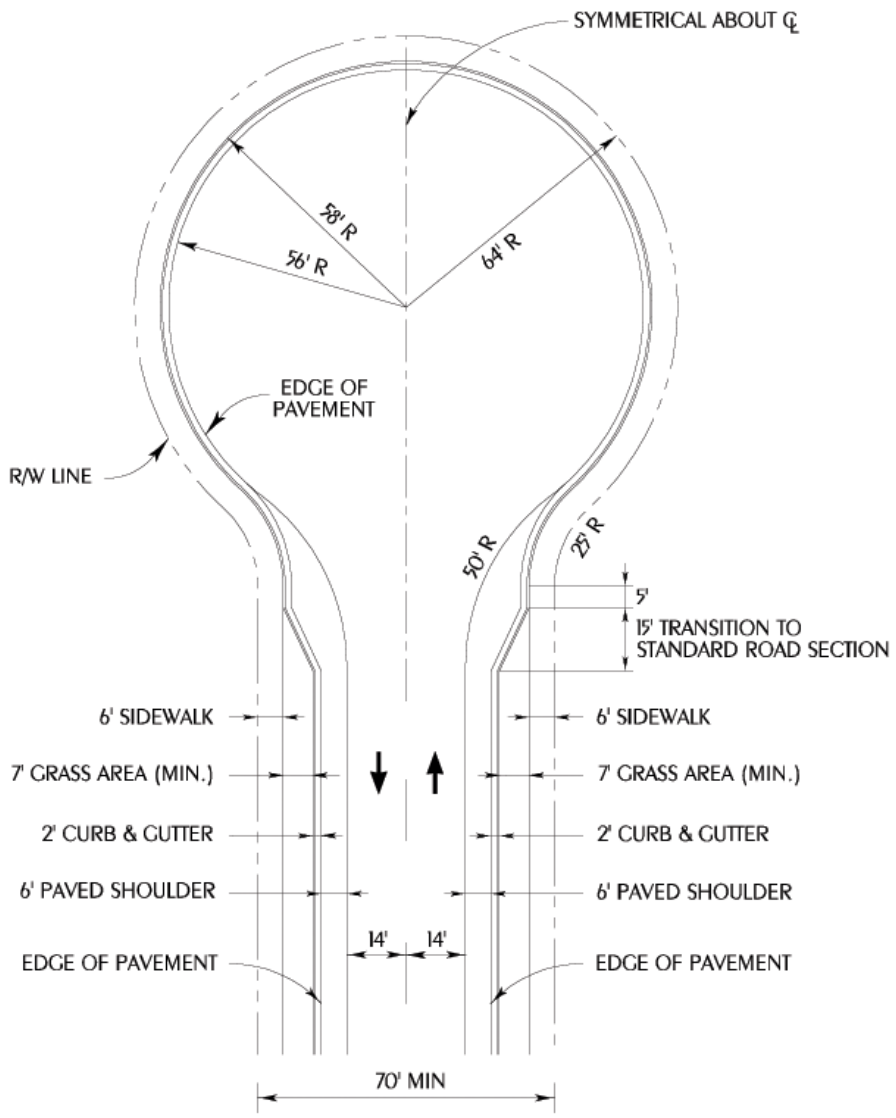
D01691\STANDARDS\INTSEC.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL ROADWAY INTERSECTION TWO-WAY FOUR-LANE DIVIDED WITH SINGLE LEFT-TURN LANE	EXHIBIT 7



D01:69\STANDARDS\INTSEC.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL ROADWAY INTERSECTION TWO-WAY SIX-LANE DIVIDED WITH SINGLE LEFT-TURN LANE	EXHIBIT 8

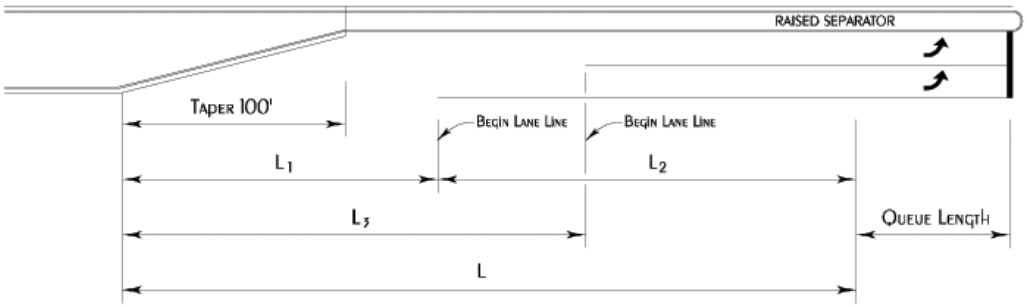


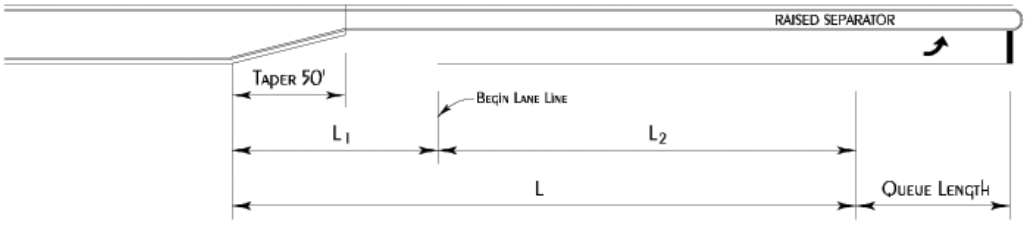
Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D:\691\STANDARDS\CUL DE SAC.DGN

	PROJECT:	TITLE:	EXHIBIT
dpa	SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	CUL-DE-SAC WITH CURB AND GUTTER	9





DESIGN SPEED (MPH)	ENTRY SPEED (MPH)	L_1 CLEARANCE DISTANCE	L_2 BRAKE TO STOP DISTANCE	L TOTAL DECELERATION DISTANCE	L_3 CLEARANCE DISTANCE
35	25	70'	75'	145'	110'
40	30	80'	75'	155'	120'
45	35	85'	100'	185'	135'
50	40	105'	135'	240'	160'

NOTES

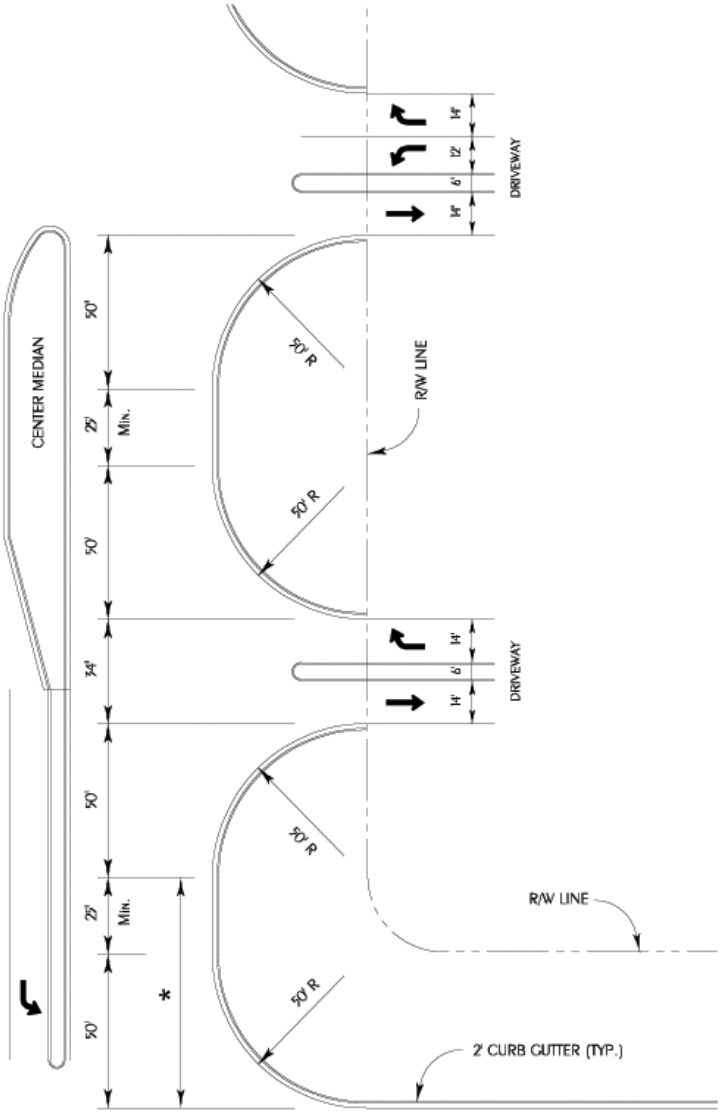
1. QUEUE LENGTH IS MEASURED FROM THE MEDIAN NOSE RADIAL POINT OR, WHEN A STOP BAR IS REQUIRED, FROM THE STOP BAR
2. RIGHT-TURN LANE TAPERS AND DISTANCES ARE IDENTICAL TO LEFT-TURN LANES UNDER STOP CONTROL CONDITIONS; RIGHT-TURN LANE TAPERS AND/OR DISTANCES ARE SITE SPECIFIC UNDER FREE-FLOW OR YIELD CONDITIONS

LEGEND

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D:\GIS\STANDARDS\TURN_N.DGN

	PROJECT:	TITLE:	EXHIBIT
dpa	SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TYPICAL TURN LANE REQUIREMENTS	10



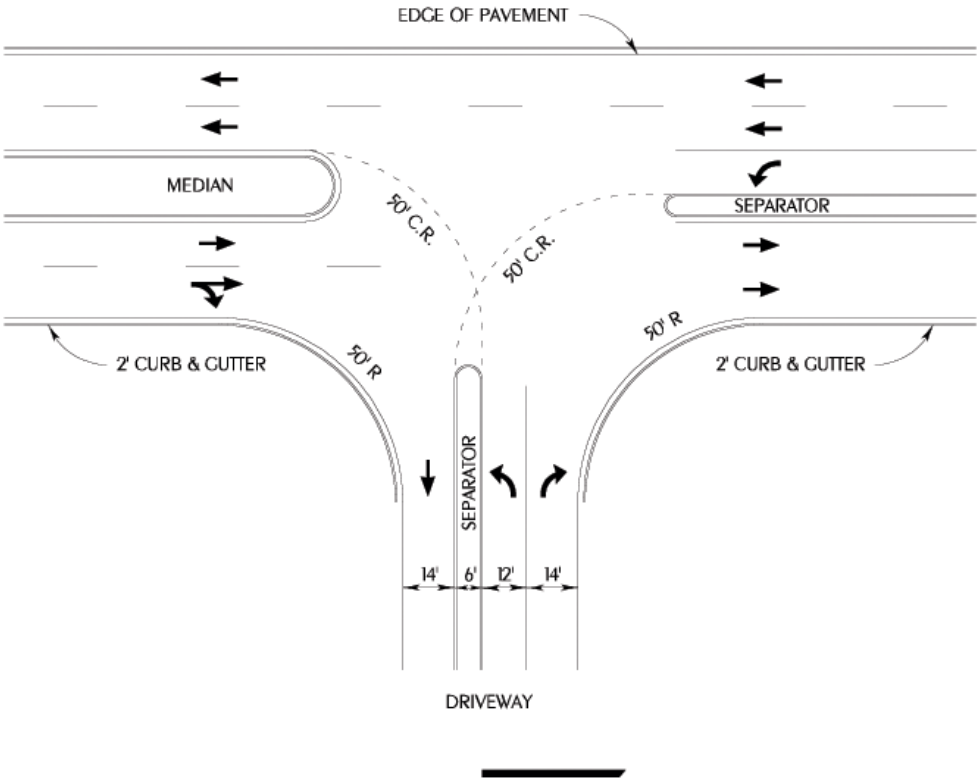
NOTE

MINIMUM MEDIAN OPENING SPACING SHALL BE NO LESS THAN 330 FEET

* DRIVEWAYS ARE NOT TO BE CONTRUCTED WITHIN THESE LIMITS

D:\ES\STANDARDS\DWG\SPC.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: DRIVEWAY SPACING	EXHIBIT 11

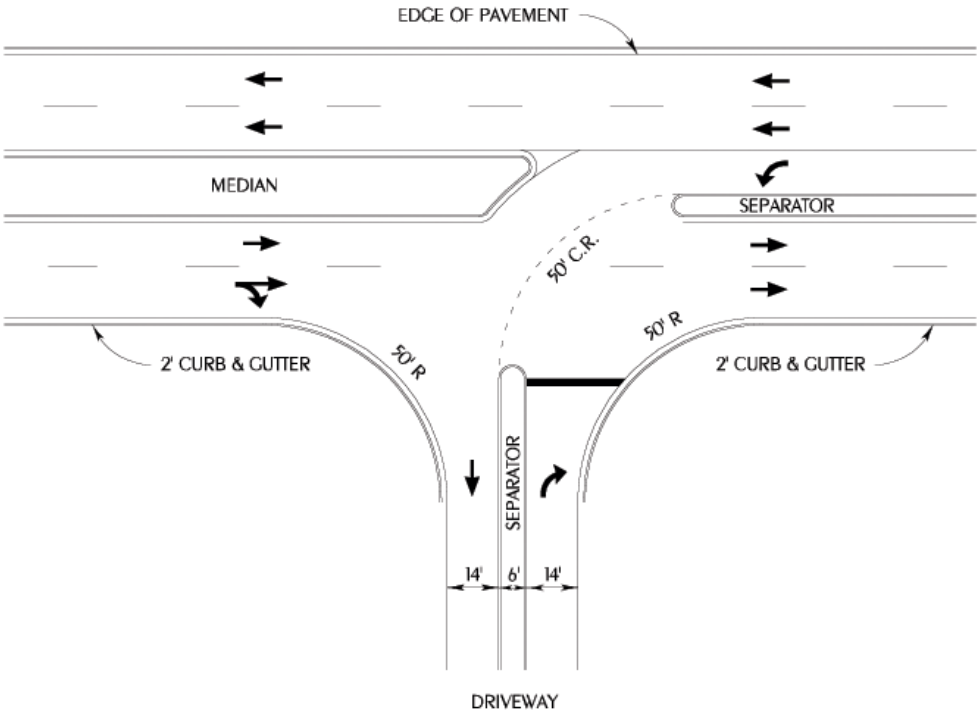


Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D:\69\STANDARDS\D21VEWYS.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL FULL ACCESS DRIVEWAY GEOMETRICS	EXHIBIT 12

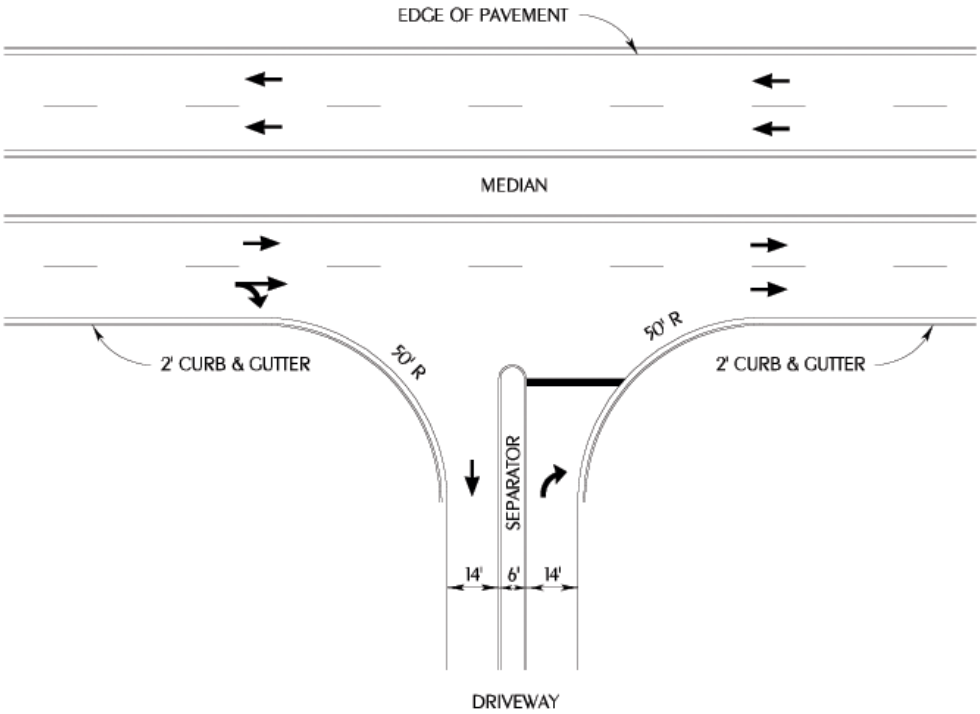


Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D01691\STANDARDS\DRIVEWYS.DGN

	PROJECT:	TITLE:	EXHIBIT
dpa	SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TYPICAL PARTIAL ACCESS DRIVEWAY GEOMETRICS	13



Legend

→ DENOTES DIRECTION OF TRAVEL, NOT PAVEMENT MARKINGS

D01691\STANDARDS\D21VEWYS.DGN

dpa	PROJECT: SHORT RANGE TRUCK TRAFFIC STUDY FOR THE AIRPORT WEST AREA	TITLE: TYPICAL RIGHT-TURN ONLY DRIVEWAY GEOMETRICS	EXHIBIT 14

Appendix E
Background Research

Summaries of Previous Studies

Miami-Dade County Freight Movement Study, MPO, 1996

- The AWA is one of the major generators of freight trips in Miami-Dade County.
- It includes the area between NW 72 Avenue and Florida's Turnpike, north of SR836 to NW 74 Street.
- Roadway segments which provide access to MIA and exceed acceptable levels of congestion are SR836, SR826, NW 12 Street, NW 25 Street, NW 21 Street and NW 72 Avenue.
- From the survey of truck carriers/organizations in Miami-Dade County, most respondents said traffic congestion, lack of parking, and rush-hour deliveries were the most problematic. (p. 3-54)
- At the steering committee workshop, representatives of public and private sector entities involved in freight movement stated that the design of some new roads does not consider trucks. Part of the reason for this is design standards are often pressed to make the highway system more pedestrian-friendly and, as a result, create problems for trucks and other large vehicles. (p. 3-58)
- Representatives from the Miami-Dade Aviation Department stated that the geometry of the roads west of the airport serving the warehouse and distribution center is very poor for trucks (they were designed for cars). Major redesign of most of the roads and intersections would be required for this to be a really effective freight transportation area. (p. 3-64)
- Many respondents of the mail-back survey said that a freight-only lane would be important. (p. 4-6)
- An O-D survey conducted at the Port of Miami, the FEC Hialeah Intermodal Yard and the Miami Free Trade Zone identified the following roads within the AWA as among the most traveled in the entire county: SR836, SR826, NW 25 Street, NW 74 Street, NW 72 Avenue, NW 36 Street, and NW 107 Avenue. (p. 4-8, 4-14)

Travel Demand Study Report, NW 25 Street PD&E Study, FDOT, 1997

- NW 25 Street was identified as experiencing continuous socio-economic growth east and west of SR826. Traffic counts estimated that trucks account for 15 to 20% of the total number of vehicles without any decrease during the peak hours of the day. (p. 1-1)
- Traffic congestion along NW 25 Street is caused by the high presence of trucks and other factors including many traffic generators along the corridor, sub-standard lane widths and turning radii, absence of medians throughout majority of the roadway, poor access management, numerous traffic signals with relatively small distances between them, and train movements at four gate-controlled locations. (p. 1-1)
- The peak hour along NW 25 Street between NW 87 Avenue and NW 67 Avenue occurred at 1:00 pm. (p. 3-11)
- Truck factors (T-factors), representing truck traffic percentage in 24 hours, ranged from 10% to 20% along NW 25 Street (with lower percentages exhibited away from the airport periphery). (p. 3-6)
- Approximate T-factors on cross-streets (near NW 25 Street) were as follows: 6% on NW 87 Avenue; 9% on NW 72 Avenue; and 15% on NW 67 Avenue. (p. 3-7)
- Peak hour truck percentages (PHT), representing truck traffic percentage within the peak hour, ranged from 11% to 21% (with lower percentages exhibited away from the airport periphery). (p. 3-12)
- A traffic count of vehicles making a special U-turn movement on NW 25 Street from northbound NW 82 Avenue to southbound NW 84 Avenue was performed. The combined result of the AM, Midday, and PM peak hours are as follows: of the cars making a left-turn on northbound NW 82 Avenue, 13% made another left-turn at NW 84 Avenue; of the trucks making a left-turn on northbound NW 82 Avenue, 67% made another left-turn at NW 84 Avenue; and of all vehicles making a left-turn on northbound NW 82 Avenue, 26% made another left-turn at NW 84 Avenue. A connection between NW 82 Avenue and NW 84 Avenue on NW 21 Street, NW 17 Street, or NW 14 Street would relieve the traffic congestion on the segment of NW 25 Street between these two avenues as well as at both intersections. (p. 3-18)

- During a Travel Time and Delay Study, the least delays and highest travel speeds occurred during the AM peak period. The most delays and longest travel times were observed during the Midday peak period. (p. 3-25)
- Along NW 25 Street, from January to May of 1995, approximately 40% of crashed involved a truck. (p. 3-29)
- A Truck Origin-Destination (O-D) study was conducted in March 1996. Truck drivers traveling eastbound and westbound on NW 25 Street were interviewed while they were stopped during the red light at NW 82 Avenue and at NW 79 Avenue. At each station, truck drivers were asked their origin, the avenue they used to enter NW 25 Street, the avenue they would use to exit NW 25 Street, and their destination. About 1,400 interviews were conducted during the three peak periods (AM, Midday, and PM). Following is a summary of existing daily truck movements entering and exiting the airport periphery (east of NW 72 Avenue):

  Entering: 57% were coming from west of SR-826
  11% were coming from north on SR-826
  3% were coming from south on SR-826
  29% were coming from east of SR-826

  Exiting: 45% were going west of SR-826
  21% were going north on SR-826
  4% were going south on SR-826
  30% were going east of SR-826

  (p. 5-1, 2-3, 5-10)
- The recommended factors for future traffic projections on the NW 25 Street corridor are as follows: K_{30}-factor = 9.2%; D_{30}-factor = 55.8%; PHF = 0.95; T-factor = 15%; DHT = 15% (p. 6-4)

Preliminary Engineering Report, NW 25 Street PD&E Study, FDOT, 1998

- Design criteria for NW 25 Street includes 3.6-meter (12-foot) lanes with 6.0-meter median. Design criteria for the viaduct includes 4.5-meter (15-foot) lanes, 2.4-meter (8-foot) right shoulder and 1.2-meter (4-foot) left shoulder, with 0.6-meter barrier as a median separator. (p. 7-2)
- One study alternative included a combination of an elevated structure (viaduct) parallel to NW 25 Street with alternate connections to SR-826 and at-grade widening along NW 25 Street. A Tier 1 analysis was performed to determine the preferred connection of the viaduct to SR-826 and a Tier 2 analysis was performed to determine the preferred study alternative. (p. 8-1)
- In the Tier 1 analysis, the "Overpass with Slip Ramps" alternate ranked in first place and was selected as the preferred connection to SR-826. (p. 8-11)
- In the Tier 2 analysis, the Alternative B (Viaduct on the North Side and Widening of NW 25 Street to Six Lanes) was selected as the preferred alternative. (p. 8-49)
- See alignment and intersection concepts for at-grade widening (p. 9-1) and for viaduct (p. 9-6)
- The viaduct will facilitate vehicular traffic, particularly truck traffic, traveling to and from the west, the SR-826, and the airport periphery. This alternative will also alleviate traffic congestion on NW 25 Street by reducing non-local traffic using NW 25 Street. (p. 9-6)

Appendix F
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