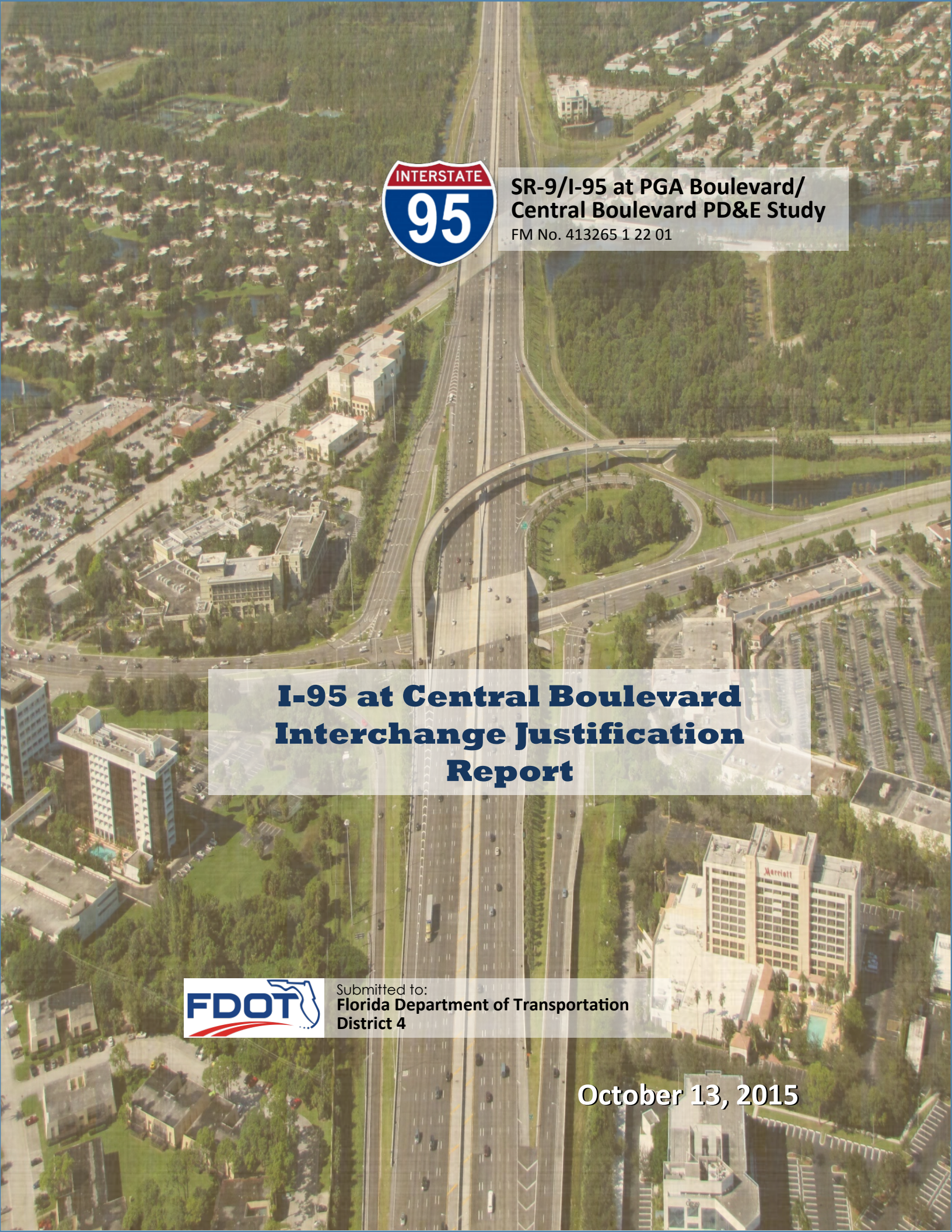

SR-9/I-95 at PGA Boulevard/ Central Boulevard PD&E Study
FM No. 413265 1 22 01

I-95 at Central Boulevard Interchange Justification Report

Submitted to:
Florida Department of Transportation
District 4

October 13, 2015

I-95 at Central Boulevard Interchange Justification Report

Financial Management Number 413265-1-22-01

Prepared for

Florida Department for Transportation
District 4

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TABLE OF CONTENTS

Executive Summary xi
1.0 Introduction 1-1
2.0 Methodology 2-1
2.1 Overview 2-1
2.2 Analysis Years 2-1
2.3 Traffic Counts 2-1
2.4 Signal Timing 2-10
2.5 Field Review 2-10
2..6 Travel Demand Forecasting 2-10
2.6.1 Network 2-12
2.6.2 Land Use 2-13
2.6.3 Congestion Induced Diversion 2-15
2.7 Directional Design Hour Volumes and Turning Movements 2-16
2.8 Traffic Factors 2-17
3.0 Existing Conditions Analysis 3-1
3.1 Existing Conditions Intersection Level of Service Analysis 3-7
3.2 Existing Conditions Queuing Analysis 3-9
3.3 Existing Conditions Roadway Level of Service 3-11
3.4 Existing Conditions Crash Analysis 3-15
3.4.1 PGA Boulevard from Florida Turnpike to Victoria Gardens 3-15
3.4.2 North Military Trail from PGA Boulevard to Donald Ross Road 3-18
3.4.3 Interstate 95 from Northlake Boulevard to Donald Ross Road 3-20
3.5 Existing Conditions Environmental Data 3-27
3.5.1 Land Use 3-28
3.5.2 Social 3-28

3.5.3 Economic 3-32
3.5.4 Mobility 3-34
3.5.5 Aesthetics 3-35
3.5.6 Relocation Potential 3-35
3.5.7 Cultural Resources 3-36
3.5.8 Section 4(F) 3-38
3.5.9 Wetlands and Other Surface Waters 3-39
3.5.10 Water Quality 3-41
3.5.11 Wildlife and Habitat 3-43
3.5.12 Noise 3-50
3.5.13 Air 3-51
3.5.14 Construction Impact Analysis 3-53
3.5.15 Contamination 3-53
3.5.16 Class of Action 3-56
4.0 Future Conditions Analysis 4-1
4.1 Committed Improvements 4-1
4.2 No-Build Lange Geometries 4-1
4.3 No-Build Volumes 4-3
4.4 No-Build Intersection Level of Service 4-16
4.5 No-Build Roadway Level of Service 4-20
4.6 No-Build Queuing Analysis 4-24
5.0 Purpose and Need for the Project 5-1
6.0 Development of Alternatives 6-1
6.1 Screening of Project Alternatives 6-1
6.1.1 Tier 1 – Fatal Flaw Screening of Concepts 6-1
6.1.2 Tier 2 – Operational Analysis of Refined Alternatives 6-1
6.1.3 Tier 3 – Selection of Final Alternatives for Interchange Justification Study 6-2

6.2 Tier 1 Concepts Considered 6-3
6.3 Comparative Evaluation of Tier 1 Concepts 6-10
6.3.1 Regional Transportation Performance 6-11
6.3.2 Right-of-Way Impacts 6-11
6.3.3 Environmental Impacts 6-12
6.3.4 Construction Costs 6-12
6.3.5 Utility Impacts 6-13
6.3.6 Other Costs 6-13
6.3.7 Analysis of Flawed Concepts 6-14
6.3.8 Comparative Matrix 6-19
6.4 Tier 2 Recommendations 6-22
6.4.1 Tier 1 Concepts Developed into Full Tier 2 Alternatives 6-22
6.4.2 Concepts That Have Limited Merit for Continued Study 6-24
6.5 Recommended Alternatives 6-26
6.5.1 Alternative 1 – New Diamond Interchange at Central Boulevard 6-28
6.5.2 Alternative 2 – New Diamond Interchange at Central Boulevard with Collector/Distributor Roads from Military Trail to Central Boulevard 6-28
6.5.3 Alternative 3 – New Diamond Interchange at Central Boulevard with Braided Ramps between Military Trail to Central Boulevard 6-28
7.0 Alternatives Analysis 7-1
7.1 Build alternative Design Traffic Volumes 7-1
7.2 Intersection Analysis 7-14
7.3 Queuing Analysis 7-18
7.4 Roadway Level of Service Analysis 7-22
7.4.1 Arterial Roadways Level of Service 7-22
7.4.2 Alternative 2 Freeway Facilities Analysis 7-26
7.4.3 Alternative 3 Freeway Facilities Analysis 7-42
7.4 Environmental 7-58

7.5 Conclusions 7-59
7.5.1 Intersection and Arterial Delay Analysis 7-60
7.6. Recommendations 7-68
8.0 Justification 8-1
8.1 8-1
8.2 8-3
8.3 8-4
8.4 8-6
8.5 8-6
8.6 8-9
8.7 8-10
8.8 8-11

LIST OF FIGURES

Figure 1-1 Project Location 1-2
Figure 2-1 Traffic Count Locations 2-2
Figure 2-2 TAZs Selected for Land Use Comparison 2-14
Figure 3-1 Existing Intersection Geometry 3-2
Figure 3-2 Existing Conditions AM Peak Hour Turing Movements 3-3
Figure 3-3 Existing Conditions PM Peak Hour Turning Movements 3-4
Figure 3-4: Existing Conditions AM Peak Hour Volumes 3-5
Figure 3-5 Existing Conditions PM Peak Hour Volumes 3-6
Figure 3-6 Existing Conditions Arterial Level of Service 3-14
Figure 3-7 PGA Corridor Crash Location Distribution 3-16
Figure 3-8 PGA Corridor Crash Type Distribution 3-17
Figure 3-9 Military Trail Corridor Crash Type Distribution 3-19
Figure 3-10 I-95 Corridor Crash Distribution by Location 3-25

Figure 3-11 I-95 Corridor Crash Severity Distribution by Location 3-26
Figure 3-12 Existing Land Use 3-29
Figure 3-13 Future Land Use 3-30
Figure 3-14 Developments of Regional Impact 3-33
Figure 3-15 Wetlands 3-40
Figure 3-16 Water Quality 3-42
Figure 3-17 Wood Stork 3-44
Figure 3-18 Red Cockaded Woodpecker 3-45
Figure 3-19 Everglades Snail Kite 3-47
Figure 3-20 Florida Scrub Jay 3-48
Figure 3-21 Potential Noise Sensitive Sites 3-52
Figure 3-22 Potential Contamination 3-55
Figure 4-1 Future No-Build Geometries 4-2
Figure 4-2 No Build Design Hour Traffic 2020 AM 4-4
Figure 4-3 No Build Design Hour Traffic 2030 AM 4-5
Figure 4-4 No Build Design Hour Traffic 2040 AM 4-6
Figure 4-5 No Build Design Hour Traffic 2020 PM 4-7
Figure 4-6 No Build Design Hour Traffic 2030 PM 4-8
Figure 4-7 No Build Design Hour Traffic 2040 PM 4-9
Figure 4-8 No Build Alternative Turning Movements 2020 AM 4-10
Figure 4-9 No Build Alternative Turning Movements 2030 AM 4-11
Figure 4-10 No Build Alternative Turning Movements 2040 AM 4-12
Figure 4-11 No Build Alternative Turning Movements 2020 PM 4-13
Figure 4-12 No Build Alternative Turning Movements 2030 PM 4-14
Figure 4-13 No Build Alternative Turning Movements 2040 PM 4-15
Figure 5-1 Commercial Areas 5-2
Figure 5-2 Constrained Facilities 5-3

Figure 6-1 Build Alternatives Intersection Lane Geometry 2020 6-30
Figure 6-2 Build Alternatives Intersection Lane Geometry 2030 6-31
Figure 6-3: Build Alternatives Intersection Lane Geometry 2040 6-32
Figure 7-1 Build Alternatives Design Hour Traffic 2020 AM 7-2
Figure 7-2 Build Alternatives Design Hour Traffic 2030 AM 7-3
Figure 7-3 Build Alternatives Design Hour Traffic 2040 AM 7-4
Figure 7-4 Build Alternatives Design Hour Traffic 2020 PM 7-5
Figure 7-5 Build Alternatives Design Hour Traffic 2030 PM 7-6
Figure 7-6 Build Alternatives Design Hour Traffic 2040 PM 7-7
Figure 7-7 Build Alternatives Turning Movements 2020 AM 7-8
Figure 7-8 Build Alternatives Turning Movements 2030 AM 7-9
Figure 7-9 Build Alternatives Turning Movements 2040 AM 7-10
Figure 7-10 Build Alternatives Turning Movements 2020 PM 7-11
Figure 7-11 Build Alternatives Turning Movements 2030 PM 7-12
Figure 7-12 Build Alternatives Turning Movements 2040 PM 7-13
Figure 7-16 Alternative 2 Freeway Operations Analysis 2020 7-28
Figure 7-17 Alternative 2 Freeway Operations Analysis 2030 7-33
Figure 7-18 Alternative 2 Freeway Operations Analysis 2040 7-38
Figure 7-19 Alternative 3 Freeway Operations Analysis 2020 7-44
Figure 7-20 Alternative 3 Freeway Operations Analysis 2030 7-49
Figure 7-21 Alternative 3 Freeway Operations Analysis 2040 7-54

LIST OF TABLES

Table 1-1: Operational Interchange Spacing Along I-95 (SR 9) 1-3
Table 2-1: Growth in Zonal Data Within 10 Mile Radius 2-14
Table 3-1: 2013 Existing Conditions Intersection Level of Service 3-8

Table 3-2: Existing Conditions Queuing Analysis Results 3-10
Table 3-3: Existing Conditions - I-95 3-12
Table 3-4: Existing Conditions Arterial Level of Service 3-13
Table 3-7: PGA Corridor Crash Rates 3-18
Table 3-8: Military Trail Corridor Crash Rates 3-20
Table 3-9: I-95 Corridor Crash Summary 3-21
Table 3-10: I-95 Corridor Crash Rates 3-24
Table 3-11: I-95 Corridor Crash Summary by Location 3-25
Table 3-12: Previously Conducted Surveys Intersecting the Project Corridor 3-37
Table 3-13: Queried GIS Geodatabases 3-54
Table 4-1: No Build Alternative – Intersection Level of Service - 2020 4-17
Table 4-2: No Build Alternative – Intersection Level of Service - 2030 4-18
Table 4-3: No Build Alternative – Intersection Level of Service - 2040 4-19
Table 4-4: No-Build Alternative Roadway Level of Service - 2020 4-21
Table 4-5: No-Build Alternative Roadway Level of Service - 2030 4-22
Table 4-6: No-Build Alternative Roadway Level of Service - 2040 4-23
Table 4-7: No-Build Alternative Queuing Analysis Results - 2020 4-25
Table 4-8: No-Build Alternative Queuing Analysis Results - 2030 4-26
Table 4-9: No-Build Alternative Queuing Analysis Results - 2040 4-27
Table 5-1: Findings of the I-95 Area Wide Mobility Study 5-4
Table 5-2: 5-Year Crash Profile for Key Project Corridors 5-5
Table 6-1: Ranking Symbols for Regional Transportation Performance 6-10
Table 6-2: Ranking Symbols for Other Comparative Criteria 6-10
Table 6-3: Regional Transportation Performance Evaluation Matrix 6-20
Table 6-4: Tier 1 Comparative Evaluation Matrix 6-21
Table 6-5: Delay Benefits of alternative Interchanges Compared to 2040 No-Build 6-27
Table 7-1: Build Alternatives – Intersection Level of Service - 2020 7-15

Table 7-2: Build Alternatives – Intersection Level of Service - 2030 7-16
Table 7-3: Build Alternatives – Intersection Level of Service - 2040 7-17
Table 7-4: Build Alternatives Queuing Analysis Results - 2020 7-19
Table 7-5: Build Alternatives Queuing Analysis Results - 2030 7-20
Table 7-6: Build Alternatives Queuing Analysis Results - 2040 7-21
Table 7-7: Build Alternatives Roadway Level of Service - 2020 7-23
Table 7-8: Build Alternatives Roadway Level of Service - 2030 7-24
Table 7-9: Build Alternatives Roadway Level of Service - 2040 7-25
Table 7-10: Alternative 2 Freeway Facility Level of Service - 2020 7-27
Table 7-11: Alternative 2 Freeway Facility Level of Service - 2030 7-32
Table 7-12: Alternative 2 Freeway Facility Level of Service - 2040 7-37
Table 7-13: Alternative 3 Freeway Facility Level of Service - 2020 7-43
Table 7-14: Alternative 3 Freeway Facility Level of Service - 2030 7-48
Table 7-15: Alternative 3 Freeway Facility Level of Service - 2040 7-53
Table 7-16: Potential for Significant Environmental Impact 7-58
Table 7-17: Arterial Delay Savings for Build Alternatives 7-61
Table 7-18: 2040 Comparison of Vehicular Delay for Build Alternatives to the 2040 No-Build Condition 7-63
Table 7-19: Benefit Cost Analysis of Alternatives – All Study Area Intersections 7-65
Table 7-20 Benefit Cost Analysis of Alternatives – Interchange Intersections 7-66
Table 7-21: Benefit Cost Relationship of Build Alternatives 7-67

LIST OF APPENDICES

Appendix A: Methodology Letter of Understanding (MLOU)
Appendix B: Data Collection
Appendix C: 2040 FSUTMS Volume Plots
Appendix D: Existing Conditions Analysis Synchro Reports
Appendix E: Existing Conditions HCS+ Ramp Analysis
Appendix F: Crash Analysis
Appendix G: Committed Improvements
Appendix H: No-Build Alternative – 2020 AM Synchro Reports
Appendix I: No-Build Alternative – 2020 PM Synchro Reports
Appendix J: No-Build Alternative – 2030 AM Synchro Reports
Appendix K: No-Build Alternative – 2030 PM Synchro Reports
Appendix L: No-Build Alternative – 2040 AM Synchro Reports
Appendix M: No-Build Alternative – 2040 PM Synchro Reports
Appendix N: No-Build Alternative HCS Facility Analysis Reports
Appendix O: Conceptual Designs
Appendix P: Build Alternatives – 2020 AM Synchro Reports
Appendix Q: Build Alternatives – 2020 PM Synchro Reports
Appendix R: Build Alternatives – 2030 AM Synchro Reports
Appendix S: Build Alternatives – 2030 PM Synchro Reports
Appendix T: Build Alternatives – 2040 AM Synchro Reports
Appendix U: Build Alternatives – 2040 PM Synchro Reports
Appendix V: No-Build Volume Development Tables
Appendix W: No-Build Turning Movement Development – 2020 AM
Appendix X: No-Build Turning Movement Development – 2020 PM
Appendix Y: No-Build Turning Movement Development – 2030 AM
Appendix Z: No-Build Turning Movement Development – 2030 PM
Appendix AA: No-Build Turning Movement Development – 2040 AM
Appendix AB: No-Build Turning Movement Development – 2040 PM
Appendix AC: Build Alternatives Volume Development Tables
Appendix AD: Build Alternatives Turning Movement Development – 2020 AM

Appendix AE: Build Alternatives Turning Movement Development – 2020 PM
Appendix AF: Build Alternatives Turning Movement Development – 2030 AM
Appendix AG: Build Alternatives Turning Movement Development – 2030 PM
Appendix AH: Build Alternatives Turning Movement Development – 2040 AM
Appendix AI: Build Alternatives Turning Movement Development – 2040 PM
Appendix AJ: Delay Comparison – 6 Alternatives
Appendix AL: Alternative 2 HCS Facility Analysis Reports
Appendix AM: Alternative 3 HCS Facility Analysis Reports
Appendix AN: FDOT and Palm Beach County Traffic Counts

EXECUTIVE SUMMARY

This Executive Summary presents the key findings of an analysis supporting the proposed interchange justification for Central Boulevard with Interstate 95 (I-95) in Palm Beach County, Florida, and a discussion of the eight Federal Highway Administration (FHWA) Policies associated with justification.

Project Description

The proposed project will improve regional mobility by constructing an interchange at I-95 and Central Boulevard in northern Palm Beach County. An interchange at this location was in the 2035 LRTP Needs Plan, and is shown in the 2040 LRTP Cost Feasible Plan. Central Boulevard currently crosses over, but does not provide access to, I-95 at this location.

The proposed Central Boulevard interchange would be located approximately 1.0 mile north of the existing Military Trail (SR 809) partial interchange, and 2.0 miles south of the existing Donald Ross Road interchange. The design year for this assessment is 2040. The area in which regional mobility would be improved is depicted in Figure ES-1.

Introduction

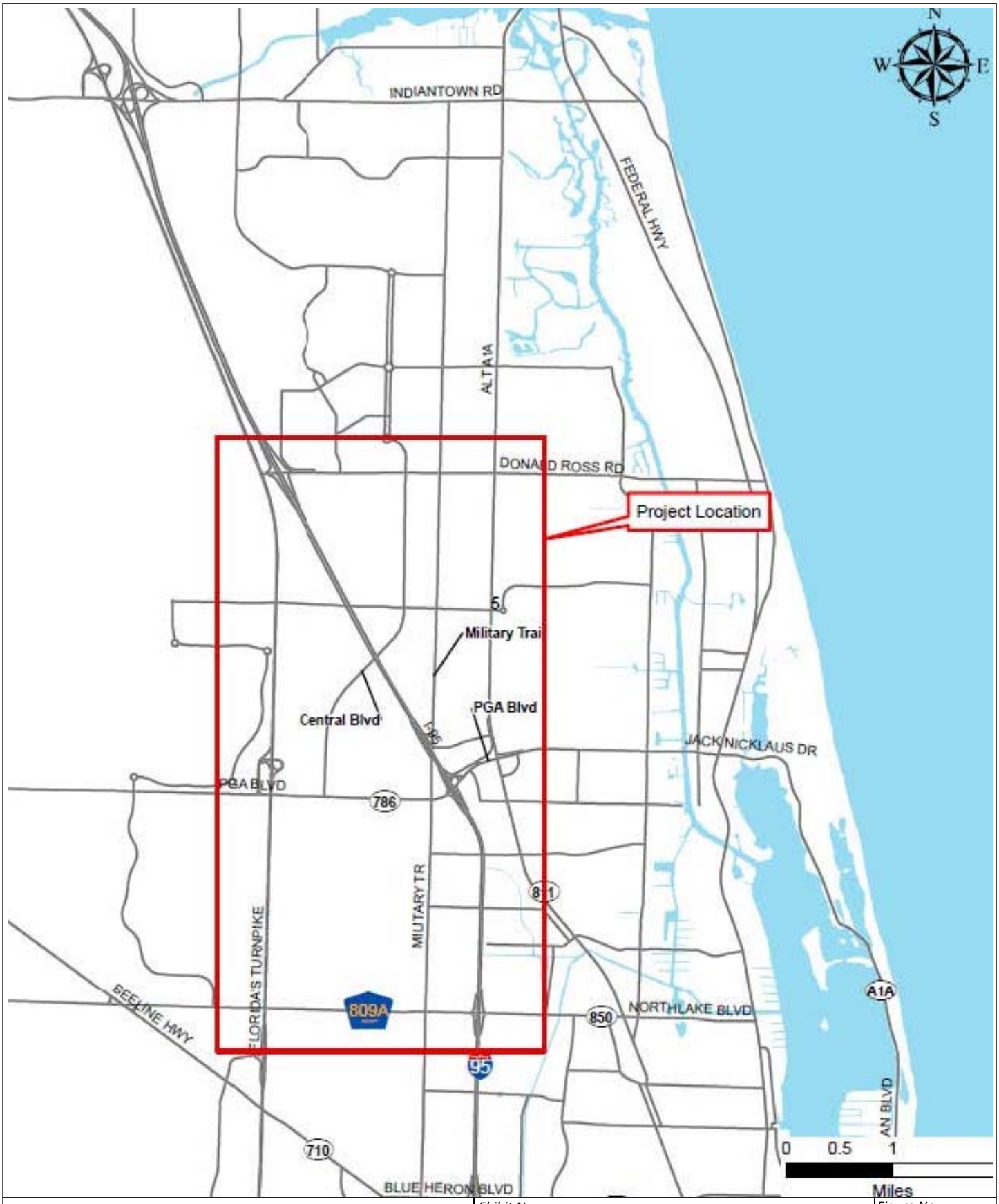
The Florida Department of Transportation (Department) is seeking infrastructure solutions that could reduce congestion and improve mobility in the northern Palm Beach County area, within the City of Palm Beach Gardens. As the major north-south artery in north Palm Beach County, Interstate 95/State Road 9 (I-95) (county section number 93220) access influences adjacent highway network roadway operating conditions. This combined with existing high density commercial/retail development of regional impact along with future planned development have created the need for additional transportation solutions. One solution that the Department is exploring is added interchange access within the City of Palm Beach Gardens.

This Interchange Justification Report documents study efforts to explore options for new interchange access along I-95 from PGA Boulevard

(Milepost 36.969) northerly to Donald Ross Road (milepost 40.385). The study area is shown on Figure ES-1. The study area is bounded on the south by Northlake Boulevard (milepost 34.783), on the north by Donald Ross Road (40.385), on the west by Florida's Turnpike and on the east by Lake Victoria Gardens Boulevard. Along I-95, existing interchanges exist at the following locations (Operational Spacing in Table ES-1):

- Full Access Interchange at Northlake Boulevard (milepost 34.783)
- Full Access Interchange at SR 786/PGA Boulevard (milepost 36.969)
- Partial Access Interchange to and from the north at SR 809/Military Trail (milepost 37.359)
- Full Access Interchange at Donald Ross Road (milepost 40.385)

An interchange on Florida's Turnpike at PGA Boulevard exists at the western edge of the study area.



Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard

Project Development & Environmental Study

FM No. 413265-1-22-01

Ehibit Name:

Project Location Map

Report Title:

Interchange Justification Report

Figure No. ES-1

Page No. xiii

Date: Oct 13, 2015

Table ES-1 - Operational Interchange Spacing Along I-95 (SR 9)

Cross Street	Centerline Milepost	Northbound Interchange Spacing	Southbound Interchange Spacing
Northlake Boulevard	34.783	1.553	1.599
PGA Boulevard	36.969		
Military Trail	37.359	2.158	2.034
Donald Ross Road	40.385		
Operational Interchange Spacing is defined as the distance between upstream on-ramp gore and downstream off-ramp gore locations.			

Purpose and Need/Existing Condition

The positive economic growth in north Palm Beach County has brought, and will continue to bring, congestion and other associated stress to the regional transportation network. I-95 currently operates at an acceptable level-of-service; particularly with the newly widened mainline through the limits of this study. Other State Highways in the area, however, suffer significant congestion and delay, led by SR 786/PGA Boulevard and SR 809/Military Trail. A number of studies conducted by both Palm Beach County and the Department indicate that these congested conditions will continue and worsen into the future.

Palm Beach County has identified constrained facilities within their jurisdiction from both an intersection and segment standpoint. Within the study limits these constrained facilities are:

- Interchange of Florida's Turnpike and PGA Boulevard;
- Intersection of Central Boulevard at PGA Boulevard;
- The intersection of Military Trail at PGA Boulevard; and
- PGA Boulevard from Florida's Turnpike to US 1.

These Constrained Roadways At Lower Level of Service, referred to as CRALLS locations by Palm Beach County, are an indication of limitations to regional mobility. In addition to these documented findings of Palm Beach County, the Florida Department of Transportation performed an operational study of the roadway network in this area, entitled, "I-95 Area Wide Mobility Study", in 2011 and found that many of the roadway segments, because of intersection failures, as shown in Table ES-2, will continue to break down and have below acceptable levels of service.

Some of these capacity failures will begin as early as 2015, with major congestion issues coming on line in the early 2020's. Even with traffic operational improvements to maximize the capacity of the network in the region; levels of service will continue to fall below standards (Level-of-service D) for the state highway system in the area. Data collection conducted as a part of this study reinforces this increase in demand and decline in level of service (LOS).

Table ES-2 - Findings of the I-95 Area Wide Mobility Study

Intersection	Intersection Condition	Operating Condition
PGA Boulevard at Florida's Turnpike	No Build	Fails by 2025
	Short Term Improvements	Fails by 2035
PGA Boulevard at Central Boulevard	No Build	Fails by 2025
	Short Term Improvements	Fails by 2035
PGA Boulevard at Military Trail	No Build	Fails by 2015
	Short Term Improvements	Fails by 2025
PGA Boulevard at I-95 SB Off Ramp	No Build	Fails by 2025
	Short Term Improvements	No strategy identified
PGA Boulevard at I-95 NB Off Ramp	No Build	Fails by 2025
	Short Term Improvements	No strategy identified

Build Alternatives Selection Process

In selecting build alternatives to consider, a tiered selection process was used to screen from a large (26) group of initial concepts to a finite number of distinct alternatives. Three (3) tiers were employed starting with Tier 1 which qualitatively screened concepts for flaws or other conditions that would eliminate that concept from further consideration. Tier 2 examined six (6) build alternatives surviving the Tier 1 process along with the No Build alternative. Tier 2 involved additional transportation related quantitative analysis including a comparison of arterial delay benefits compared to the No Build condition. The final Tier 3 distinguished between a limited number of build alternatives based on more complete quantitative measures.

The build alternatives thus selected and summarized below are depicted in Appendix O.

Final Alternatives

No Build Alternative

The No-Build Alternative describes the conditions that will exist for the study area if no improvements are considered except for planned/committed improvements.

The only addition to existing lane calls within the study area for the future No-Build analyses was the improvement of Hood Rd. to a four lane section (FY17). Existing signal timing and phasing were preserved in all intersections.

The No-Build intersection geometries included improvements funded in adopted work programs.

Alternative 2

Alternative 2 includes a new diamond interchange at Central Boulevard. It also creates a collector-distributor roadway system adjacent to northbound and southbound SR 9/I-95. This alternative removes the direct connection of the ramps at Military Trail to I-95. Northbound Military Trail on ramp traffic merges with northbound Central Boulevard off ramp traffic and the weaving movement between the two occurs on the northbound collector road. Similarly, Central Boulevard southbound on ramp traffic merges with southbound Military off ramp traffic and the weaving movement between the two occurs on the on the southbound collector road.

On the arterial street network within the study area, this alternative is projected to provide a reduction of 1.4 million hours of delay annually, of which 533,000 hours are at the existing interchange ramp terminal intersections.

Alternative 3

Alternative 3 includes a new diamond interchange at Central Boulevard. It also includes braided ramps between Military Trail and Central Boulevard to eliminate the weaving sections there. In both directions the Central Boulevard ramps (northbound off, southbound on) pass over top of the Military Trail ramps (northbound on, southbound off). This alternative differs from Alternative 2 only in the treatment of ramp maneuvers on I-95. Consequently, as in Alternative 2, on the arterial street network within the

study area, this alternative is projected to provide a reduction of 1.4 million hours of delay annually, of which 533,000 hours are at the existing interchange ramp terminal intersections.

The resulting operational spacing including the new interchange is shown in Table ES-3

Table ES-3 – Build Alternatives Operational Interchange Spacing Along I-95 (SR 9)

Alternative 2			
Cross Street	**Centerline Milepost**	**Northbound Interchange Spacing**	**Southbound Interchange Spacing**
Military Trail	34.783		
		0.487	0.779
Central Boulevard	38.410		
		0.797	0.764
Donald Ross Road	40.385		
Alternative 3			
Cross Street	**Centerline Milepost**	**Northbound Interchange Spacing**	**Southbound Interchange Spacing**
Military Trail	34.783		
		0.345	0.310
Central Boulevard	38.410		
		0.797	0.764
Donald Ross Road	40.385		
Operational Interchange Spacing is defined as the distance between upstream on-ramp gore and downstream off-ramp gore locations.			

Conclusions

The benefit of the build alternatives is the reduction in delay on the arterial streets that results from the shifting of traffic from the existing interchanges to the new one, an improvement in regional mobility. The estimated present value of that delay savings is such a substantial multiple of the estimated cost (3.6 to 6.5 – see Table ES-4) that it should be a warranting factor in the decision to add interchange access at Central Boulevard and I-95.

Table ES-4 – Cost Benefit Relationship of Build Alternatives Based on 2040 Delay Benefits

Alternative	Description of Alternative	Benefit- Cost Ratio		Recommendation
		Total Study Area	Interchanges Only	
2	Full Diamond Interchange at Central Boulevard and I-95 w C/D Roads	6.5	2.4	Consider This Build Alternative Further
3	Full Diamond Interchange at Central Boulevard with Braided Ramps	3.6	1.3	Consider This Build Alternative Further

Based on the above conclusions, it is recommended that new interchange access be provided at Central Boulevard and I-95. The specific interchange that should be implemented should be based on the conclusions reached once a NEPA study is completed. Both build alternatives provide similar transportation mobility benefits, and therefore the environmental issues should drive the decision making between the two build alternatives. Therefore it is recommended that both alternatives move forward into a Project Development & Environmental Study phase of development for analysis and final selection of the preferred alternative.

FHWA 8 INTERSTATE ACCESS POLICY CONSIDERATIONS AND REQUIREMENTS FOR INTERSTATE 95 AND CENTRAL BOULEVARD

8.1 The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).

Response:

The primary need for the I-95 and Central Boulevard interchange is to provide improved regional connectivity to the population in northern Palm Beach County (PBC), and it is not being proposed to specifically address an existing or proposed interstate deficiency. The current number and locations of interchanges serving the Palm Beach Gardens area concentrates the demand for access and consequent congestion in the area of the PGA Boulevard interchange. This area is dominated by major commercial and office development east and west of I-95 and adjacent to SR 786/PGA Boulevard. These developments are dense with major shopping malls and other large "big box" shopping centers located east of I-95 and both north and south of SR 786/PGA Boulevard. West of I-95 significant office land uses exist adjacent to the SR 786/PGA Boulevard interchange with I-95. Commercial/retail/leisure land uses exist further west of the I-95 interchange north and south of SR 786/PGA Boulevard. Development along SR 786/PGA Boulevard is near build out, but parcels do exist for additional development, North of SR 786/PGA Boulevard and west of I-95, single-family and multi-family residential properties dominate the land use. This includes a major golf course within the residential areas. This residential land use extends northerly to Donald Ross Road.

This intense mixed land use pattern produces heavy travel demand which exceeds or will exceed capacity within the next five to 15 years. In fact, two of the most congested roadway links in Palm Beach County fall within the study area. They are SR 786/PGA Boulevard from Florida's Turnpike to the west to Lake Victoria Road to the east of I-95 and Military Trail from PGA Boulevard to Hood Road. PGA

Boulevard is on the congested roadway list that Palm Beach County calls CRALLS (Constrained Roadways at Lower Levels of Service). This designation and the absence of PGA Boulevard from the MPO's 2040 Desires Plan acknowledges that avoiding the damage to local businesses that flank the road that would be involved in any further widening must outweigh the congestion relief effect of such widening.

To support the current level of service for the roadways that fall within the study area the Florida Department studied the existing conditions of these roadways in 2011 and published a report (I-95 Areawide Mobility Study) on the existing, short-term and long-term anticipated operating conditions in the area. The report identified several area intersections that would be unable to provide acceptable level of service in the design year 2035 even with additional turn lanes.

The operational analysis conducted as a part of this interchange proposal reinforced the findings of the 2011 report. The area arterials and intersections will be over capacity now or in the near term and ITS, intersection improvements, or transportation system management strategies will not provide sufficient improvement to address this congestion.

In this study, there were no instances identified where adding interchange ramp lanes could benefit arterial congestion. The heaviest ramp volumes that end at signalized intersections show future demand volumes that provide acceptable level of service given their cross section.

In addition to the residential property a large tract of vacant land exists from Hood Road north to Donald Ross Road. This property is planned for development and will include land uses compatible with the medical facilities at the Scripps Research Facility. This development will include research facilities and office space, as well as residential and retail/commercial development to support this area's land use.

An additional benefit of an interchange at Central Boulevard is improved emergency response time for incidents which occur on the stretch of I-95 between the PGA Boulevard and Donald Ross Road.

The No Build (without Central Boulevard interchange) operations analysis for the design (2040) year indicates that several links and intersections in the study area will operate no better than LOS E with a number of the major intersections at LOS F

for both AM and PM peak hours. The mainline of I-95 is projected to operate at acceptable levels of service for all sections from PGA Boulevard and Donald Ross Road. Some ramps and ramp terminals for I-95 will show unacceptable levels of service.

Central Boulevard is projected to operate with an acceptable level of service. However, a critical segment is southbound Central Boulevard just north of PGA Boulevard is projected to operate at LOS F for the No Build condition due to the conditions at PGA Boulevard. With intersection improvements at PGA Boulevard the LOS can be improved on Central Boulevard.

While the build alternatives continue to show sections of PGA Boulevard and Military Trail with LOS conditions less than LOS D, the build alternatives do show significant improvements in delay conditions along the study area arterials. The delay in the No Build condition amounts to approximately 3.6 million hours per year. The Build Alternatives improve that to approximately 2.2 million hours, an overall improvement in delay of 1.4 million hours each year. From a cost benefit perspective, this reduced delay provides at least a 3.6 benefit-cost ratio between Build and No Build alternatives. The Build alternative provides a 40 percent improvement in delay over the No Build conditions. These operating conditions demonstrate a significant benefit to regional mobility and warrant the addition of the Central Boulevard interchange.

8.2 The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).

Response:

This north Palm Beach County area has been studied by the Florida Department of Transportation (FDOT) recently. This included a 2011 Mobility Study of I-95 and the adjacent arterial network. All of these prior studies concluded that the regional arterial network was over-burdened due to land use patterns and that anything short of major widening of these arterials will only lead to short term mobility improvements. The predominant problem discovered by these studies was the SR

786/PGA Boulevard corridor from Florida's Turnpike to east of I-95 suffered significant congestion in both the AM and PM peak periods. There were two improvement strategies that could address this congestion. They include this interchange proposal for new access at Central Boulevard or the widening of SR 786/PGA Boulevard over the entire length of PGA Boulevard within the study area.

Qualitative evaluation of these strategies shows significantly more cost and environmental impact associated with the widening of SR 786/PGA Boulevard as compared to a new interchange in the Central Boulevard location. These impacts associated with widening of PGA Boulevard included significant social impacts related to right-of-way acquisition and business relocation, physical environmental impact associated with potentially contaminated properties. The linear nature of the widening of PGA Boulevard would have miles of impact to one of the most significant corridors in northern Palm Beach County over a more localized improvement such as an interchange with minor right of way impacts.

8.3 An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that [[Page 43745]] the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and

location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

Response:

The analyses conducted for this proposal demonstrate that the proposed interchange at Central Boulevard & I-95 will have an overall improvement in regional mobility. This improvement in regional mobility will include no significant degradation of operating speeds on the mainline of I-95 within the study limits, for either of the two build alternatives evaluated as compared to the 2040 No Build condition. The ramps and ramp terminal intersections with Central Boulevard for the build alternatives will not generate queues that will affect the mainline of I-95, with more than sufficient storage capacity available in the future year to accommodate the anticipated demand.

The operational analyses demonstrate that the proposed ramps and ramp terminal at Central Boulevard will operate at acceptable Levels of Service in the design (2040) year. Further, with the construction of either of the proposed interchange alternatives at Central Boulevard, the operating Levels of Service for the ramp terminals at the adjacent interchanges of SR 786/PGA Boulevard and Donald Ross Road will operate at the same or improved levels of service over the No-Build condition.

Analysis of the area's arterials was also performed to identify the redistribution of traffic that would occur with a new interchange at Central Boulevard and the associated delay benefits. The result of this operational analysis of the arterials indicated that reduction of delay between the 2040 No-Build and Build alternatives will provide significant benefit to the traveling public. The preliminary estimate of the benefit/cost relationship of this delay reduction ranges from 3.6 to 6.5 depending on the Build alternative.

The interchange proposal demonstrates significant diversion of traffic from the congested areas along PGA Boulevard and Military Trail to the northern roadway network accessed by a new interchange at Central Boulevard. This proposed interchange at I-95 and Central Boulevard improves regional mobility and provides more direct connectivity for northern Palm Beach County, and more specifically, Palm Beach Gardens. Congestion on the arterial network, including SR 786/PGA

Boulevard and SR 809/Military Trail, cannot be mitigated by ITS, Transportation System Management techniques or other lane geometric improvements sufficiently to accomplish these goals.

It is well documented in engineering publications (eg. *Highway Safety Improvement Program Manual*) that safety is related to traffic exposure. The area arterials from which traffic is diverted should experience improved traffic safety conditions since both their traffic volumes and congestion levels will be reduced. This reduction in crash exposure should reflect a potential increase in safety along the study corridors.

A secondary but important benefit will be an improved emergency response to incidents along I-95 as well as all other health/safety emergency access time to the surrounding communities. The 40 percent reduction in delay along the area's arterials provides a reduction in travel time for fire and police responders, based on the location of area hospitals and police stations.

8.4 The proposed access connects to a public road only and will provide for all traffic movements. Less than ``full interchanges'' may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).

Response:

The proposed interchange will connect to Central Boulevard, a County Road. The proposed interchange will also provide all traffic movements and be designed and constructed to meet all current and future standards issued prior to the preparation of design plans for the interchange.

8.5 The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management

areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

Response:

Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP)

The Palm Beach County MPO has included an interchange at Central Boulevard as one of its priorities since 2005, and has included it in their last two Long Range Transportation Plans. The proposed interchange was identified as a needed project in the 2035 LRTP, and the interchange is included in the Cost Feasible Plan in the 2040 LRTP adopted in October of 2014.

Funding for design is programmed in the MPO TIP and STIP for the 2015/2016 Fiscal Year (FM# 413265-1).

An interchange at the proposed location is consistent with the Goals and Objectives of the adopted 2040 LRTP. Numerous objectives indicate the need to implement the improvements identified in the LRTP. More specifically the interchange is consistent with the following.

LRTP Goals and Objectives

Goal 1: Provide an efficient and reliable vehicular transportation system

Objective 1.1: Reduce the number of thoroughfare intersections with critical sum > 1400.

Goal 5: Preserve and Enhance Social and Environmental Resources

Objective 5.5: Decrease per capita daily Vehicles Miles Travelled (VMT/person)

Comprehensive Plan

The proposed interchange is consistent with the PALM BEACH COUNTY Comprehensive Plan. More specifically the interchange is consistent with the following Goals, Objectives, and Policies:

Goal – Transportation Element

It is the GOAL of Palm Beach County to provide an interconnected multimodal transportation system which moves people, goods, and services in a safe, efficient, convenient and economical manner with minimal adverse impact to the environment.

Objective 1.1: Level of Service Standards - By 2035, the countywide transportation system shall operate at the adopted Level of Service standard.

Policy 1.1-d: The County shall continue to use FDOT's Generalized Level of Service Tables that address capacity standards

Policy 1.1-e: The County shall utilize the best available data and methodologies for the purpose of determining traffic circulation system needs.

Objective 1.3: Management of Transportation System

Policy 1.3-i: The County will maintain policies and programs which ensure that the overall transportation system meets the County's level of service criteria in order to provide viable alternatives to the Florida Intrastate Highway System & the Strategic Intermodal System, and to protect their interregional and intrastate functions.

Goal 4: Protection of Air Quality

It is the GOAL of Palm Beach County to protect human life and native ecosystems by controlling air pollution through initiatives for the protection of air quality.

Objective 4.1: Air Quality

The County shall maintain federally adopted air quality levels, as identified by National Ambient Air Quality Standards.

Strategic Intermodal System

The proposed interchange is included in the FDOT SIS Cost Feasible Plan, and is consistent with the following Goals and Objectives of the FDOT SIS Strategic Plan:

SIS Goal

A safer and more secure transportation system for residents, businesses and visitors.

The proposed interchange will improve emergency response times to incidents that occur along I-95 between PGA Boulevard and Donald Ross Road. The interchange will also provide an additional opportunity for residents of northern Palm Beach County to access I-95 if an evacuation is ordered.

SIS Goal

A stronger economy through enhanced mobility for people and freight.

Objective: Interregional Connectivity

Interregional trips that involve I-95 do not begin or end on it. The proposed interchange will help support enhanced mobility for freight by providing less congested conditions on the arterial and collector roads in the area used for the portion of interregional trips leading to or from I-95.

Objective: Efficiency

The proposed interchange will promote more efficient use of the Strategic Intermodal System by providing relief to SR-786/PGA Boulevard and SR 809/Military Trail thereby extending its functional integrity, and helping to reduce delay along those facilities.

Objective: Emergency Management

The proposed interchange will provide an additional evacuation route for northern Palm Beach County.

8.6 In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).

Response:

There are no other interchange proposals between SR 786/PGA Boulevard and Donald Ross Road. The only interchange proposal is at Central Boulevard, a Palm Beach County Roadway.

8.7 When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).

Response:

The congested conditions that the study area roadways experience is primarily associated with existing land use. The area has experienced rapid development over the past 20 years with associated transportation improvements trying to keep pace. This growth within the study area has burdened the arterial system and the existing interchanges along I-95 to a point where current capacity is beginning to limit mobility.

The MPO has incorporated land use assumptions for the study area, including near and along Central Boulevard into its 2040 adopted LRTP. The County's Comprehensive Plan includes valid and consistent future land use along Central Boulevard east of I-95 in its Future Land Use Element.

The Comprehensive Plan further acknowledges that alleviating traffic demand along PGA Boulevard and Military Trail is a key component to the County's future plans. This alleviation of demand along these two roadways is facilitated by the inclusion of an additional interchange at Central Boulevard.

The implementation of projects in the MPO's Long Range Transportation Plan could also contribute to correcting the jobs-housing balance. Several projects in the LRTP could facilitate business development in the north and west portions of the study area south of Donald Ross Road. The proposed Central Boulevard I-95 interchange, in particular, could have a sizeable impact on job creation in this northern portion of the study area, given the propensity of businesses to locate at higher volume traffic locations.

The proposed interchange will enhance economic development within the study area in Palm Beach Gardens by redirecting traffic destined for the northern portions of the study areas away from SR 786/PGA Boulevard and SR 809/Military Trail to the Central Boulevard Interchange. This northern redirection of traffic will reduce congestion along PGA Boulevard and Military Trail and allow for more efficient movement of goods and people to these higher travel demand areas in the southern portion of the study area. The County's long term planning and commitment to this area is evident in the existing commercial and industrial businesses already established in the vicinity of PGA Boulevard. The County's commitment to this area is further supported by the 2040 LRTP and the current Comprehensive Plan.

8.8 The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

Response:

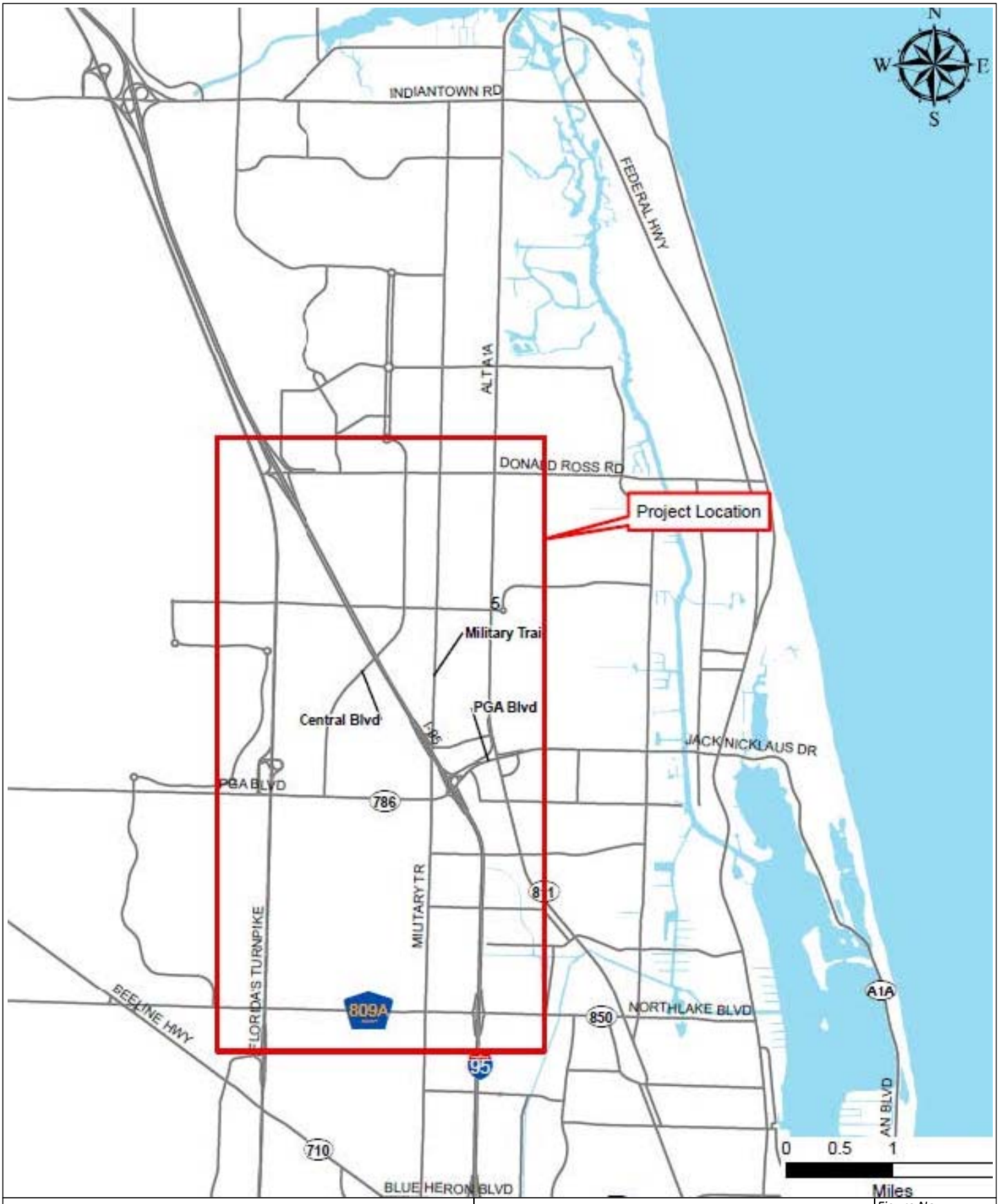
The proposal is included in the Project Development and Environment (PD&E) Study which is currently underway and concurrent with the review and approval of the IJR by the FHWA.

1.0 INTRODUCTION

The Florida Department of Transportation (Department) is seeking infrastructure solutions that could reduce congestion and improve mobility in the northern Palm Beach County area, within the City of Palm Beach Gardens. As the major north-south artery in north Palm Beach County, Interstate 95/State Road 9 (I-95) (county section number 93220) access influences adjacent highway network roadway operating conditions. This combined with existing high density commercial/retail development of regional impact along with future planned development have created the need for additional transportation solutions. One solution that the Department is exploring is added interchange access within the City of Palm Beach Gardens.

This Interchange Justification Report documents study efforts to explore options for new interchange access along I-95 from PGA Boulevard (Milepost 36.969) northerly to Donald Ross Road (milepost 40.385). The study area is shown on Figure 1-1. The study area is bounded on the south by Northlake Boulevard (milepost 34.783), on the north by Donald Ross Road (40.385), on the west by Florida's Turnpike and on the east by Lake Victoria Gardens Boulevard. Along I-95, existing interchanges exist at the following locations (Operational Spacing in Table 1-1):

- Full Access Interchange at Northlake Boulevard (milepost 34.783)
- Full Access Interchange at SR 786/PGA Boulevard (milepost 36.969)
- Partial Access Interchange to and from the north at SR 809/Military Trail (milepost 37.359)
- Full Access Interchange at Donald Ross Road (milepost 40.385)



Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Project Location Map

Figure No. 1-1

Page No.

Report Title:
Interchange Justification Report

Date:

Table 1-1 – Operational Interchange Spacing Along I-95 (SR9)

Cross Street	Centerline Milepost	Northbound Interchange Spacing	Southbound Interchange Spacing
Northlake Boulevard	34.783	1.553	1.599
PGA Boulevard	36.969		
Military Trail	37.359	2.158	2.034
Donald Ross Road	40.385		
Operational Interchange Spacing is defined as the distance between upstream on-ramp gore and downstream off-ramp gore locations.			

An alternatives analysis was conducted to identify the appropriate alternatives to consider for new interchange access. A tiered selection process identified twenty-six (26) initial concepts, and was screened down to two distinct alternatives that would be considered. The original twenty-six concepts included a range of considerations that included new access at Central Boulevard and Hood Road, modifications to the existing interchange at Military Trail, collector distributor facilities adjacent to I-95 and combinations of the above. Comparative evaluation of these concepts yielded two specific alternatives whose analysis forms Section 7 of this report.

This Interchange Justification Report examines the operational analysis of the final two interchange access configurations remaining following the above comparative evaluation of alternatives. Both alternatives include a new interchange access at Central Boulevard (milepost 38.41). They differ in the method to eliminate from the mainline the weaving movements between the Military Trail and Central Boulevard ramps. One involves braided ramps. The other uses collector-distributor roads paralleling the mainline that allow the Military Trail and Central Boulevard ramp traffic to weave on the collector-distributor road rather than the mainline. These alternatives also include potential interchange modifications at the existing SR 809/Military Trail and SR 786/PGA Boulevard interchanges.

Currently, a number of the state roads within this jurisdiction suffer significant congestion and delay, much of which is associated with land density intensification that has occurred over the past ten to fifteen years. The most impacted state roads in the area are SR 786/PGA Boulevard and SR 809/ Military Trail.

2.0 METHODOLOGY

2.1 Overview

A copy of the approved Methodology Letter of Understanding (MLOU) that documents the agreed upon approach and operational analysis required is provided in Appendix A.

2.2 Analysis Years

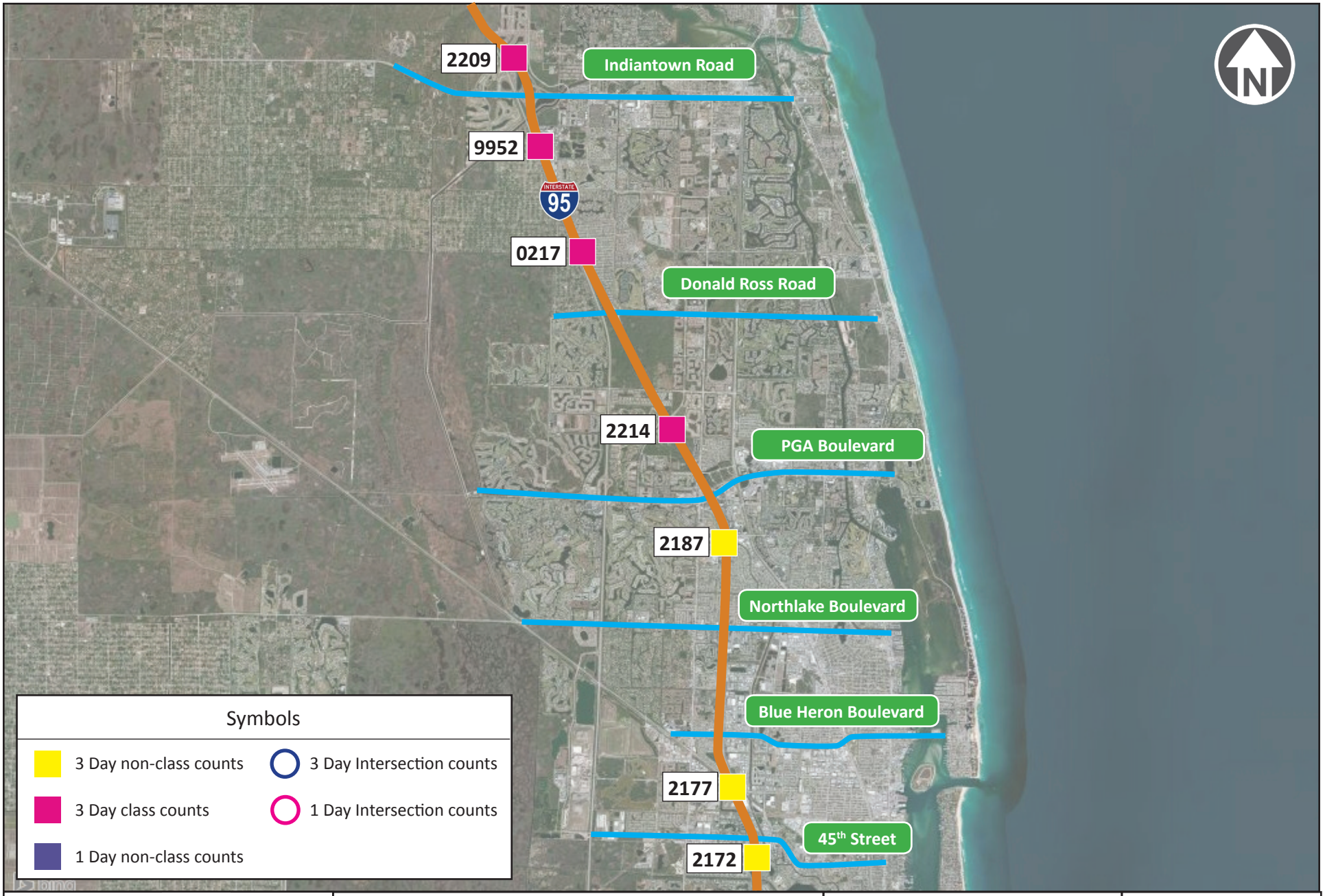
The analysis years are as follows:

- Existing Year: 2013
- Opening Year: 2020
- Interim Year: 2030
- Design Year: 2040.

2.3 Traffic Counts

Traffic volume and turning movement counts were collected at numerous locations within the study area in the middle to late April, 2013. Figure 2-1 shows the locations of the turning movement counts, distinguishing between counts collected for one day, or three days, and the location of the volume counts, distinguishing between counts that were collected for one day, three days, or three days with vehicle classification. No turning movement counts or classification counts required axle factors..

Turning movement counts were collected from 7 am to 10 am, and 3 pm to 6 pm. Three day turning movement counts were collected Tuesday through Thursday. One day turning movement counts were collected between Tuesday and Thursday.



Project Name
SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environment Study
FM No. 413265-1-22-01

Mainline Volume Count Locations

Interchange Justification Report

Figure No. 2-1 A
Page No.
Date:

October 13, 2015

Project Name
SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environment Study
FM No. 413265-1-22-01

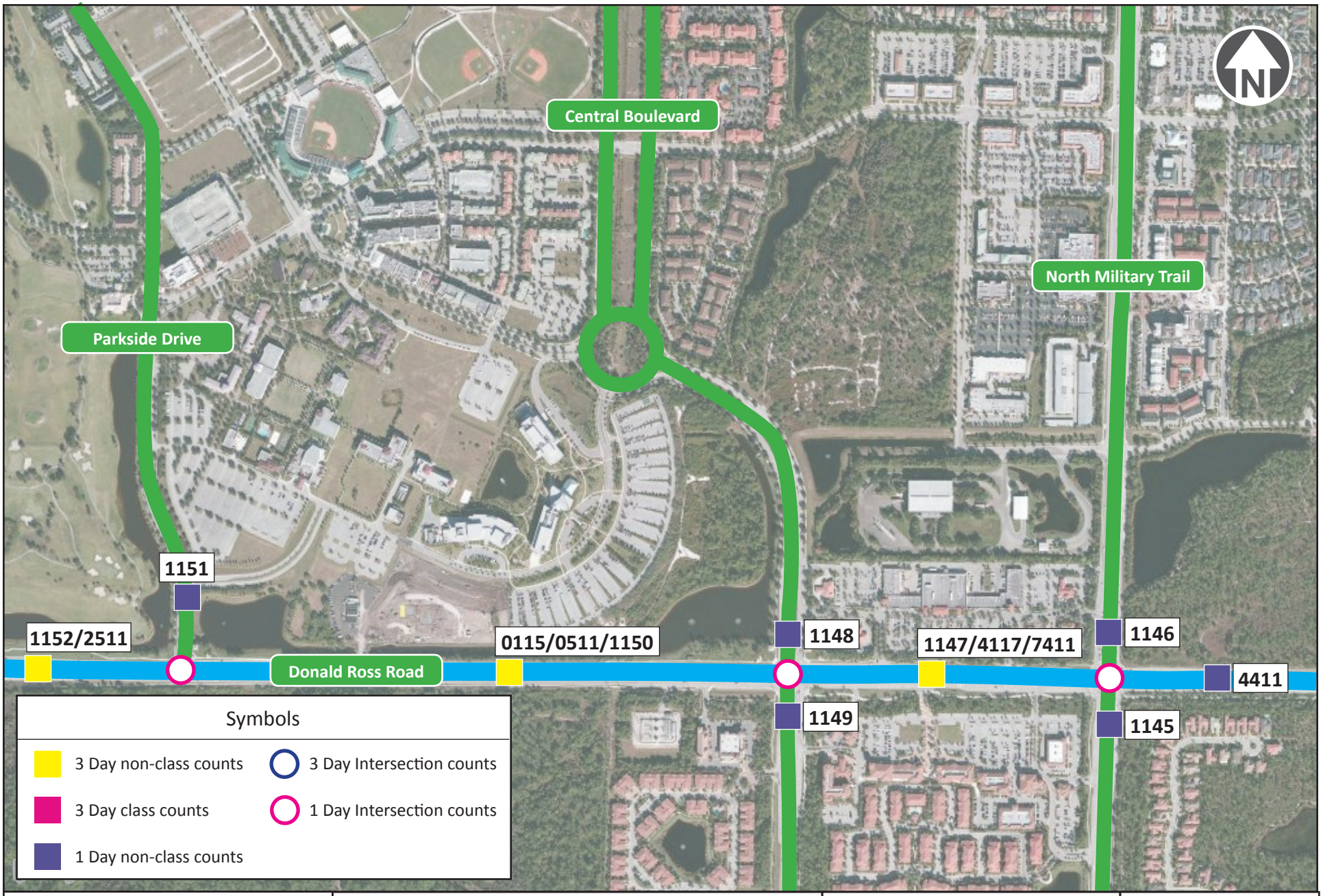
Volume and Turning Movement Count Locations

Interchange
Justification Report

Figure No. 2-1 B
Page No.
Date:

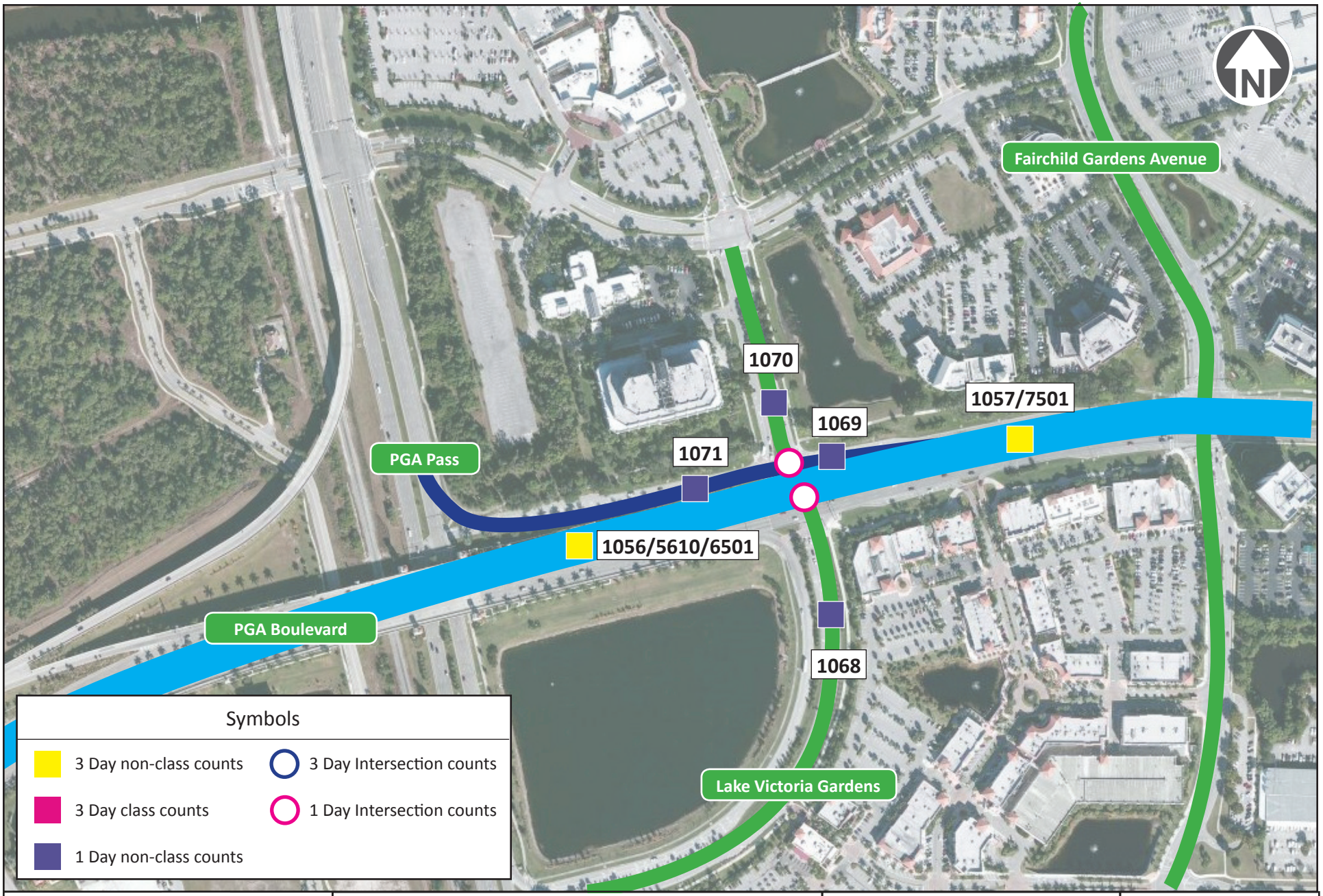
October 13, 2015

Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** **Project Development & Environment Study** **FM No. 413265-1-22-01**	Volume and Turning Movement Count Locations	Interchange Justification Report	*Figure No.* 2-1 B *Page No.* *Date:*



Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** **Project Development & Environment Study** **FM No. 413265-1-22-01**	Volume and Turning Movement Count Locations	Interchange Justification Report	*Figure No.* 2-1 B *Page No.* *Date:*

Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** **Project Development & Environment Study** **FM No. 413265-1-22-01**	Volume and Turning Movement Count Locations	Interchange Justification Report	*Figure No.* 2-1 B *Page No.* *Date:*



Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** **Project Development & Environment Study** **FM No. 413265-1-22-01**	Volume and Turning Movement Count Locations	Interchange Justification Report	*Figure No.* 2-1 B *Page No.* *Date:*

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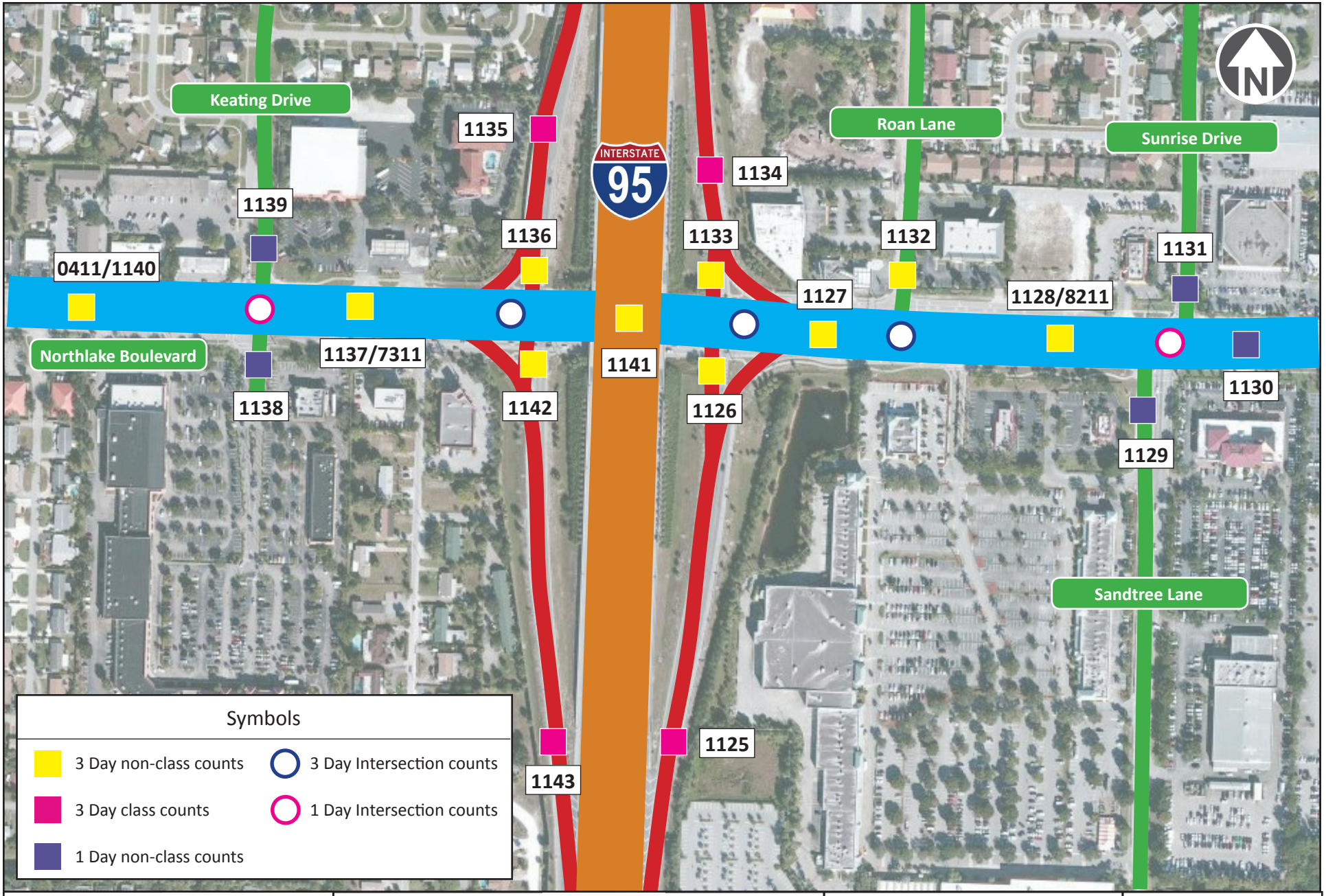
October 13, 2015



Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** **Project Development & Environment Study** **FM No. 413265-1-22-01**	Volume and Turning Movement Count Locations	Interchange Justification Report	*Figure No.* 2-1 B *Page No.* *Date:*

One day volume counts were collected on the legs of all intersections where one day of turning movement counts were taken. Three day volume counts were taken on road segments for which existing LOS was required or on segments surrounding intersections where three days of turning movement counts were collected. Details of the traffic counts collected are provided in Appendix B.

2.4 Signal Timing

Traffic signal timing information was obtained from the Palm Beach County traffic Engineering Division for the major intersections in the study area, including all the interchange ramp intersections, and incorporated into the existing conditions analysis. Details of the signal phasing and timing plans are provided in Appendix B.

2.5 Field Review

Field observations of the study roadway and intersections were conducted during the analysis AM and PM peak hours on Tuesday, June 25, 2013. The purpose of this field review was to understand and qualitatively document the existing traffic operations at the study locations given the existing traffic and roadway characteristics. The congestion levels observed are consistent with the level of service determinations made with the traffic data collected.

2.6 Travel Demand Forecasting

The Southeast Regional Planning Model (SERPM) version 6.5 is the version that was used to update the three (Palm Beach, Broward, Miami-Dade) MPO LRTPs to 2035 conditions. It was validated to 2005 conditions. SERPM v6.5x was the basis for a sub-area model used for the I-95 Corridor Planning Study (CPS), and that model bore the same name: I-95 CPS.

One of the refinements to this sub-area model was the use of Citilabs CUBE Analyst Drive software to make adjustments to the Origin-Destination (O-D) table that is the output of the trip distribution step in ways that improved the agreement between the model assignment volumes and traffic counts in the validation year.

This sub-area model was further refined to a tight sub-area model, with further adjustments made to the O-D table, and used for a Project Development and Environment (PD&E) effort along I-95 that extended from Stirling Road in Broward County to Linton Boulevard in Palm Beach County. This validation work was done on a 2010 network. The 2010 socio-economic data used in this model were not Census based, but rather an interpolation between the 2005 zonal contents and 2035 zonal contents developed for SERPM 6.5 and approved by the respective MPOs as part of the last LRTP update process. 2010 Census based estimates at the TAZ level were not yet approved for use when this effort occurred.

Similarly, the 2040 zonal contents used in the aforementioned I-95 PD&E effort were not the 2040 zonal contents being developed for the next update of the MPO LRTPs; the work effort on the I-95 PD&E preceded the approval for use of the new 2040 data sets. Rather, the 2040 socio-economic data sets used in the I-95 PD&E work contain extrapolations beyond the approved 2035 zonal contents.

The I-95 PD&E tight sub-area model followed I-95 as far north as Linton Blvd., and included the first arterial intersections east and west of the ramp terminals at each interchange.

The FDOT has extended this tight sub-area model northward to Indiantown Road for this study, and broadened it through the study area to include most of the major intersections within it.

This model produces three separate assignments: a three hour AM peak period, a three hour PM peak period, and a third assignment containing the sum of all the off-peak hours in the day. The directional balance in volumes typically observed in a daily model is absent in the peak period assignments, and the

directionality of traffic in the peak periods is evident in the assignment volumes. Summing the three assignments produces average annual daily traffic (AADT) projections.

Unlike historical models, for which validation was performed using daily traffic counts as the basis for comparison with model daily assignment volumes, the aforementioned adjustments to the O-D table were made seeking better agreement in peak period volumes (assignment versus counted). For this reason, peak period volumes were considered a more reliable output from this model than AADT. As a result, in the I-95 PD&E, the traditional factoring of model daily volumes down to peak hour directional volumes through the use of K and D factors was not used; peak period volumes were used directly, subject to reasonableness checks. This will be the approach used also in this study for the volumes used to compare the efficacy of the final tier of alternatives and choose the aforementioned two.

The model's peak period output does need to be converted to a peak hour volume. The developer of the tight sub-area model used the term "diurnal factor" to describe the peak hour's fraction of the three hour peak period. The developer noted sufficient spatial stability in this factor to use only one in all locations, with a separate factor for the AM and PM peak periods. This estimation work was done for mainline locations. The two diurnal factors for AM and PM from the PD&E work will be used for all peak period assignment volumes, mainline or arterial, in this study.

2.6.1 Network

The new reliance on the model for turning movements prompted increased scrutiny of intersection coding fidelity. The following issues were noted:

1. The tight sub-area model allowed NB left turns emerging from RCA Blvd. onto PGA Blvd. though none have been allowed for at least five years. This was corrected.

2. At the Military Trail interchange, the model had the northbound on-ramp connected to Military Trail north of the Military Trail's intersection with Kyoto Gardens. This was corrected.

3. At the PGA Blvd. interchange, the northbound on and off ramps formed a single intersection with PGA Blvd., though they are separate, and the I-95 NB to PGA Blvd. WB loop off-ramp connection was to the west of the combined intersection, rather than in between the two separated ones. This original coding meant the model was unable to simulate the two way volume that would be collected by a tube counter placed just east of the NB off ramp intersection, and just west of the NB to WB loop ramp juncture, which happens to be the highest possible two way volume along PGA Blvd. between the outer ramp intersections. This was corrected.

4. The tight sub area model does not include the intersections of PGA Blvd. and PGA Pass with Lake Victoria Gardens Drive. At this location PGA Blvd. and PGA Pass are connectors to external stations.

5. Some minor intersections were never coded into SERPM: only the main street peak hour directional volumes were available at these locations.

2.6.2 Land Use

Traffic Analysis Zones (TAZs) within a ten mile radius of Central Boulevard were selected (Figure 2-2.) and the sum of their contents compared between the 2010 and 2040 socio-economic data sets. Growth in land use from 2010 to 2040 within them was on the order of one percent per year (exponential – Table 2-1). Given the manner in which these socio-economic data were prepared, this posited growth rate is essentially the one chosen when the 2035 LRTPs were produced.

Figure 2-2 –TAZs Selected for Land Use Comparison

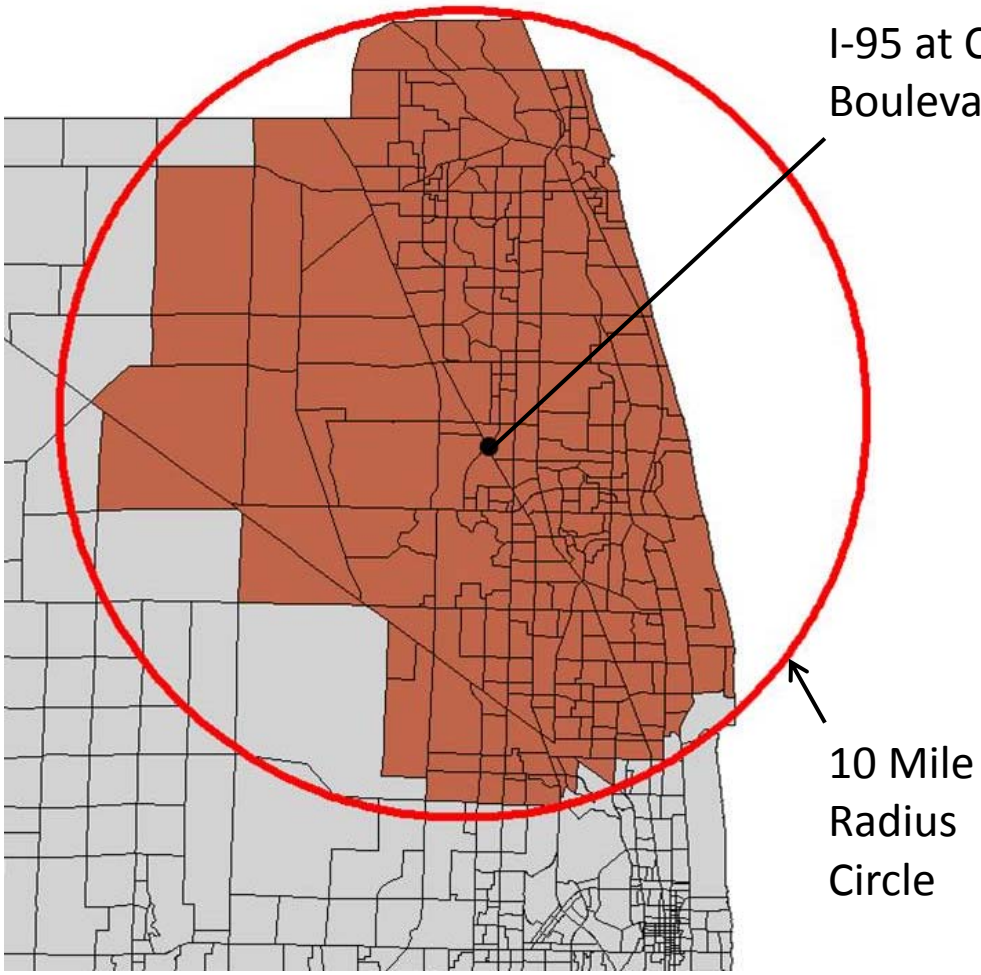


Table 2-1 – Growth in Zonal Data Within 10 Mile Radius

Measure	2010	2040	Total Growth	Annual Percent-age Growth
Employment	122,541	193,520	158%	1.53%
Households	95,252	125,602	132%	0.93%
Population	212,280	290,008	137%	1.05%

2.6.3 Congestion Induced Diversion

When all 2040 turning movements in the study area are compared with 2013 turning movements, volume weighted average annual growth is around 2.6 percent per year (exponential), so the model is projecting an overall increase in travel in the study area. However, it appears that in the model, congestion induced diversion of trips to alternate routes is occurring at lower congestion levels than what trip makers today will clearly tolerate. For instance, in the 2040 No-Build scenario, the model is assigning fewer vehicles eastbound on PGA Blvd. than in 2013. Consequently, many of the turning movements that compose the PGA Blvd. EB volume are lower in the 2040 model than in 2013. For example, the NBR movement at the intersection of PGA Blvd. and Military Trail was 380 in the AM peak hour 2013, but 37 in the 2040 model.

In the forecasting of future volumes, the traditional response to this kind of under-assignment (less than existing conditions) in the model is to selectively replace under-assigned volumes with volumes that are based on an existing count grown up with some selected growth rate. This distorts the forecast process from a study-area-wide perspective. Ideally, the algorithm in the model would be adjusted such that simulated trip makers endure higher congestion levels before diverting to alternate routes, in a way that produces future year assignment volumes that show the kind of increase expected. But that increase in volumes (based on algorithm adjustment) on some segments would be balanced by a reduction on the segments that formerly bore the diverted trips.

Despite this under-assignment issue, the model is the ideal tool for measuring the effect on travel patterns of a new interchange, but only if the build and no-build volumes are adjusted minimally. Significantly altering either of them to improve their appearance compared either to present conditions or compared to adjacent intersections reduces the credibility of any conclusions based on the comparison of build and no-build volumes.

For the alternative selection process described in Section 6, the turning movements used in the comparison of intersection operations were taken directly from the tight sub-area model (peak period) and converted to peak hour using the diurnal factors proposed in the development of the model.

The model produces turning movement text files (From Node, Through Node, To Node, Volume) that were imported into a spreadsheet for review, adjustment, and export to Synchro software for analysis.

The model output provides peak period turning movement volumes where intersections are coded. In the tight sub-area model used for this study, the following intersections deemed needing analysis were not coded in the model:

1. Donald Ross Road at 64th Drive North;
2. Hood Road at Eastpointe Boulevard;
3. Northlake Boulevard at Roan Lane;
4. PGA Boulevard at Lake Victoria Gardens Avenue; and
5. PGA Pass at Lake Victoria Gardens Avenue.

At these locations, the model provided peak period volumes along the major street, with no information for the side street. Turning movements to and from the side streets are proportional to the development intensity within flanking land use areas that are largely built out. For this reason, these movements were kept at the levels observed in 2013. The main street through movements for 2040 were the remainder after the turning movements into the flanking land uses were deducted, such that the total approach volume predicted by the model was preserved.

These minimally adjusted 2040 model volumes were the basis for the selection of the final alternatives selected, as described in Section 6.

2.7 Directional Design Hour Volumes and Turning Movements

When the tight sub-area demand forecasting model was developed, the only source available for 2040 zonal contents was to extrapolate beyond 2035 zonal contents, on the trend observed to 2035 from the 2005 validation year zonal contents. The validation year 2010 zonal contents were similarly an interpolation between 2005 and 2035. As such, the model preserved the expectations in average annual development growth rates that

were deemed appropriate when the 2035 LRTPs were being developed, and effectively moved the start and end points outward by five years. The Recession interrupted that trend. As a result, to reach the 2040 traffic volumes from the model, when compared to 2013 existing conditions traffic volumes, would require a growth rate from those existing conditions that no longer seemed reasonable. The 2013 existing conditions were in essence well below the 2013 point on the volume growth curve as predicted by the model. For this reason, having selected the final two alternatives, a different volume development approach was used to produce the design traffic volumes.

The design traffic volumes analyzed in Section 4 for the future No-Build condition are consistent with the I-95 Corridor Planning model as follows:

- 2013 peak hour directional volumes from Palm Beach County and FDOT were assembled for study area roadway segments;
- The percent change in model volumes from the 2010 to 2040 I-95 Corridor Planning models for each segment were noted;
- 7/30, 17/30 and 27/30 of that percent change were applied to the 2013 directional volumes to produce 2020, 2030 and 2040 peak hour directional volumes respectively;
- In the instances where the only existing count information was from 2014, the portions of the 30 year percent change in model volumes used were 6/30, 16/30 and 26/30 to produce the 2020, 2030, and 2040 peak hour directional volumes respectively;
- I-95 mainline and ramp volumes were adjusted to be consistent with each other;
- Peak hour directional volumes were split into turning movements at the intersections based on turning movement counts collected; and
- These first estimate turning movement counts were adjusted to minimize directional volume discrepancies between closely spaced intersections.

For the Build condition, the No-Build peak hour directional link volumes were each adjusted according to the percent change in model volumes observed when the 2040 No-Build and Build alternative model runs were compared. Peak hour directional volumes were split into turning movements at the intersections based on turning movement splits observed in the model. These first estimate turning movements were adjusted to minimize directional volume discrepancies between closely spaced intersections.

2.8 Traffic Factors

The Diurnal Factors used to convert peak period model volumes to peak hour volumes (taken from the I-95 PD&E report) were:

- AM: 0.357; and
- PM: 0.334.

Traditional use of K and D factors was not involved in the development of future peak hour peak directional volumes. For future capacity analyses, the PHF used was 0.95, the arterial truck factor was 1.7 percent, and the I-95 mainline truck factor was 3.7 percent.

3.0 EXISTING CONDITIONS ANALYSIS

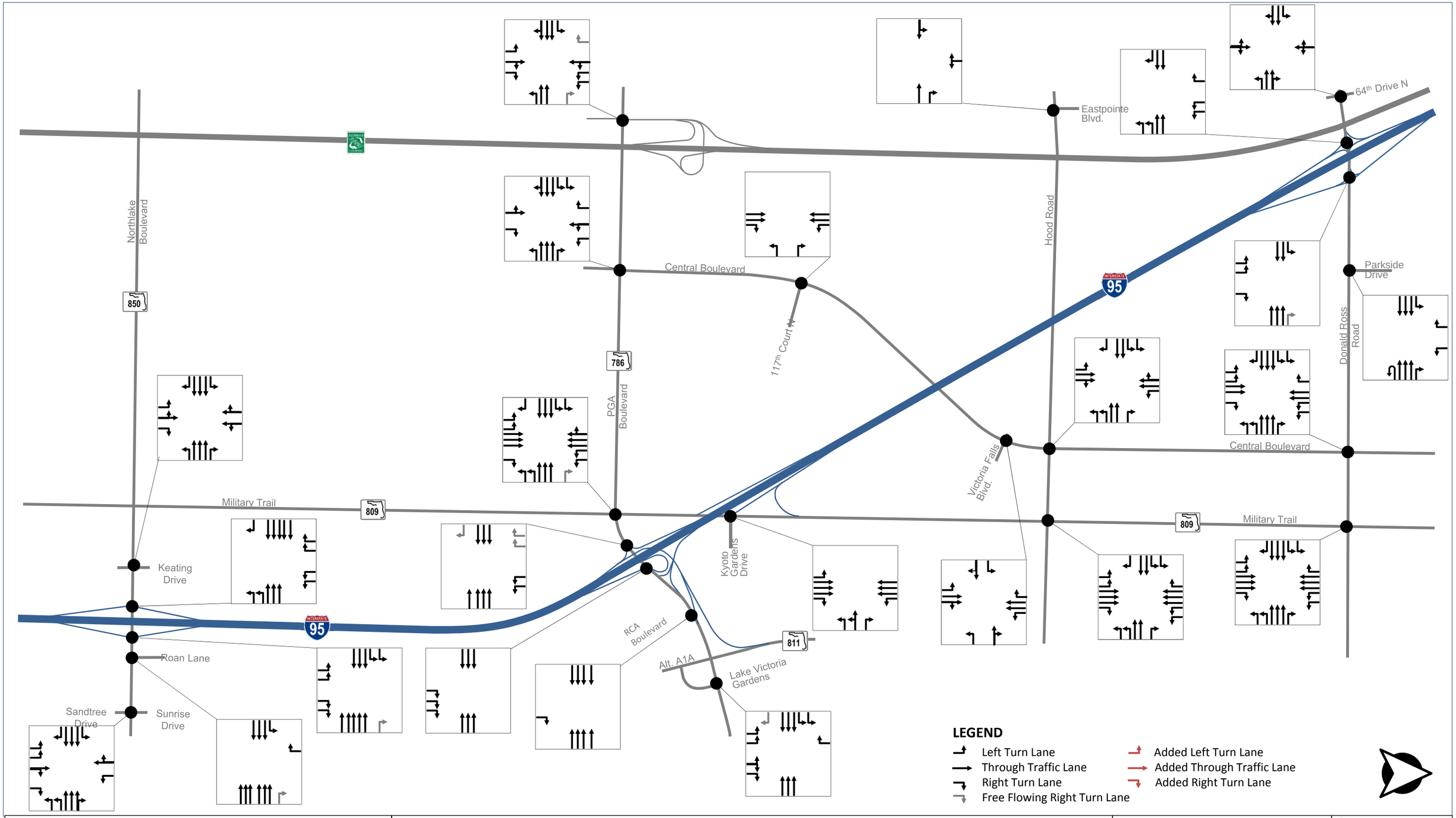
Figure 3-1 illustrates the existing geometry within the study area.

For the mainline and ramps of SR 9/I-95 existing lane geometry, location of ramp gores and terminals and observed speed conditions were used in the existing operational analysis. For the existing arterials intersection lane geometry, traffic signal phasing and timing plans were used in the analysis. The turning movements analyzed were produced using TMTool. These effectively represent demand volumes since the volume basis was counted upstream of the intersection. The TMTool worksheets are contained in Appendix D.

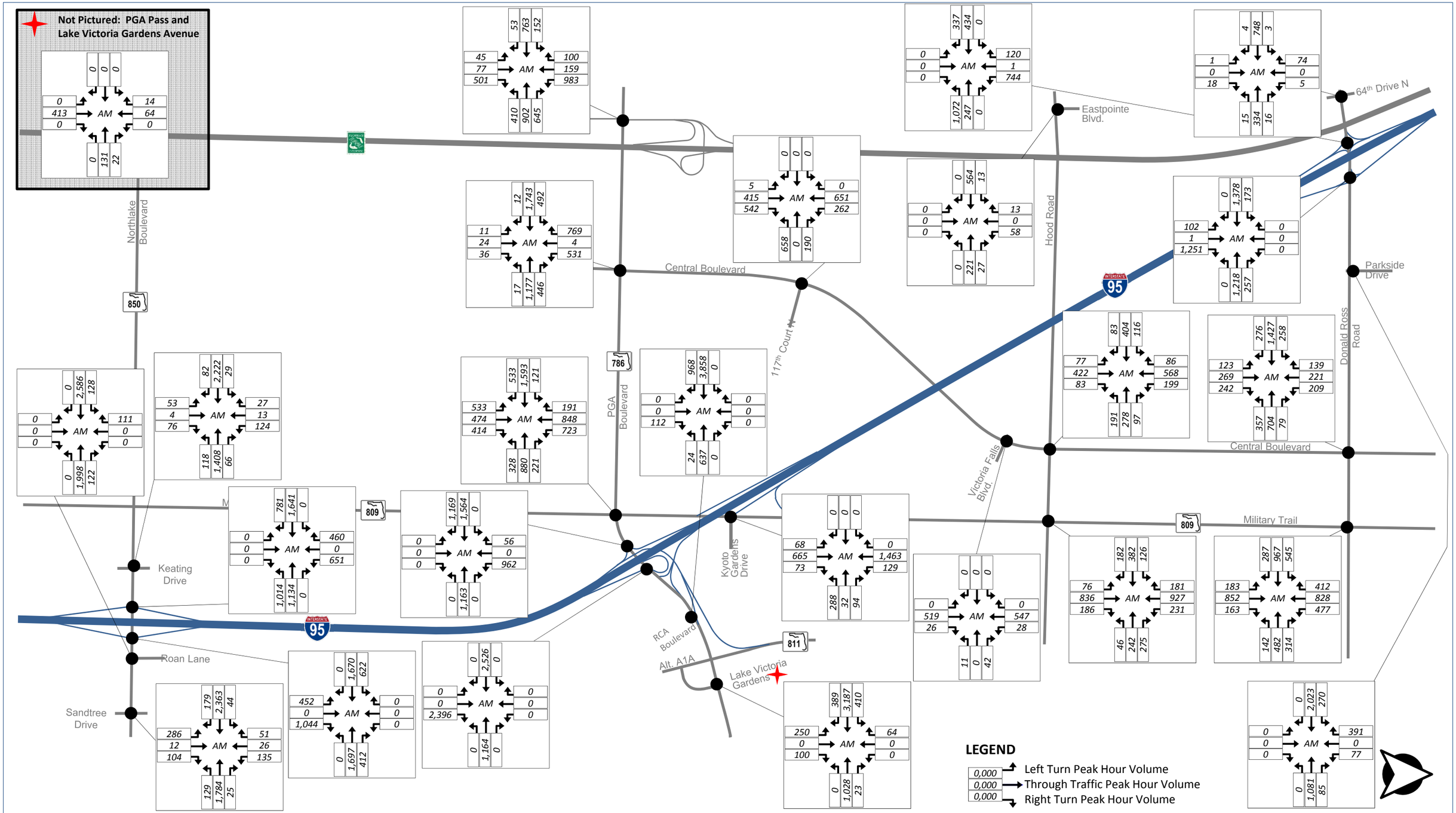
Figures 3-2 and 3-3 illustrate the AM and PM peak hour turning movements used in the analysis. The truck percentage for each approach was consistent with that observed on the day the turning movement counts were taken. A single peak hour factor (PHF) was used for each intersection, and was consistent with the PHF observed on the day the turning movement counts were taken.

Figure 3-4 illustrates the AM peak hour volumes on the arterials, I-95 mainline segments and ramps used in the analysis.

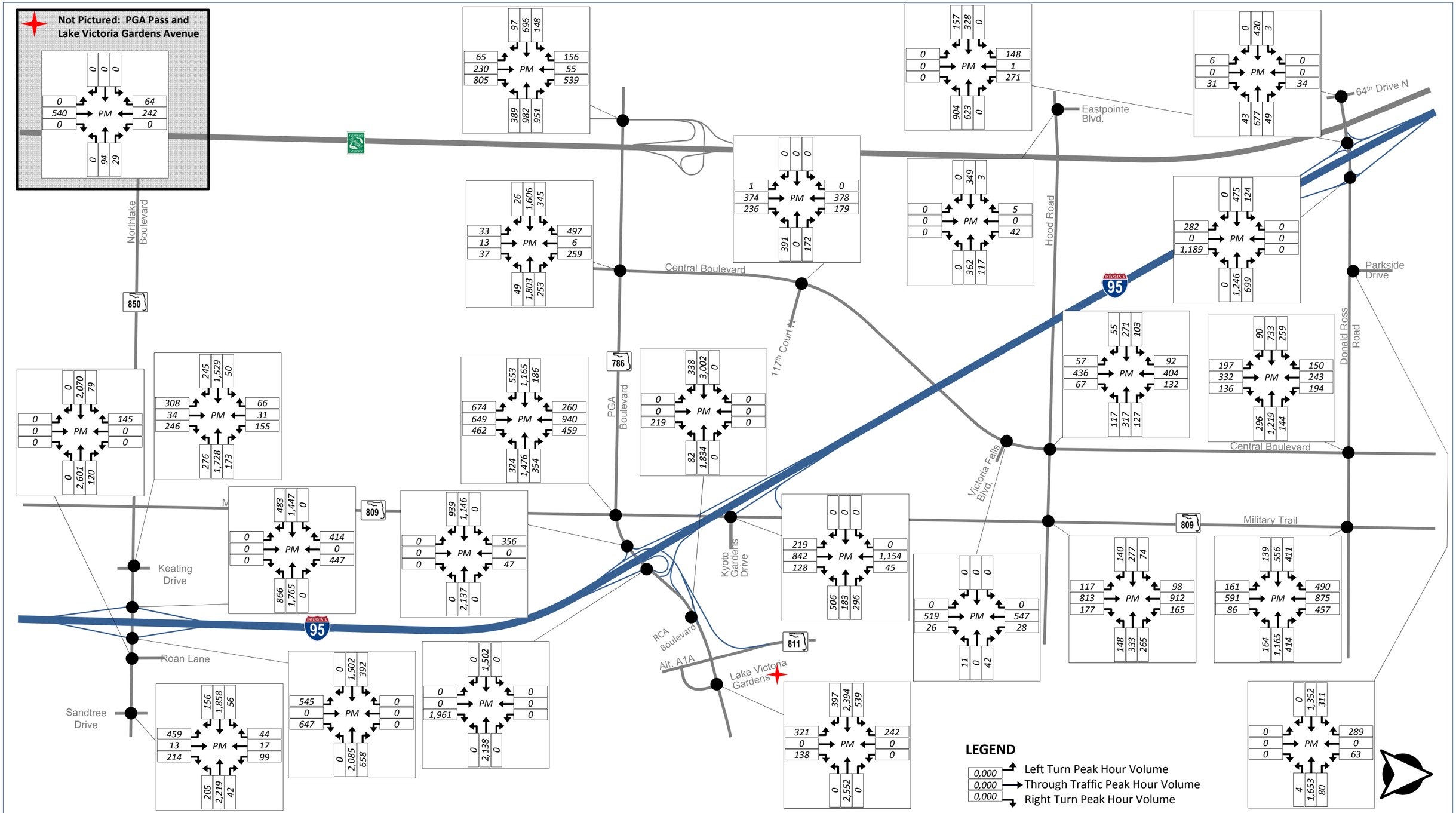
Figure 3-5 illustrates the PM peak hour peak directional volumes on the I-95 mainline segments and ramps used in the analysis.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**Existing 2013 Intersection Lane Geometry**	*Report Title:* Interchange Justification Report	*Figure No.* 3-1
			Page No.
			Date:



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**Existing 2013 AM Peak Hour Turning Movement Volumes**	*Report Title:* Interchange Justification Report	*Figure No.* 3-2
			Page No.
			Date:



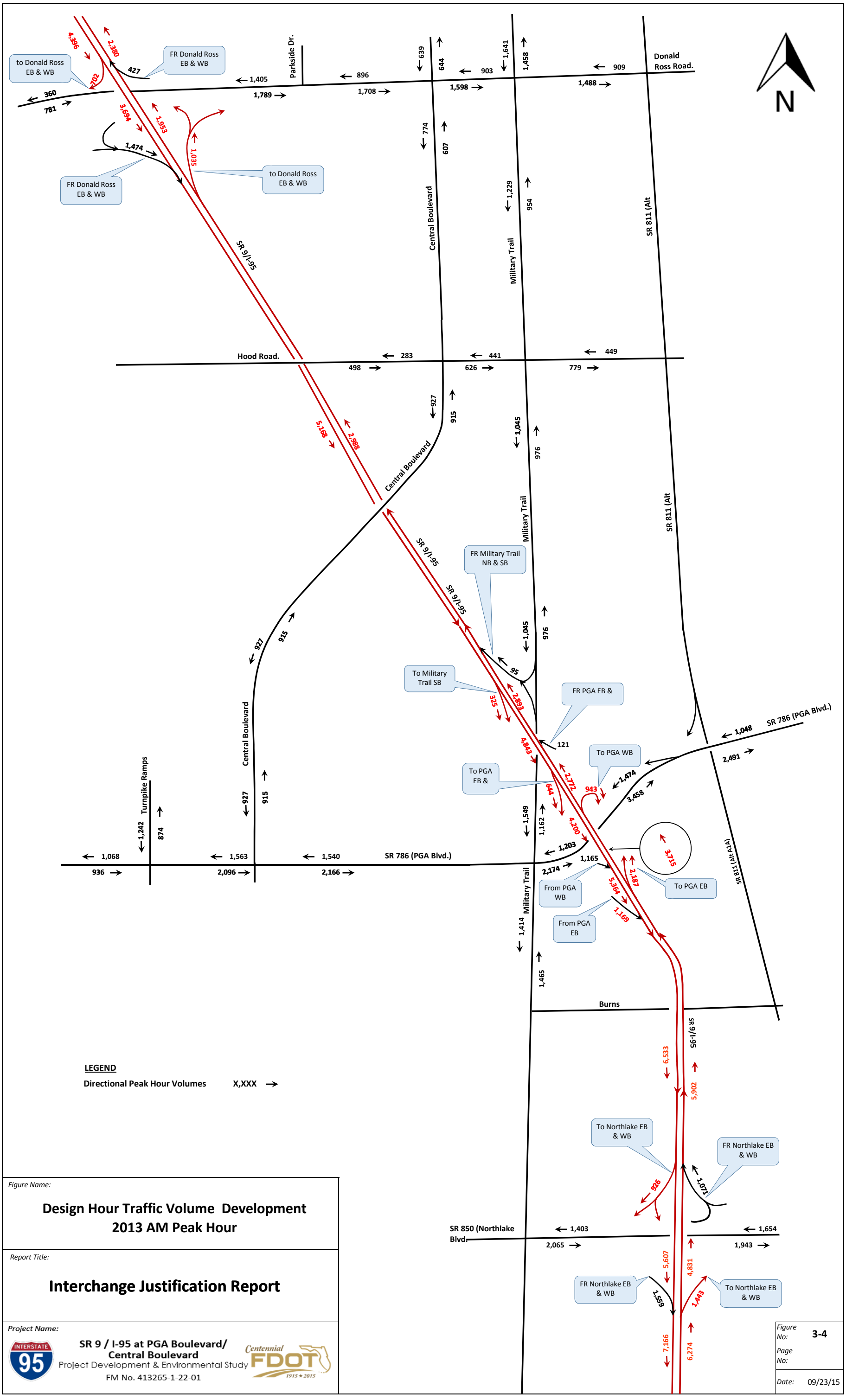
Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Existing 2013 PM Peak Hour Turning Movement Volumes

Report Title:
Interchange Justification Report

Figure No. 3-3
Page No.
Date:



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2013 AM Peak Hour

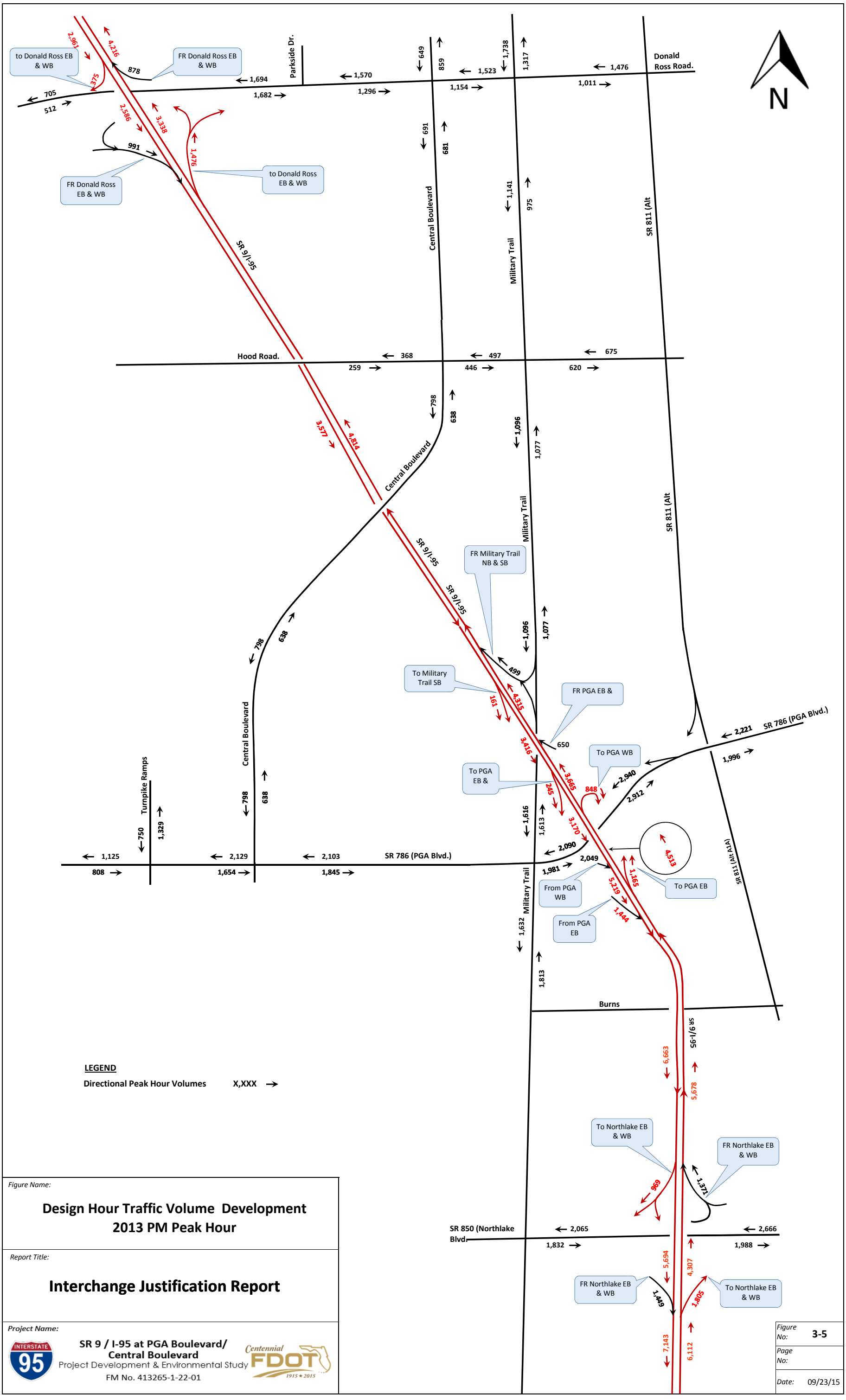
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	3-4
Page No:	
Date:	09/23/15



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2013 PM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No: 3-5
Page No:
Date: 09/23/15

3.1 Existing Conditions Intersection LOS Analysis

A detailed AM and PM peak hour capacity and LOS analysis was performed using the latest version of Trafficware's Synchro software (Synchro 8) utilizing the methodologies outlined in the Highway Capacity Manual, 2010 edition (HCM 2010).

Overall LOS and delay along with LOS and delay for each movement is contained in Table 3-1. Of the study area intersections, sixteen have overall LOS either LOS E or LOS F in the AM and/or the PM peak periods. These include all of the signalized intersections analyzed on PGA Boulevard, and all of the signalized intersections analyzed on Military Trail.

The Synchro reports for Existing Conditions Intersection LOS are in Appendix D.

Table 3-1 – 2013 Existing Conditions Intersection Level of Service

Corridor	Intersection	Period	Overall		Eastbound									Westbound									Northbound									Southbound								
					LEFT			THROUGH			RIGHT			LEFT			THROUGH			RIGHT			LEFT			THROUGH			RIGHT			LEFT			THROUGH			RIGHT	
			Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay
Central Boule-vard	Central Boulevard and Victoria Falls Boulevard	AM	4.8	n/a	-	-	-	-	-	-	-	-	-	104	69.3	F	-	-	-	32	-	-	5	-	-	574	-	-	49	-	-	25	9.8	A	846	-	-	-	-
	Central Boulevard and Victoria Falls Boulevard	PM	0.8	n/a	-	-	-	-	-	-	-	-	-	12	19.8	C	-	-	-	43	-	-	-	-	-	540	-	-	27	-	-	29	9.1	A	568	-	-	-	-
	Central Boulevard and 117th Court	AM	105.2	F	-	-	-	-	-	-	-	-	-	684	169.6	F	-	-	-	198	32.7	C	5	-	-	431	36.8	D	563	235.3	F	272	40.8	D	677	22.7	C	-	-
	Central Boulevard and 117th Court	PM	39.5	D	-	-	-	-	-	-	-	-	-	519	71.9	E	-	-	-	179	32.5	C	1	-	-	389	30.8	C	245	35.4	D	186	22.7	C	393	19.2	B	-	-
Hood Road	Hood Rd and Eastpointe Boulevard	AM	2.3	n/a	13	8.3	A	575	-	-	-	-	-	-	-	-	353	-	-	47	-	-	-	-	-	-	-	-	-	-	-	59	31.7	D	-	-	-	13	-
	Hood Rd and Eastpointe Boulevard	PM	1.0	n/a	3	8.1	A	355	-	-	-	-	-	-	-	-	369	-	-	119	-	-	-	-	-	-	-	-	-	-	-	45	16.5	C	-	-	-	5	-
	Hood Rd and Central Boulevard	AM	39.9	D	121	64.5	E	428	55.1	E	85	34.2	C	174	63.7	E	245	33.1	C	89	32.6	C	77	26.1	C	443	35.7	D	80	35.8	D	186	24.9	C	518	31.9	C	78	32.0
	Hood Rd and Central Boulevard	PM	27.5	C	86	50.7	D	262	40.8	D	51	34.1	C	118	50.5	D	325	35.6	D	115	35.1	D	59	15.1	B	396	19.6	B	82	19.7	B	156	14.3	B	462	17.8	B	106	17.8
	Hood Rd and North Military Trail	AM	41.9	D	128	75.0	E	389	46.5	D	185	47.5	D	47	78.1	E	246	47.6	D	280	66.9	E	77	75.7	E	852	32.6	C	189	31.3	C	236	70.6	E	945	27.5	C	184	25.5
	Hood Rd and North Military Trail	PM	46.7	D	75	60.0	E	282	53.9	D	142	64.8	E	150	62.8	E	339	53.4	D	270	160.7	F	119	61.8	E	829	25.1	C	180	24.1	C	168	61.6	E	930	24.4	C	99	20.9
Northlake Boule-vard	Northlake Boulevard and Keating Drive	AM	25.8	C	20	54.9	D	2,310	29.9	C	85	12.5	B	123	52.5	D	1,464	13.2	B	69	8.9	A	55	51.9	D	4	52.0	D	79	49.2	D	129	-	-	14	48.4	D	28	-
	Northlake Boulevard and Keating Drive	PM	54.1	D	52	73.8	E	1,590	35.7	D	254	25.3	C	287	306.9	F	1,797	30.7	C	180	19.9	B	320	70.0	E	35	70.1	E	255	57.4	E	161	-	-	32	72.2	E	68	-
	Northlake Boulevard and I-95 West Ramp	AM	242.2	F	-	-	-	1,706	29.7	C	812	35.4	D	1,054	1,096.1	F	1,179	21.9	C	-	-	-	-	-	-	-	-	-	-	-	-	677	204.7	F	-	-	-	478	65.1
	Northlake Boulevard and I-95 West Ramp	PM	170.7	F	-	-	-	1,504	19.7	B	502	19.3	B	900	890.9	F	1,835	11.9	B	-	-	-	-	-	-	-	-	-	-	-	-	464	167.7	F	-	-	-	430	48.8
	Northlake Boulevard and I-95 East Ramp	AM	188.7	F	646	570.6	F	1,736	11.9	B	-	-	-	-	-	-	1,764	32.6	C	428	28.0	C	470	143.9	F	-	-	-	1,085	580.7	F	-	-	-	-	-	-	-	-
	Northlake Boulevard and I-95 East Ramp	PM	51.4	D	407	244.2	F	1,562	5.9	A	-	-	-	-	-	-	2,171	25.7	C	684	21.7	C	566	131.1	F	-	-	-	672	86.4	F	-	-	-	-	-	-	-	-
	Northlake Boulevard and Roan Lane	AM	6.2	A	133	87.6	F	2,689	0.2	A	-	-	-	-	-	-	2,077	5.0	A	127	0.1	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	115	79.1
	Northlake Boulevard and Roan Lane	PM	6.2	A	82	87.6	E	2,705	0.2	A	-	-	-	-	-	-	2,705	5.0	A	125	0.1	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	151	79.1
	Northlake Boulevard and Sandtree Drive	AM	128.0	F	46	88.6	F	2,457	203.2	F	186	32.2	C	134	80.5	F	1,855	63.6	E	26	-	-	286	97.6	F	12	29.7	C	107	29.5	C	140	-	-	27	48.5	D	53	-
	Northlake Boulevard and Sandtree Drive	PM	63.7	E	60	56.5	E	2,005	48.7	D	168	20.6	C	213	53.0	D	2,307	68.7	E	44	-	-	477	143.7	F	14	30.9	C	222	30.7	C	103	-	-	18	51.3	D	46	-
Donald Ross Road	Donald Ross Rd and 64th Dr N-E Pointe Court	AM	1.0	n/a	3	8.1	A	770	-	-	4	-	-	15	9.7	A	354	-	-	16	-	-	1	-	-	-	12.4	B	19	-	-	5	-	-	-	10.9	B	76	-
	Donald Ross Rd and 64th Dr N-E Pointe Court	PM	1.7	n/a	3	9.4	A	432	-	-	-	-	-	44	8.4	A	687	-	-	50	-	-	6	-	-	-	12.2	B	31	-	-	35	-	-	-	35.8	E	-	-
	Donald Ross Rd and West Ramp	AM	695.5	F	-	-	-	447	21.3	C	347	22.9	C	1,104	1,377.4	F	254	20.3	C	-	-	-	-	-	-	-	-	-	-	-	-	766	735.4	F	-	-	-	124	70.4
	Donald Ross Rd and West Ramp	PM	260.8	F	-	-	-	337	18.2	B	161	0.1	A	931	665.8	F	641	16.4	B	-	-	-	-	-	-	-	-	-	-	-	-	279	55.4	E	-	-	-	152	0.1
	Donald Ross Rd and East Ramp	AM	179.5	F	178	221.5	F	1,378	30.0	C	-	-	-	-	-	-	1,254	21.0	C	264	18.4	B	105	53.1	D	-	-	-	1,288	531.3	F	-	-	-	-	-	-	-	-
	Donald Ross Rd and East Ramp	PM	107.4	F	127	85.6	F	489	14.5	B	-	-	-	-	-	-	1,283	17.6	B	719	19.5	B	290	52.3	D	-	-	-	1,224	305.5	F	-	-	-	-	-	-	-	-
	Donald Ross Rd and Parkside Drive	AM	22.7	C	270	23.2	C	2,083	13.0	B	-	-	-	-	-	A	1,113	20.5	C	87	16.2	B	-	-	-	-	-	-	-	-	-	79	48.2	D	-	-	-	402	74.4
	Donald Ross Rd and Parkside Drive	PM	23.7	C	320	51.4	D	1,392	10.4	B	-	-	-	6	11.4	B	1,283	16.3	B	106	12.3	B	-	-	-	-	-	-	-	-	-	65	46.1	D	-	-	-	297	87.0
	Donald Ross Rd and Central Boulevard	AM	53.9	D	313	84.9	F	1,518	49.9	D	331	40.5	D	304	81.7	F	731	35.9	D	69	31.7	C	202	77.2	E	277	46.5	D	221	53.0	D	121	74.2	E	227	48.4	D	270	66.2
	Donald Ross Rd and Central Boulevard	PM	61.2	E	488	187.3	F	850	31.2	C	118	25.7	C	335	78.4	E	1,324	43.8	D	154	27.0	C	266	77.3	E	346	51.0	D	123	42.0	D	165	55.0	E	250	46.6	D	162	42.8
	Donald Ross Rd and North Military Trail	AM	78.8	E	561	221.6	F	996	46.1	D	295	48.6	D	146	91.9	F	496	49.7	D	323	75.2	E	167	89.5	F	877	52.9	D	188	48.9	D	456	142.7	F	852	52.3	D	424	67.2
	Donald Ross Rd and North Military Trail	PM	83.3	F	423	136.4	F	572	34.6	C	143	34.0	C	168	55.7	E	1,199	59.0	E	426	114.7	F	165	58.4	E	608	39.8	D	88	36.9	D	470	184.9	F	901	64.1	E	504	157.5
Military Trail	North Military Trail and Kyoto Gardens Drive	AM	110.4	F	-	-	-	-	-	-	-	-	-	300	75.3	E	33	67.6	E	98	58.4	E	71	67.8	E	692	39.6	D	76	2,941.5	F	134	85.5	F	1,521	17.0	B	-	-
	North Military Trail and Kyoto Gardens Drive	PM	35.1	D	-	-	-	-	-	-	-	-	-	526	90.9	F	190	48.6	D	308	29.2	C	228	31.1	C	875	16.4	B	133	36.2	D	47	46.4	D	1,200	29.9	C	-	-
PGA Boule-vard	PGA Boulevard and FL Turnpike	AM	123.4	F	142	56.1	E	737	103.3	F	49	-	-	422	542.2	F	929	81.8	F	664	50.6	D	40	56.8	E	68	79.6	E	456	57.2	E	103	40.6	D	163	45.8	D	95	0.1
	PGA Boulevard and FL Turnpike	PM	173.4	F	152	46.4	D	716	62.5	E	69	-	-	400	515.7	F	1,011	70.3	E	979	198.4	F	67	37.0	D	236	422.4	F	829	220.5	F	555	47.3	D	56	54.5	D	160	0.1
	PGA Boulevard and Central Boulevard	AM	323.4	F	492	407.6	F	1,795	49.7	D	12	-	-	18	69.1	E	1,212	71.8	E	459	47.6	D	11	-	-	24	68.7	E	37	62.1	E	546	2,289.5	F	4	2,379.0	F	792	73.8
	PGA Boulevard and Central Boulevard	PM	165.1	F	367	521.8	F	1,706	82.1	F	26	-	-	53	46.5	D	1,857	178.1	F	279	27.3	C	38	-	-	13	51.8	D	32	42.5	D	266	529.6	F	6	548.6	F	483	44.8
	PGA Boulevard and North Military Trail	AM	96.5	F	121	76.1	E	1,596	188.1	F	534	-	-	128	78.0	E	880	52.1	D	211	-	-	536	67.1	E	476	51.2	D	416	-	-	722	66.3	E	848	53.6	D	191	57.3
	PGA Boulevard and North Military Trail	PM	138.7	F	192	51.8	D	1,199	58.5	E	569	-	-	364	72.6	E	1,520	68.5	F	364	-	-	694	407.8	F	668	44.8	D	475	-	-	472	141.4	F	968	231.7	F	267	241.2
	PGA Boulevard and West Ramps	AM	27.7	C	-	-	-	1,626	13.6	B	-	-	-	-	-	-	1,209	6.9	A	-	-	-	-	-	-	-	-	-	-	-	-	1,000	76.1	E	-	-	-	58	19.7
	PGA Boulevard and West Ramps	PM	9.7	A	-	-	-	1,191	9.3	A	-	-	-	-	-	-	2,222	8.2	A	-	-	-	-	-	-	-	-	-	-	-	-	370	18.6	B	-	-	-	48	16.5
	PGA Boulevard and NB OFF Ramps	AM	300.9	F	-	-	-	1,210	8.2	A	-	-	-	-	-	-	2,665	57.2	E	-	-	-	-	-	-	-	-	-	2,491	703.9	F	-	-	-	-	-	-	-	-
	PGA Boulevard and NB OFF Ramps	PM	218.9	F	-	-	-	1,562	7.0	A	-	-	-	-	-	-	2,223	17.4	B	-	-	-	-	-	-	-	-	-	2,039	600.9	F	-	-	-	-	-	-	-	-
	PGA Boulevard and RCA Boulevard	AM	5.1	n/a	-	-	-	3,973	-	-	997	-	-	-	-	-	656	-	-	-	-	-	-	-	-	-	-	-	115	37.1	E	25	1,004.4	F	-	-	-	-	-
	PGA Boulevard and RCA Boulevard	PM	14.1	n.a	-	-	-	1,889	-	-	84	-	-	-	-	-	3,092	-	-	-	-	-	-	-	-	-	-	-	225	18.9	C	348	215.5	F	-	-	-	-	-
	PGA Boulevard and Lake Victoria Gardens	AM	38.2	D	413	64.2	E	3,187	33.5	C	389	17.2	B	-	-	-	1,028	39.6	D	-	-	-	250	70.5	E	-	-	-	100	59.8	E	-	-	-	-	-	-	64	49.8
	PGA Boulevard and Lake Victoria Gardens	PM	117.8	F	555	155.3	F	2,465	23.6	C	408	16.9	B	-	-	-	2,658	226.8	F	-	-	-	330	80.9	F	-	-	-	142	61.9	E	-	-	-	-	-	-	249	50.6
Lake Victoria Gardens	PGA Passage and Lake Victoria Gardens	AM	17.8	B	-	-	-	-	-	-	-	-	-	-	-	-	131	33.1	C	22	30.7	C	-	-	-	413	-	-	-	-	-	-	-	-	64	52.5	D	14	49.3
	PGA Passage and Lake Victoria Gardens	PM	67.6	E	-	-	-	-	-	-	-	-	-	-	-	-	96	30.6	C	23	29.0	C	-	-	-	555	-	-	-	-	-	-	-	-	249	86.9	F	66	55.8

3.2 Existing Conditions Queuing Analysis

A vehicular queuing analysis was performed to determine if turn bay lengths were adequate for the queues that develop. The 95th percentile queue estimated by Synchro was used. One component is to determine whether or not the vehicular queues on the arterial roadways extend upstream such that they impede the traffic operations at nearby intersections. Another component is to determine if the vehicular queues along the I-95 exit ramps extend to the freeway mainline and create conflict.

For this analysis, the 95th percentile vehicular queue length in feet (ft.) for the lane groups at each of the study intersections were evaluated and compared against the existing storage distance in order to determine if the available storage lengths provided can accommodate the vehicular demands. The standard vehicle length for passenger cars used in the evaluations is assumed to be 25 ft., which includes the length of the vehicle plus a nominal space between queued vehicles.

Table 3-2 compares the 95th percentile queues with the existing storage lengths and identifies instances where the estimated queue exceeds the storage capacity. Both the turning movement queue and the through queue were compared against the turn bay length.

Estimated queue lengths exceeded available storage lengths at five intersections, including PGA Boulevard's intersections with Florida Turnpike and Military Trail.

Table 3-2 – Existing Conditions Queuing Analysis

Corridor	Intersection	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	93	52	1340	92	0	0	0	0	881	0	124
			PM	ft	0	58	0	820	177	0	0	0	0	164	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?						NO								
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	112	290	0	0	252	42	85	0	1232	0	0	0
			PM	ft	92	170	0	0	202	55	192	0	536	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?														
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	368	218	1310	231	0	0	0	0	662	0	157
			PM	ft	0	211	56	794	200	0	0	0	0	342	0	60
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?						NO								
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	757	313	0	0	498	155	461	0	974	0	0	0
			PM	ft	317	163	0	0	460	100	400	0	322	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?			NO				NO C)							
PGA Blvd	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	257	0	0	55	0	0	0	0	437	0	14
			PM	ft	0	126	0	0	124	0	0	0	0	96	0	19
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?														
	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	135	0	0	704	0	0	0	1136	0	0	0
			PM	ft	0	109	0	0	339	0	0	0	711	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?														
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens	95th %-ile Queue	AM	ft	0	0	0	239	289	29	145	331	72	230	387	0
			PM	ft	0	0	0	448	406	65	162	232	60	65	332	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO (D)				

Notes: A) Storage shown is cumulative.
B) Through queue exceeds left turn storage.
C) Through queue exceeds through storage.
D) Through queue exceeds right turn storage.

3.3 Existing Conditions Roadway Level of Service

The existing AM and PM peak hour operating conditions for the I-95 mainline sections were analyzed using Highway Capacity Software 2010, based on Highway Capacity Manual 2010 methodology. The Freeway Facilities module was used, which combines mainline segments and ramps. Table 3-3 reports the levels of service

The HCS reports are in Appendix E.

Table 3-4 reports the arterial level of service using the FDOT's 2012 LOS Tables, based on the maximum peak hour directional volume from Figures 3-4 and 3-5. The arterial LOS results are displayed in Figure 3-6.

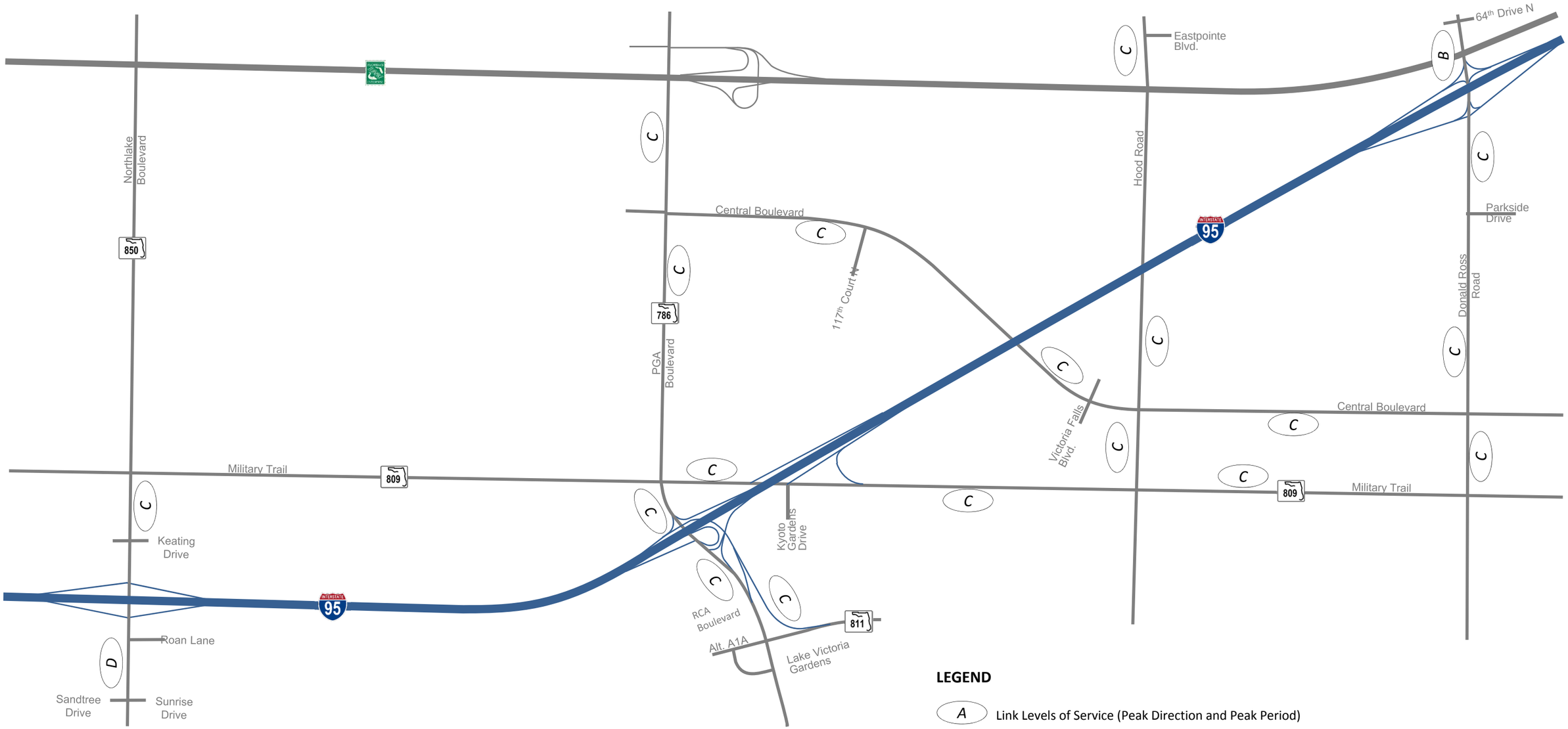
Table 3-3 – Existing Conditions I-95

Direction	Existing Conditions								
	I-95 Segment Description	Analysis		Period	DDHV	Density	Speed (MPH)	LOS
		Type	Limits					
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,474	24.6	60.0	C
				PM	991	17.7	61.0	B
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	5,168	15.9	70.0	B
				PM	3,577	11.0	70.0	A
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	325	19.2	62.6	B
				PM	161	15.0	63.0	B
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	4,843	14.9	70.0	B
				PM	3,416	10.5	70.0	A
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	644	6.9	65.3	A
				PM	245	3.4	66.4	A
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,200	12.9	70.0	B
				PM	3,170	9.7	70.0	A
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,165	23.4	60.0	C
				PM	2,049	27.8	59.0	C
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,364	16.5	70.0	B
				PM	5,219	16.0	70.0	B
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,169	26.1	60.0	C
				PM	1,444	28.0	59.0	C
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	6,533	20.2	69.5	C
				PM	6,663	20.6	69.4	C
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	926	10.1	60.9	B
				PM	969	10.4	60.8	B
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,071	24.3	60.0	C
				PM	1,371	25.3	60.0	C
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	5,902	18.1	69.9	C
				PM	5,678	17.4	70.0	B
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,187	18.2	59.2	B
				PM	1,165	10.5	62.1	B
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	3,715	11.4	70.0	B
				PM	4,513	13.8	70.0	B
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	943	19.8	55.4	B
				PM	848	20.7	55.7	C
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	2,772	8.5	70.0	A
				PM	3,665	11.2	70.0	B
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	121	11.2	62.0	B
				PM	650	17.8	61.0	B
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	2,893	8.9	70.0	A
				PM	4,315	13.2	70.0	B
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	95	11.3	62.0	B
				PM	499	18.3	61.0	B
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	2,988	9.2	70.0	A
				PM	4,814	14.8	70.0	B
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,035	5.2	60.6	A
				PM	1,476	11.5	59.4	B

Table 3-4 – Existing Conditions Arterial Level of Service

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	781	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	1789	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	1708	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1598	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	498	420	840	1190	1640		C	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	498	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	626	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2129	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2166	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2174	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	3458	N/A	3970	4040	4040	4811	C	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	3458	N/A	3970	4040	4040	4835	C	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1616	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	1096	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1229	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2065	N/A	2650	2720	2720	3890	C	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	2666	N/A	2650	2720	2720	3890	D	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	927	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	927	N/A	1720	1800	1800		C	N
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	774	N/A	1720	1800	1800		C	N

Notes:
1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**Existing 2013 Link Level of Service (LOS)**	*Report Title:* Interchange Justification Report	*Figure No.* 3-6
			Page No.
			Date:

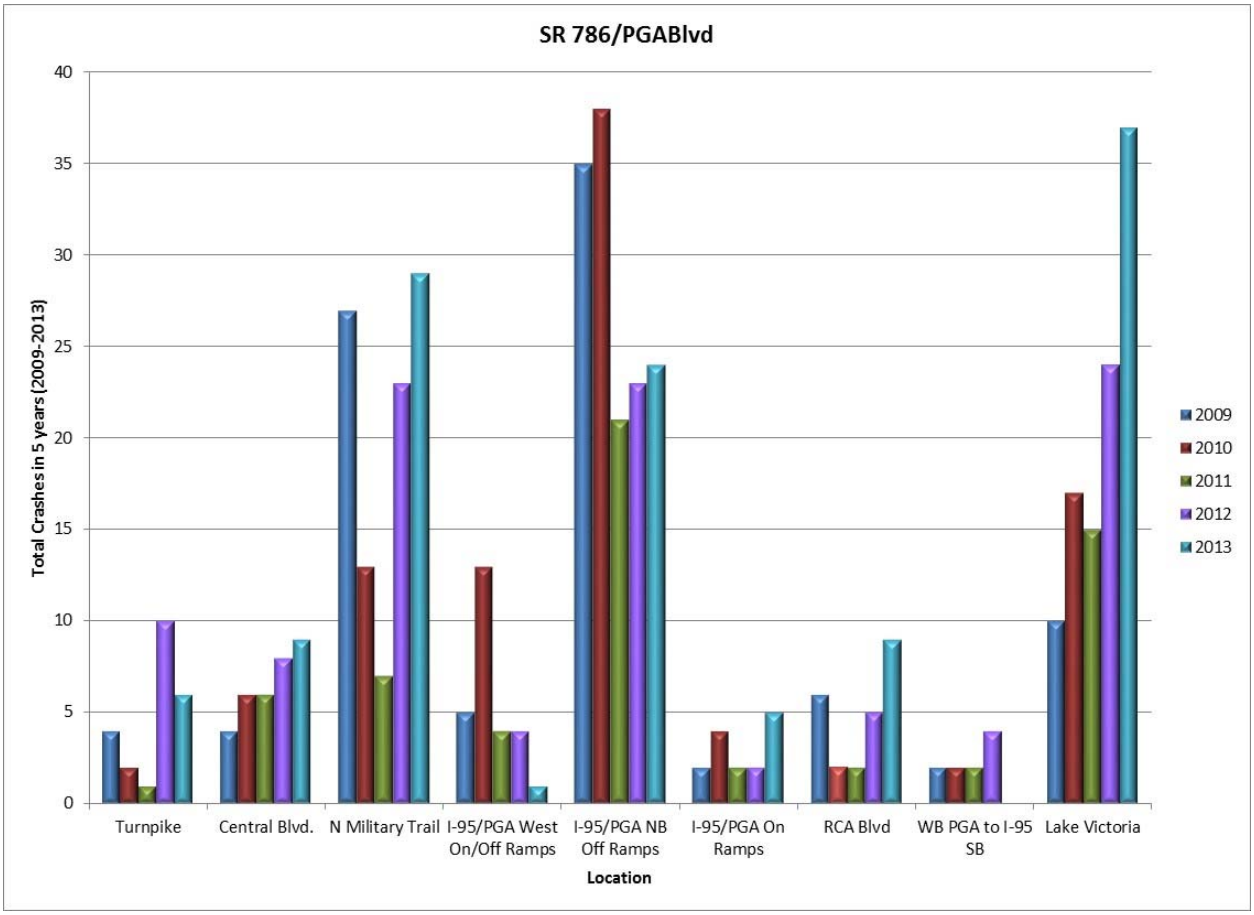
3.4 Existing Conditions Crash Analysis

A generalized analysis of FDOT Crash Reporting System (CARS) crash data for I-95, along with the two corridors of PGA between the Florida Turnpike and Victoria Gardens and Military Trail between PGA Blvd and Donald Ross Blvd was performed. The raw data was obtained from FDOT District 4. Source data for the figures that follow and the CARS data reports are included in Appendix F.

3.4.1 SR 786/PGA Boulevard from Florida's Turnpike to Lake Victoria Gardens

A total of 475 crashes were reported for PGA Boulevard (section 93001000) between Mile Post (MP) 4.129 to MP 6.789 during the five year study period from January 2009 to December 2013. Of the 475 reported crashes, 193 crashes occurred within the influence area of the interchange ramps. The crash distribution depicted in **Figure 3-7** indicates that the intersections of PGA Boulevard with I-95 northbound off ramps, with Lake Victoria Gardens Boulevard and with N Military Trail, comprise the top three high frequency crash locations during the five year reporting period.

Figure 3-7: PGA Corridor Crash Location Distribution



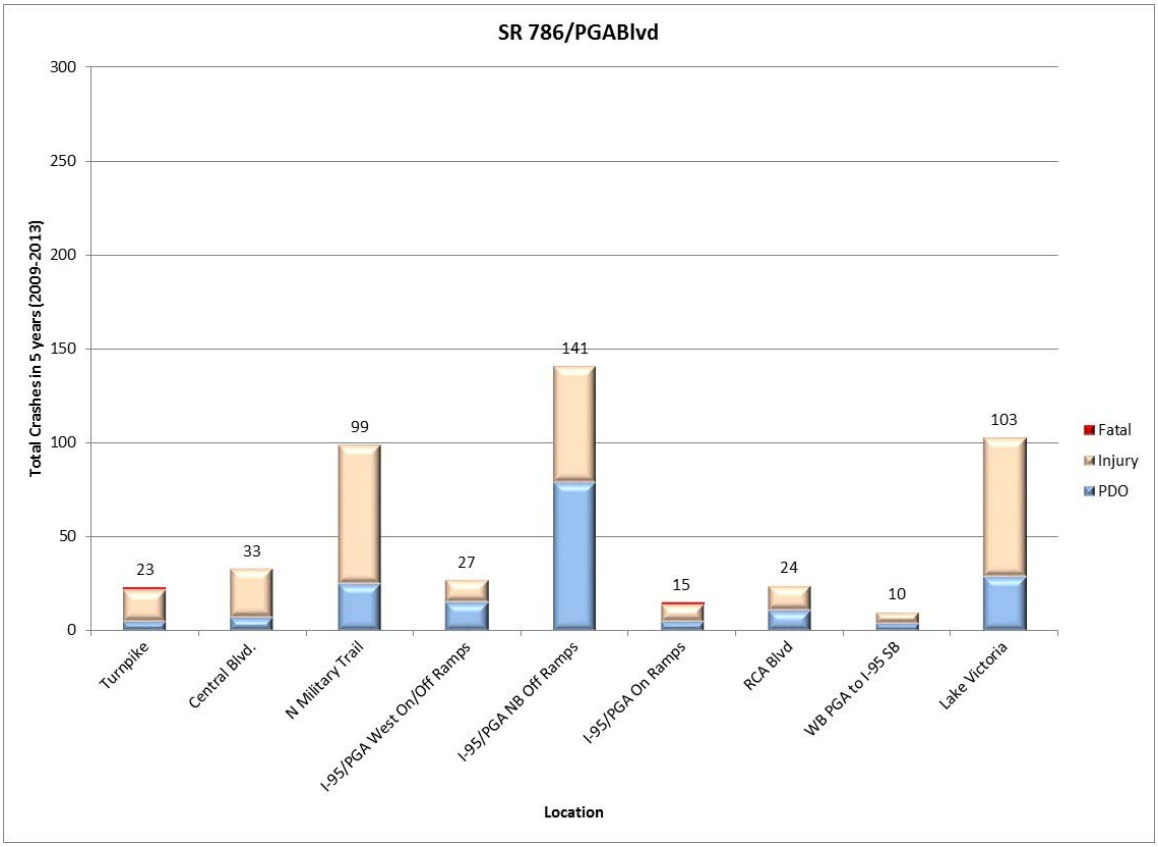
A more in-depth review of the crash statistics indicates that the predominant crash types comprised rear end crashes at 68% followed by angle crashes at 12%. Based on crash severity, of the 475 crashes reported, 293 (62%) were injury type crashes and 180 (38%) were property damage only crashes. There were 2 fatal crashes reported during the referenced five year period as follows:

- Near Florida's Turnpike Ramps:
  - A fatal crash was reported on Tuesday August 28, 2012 during the 11:00PM hour and involved the collision a bicycle.

- Near I-95/PGA Boulevard northbound on-ramps:
  - A fatal crash was reported on Thursday January 10, 2013 during the 4:00AM hour and involved the collision with a fixed object on the roadway. Excessive speed was cited as a contributing cause for this crash.

There were a total of 127 (27%) night/dusk/dawn crashes reported which is lower than the statewide average for all roadways of 34 percent. 98 (21%) of the total crashes reported occurred under wet/slippery pavement conditions which is higher than the statewide average for all roadways of 13 percent. There were 3 pedestrian crashes and 4 bicycle crashes reported during the five year period. Figure **3-8** presents a summary of the distribution of crashes by location along the corridor.

Figure 3-8: I-95 Corridor Crash Severity Distribution by Location



The calculated spot safety ratios and confidence levels for the years 2009 through 2013 are presented in **Table 3-7.** According to the Highway Safety Improvement Guidelines (HSIG), locations with a confidence level greater than 99.95 % for urban facilities and safety ratios greater than 1.0 are regarded as experiencing abnormally high crash rates.

Table 3-7: PGA Boulevard Corridor Crash Rates

Year	Number of Crashes	ADT	Actual Crash Rate (ACR)	District 4 Average Crash Rate (A)	Average Vehicle Exposure (M)	Critical Crash Rate (CCR)	Safety Ratio	Statistical Significance	Confidence Level
2009	95	34,383	2.846	3.015	33.382	3.989	0.713	-0.513	30.3923%
2010	97	46,762	2.137	2.986	45.401	3.819	0.559	-3.270	0.0539%
2011	60	46,325	1.334	3.062	44.977	3.910	0.341	-6.580	0.0000%
2012	103	46,587	2.277	3.570	45.231	4.484	0.508	-4.562	0.0003%
2013	120	46,174	2.677	4.085	44.830	5.067	0.528	-4.628	0.0002%

LEGEND

ADT: Average Daily Traffic

ACR: Actual Crash Rate = No. of crashes in a year / Average Vehicle Exposure (M)

M: Average Vehicle Exposure (million vehicles or million vehicles miles) = [(ADT * 365 * L) / 1,000,000]

L : Length of the Segment for Segment Analysis, 1 for Spot Analysis

A: Average Crash Rate

CCR: Critical Crash Rate = A + K * (SQRT[A/M]) - (1/[2 * M]) (Ref: FDOT Highway Safety Improvement Program Guidelines)

K: 3.291 for Urban, 1.960 for Suburban, 1.645 for Rural K = 3.291

Safety Ratio: ACR/CCR

Statistical significance: (ACR - A + (1/2M))/SQRT(A/M)

Confidence Level: Percent probability that the crash rate is abnormally high for the location under study, using the district-wide average as a basis.

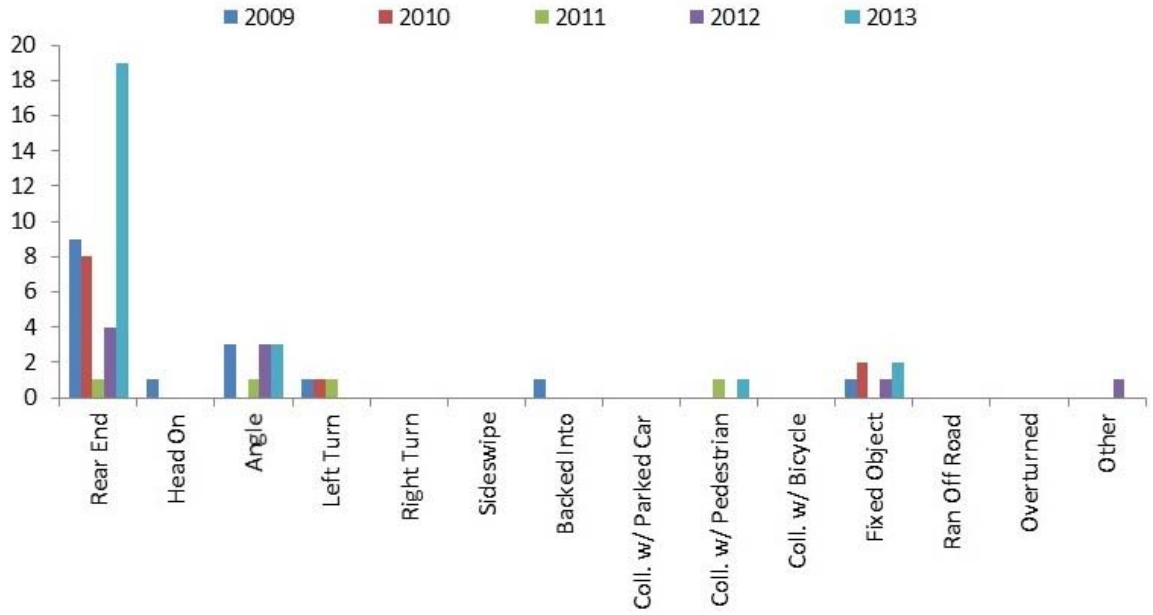
As can be seen from **Table 3-7**, the calculated confidence levels and safety ratios for the study corridor indicate that the subject PGA Boulevard facility did not experience a greater frequency of crashes than would typically be anticipated on a similar facility during the five year review period.

3.4.2 North Military Trail from PGA Blvd to Donald Ross

A total of 65 crashes were reported for Military Trail (section 93150000) between Mile Post (MP) 11.068 to MP 14.147 during the five year study period from January 2009 to December 2013. A more in-depth review of the crash statistics

indicates that the predominant crash types comprised rear end crashes at 63% followed by angle crashes at 15%. **Figure 3-9** depicts the distribution of crashes by harmful event along the Military Trail Corridor.

Figure 3-9: Military Trail Corridor Crash Type Distribution



Based on crash severity, of the 65 crashes reported, 47 (72%) were injury type crashes and 18 (28%) were property damage only crashes. No fatal crashes were reported during the referenced five year period. There were a total of 29 (45%) night/dusk/dawn crashes reported which is higher than the statewide average for all roadways of 34 percent. 9 (14%) of the total crashes reported occurred under wet/slippery pavement conditions which is slightly higher than the statewide average for all roadways of 13 percent. There were 2 pedestrian crashes and no bicycle crashes reported during the five year period.

The calculated spot safety ratios and confidence levels for the years 2009 through 2013 are presented in **Table 3-8.** According to the Highway Safety

Improvement Guidelines (HSIG), locations with a confidence level greater than 99.95 % for urban facilities and safety ratios greater than 1.0 are regarded as experiencing abnormally high crash rates.

Table 3-8: Military Trail Corridor Crash Rates

Year	Number of Crashes	ADT	Actual Crash Rate (ACR)	District 4 Average Crash Rate (A)	Average Vehicle Exposure (M)	Critical Crash Rate (CCR)	Safety Ratio	Statistical Significance	Confidence Level
2009	16	36,438	0.391	3.015	40.950	3.896	0.100	-9.627	0.0000%
2010	11	32,500	0.301	2.986	36.525	3.913	0.077	-9.342	0.0000%
2011	4	42,000	0.085	3.062	47.201	3.890	0.022	-11.648	0.0000%
2012	9	33,000	0.243	3.570	37.087	4.578	0.053	-10.681	0.0000%
2013	25	31,500	0.706	4.085	35.401	5.189	0.136	-9.905	0.0000%

LEGEND

ADT: Average Daily Traffic

ACR: Actual Crash Rate = No. of crashes in a year / Average Vehicle Exposure (M)

M: Average Vehicle Exposure (million vehicles or million vehicles miles) = [(ADT * 365 * L) / 1,000,000]

L : Length of the Segment for Segment Analysis, 1 for Spot Analysis

A: Average Crash Rate

CCR: Critical Crash Rate = A + K * (SQRT[A/M]) - (1/[2 * M]) (Ref: FDOT Highway Safety Improvement Program Guidelines)

K: 3.291 for Urban, 1.960 for Suburban, 1.645 for Rural K = 3.291

Safety Ratio: ACR/CCR

Statistical significance: (ACR - A + (1/2M))/SQRT(A/M)

Confidence Level: Percent probability that the crash rate is abnormally high for the location under study, using the district-wide average as a basis.

As can be seen from **Table 3-8**, the calculated confidence levels and safety ratios for the study corridor indicate that the subject Military Trail facility did not experience a greater frequency of crashes than would typically be anticipated on a similar facility during the five year review period.

3.4.3 SR 9/I-95 from Northlake Boulevard to Donald Ross Road

A total of 847 crashes were reported for I-95 (section 93220000) between Mile Post (MP) 34.056 to MP 40.837 during the five year study period from January 2009 to December 2013. **Table 3-9** presents a summary of the crash data that were downloaded from the FDOT's Crash Analysis Reporting System (CARS) for the corresponding study period.

Table 3-9: I-95 Corridor Crash Summary

SR 9/I-95: Northlake Blvd to Donald Ross Rd		Number of Crashes Year					5 Year Total Crashes	Mean Crashes Per Year	%
		2009	2010	2011	2012	2013			
CRASH TYPE	Rear End	42	73	55	19	30	219	43.80	25.9%
	Head On	2	4	0	2	0	8	1.60	0.9%
	Angle	10	9	7	4	8	38	7.60	4.5%
	Left Turn	0	1	0	0	0	1	0.20	0.1%
	Right Turn	0	0	0	0	0	0	0.00	0.0%
	Sideswipe	33	43	0	0	0	76	15.20	9.0%
	Backed Into	0	0	0	0	0	0	0.00	0.0%
	Coll. w/ Parked Car	0	2	3	1	0	6	1.20	0.7%
	Coll. w/ Pedestrian	0	0	1	1	1	3	0.60	0.4%
	Coll. w/ Bicycle	0	0	0	0	0	0	0.00	0.0%
	Fixed Object	26	56	34	38	53	207	41.40	24.4%
	Ran Off Road	2	3	0	0	1	6	1.20	0.7%
	Overturned	4	2	2	2	1	11	2.20	1.3%
	Other	28	41	68	56	79	272	54.40	32.1%
	Total Crashes	**147**	**234**	**170**	**123**	**173**	**847**	**169.40**	**100.0%**
SEVERITY	PDO Crashes	84	131	95	62	105	477	95.40	56.3%
	Fatal Crashes	1	0	2	4	1	8	1.60	0.9%
	Injury Crashes	62	103	73	57	67	362	72.40	42.7%
LIGHTING CONDITIONS	Daylight	86	150	105	79	117	537	107.40	63.4%
	Dusk	8	9	13	6	14	50	10.00	5.9%
	Dawn	0	4	3	4	5	16	3.20	1.9%
	Dark	53	71	49	34	37	244	48.80	28.8%
	Unknown	0	0	0	0	0	0	0.00	0.0%
SURFACE CONDITIONS	Dry	131	172	121	85	113	622	124.40	73.4%
	Wet	15	61	49	38	60	223	44.60	26.3%
	Others	1	1	0	0	0	2	0.40	0.2%

As can be seen from **Table 3-9**, of the 847 documented crashes, 147 crashes were reported in 2009, 234 crashes in 2010, 170 crashes in 2011, 123 crashes in 2012, and 173 crashes in 2013. The crash types were (percentages are rounded numbers):

- 219 Rear End crashes (26%)
- 207 Fixed Object crashes (24%)
- 76 Sideswipe crashes (9%)
- 38 Angle crashes (4%)
- 11 Overturned crashes (1%)
- 8 Head On crashes (1%)

- 6 Coll. w/ Parked Car crashes (1%)
- 6 Ran Off Road crashes (1%)
- 3 Coll. w/ Pedestrian crashes (0%)
- 1 Left Turn crash (0%)
- 272 Other crashes (32%)

Based on crash severity, of the 847 crashes reported, 362 (43%) were injury type crashes and 477 (56%) were property damage only crashes. There were 8 fatal crashes reported during the referenced three year period as follows:

- Northlake Boulevard Interchange:
  - A fatal crash was reported on Monday January 3, 2011 during the 2:00AM hour and involved the collision with a barrier wall.
  - A fatal crash was reported on Tuesday November 20, 2012 during the 3:00PM hour and involved the collision with a moveable object on the roadway.
  - A fatal crash was reported on Tuesday March 26, 2013 during the 11:00AM hour. No other information from the CARS report is available for this crash.

- Between Military Trail and Donald Ross Road Interchanges:
  - A fatal crash was reported on Friday March 16, 2012 during the 10:00AM hour and involved an overturned vehicle.

- Donald Ross Road Interchange:
  - A fatal crash was reported on Wednesday May 13, 2009 during the 1:00AM hour and involved the collision with a moveable object on the roadway. Driving under the influence was cited as a contributing cause for this crash.
  - A fatal crash was reported on Wednesday February 23, 2011 during the 3:00PM hour and occurred when an occupant fell from the vehicle.
  - A fatal crash was reported on Sunday July 22, 2012 during the 9:00PM hour and involved the collision with a pedestrian. Careless driving was cited as a contributing cause.

- A fatal crash was reported on Sunday January 8, 2012 during the 2:00PM hour and involved the collision with a utility/light pole.

There were a total of 310 (37%) night/dusk/dawn crashes reported which is higher than the statewide average for all roadways of 31 percent. 223 (26%) of the total crashes reported occurred under wet/slippery pavement conditions which is higher than the statewide average for all roadways of 17 percent. There were 3 pedestrian crashes which is atypical given that pedestrian activity is prohibited (except in roadside emergency situations) on limited access facilities such as I-95.

The calculated spot safety ratios and confidence levels for the years 2009 through 2013 are presented in **Table 3-10.** According to the Highway Safety Improvement Guidelines (HSIG), locations with a confidence level greater than 99.95 % for urban facilities and safety ratios greater than 1.0 are regarded as experiencing abnormally high crash rates.

Table 3-10: I-95 Corridor Crash Rates

Year	Number of Crashes	ADT	Actual Crash Rate (ACR)	District 4 Average Crash Rate (A)	Average Vehicle Exposure (M)	Critical Crash Rate (CCR)	Safety Ratio	Statistical Significance	Confidence Level
2009	147	108,372	0.548	0.936	268.228	1.129	0.486	-6.536	0.0000%
2010	234	145,659	0.649	0.722	360.515	0.868	0.748	-1.599	5.4947%
2011	170	142,346	0.483	0.645	352.316	0.784	0.615	-3.764	0.0084%
2012	123	124,788	0.398	0.771	308.858	0.934	0.426	-7.428	0.0000%
2013	173	113,744	0.615	0.888	281.524	1.071	0.574	-4.838	0.0001%

LEGEND	
ADT:	Average Daily Traffic
ACR:	Actual Crash Rate = No. of crashes in a year / Average Vehicle Exposure (M)
M:	Average Vehicle Exposure (million vehicles or million vehicles miles) = [(ADT * 365 * L) / 1,000,000]
L:	Length of the Segment for Segment Analysis, 1 for Spot Analysis
A:	Average Crash Rate
CCR:	Critical Crash Rate = A + K * (SQRT[A/M]) - (1/[2 * M]) (Ref: FDOT Highway Safety Improvement Program Guidelines)
K:	3.291 for Urban, 1.960 for Suburban, 1.645 for Rural
Safety Ratio:	ACR/CCR
Statistical significance:	(ACR - A + (1/2M))/SQRT(A/M)
Confidence Level:	Percent probability that the crash rate is abnormally high for the location under study, using the district-wide average as a basis.

As can be seen from **Table 3-10**, the calculated confidence levels and safety ratios for the study corridor indicate that the subject I-95 facility did not experience a greater frequency of crashes than would typically be anticipated on a similar facility during the five year review period.

Summaries depicting a breakdown of the 847 crashes by location along the I-95 study corridor are presented in **Table 3-11**, and **Figures 3-10** & **3-11**.

Table 3-11: I-95 Corridor Crash Summary by Location

Location	Distance (Miles)	Mile Post		Total Crashes in 5 years (2009-2013)									
		Begin	End	2009	2010	2011	2012	2013	PDO	Injury	Fatal	Totals	Average
Northlake Blvd	1.004	34.056	35.060	24	41	20	24	39	86	59	3	148	30
Btw Northlake and PGA Blvd.	1.156	35.060	36.216	21	24	22	13	24	61	43	0	104	21
PGA Blvd	1.030	36.216	37.246	30	88	59	35	49	146	115	0	261	52
Btw PGA & Military Trail	0.220	37.246	37.466	4	8	7	4	5	12	16	0	28	6
Military Trail	0.284	37.466	37.750	0	3	1	2	5	6	5	0	11	2
Btw Military Tr and Donald Ross Rd	1.669	37.750	39.419	24	16	15	18	23	58	37	1	96	19
Donald Ross Rd.	1.418	39.419	40.837	44	54	46	27	28	108	87	4	199	40
			Total	147	234	170	123	173	477	362	8	847	170

Figure 3-10: I-95 Corridor Crash Distribution by Location

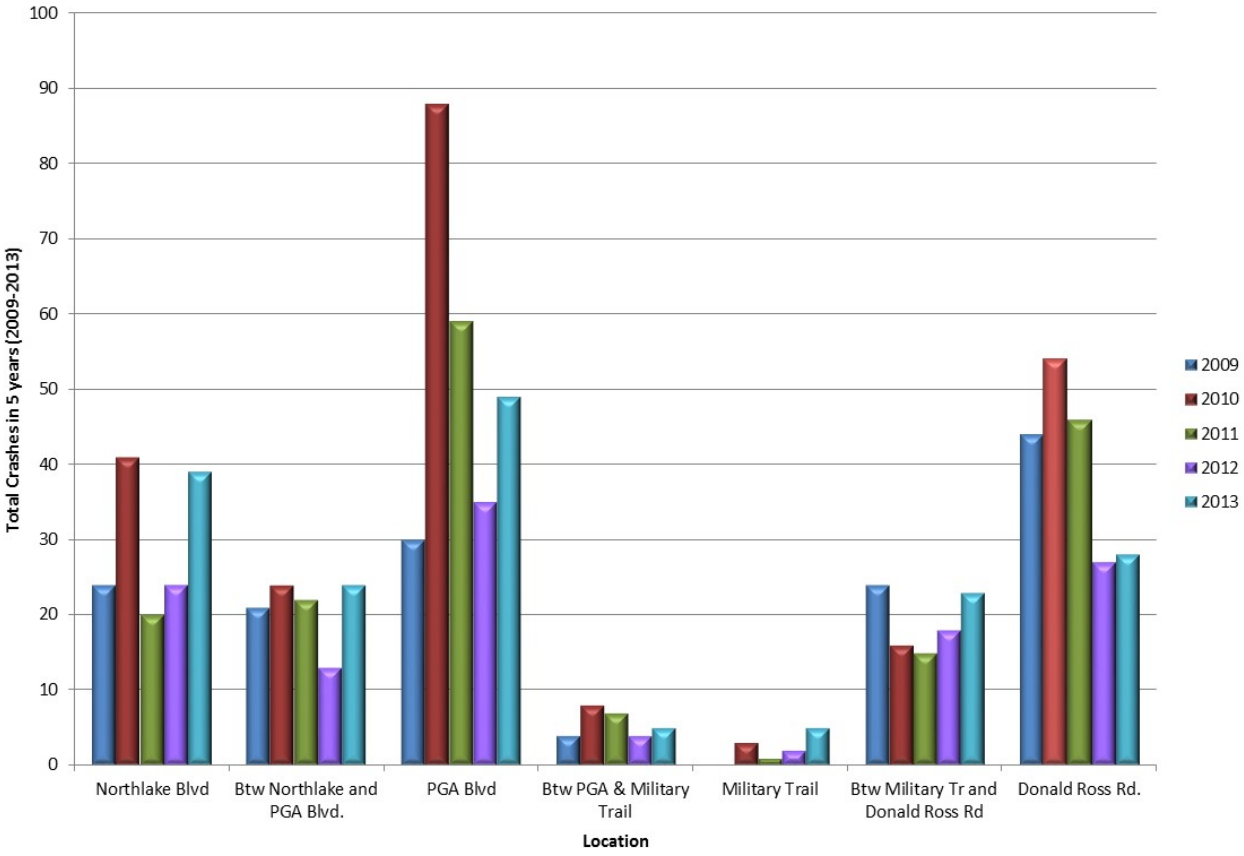
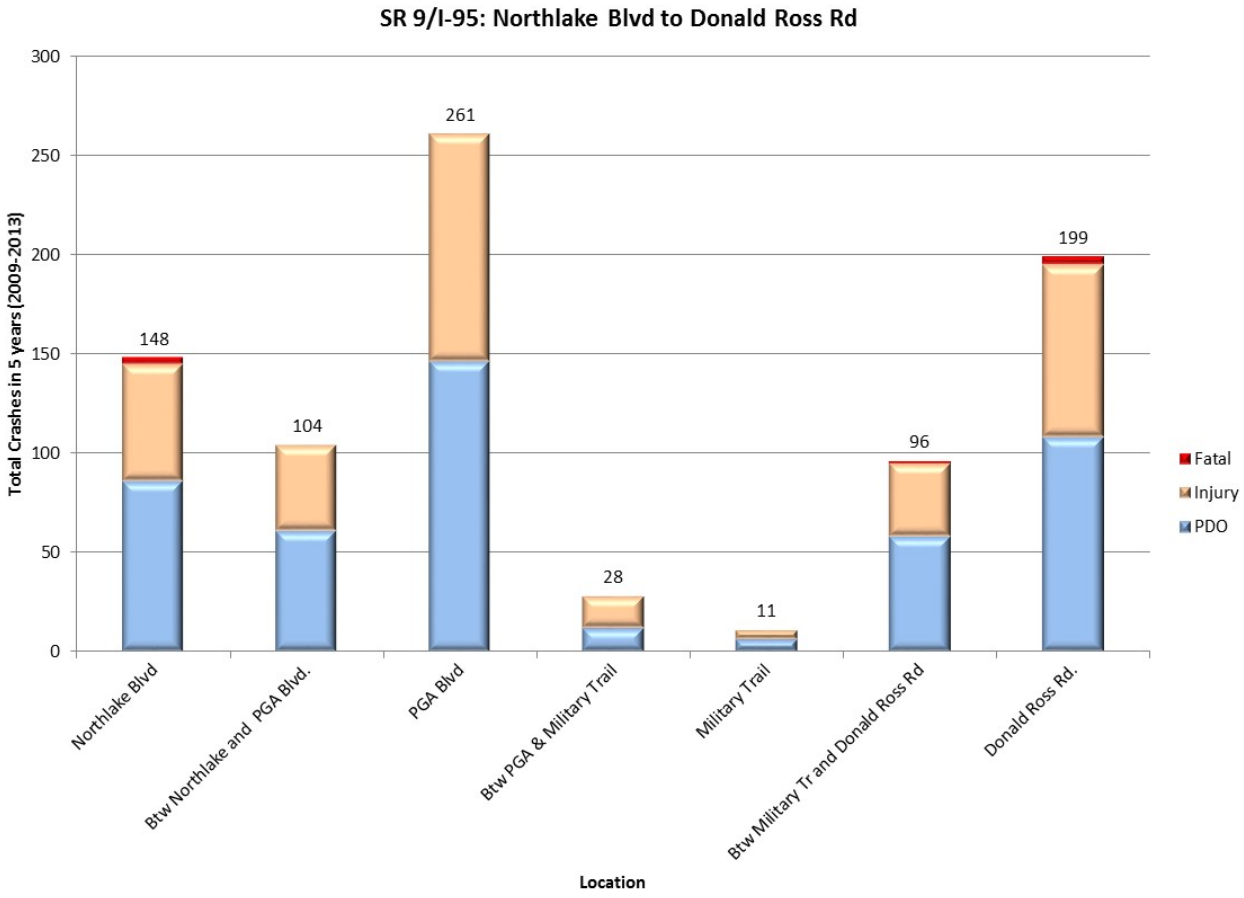


Figure 3-11: I-95 Corridor Crash Severity Distribution by Location



As can be seen from the preceding exhibits the highest frequency of reported crashes were within the vicinity of the PGA Boulevard interchange followed by the interchange at Donald Ross Road then the interchange at Northlake Boulevard. Fatalities were reported at the Northlake Boulevard and Donald Ross Road Interchanges and along the I-95 segment between Military Trail and Donald Ross Road as previously noted.

Detailed crash summaries for the I-95 corridor are included in **Appendix F**.

3.5 Existing Conditions Environmental Data

A new interchange at I-95 and Central Blvd is being evaluated as part of the systematic, phased approach for the SR 9 (I-95) at PGA Blvd and Central Blvd Project Development and Environment (PD&E) Study. The PD&E project proposes to enhance the operational capacity and relieve congestion at the existing I-95 and PGA Blvd interchange located within the City of Palm Beach Gardens in Palm Beach County. An evaluation of a new interchange at I-95 and Central Blvd through an Interchange Justification Report (IJR) is being completed in conjunction with the I-95 at PGA Blvd and Central Blvd PD&E Study. A preliminary environmental review of the new Central Blvd and I-95 interchange has been completed to identify any significant environmental issues that may affect the overall feasibility of the proposed interchange.

Background information was collected and agency data bases were reviewed to determine the potential environmental issues within the existing I-95 corridor and within the potential worst case footprint for the proposed Central Blvd interchange, as currently conceived. A preliminary field inspection of the project corridor was conducted to evaluate the current site conditions, verify the data collected, and identify wetlands and potential wildlife habitat. For the preliminary environmental review, the conceptual worst case footprint was defined by the outer limit of all conceptual alternative footprints overlaid.

The project was evaluated using the following sources:

- Geographic Information Systems (GIS) review of contamination; historic and archaeological sites; recreation and Section 4(f); land use; social; water quality; wetlands; and, wildlife and habitat using the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST).
- Review of ETDM Report 13748 for the Interchange Improvements to SR 9 (I-95) at PGA Blvd and Central Blvd.
- Review of aerials using GIS, ETDM EST, and GoogleEarth Pro.
- Field review conducted on September 29, 2014.

Based on the preliminary review of potential environmental and social impacts, there are no substantive issues that would preclude the construction of an interchange at I-95 and Central Blvd. The assessment of environmental considerations is provided below.

3.5.1 Land Use

According to the City of Palm Beach Gardens Existing Land Use Map (see Figure 3-12), the current land use along the project corridor is mainly open space/vacant land from Donald Ross Road to Hood Road. From south of Hood Road to the end of the project limits, the area is predominantly open space/vacant land, low density residential, and golf course (Old Palm Golf Club, private) land use.

The City of Palm Beach Gardens Future Land Use Map (see Figure 3-13) dated January 2014 identifies the project corridor from Donald Ross Road to Hood Road as mixed use, with a bioscience research protection overlay on the east side of I-95 (Briger Tract, see Economic section). The area from south of Hood Road to the end of the project limits is predominantly residential (low, medium and high denisities) and some mixed use with bioscience research protection overlay areas.

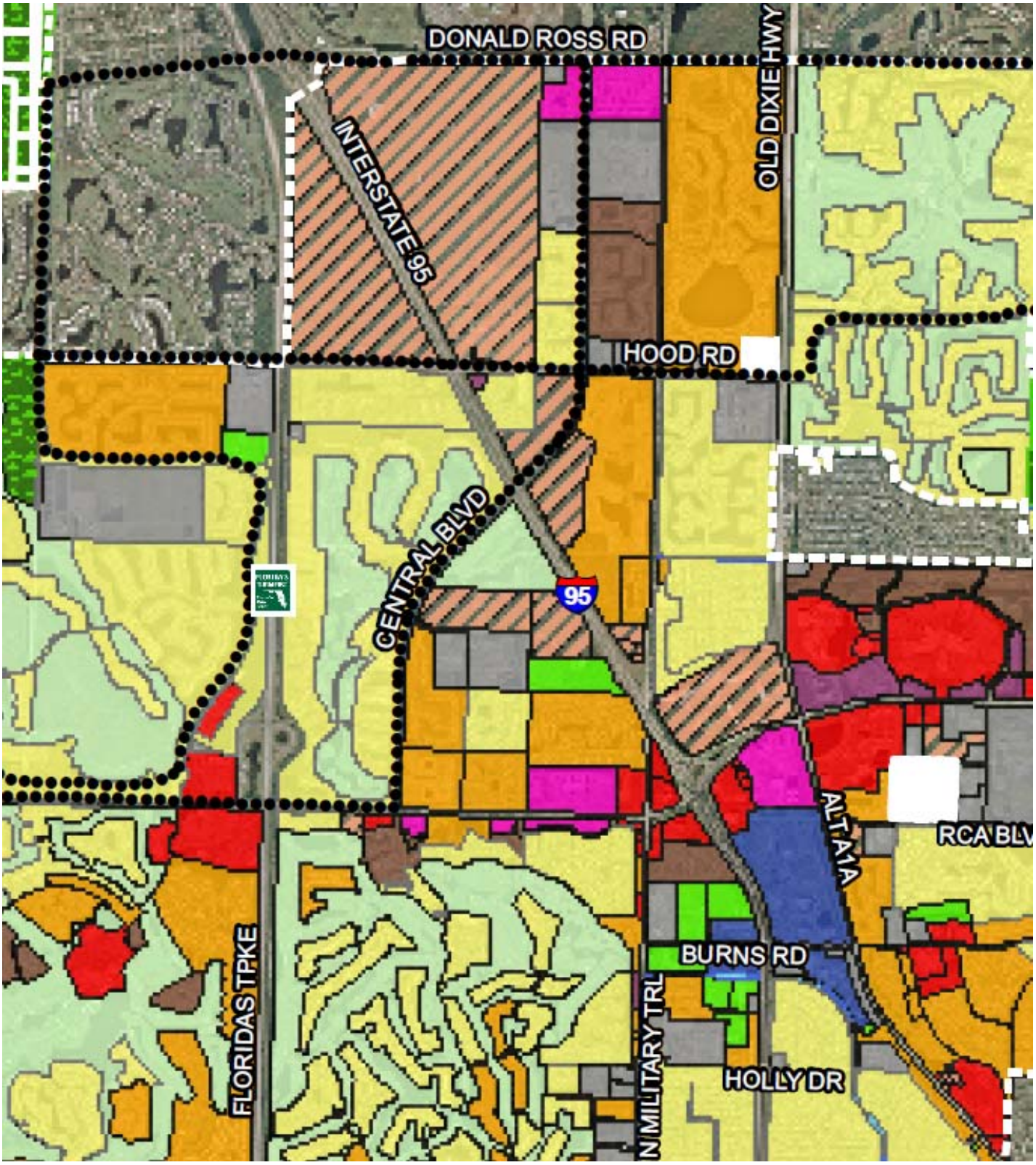
Land Use is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.2 Social

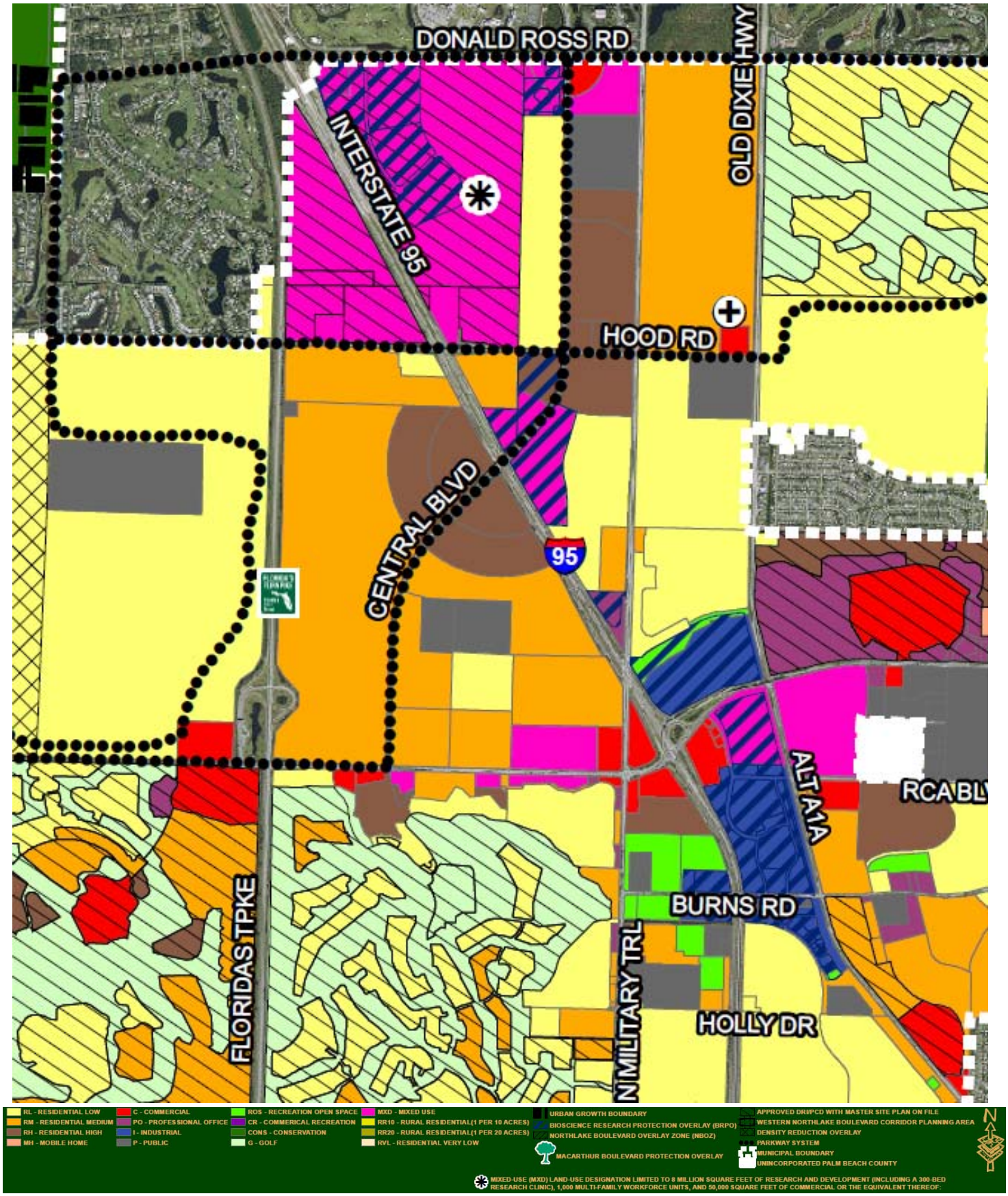
The project is located within the City of Palm Beach Gardens, FL in Palm Beach County. The northern project limit at Donald Ross Road abuts the City of Jupiter. As designated by the Florida Division of Emergency Management, I-95 serves as part of the emergency evacuation route network. I-95 is also a part of the Florida's Strategic Intermodal System (SIS) facility.

Community services within the project vicinity include educational facilities, civic facilities, and emergency services. The following community features are located within the project vicinity:

- City of Palm Beach Gardens Tennis Center, 5110 117th Ct
- Timber Trace Elementary School, 5200 117th Ct



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**EXISTING LAND USE** *Report Title:* Interchange Justification Report	*Figure No.* 3-12 *Page No.* *Date:*



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**FUTURE LAND USE** *Report Title:* Interchange Justification Report	*Figure No.* 3-13 *Page No.* *Date:*

- Nova Southeastern University, 11501 N. Military Trail
- Watson B. Duncan Middle School, 5150 117th Ct
- Mandel Jewish Community Center, 521 Hood Rd
- Palm Beach Gardens Fire Rescue Station 5, 3913 Hood Rd
- Gardens Presbyterian Church, 4677 Hood Rd
- Temple Beth David, 4657 Hood Rd
- LaBovick Law Group, 5220 Hood Rd, Palm Beach Gardens, FL
- Maids of Palm Beach, 12720 Woodmill Drive, Palm Beach Gardens, FL
- Wandering Trails Riding Academy, 5705 Hood Rd, Palm Beach Gardens, FL
- Hood Road Center, 5220 Hood Rd, Palm Beach Gdns, FL,
- Central Gardens/The Hamptons
- The Island, 238 Barbados Dr, Jupiter, FL 33458
- Abacoa Golf Club, 105 Barbados Dr, Jupiter, FL 33458
- Living Oaks Ministries, 14156 64th Dr N, Palm Beach Gardens, FL 33418
- Sunshine Tree Montessori School, 6327 Donald Ross Rd, West Palm Beach, FL 33418

In accordance with the Title VI of the Civil Rights Act of 1964 and Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency (LEP)", the project team will make every effort to reach out to disadvantaged groups. Public participation is solicited without regard to race, color, national origin, age, sex, religion, disability or family status. The project limits lie within two census tracts (2.09 and 2.14) of the 2010 Census. Demographics analysis on the two census tracts identified the following:

- Total Population: 12765
- Asian: 527
- Black: 337
- Hawaiian/Pacific Islander: 4

- Native American/American Eskimo: 27
- White: 11497
- Multi-Race: 214
- Other:159
- *Hispanic: 1359

  *includes Black and White.

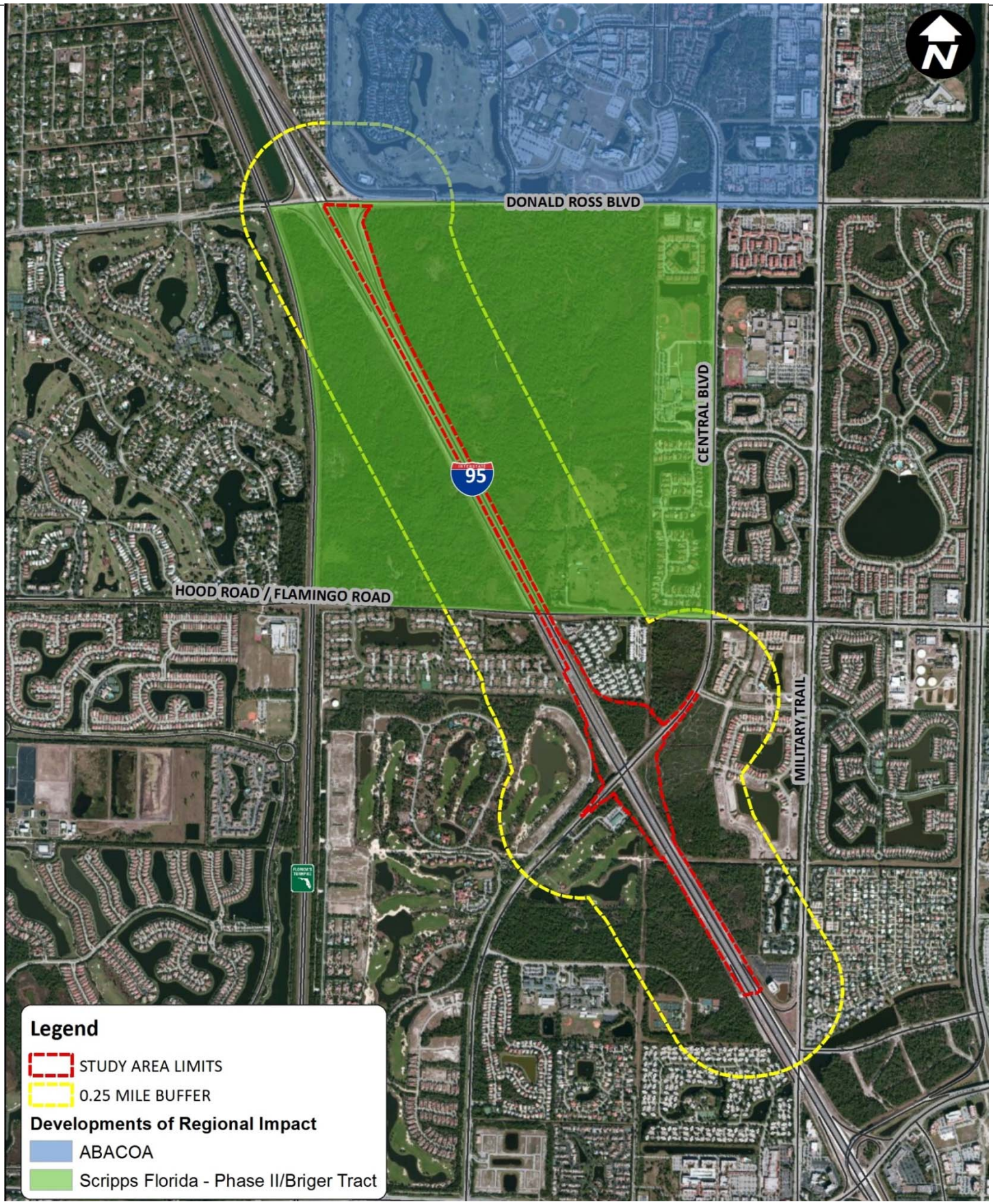
LEP analysis identified 1.83% (212) of Spanish-speakers that speak English "less than very well," 0.70% (81) of Vietnamese-speakers that speak English "less than very well", and 0.60% (70) of Chinese-speakers that speak English "less than very well." Based on this analysis, the project does not meet the 5% or 1,000 person or more criteria. Therefore, LEP accommodations are not required.

The proposed project, as presently conceived, is not anticipated to displace any residences or businesses within the community. Increases or decreases in population are not expected as a sole result of the proposed project. The population is expected to increase or decrease in response to regional factors unrelated to the project and it is anticipated that any future growth in the study area will be in accordance with the Palm Beach County Comprehensive Plan. Changes to social relationships and patterns and disruptions to community cohesion are not anticipated since the proposed project is located within an existing I-95 facility. The proposed project will provide increased mobility and access to businesses to the north near the Donald Ross Road Interchange and to the residences located to the south. Additionally, the proposed project is anticipated to enhance operational capacity and relieve congestion at the existing I-95 and PGA Blvd interchange.

Social is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.3 Economic

There are two Development of Regional Impact (DRI) within the project area: Scripps Florida – Phase 2/Briger Tract DRI and ABACOA DRI (see Figure 3-14). The Scripps Florida – Phase 2/Briger Tract DRI is located between Donald Ross Road and Hood Road on both sides of I-95. The DRI covers 682 acres and is approved for 2,700 dwelling



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**DEVELOPMENTS OF REGIONAL IMPACT** *Report Title:* Interchange Justification Report	*Figure No.* 3-14 *Page No.* *Date:*

units; 500,000 square feet (sf) of retail; 1.6 million sf of biotechnology research and development; and, 2.4 million sf of biotechnological/biomedical, pharmaceutical, ancillary office space and other related uses. According to the Treasure Coast Regional Planning Council, development of the DRI has not yet commenced. Commencement is scheduled for April 2017 and the anticipated build out date is unknown at this time.

ABACOA DRI is located north of the project limits. ABACOA DRI is located east of I-95, south of Indian Creek Parkway, west of A1A and north of Donald Ross Road. The DRI is approximately 2,055 acres and was approved for 6,325 dwelling units; 841,400 sf of retail; 1.7 million sf of workspace; 217,720 sf of office; a 7,500 seat stadium; 509 acres of open space; a 130-room hotel; and a 4,009-seat movie theater. This DRI has a scheduled build out date of 2015.

Economic is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.4 Mobility

I-95 is part of the emergency evacuation route network designated by the Florida Division of Emergency Management. The proposed project is anticipated to enhance emergency evacuation and response times by improving connectivity and accessibility to I-95 and other major arterials designated on the state evacuation route network and increasing the number of residents that can be evacuated during an emergency event through expanded operational capacity. Additionally, I-95 is a Florida's Strategic Intermodal System (SIS) facility, which is an intermodal network of transportation facilities that seamlessly flows from one mode to the next with the goal of providing the highest degree of mobility for people and goods traveling through the State of Florida.

The proposed interchange improvements aim to achieve acceptable Levels of Service (LOS) at the interchange in the future condition by accommodating future travel demand projected as a result of Palm Beach County population and employment growth. It will also allow I-95 to continue to serve as a critical arterial in facilitating the north-south movement of traffic in Southeast Florida as it connects major employment centers, residential areas, and other regional destinations between Miami-Dade, Broward and Palm Beach Counties.

Mobility is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.5 Aesthetics

The land use along the project corridor is primarily open space/vacant land with a strip of low density residential south of Hood Road and scattered individual commercial properties.

There are existing noise wall barriers on both sides of I-95, south of Hood Road. While noise and vibration related effects may be of concern to proximate residences and commercial properties, impacts to aesthetics as a result of the interchange improvements are not anticipated. Additionally, as the proposed project involves improvements on the existing I-95 facility, the improvements are perceived as being compatible and in character with the community's aesthetic values and no features that are inconsistent with the character of the community are proposed.

Aesthetics is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.6 Relocation Potential

The land use along the project corridor is primarily open space/vacant land with a strip of low density residential south of Hood Road and scattered individual commercial properties.

I-95 is currently a ten-lane divided facility (eight general use and two HOV lanes) with a functional classification of 'Urban Principal Arterial Interstate'. The I-95 right of way width varies as the corridor approaches interchanges, such as the Donald Ross Rd Interchange to the north and the PGA Boulevard Interchange to the south, but is typically between 324 to 400 feet. The interchange improvements could potentially require additional right-of-way; however, the specific right of way requirements are not known at this time and will be determined through further analysis.

Relocation Potential is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.7 Cultural Resources

At the request of the Florida Department of Transportation (FDOT), District 4 and in conjunction with BCC Engineering, Inc., Janus Research conducted a desktop analysis for the proposed I-95 at Central Boulevard interchange improvements located in Palm Beach County (Figure 1). These improvements are part of the SR 9/I-95 at PGA Boulevard/Central Boulevard Project Development and Environment (PD&E) Study (413265-1-22-01), which is both state and federally funded. The purpose of this analysis was to provide preliminary cultural resource information to assist in the avoidance of previously recorded resources listed in, determined eligible for, or considered eligible for listing the National Register of Historic Places (National Register). The intersection improvements are located in Sections 26, 35, and 36 of Township 41 South, Range 42 East and Section 1 of Township 42 South, Range 42 East on the Riviera Beach (1946, Photorevised [PR] 1983) USGS quadrangle map.

3.5.7.1 Area Of Potential Effect - The proposed project area of potential effect (APE) was determined by evaluating the improvements that will be implemented as part of the proposed project. The determination also considered the character of the area containing the project improvements. The APE for archaeological resources typically focuses upon identifying and evaluating resources within the geographic limits of the proposed action and its associated ground disturbing activities. Therefore the archaeological APE for this desktop analysis consisted of the footprint of the proposed interchange improvements within the existing ROW and the entire footprint of areas of ROW impact. Structural resources and other above ground sites are often impacted by those activities as well as alterations to setting, access and appearance. Therefore, the historic resources APE for the desktop analysis consisted of a 150-foot buffer from both the edge of the footprint of improvements within existing ROW and the areas of proposed ROW impact.

3.5.7.2 Methods - The desktop analysis included a review of the Florida Master Site File (FMSF)[1] to identify previous surveys and previously recorded archaeological and

[1] The FMSF serves as an archive and repository of information about Florida's recorded cultural resources. The FMSF is an important planning tool that assists in identifying potential cultural resources issues and resources that may warrant further investigation and protection. It can be used as a guide but should not be used to determine the Florida Division of Historical Resources'/State Historic Preservation Office's (FDHR/SHPO) official position about the significance of a resource.

historic resources within the proposed project APE. A review of Palm Beach County Property Appraiser records was also conducted to identify the potential for unrecorded historic resources[2].

3.5.7.3 Results - A search of FMSF data identified four previously conducted cultural resource surveys that intersect the project APE (Table 3.12). The project improvements located within the existing I-95 ROW, as well as those improvements located within 100 feet of the centerline of I-95 were surveyed for archaeological and historic resources in 2000 as part of the *Cultural Resource Assessment Survey of I-95 (SR 9) from PGA Boulevard (SR 786) to Indiantown Road (SR 706) in Palm Beach County Florida* (FMSF Survey Manuscript 6001). The survey identified no cultural resources within or adjacent to I-95.

Table 3.12. Previously Conducted Surveys Intersecting the Project Corridor

Survey #	Title	Author(s)	Publication Date
6001	CRAS of I-95 (SR 9) from PGA Boulevard (SR 786) to Indiantown Road (SR 706) in Palm Beach County Florida	Estabrook, Richard and Lucy Jones	2000
10660	An Archaeological and Historical Assessment of the Paloma Parcel, Palm Beach County, Florida	Carr, Robert S. and Victor Longo	2004
14000	Cultural Resources Reconnaissance Study South Florida East Coast Corridor Transit Analysis Miami-Dade, Broward and Palm Beach Counties	Janus Research	2006
15852	A Cultural Resource Survey of the Briger Parcel, Palm Beach County, Florida	Beriault, John G., Robert S. Carr, and Ryan Franklin	2008

[2] Please note that a comprehensive land use history and the development of archaeological probability models was beyond the scope of this desktop analysis.

A search of the FMSF identified no previously recorded archaeological sites or historic resources within the APE for the current project. The FMSF also indicated that no subsurface testing has been conducted within the areas of the proposed improvements located outside of the APE established for the 2000 CRAS (FMSF Survey Manuscript 6001).

A search of property appraiser data identified one parcel with an historic actual year built (AYRB) date: 5212 Hood Road. This resource was formerly located on a parcel adjacent to the existing ROW containing the proposed improvements. While the property appraiser data shows this parcel has an AYRB date of 1954, a review of modern aerials found that the potentially historic structure located on this parcel was demolished between March 21, 2011 and January 18, 2014.

3.5.7.4 Summary - The desktop analysis identified no previously recorded archaeological sites or historic resources within the APE proposed for the two interchange improvement alternatives. The review of the Palm Beach County Property Appraiser data identified one parcel with a potential historic structure within the historic resources APE for all of the interchange improvement alternatives, but a review of modern aerials show that this structure is no longer extant.

Cultural Resources is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.8 Section 4(f)

Three recreational properties are located adjacent to the west side of I-95. From north to south, these properties include the Old Palm Golf Club - a private golf club located on both sides of Hood Road, Palm Beach Gardens District Nature Park, and the City of Palm Beach Gardens Tennis Center. Wandering Trails Riding Academy, a privately owned equine facility, is located in the northeast quadrant of the I-95 and Hood Road Interchange. Additionally, existing trails are apparent in the southeast quadrant of the I-95 and Central Blvd intersection. Further coordination with the City of Palm Beach Gardens and Palm Beach County will be required during the PD&E Study to determine the recreation designation status of these trails. Due to the proposed interchange improvements adjacent to these facilities, a Section 4(f) Determination of Applicability

(DOA) will be prepared during the PD&E Phase to evaluate any potential direct and/or indirect impacts to the recreational facilities.

Section 4(f) is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.9 Wetlands and Other Surface Waters

Wetland areas were identified through the review of aerial photography, GIS layers from the South Florida Water Management District (SFWMD), the Natural Resources Conservation Service (NRCS) and U.S. Geological Survey (USGS), and a field review on September 29, 2014. The wetland review identified swales dominated by hydrophytic vegetation within the existing right-of-way and wetlands outside of the existing right of way, including within the potential footprint of the new interchange (Figure 3-15, Wetlands). The man-made swales may have a hydrologic regime conducive to the development of hydric soil indicators, but provide minimal habitat support due to their disturbed nature and location within a transportation facility. The wetland areas are generally isolated pockets scattered within the pine flatwoods adjacent to the I-95 corridor. These wetland areas provide more suitable habitat for wetland dependent species. Additionally, the project corridor crosses a local drainage canal (Other Surface Water) just south of the I-95/Central Boulevard intersection. Wetlands will be further evaluated and delineated during the PD&E Phase, as warranted by the alternatives.

Design concepts will require the implementation of avoidance and minimization measures to reduce the potential wetland impacts to the greatest extent practicable. Any unavoidable wetland impacts will require compensatory mitigation. The SFWMD does not require mitigation for impacts to man-made features. However, USACE requires mitigation for any impacts to jurisdictional man-made areas, such as swales, within the right of way. Such impacts may be offset through the creation of man-made features that provide a similar functional value. Mitigation will be required for any unavoidable wetland impacts. Mitigation for wetland impacts can be accomplished through wetland creation, enhancement, preservation, purchase of mitigation credits from an approved mitigation bank or a combination of these options. The mitigation banks that service the project area include Bluefield Ranch Mitigation Bank, Loxahatchee Mitigation Bank and the Dupuis Natural Area, which offer both freshwater herbaceous and forested mitigation credits.

Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**WETLANDS** *Report Title:* Interchange Justification Report	*Figure No.* 3-15 *Page No.* *Date:*

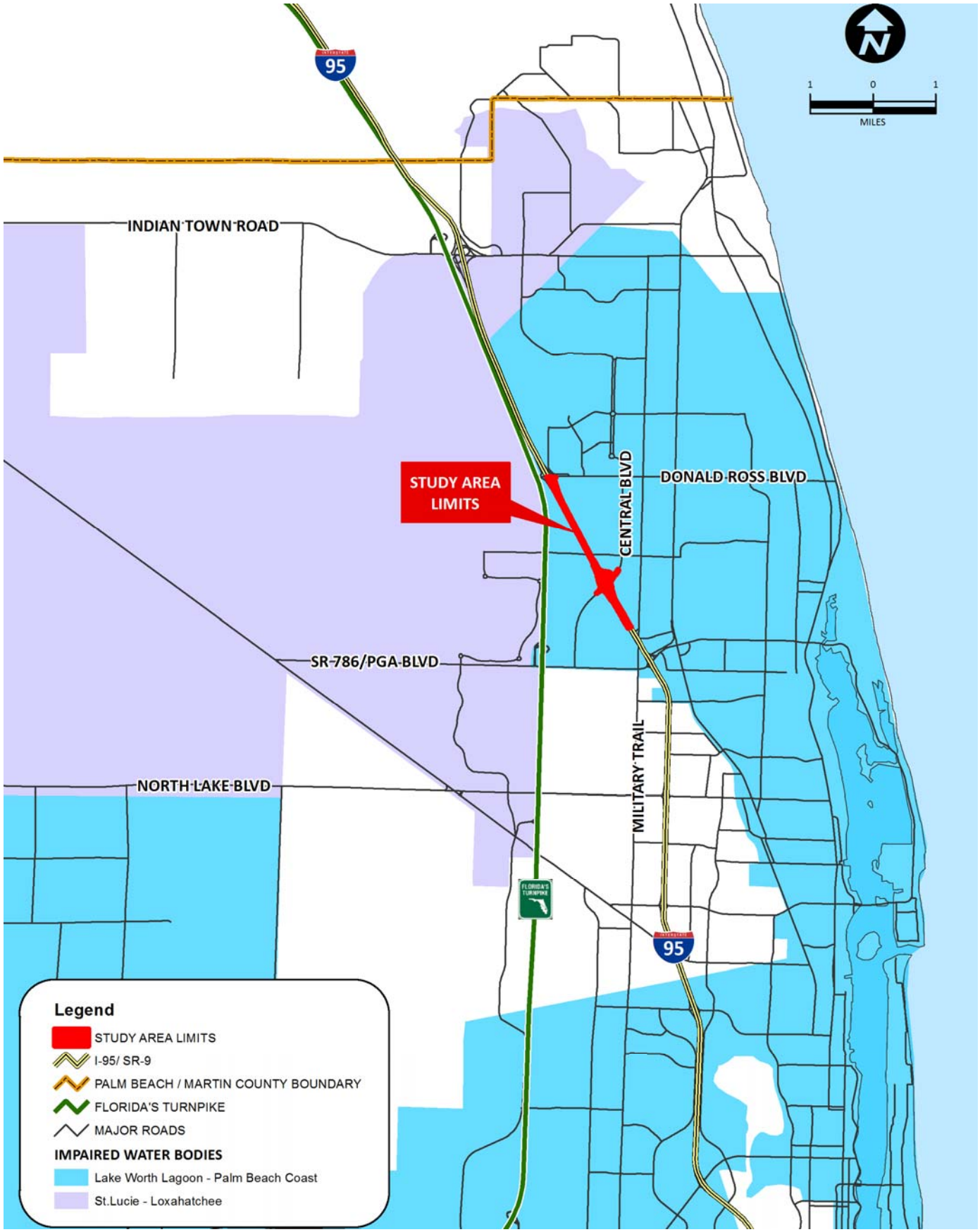
The project area is within the Core Foraging Area (CFA) of one wood stork (Myceteria americana) nesting colony (Figure 3-15), as further described in the Wildlife and Habitat section below. Impacts to wetlands and other surface waters may require mitigation for impacts to wood stork foraging habitat. The U.S. Fish and Wildlife Service (USFWS) generally accepts wetland mitigation credits to offset impacts to suitable foraging habitat and may require completion of a wood stork biomass calculation to ensure adequate compensation.

Wetlands is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.10 Water Quality

The project will increase the impervious area and impact the existing drainage system. The four existing Environmental Resource Permits within the project area that may be affected. Existing storm water adequacy, as well as the proposed storm water design, will require evaluation and coordination with the SFWMD during the PD&E Phase. At a minimum, the proposed storm water facility design must meet the water treatment and attenuation requirements set forth by the SFWMD. The area immediately surrounding the project is largely undeveloped providing ample area for storm water management ponds. Therefore no constructability issues are anticipated. Although there are no impaired waterbody segments within the project limits, the project is within the Lake Worth Lagoon – Palm Beach Coast impaired watershed (see Figure 3-16, Water Quality). Nutrient loading will be evaluated during the PD&E Study. The project corridor is not within any zone of the 100-year floodplain.

The project is located within the recharge area of the Biscayne Aquifer, a sole source aquifer. Therefore, coordination with the Environmental Protection Agency will be required in accordance with the Sole Source Aquifer Memorandum of Understanding, pursuant to Section 1424(e) of the Safe Drinking water Act. The project is not within an aquatic preserve, Outstanding Florida Water (OFW), or any other special designation as noted on the Water Quality Impact Evaluation (WQIE) checklist. The WQIE checklist will be further developed during PD&E to document avoidance and minimization strategies.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**WATER QUALITY** Impaired Water Bodies *Report Title:* Interchange Justification Report	*Figure No.* 3-16 *Page No.* *Date:*

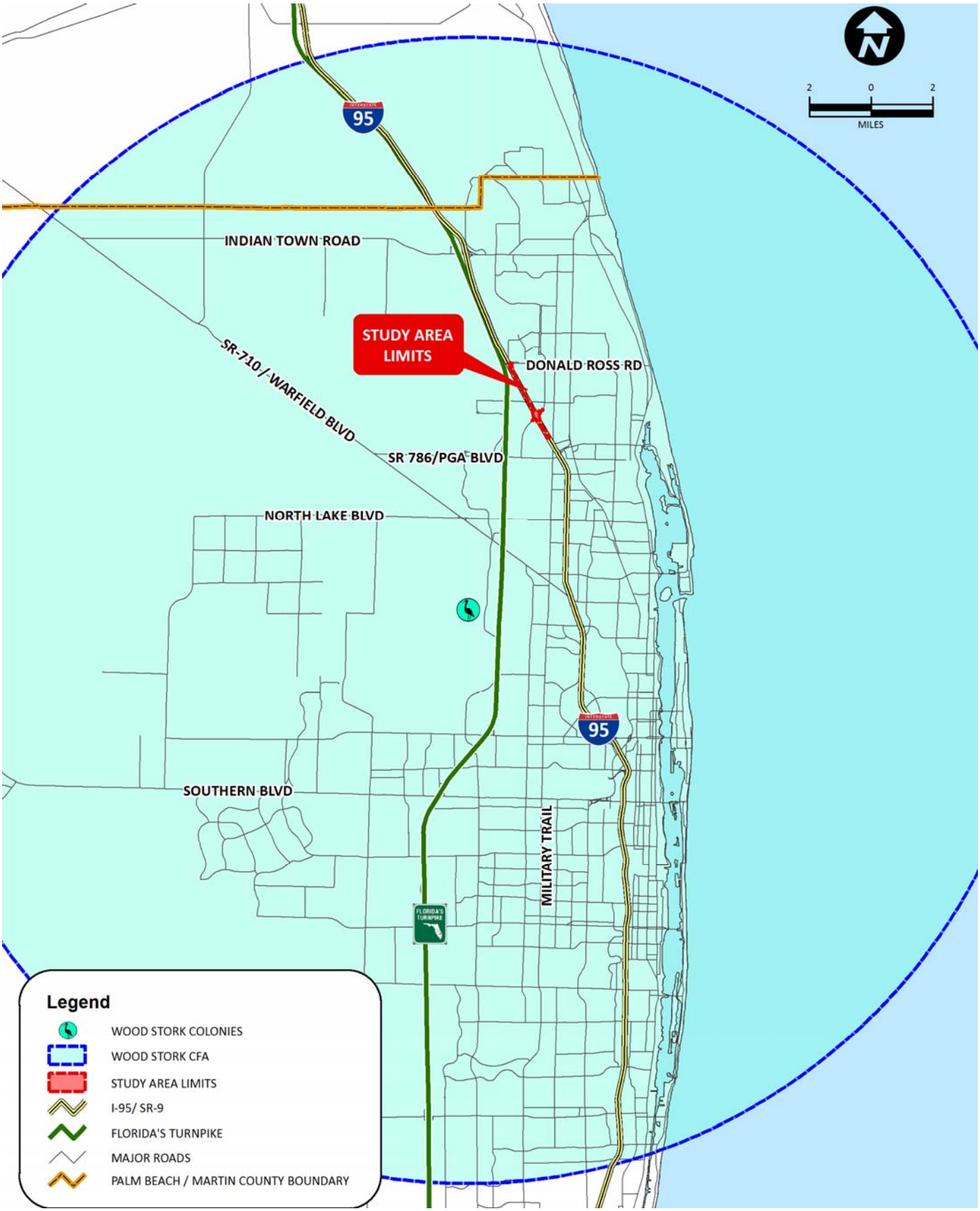
I-95 corridor crosses a local drainage district canal approximately 1,500 feet south of Central Blvd. The Contractor will be required to adhere to the FDOT Standard Specifications for Road and Bridge Construction and National Pollutant Discharge Elimination System (NPDES) regulations, as well as implement all appropriate Best Management Practices (BMPs) during construction to ensure the project does not result in the degradation of surface waters or wetlands beyond any permitted impacts. A Storm Water Pollution Prevention Plan (SWPPP) must be developed in accordance with Chapter 62-621 Florida Administrative Code (FAC) and included in the design.

Water Quality is unlikely to be a substantial issue that would prevent the project from being constructed.

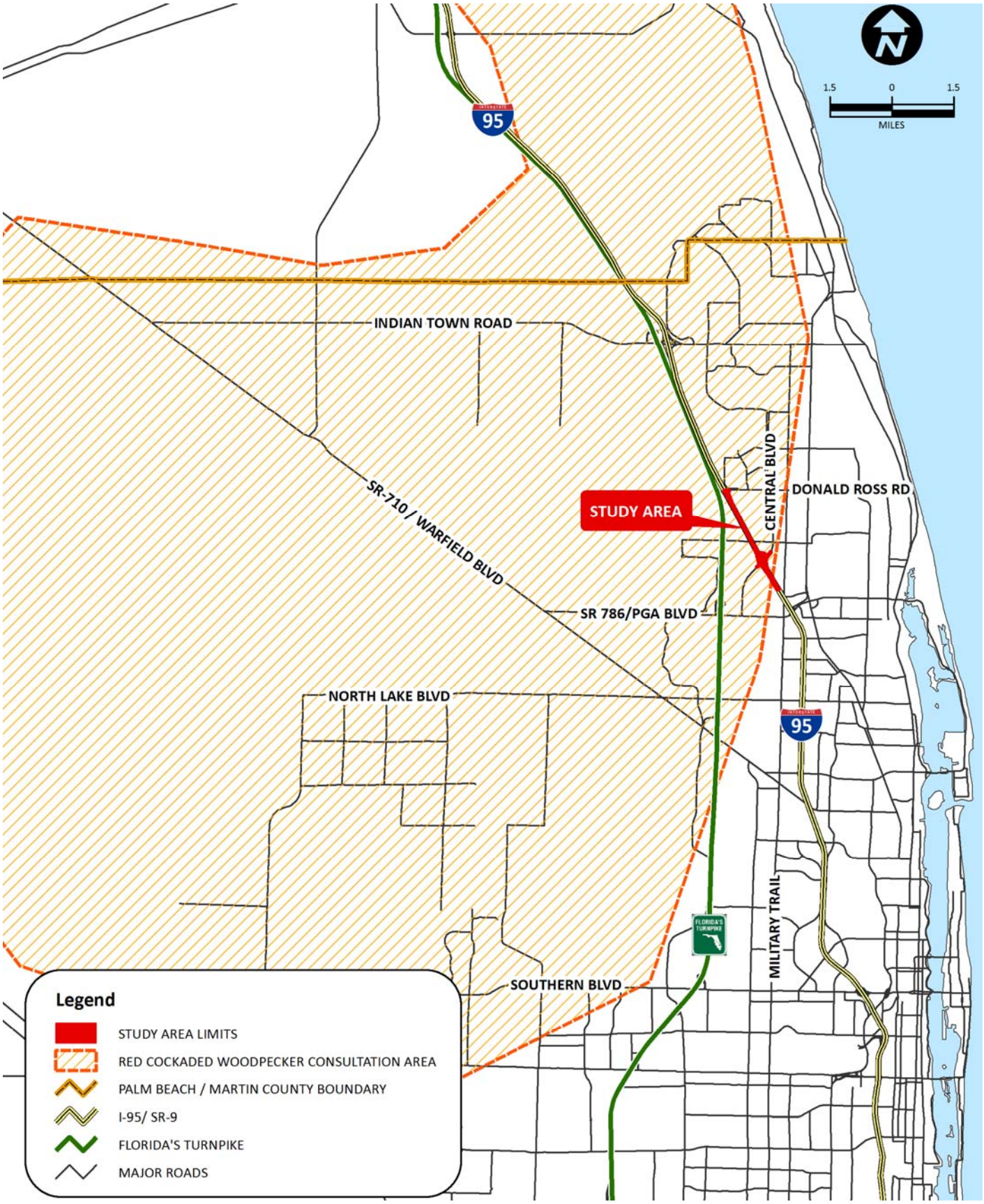
3.5.11 Wildlife & Habitat

3.5.11.1 Wood Stork - The project area is within the CFA of one wood stork (Myceteria americana) nesting colony (Figure 3-17). The USFWS has designated the 18.6 mile radius around active wood stork colonies as CFA. Impacts to wetlands and other surface waters may require mitigation for impacts to wood stork foraging habitat. The "Wood Stork Foraging Analysis Methodology" and the "Wood Stork Effect Determination Key" will be used to assess the potential of the project to affect wood stork CFA. Mitigation is typically required for the loss of suitable foraging habitat (SFH) within a CFA. USFWS generally accepts wetland mitigation credits to offset impacts to suitable foraging habitat and may require completion of a wood stork biomass calculation to ensure adequate compensation. There is suitable wood stork habitat within the project limits. However, all impacts will be mitigated as necessary. Therefore, no substantial issues with the wood stork are anticipated.

3.5.11.2 Red Cockaded Woodpecker - The project area is within the consultation area of the red cockaded woodpecker (Picoides borealis) (Figure 3-18). The red-cockaded woodpecker was federally listed as endangered in 1970 and is currently classified as threatened by the State of Florida. The red cockaded woodpecker inhabits open, mature pine woodlands that have a diversity of grass, forb, and shrub species and generally occupies mixed longleaf pine and slash pine in south-central Florida. No suitable habitat for the red-cockaded woodpecker has been identified within or immediately adjacent to the study area. No substantial issues with the red-cockaded wood peckers are anticipated.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**WOOD STORK** Core Foraging Area (CFA) *Report Title:* Interchange Justification Report	*Figure No.* 3-17 *Page No.* *Date:*



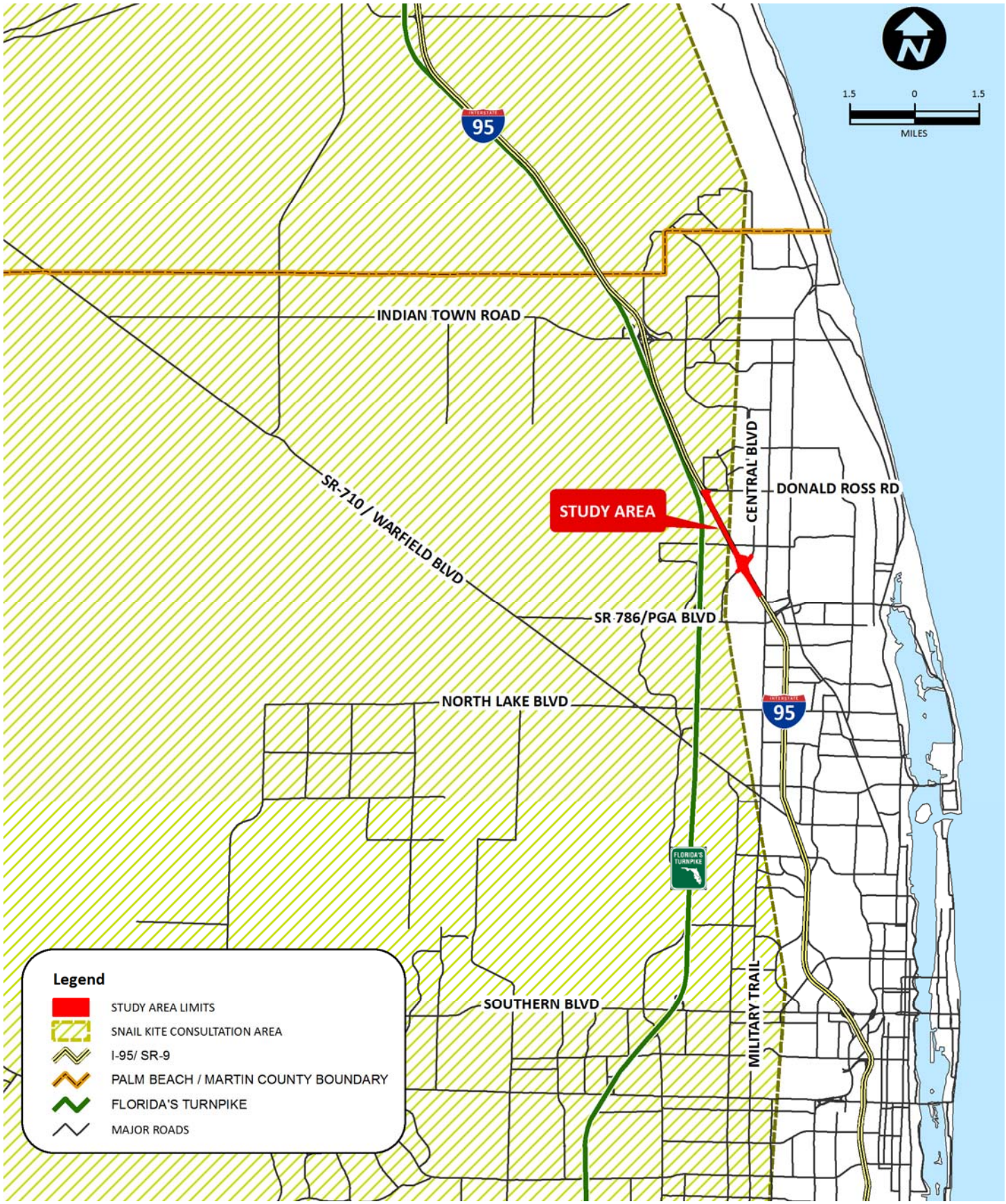
Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**RED COCKCADED WOODPECKER** CONSULTATION AREA *Report Title:* Interchange Justification Report	*Figure No.* 3-18 *Page No.* *Date:*

3.5.11.3 Everglade Snail Kite - The project area is within the consultation area of the Everglade snail kite (Rostrhamus sociabilis plumbeus) (Figure 3-19). The Everglade snail kite is a raptor species that was first listed as endangered pursuant to the Endangered Species Conservation Act in 1967. Snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes (natural and man-made) where apple snails can be found. The project area does not provide suitable habitat for the Everglade snail kite. No substantial issues with the snail kite are anticipated.

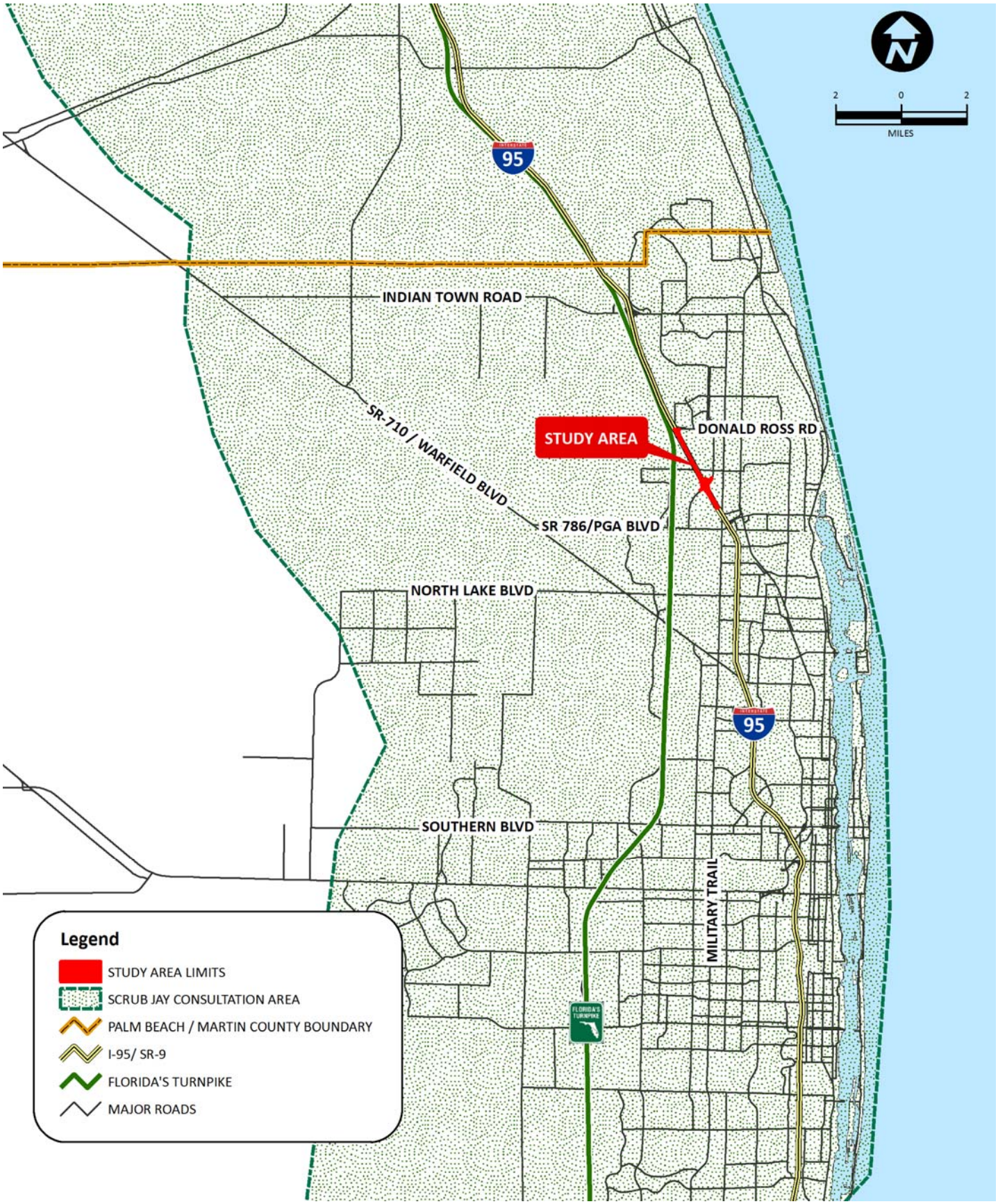
3.5.11.4 Florida Scrub Jay - The project area is within the consultation area of the Florida scrub jay (Aphelocoma coerulescens) (Figure 3-20). The Florida Scrub-jay inhabits fairly open scrub habitat occurring within well-drained sandy soils. These birds may persist in areas with sparser oak or scrub areas that are overgrown, but at lower densities and reduced survivorship. Scrub-jays are extremely habitat-specific, sedentary, and territorial. No suitable habitat for the Florida scrub jay has been identified within or immediately adjacent to the study area. No substantial issues with the scrub jay are anticipated.

3.5.11.5 Eastern Indigo Snake - The eastern indigo snake is a large, black, nonvenomous snake found in the southeastern U.S. There is no designated critical habitat for the eastern indigo snake, but it is widely distributed throughout central and South Florida. The eastern indigo snake frequents several habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, and edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. There is suitable habitat for the eastern indigo snake within the project limits. Potential project effects will be evaluated using the USFWS Eastern Indigo Snake Effect Determination Key. No substantial issues with eastern indigo snakes are anticipated.

3.5.11.6 Gopher Tortoise - Gopher tortoises are long-lived reptiles that occupy upland habitat throughout Florida including forests, pastures, and yards. They dig deep burrows for shelter and forage on low-growing plants. Gopher tortoises share these burrows with more than 350 other species, and are therefore referred to as a keystone species. The Gopher Tortoise is candidate species for listing by the USFWS and is listed as a threatened species by the State of Florida. If tortoises are found and cannot be avoided, it would not likely have a substantial effect on the project. Tortoises relocations can be permitted and performed immediately prior to construction activities. The minimum protective buffer zone for a gopher tortoise burrow is 25 feet.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**EVERGLADE SNAIL KITE** CONSULTATION AREA *Report Title:* Interchange Justification Report	*Figure No.* 3-19 *Page No.* *Date:*



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**FLORIDA SCRUB JAY** CONSULTATION AREA *Report Title:* Interchange Justification Report	*Figure No.* 3-20 *Page No.* *Date:*

Any construction within 25 feet of a burrow would require a permit from the Florida Fish and Wildlife Conservation Commission (FWC) to relocate the tortoise. A gopher tortoise survey would be required within 60 to 90 days of construction (to be valid for permitting, the survey must be done no earlier than 90 days prior construction). Gopher tortoise burrows were not observed during the preliminary field review conducted by Stantec on September 29, 2014; however, suitable habitat is present. No substantial issues with the gopher tortoise are anticipated.

3.5.11.7 Tiny Polygola - Tiny polygola (Polygala smallii) is in the family Polygalaceae, commonly referred to as the milkworts. It was once thought to be endemic to Miami-Dade and Broward counties, but recent surveys have extended its range to southern St. Lucie County. The only known populations occur in sand pockets of pine rocklands, open sand pine scrub, slash pine, high pine, and well-drained coastal spoil. Within these habitats, it requires high light levels and open sand with little to no organic litter accumulation. The survival and recovery of Polygala smallii is threatened by habitat loss from urban development, fire suppression, and exotic plant infestation. Tiny polygola habitat is present along the project corridor but was not observed during the preliminary field review. No substantial issues with the tiny polygola are anticipated.

3.5.11.8 Other Protected Wildlife Species - No wading birds, nesting activities, or wading bird rookeries were observed during the field survey. However, listed wading bird species could potentially utilize corridor habitats and surface waters for foraging. Listed wading bird species that could potentially utilize the project corridor include the little blue heron (Egretta caerulea), white ibis (Eudocimus albus), tri-colored heron (Egretta tricolor), snowy egret (Egretta thula), and roseate spoonbill (Platalea ajaja). These wading bird species are listed as species of special concern (SSC) by the Florida Fish and Wildlife Conservation Commission (FWC). Any associated impacts to potential foraging habitat within the surface waters would be appropriately mitigated, proving no net loss of wading bird habitat and no adverse impact.

Wildlife is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.11.9 Permits - Based on the proposed improvements, the following regulatory authorizations are anticipated to be required:

- U.S. Army Corp of Engineers, Dredge and Fill Permit

- SFWMD Environmental Resource Permit (ERP)
- SFWMD Water Use Permit
- FDEP National Pollutant Discharge Elimination System (NPDES) Permit
- Local Drainage District permit
- FWC Gopher Tortoise Permit (if warranted)

Permits is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.11.10 Farmlands - There are farmlands of unique importance in proximity to the project, but there are no active farmlands within the project area. Furthermore, the project is located entirely within the City of Palm Beach Gardens urbanized area. The existing and future land use maps from the City of Palm Beach Gardens' Comprehensive Plan show no agricultural land within the project vicinity.

Through coordination with the Natural Resources Conservation Service (NRCS) via ETDM, it has been determined that the project area which is located within the urbanized area of the City of Palm Beach Gardens does not meet the definition of farmland as defined in 7 CFR 658. Therefore, the provisions of the Farmland Protection Policy Act of 1984 do not apply to this project.

This project will have no involvement with Farmlands.

3.5.12 Noise

The I-95 study area contains a number of properties that could be considered noise sensitive receptors. Noise sensitive receptors are defined as "Any property (owner occupied, rented, or leased) where frequent exterior human use occurs and where a lowered noise level would be of benefit. In those situations where there are no exterior activities to be affected by the traffic noise, the interior of the building shall be used to identify a noise sensitive receiver."

The land uses adjacent to the I-95 corridor include single family residential, multi family residential, commercial/retail, recreational and vacant land. For a new interchange at Central Boulevard and I-95 the most significant considerations would be the residential

properties. As shown on Figure 3-21 several noise sensitive receptors are located within the study area. With the potential addition of auxiliary lanes from Northlake Boulevard to PGA Boulevard(westside only) and PGA Boulevard to Donald Ross Road varying on both sides of I-95, residential properties could be impacted. In particular residential development along I-95 from Northlake Boulevard to PGA Boulevardand at the northeast and southeast quadrants of the Central Boulevard overpass of 1-95 warrant consideration. A substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed. This may be the case in the locations shown on Figure 3-19 in yellow.

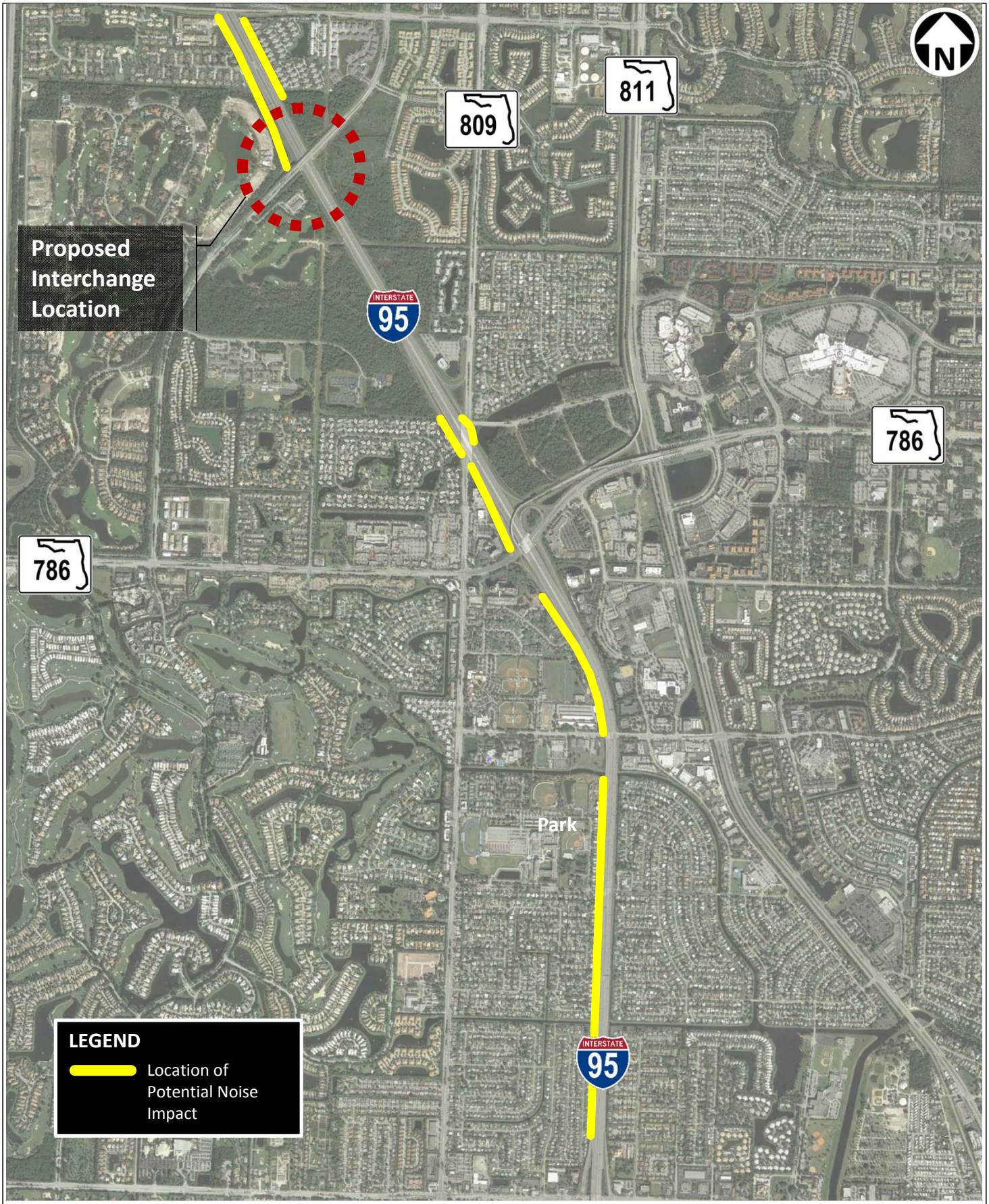
In order to determine if in fact a substantial noise increase will occur and to determine if noise abatement measures are necessary adjacent to the 1-95 mainline and ramps a noise study must be completed during the NEPA phase of the project. These potential impacts will be evaluated and avoided to the maximum extent practicable during the PD&E phase, and will be addressed in the Noise Study Report for the project.

The Noise Study will propose mitigation for any unavoidable noise impacts, which will likely consist of the construction of noise barrier walls between the mainline and/or ramps and noise sensitive receptors, where feasible. **The potential noise impacts associated with this project are not anticipated to be significant.**

3.5.13 Air

The State of Florida, including Palm Beach County, is currently in attainment for all of the National Ambient Air Quality Standards (NAAQS) under the criteria provided in the Clean Air Act. Therefore, the Clean Air Act conformity requirements do not apply to this project at this time and project level air quality analysis is not necessary for the project.

Temporary, short-term air quality impacts may occur within the immediate vicinity of the project due to construction vehicle exhaust and dust from earthwork. Such emissions shall be controlled in accordance with the FDOT Standard Specifications for Road and Bridge Construction. **Air is unlikely to be a substantial issue that would prevent the project from being constructed.**



Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	**POTENTIAL NOISE SENSITIVE SITES**	*Figure No.* 3-21
	Report Title: Interchange Justification Report	*Date:* 10/6/14

3.5.14 Construction Impact Analysis

Construction activities for the proposed project may generate air, noise, vibration, water quality, and visual impacts of a temporary nature for those businesses and residents within the immediate project vicinity. As discussed in the individual impact sections above, the Contractor will adhere to the measures outlined in the latest edition of the FDOT Standard Specifications for Road and Bridge Construction. The removal of structures and debris will be in accordance with local and State regulation agencies permitting this operation. The Contractor is responsible for methods of controlling pollution on haul roads, in borrow pits, other material pits, and areas used for disposal of waste materials from the project. Temporary erosion control features as specified in Section 104 of the FDOT Standard Specifications for Road and Bridge Construction may consist of temporary grassing, sodding, mulching, sandbagging, slope drains, sediment basins, sediment checks, artificial coverings, and berms.

During construction, the safety and mobility of both vehicular and pedestrian traffic must be ensured, and impacts to transit and businesses must be minimized. The sequence of construction will be planned in such a way as to minimize traffic delays. The Design-Build Firm will be required to develop and implement a traffic control plan for the construction of the proposed improvements. Temporary lane closures may be required and will be limited to off-peak hours. The local news media will be notified in advance of road closings and other construction-related activities, which could excessively inconvenience the community so that business owners, residents, and/or tourists in the area can plan travel routes in advance. A sign providing the name, address, and telephone number of an FDOT contact person will be displayed on-site to assist the public in obtaining answers to questions or complaints about project construction.

Construction Impact is unlikely to be a substantial issue that would prevent the project from being constructed.

3.5.15 Contamination

Contamination sites were identified based on a review of the Palm Beach County (PBC), Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) GIS geodatabases. Table 3-13 below summarizes the queried:

Table 3-13. Queried GIS Geodatabases

Source Agency	Database/Layer Name	Distance
FDEP	Drycleaners	500 ft
FDEP	STCM	500 ft
FDEP	TSDS	500 ft
FDEP	State Cleanup Sites	500 ft
EPA	RCRA	500 ft
EPA	Superfund	1.0 Mi
PBC	RP Tanks	500 ft
PBC	RP SWA Sites	0.25 Mi

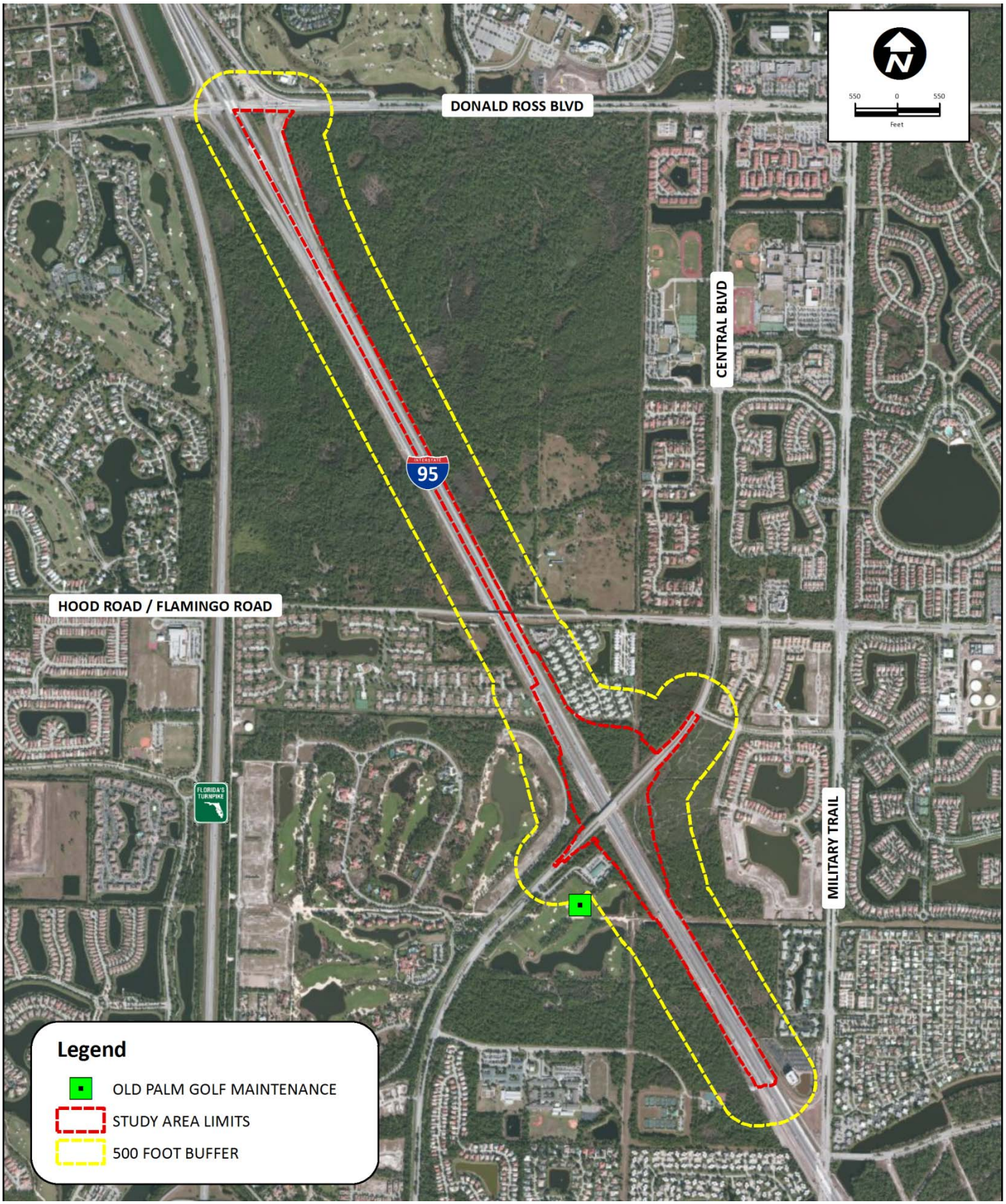
One potential contaminated site was identified within 500 feet from the project corridor (see Figure 3-22 Contamination Map):

- Old Palm Golf Maintenance, 11962 Central Boulevard, Palm Beach Gardens 33410; FDEP Facility Id. 9806455

The site is an active petroleum user, utilizing one (1) 2,000 gallon above ground storage tank (AST). Based on a preliminary review of agency files for the site, there have been no reported discharges for this facility. A detailed Level I Contamination Assessment will be prepared during the PD&E phase to determine the extent of potential contamination involvement for the project.

The Contractor shall be required to abide by the provisions (Subarticle 120-1.2 of Section 120, Excavation and Embankment) of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction – "Unidentified Areas of Contamination". In event that any hazardous materials or suspected contamination is encountered during construction, or if any spill of hazardous materials occurs during construction, the Contractor shall stop work immediately and notify the project's Construction Project Manager who will coordinate with the District Contamination Impact Coordinator.

Contamination is unlikely to be a substantial issue that would prevent the project from being constructed.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**POTENTIAL CONTAMINATION** *Report Title:* Interchange Justification Report	*Figure No.* 3-22 *Page No.* *Date:*

3.5.16 Class of Action

The Class of Action for the proposed interchange at I-95 and Central Blvd is anticipated to be a Categorical Exclusion Type 2 in accordance with Part 1, Chapter 2 of the PD&E Manual.

4.0 FUTURE CONDITIONS ANALYSES

The No-Build Alternative describes the conditions that will exist for the study area if no improvements are considered except for planned/committed improvements.

The only addition to existing lane calls within the study area for the future No-Build analyses was the improvement of Hood Rd. to a four lane section (FY17). Existing signal timing and phasing were preserved in all intersections.

4.1 Committed Improvements

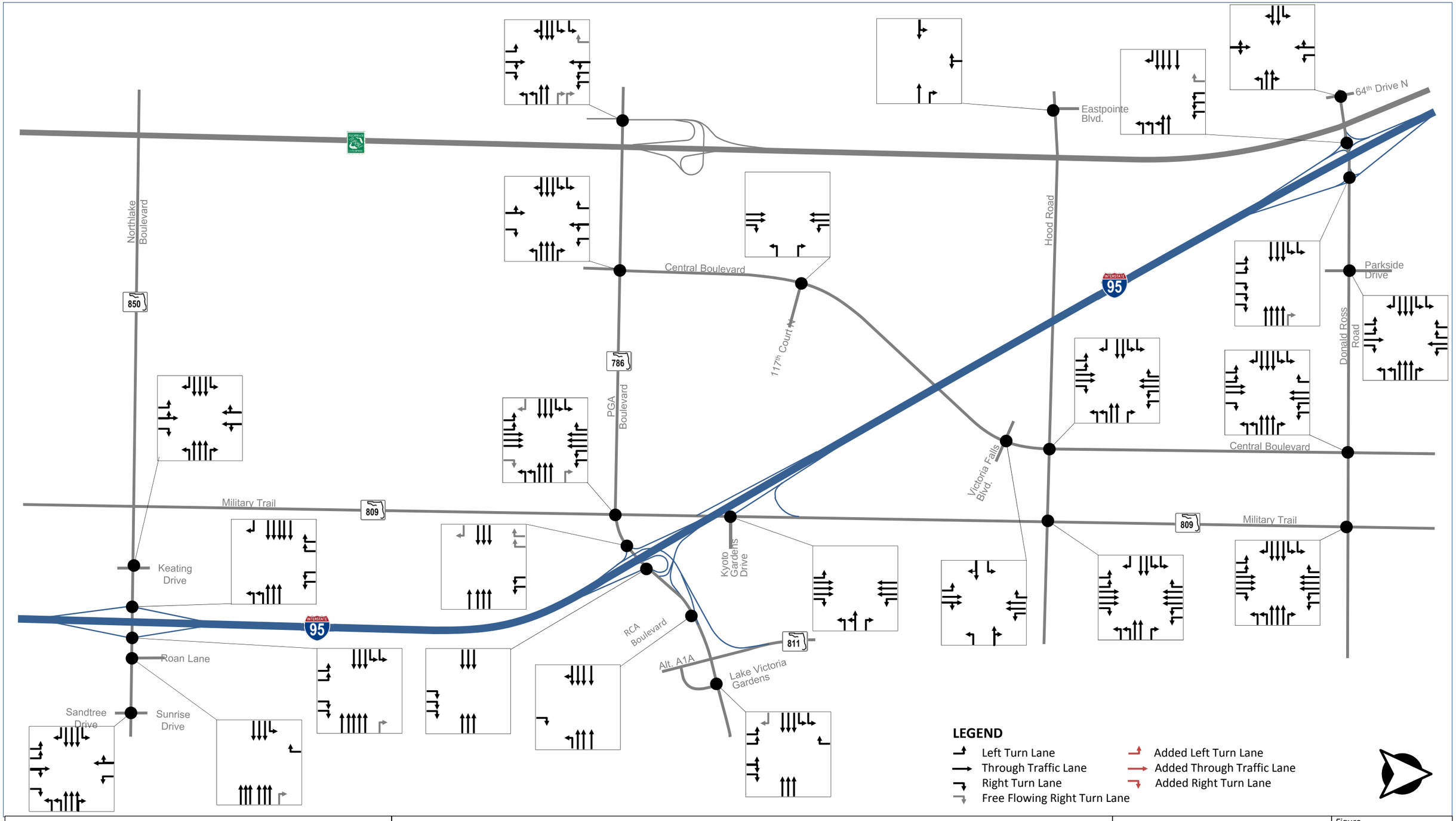
The following improvements to existing conditions were included in the No-Build intersection geometries:

1 Interchange of I-95 at Donald Ross Road: At the SB ramp intersection, add a SB left turn lane and allow left turns from inside WB through lane. At the NB ramp intersection, add a NB right turn lane and an additional EB through lane (FY15).
2 Northlake Boulevard at Military Trail intersection: add a WB right turn lane (FY16).
3 PGA Boulevard at Military Trail intersection: add a SB right turn lane (FY16).
4 PGA Boulevard at Turnpike interchange: add an EB left turn lane, a WB left turn lane and a WB right turn lane (FY16).
5 Hood Road at Central Boulevard intersection: add a SB right turn lane, a SB left turn lane, a NB right turn lane and a NB left turn lane and (FY18).

The work program excerpts, Donald Ross Rd. IOAR excerpt and email correspondence used to confirm this information is in Appendix G.

4.2 No Build Lane Geometries

Figure 4-1 depicts the intersection lane geometry used for all the future No-Build analyses, incorporating the funded improvements listed above.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**No Build 2020, 2030, 2040 Intersection Lane Geometry**	*Report Title:* Interchange Justification Report	*Figure No.* 4-1
			Page No.
			Date:

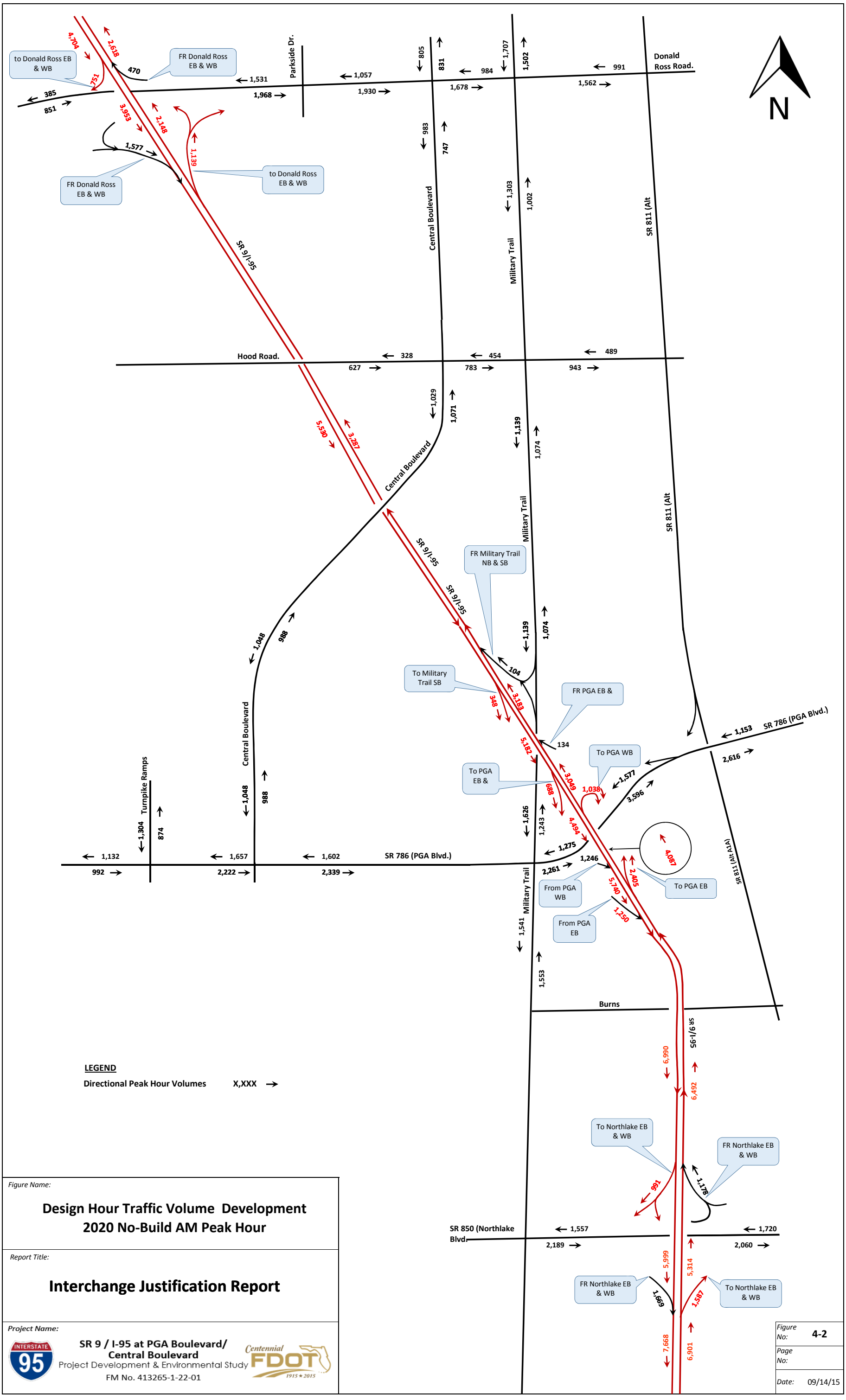
4.3 Future No Build Design Traffic Volumes

Appendix V contains the future No Build peak hour volume development worksheets. The process to develop the No Build volumes was described in Section 2.7.

Appendices W through AB contain the future No Build turning movement development work sheets.

Figures 4-2 through 4-7 depict the peak hour directional volumes: 2020 AM, 2030 AM, 2040 AM, 2020 PM, 2030 PM, and 2040 PM respectively.

Figures 4-8 through 4-13 depict the turning movements for all intersections: 2020 AM, 2030 AM, 2040 AM, 2020 PM, 2030 PM, and 2040 PM respectively.



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2020 No-Build AM Peak Hour

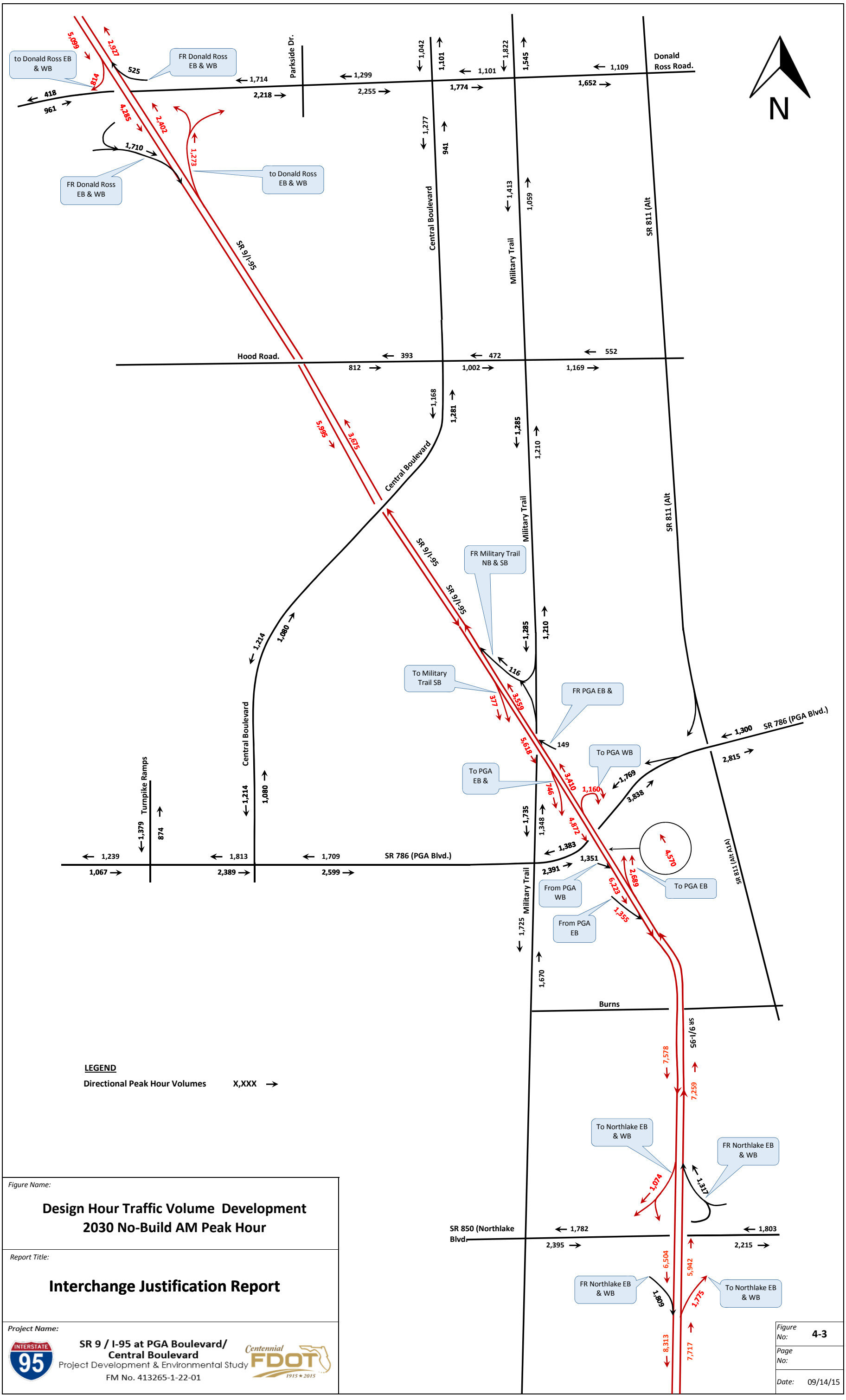
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**4-2**
Page No:	
Date:	09/14/15



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Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2030 No-Build AM Peak Hour

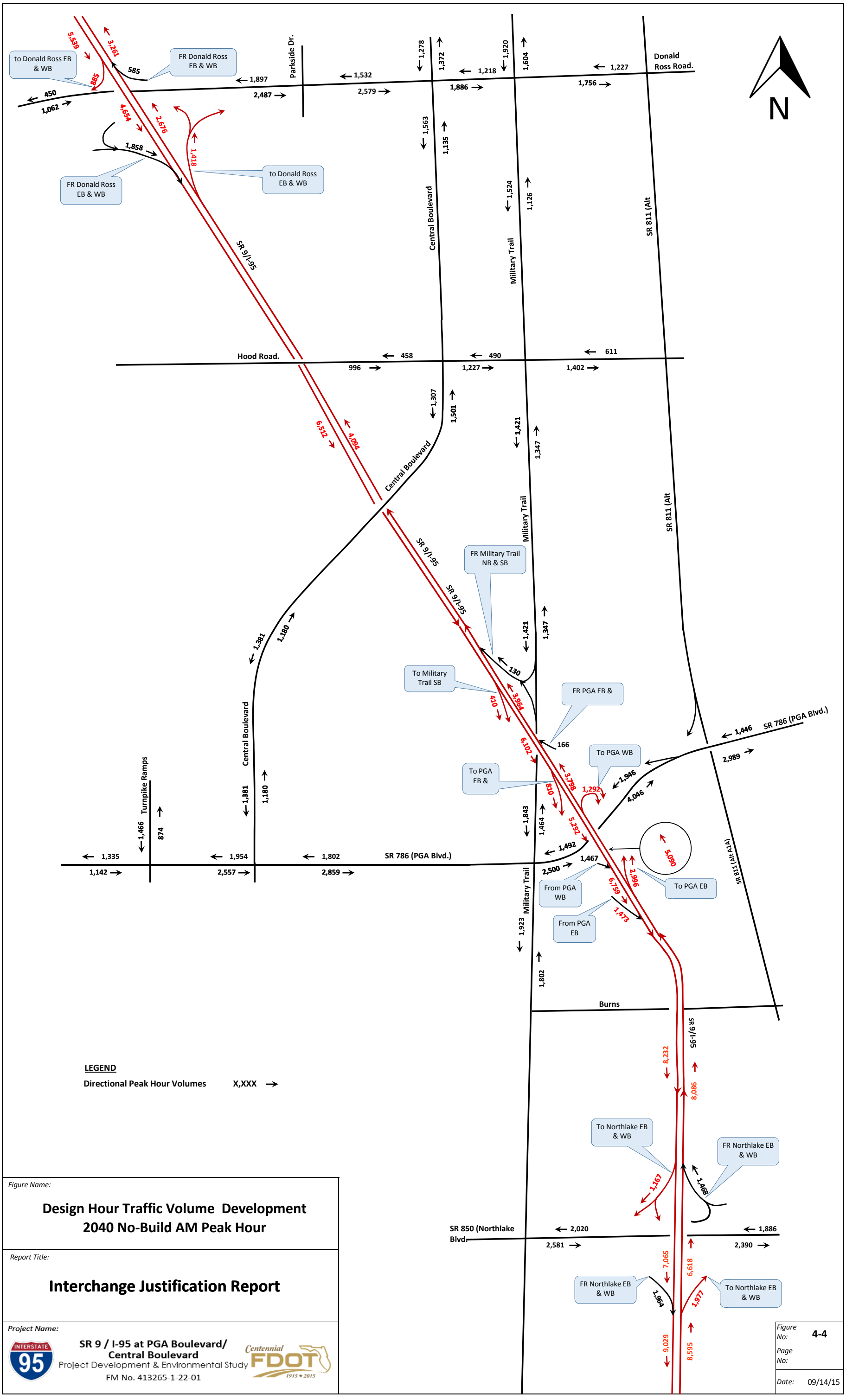
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**4-3**
Page No:	
Date:	09/14/15



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Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2040 No-Build AM Peak Hour

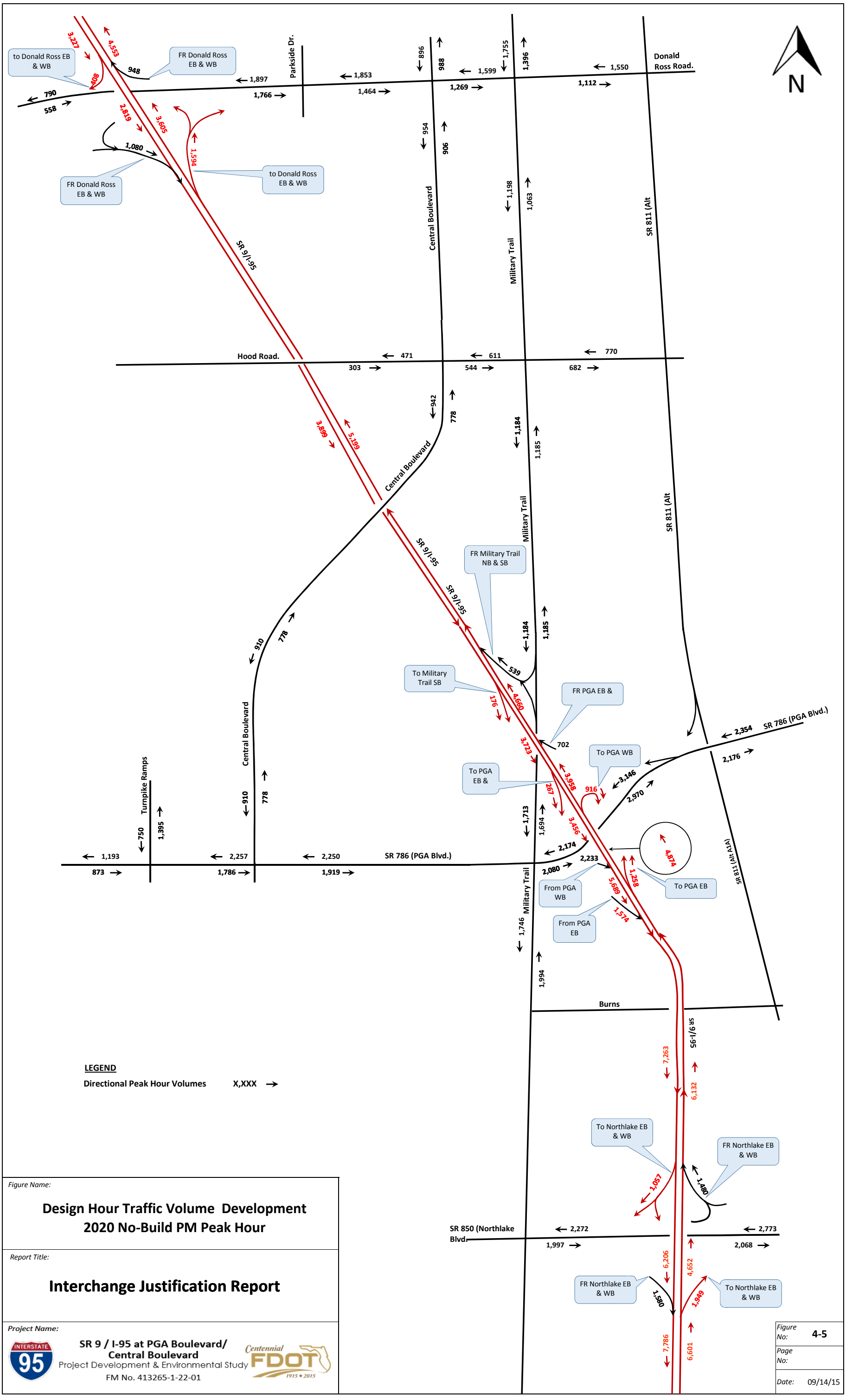
Report Title:

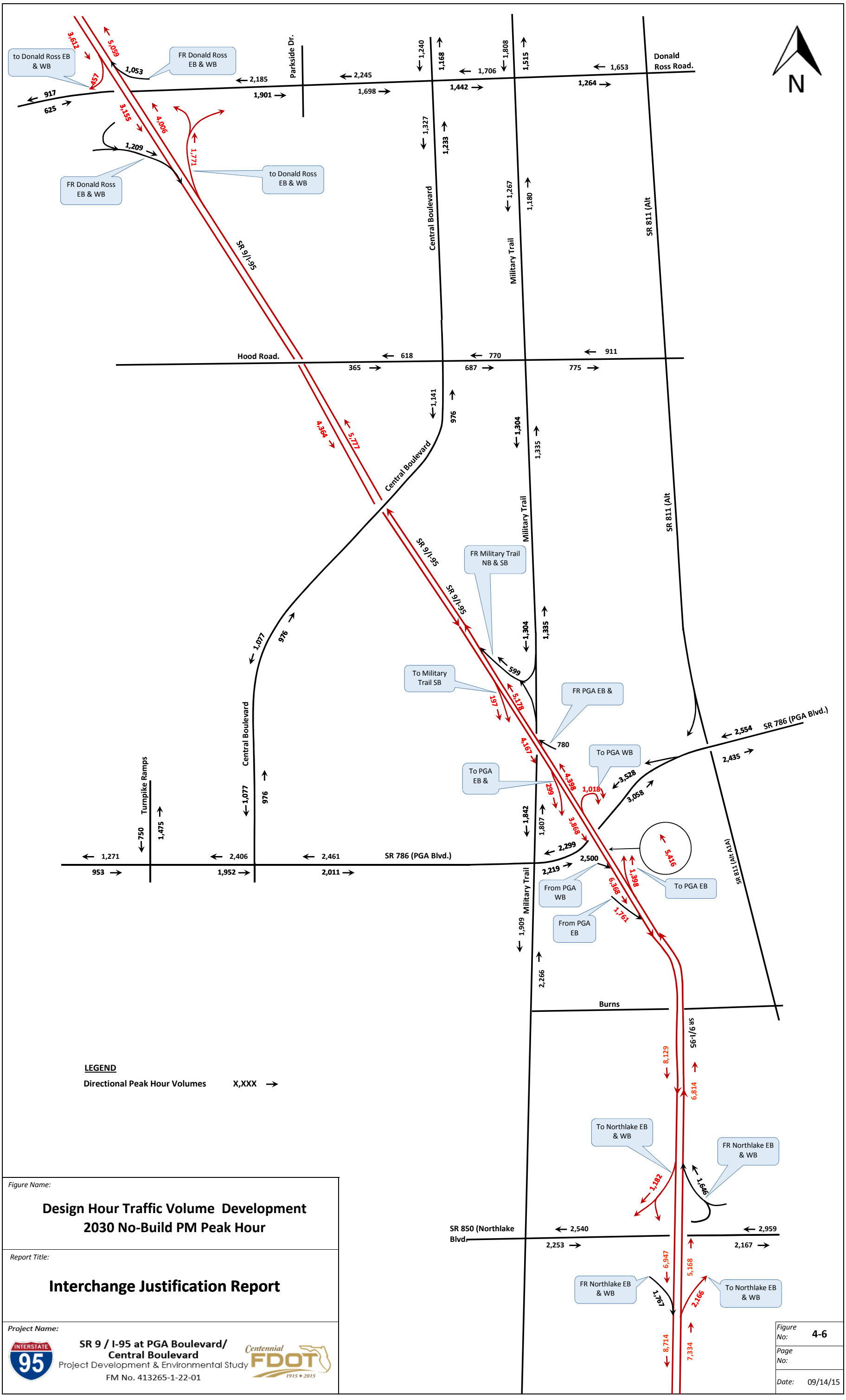
Interchange Justification Report

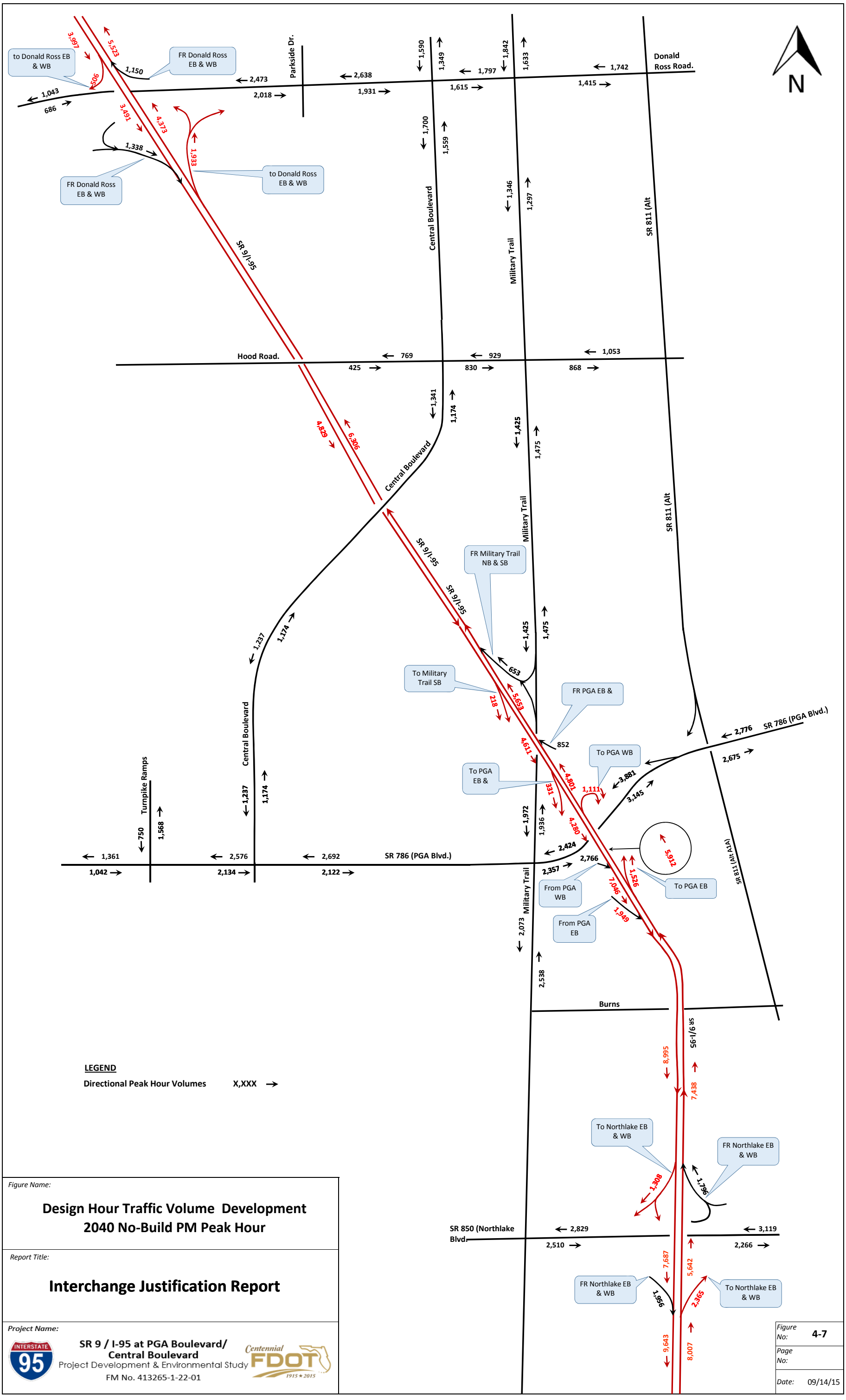
Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**4-4**
Page No:	
Date:	09/14/15


N
to Donald Ross EB & WB
FR Donald Ross EB & WB
3,227
4,553
948
408
1,897
Parkside Dr.
1,853
896
988
1,599
1,755
1,396
1,550
Donald Ross Road.
790
558
1,766
1,464
1,269
1,112
2,819
3,605
1,080
1,594
954
906
FR Donald Ross EB & WB
to Donald Ross EB & WB
Central Boulevard
1,198
1,063
Military Trail
SR 811 (Alt
SR 9/I-95
Hood Road.
471
611
770
303
544
682
942
778
3,899
5,199
1,184
1,185
910
778
539
To Military Trail SB
FR Military Trail NB & SB
176
4,660
FR PGA EB &
702
3,723
To PGA WB
To PGA EB &
3,958
267
916
3,146
2,970
2,354
SR 786 (PGA Blvd.)
2,176
Turnpike Ramps
750
1,395
1,713
1,694
3,456
2,174
1,193
873
2,257
1,786
2,250
1,919
2,233
2,080
4,674
1,258
5,689
1,574
From PGA WB
From PGA EB
To PGA EB
1,746
1,994
Burns
7,263
6,132
To Northlake EB & WB
FR Northlake EB & WB
1,057
1,480
SR 850 (Northlake Blvd
2,272
1,997
2,773
2,068
6,206
4,652
1,580
1,949
7,786
6,601
LEGEND
Directional Peak Hour Volumes X,XXX →
Figure Name:
Design Hour Traffic Volume Development
2020 No-Build PM Peak Hour
Report Title:
Interchange Justification Report
Project Name:
SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01
Figure No: 4-5
Page No:
Date: 09/14/15


N
to Donald Ross EB & WB
FR Donald Ross EB & WB
3,612
5,059
457
1,053
917
625
2,185
Parkside Dr.
2,245
1,901
1,698
1,240
1,168
1,706
1,808
1,515
1,653
Donald Ross Road.
1,442
1,264
3,155
4,006
1,771
1,209
FR Donald Ross EB & WB
to Donald Ross EB & WB
1,327
1,233
Central Boulevard
1,267
1,180
Military Trail
SR 811 (Alt
SR 9/I-95
Hood Road.
618
770
911
365
687
775
1,141
976
4,364
5,777
1,304
1,335
1,077
976
599
To Military Trail SB
FR Military Trail NB & SB
197
5,178
FR PGA EB &
780
4,167
To PGA EB &
To PGA WB
2,554
SR 786 (PGA Blvd.)
2,435
3,528
3,058
1,018
299
4,398
3,868
1,842
1,807
2,299
2,500
2,219
5,416
1,398
6,368
1,761
From PGA WB
From PGA EB
To PGA EB
1,909
2,266
Burns
Turnpike Ramps
750
1,475
1,271
953
2,406
1,952
2,461
2,011
SR 786 (PGA Blvd.)
8,129
6,814
To Northlake EB & WB
FR Northlake EB & WB
1,182
1,646
SR 850 (Northlake Blvd
2,540
2,253
2,959
2,167
6,947
5,168
1,767
2,166
8,714
7,334
LEGEND
Directional Peak Hour Volumes X,XXX →
Figure Name:
Design Hour Traffic Volume Development
2030 No-Build PM Peak Hour
Report Title:
Interchange Justification Report
Project Name:
SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01
Figure No: 4-6
Page No:
Date: 09/14/15



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Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2040 No-Build PM Peak Hour

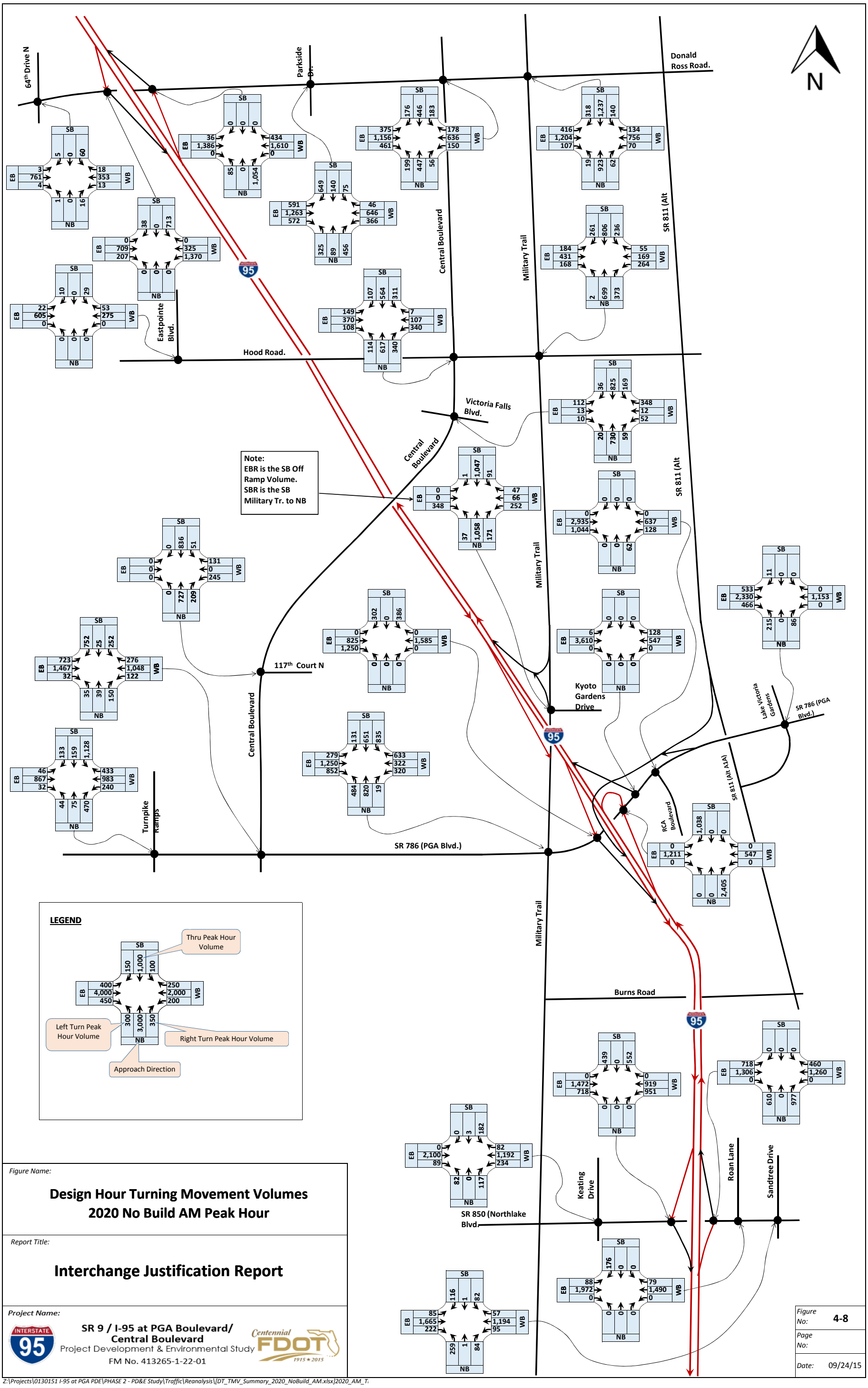
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**4-7**
Page No:	
Date:	09/14/15


64th Drive N
Parkside Dr.
Donald Ross Road.
Central Boulevard
Military Trail
SR 811 (Alt
Eastpointe Blvd.
Hood Road.
Victoria Falls Blvd.
Note:
EBR is the SB Off Ramp Volume.
SBR is the SB Military Tr. to NB
117th Court N
Kyoto Gardens Drive
Lake Victoria Gardens
SR 786 (PGA Blvd.)
RCA Boulevard
SR 811 (Alt A1A)
Turnpike Ramps
Burns Road
Keating Drive
Roan Lane
Sandtree Drive
SR 850 (Northlake Blvd.
N
LEGEND
Thru Peak Hour Volume
Left Turn Peak Hour Volume
Right Turn Peak Hour Volume
Approach Direction
Figure Name:
Design Hour Turning Movement Volumes
2020 No Build AM Peak Hour
Report Title:
Interchange Justification Report
Project Name:
SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01
Figure No: 4-8
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Date: 09/24/15
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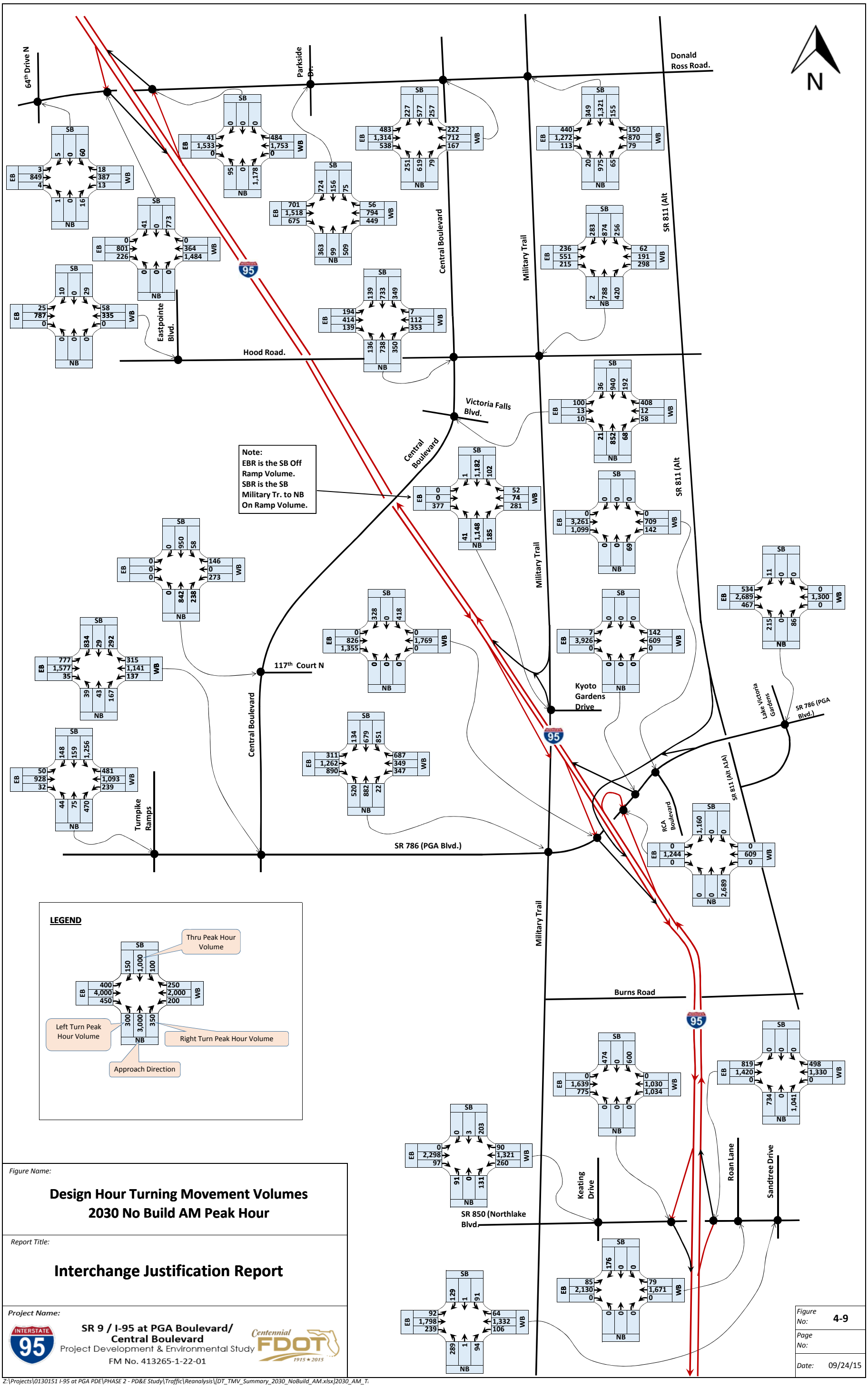

Figure Name:

Design Hour Turning Movement Volumes
2030 No Build AM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	4-9
Page No:	
Date:	09/24/15

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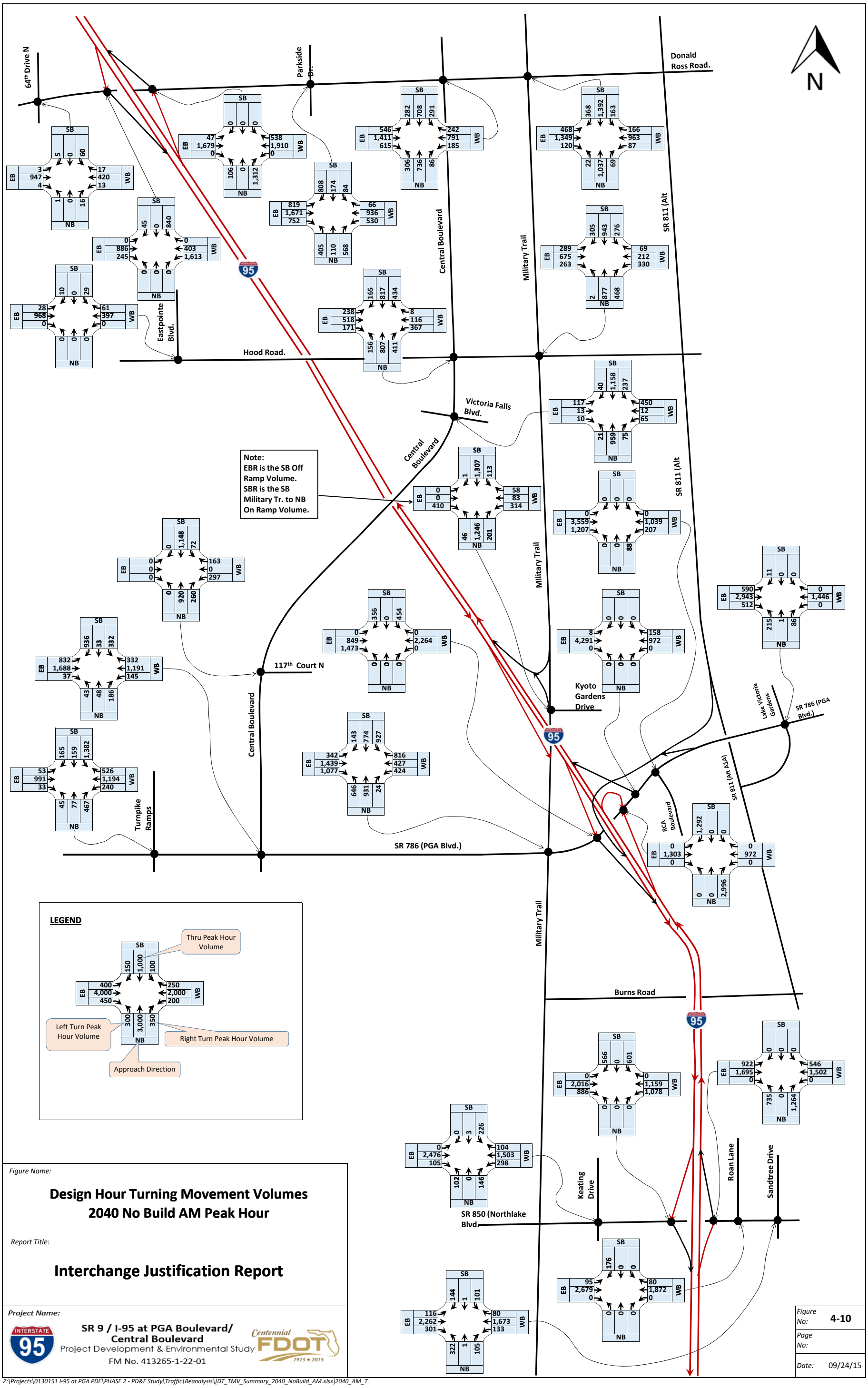

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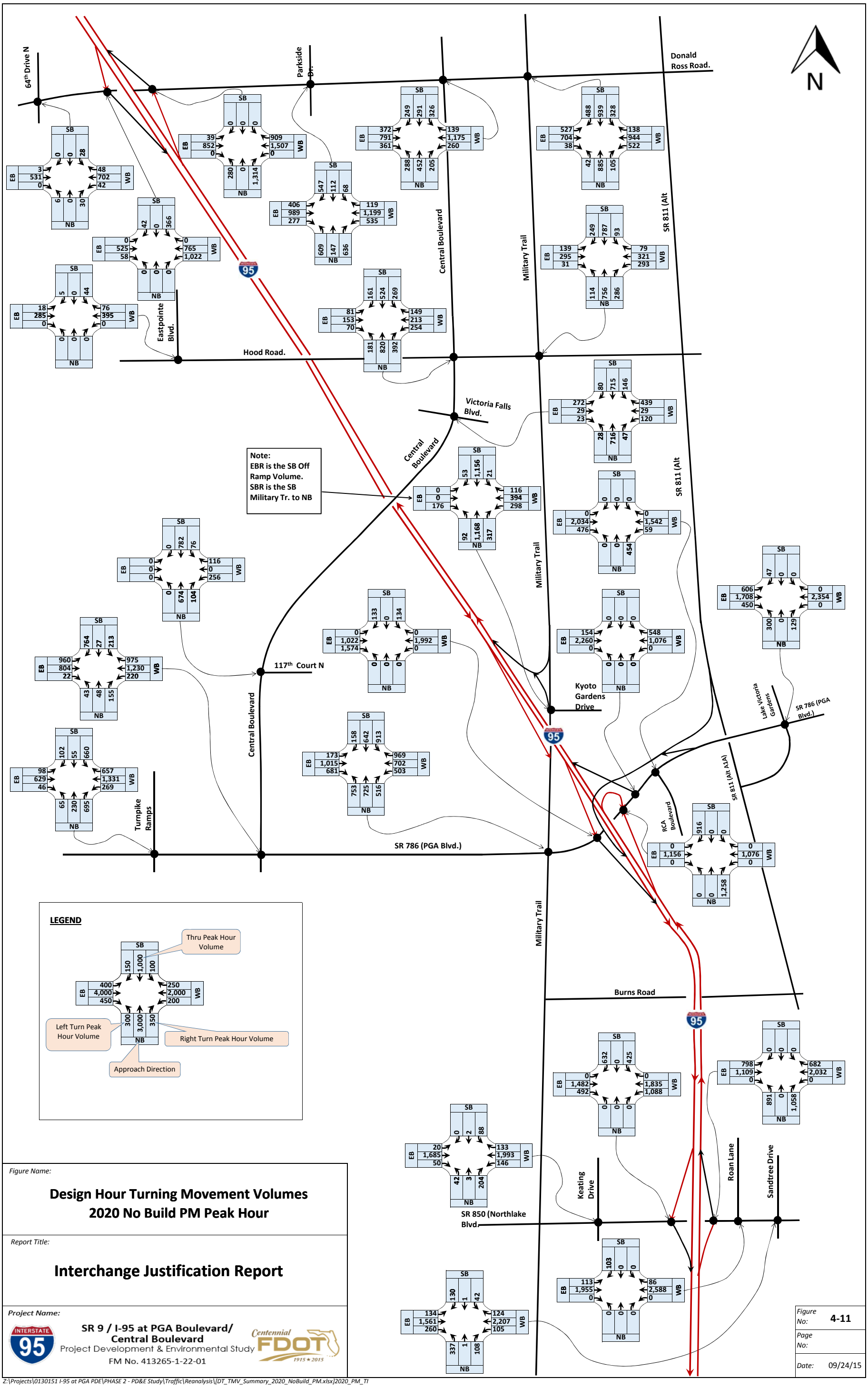

Figure Name:

Design Hour Turning Movement Volumes
2020 No Build PM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	4-11
Page No:	
Date:	09/24/15

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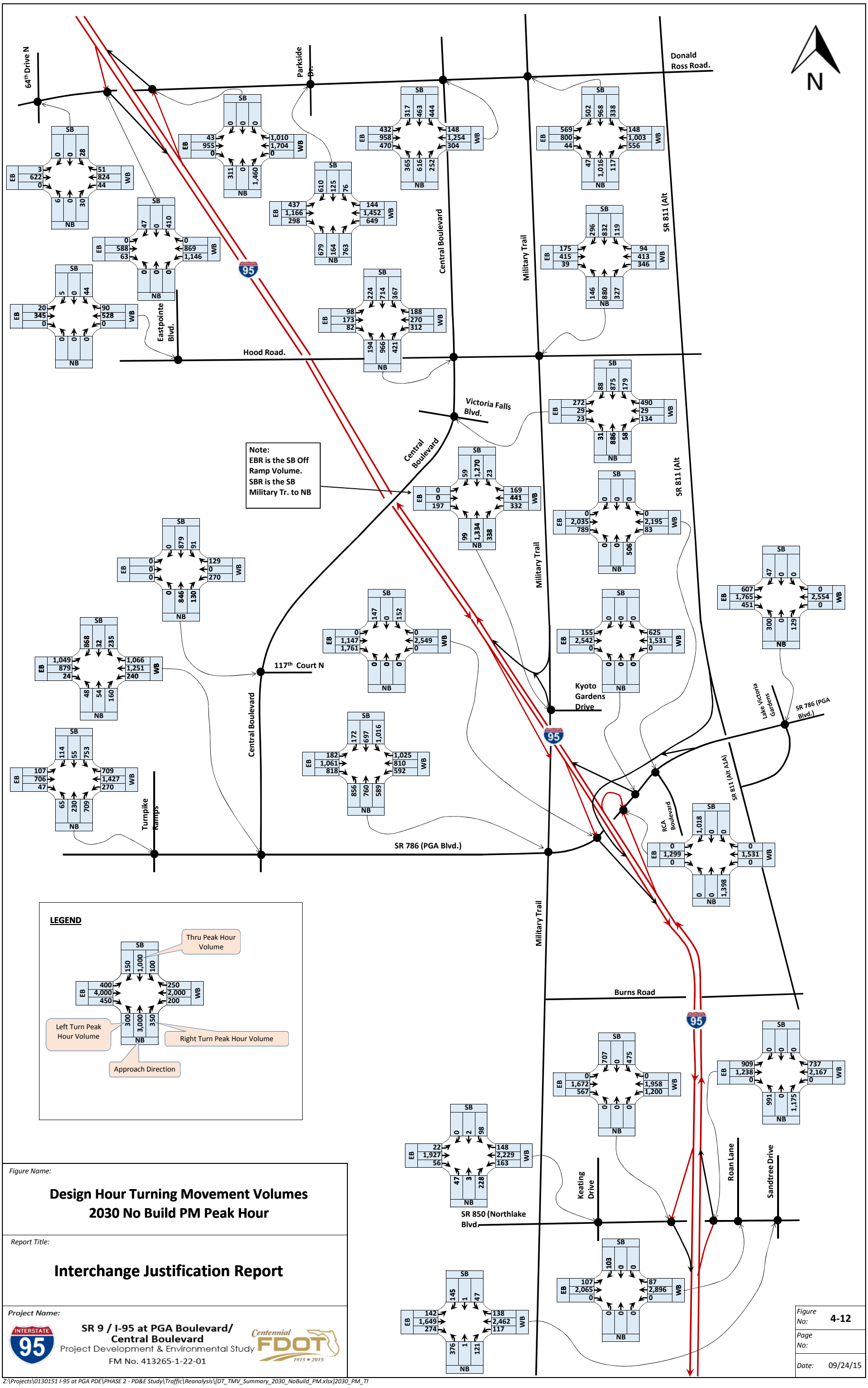

Figure Name:

Design Hour Turning Movement Volumes
2030 No Build PM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	4-12
Page No:	
Date:	09/24/15

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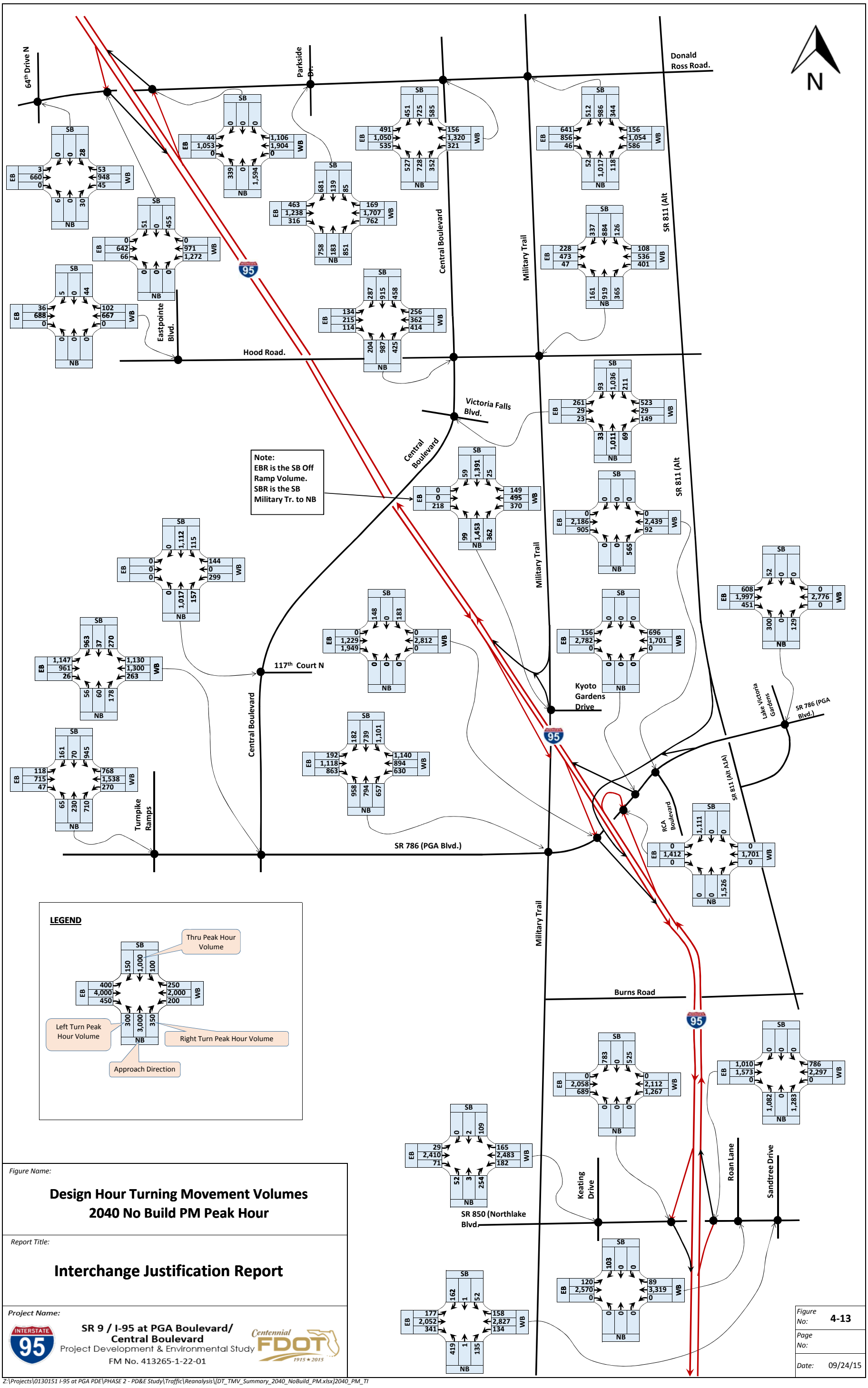

Figure Name:

Design Hour Turning Movement Volumes
2040 No Build PM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**4-13**
Page No:	
Date:	09/24/15

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4.4 No Build Intersection Level of Service

Tables 4-1 through 4-3 contain the delay and LOS by movement, at all intersections, for the No-Build alternative, for the years 2020, 2030, and 2040 respectively. By 2040, 13 intersections would be experiencing failing overall LOS. The No Build Synchro analysis reports are in Appendices H-M.

Along the PGA Boulevard Corridor there are several intersections which face challenges of producing an HCM 2010 report in Synchro. The intersections that are faced with this problem are the West Ramp, East Ramp, Parclo Off Ramp, and NB On Ramp. The reasons why these can't be viewed in an HCM 2010 report differ for each intersection. For the West and East Ramp intersections, an HCM 2010 report isn't possible because these two intersections are so close together that they are treated as clustered intersections, which can't be viewed in an HCM 2010 report. Additionally, if these intersections were un-clustered they still could not produce an HCM 2010 report for the fact that these intersections use non-NEMA phasing. If one was to un-cluster the intersections and change those to conventional NEMA phasing then the HCM 2010 report produced would not accurately portray the proposed operation of these intersections in the future. As for the other two intersections, the Parclo Off Ramp and the NB On Ramp, the "HCM research expects at least one 'Stop' controlled approach at the intersection." These intersections are free flowing and yield controlled so therefore they too can not be analyzed by HCM 2010.

Table 4-1 – No Build Alternative – Intersection Level of Service - 2020

Corridor	Intersection	2020 No-Build Peak Period	Overall Delay (s/veh)	LOS
CENTRAL BLVD	- Victoria Falls Boulevard	AM	189	-
		PM	1611.3	-
	- I-95 SB Ramps	AM	-	-
		PM	-	-
	- I-95 NB Ramps	AM	-	-
		PM	-	-
	- 117th Court	AM	11.4	B
		PM	11.9	B
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	1.4	-
		PM	1.4	-
	- I-95 West Ramps	AM	37.5	D
		PM	27.7	C
	- I-95 East Ramps	AM	23.4	C
		PM	19.5	B
	- Parkside Drive	AM	70.9	E
		PM	67.7	E
	- Central Boulevard	AM	56.1	E
		PM	52.3	D
	- N Military Trail	AM	45	D
		PM	59.9	E
HOOD ROAD	- East Pointe Boulevard	AM	0.9	-
		PM	1.1	-
	- Central Boulevard	AM	36.1	D
		PM	25.2	C
	- N Military Trail	AM	46.6	D
		PM	43.7	D
NORTHLAKE BOULEVARD	- Keating Drive	AM	41.9	D
		PM	23.2	C
	- I-95 West Ramps	AM	30.8	C
		PM	48.9	D
	- I-95 East Ramps	AM	30	C
		PM	49.6	D
	- Roan Lane	AM	2.6	A
		PM	4.4	A
	- Sandtree Drive	AM	26.5	C
		PM	38.5	D
PGA BOULEVARD	- Florida Turnpike	AM	59.5	E
		PM	50.6	D
	- Central Boulevard	AM	50.5	D
		PM	118.1	F
	- N Military Trail	AM	76.9	E
		PM	82.4	F
	- I-95 West Ramps	AM	32	C
		PM	39	D
	- I-95 NB Off Ramps	AM	95.5	F
		PM	24.9	C
	- NB On Ramps	AM	-	-
		PM	-	-
	- RCA Boulevard	AM	30.4	-
		PM	4.1	-
	- Lake Victoria Gardens	AM	35.2	D
		PM	90.5	F
PGA Passage at Lake Victoria Gardens		AM	12.8	B
		PM	29	C
MILI-TARY	- Kyoto Gardens Drive	AM	27.2	C
		PM	28.3	C

Table 4-2 – No Build Alternative – Intersection Level of Service - 2030

Corridor	Intersection	2030 No-Build Peak Period	Overall Delay (s/veh)	LOS
CENTRAL BLVD	- Victoria Falls Boulevard	AM	554.8	-
		PM	0.8	-
	- I-95 SB Ramps	AM	-	-
		PM	-	-
	- I-95 NB Ramps	AM	-	-
		PM	-	-
	- 117th Court	AM	12.2	B
		PM	12.3	B
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	-	-
		PM	-	-
	- I-95 West Ramps	AM	44.3	D
		PM	34.1	C
	- I-95 East Ramps	AM	27.3	C
		PM	22.1	C
	- Parkside Drive	AM	67.8	E
		PM	107.1	F
	- Central Boulevard	AM	216.5	F
		PM	77.3	E
	- N Military Trail	AM	63.2	E
		PM	66.3	E
HOOD ROAD	- East Pointe Boulevard	AM	0.9	-
		PM	1.1	-
	- Central Boulevard	AM	30.7	C
		PM	25.7	C
	- N Military Trail	AM	59.5	E
		PM	42.8	D
NORTHLAKE BOULEVARD	- Keating Drive	AM	45.5	D
		PM	23.7	C
	- I-95 West Ramps	AM	38.3	D
		PM	75.2	E
	- I-95 East Ramps	AM	39.6	D
		PM	63.3	E
	- Roan Lane	AM	2.6	A
		PM	4.5	A
	- Sandtree Drive	AM	30.9	C
		PM	51.5	D
PGA BOULEVARD	- Florida Turnpike	AM	67.6	E
		PM	93.9	F
	- Central Boulevard	AM	60.4	E
		PM	154.1	F
	- N Military Trail	AM	86.5	F
		PM	103.3	F
	- I-95 West Ramps	AM	34.7	C
		PM	61.4	E
	- I-95 NB Off Ramps	AM	138.6	F
		PM	32.7	C
	- NB On Ramps	AM	-	-
		PM	-	-
	- RCA Boulevard	AM	61.6	-
		PM	2.1	-
	- Lake Victoria Gardens	AM	37.1	D
		PM	109.6	F
PGA Passage at Lake Victoria Gardens		AM	13.7	B
		PM	29.6	C
MILI-TARY	- Kyoto Gardens Drive	AM	32.4	C
		PM	29.3	C

Table 4-3 – No Build Alternative – Intersection Level of Service - 2040

Corridor	Intersection	2040 No-Build Peak Period	Overall Delay (s/veh)	LOS
CENTRAL BLVD	- Victoria Falls Boulevard	AM	1.2	-
		PM	0.9	-
	- I-95 SB Ramps	AM	-	-
		PM	-	-
	- I-95 NB Ramps	AM	-	-
		PM	-	-
	- 117th Court	AM	13.1	B
		PM	13.4	B
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	1.5	-
		PM	1.7	-
	- I-95 West Ramps	AM	53.3	D
		PM	31.7	C
	- I-95 East Ramps	AM	38.2	D
		PM	29.1	C
	- Parkside Drive	AM	79.2	E
		PM	99.5	F
	- Central Boulevard	AM	79.6	E
		PM	108.8	F
	- N Military Trail	AM	51.6	D
		PM	71.5	E
HOOD ROAD	- East Pointe Boulevard	AM	1.1	-
		PM	1.8	-
	- Central Boulevard	AM	37.7	D
		PM	33.9	C
	- N Military Trail	AM	66.3	E
		PM	54.2	D
NORTHLAKE BOULEVARD	- Keating Drive	AM	46.4	D
		PM	34.8	C
	- I-95 West Ramps	AM	46.4	D
		PM	105.3	F
	- I-95 East Ramps	AM	50.5	D
		PM	87.9	F
	- Roan Lane	AM	2.6	A
		PM	4.6	A
	- Sandtree Drive	AM	38.6	D
		PM	83.2	F
PGA BOULEVARD	- Florida Turnpike	AM	80.8	F
		PM	116.9	F
	- Central Boulevard	AM	77.6	E
		PM	188.3	F
	- N Military Trail	AM	113	F
		PM	127.2	F
	- I-95 West Ramps	AM	40.5	D
		PM	113.9	F
	- I-95 NB Off Ramps	AM	181.8	F
		PM	35.8	D
	- NB On Ramps	AM	-	-
		PM	-	-
	- RCA Boulevard	AM	201.4	-
		PM	2.8	-
	- Lake Victoria Gardens	AM	38	D
		PM	127.2	F
PGA Passage at Lake Victoria Gardens		AM	14.2	B
		PM	30.5	C
MILI-TARY	- Kyoto Gardens Drive	AM	43.5	D
		PM	32.4	C

4.5 No Build Roadway Level of Service

Because the focus of the justification is the mitigation of delay on the surrounding arterials, and not to address any particular issue on the interstate itself, the No Build analysis of the freeway segments is presented alongside the analysis of the different build conditions in Chapter 7.

Tables 4-4 through 4-6 contain the roadway level of service estimates for the years 2020, 2030, and 2040 respectively, using the maximum peak hour directional volumes from Figures 4-2 to 4-7.

Table 4-4 – No Build Roadwav Level of Service - 2020

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	851	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	1968	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	1930	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1678	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	627	420	840	1190	1640		C	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	627	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	783	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2257	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2339	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2261	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	3596	N/A	3970	4040	4040	4811	C	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	3596	N/A	3970	4040	4040	4835	C	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1713	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	1185	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1303	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2272	N/A	2650	2720	2720	3890	C	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	2773	N/A	2650	2720	2720	3890	F	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	1048	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	1071	N/A	1720	1800	1800		C	N
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	983	N/A	1720	1800	1800		C	N

Notes:
1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element

Table 4-5 – No Build Roadwav Level of Service - 2030

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	961	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	2218	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2255	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1774	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	812	420	840	1190	1640		C	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	812	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	1002	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2406	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2599	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2391	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	3838	N/A	3970	4040	4040	4811	C	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	3838	N/A	3970	4040	4040	4835	C	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1842	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	1335	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1413	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2540	N/A	2650	2720	2720	3890	C	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	2959	N/A	2650	2720	2720	3890	F	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	1214	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	1281	N/A	1720	1800	1800		C	N
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	1327	N/A	1720	1800	1800		C	N

Notes:
1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element

Table 4-6 – No Build Roadway Level of Service - 2040

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	1062	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	2487	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2638	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1886	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	996	420	840	1190	1640		D	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	996	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	1227	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2576	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2859	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2500	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	4046	N/A	3970	4040	4040	4811	F	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	4046	N/A	3970	4040	4040	4835	F	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1972	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	1475	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1524	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2829	N/A	2650	2720	2720	3890	F	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	3119	N/A	2650	2720	2720	3890	F	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	1381	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	1501	N/A	1720	1800	1800		C	N
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	1700	N/A	1720	1800	1800		C	N

Notes: 1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element

4.6 No Build Queuing Analysis

Tables 4-7 through 4-9 contain the 95 percentile queues that develop in the No-Build Alternative, in the years 2020, 2030, and 2040 respectively, compared to the measured available storage lengths, at the I-95 ramp terminal intersections. By 2040, in the No Build condition, 7 of those intersections are expected to experience a queue failure (95th percentile queue exceeds the available storage length). In situations like the interchange at Donald Ross where storage for left turns onto the ramps begins before the upstream ramp intersection, the queue storage length shown is the total available at both intersections. When the storage for the through movement is shown as inadequate it is due to comparison of the through queue length with the minimum storage length available for all three movements (Left Through Right).

Table 4-7 – No Build Queue Analysis - 2020

Corridor	Inter-section	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	127	0	443	273	0	0	0	0	189	0	0
			PM	ft	0	96	0	405	263	0	0	0	0	97	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?														
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	17	411	0	0	181	0	42	0	43	0	0	0
			PM	ft	28	121	0	0	166	0	117	0	101	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?														
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	228	0	408	99	0	0	0	0	252	0	37
			PM	ft	0	294	0	527	564	0	0	0	0	192	0	48
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?							NO C)							
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	304	342	0	0	181	0	292	0	46	0	0	0
			PM	ft	494	171	0	0	370	0	517	0	46	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?				NO			NO C)							
	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	190	0	0	392	0	0	0	0	312	0	49
			PM	ft	0	149	292	0	290	0	0	0	0	59	0	19
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?														
PGA Blvd	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	552	0	0	126	0	0	0	1086	0	0	0
			PM	ft	0	250	0	0	101	0	0	0	178	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?				NO C)										
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens Drive	95th %-ile Queue	AM	veh/ln				3.3	0	2.6	1.5	10.5	5.1	4.9	10.4	
				ft	0	0	0	84	0	66	38	267	130	124	264	0
			PM	veh/ln				4.4	0	7.3	4.9	11.7	10.3	0.9	12.9	
				ft	0	0	0	112	0	185	124	297	262	23	328	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO D)	NO			

Notes: A) Storage shown is cumulative.

B) Through queue exceeds left turn storage.

C) Through queue exceeds through storage.

D) Through queue exceeds right turn storage.

Table 4-8 – No Build Queue Analysis - 2030

Corridor	Inter-section	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	153	0	532	289	0	0	0	0	265	0	0
			PM	ft	0	109	0	479	422	0	0	0	0	108	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?														
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	19	479	0	0	199	0	52	0	69	0	0	0
			PM	ft	29	134	0	0	195	0	128	0	196	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?				NO										
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	284	0	482	123	0	0	0	0	292	0	39
			PM	ft	0	418	0	745	793	0	0	0	0	261	0	52
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?							NO C)							
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	377	430	0	0	221	0	395	0	50	0	0	0
			PM	ft	679	495	0	0	513	0	708	0	197	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?			NO	NO C)			NO C)							
	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	193	0	0	449	0	0	0	0	339	0	50
			PM	ft	0	192	542	0	471	0	0	0	0	100	0	31
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?					NO									
PGA Blvd	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	574	0	0	140	0	0	0	1328	0	0	0
			PM	ft	0	360	0	0	220	0	0	0	277	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?				NO C)										
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens Drive	95th %-ile Queue	AM	veh/ln				3.8	0	3	1.7	12.1	5.6	5.5	12.6	0
				ft	0	0	0	97	0	76	43	307	142	140	320	0
			PM	veh/ln				6	0	10	7.2	14.3	11.3	1.2	14.7	0
				ft	0	0	0	152	0	254	183	363	287	30	373	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO (D)	NO			

Notes: A) Storage shown is cumulative.
B) Through queue exceeds left turn storage.
C) Through queue exceeds through storage.
D) Through queue exceeds right turn storage.

Table 4-9 – No Build Queue Analysis - 2040

Corridor	Inter-section	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	222	0	790	319	0	0	0	0	396	0	0
			PM	ft	0	142	0	623	586	0	0	0	0	145	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?							NO							
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	29	659	0	0	267	0	74	0	163	0	0	0
			PM	ft	34	170	0	0	240	0	168	0	265	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?				NO										
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	447	0	636	158	0	0	0	0	364	0	43
			PM	ft	0	603	0	855	953	0	0	0	0	306	0	52
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?				NO C)			NO C)							
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	528	669	0	0	317	0	498	0	51	0	0	0
			PM	ft	703	679	0	0	604	0	837	0	388	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?			NO	NO (B,C)			NO C)							
	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	197	206	0	616	0	0	0	0	363	0	51
			PM	ft	0	260	822	0	677	0	0	0	0	140	0	32
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?					NO									
PGA Blvd	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	628	0	0	229	0	0	0	1552	0	0	0
			PM	ft	0	373	0	0	248	0	0	0	487	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?				NO C)										
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens Drive	95th %-ile Queue	AM	veh/ln				4.2	0	3.3	2	15	6.2	6.5	15.9	0
				ft	0	0	0	107	0	84	51	381	157	165	404	0
			PM	veh/ln				6.3	0	10	7.2	16	12.4	1.3	16.7	0
				ft	0	0	0	160	0	254	183	406	315	33	424	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO (D)	NO		NO (B)	

Notes: A) Storage shown is cumulative.

B) Through queue exceeds left turn storage.

C) Through queue exceeds through storage.

D) Through queue exceeds right turn storage.

5.0 PURPOSE AND NEED FOR THE PROJECT

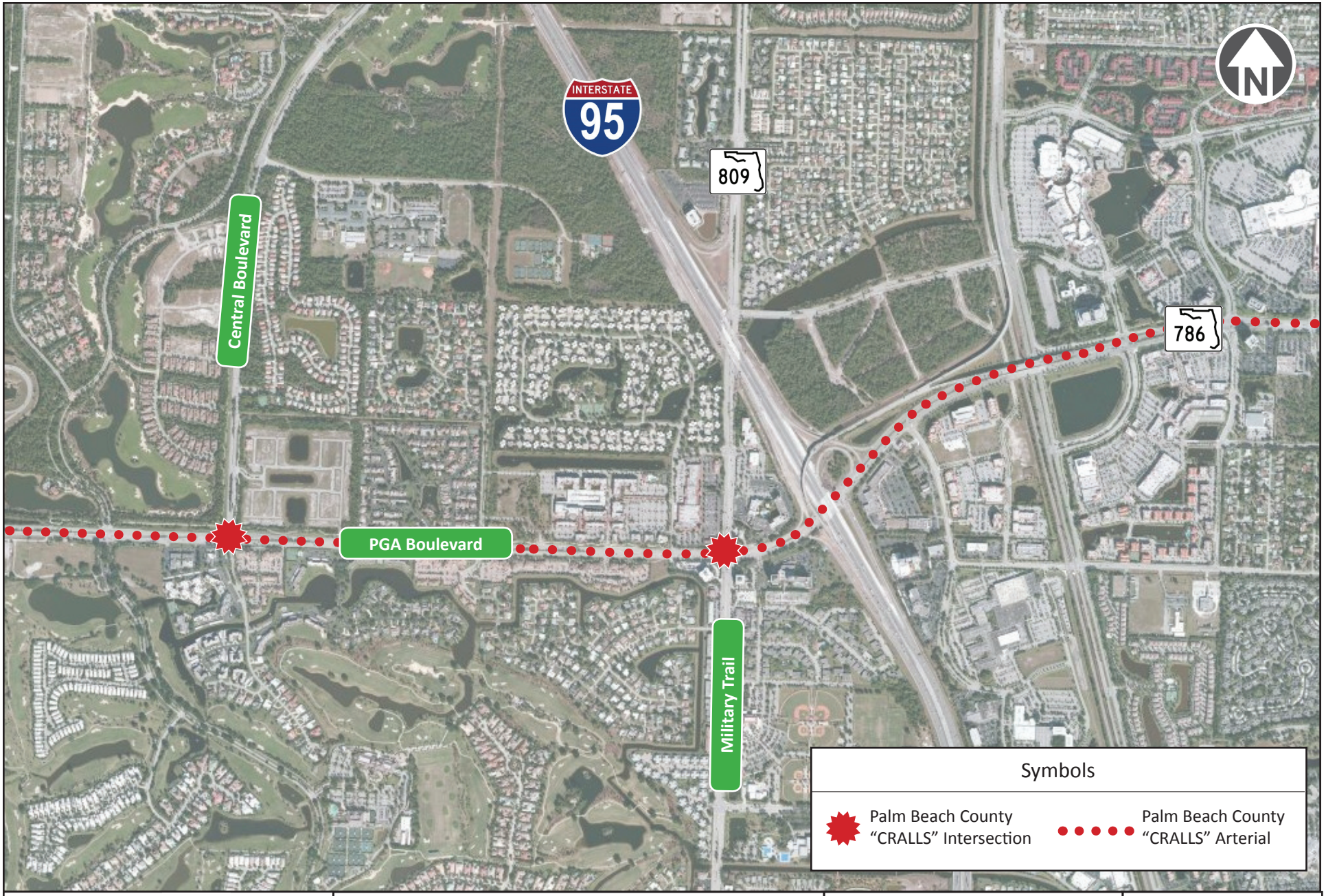
The commercial areas of north Palm Beach County have developed into high volume destinations for this region. Shown on Figure 5-1, these commercial areas include numerous shopping malls and centers, such as the Gardens Mall, that attract employees and patrons from outside the local area. In addition to this commercial hub, the area just north of these destinations, highlighted by the Scripps Institute adjacent to the Florida Atlantic University Campus, has also developed into a biomedical research economic development cluster for Palm Beach County, with additional associated development planned in the near future. As the economic development of north Palm Beach County has continued, particularly within the city of Palm Beach Gardens, residential development has intensified as well.

This positive economic growth in north Palm Beach County has brought, and will continue to bring, congestion and other associated stress to the regional transportation network. I-95 currently operates at an acceptable level-of-service; particularly with the newly widened mainline through the limits of this study. Other State Highways in the area, however, suffer significant congestion and delay, led by SR 786/PGA Boulevard and SR 809/Military Trail. A number of studies conducted by both Palm Beach County and the Department indicate that these congested conditions will continue and worsen into the future.

Palm Beach County has identified constrained roadways within their jurisdiction from both an intersection and segment standpoint. Two (2) such constrained facilities, shown on Figure 5-2, exist within the study limits:

- Interchange of Florida's Turnpike and PGA Boulevard
- Intersection of Central Boulevard at PGA Boulevard
- The intersection of Military Trail at PGA Boulevard
- PGA Boulevard from Florida's Turnpike to US 1

Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environment Study** **FM No. 413265-1-22-01**	Palm Beach Gardens Commercial Areas	Interchange Justification Report	*Figure No.* 5-1 *Page No.* *Date:*



Project Name **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** **Project Development & Environment Study** **FM No. 413265-1-22-01**	Constrained Facilities	Interchange Justification Report	*Figure No.* 5-2 *Page No.* *Date:*

These Constrained Roadways At Lower Level of Service, referred to as CRALLS locations by Palm Beach County, are an indication of limitations to regional mobility. In addition to these documented findings of Palm Beach County, the Florida Department of Transportation performed an operational study of the roadway network in this area, entitled, "I-95 Area Wide Mobility Study", in 2011 and found that many of the roadway segments, because of intersection failures, as shown in Table 5-1, will continue to break down and have below acceptable levels of service.

Some of these capacity failures will begin as early as 2015, with major congestion issues coming on line in the early 2020's. Even with traffic operational improvements to maximize the capacity of the network in the region; levels of service will continue to fall below standards (Level-of-service D) for the state highway system in the area. Data collection conducted as a part of this study reinforces this increase in demand and decline in level of service (LOS).

Table 5-1 - Findings of the I-95 Area Wide Mobility Study

Intersection	Intersection Condition	Operating Condition
PGA Boulevard at Florida's Turnpike	No Build	Fails by 2025
	Short Term Improvements	Fails by 2035
PGA Boulevard at Central Boulevard	No Build	Fails by 2025
	Short Term Improvements	Fails by 2035
PGA Boulevard at Military Trail	No Build	Fails by 2015
	Short Term Improvements	Fails by 2025
PGA Boulevard at I-95 SB Off Ramp	No Build	Fails by 2025
	Short Term Improvements	No strategy identified
PGA Boulevard at I-95 NB Off Ramp	No Build	Fails by 2025
	Short Term Improvements	No strategy identified

The presence of congestion often contributes to vehicular safety. As shown in Table 5-2, PGA Boulevard does not have the abnormally high crash rate that Military Trail does, due to the higher ADT volumes it experiences. PGA Boulevard, however, with an average of 95 crashes per year, experiences

Table 5-2 – 5-Year Crash Profile for Key Project Corridors

Year	Number of Crashes	ADT	Actual Crash Rate (ACR)	District 4 Average Crash Rate (A)	Average Vehicle Exposure (M)	Critical Crash Rate (CCR)	Safety Ratio	Statistical Significance	Confidence Level
PGA Boulevard from Florida's Turnpike to Lake Victoria Gardens Avenue									
2009	95	34,383	2.846	3.015	33.382	3.989	0.713	-0.513	30.3923%
2010	97	46,762	2.137	2.986	45.401	3.819	0.559	-3.270	0.0539%
2011	60	46,325	1.334	3.062	44.977	3.910	0.341	-6.580	0.0000%
2012	103	46,587	2.277	3.570	45.231	4.484	0.508	-4.562	0.0003%
2013	120	46,174	2.677	4.085	44.830	5.067	0.528	-4.628	0.0002%
Military Trail from PGA Boulevard to Donald Ross Road									
2009	16	36,438	0.391	3.015	40.950	3.896	0.100	-9.627	0.0000%
2010	11	32,500	0.301	2.986	36.525	3.913	0.077	-9.342	0.0000%
2011	4	42,000	0.085	3.062	47.201	3.890	0.022	-11.648	0.0000%
2012	9	33,000	0.243	3.570	37.087	4.578	0.053	-10.681	0.0000%
2013	25	31,500	0.706	4.085	35.401	5.189	0.136	-9.905	0.0000%

LEGEND

ADT: Average Daily Traffic

ACR: Actual Crash Rate = No. of crashes in a year / Average Vehicle Exposure (M)

M: Average Vehicle Exposure (million vehicles or million vehicles miles) = [(ADT * 365 * L) / 1,000,000]

L : Length of the Segment for Segment Analysis, 1 for Spot Analysis

A: Average Crash Rate

CCR: Critical Crash Rate = A + K * (SQRT[A/M]) - (1/[2 * M]) (Ref: FDOT Highway Safety Improvement Program Guidelines)

K: 3.291 for Urban, 1.960 for Suburban, 1.645 for Rural K = 3.291

Safety Ratio: ACR/CCR

Statistical significance: (ACR - A + (1/2M))/SQRT(A/M)

Confidence Level: Percent probability that the crash rate is abnormally high for the location under study, using the district-wide average as a basis.

substantially more crashes than Military Trail (average of 13 per year) due to the higher volumes. As traffic continues to grow on these roadways it is anticipated that vehicular safety will begin to erode, particularly with these failures occurring at intersection locations. As roadway congestion increases crash patterns form and safety suffers. This condition will increase as roadway volumes and congestion increases.

With today's conditions and those spelled out above for the future, the need to balance demand on the network should be explored. The purpose of this study is to analyze transportation alternatives that would reduce demand and associated congestion on regional transportation facilities, such as PGA Boulevard and Military Trail, by transferring that demand to other roadways with available capacity via a new or modified interchange access between PGA Boulevard and Donald Ross Road along I-95. Such a transfer should also improve operating conditions at the ramp terminal intersections at adjacent interchanges where demand volumes are reduced.

In order for these alternative improvements to be effective they must balance travel-demand on a regional basis rather than rely on a limited number of arterials. As concepts and alternatives are developed to address the needs of this area, they must meet a number of measures to be effective. These measures include:

- Reduce future year demand and improve the LOS on PGA Boulevard from Florida's Turnpike to Lake Victoria Gardens Avenue.
- Reduce future year demand and improve the LOS on Military Trail from south of PGA Boulevard to Hood Road.
- Identify ways to consolidate demand and minimize the addition of ramp gores to the mainline of I-95, including, when feasible, the reduction in travel demand at adjacent interchanges.
- Ensure that mainline operations (LOS) on I-95 are not degraded by any improvement.

6.0 DEVELOPMENT OF ALTERNATIVES

6.1 SCREENING OF PROJECT ALTERNATIVES

A tiered selection process was used to screen from a large group of initial concepts to a finite number of distinct alternatives. Three (3) tiers were employed starting with Tier 1 which qualitatively screened concepts for flaws or other conditions that would eliminate that concept from further consideration. Tier 2 examined six (6) build alternatives surviving the Tier 1 process along with the No Build and Transportation System Management (TSM) alternatives. Tier 2 involved additional transportation related quantitative analysis. The final Tier 3 distinguished between a limited number of build alternatives based on more complete quantitative measures. Each of the processes followed in the tiers are described as follows.

6.1.1 Tier 1 – Fatal Flaw Screening of Concepts

Tier 1 began by developing 26 concepts formed from the scenarios described in section 3 below. Travel demand projections were made for the majority of the concepts as well as the No Build condition for the 2040 year. The time of day Southeastern Regional Planning Model (SERPM) developed for the I-95 corridor was used to conduct the travel demand projections.

In developing these concepts qualitative judgments were made relative to cost, utility impacts, and right-of-way impacts. For transportation performance, travel demand projections for each concept were compared to the no build condition for the 2040 year. The comparative basis for transportation performance looked at how each concept contributed to reducing demand on over capacity facilities by transferring that demand to under-utilized facilities. Finally, environmental conditions were evaluated for each concept from a desktop review of documented conditions and the potential for impact.

For Tier 1 no weighting of criteria was used in the evaluation. All categories were considered of equal importance since the primary purpose was to screen out concepts that clearly would not perform adequately or would have other impacts that could not be mitigated effectively. Significant amount of professional judgment was applied during Tier 1.

6.1.2 Tier 2 – Operational Analysis of Refined Alternatives

For the six (6) concepts that passed from Tier 1 into Tier 2, further development was conducted to optimize the concepts into alternatives. This included analysis to measure the level of service (LOS) conditions that each alternative would produce in 2040.

For Tier 2 more detailed cost analyses were prepared as well, using Long-Range Estimating procedures to estimate construction costs. Right-of-way impacts were also measured, both from a social impact as well as cost perspective. Other engineering and administrative costs were estimated using factors normally used by the Department. Utility impacts remained at the qualitative level for Tier 2.

6.1.3 Tier 3 – Selection of Final Alternatives for Interchange Justification Study

Tier 3 alternatives are the best performing alternatives from Tier 2 and are recommended to move into the National Environmental Policy Act (NEPA) phase of the project.

6.2 TIER 1 CONCEPTS CONSIDERED

A total of 26 build concepts were conceptualized in Tier 1. These concepts considered access conditions for a number of scenarios. The concepts were formed by combining different arrangements of scenarios. The scenarios that the Tier 1 concepts were developed from are:

- **Scenario 1**: New General Use Interchange Access at either Central Boulevard or Hood Road and I-95
- **Scenario 2**: New Partial General Use Interchange Access at either Central Boulevard or Hood Road and I-95
- **Scenario 3**: Maintenance of the existing partial interchange to/from the north at Military Trail and I-95
- **Scenario 4**: Removal of the existing partial interchange to/from the north at Military Trail and I-95
- **Scenario 5**: New Partial Special Use Interchange Access to Special Use lanes within the median of I-95 either at Central Boulevard or Hood Road
- **Scenario 6**: Connection of interchanges through collector-distributor road systems adjacent and connected to cross streets and I-95

The following is a brief description of these concepts.

6.2.1 Concept 1: New Diamond Interchange at Central Boulevard

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.2 Concept 2: New Diamond Interchange at Central Boulevard with Existing Interchange at Military Trail Removed

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.3 Concept 3: New Diamond Interchange at Central Boulevard with New Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. No interchange access will be provided at Hood Road.

6.2.4. Concept 4: New Partial Diamond Interchange to/from the South at Central Boulevard

This concept will introduce a new partial tight diamond interchange along I-95 at Central Boulevard. This interchange will provide access to and from the south only on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.5 Concept 5: New Partial Diamond Interchange to/from the South at Central Boulevard with Existing Interchange at Military Trail Removed

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide access to and from the south only on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.6 Concept 6: New Partial Diamond Interchange to/from the South at Central Boulevard with Partial Diamond Interchange to Special Use Lanes to/from the South at Military Trail

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide partial access to and from the south only on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. No interchange access will be provided at Hood Road.

6.2.7 Concept 7: New Partial Cloverleaf (NE Quadrant) Interchange at Central Boulevard

This concept will introduce a new Partial Cloverleaf interchange along I-95 at Central Boulevard. The cloverleaf ramp will be located in the northeast quadrant

of the interchange and provide for the NB I-95 off movement to Central Boulevard. This cloverleaf movement will be provided to improve the weave distance between the northbound on ramp from Military Trail and the northbound off ramp to Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.8 Concept 8: New Partial Cloverleaf (NE Quadrant) Interchange at Central Boulevard with No Interchange at Military Trail

This concept will introduce a new Partial Cloverleaf interchange along I-95 at Central Boulevard. The cloverleaf ramp will be located in the northeast quadrant of the interchange and provide for the NB I-95 off movement to Central Boulevard. The existing partial interchange at Military Trail will be eliminated in this concept. This cloverleaf movement will be provided to improve the weave distance between the northbound on ramp from PGA Boulevard and the northbound off ramp to Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.9 Concept 9: New Partial Cloverleaf (NE Quadrant) Interchange at Central Blvd. with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

This concept will introduce a new Partial Cloverleaf interchange along I-95 at Central Boulevard. The cloverleaf ramp will be located in the northeast quadrant of the interchange and provide for the NB I-95 off movement to Central Boulevard. The existing partial interchange at Military Trail will be eliminated in this concept. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. The cloverleaf movement will be provided to improve the weave distance between the northbound on ramp from PGA Boulevard and the northbound off ramp to Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.10 Concept 10: Existing Military Trail Interchange with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

In this concept the interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition except at Military Trail. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. No interchange access will be provided at Central Blvd. or Hood Road.

6.2.11 Concept 11: New Diamond Interchange at Hood Road

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.12 Concept 12: New Diamond Interchange at Hood Road with Existing Interchange at Military Trail removed

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide full access to and from the north and south on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.13 Concept 13: New Diamond Interchange at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. No interchange access will be provided at Central Boulevard.

6.2.14 Concept 14: New Partial Diamond Interchange to/from the South at Hood Road

This concept will introduce a new partial tight diamond interchange along I-95 at Hood Road. This interchange will provide partial access to and from the south only on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.15 Concept 15: New Partial Diamond Interchange to/from the South at Hood Road with Existing Interchange at Military Trail Removed

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide access to and from the south only on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.16 Concept 16: New Partial Diamond Interchange to/from the South at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide partial access to and from the south only on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. No interchange access will be provided at Central Boulevard.

6.2.17 Concept 17: New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road

This concept will introduce a new Partial Cloverleaf interchange along I-95 at Hood Road. The cloverleaf ramp will be located in the northeast quadrant of the interchange and provide for the NB I-95 off movement to Hood Road. This cloverleaf movement will be provided to improve the weave distance between the northbound on ramp from Military Trail and the northbound off ramp to Hood Road. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.18 Concept 18: New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road with Existing Interchange at Military Trail Removed

This concept will introduce a partial diamond interchange along I-95 at Hood Road. This interchange will provide partial access to and from the south only on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.19 Concept 19: New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

This concept will introduce a new Partial Cloverleaf interchange along I-95 at Hood Road. The cloverleaf ramp will be located in the northeast quadrant of the interchange and provide for the NB I-95 off movement to Hood Road. The existing partial interchange at Military Trail will be eliminated in this concept. Additional interchange access will be provided from Military Trail to and from the south into special use lanes on I-95. The cloverleaf movement will be provided to improve the weave distance between the northbound on ramp from PGA Boulevard and the northbound off ramp to Hood Road. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.20 Concept 20: New Diamond Interchange at Central Boulevard with a New Diamond Interchange at Hood Road with a New Diamond Interchange at Military Trail

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard & Hood Road. These interchanges will provide full access to and from the north and south on I-95. The interchange at Military Trail will be converted into a full diamond interchange with full access to and from the north and south on I-95. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition.

6.2.21 Concept 21: New Diamond Interchange at Hood Road Combined with a New Diamond Interchange at Military Trail

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide full access to and from the north and south on I-95. The interchange at Military Trail will be converted into a full diamond interchange with full access to and from the north and south on I-95. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.22 Concept 22: New Partial Special Use Interchange to/from the South at Central Blvd.

Additional interchange access will be provided from Central Boulevard to and from the south into special use lanes on I-95. The interchanges at PGA Boulevard,

Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.23 Concept 23: New Full Special Use Interchange at Central Boulevard

This concept will introduce a new tight diamond special use interchange along I-95 into special use lanes at Central Boulevard. This interchange will provide full access to and from the north and south into the special use lanes. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.2.24 Concept 24: New Full Special Use Interchange at Hood Road

This concept will introduce a new tight diamond special use interchange along I-95 into special use lanes at Hood Road. This interchange will provide full access to and from the north and south into the special use lanes. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.25 Concept 25: New Partial Special Use Interchange to/from the South at Hood Road

Additional interchange access will be provided from Hood Road to and from the south into special use lanes on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.2.26 Concept 26: New Collector-Distributor (C-D) Road from PGA Boulevard to Hood Road with Access to PGA Boulevard, Military Trail, and Central Boulevard from C-D Roads

This concept will provide collector-distributor (C-D) roadways that run parallel to but separate from the mainline of I-95. These C-D roads will connect PGA Boulevard, Military Trail, and Central Boulevard together, while minimizing mainline on and off ramp gores. Modifications to the existing PGA Boulevard and Military Trail interchanges will be required to accommodate this concept.

6.3 COMPARATIVE EVALUATION OF TIER 1 CONCEPTS

The 26 concepts were evaluated against a set of criteria to distinguish those concepts that warrant further consideration and to identify those concepts that had flaws or other impacts that would eliminate them from further consideration. The following describes the criteria used for this comparison along with the rating of each concept against these comparative criteria.

For Tier 1, qualitative measures were employed to compare and evaluate build concepts. There were five (5) rankings used for this qualitative evaluation, represented by circular symbols. These symbols included a fully filled green circle, 3/4 filled green circle, 1/2 filled and so on. The more the circle was filled with color the more positive the ranking. These symbols for the Regional Transportation Performance are shown in Table 6-1. Symbology for the other comparative criteria is shown in Table 6-2.

Table 6-1 Ranking Symbols for Regional Transportation Performance

Ranking	Change in 2040 Traffic "NO BUILD" to "BUILD"	Comments
	> 12% reduction in traffic	Best condition. Concept will significantly reduce traffic on link and greatly improve LOS.
	3% reduction to 12% reduction in traffic	Good condition. Concept will reduce traffic on link and improve LOS.
	3% increase to 3% reduction in traffic	No change condition. Concept will have little or no impact on LOS.
	12% increase to 3% increase in traffic	Poor condition. Concept will increase link traffic and degrade LOS.
	>12% increase in traffic	Worst condition. Concept will increase link traffic and significantly degrade LOS.

Table 6-2 Ranking Symbols for Other Comparative Criteria

Ranking	Impact Level Criteria	Cost Based Criteria
	Very Low Impact to No Impact	Very Low Cost
	Low Impact	Low Cost
	Moderate Impact	Moderate Cost
	High Impact	High Cost
	Very High Impact	Very High Cost

The comparative criteria used in the tiered selection process are described below.

6.3.1 Criterion 1: Regional Transportation Performance

As a part of this Tier 1 analysis future travel demand was projected for the no build and build conditions for the 2040 horizon year. Although DDHV were not available during Tier 1, projected link volumes were. This allowed for a comparison of the build concept travel to no build travel in 2040, link by link. Measured in percent (%) change in volume, system performance was quantified for the three (3) critical roadways most indicative of regional mobility. Each roadway had two critical links that were evaluated. The results of this analysis, displayed in GIS formatted band width drawings, are contained in Appendix B.

6.3.1.1 **Mainline I-95** - The links north of and south of PGA Boulevard were considered the critical performance segments for mainline I-95.

6.3.1.2 **PGA Boulevard** - The links west of and east of Military Trail were considered the critical performance segments for PGA Boulevard.

6.3.1.3 **Military Trail** - The links north of and south of Hood Road were considered the critical performance segments for Military Trail.

6.3.2 Right-of-Way Impacts

Another critical area that was compared was the impact land acquisition would have on the community and the individual property owners. Two areas were examined, the amount of property that would need to be acquired and the number of properties that would require relocation of either residents or businesses. These criteria did not consider the cost implications of acquiring property. That was scored in the cost category.

6.3.2.1 **Right-of-Way Land Acquisition** – The order of magnitude of property that would be required to construct the build concept was assessed. The impact on use of properties and access was also considered.

6.3.2.2 **Relocations** – A determination was made as to whether the relocation of residents or businesses would be required as a part of the acquisition of property. As a part of Tier 1, this was a broad assessment, and not a detailed examination of business use or operations.

6.3.3 Environmental Impacts

Each concept was assessed to determine if any potential environmental impact would be created as a part of the construction of transportation improvements. For Tier 1 a limited desktop review of environmental conditions was conducted through the examination of aerial photography or database information readily available from regulatory agencies.

6.3.3.1 **Natural –** The potential presence of threatened or endangered species within the influence area of the concepts was examined. In addition to the species, their habitat was also examined for impact. As a major part of habitat, the presence of wetlands and the quality of those wetland systems was also reviewed to determine the order of magnitude of impact.

6.3.3.2 **Physical –** The potential for noise, air and water quality impact was assessed and scored for each concept. This category also focused on any potential contamination that might be present, based on existing land use or documented conditions.

6.3.3.3 **Social –** The impact that each concept might have on the human environment was also assessed as a part of Tier 1 analysis. This included examination of documented historic and/or cultural resources that might be impacted, public lands whose use may be impacted by the concept and other conditions, either temporary or permanent, that could impact the human environment.

6.3.4 Construction Costs

The capital cost to construct the concepts was examined intuitively. The quantity and type of construction, the length and extent of construction and the order of magnitude of the work was assessed. The elements of costs that were evaluated are listed below.

6.3.4.1 **Roadway Only Costs –** This includes all elements of the typical section, outside of bridges and ramps. This would include both the mainline of I-95 as well as the arterial roadway intersecting with I-95. No detailed cost estimation, quantity calculations or historical cost analysis was done as a part of this Tier 1 analysis.

6.3.4.2 **Roadway Bridges –** The number of bridges, complexity of construction for each, span configurations and lengths were examined for each of the concepts to determine the relative cost of construction.

6.3.4.3 **Interchange –** The cost of ramp pavement structures and other features not a part of the mainline roadways was evaluated. This did not include bridges located on ramps. Those bridge costs are considered in 4.4.2 above.

6.3.4.4 **Right-of-Way Land Costs –** The cost of the acquisition of real property would be accounted for in this category.

6.3.4.5 **Right-of-Way Relocation & Business Damages –** This would consider the cost impacts associated with the operation of businesses that might be acquired, the cost to relocate residents to new properties and other non-land costs associated with right-of-way administration.

6.3.4.6 **Utility Relocation –** The cost of constructing conflict structures to accommodate those conflicts and relocation/reconstruction of utility systems that are reimbursable to the utility companies would be assessed in this category.

6.3.4.7 **Environmental Mitigation -** The cost of providing mitigation of environmental impacts would be considered here. This could be wetland mitigation, either purchased credits at a mitigation bank or construction of mitigation sites.

6.3.5 Utility Impacts

The impact to utility systems explores both the physical impact to the facilities as well as the potential impact to the public if those systems cannot meet the needs of the users.

6.3.5.1 **Major Utility Impacts –** This area would include impacts to major utility facilities, such as power substations, water and sewer pump stations, utility operational facilities or other major structures that could require special attention and detail to avoid service interruption for the public.

6.3.5.2 **Miles of Utility Relocation –** This category explores impacts that have long linear influence to utility lines or conduits.

6.3.5.3 **Utility Conflict Sites –** This area would be associated with the number of anticipated conflicts between transportation systems and those utility systems, including both aerial and particularly underground conflicts.

6.3.6 Other Costs

A number of administrative and overhead costs also can factor into to the evaluation of concepts and alternatives. Those indirect cost types are listed below. At the Tier 1 level these costs are usually proportional to the construction cost and therefore do not weigh heavily in the comparison of concepts. Normally, they are calculated by applying factors to the construction cost. For Tier 1, these areas were rated, but did not weigh heavily in our judgment or recommendations. These items, particularly contingency, become much more important in later tiers.

6.3.6.1 Mobilization

6.3.6.2 Contingency

6.3.6.3 Preliminary Engineering

6.3.6.4 Construction Engineering and Inspection

6.3.7 Analysis of Flawed Concepts

Prior to comparing the concepts, an analysis of the flaws and impacts that might be present and which would eliminate a concept from further consideration was performed. The following concepts were eliminated from further consideration. The flaws and impacts are described along with any other information that supports the elimination of that concept.

6.3.7.1 **Concept 3: New Diamond Interchange at Central Boulevard with New Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South.**

Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive. The challenges of getting a SB special use on-ramp from Military Trail would require the replacement of the flyover ramp from SR 811 to SB I-95 to make room for this special use ramp within the median of I-95. This structure would require replacement due to the fact that the proposed SB ramp would be required to rise quickly at a grade that would exceed Department criteria for limited access ramps. This ramp would have to elevate sufficiently to provide clearance between this new ramp and the SB lanes of I-95. Once it traverses the SB lanes of I-95, it must then come back down to the I-95 SB mainline grade, again at a gradient greater than criteria. To meet criteria this ramp would require in excess of 2,000 feet to rise and return to grade. The existing flyover bridge location only provides approximately 1,100 feet for this maneuver. In addition to the costly requirement of replacing the SR 811 flyover structure, it is not anticipated that this concept would not have a significant positive impact on regional mobility.

6.3.7.2 **Concept 6: New Partial Diamond Interchange to/from the South at Central Boulevard with Partial Diamond Interchange to Special Use Lanes to/from the South at Military Trail.**

Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive. The challenges of getting a SB special use on-ramp from Military Trail would require the replacement of the flyover ramp from SR 811 to SB I-95 to make room for this special use ramp within the median of I-95. This structure would require replacement due to the fact that the proposed SB ramp would be required to rise quickly at a grade that would exceed Department criteria for limited access ramps. This ramp would have to elevate sufficiently to provide clearance between this new ramp and the SB lanes of I-95. Once it

traverses the SB lanes of I-95, it must then come back down to the I-95 SB mainline grade, again at a gradient greater than criteria. To meet criteria this ramp would require in excess of 2,000 feet to rise and come back down to grade. The existing flyover bridge location only provides approximately 1,100 feet for this maneuver. In addition to the costly requirement of replacing the SR 811 flyover structure, it is not anticipated that this concept would not have a significant positive impact on regional mobility.

6.3.7.3 **Concept 8: New Partial Cloverleaf (NE Quadrant) Interchange at Central Boulevard with No Interchange at Military Trail**

This concept has similar traffic benefits as concept 2. The introduction of a partial cloverleaf ramp for the NB off-ramp to Central Boulevard, while removing the existing Military Trail partial interchange is not warranted. The primary reason to provide the partial cloverleaf ramp is to increase the weaving distance (on-ramp gore to off-ramp gore) between the upstream on-ramp and the proposed Central Boulevard off-ramp. With the removal of the Military Trail interchange, the weaving distance between the PGA Boulevard NB on-ramp and the proposed Central Boulevard off-ramp could be accommodated by a diamond interchange configuration at Central Boulevard. This would mean that the cost of acquiring the property to support construction of the cloverleaf off-ramp is not warranted. Based on this, Concept 2 is superior and provides for the options needed.

6.3.7.4 **Concept 9: New Partial Cloverleaf (NE Quadrant) Interchange at Central Blvd. with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South.**

The flaw in this concept is two-fold. First, connecting with any proposed special use lane interchange at Military Trail to the south has been shown to be flawed (see 4.7.2 above). Second, with the removal of the existing partial interchange at Military Trail, the cloverleaf off-ramp at Central Boulevard would not be warranted from a cost standpoint, as described in 4.7.3 above.

6.3.7.5 **Concept 10: Existing Military Trail Interchange with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South.**

Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive. The challenges of getting a SB special use on-ramp from Military Trail would require the replacement of the flyover ramp from SR 811 to SB I-95 to make room for this special use ramp within the median of I-95. This structure would require replacement due to the fact that the proposed SB ramp would be required to rise quickly at a grade that would exceed Department

criteria for limited access ramps. This ramp would have to elevate sufficiently to provide clearance between this new ramp and the SB lanes of I-95. Once it traverses the SB lanes of I-95, it must then come back down to the I-95 SB mainline grade, again at a gradient greater than criteria. To meet criteria this ramp would require in excess of 2,000 feet to rise and come back down to grade. The existing flyover bridge location only provides approximately 1,100 feet for this maneuver. In addition to the costly requirement of replacing the SR 811 flyover structure, it is not anticipated that this concept would not have a significant positive impact on regional mobility.

6.3.7.6 Concept 13: New Diamond Interchange at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive. The challenges of getting a SB special use on-ramp from Military Trail would require the replacement of the flyover ramp from SR 811 to SB I-95 to make room for this special use ramp within the median of I-95. This structure would require replacement due to the fact that the proposed SB ramp would be required to rise quickly at a grade that would exceed Department criteria for limited access ramps. This ramp would have to elevate sufficiently to provide clearance between this new ramp and the SB lanes of I-95. Once it traverses the SB lanes of I-95, it must then come back down to the I-95 SB mainline grade, again at a gradient greater than criteria. To meet criteria this ramp would require in excess of 2,000 feet to rise and come back down to grade. The existing flyover bridge location only provides approximately 1,100 feet for this maneuver. In addition to the costly requirement of replacing the SR 811 flyover structure, it is not anticipated that this concept would not have a significant positive impact on regional mobility.

6.3.7.7 Concept 16: New Partial Diamond Interchange to/from the South at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive. The challenges of getting a SB special use on-ramp from Military Trail would require the replacement of the flyover ramp from SR 811 to SB I-95 to make room for this special use ramp within the median of I-95. This structure would require replacement due to the fact that the proposed SB ramp would be required to rise quickly at a grade that would exceed Department criteria for limited access ramps. This ramp would have to elevate sufficiently to provide clearance between this new ramp and the SB lanes of I-95. Once it traverses the SB lanes of I-95, it must then come back down to the I-95 SB

mainline grade, again at a gradient greater than criteria. To meet criteria this ramp would require in excess of 2,000 feet to rise and come back down to grade. The existing flyover bridge location only provides approximately 1,100 feet for this maneuver. In addition to the costly requirement of replacing the SR 811 flyover structure, it is not anticipated that this concept would not have a significant positive impact on regional mobility.

6.3.7.8 Concept 18: New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road with Existing Interchange at Military Trail Removed

This concept has similar traffic benefits as concept 12. The introduction of a partial cloverleaf ramp for the NB off-ramp to Hood Road, while removing the existing Military Trail partial interchange is not warranted. The primary reason to provide the partial cloverleaf ramp is to increase the weaving distance (on-ramp gore to off-ramp gore) between the downstream on-ramp and the proposed Hood Road off-ramp. With the removal of the Military Trail interchange, the weaving distance between the PGA Boulevard NB on-ramp and the proposed Hood Road off-ramp could be accommodated by a diamond interchange configuration at Hood Road. This would mean that the cost of acquiring the property to support construction of the cloverleaf off-ramp is not warranted. Based on this, Concept 12 is superior and provides for the options needed.

6.3.7.9 Concept 19: New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South

Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive. The challenges of getting a SB special use on-ramp from Military Trail would require the replacement of the flyover ramp from SR 811 to SB I-95 to make room for this special use ramp within the median of I-95. This structure would require replacement due to the fact that the proposed SB ramp would be required to rise quickly at a grade that would exceed Department criteria for limited access ramps. This ramp would have to elevate sufficiently to provide clearance between this new ramp and the SB lanes of I-95. Once it traverses the SB lanes of I-95, it must then come back down to the I-95 SB mainline grade, again at a gradient greater than criteria. To meet criteria this ramp would require in excess of 2,000 feet to rise and return down to grade. The existing flyover bridge location only provides approximately 1,100 feet for this maneuver. In addition to the costly requirement of replacing the SR 811 flyover structure, it is not anticipated that this concept would not have a significant positive impact on regional mobility.

6.3.8 Concept 20: New Diamond Interchange at Central Boulevard with a New Diamond Interchange at Hood Road with a New Diamond Interchange at Military Trail

Fatally Flawed – The addition of new interchanges at Central Boulevard and Hood Road and completion of the interchange at Military Trail is not geometrically possible. The close proximity of these cross streets would not allow for proper interchange spacing. Even with the introduction of braided ramps to accommodate some of these interchange movements, particularly between Central Boulevard and Hood Road. In addition to the geometry, I-95 mainline operations would be negatively impacted by this alternative.

6.3.8.1 Concept 21: New Diamond Interchange at Hood Road Combined with a New Diamond Interchange at Military Trail

From a traffic performance standpoint, a new interchange at Central Boulevard would provide better relief to regional roadways than an interchange at Hood Road, as demonstrated in the traffic analysis contained in Appendix B. At Military Trail, the completion of the interchange movements does not provide significant positive benefit from a regional perspective, but would add significant cost to the project, given the amount of new bridge and bridge modifications that would be required. The configuration of the new SB on-ramp from Military Trail would also present operational challenges on the existing SR 811 flyover to SB I-95 that could severely degrade the ramp's level of service. In addition to these challenges, Concept 11, a new interchange at Hood Road alone would provide for similar regional transportation benefits at a much lower cost. For these reasons, this concept was eliminated from further consideration.

6.3.8.2 Concept 22: New Partial Special Use Interchange to/from the South at Central Blvd.

Fatal Flaw – Special use demand at Central Boulevard does not warrant a special use Interchange at this location.

6.3.8.3 Concept 26: New Collector-Distributor (C-D) Road from PGA Boulevard to Hood Road with Access to PGA Boulevard, Military Trail, and Central Boulevard from C-D Road

The collector-distributor (C-D) roadway system would begin (NB) and end (SB) at PGA Boulevard. The geometric improvements for the C-D concept would be similar to that proposed for the completion of the Military Trail to the south. As discussed in 4.7.2, the ramp features from PGA Boulevard to Military Trail would add significant cost to the project, given the amount of new bridge and bridge modifications that would be required. The configuration of the new SB

on-ramp from Military Trail would also present operational challenges on the existing SR 811 flyover to SB I-95 that could severely degrade the ramp's level of service. At the northern end of the project, north of Hood Road, the NB on-ramp would have a relatively short distance to the Donald Ross Road off-ramp. The weaving section may not be capable of accommodating the volumes and may perform at a low level of service.

6.3.9 Comparative Matrix

The following pages contain the comparative matrices that document each concept against the comparative criteria. Table 6-3 is the quantitative evaluation of the Regional Transportation Performance Matrix that feeds into the overall comparative matrix included in Table 6-4. Table 6-4 also describes those flaws, impacts or other conditions that would preclude further consideration of that concept.

Table 6-3 – Regional Transportation Performance Evaluation Matrix

Highest Rated Concpets Compared to NO BUILD Conditions		2040 Percent Change in Demand Compared to NO BUILD											
		I-95				PGA Blvd.				Military Trail			
Alt #	Description	South of PGA Blvd.	North of PGA Blvd.	Average	Comparative Rating	West of Military Trail	East of Military Trail	Average	Comparative Rating	South of Hood Rd.	North of Hood Rd.	Average	Comparative Rating
1	Full Diamond at Central Blvd.	3%	16%	10%		-7%	-9%	-8%		-19%	3%	-8%	
2	Full Diamond at Central Blvd. without Military Trail	3%	17%	10%		-6%	-10%	-8%		-19%	3%	-8%	
4	Partial (to/from South) Interchange at Central Blvd.	3%	16%	10%		-1%	-10%	-6%		-21%	0%	-11%	
5	Partial (to/from South) Interchange at Central Blvd. without Military Tr	3%	17%	10%		-2%	-9%	-6%		-21%	3%	-9%	
11	Full Diamond at Hood Rd.	2%	32%	17%		-2%	-4%	-3%		-12%	1%	-6%	
12	Full Diamond at Hood Rd. without Military Trail	2%	32%	17%		-1%	-4%	-3%		-10%	4%	-3%	
14	Partial (to/from South) Interchange at Hood Rd.	2%	33%	18%		0%	-5%	-3%		-12%	4%	-4%	
15	Partial (to/from South) Interchange at Hood Rd. without Military Trail	2%	33%	18%		0%	-4%	-3%		-10%	5%	-3%	
23	**Full Special Use Interchange at Central Blvd.**	9%	11%	10%		0%	-3%	-2%		-8%	1%	-5%	
24	**Full Special Use Interchange at Hood Rd.**	7%	21%	14%		0%	-2%	-1%		1%	-3%	-1%	

Increase in 2040 Volumes on Link — Decrease in 2040 Volumes on Link

Rankings Based on Average Change

> 12% increase | 3% to 12% increase | Plus 3% to Minus 3% | 3% to 12% reduced | > 12% reduced

SR-9/I-95 @ PGA Boulevard / Central Boulevard
Interchange Justification Report

Table 6-4 Tier 1 Comparative Evaluation Matrix

LEGEND: ○ Very High ◔ High ◑ Moderate ◕ Low ● Very Low to None — Concept No Longer Being Considered — Concept May Be Incorporated into Other Concepts

Tier 1 Concepts	Regional Transportation Performance			R/W Impacts		Environmental Impacts			Utility Impacts			Construction Costs							Other Costs			
	Mainline I-95 Operations	PGA Boulevard	Military Trail	Land Acquisition	Relocation Potential	Natural Environment	Physical Environment	Social Environment	Major Utility Impacts	Miles of Utility Relocation	Utility Conflict Sites	Roadway Only Costs	Roadway Bridges	Interchange	Right-of-Way Land Costs	Right-of-Way Bus Dam	Utility Relocation	Environmental Mitigation	Mobilization	Contingency	Engineering	CEI
1 New Diamond Interchange at Central Boulevard	◔	◕	●	◕	●	◕	◕	◕	●	●	◕	◕	●	◑	◕	●	◕	●	◕	◕	◕	◕
2 New Diamond Interchange at Central Boulevard with No Interchange at Military Trail	◔	◕	●	◕	●	◕	◕	◕	●	●	◕	◕	●	◑	●	●	◕	●	◕	◕	◕	◕
3 New Diamond Interchange at Central Boulevard with New Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South	Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive																					
4 New Partial Diamond Interchange to/from the South at Central Boulevard	◔	◕	●	●	●	◕	◕	◕	●	●	◕	●	●	◑	◕	●	●	●	●	●	●	●
5 New Partial Diamond Interchange to/from the South at Central Boulevard with No Interchange at Military Trail	◔	◕	●	●	●	◕	◕	◕	●	●	◕	●	●	◑	●	●	●	●	●	●	●	●
6 New Partial Diamond Interchange to/from the South at Central Boulevard with Partial Diamond Interchange to Special Use Lanes to/from the South	Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive																					
7 New Partial Cloverleaf (NE Quadrant) Interchange at Central Boulevard	May be Considered as an Option in Concept 1 in Tier 2																					
8 New Partial Cloverleaf (NE Quadrant) Interchange at Central Boulevard with No Interchange at Military Trail	Removal of Military Trail makes Right-of-Way Acquisition in NE Quadrant not Necessary. Concept 2 Superior.																					
9 New Partial Cloverleaf (NE Quadrant) Interchange at Central Boulevard with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South	Removal of Military Trail makes Right-of-Way Acquisition in NE Quadrant not Necessary. Also see Concept 6 Flaw.																					
10 Existing Military Trail Interchange with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South	Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive																					
11 New Diamond Interchange at Hood Road	○	◑	●	◑	◕	◕	◕	◕	●	●	◕	◕	●	◑	◑	●	◕	◕	◕	◕	◕	◕
12 New Diamond Interchange at Hood Road with No Interchange at Military Trail	○	◑	◕	◑	◕	◕	◕	◕	●	●	◕	◕	●	◑	◕	●	◕	◕	◕	◕	◕	◕
13 New Diamond Interchange at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South	Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive																					
14 New Partial Diamond Interchange to/from the South at Hood Road	○	◑	◕	◕	◕	◕	◕	◕	●	●	◕	◕	●	◕	◕	●	◕	◕	◕	◕	◕	◕
15 New Partial Diamond Interchange to/from the South at Hood Road with No Interchange at Military Trail	○	◑	◕	◕	◕	◕	◕	◕	●	●	◕	◕	●	◕	●	●	◕	◕	◕	◕	◕	◕
16 New Partial Diamond Interchange to/from the South at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South	Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive																					
17 New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road	May be Considered as an Option in Concept 11 in Tier 2																					
18 New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road with No Interchange at Military Trail	Removal of Military Trail makes Right-of-Way Acquisition in NE Quadrant not Necessary. Concept 2 Superior.																					
19 New Partial Cloverleaf (NE Quadrant) Interchange at Hood Road with Partial Diamond Interchange at Military Trail to Special Use Lanes to/from the South	Flawed Concept – Direct Access to Future Special Use Lanes from Military Trail is Cost Prohibitive																					
20 New Diamond Interchange at Central Boulevard with a New Diamond Interchange at Hood Road with a New Diamond Interchange at Military Trail	Fatal Flaw – Mainline Operational Impacts Due to Closely Spaced Interchanges																					
21 New Diamond Interchange at Hood Road Combined with a New Diamond Interchange at Military Trail	Flawed Concept – Interchange Ramps to/from the South Are Cost Prohibitive & May Introduce Operational Challenges																					
22 New Partial Special Use Interchange to/from the South at Central Boulevard	Fatal Flaw – Special Use Demand at Central Boulevard Does Not Warrant Interchange																					
23 New Full Special Use Interchange at Central Boulevard	◔	◑	◕	●	●	◕	◕	◕	●	●	◕	●	●	◑	◕	●	●	●	●	●	●	●
24 New Full Special Use Interchange at Hood Road	○	◑	◕	●	●	◕	◕	◕	●	●	◕	●	●	◑	◕	●	●	●	●	●	●	●
25 New Partial Special Use Interchange to/from the South at Hood Road	Fatal Flaw – Special Use Demand at Central Boulevard Does Not Warrant Interchange																					

6.4 TIER 2 RECOMMENDATIONS

The alternatives in Table 6-3 were discussed at the FDOT District Interchange Review Committee (DIRC) at their meeting on March 27, 2014 to select those for which operational performance at all study area intersections would be compared. The committee agreed on Alternative 1, with an additional version described below, Concept 2, with a modification described below, along with Concepts 4, 5, 11 and 23.

6.4.1 Tier 1 Concepts Developed Into Full Tier 2 Alternatives

6.4.1.1 Concept 1a: New Diamond Interchange at Central Boulevard

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.4.1.2 Concept 1b: New Partial Cloverleaf Interchange at Central Boulevard

This concept will introduce a new partial cloverleaf interchange along I-95 at Central Boulevard, with a cloverleaf NB off ramp. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.4.1.3 Concept 2: New Diamond Interchange at Central Boulevard with Collector/Distributor roads from Military Trail

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide full access to and from the north and south on I-95. The existing partial interchange at Military Trail will connect to Collector Distributor roads that connect to I-95 on the north side of the new Central Boulevard interchange. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.4.1.4 Concept 4: New Partial Diamond Interchange to/from the South at Central Boulevard

This concept will introduce a new partial tight diamond interchange along I-95 at Central Boulevard. This interchange will provide access to and from the south only on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road. This alternative may be improved by incorporating Concept 7, a partial cloverleaf off-ramp for the NB to Central Boulevard movement, if the diamond configuration does not perform operationally.

6.4.1.5 Concept 5: New Partial Diamond Interchange to/from the South at Central Boulevard with Existing Interchange at Military Trail Removed

This concept will introduce a new tight diamond interchange along I-95 at Central Boulevard. This interchange will provide access to and from the south only on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.4.1.6 Concept 11: New Diamond Interchange at Hood Road

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide full access to and from the north and south on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.4.1.7 Concept 23: New Full Special Use Interchange at Central Boulevard

This concept will introduce a new single point interchange along I-95 into the special use lanes at Central Boulevard. This interchange will provide full access to and from the north and south into the special use lanes. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Hood Road.

6.4.2 Concepts That Have Limited Merit for Continued Study

The following concepts did not provide superior results for regional transportation performance were not considered further.

6.4.2.1 Concept 12: New Diamond Interchange at Hood Road with Existing Interchange at Military Trail removed

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide full access to and from the north and south on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard. This alternative may be improved by incorporating Concept 17, a partial cloverleaf off-ramp for the NB to Hood Road movement, if the diamond configuration does not perform operationally.

6.4.2.2 Concept 14: New Partial Diamond Interchange to/from the South at Hood Road

This concept will introduce a new partial tight diamond interchange along I-95 at Hood Road. This interchange will provide partial access to and from the south only on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard. This alternative may be improved by incorporating concept 17, a partial cloverleaf off-ramp for the NB to Hood Road movement, if the diamond configuration does not perform operationally.

6.4.2.3 Concept 15: New Partial Diamond Interchange to/from the South at Hood Road with Existing Interchange at Military Trail Removed

This concept will introduce a new tight diamond interchange along I-95 at Hood Road. This interchange will provide access to and from the south only on I-95. The existing partial interchange at Military Trail will be eliminated in this concept. The interchanges at PGA Boulevard and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.4.2.4 Concept 24: New Full Special Use Interchange at Hood Road

This concept will introduce a new tight diamond special use interchange along I-95 into special use lanes at Hood Road. This interchange will provide full access to and from the north and south into the special use lanes. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.4.2.5 Concept 25: New Partial Special Use Interchange to/from the South at Hood Road

Additional interchange access will be provided from Hood Road to and from the south into special use lanes on I-95. The interchanges at PGA Boulevard, Military Trail and Donald Ross Road will remain unchanged from their existing condition. No interchange access will be provided at Central Boulevard.

6.4.2.6 Concept 26: New Collector-Distributor (C-D) Road from PGA Boulevard to Hood Road with Access to PGA Boulevard, Military Trail, and Central Boulevard from C-D Roads

This concept will provide collector-distributor (C-D) roadways that run parallel to but separate from the mainline of I-95. These C-D roads will connect PGA Boulevard, Military Trail, and Central Boulevard together, while minimizing mainline on and off ramp gores. Modifications to the existing PGA Boulevard and Military Trail interchanges will be required to accommodate this concept.

6.5 Recommended Alternatives

Of the Tier 2 alternatives listed in section 6.4.1, Alternative 5 was subsequently eliminated from the group given the likely difficulty of ever removing the current access provided at Military Trail. The remaining concepts were reviewed by the District Interchange Review Committee on May 22, 2014. Operational analysis of all intersections had been conducted for all the Tier 2 alternatives. Delay in seconds for each intersection movement was multiplied by its respective demand volume, and the products summed across all movements at all intersections. Done only once with 2040 demand volumes (see Appendix AJ), and multiplied over 250 days of the year, this yielded an estimate in total annual delay for each build alternative, and thus an annual savings in hours of delay for that alternative when compared with the No Build Alternative (see Table 6-5). This savings in hours was monetized using a value per hour of time saved recommended by the Department that incorporates auto occupancy. The demand volumes used were the minimally adjusted 2040 model volumes described in Section 2.7.

The delay benefits are superior for the three alternatives that provide full access at Central Boulevard (1a, 1b, and 2), and less so for Concept 4 (which provides partial access at Central Boulevard), Concept 11 (which provides full access, but further north at Hood Road), and Concept 23 (which provides only Special Use lane access at Central Boulevard).

Table 6-5 – Delay Benefits of Alternative Interchanges Compared to 2040 No Build

Corridors	No Build	Total Daily Peak Hour Delay (Hours) Difference Between Alternative and No Build											
		Alternative 1A		Alternative 1B		Alternative 2		Alternative 4		Alternative 11		Alternative 23	
		Delay	Benefit	Delay	Benefit	Delay	Benefit	Delay	Benefit	Delay	Benefit	Delay	Benefit
Central Boulevard	3,292.1	1,639.7	1,652.4	1,639.7	1,652.4	1,639.7	1,652.4	1,595.6	1,696.5	1,431.5	1,860.6	1,835.1	1,457.0
Donald Ross Road	1,399.4	639.8	759.6	639.8	759.6	639.8	759.6	670.6	728.8	660.1	739.3	660.4	739.0
Hood Road	2,143.3	502.2	1,641.0	502.2	1,641.0	502.2	1,641.0	535.2	1,608.1	614.4	1,528.9	591.5	1,551.8
Northlake Boulevard	1,784.9	787.0	997.9	787.0	997.9	787.0	997.9	786.0	998.9	928.5	856.3	896.5	888.4
PGA Boulevard	5,181.1	616.8	4,564.3	616.8	4,564.3	616.8	4,564.3	668.6	4,512.5	837.7	4,343.4	926.4	4,254.7
Military Trail	2,289.6	1,175.7	1,113.9	1,251.0	1,038.6	1,175.7	1,113.9	1,446.4	843.3	1,581.6	708.0	1,561.4	728.3
Total Daily Peak Hour Delay (hrs)	16,090.4	5,361.3		5,436.5		5,361.3		5,702.4		6,053.9		6,471.2	
Total Daily Peak Hour Benefit (Hrs)			10,729.1		10,653.8		10,729.1		10,388.1		10,036.5		9,619.2
Days of Delay per Year	250	250	250	250	250	250	250	250	250	250	250	250	250
Annual Delay (hours)	4,022,595	1,340,320	2,682,275	1,359,132	2,663,450	1,340,320	2,682,275	1,425,594	2,597,025	1,513,466	2,509,125	1,617,809	2,404,800
Cost per Hour of Delay	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41
Total Annual Delay Cost	$ 94,168,943	$ 31,376,882		$ 31,817,288		$ 31,376,882		$ 33,373,158		$ 35,430,247		$ 37,872,906	
Total Annual Delay Benefit			$ 62,792,058		$ 62,351,365		$ 62,792,058		$ 60,796,355		$ 58,738,616		$ 56,296,368

At the May 22, 2014 DIRC meeting, following review of the delay reduction results outlined above, it was agreed to continue the analyses by quantifying the effect on I-95 mainline sections and ramps for only three alternatives: a new diamond interchange at Central Boulevard, the same interchange with a partial cloverleaf in the northeast quadrant, and a new diamond interchange at Central Boulevard with collector distributor roads that carried the Military Trail ramp traffic over Central Boulevard, to connect to the mainline on the north side of the interchange there.

Subsequent review of the partial cloverleaf alternative eliminated it due to the social (potential relocation) impacts in the quadrant containing the cloverleaf, the difficulty in achieving acceptable level of service at the cloverleaf ramp junction intersection (where heavy NB to EB demand becomes a left turn movement), and its cost.

By the June 29, 2015 DIRC meeting, a braided ramp alternative had been added, and it was agreed to revisit design traffic volumes and perform detailed operational analysis on the following three alternatives:

6.5.1 Alternative 1

Alternative 1 is a new diamond interchange at Central Boulevard.

6.5.2 Alternative 2

Alternative 2 includes a new diamond interchange at Central Boulevard. It also creates a collector-distributor roadway system adjacent to northbound and southbound SR 9/I-95. This alternative removes the direct connection of the ramps at Military Trail to I-95. Northbound Military Trail on ramp traffic merges with northbound Central Boulevard off ramp traffic and the weaving movement between the two occurs on the northbound collector road. Similarly, Central Boulevard southbound on ramp traffic merges with southbound Military off ramp traffic and the weaving movement between the two occurs on the on the southbound collector road.

6.5.3 Alternative 3

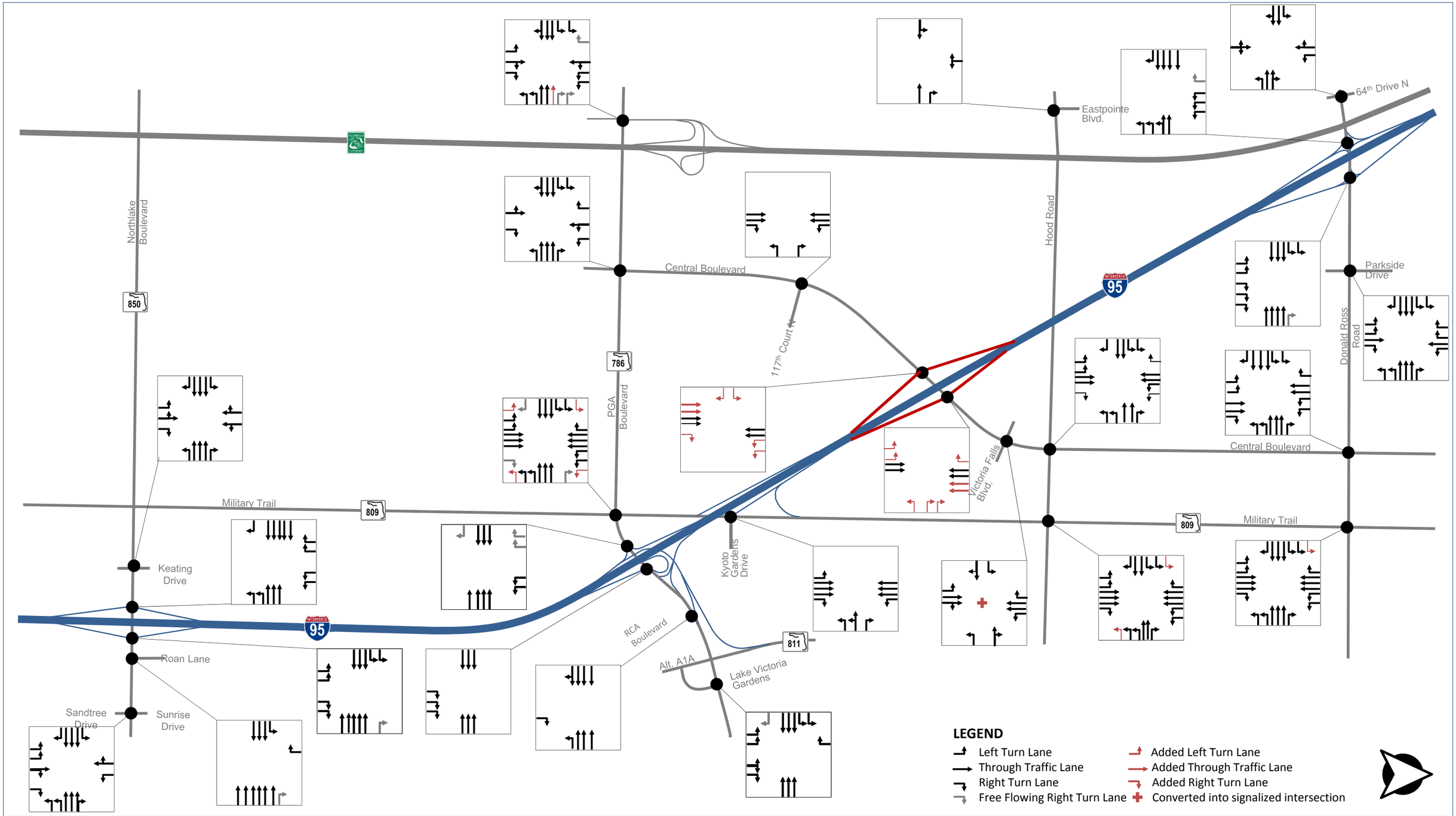
Alternative 3 includes a new diamond interchange at Central Boulevard. It also includes braided ramps between Military Trail and Central Boulevard to eliminate

the weaving sections there. In both directions the Central Boulevard ramps (northbound off, southbound on) pass over top of the Military Trail ramps (northbound on, southbound off).

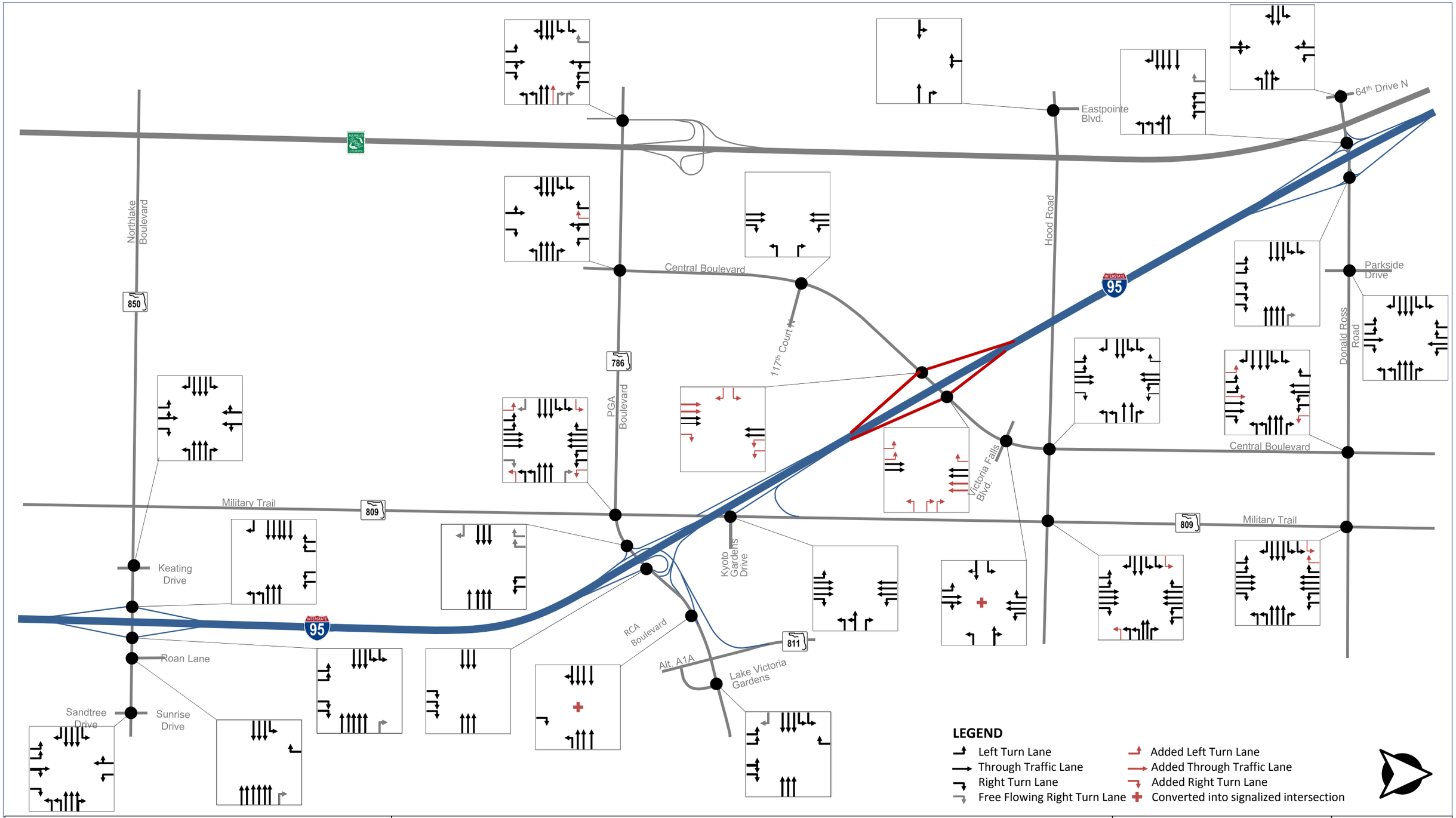
The subsequent analysis of Alternative 1 revealed operational degradation due to weaving movements so substantial it was removed from further consideration, leaving Alternatives 2 and 3.

Appendix O contains conceptual drawings of these two alternatives.

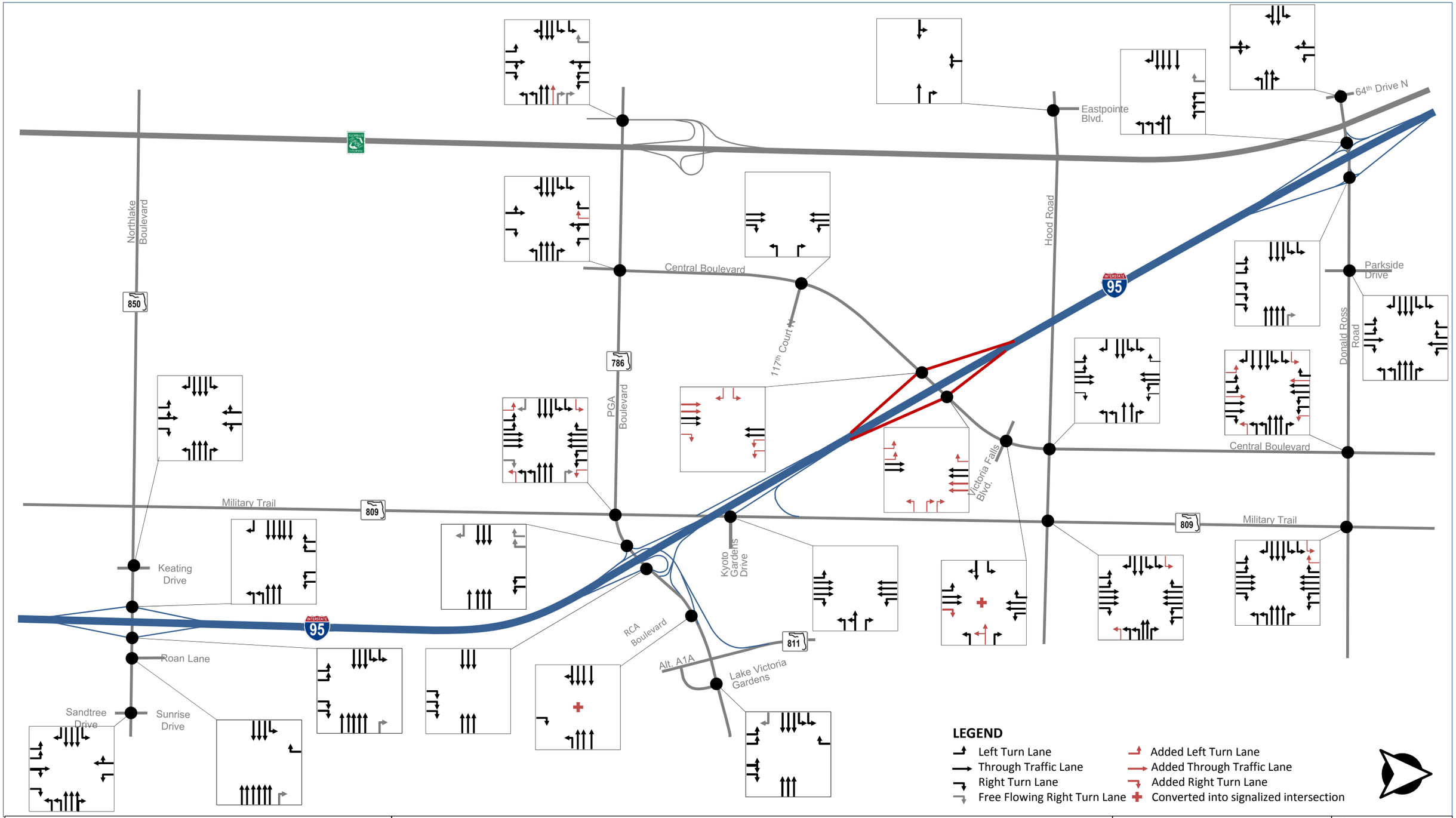
Figures 6-1 through 6-3 depict the intersection lane geometries necessary to achieve acceptable levels of service at the new interchange ramp intersections, and the other study area intersections, in the years 2020, 2030, and 2040 respectively.



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**Build Alternatives- 2020 Intersection Lane Geometry**	*Report Title:* Interchange Justification Report	*Figure No.* 6-1 *Page No.* *Date:*



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**Build Alternatives - 2030 Intersection Lane Geometry**	*Report Title:* Interchange Justification Report	*Figure No.* 6-2
			Page No.
			Date:



Project Name: **SR 9 / I-95 at PGA Boulevard/ Central Boulevard** Project Development & Environmental Study FM No. 413265-1-22-01	**Build Alternatives - 2040 Intersection Lane Geometry**	*Report Title:* Interchange Justification Report	*Figure No.* 6-3
			Page No.
			Date:

7.0 ALTERNATIVES ANALYSIS

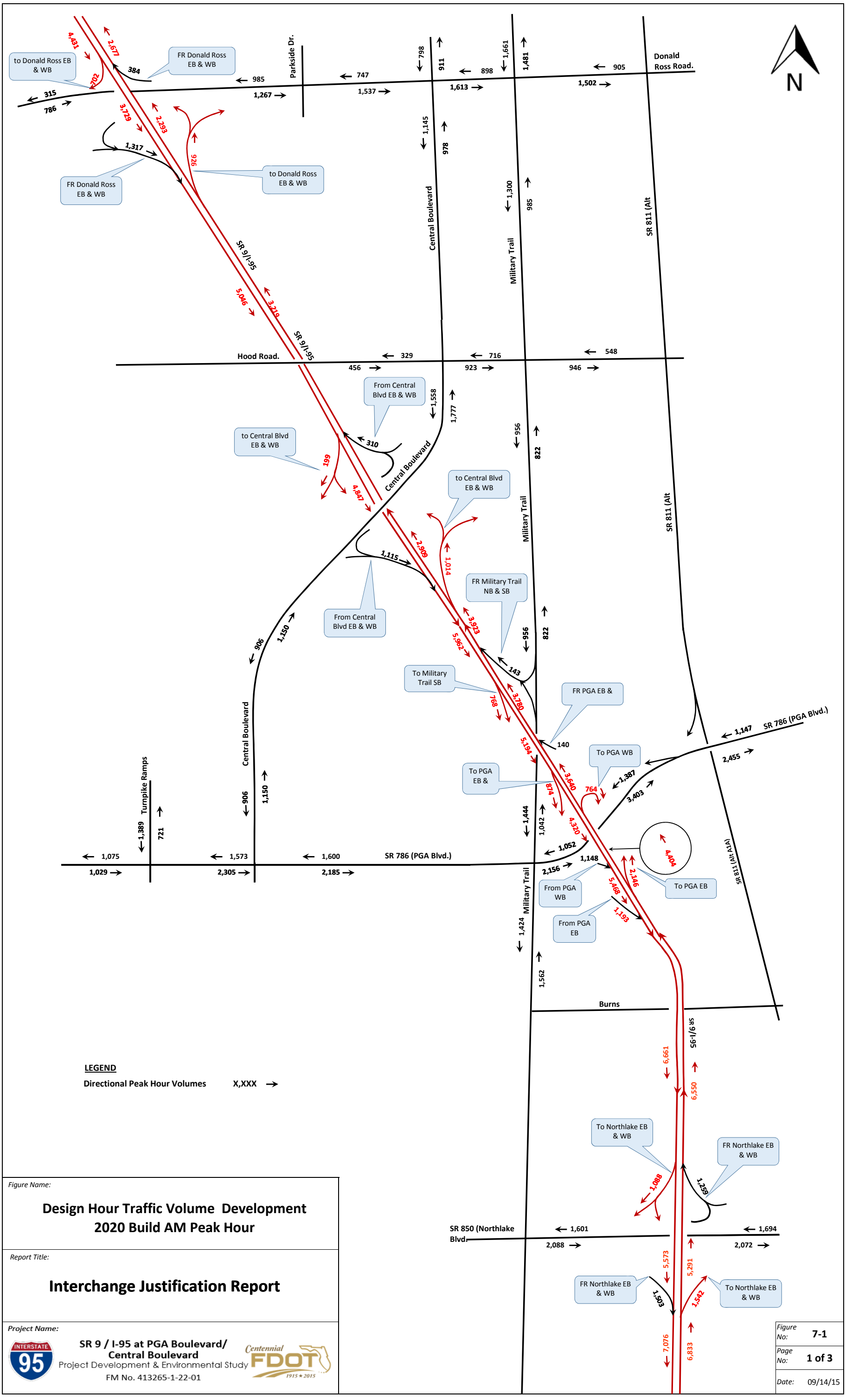
7.1 Build Alternative Design Traffic Volumes

For the Build condition, the No-Build peak hour directional link volumes were each adjusted according to the percent change in model volumes observed when the 2040 No-Build and Build alternative model runs were compared. Peak hour directional volumes were split into turning movements at the intersections based on turning movement splits observed in the model. These first estimate turning movements were adjusted to minimize directional volume discrepancies between closely spaced intersections. These peak hour directional volumes and turning movement volumes are identical for both Alternative 2 and Alternative 3, which differ only in the operational characteristics along I-95 between the Military Trail ramps and the Central Boulevard ramps. Appendix AC contains the future Build Alternatives peak hour volume development worksheets.

Appendices AD through AI contain the future Build Alternatives turning movement development work sheets.

Figures 7-1 through 7-6 depict the peak hour directional volumes: 2020 AM, 2030 AM, 2040 AM, 2020 PM, 2030 PM, and 2040 PM respectively.

Figures 7-7 through 7-12 depict the turning movements for all intersections: 2020 AM, 2030 AM, 2040 AM, 2020 PM, 2030 PM, and 2040 PM respectively.



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2020 Build AM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**7-1**
Page No:	**1 of 3**
Date:	09/14/15

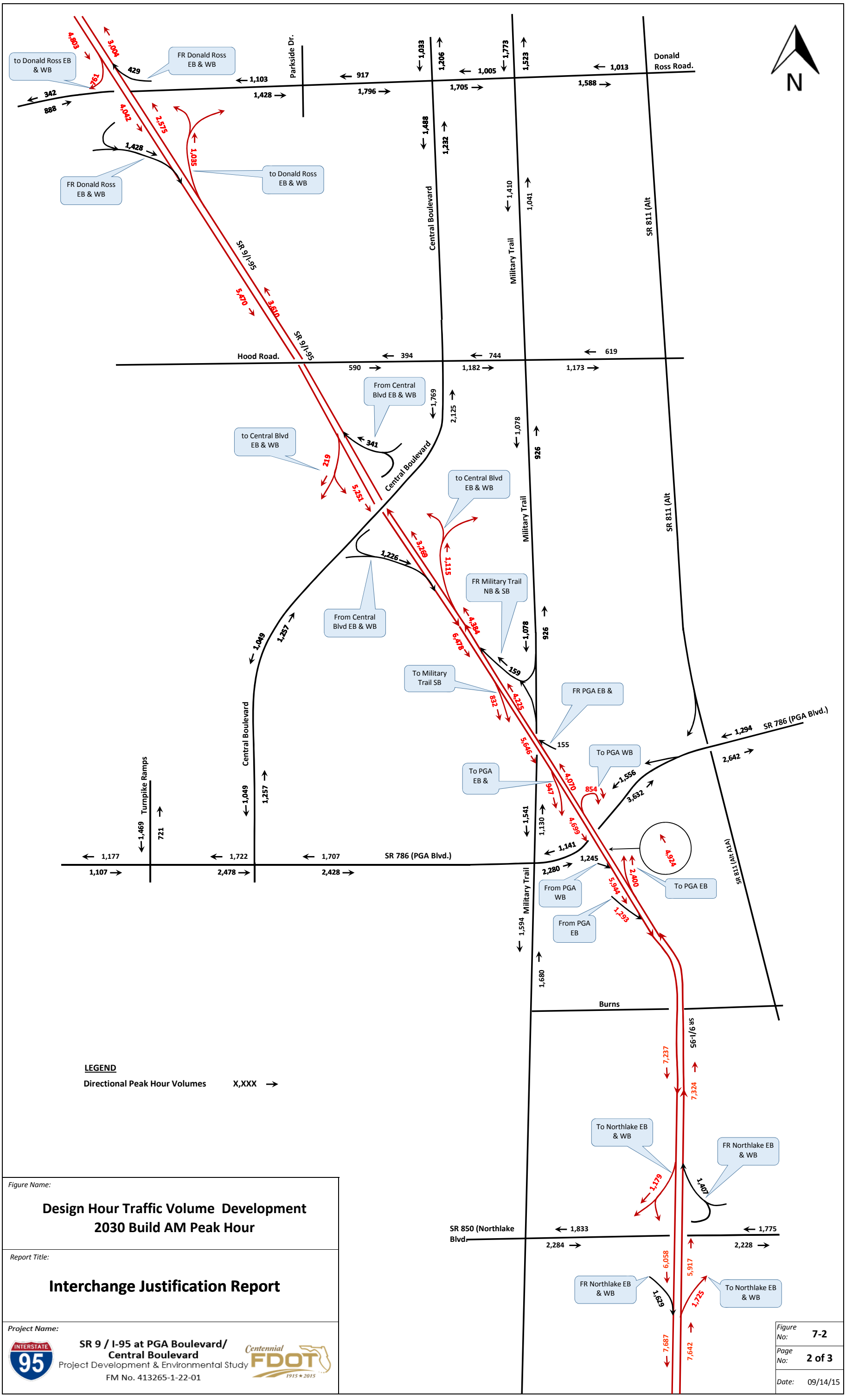


Figure Name:

Design Hour Traffic Volume Development
2030 Build AM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	7-2
Page No:	2 of 3
Date:	09/14/15

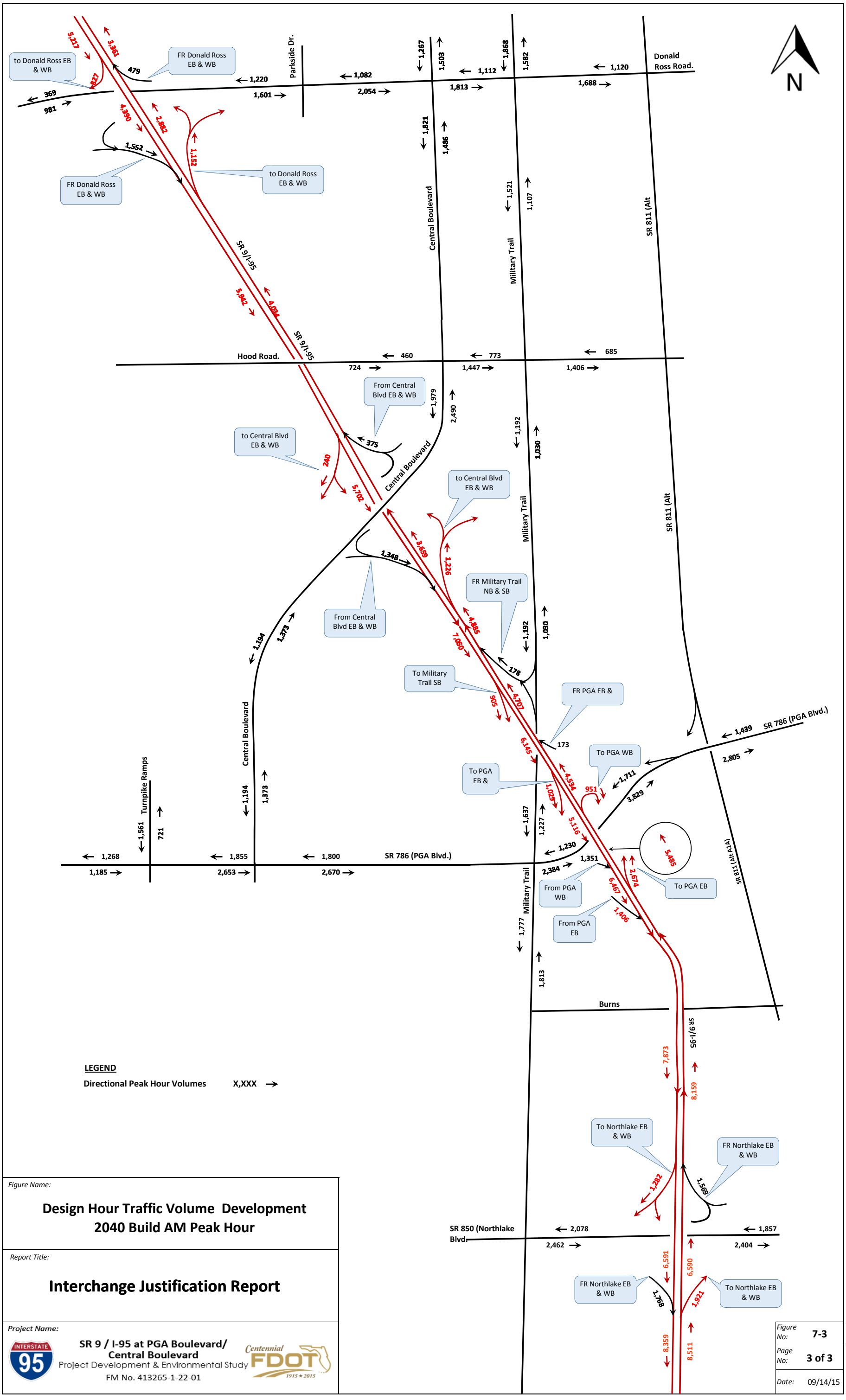


Figure Name:

Design Hour Traffic Volume Development
2040 Build AM Peak Hour

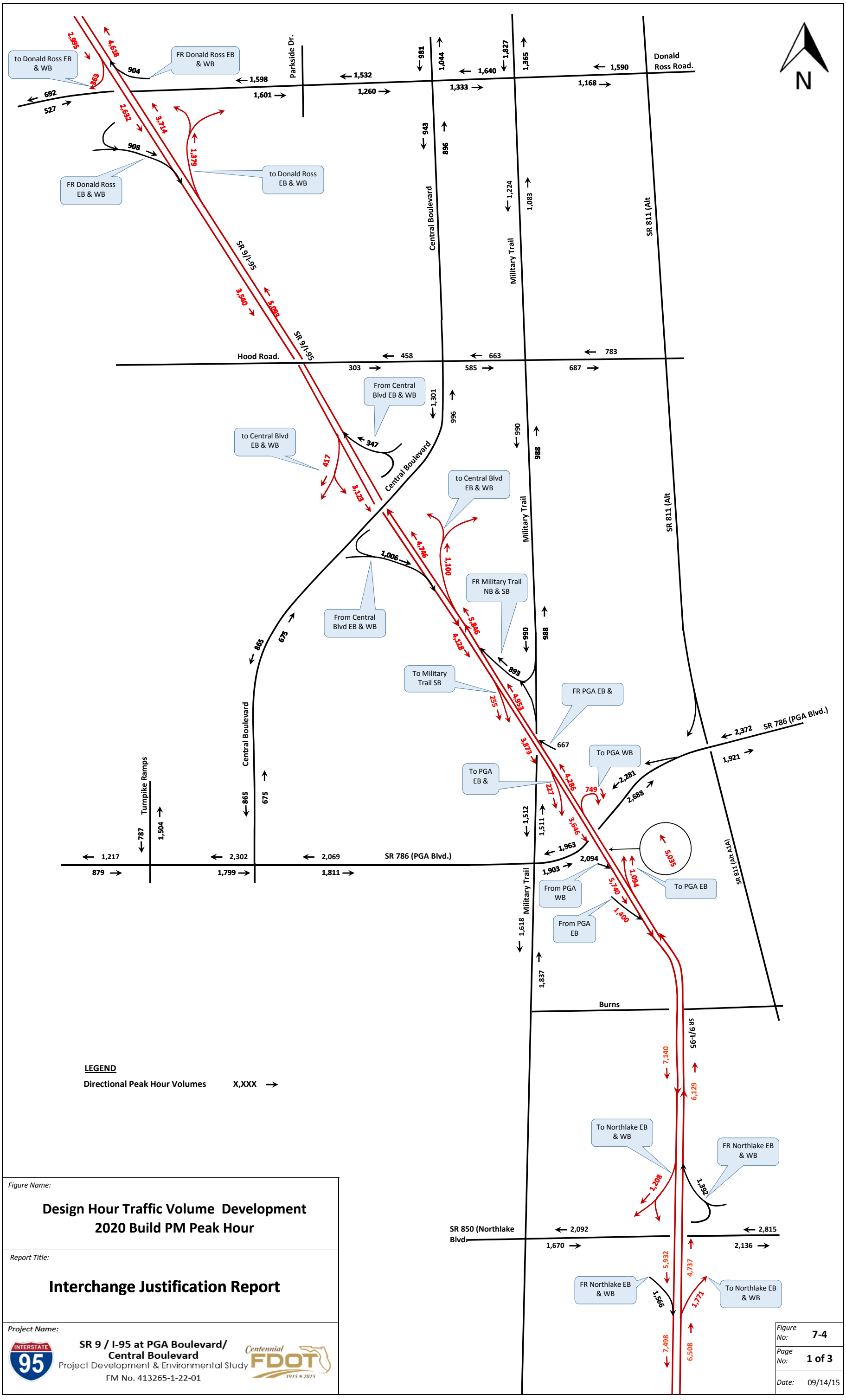
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	7-3
Page No:	3 of 3
Date:	09/14/15



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2020 Build PM Peak Hour

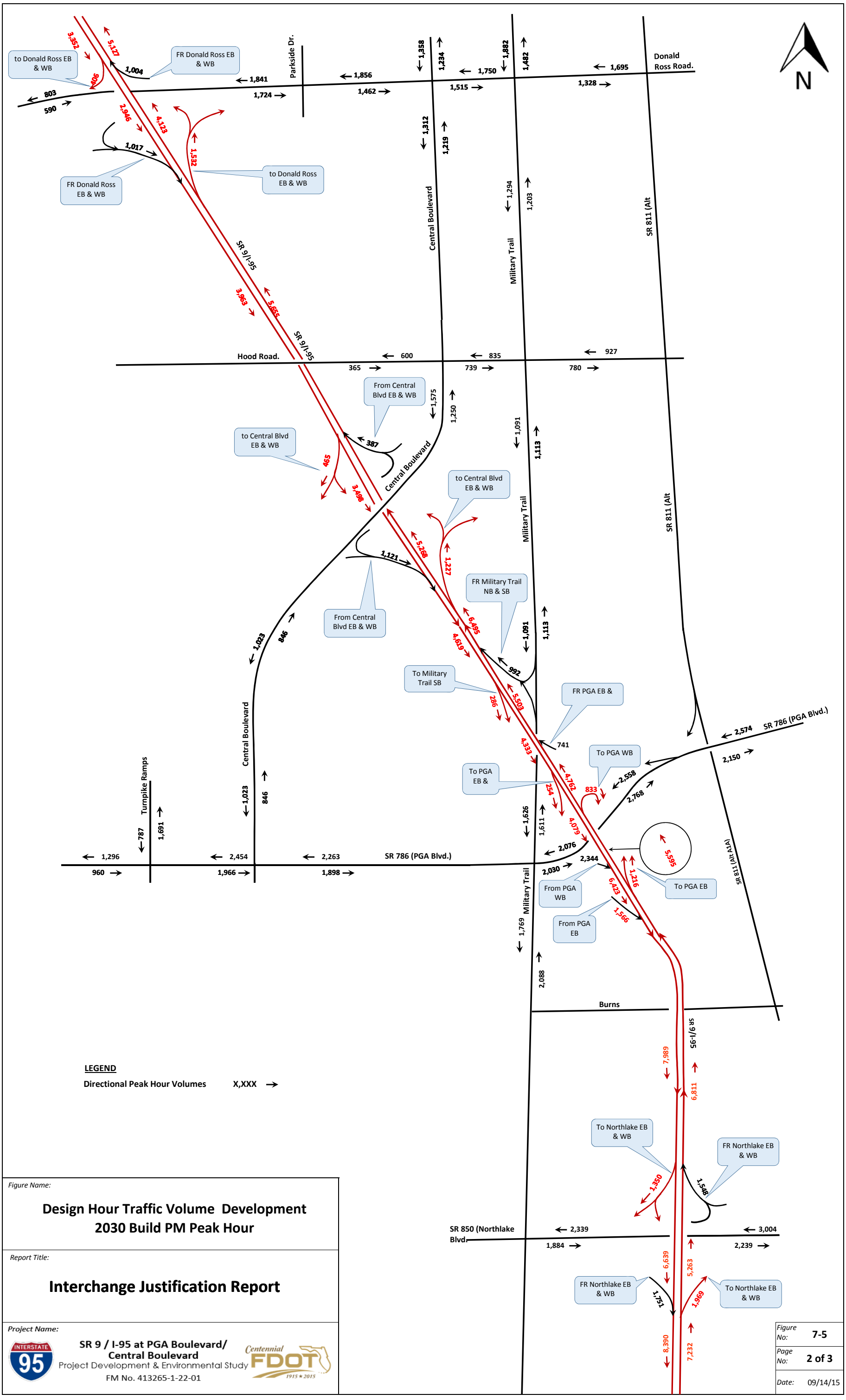
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	7-4
Page No:	1 of 3
Date:	09/14/15



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2030 Build PM Peak Hour

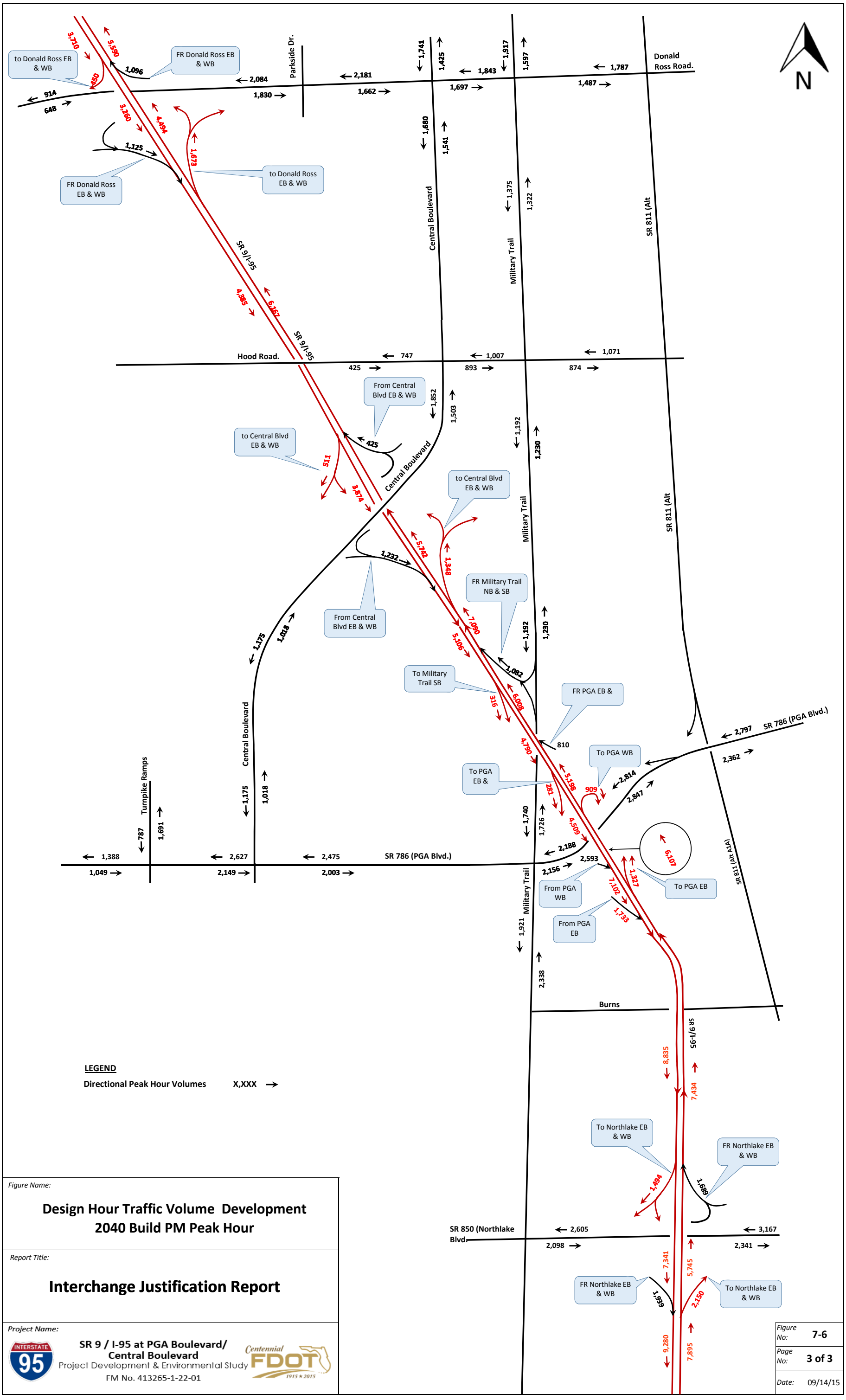
Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	7-5
Page No:	2 of 3
Date:	09/14/15



LEGEND

Directional Peak Hour Volumes X,XXX →

Figure Name:

Design Hour Traffic Volume Development
2040 Build PM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**7-6**
Page No:	**3 of 3**
Date:	09/14/15

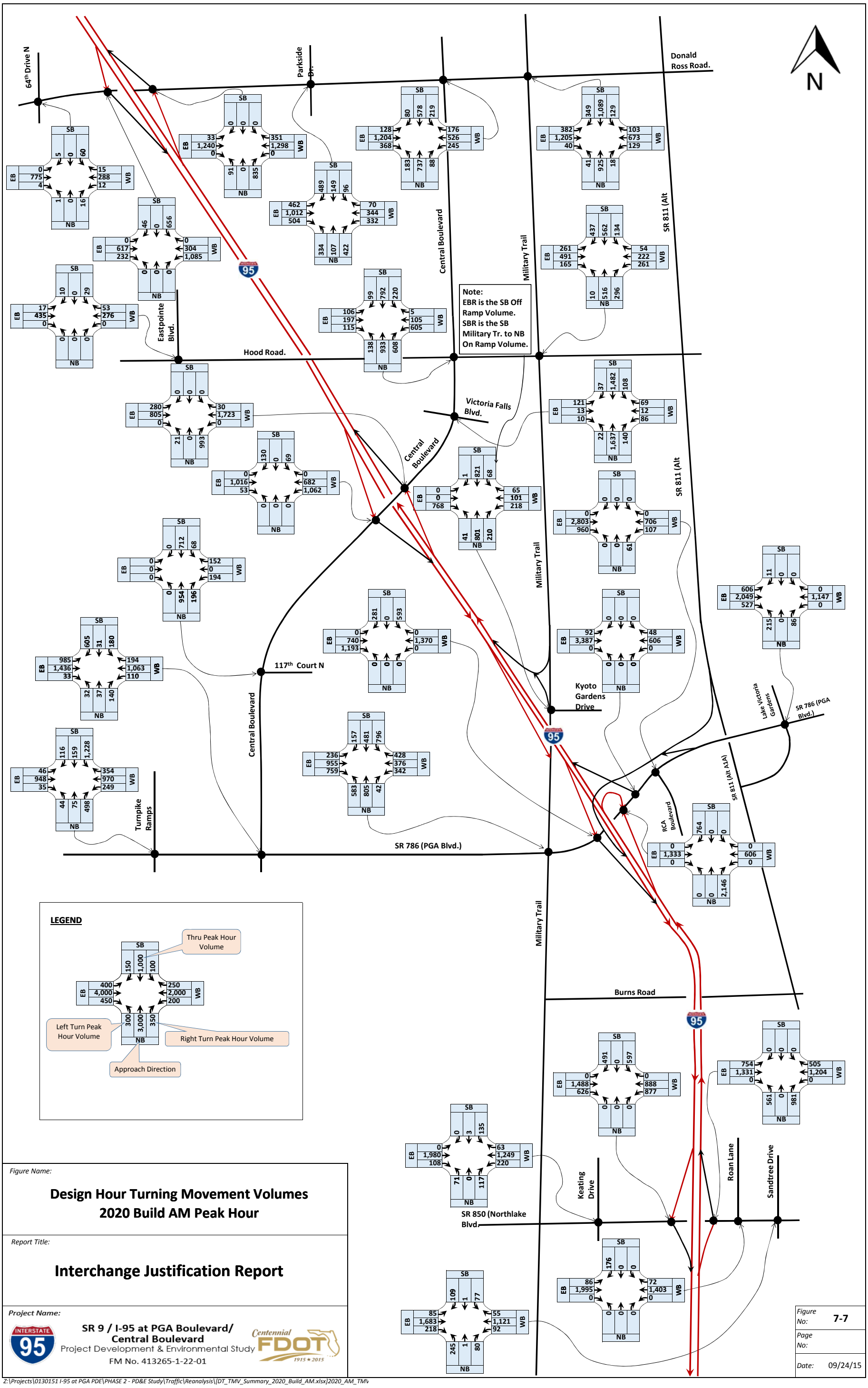


Figure Name:

Design Hour Turning Movement Volumes
2020 Build AM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No: 7-7
Page No:
Date: 09/24/15

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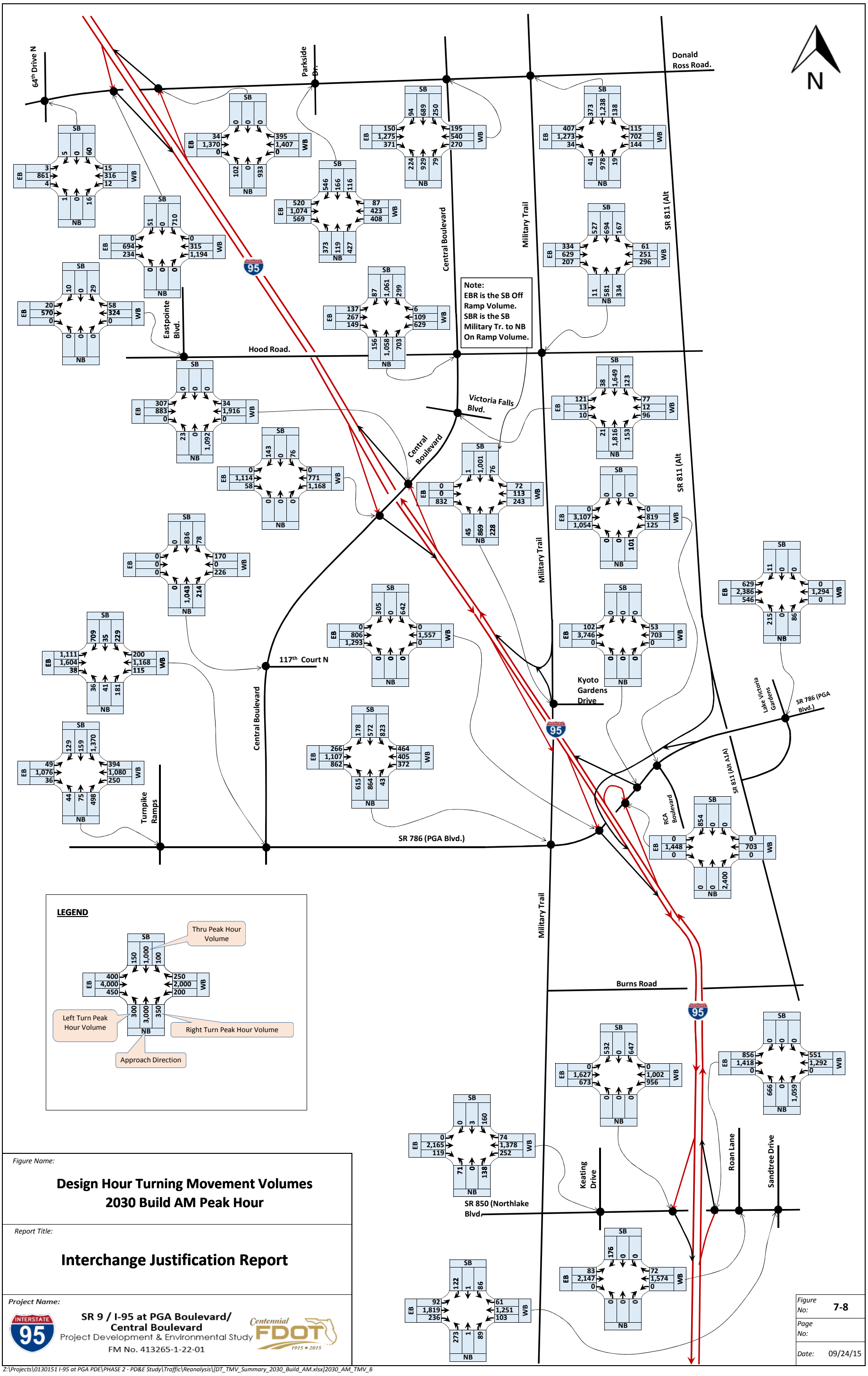

Figure Name:

Design Hour Turning Movement Volumes
2030 Build AM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No: 7-8
Page No:
Date: 09/24/15

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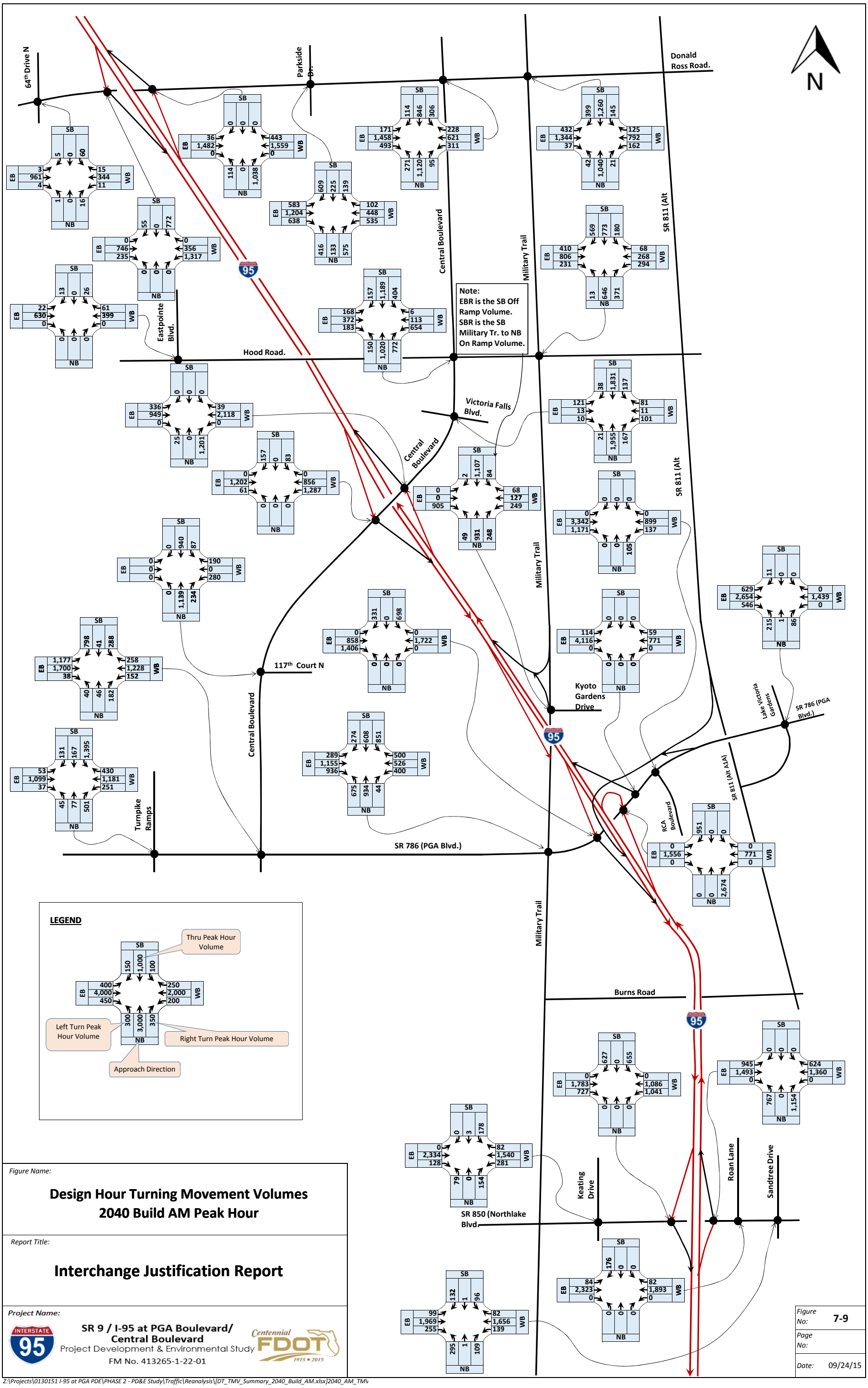

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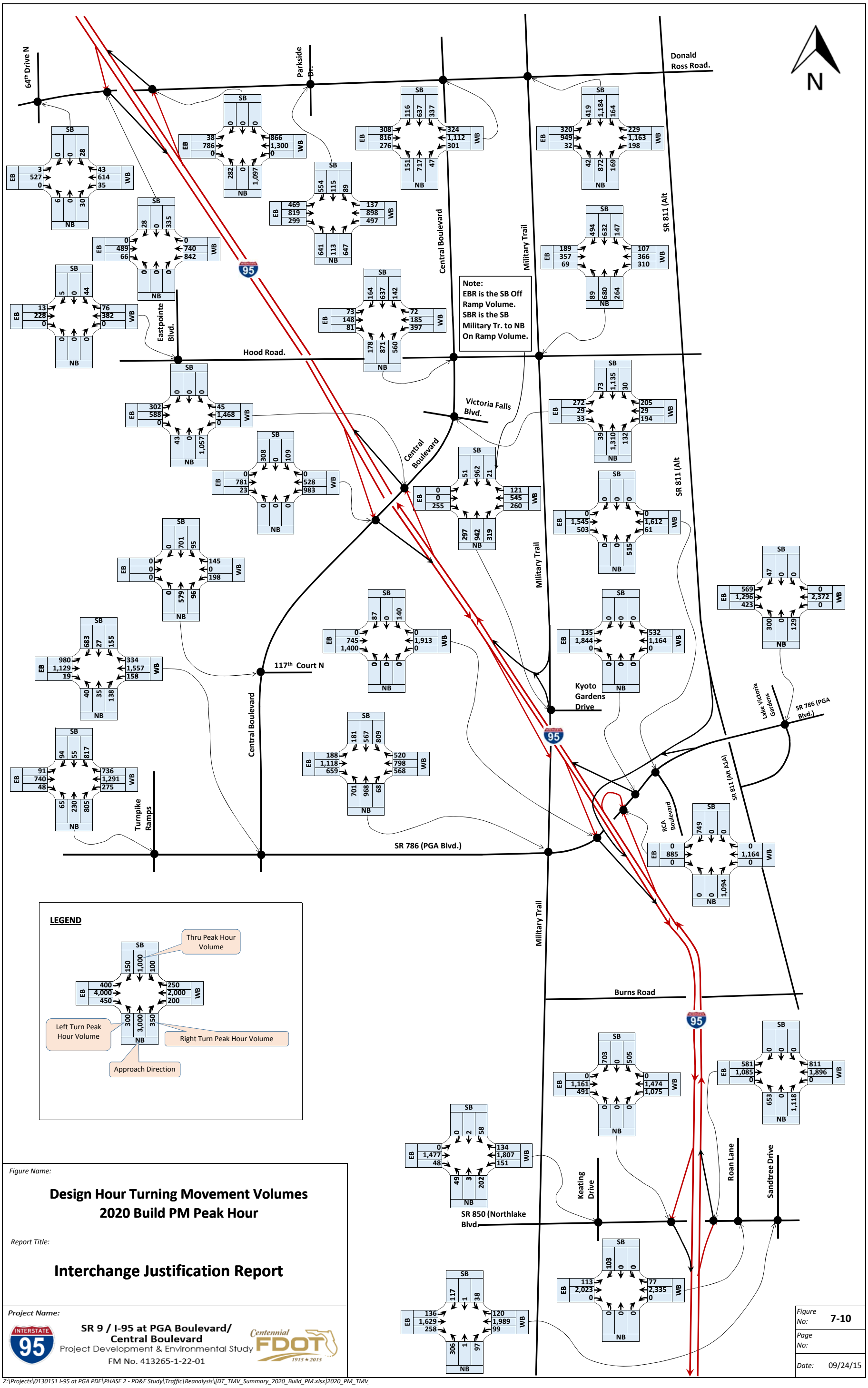

Figure Name:

Design Hour Turning Movement Volumes
2020 Build PM Peak Hour

Report Title:

Interchange Justification Report

Project Name:

SR 9 / I-95 at PGA Boulevard/
Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure No:	**7-10**
Page No:	
Date:	09/24/15

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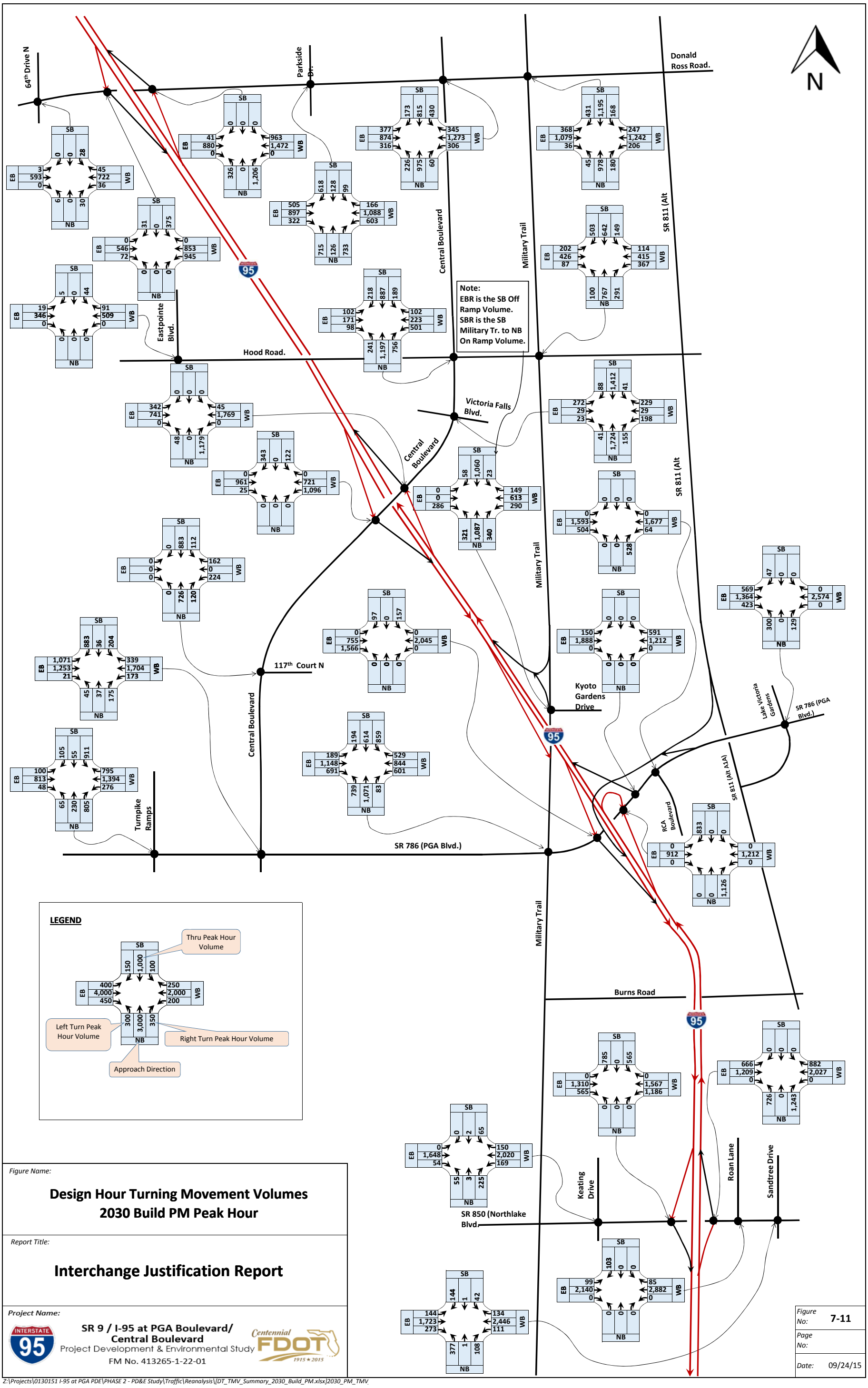

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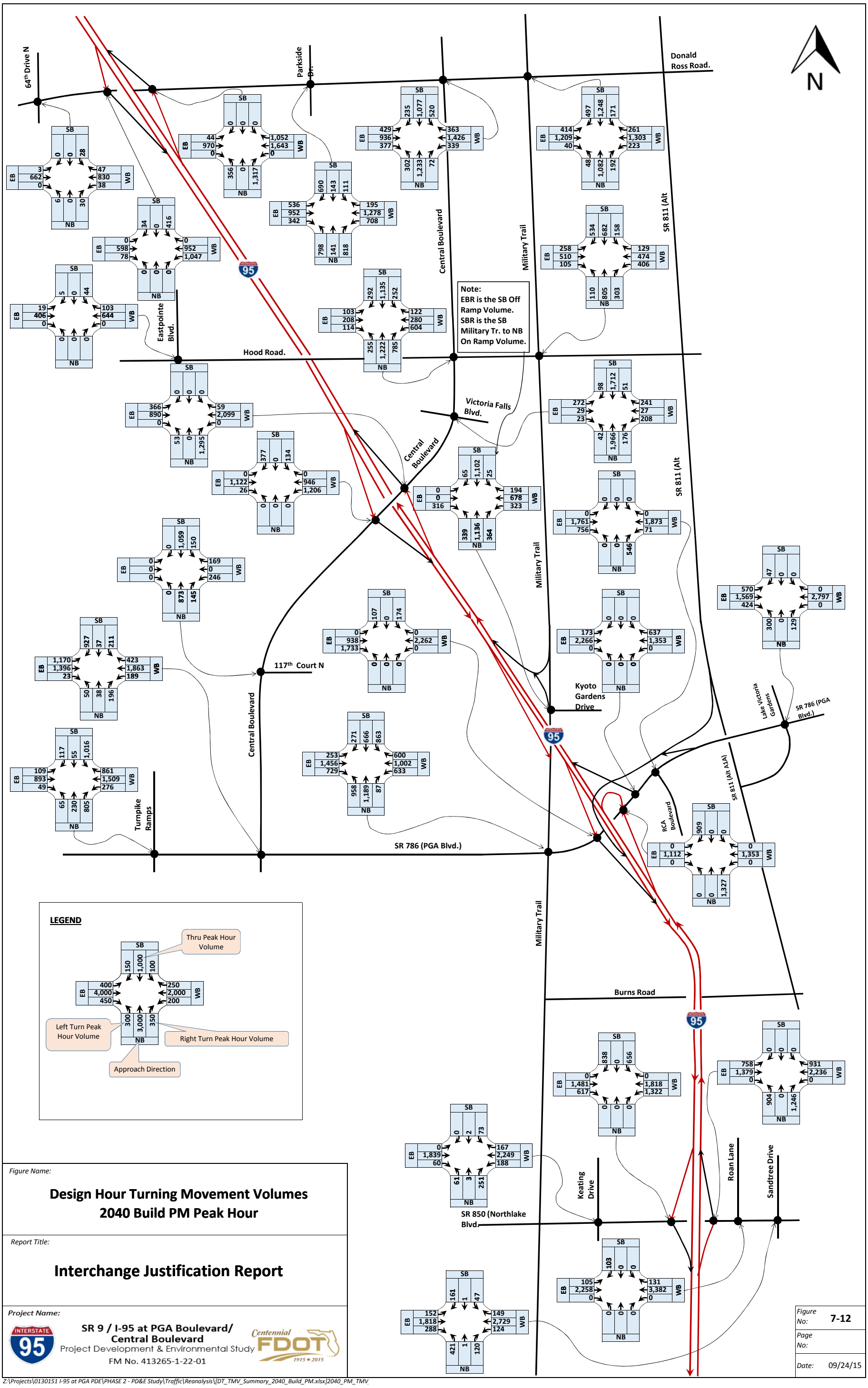

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7.2 Intersection Analysis

Tables 7-1 through 7-3 contain the delay and LOS by movement, at all intersections, for both Build Alternatives, for the years 2020, 2030, and 2040 respectively, alongside the No Build results for comparison. By 2040, 7 intersections would be experiencing failing overall LOS, an improvement from the 13 in the No Build Alternative.

All of the ramp volumes at the Donald Ross Road interchange, and most of the ramp volumes at the PGA Boulevard interchange, are lower than those in the No-Build Alternative, confirming the expectation that a new interchange will draw traffic from existing interchanges nearby. The exceptions to this expectation are the southbound off-ramp and northbound on-ramp volumes at PGA Boulevard, in the AM period only, consistent with the percent changes in model volumes noted on those ramps. The increase in these ramp volumes in the modeling of the Build Alternative may suggest the need for a thorough review of the turn penalties at the ramp terminal intersections at all interchanges, to better simulate the likelihood of very short trips being made using the interstate instead of the arterial streets.

Synchro analysis reports are in Appendices P through U.

Table 7-1 – Build Alternatives – Intersection Level of Service - 2020

Corridor	Intersection	2020 No-Build			2020 Build			2020 Build Vs 2020 No-Build		
		Peak Period	Overall Delay (s/veh)	LOS	Peak Period	Overall Delay (s/veh)	LOS	Peak Period	Overall Delay % Δ	Δ LOS
CENTRAL BLVD	- Victoria Falls Boulevard	AM	189	-	AM	17.1	B	AM	-91%	-
		PM	1611.3	-	PM	28.9	C	PM	-98%	-
	- I-95 SB Ramps	AM	-	-	AM	18.6	B	AM	-	-
		PM	-	-	PM	12.9	B	PM	-	-
	- I-95 NB Ramps	AM	-	-	AM	22.4	C	AM	-	-
		PM	-	-	PM	26	C	PM	-	-
	- 117th Court	AM	11.4	B	AM	10.2	B	AM	-11%	Same
		PM	11.9	B	PM	10.2	B	PM	-14%	Same
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	1.4	-	AM	1.4	-	AM	-	-
		PM	1.4	-	PM	1.3	-	PM	-	-
	- I-95 West Ramps	AM	37.5	D	AM	28.7	C	AM	-23%	Better
		PM	27.7	C	PM	32	C	PM	16%	Same
	- I-95 East Ramps	AM	23.4	C	AM	20.3	C	AM	-13%	Same
		PM	19.5	B	PM	17.5	B	PM	-10%	Same
	- Parkside Drive	AM	70.9	E	AM	37.5	D	AM	-47%	Better
		PM	67.7	E	PM	51.9	D	PM	-23%	Better
	- Central Boulevard	AM	56.1	E	AM	50	D	AM	-11%	Better
		PM	52.3	D	PM	56.8	E	PM	9%	Lower
	- N Military Trail	AM	45	D	AM	44.5	D	AM	-1%	Same
		PM	59.9	E	PM	45.2	D	PM	-25%	Better
HOOD ROAD	- East Pointe Boulevard	AM	0.9	-	AM	0.9	-	AM	-	-
		PM	1.1	-	PM	1.1	-	PM	-	-
	- Central Boulevard	AM	36.1	D	AM	59	E	AM	63%	Lower
		PM	25.2	C	PM	40.7	D	PM	62%	Lower
	- N Military Trail	AM	46.6	D	AM	32.3	C	AM	-31%	Better
		PM	43.7	D	PM	37.6	D	PM	-14%	Same
NORTHLAKE BOULEVARD	- Keating Drive	AM	41.9	D	AM	20.6	C	AM	-51%	Better
		PM	23.2	C	PM	19.2	B	PM	-17%	Better
	- I-95 West Ramps	AM	30.8	C	AM	24.9	C	AM	-19%	Same
		PM	48.9	D	PM	25.7	C	PM	-47%	Better
	- I-95 East Ramps	AM	30	C	AM	21	C	AM	-30%	Same
		PM	49.6	D	PM	18.6	B	PM	-63%	Better
	- Roan Lane	AM	2.6	A	AM	2.6	A	AM	0%	Same
		PM	4.4	A	PM	3.9	A	PM	-11%	Same
	- Sandtree Drive	AM	26.5	C	AM	28.6	C	AM	8%	Same
		PM	38.5	D	PM	43.7	D	PM	14%	Same
PGA BOULEVARD	- Florida Turnpike	AM	59.5	E	AM	61.4	E	AM	3%	Same
		PM	50.6	D	PM	78.6	E	PM	55%	Lower
	- Central Boulevard	AM	50.5	D	AM	33.3	C	AM	-34%	Better
		PM	118.1	F	PM	48.3	D	PM	-59%	Better
	- N Military Trail	AM	76.9	E	AM	48.6	D	AM	-37%	Better
		PM	82.4	F	PM	63.2	E	PM	-23%	Better
	- I-95 West Ramps	AM	32	C	AM	8.8	A	AM	-73%	Better
		PM	39	D	PM	7.8	A	PM	-80%	Better
	- I-95 NB Off Ramps	AM	95.5	F	AM	44.6	D	AM	-53%	Better
		PM	24.9	C	PM	10.2	B	PM	-59%	Better
	- NB On Ramps	AM	-	-	AM	-	-	AM	-	-
		PM	-	-	PM	-	-	PM	-	-
	- RCA Boulevard	AM	30.4	-	AM	0	0	AM	-100%	-
		PM	4.1	-	PM	0	0	PM	-100%	-
	- Lake Victoria Gardens	AM	35.2	D	AM	13.5	B	AM	-62%	Better
		PM	90.5	F	PM	31.2	C	PM	-66%	Better
PGA Passage at Lake Victoria Gardens		AM	12.8	B	AM	7.5	A	AM	-41%	Better
		PM	29	C	PM	21.8	C	PM	-25%	Same
MILI-TARY	- Kyoto Gardens Drive	AM	27.2	C	AM	12.5	B	AM	-54%	Better
		PM	28.3	C	PM	15.7	B	PM	-45%	Better

Table 7-2 – Build Alternatives – Intersection Level of Service - 2030

Corridor	Intersection	2030 No-Build			2030 Build			2030 Build Vs 2030 No-Build		
		Peak Period	Overall Delay (s/veh)	LOS	Peak Period	Overall Delay (s/veh)	LOS	Peak Period	Overall Delay % Δ	Overall Δ LOS
CENTRAL BLVD	- Victoria Falls Boulevard	AM	554.8	-	AM	26.6	C	AM	-	-
		PM	0.8	-	PM	46.3	D	PM	-	-
	- I-95 SB Ramps	AM	-	-	AM	21.8	C	AM	-	-
		PM	-	-	PM	16.9	B	PM	-	-
	- I-95 NB Ramps	AM	-	-	AM	26.2	C	AM	-	-
		PM	-	-	PM	28.9	C	PM	-	-
	- 117th Court	AM	12.2	B	AM	11.2	B	AM	-8%	Same
		PM	12.3	B	PM	10.6	B	PM	-14%	Same
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	-	-	AM	-	-	AM	-	-
		PM	-	-	PM	-	-	PM	-	-
	- I-95 West Ramps	AM	44.3	D	AM	30.8	C	AM	-30%	Better
		PM	34.1	C	PM	25	C	PM	-27%	Same
	- I-95 East Ramps	AM	27.3	C	AM	22.7	C	AM	-17%	Same
		PM	22.1	C	PM	18.8	B	PM	-15%	Better
	- Parkside Drive	AM	67.8	E	AM	52.1	D	AM	-23%	Better
		PM	107.1	F	PM	70.7	E	PM	-34%	Better
	- Central Boulevard	AM	216.5	F	AM	44.6	D	AM	-79%	Better
		PM	77.3	E	PM	55.5	E	PM	-28%	Same
	- N Military Trail	AM	63.2	E	AM	46.3	D	AM	-27%	Better
		PM	66.3	E	PM	48.3	D	PM	-27%	Better
HOOD ROAD	- East Pointe Boulevard	AM	0.9	-	AM	-	-	AM	-	-
		PM	1.1	-	PM	-	-	PM	-	-
	- Central Boulevard	AM	30.7	C	AM	71.2	E	AM	132%	Lower
		PM	25.7	C	PM	52.9	D	PM	106%	Lower
	- N Military Trail	AM	59.5	E	AM	44.9	D	AM	-25%	Better
		PM	42.8	D	PM	42.9	D	PM	0%	Same
NORTHLAKE BOULEVARD	- Keating Drive	AM	45.5	D	AM	33.7	C	AM	-26%	Better
		PM	23.7	C	PM	20.3	C	PM	-14%	Same
	- I-95 West Ramps	AM	38.3	D	AM	33.7	C	AM	-12%	Better
		PM	75.2	E	PM	30.1	C	PM	-60%	Better
	- I-95 East Ramps	AM	39.6	D	AM	25.4	C	AM	-36%	Better
		PM	63.3	E	PM	24.2	C	PM	-62%	Better
	- Roan Lane	AM	2.6	A	AM	2.7	A	AM	4%	Same
		PM	4.5	A	PM	4.5	A	PM	0%	Same
	- Sandtree Drive	AM	30.9	C	AM	33.3	C	AM	8%	Same
		PM	51.5	D	PM	54.5	D	PM	6%	Same
PGA BOULEVARD	- Florida Turnpike	AM	67.6	E	AM	70.4	E	AM	4%	Same
		PM	93.9	F	PM	82	F	PM	-13%	Same
	- Central Boulevard	AM	60.4	E	AM	45.4	D	AM	-25%	Better
		PM	154.1	F	PM	61.6	E	PM	-60%	Better
	- N Military Trail	AM	86.5	F	AM	57.4	E	AM	-34%	Better
		PM	103.3	F	PM	71.3	E	PM	-31%	Better
	- I-95 West Ramps	AM	34.7	C	AM	9.8	A	AM	-72%	Better
		PM	61.4	E	PM	23.3	C	PM	-62%	Better
	- I-95 NB Off Ramps	AM	138.6	F	AM	72.8	E	AM	-47%	Better
		PM	32.7	C	PM	10.6	B	PM	-68%	Better
	- NB On Ramps	AM	-	-	AM	-	-	AM	-	-
		PM	-	-	PM	-	-	PM	-	-
	- RCA Boulevard	AM	61.6	-	AM	0.6	A	AM	-99%	-
		PM	2.1	-	PM	0.1	A	PM	-95%	-
	- Lake Victoria Gardens	AM	37.1	D	AM	18	B	AM	-51%	Better
		PM	109.6	F	PM	33.7	C	PM	-69%	Better
PGA Passage at Lake Victoria Gardens		AM	13.7	B	AM	12	B	AM	-12%	Same
		PM	29.6	C	PM	18.1	B	PM	-39%	Better
MILI-TARY	- Kyoto Gardens Drive	AM	32.4	C	AM	12.9	B	AM	-60%	Better
		PM	29.3	C	PM	19	B	PM	-35%	Better

Table 7-3 – Build Alternatives – Intersection Level of Service - 2040

Corridor	Intersection	2040 No-Build			2040 Build			2040 Build Vs 2040 No-Build		
		Peak Period	Overall Delay (s/veh)	LOS	Peak Period	Overall Delay (s/veh)	LOS	Peak Period	Overall Delay % Δ	Δ LOS
CENTRAL BLVD	- Victoria Falls Boulevard	AM	1.2	-	AM	23.1	C	AM	-	-
		PM	0.9	-	PM	45.5	D	PM	-	-
	- I-95 SB Ramps	AM	-	-	AM	22.8	C	AM	-	-
		PM	-	-	PM	18	B	PM	-	-
	- I-95 NB Ramps	AM	-	-	AM	30	C	AM	-	-
		PM	-	-	PM	33.2	C	PM	-	-
	- 117th Court	AM	13.1	B	AM	13.5	B	AM	3%	Same
		PM	13.4	B	PM	11.4	B	PM	-15%	Same
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	1.5	-	AM	1.5	-	AM	-	-
		PM	1.7	-	PM	1.5	-	PM	-	-
	- I-95 West Ramps	AM	53.3	D	AM	34.8	C	AM	-35%	Better
		PM	31.7	C	PM	26	C	PM	-18%	Same
	- I-95 East Ramps	AM	38.2	D	AM	19.8	B	AM	-48%	Better
		PM	29.1	C	PM	9.6	A	PM	-67%	Better
	- Parkside Drive	AM	79.2	E	AM	57.2	E	AM	-28%	Same
		PM	99.5	F	PM	83	F	PM	-17%	Same
	- Central Boulevard	AM	79.6	E	AM	54.7	D	AM	-31%	Better
		PM	108.8	F	PM	65.8	E	PM	-40%	Better
	- N Military Trail	AM	51.6	D	AM	48.2	D	AM	-7%	Same
		PM	71.5	E	PM	52.6	D	PM	-26%	Better
HOOD ROAD	- East Pointe Boulevard	AM	1.1	-	AM	0.9	-	AM	-	-
		PM	1.8	-	PM	1.2	-	PM	-	-
	- Central Boulevard	AM	37.7	D	AM	79.1	E	AM	110%	Lower
		PM	33.9	C	PM	68.1	E	PM	101%	Lower
	- N Military Trail	AM	66.3	E	AM	41.7	D	AM	-37%	Better
		PM	54.2	D	PM	41.6	D	PM	-23%	Same
NORTHLAKE BOULEVARD	- Keating Drive	AM	46.4	D	AM	33.7	C	AM	-27%	Better
		PM	34.8	C	PM	17.8	B	PM	-49%	Better
	- I-95 West Ramps	AM	46.4	D	AM	33.9	C	AM	-27%	Better
		PM	105.3	F	PM	36.1	D	PM	-66%	Better
	- I-95 East Ramps	AM	50.5	D	AM	25.8	C	AM	-49%	Better
		PM	87.9	F	PM	40.3	D	PM	-54%	Better
	- Roan Lane	AM	2.6	A	AM	2.9	A	AM	12%	Same
		PM	4.6	A	PM	5.3	A	PM	15%	Same
	- Sandtree Drive	AM	38.6	D	AM	49.7	D	AM	29%	Same
		PM	83.2	F	PM	64.8	E	PM	-22%	Better
PGA BOULEVARD	- Florida Turnpike	AM	80.8	F	AM	72.2	E	AM	-11%	Better
		PM	116.9	F	PM	105.7	F	PM	-10%	Same
	- Central Boulevard	AM	77.6	E	AM	44.6	D	AM	-43%	Better
		PM	188.3	F	PM	55	D	PM	-71%	Better
	- N Military Trail	AM	113	F	AM	62.2	E	AM	-45%	Better
		PM	127.2	F	PM	95.8	F	PM	-25%	Same
	- I-95 West Ramps	AM	40.5	D	AM	11.7	B	AM	-71%	Better
		PM	113.9	F	PM	36.8	D	PM	-68%	Better
	- I-95 NB Off Ramps	AM	181.8	F	AM	109.8	F	AM	-40%	Same
		PM	35.8	D	PM	15.2	B	PM	-58%	Better
	- NB On Ramps	AM	-	-	AM	-	-	AM	-	-
		PM	-	-	PM	-	-	PM	-	-
	- RCA Boulevard	AM	201.4	-	AM	0.9	A	AM	-	-
		PM	2.8	-	PM	0.1	A	PM	-	-
	- Lake Victoria Gardens	AM	38	D	AM	19.2	B	AM	-49%	Better
		PM	127.2	F	PM	35.5	D	PM	-72%	Better
PGA Passage at Lake Victoria Gardens		AM	14.2	B	AM	15.7	B	AM	11%	Same
		PM	30.5	C	PM	21.1	C	PM	-31%	Same
MILI-TARY	- Kyoto Gardens Drive	AM	43.5	D	AM	17.7	B	AM	-59%	Better
		PM	32.4	C	PM	19	B	PM	-41%	Better

7.3 Queuing Analysis

Tables 7-4 through 7-6 contain the 95 percentile queues that develop in the Build Alternatives, in the years 2020, 2030, and 2040 respectively, compared to the measured available storage lengths. By 2040, 4 of the ramp terminal intersections are expected to experience a queue failure (95th percentile queue exceeds the available storage length), an improvement from the 7 in the No Build condition. In situations like the interchange at Donald Ross where storage for left turns onto the ramps begins before the upstream ramp intersection, the queue storage length shown is the total available at both intersections. When the storage for the through movement is shown as inadequate it is due to comparison of the through queue length with the minimum storage length available for all three movements (Left Through Right).

Table 7-4 – Build Alternatives Queue Analysis - 2020

Corridor	Inter-section	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Central Blvd	Central Boulevard & I-95 SB Ramp	95th %-ile Queue	AM	ft	0	191	8	153	24	0	0	0	0	120	0	0
			PM	ft	0	94	0	221	21	0	0	0	0	104	0	0
		Existing Storage			-	-	400	650 (A)	-	-	-	-	-	-	-	300
		Adequate?														
	Central Boulevard & I-95 NB Ramp	95th %-ile Queue	AM	ft	359	266	0	0	268	0	144	0	197	0	0	0
			PM	ft	261	126	0	0	179	0	276	0	295	0	0	0
		Existing Storage			610 (A)	-	-	-	-	550	-	-	550	-	-	-
		Adequate?							(D)							
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	99	0	364	291	0	0	0	0	150	0	0
			PM	ft	0	76	0	411	241	0	0	0	0	78	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?														
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	14	303	0	0	141	0	39	0	38	0	0	0
			PM	ft	27	103	0	0	141	0	102	0	108	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?														
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	225	0	324	88	0	0	0	0	245	0	40
			PM	ft	0	178	0	391	190	0	0	0	0	198	0	50
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?														
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	270	141	0	0	156	0	174	0	67	0	0	0
			PM	ft	237	0	0	0	184	139	256	0	70	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?														
	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	63	23	0	93	0	0	0	0	98	0	53
			PM	ft	0	35	142	0	80	0	0	0	0	35	0	27
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?														
PGA Blvd	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	578	0	0	0	0	0	0	1030	0	0	0
			PM	ft	0	106	0	0	0	0	0	0	235	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?				NO C)										
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens Drive	95th %-ile Queue	AM	veh/ln				2.8	3.3	0	0.8	5.6	4.5	2.4	3.8	0
				ft	0	0	0	71	84	0	20	142	114	61	97	0
			PM	veh/ln				8.4	13.6	0	14.5	7.9	8.4	1.8	4.5	0
				ft	0	0	0	213	345	0	368	201	213	46	114	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO (D)	NO			

Notes: A) Storage shown is cumulative.
B) Through queue exceeds left turn storage.
C) Through queue exceeds through storage.
D) Through queue exceeds right turn storage.

Table 7-5 – Build Alternatives Queue Analysis - 2030

Corridor	Inter-section	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Central Blvd	Central Boulevard & I-95 SB Ramp	95th %-ile Queue	AM	ft	0	140	0	365	65	0	0	0	0	84	0	0
			PM	ft	0	142	0	483	28	0	0	0	0	137	0	0
		Existing Storage			-	-	400	650 (A)	-	-	-	-	-	-	-	300
		Adequate?														
	Central Boulevard & I-95 NB Ramp	95th %-ile Queue	AM	ft	212	296	0	0	266	0	329	0	353	0	0	0
			PM	ft	315	237	0	0	312	2	445	0	460	0	0	0
		Existing Storage			610 (A)	-	-	-	-	550	-	-	550	-	-	-
		Adequate?														
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	120	0	375	268	0	0	0	0	187	0	0
			PM	ft	0	100	0	384	229	0	0	0	0	100	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?														
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	15	386	0	0	153	0	49	0	42	0	0	0
			PM	ft	29	123	0	0	161	0	134	0	59	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?														
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	265	0	411	108	0	0	0	0	304	0	41
			PM	ft	0	224	0	451	199	0	0	0	0	271	0	111
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?														
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	324	154	0	0	179	0	261	0	138	0	0	0
			PM	ft	275	0	0	0	325	0	324	0	162	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?														
	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	69	80	0	109	0	0	0	0	107	0	58
			PM	ft	0	47	236	0	114	0	0	0	0	35	0	27
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?														
PGA Blvd	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	713	0	0	0	0	0	0	1311	0	0	0
			PM	ft	0	110	0	0	0	0	0	0	251	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?				NO C)										
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens Drive	95th %-ile Queue	AM	veh/ln				3.1	3.7	0	1	6.3	5.2	2.6	4.9	0
				ft	0	0	0	79	94	0	25	160	132	66	124	0
			PM	veh/ln				9.3	16.6	0	21.3	9.6	9.4	2	7.9	0
				ft	0	0	0	236	422	0	541	244	239	51	201	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO (D)	NO			

Notes: A) Storage shown is cumulative.

B) Through queue exceeds left turn storage.

C) Through queue exceeds through storage.

D) Through queue exceeds right turn storage.

Table 7-6 – Build Alternatives Queue Analysis - 2040

Corridor	Inter-section	Length	Period		EB			WB			NB			SB		
					L	T	R	L	T	R	L	T	R	L	T	R
Central Blvd	Central Boulevard & I-95 SB Ramp	95th %-ile Queue	AM		0	174	0	299	32	0	0	0	0	102	0	0
			PM		0	217	0	90	56	0	0	0	0	127	0	102
		Existing Storage			-	-	400	650 (A)	-	-	-	-	-	-	-	300
		Adequate?														
	Central Boulevard & I-95 NB Ramp	95th %-ile Queue	AM		97	368	0	0	386	0	35	0	378	0	0	0
			PM		140	371	0	0	355	0	55	0	514	0	0	0
		Existing Storage			610 (A)	-	-	-	-	550	-	-	550	-	-	-
		Adequate?														
Donald Ross	Donald Ross Rd & West Ramp	95th %-ile Queue	AM	ft	0	131	0	428	306	0	0	0	0	223	0	0
			PM	ft	0	112	0	434	269	0	0	0	0	110	0	0
		Existing Storage			430	-	-	1200 (A)	470	-	-	-	-	1240	-	2050
		Adequate?														
	Donald Ross Rd & East Ramp	95th %-ile Queue	AM	ft	15	451	0	0	174	0	54	0	44	0	0	0
			PM	ft	29	135	0	0	186	0	146	0	66	0	0	0
		Existing Storage			1000 (A)	470	-	-	-	-	1070	-	2500	-	-	-
		Adequate?														
Northlake Blvd	Northlake Boulevard & I-95 West Ramp	95th %-ile Queue	AM	ft	0	321	0	419	49	0	0	0	0	322	0	43
			PM	ft	0	311	0	670	257	0	0	0	0	380	0	321
		Existing Storage			-	600	-	900 (A)	340	-	-	-	-	1280	-	500
		Adequate?														
	Northlake Boulevard & I-95 East Ramp	95th %-ile Queue	AM	ft	295	2	0	0	226	0	351	0	265	0	0	0
			PM	ft	454	235	0	0	489	0	527	0	193	0	0	0
		Existing Storage			530 (A)	320	-	-	350	-	900	-	1230	-	-	-
		Adequate?							NO C)							
PGA Blvd	PGA Blvd & I-95 West Ramps	95th %-ile Queue	AM	ft	0	74	145	0	124	0	0	0	0	120	0	63
			PM	ft	0	54	330	0	122	0	0	0	0	39	0	30
		Existing Storage			-	-	460	-	-	-	-	-	-	1350	-	840
		Adequate?														
	PGA Blvd & I-95 NB Off Ramps	95th %-ile Queue	AM	ft	0	784	0	0	0	0	0	0	1576	0	0	0
			PM	ft	0	157	0	0	0	0	0	0	350	0	0	0
		Existing Storage			-	330	-	-	-	-	-	-	1630	-	-	-
		Adequate?				NO C)										
	PGA Blvd & I-95 NB On Ramps	95th %-ile Queue	AM	ft	0	0	0	0	0	0	0	0	0	0	0	0
			PM	ft	0	0	0	0	0	0	0	0	0	0	0	0
		Existing Storage			340	-	-	-	-	-	-	-	-	-	-	-
		Adequate?														
North Military Trail	North Military Trail & Kyoto Gardens Drive	95th %-ile Queue	AM	veh/ln				3.1	3.3	0	0.8	7	6	2.7	8.4	0
				ft	0	0	0	79	84	0	20	178	152	69	213	0
			PM	veh/ln				5.2	11.4	0	7.6	9.2	9.6	1.2	10.6	0
				ft	0	0	0	132	290	0	193	234	244	30	269	0
		Existing Storage			-	-	-	580	-	-	720	-	200	390	1260	-
		Adequate?										NO (D)	NO			

Notes: A) Storage shown is cumulative.

B) Through queue exceeds left turn storage.

C) Through queue exceeds through storage.

D) Through queue exceeds right turn storage.

7.4 Roadway Level of Service Analysis

7.4.1 Arterial Roadways Level of Service

Tables 7-7 through 7-9 display the roadway level of service for the years 2020, 2030, and 2040 respectively, based on the maximum peak hour directional volume from Figures 7-1 to 7-6.

Table 7-7 –Build Alternatives Roadwav Level of Service - 2020

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	786	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	1601	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	1537	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1640	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	458	420	840	1190	1640		C	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	458	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	923	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2305	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2185	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2156	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	3403	N/A	3970	4040	4040	4811	C	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	3403	N/A	3970	4040	4040	4835	C	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1512	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	990	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1300	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2092	N/A	2650	2720	2720	3890	C	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	2815	N/A	2650	2720	2720	3890	F	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	1150	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	1777	N/A	1720	1800	1800		D	N
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	1145	N/A	1720	1800	1800		C	N

Notes:
1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element

Table 7-8 –Build Alternatives Roadwav Level of Service - 2030

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	888	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	1841	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	1856	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1750	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	600	420	840	1190	1640		C	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	600	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	1182	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2478	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2428	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2280	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	3632	N/A	3970	4040	4040	4811	C	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	3632	N/A	3970	4040	4040	4835	C	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1626	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	1113	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1410	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2339	N/A	2650	2720	2720	3890	C	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	3004	N/A	2650	2720	2720	3890	F	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	1257	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	2125	N/A	1720	1800	1800		F	Y
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	1488	N/A	1720	1800	1800		C	N

Notes:
1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element

Table 7-9 –Build Alternatives Roadway Level of Service - 2040

Road Name	SR #	From	To	Number of Lanes	Speed Limit (mph)	FHWA Funct-ional Class	Facility Type	Peak Hour Volume (1)	Peak Hour Peak Direction LOS Threshold Volumes (2)					LOS	Defic-ient
									B	C	D	E	CRALLS (3)		
Donald Ross Road		East-pointe Way	I-95	4 standard lanes divided	45	Major Collector	Uninter-rupted	981	1810	2560	3240	3590		B	N
Donald Ross Road		I-95	Parkside Drive	6 standard lanes divided	45	Principal Arterial	Class I	2084	N/A	2650	2720	2720		C	N
Donald Ross Road		Parkside Drive	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2181	N/A	2650	2720	2720		C	N
Donald Ross Road		Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	1843	N/A	2650	2720	2720		C	N
Hood Road		Jog Road	E. of Turnpike	2 standard lanes undivided	45	Major Collector	Uninter-rupted	747	420	840	1190	1640		C	N
Hood Road		E of Turn-pike	Central Boulevard	4 standard lanes divided	45	Major Collector	Class I	747	N/A	1720	1800	1800		C	N
Hood Road		Central Boulevard	Military Trail	4 standard lanes divided	45	Major Collector	Class I	1447	N/A	1720	1800	1800		C	N
PGA Boulevard	786	Florida Turnpike	Central Boulevard	6 standard lanes divided	45	Principal Arterial	Class I	2653	N/A	2940	3020	3020	2747	C	N
PGA Boulevard	786	Central Boulevard	Military Trail	6 standard lanes divided	45	Principal Arterial	Class I	2670	N/A	2940	3020	3020	2900	C	N
PGA Boulevard	786	Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2384	N/A	2940	3020	3020	3720	C	N
PGA Boulevard	786	I-95	RCA Blvd.	8 standard lanes divided	45	Principal Arterial	Class I	3829	N/A	3970	4040	4040	4811	C	N
PGA Boulevard	786	RCA Blvd.	Lake Victoria Gardens	8 standard lanes divided	45	Principal Arterial	Class I	3829	N/A	3970	4040	4040	4835	C	N
Military Trail	809	PGA Boulevard	I-95	6 standard lanes divided	45	Principal Arterial	Class I	1740	N/A	2940	3020	3020		C	N
Military Trail	809	I-95	Hood Road	6 standard lanes divided	45	Principal Arterial	Class I	1230	N/A	2940	3020	3020		C	N
Military Trail	809	Hood Road	Donald Ross Road	6 standard lanes divided	45	Principal Arterial	Class I	1521	N/A	2940	3020	3020		C	N
Northlake Boulevard		Military Trail	I-95	6 standard lanes divided	45	Principal Arterial	Class I	2605	N/A	2650	2720	2720	3890	C	N
Northlake Boulevard		I-95	Sandtree Lane	6 standard lanes divided	45	Principal Arterial	Class I	3167	N/A	2650	2720	2720	3890	F	N
Central Boulevard		PGA Boulevard	I-95	4 standard lanes divided	45	Major Collector	Class I	1373	N/A	1720	1800	1800		C	N
Central Boulevard		I-95	Hood Road	4 standard lanes divided	45	Major Collector	Class I	2490	N/A	1720	1800	1800		F	Y
Central Boulevard		Hood Road	Donald Ross Road	4 standard lanes divided	45	Major Collector	Class I	1821	N/A	1720	1800	1800		F	Y

Notes:
1) Maximum of the AM and PM directional volumes
2) FDOT 2012 LOS Tables
3) City of Palm Beach Gardens Transportation Element

The analyses that follow demonstrate the degree to which the build alternatives avoid significant adverse impacts to the interstate facility as required in FHWA policy 3 (See section 8.3). Significant impacts to operating speed are chosen here to be those that exceed ten percent of the No Build MOE value, in accordance with the Highway Capacity Manual, which lists that amount as the upper bound of the confidence interval surrounding results using its technique. Adverse impacts are those that degrade the LOS below the adopted standard of LOS D, consistent the Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.

Each analysis includes the design traffic volumes and MOEs of the No Build alternative, allowing direct comparison with the particular Build Alternative.

7.4.2 Alternative 2 Freeway Facilities Analysis

Tables 7-10 through 7-12 display in tabular form the volumes and MOEs for Alternative 2 for the years 2020, 2030, and 2040 respectively. Figures 7-16 through 7-18 display the information graphically for the years 2020, 2030, and 2040 respectively.

Table 7-10 - Alternative 2 2020 HCS Analysis

Freeway Operational Assessment - SR 9 (I-95) Between Northlake Boulevard and Donald Ross Road

Direction	2020 NO-BUILD								2020 Build (Alternative 2)								2020 Build Alt. 2 Vs 2020 No-Build						
		Analysis								Analysis							Peak Period	Change in Density		Change in Speed		Change in LOS?	Significant & Adverse?[2]
	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS		Δ Value	Δ %[1]	Δ Value	Δ %[1]		
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,577	26.1	60.0	C	**Between** On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Central Boulevard EB & WB	Weave	S1 - S2	AM	5,046	14.5	62.9	B	AM	(11.6)	-44.4%	2.9	4.8%	Better	No
				PM	1,080	19.1	61.0	B				PM	3,540	10.2	62.5	B	PM	(8.9)	-46.6%	1.5	2.5%	Same	No
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	5,530	17.0	70.0	B	**Between** Off-Ramp to Central Blvd. EB & WB **and** Off-Ramp to Military Trail/CD Road	Basic	S2 - S3	AM	4,847	14.9	70.0	B	AM	(2.1)	-12.4%	0.0	0.0%	Same	No
				PM	3,899	12.0	70.0	B				PM	3,123	9.6	70.0	A	PM	(2.4)	-20.0%	0.0	0.0%	Better	No
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	348	20.5	63.0	C	**At** Off-Ramp to Military Trail/CD Road	Diverge	S3 - S4	AM	768	21.4	61.0	C	AM	0.9	4.4%	(2.0)	-3.2%	Same	No
				PM	176	14.8	63.0	B				PM	255	13.7	63.0	B	PM	(1.1)	-7.4%	0.0	0.0%	Same	No
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	5,182	15.9	70.0	B	**Between** Off-Ramp to Military Trail/CD Road **and** On-Ramp from Central Blvd/CD Road	Basic	S4 - S5	AM	4,079	12.5	70.0	B	AM	(3.4)	-21.4%	0.0	0.0%	Same	No
				PM	3,723	11.4	70.0	B				PM	2,868	8.8	70.0	A	PM	(2.6)	-22.8%	0.0	0.0%	Better	No
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	688	7.0	65.0	A	**Between** On-Ramp from Central Blvd/CD Road **and** Off-Ramp from to PGA Blvd EB & WB	Weave	S5 - S6	AM	5,194	14.7	63.8	B	AM	7.7	110.0%	(1.2)	-1.8%	Lower	No
				PM	267	4.5	66.0	A				PM	3,873	10.8	65.0	B	PM	6.3	140.0%	(1.0)	-1.5%	Lower	No
									CD Road: Between On-Ramp to Military Trail and Off-Ramp to Military Trail	Weave	SC1 - SC2	AM	1,883	23.1	45.0	B						
												PM	1,261	14.9	47.0	B							
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,494	13.8	70.0	B	**Between** Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,320	13.3	70.0	B	AM	(0.5)	-3.6%	0.0	0.0%	Same	No
				PM	3,456	10.6	70.0	A				PM	3,646	11.2	70.0	B	PM	0.6	5.7%	0.0	0.0%	Lower	No
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,246	24.8	60.0	C	**At** On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,148	23.6	60.0	C	AM	(1.2)	-4.8%	0.0	0.0%	Same	No
				PM	2,233	30.1	58.0	D				PM	2,094	29.4	58.0	D	PM	(0.7)	-2.3%	0.0	0.0%	Same	No
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,740	17.6	70.0	B	**Between** On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,468	16.8	70.0	B	AM	(0.8)	-4.5%	0.0	0.0%	Same	No
				PM	5,689	17.5	70.0	B				PM	5,740	17.6	70.0	B	PM	0.1	0.6%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,250	27.7	59.0	C	**At** On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,193	26.5	60.0	C	AM	(1.2)	-4.3%	1.0	1.7%	Same	No
				PM	1,574	30.2	58.0	D				PM	1,400	28.9	59.0	D	PM	(1.3)	-4.3%	1.0	1.7%	Same	No
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	6,990	21.8	69.0	C	**Between** On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	6,661	20.6	69.0	C	AM	(1.2)	-5.5%	0.0	0.0%	Same	No
				PM	7,263	22.8	69.0	C				PM	7,140	22.3	69.0	C	PM	(0.5)	-2.2%	0.0	0.0%	Same	No
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	991	11.4	61.0	B	**At** Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,088	11.2	61.0	B	AM	(0.2)	-1.8%	0.0	0.0%	Same	No
				PM	1,057	12.2	61.0	B				PM	1,208	12.9	60.0	B	PM	0.7	5.7%	(1.0)	-1.6%	Same	No
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,178	26.0	60.0	C	**At** On-Ramp from Northlake Blvd. EB & WB	Merge	N1 - N2	AM	1,259	26.6	60.0	C	AM	0.6	2.3%	0.0	0.0%	Same	No
				PM	1,480	27.1	59.0	C				PM	1,392	26.6	60.0	C	PM	(0.5)	-1.8%	1.0	1.7%	Same	No
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	6,492	20.0	70.0	C	**Between** On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	6,550	20.2	70.0	C	AM	0.2	1.0%	0.0	0.0%	Same	No
				PM	6,132	18.9	70.0	C				PM	6,129	18.8	70.0	C	PM	(0.1)	-0.5%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,405	20.9	59.0	C	**At** Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,146	18.4	59.0	B	AM	(2.5)	-12.0%	0.0	0.0%	Better	No
				PM	1,258	12.1	62.0	B				PM	1,094	10.9	62.0	B	PM	(1.2)	-9.9%	0.0	0.0%	Same	No
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,087	12.5	70.0	B	**Between** Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,404	13.5	70.0	B	AM	1.0	8.0%	0.0	0.0%	Same	No
				PM	4,874	15.0	70.0	B				PM	5,035	15.4	70.0	B	PM	0.4	2.7%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	1,038	20.1	55.0	C	**At** Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	764	19.8	56.0	B	AM	(0.3)	-1.5%	1.0	1.8%	Better	No
				PM	916	22.3	56.0	C				PM	749	22.0	56.0	C	PM	(0.3)	-1.3%	0.0	0.0%	Same	No
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,049	9.4	70.0	A	**Between** Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,640	11.2	70.0	B	AM	1.8	19.1%	0.0	0.0%	Lower	No
				PM	3,958	12.1	70.0	B				PM	4,286	13.1	70.0	B	PM	1.0	8.3%	0.0	0.0%	Same	No
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	134	12.0	62.0	B	**Between** On-ramp from PGA EB & WB **and** Off-ramp to Central Blvd/CD Road	Weave	N7 - N8	AM	3,780	10.6	64.2	B	AM	(1.4)	-11.7%	2.2	3.5%	Same	No
				PM	702	19.0	61.0	B				PM	4,953	15.0	59.9	B	PM	(4.0)	-21.1%	(1.1)	-1.8%	Same	No
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	3,183	9.8	70.0	A	**Between** Off-ramp to Central Blvd/CD Road **and** On-Ramp From Military Trail/CD Road	Basic	N8 - N9	AM	2,766	8.5	70.0	A	AM	(1.3)	-13.3%	0.0	0.0%	Same	No
				PM	4,660	14.3	70.0	B				PM	3,853	11.8	70.0	B	PM	(2.5)	-17.5%	0.0	0.0%	Same	No
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	104	12.1	62.0	B	**At** On-Ramp From Military Trail/CD Road	Merge	N9 - N10	AM	143	11.3	62.0	B	AM	(0.8)	-6.6%	0.0	0.0%	Same	No
				PM	539	19.5	61.0	B				PM	893	20.3	61.0	C	PM	0.8	4.1%	0.0	0.0%	Lower	No
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	3,287	10.1	70.0	A	**Between** On-Ramp From Military Trail/CD Road **and** On-Ramp from Central Boulevard EB & WB	Basic	N10 - N11	AM	2,909	8.9	70.0	A	AM	(1.2)	-11.9%	0.0	0.0%	Same	No
				PM	5,199	15.9	70.0	B				PM	4,746	14.6	70.0	B	PM	(1.3)	-8.2%	0.0	0.0%	Same	No
									CD Road: Between On-Ramp From Military Trail and Off-Ramp to I-95	Weave	NC1 -NC2	AM	1,157	13.6	47.0	B						
												PM	1,993	24.6	45.0	C							
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,139	6.6	60.0	A	**Between** On-Ramp from Central Boulevard and Off-Ramp to Donald Ross Road	Weave	N11 - N12	AM	3,219	9.2	63.3	A	AM	2.6	39.4%	3.3	5.5%	Same	No
				PM	1,594	12.6	59.0	B				PM	5,093	14.9	61.9	B	PM	2.3	18.3%	2.9	4.9%	Same	No

Notes:

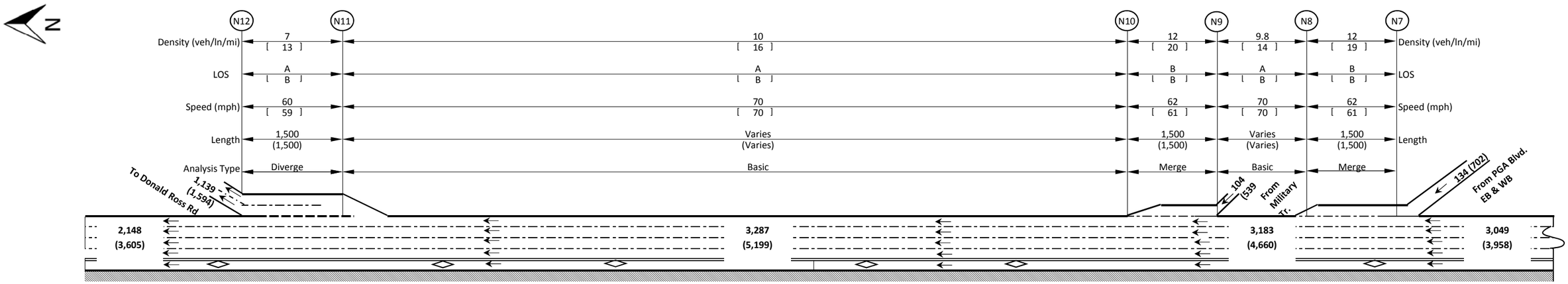
1. According to guidelines contained in the 2010 Highway Capacity Manual (HCM), "Chapter 7/Interpreting HCM and Alternative Tool Results" , HCM model inputs and outputs can be expected to be accurate to only within 5% or 10% of the "true value" given the inherent variability of the field data on which they are based. As a consequence, only speed changes that are outside a +/- 10% change when comparing the statistics from the build condition to the no-build condition, were deemed significant taking into account the accuracy levels of model outputs as promulgated by the 2010 HCM.

*2. Impacts were considered to be "Significant & Adverse" when comparing the Build Alternate to the No-Build Alternate only if there was a degradation in speed that exceeded -10% **and** the level of service fell below the adopted LOS "D" threshold which is the minimum adopted level of service standard for I-95 within the study area according to Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.*

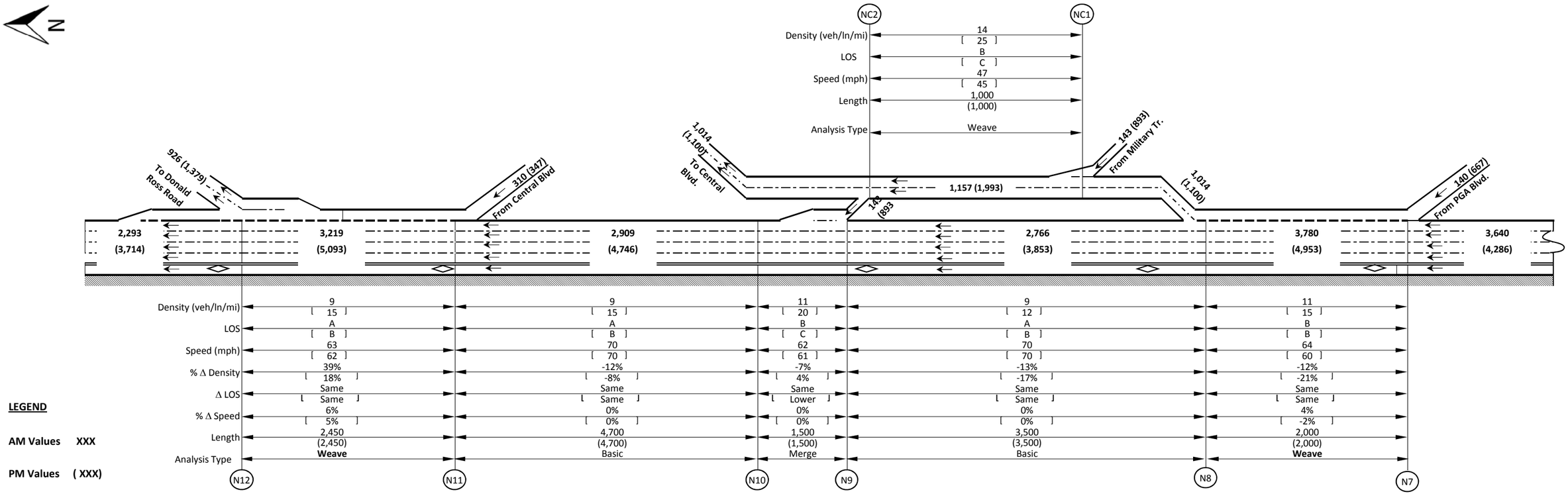
Z:\Projects\0130151 I-95 at PGA PDE\PHASE 2 - PD&E Study\Traffic\Reanalysis\HCS\2020\[Freeway_Analysis_Summary_2020.xlsx]Summary_Sheet_alt_2

NORTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

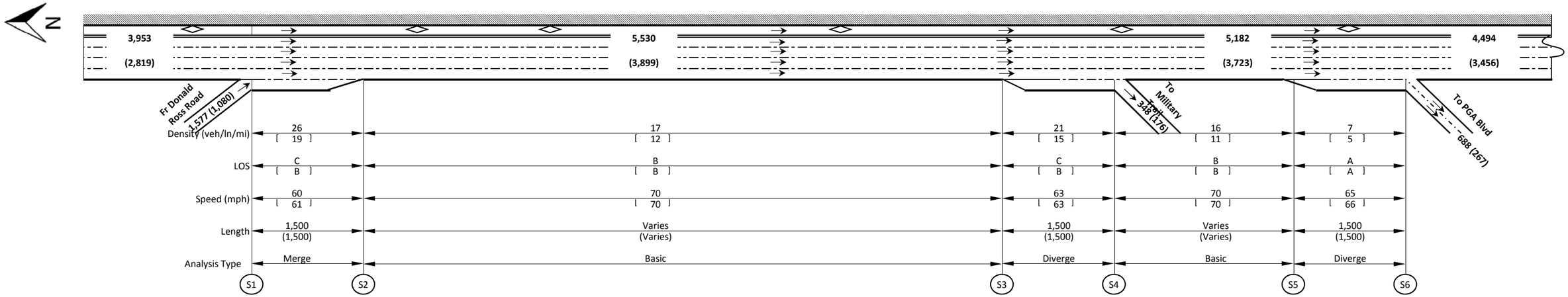
AM Values XXX

PM Values (XXX)

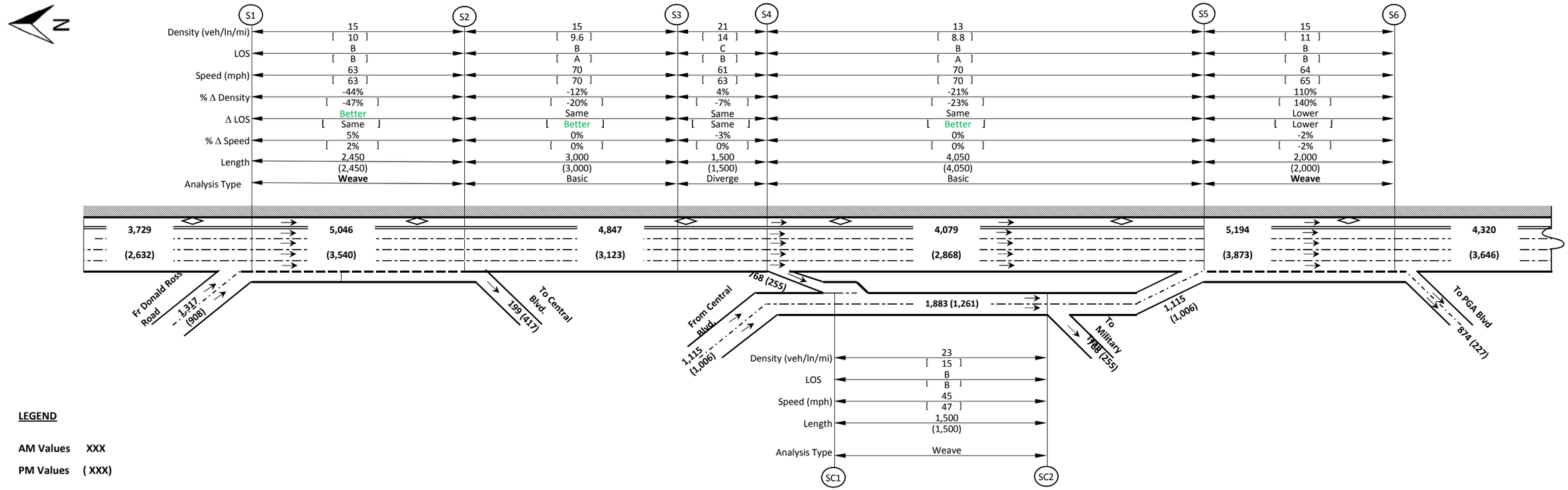
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 2 vs No-Build (Northbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-16-1** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

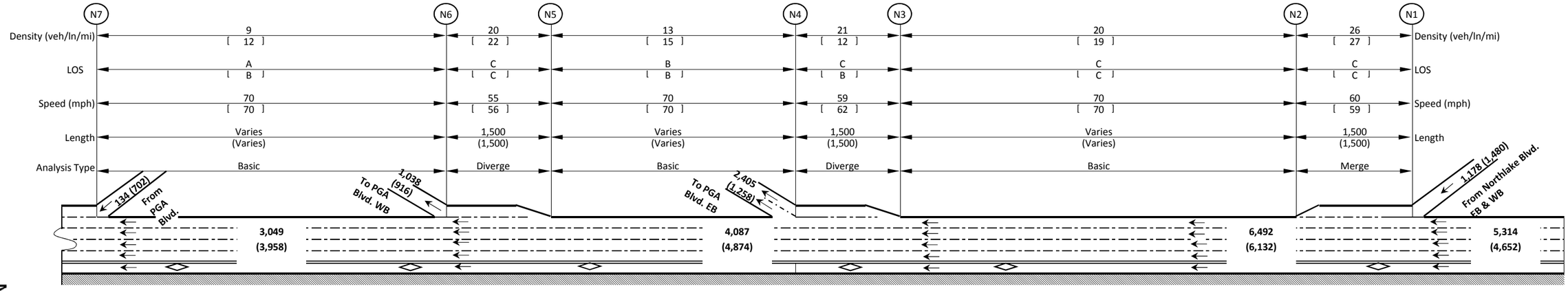
AM Values XXX

PM Values (XXX)

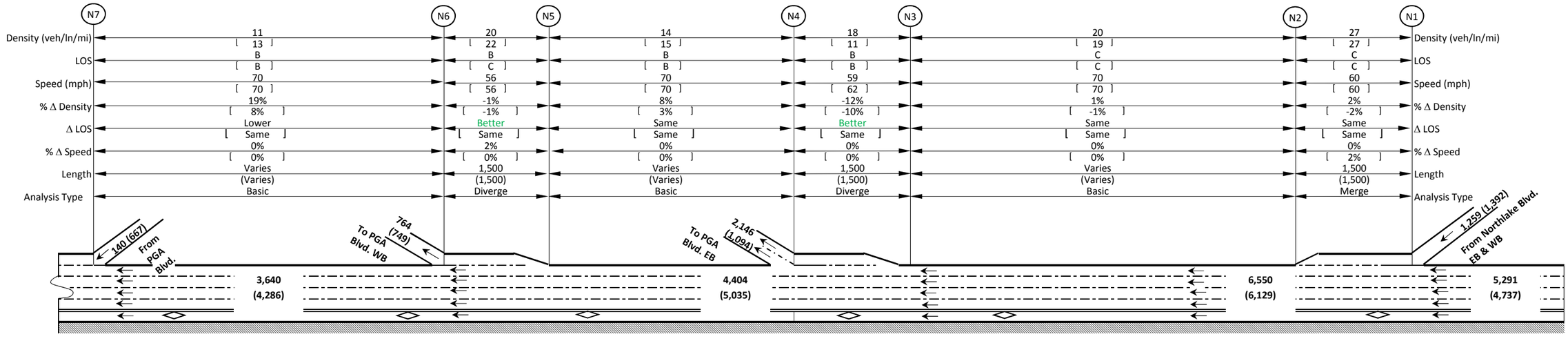
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 2 vs No-Build (Southbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-16-2** *Page No.* *Date:* 09/17/15

NORTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

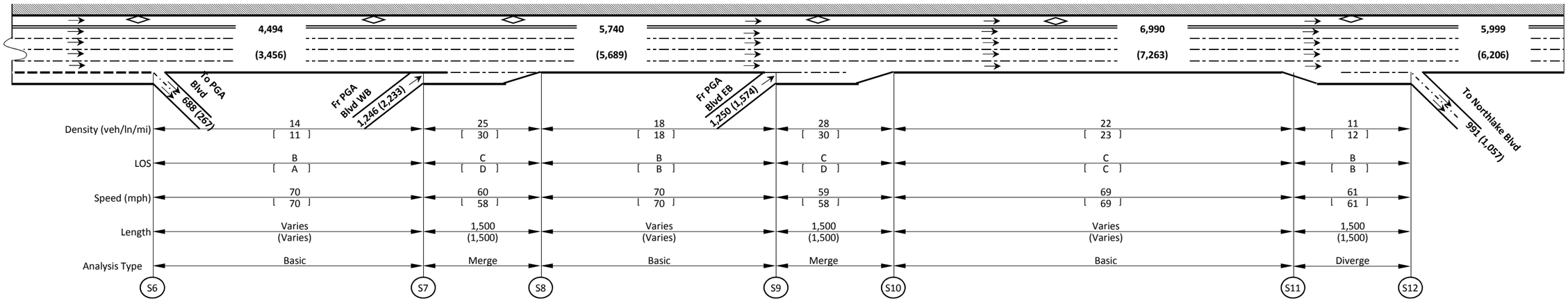
AM Values **XXX**

PM Values **(XXX)**

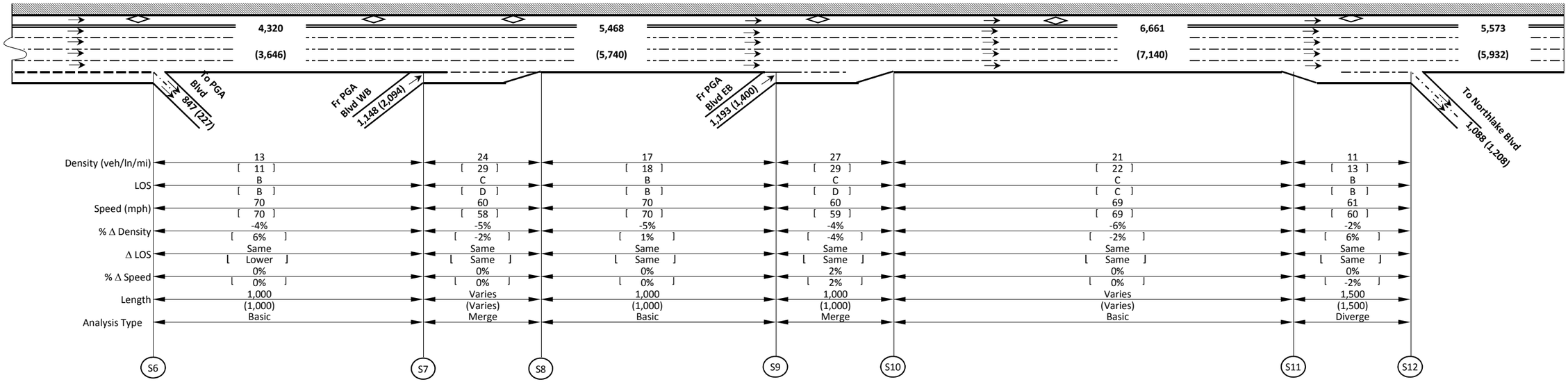
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 2 vs No-Build (Northbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-16-3** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 2 vs No-Build (Southbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-16-4** *Page No.* *Date:* 09/17/15

Table 7-11 - Alternative 2 2030 HCS Analysis

Freeway Operational Assessment - SR 9 (I-95) Between Northlake Boulevard and Donald Ross Road

Direction	2030 NO-BUILD								2030 Build (Alternative 2)								2030 Build Alt. 2 Vs 2030 No-Build						
		Analysis								Analysis							Peak Period	Change in Density		Change in Speed		Change in LOS?	Significant & Adverse?[2]
	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS		Δ Value	Δ %[1]	Δ Value	Δ %[1]		
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,710	28.0	59.0	D	**Between** On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Central Boulevard EB & WB	Weave	S1 - S2	AM	5,470	15.8	62.5	B	AM	(12.2)	-43.6%	3.5	5.9%	Better	No
				PM	1,209	21.0	61.0	C				PM	3,963	11.6	61.9	B	PM	(9.4)	-44.8%	0.9	1.5%	Better	No
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	5,995	18.4	70.0	C	**Between** Off-Ramp to Central Blvd. EB & WB **and** Off-Ramp to Military Trail/CD Road	Basic	S2 - S3	AM	5,251	16.1	70.0	B	AM	(2.3)	-12.5%	0.0	0.0%	Better	No
				PM	4,364	13.4	70.0	B				PM	3,498	10.7	70.0	A	PM	(2.7)	-20.1%	0.0	0.0%	Better	No
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	377	22.3	62.0	C	**At** Off-Ramp to Military Trail/CD Road	Diverge	S3 - S4	AM	832	22.2	61.0	C	AM	(0.1)	-0.4%	(1.0)	-1.6%	Same	No
				PM	197	16.6	63.0	B				PM	286	15.4	63.0	B	PM	(1.2)	-7.2%	0.0	0.0%	Same	No
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	5,618	17.2	70.0	B	**Between** Off-Ramp to Military Trail/CD Road **and** On-Ramp from Central Blvd/CD Road	Basic	S4 - S5	AM	4,419	13.6	70.0	B	AM	(3.6)	-20.9%	0.0	0.0%	Same	No
				PM	4,167	12.8	70.0	B				PM	3,212	9.9	70.0	A	PM	(2.9)	-22.7%	0.0	0.0%	Better	No
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	746	8.4	65.0	A	**Between** On-Ramp from Central Blvd/CD Road **and** Off-Ramp from to PGA Blvd EB & WB	Weave	S5 - S6	AM	5,646	16.1	63.5	B	AM	7.7	91.7%	(1.5)	-2.3%	Lower	No
				PM	299	4.6	66.0	A				PM	4,333	12.1	64.7	B	PM	7.5	163.0%	(1.3)	-2.0%	Lower	No
									CD Road: Between On-Ramp to Military Trail and Off-Ramp to Military Trail	Weave	SC1 - SC2	AM	2,058	25.5	45.0	C						
												PM	1,407	16.8	46.0	B							
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,872	14.9	70.0	B	**Between** Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,699	14.4	70.0	B	AM	(0.5)	-3.4%	0.0	0.0%	Same	No
				PM	3,868	11.9	70.0	B				PM	4,079	12.5	70.0	B	PM	0.6	5.0%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,351	26.6	59.0	C	**At** On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,245	25.3	60.0	C	AM	(1.3)	-4.9%	1.0	1.7%	Same	No
				PM	2,500	33.3	56.0	D				PM	2,344	32.6	56.0	D	PM	(0.7)	-2.1%	0.0	0.0%	Same	No
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	6,223	19.1	70.0	C	**Between** On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,944	18.2	70.0	C	AM	(0.9)	-4.7%	0.0	0.0%	Same	No
				PM	6,368	19.6	70.0	C				PM	6,423	19.8	70.0	C	PM	0.2	1.0%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,355	29.2	59.0	D	**At** On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,293	28.6	59.0	D	AM	(0.6)	-2.1%	0.0	0.0%	Same	No
				PM	1,761	32.8	57.0	D				PM	1,566	31.4	58.0	D	PM	(1.4)	-4.3%	1.0	1.8%	Same	No
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	7,578	24.0	68.0	C	**Between** On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	7,237	22.7	69.0	C	AM	(1.3)	-5.4%	1.0	1.5%	Same	No
				PM	8,129	26.2	67.0	D				PM	7,989	25.6	67.0	C	PM	(0.6)	-2.3%	0.0	0.0%	Better	No
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,074	13.1	61.0	B	**At** Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,179	12.9	60.0	B	AM	(0.2)	-1.5%	(1.0)	-1.6%	Same	No
				PM	1,182	14.8	60.0	B				PM	1,350	15.6	60.0	B	PM	0.8	5.4%	0.0	0.0%	Same	No
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,317	28.8	59.0	D	**At** On-Ramp from Northlake Blvd. EB & WB	Merge	N1 - N2	AM	1,407	29.4	59.0	D	AM	0.6	2.1%	0.0	0.0%	Same	No
				PM	1,646	29.5	59.0	D				PM	1,548	28.9	59.0	D	PM	(0.6)	-2.0%	0.0	0.0%	Same	No
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	7,259	22.8	69.0	C	**Between** On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	7,324	23.0	68.0	C	AM	0.2	0.9%	(1.0)	-1.4%	Same	No
				PM	6,814	21.1	69.0	C				PM	6,811	21.1	69.0	C	PM	0.0	0.0%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,689	23.6	58.0	C	**At** Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,400	21.7	59.0	C	AM	(1.9)	-8.1%	1.0	1.7%	Same	No
				PM	1,398	13.7	61.0	B				PM	1,216	12.4	62.0	B	PM	(1.3)	-9.5%	1.0	1.6%	Same	No
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,570	14.0	70.0	B	**Between** Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,924	15.1	70.0	B	AM	1.1	7.9%	0.0	0.0%	Same	No
				PM	5,416	16.6	70.0	B				PM	5,595	17.2	70.0	B	PM	0.6	3.6%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	1,160	22.5	55.0	C	**At** Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	854	22.2	56.0	C	AM	(0.3)	-1.3%	1.0	1.8%	Same	No
				PM	1,018	23.7	55.0	C				PM	833	23.4	56.0	C	PM	(0.3)	-1.3%	1.0	1.8%	Same	No
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,410	10.5	70.0	A	**Between** Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	4,070	12.5	70.0	B	AM	2.0	19.0%	0.0	0.0%	Lower	No
				PM	4,398	13.5	70.0	B				PM	4,762	14.6	70.0	B	PM	1.1	8.1%	0.0	0.0%	Same	No
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	149	13.1	62.0	B	**Between** On-ramp from PGA EB & WB **and** Off-ramp to Central Blvd/CD Road	Weave	N7 - N8	AM	4,225	12.0	63.8	B	AM	(1.1)	-8.4%	1.8	2.9%	Same	No
				PM	780	20.8	61.0	C				PM	5,503	16.9	59.0	B	PM	(3.9)	-18.8%	(2.0)	-3.3%	Better	No
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	3,559	10.9	70.0	A	**Between** Off-ramp to Central Blvd/CD Road **and** On-Ramp From Military Trail/CD Road	Basic	N8 - N9	AM	3,110	9.5	70.0	A	AM	(1.4)	-12.8%	0.0	0.0%	Same	No
				PM	5,178	15.9	70.0	B				PM	4,276	13.1	70.0	B	PM	(2.8)	-17.6%	0.0	0.0%	Same	No
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	116	13.2	62.0	B	**At** On-Ramp From Military Trail/CD Road	Merge	N9 - N10	AM	159	12.4	62.0	B	AM	(0.8)	-6.1%	0.0	0.0%	Same	No
				PM	599	21.0	61.0	C				PM	992	22.2	61.0	C	PM	1.2	5.7%	0.0	0.0%	Same	No
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	3,675	11.3	70.0	B	**Between** On-Ramp From Military Trail/CD Road **and** On-Ramp from Central Boulevard EB & WB	Basic	N10 - N11	AM	3,269	10.0	70.0	A	AM	(1.3)	-11.5%	0.0	0.0%	Better	No
				PM	5,777	17.7	70.0	B				PM	5,268	16.2	70.0	B	PM	(1.5)	-8.5%	0.0	0.0%	Same	No
									CD Road: Between On-Ramp From Military Trail and Off-Ramp to I-95	Weave	NC1 -NC2	AM	1,274	15.1	47.0	B						
												PM	2,219	27.7	44.0	C							
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,273	8.5	60.0	A	**Between** On-Ramp from Central Boulevard and Off-Ramp to Donald Ross Road	Weave	N11 - N12	AM	2,610	10.4	62.8	B	AM	1.9	22.4%	2.8	4.7%	Lower	No
				PM	1,771	15.0	59.0	B				PM	5,655	16.7	61.2	B	PM	1.7	11.3%	2.2	3.7%	Same	No

Notes:

1. According to guidelines contained in the 2010 Highway Capacity Manual (HCM), "Chapter 7/Interpreting HCM and Alternative Tool Results" , HCM model inputs and outputs can be expected to be accurate to only within 5% or 10% of the "true value" given the inherent variability of the field data on which they are based. As a consequence, only speed changes that are outside a +/- 10% change when comparing the statistics from the build condition to the no-build condition, were deemed significant taking into account the accuracy levels of model outputs as promulgated by the 2010 HCM.

*2. Impacts were considered to be "Significant & Adverse" when comparing the Build Alternate to the No-Build Alternate only if there was a degradation in speed that exceeded -10% **and** the level of service fell below the adopted LOS "D" threshold which is the minimum adopted level of service standard for I-95 within the study area according to Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.*

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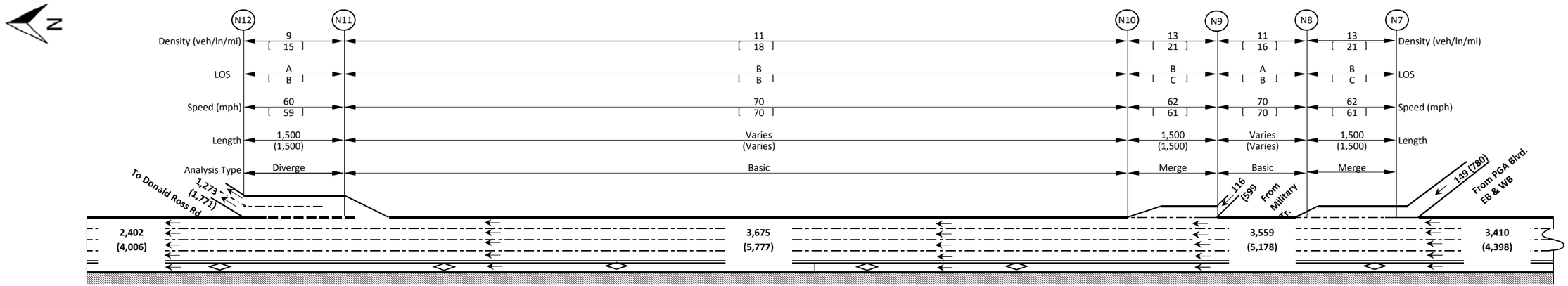
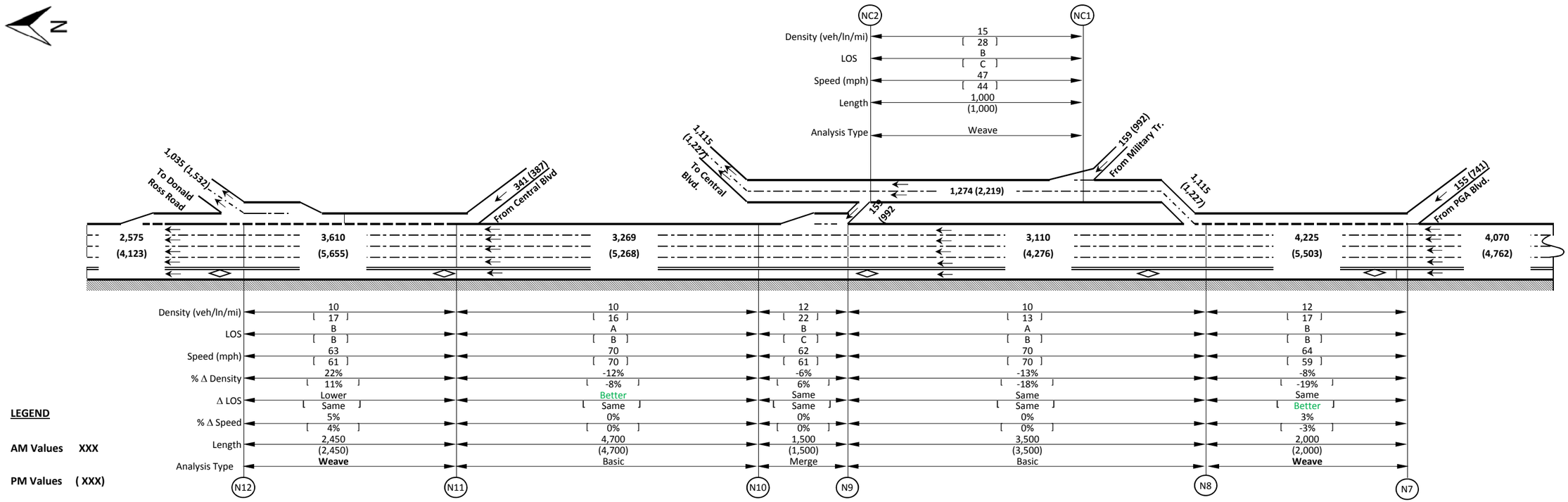
NORTHBOUND

2030 NO-BUILD



2030 BUILD



LEGEND

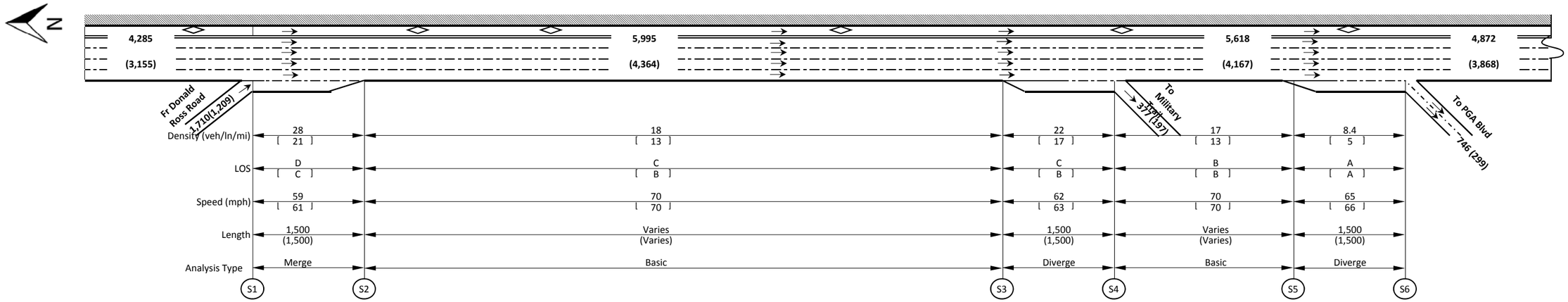
AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 2 vs No-Build (Northbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-17-1** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2030 NO-BUILD



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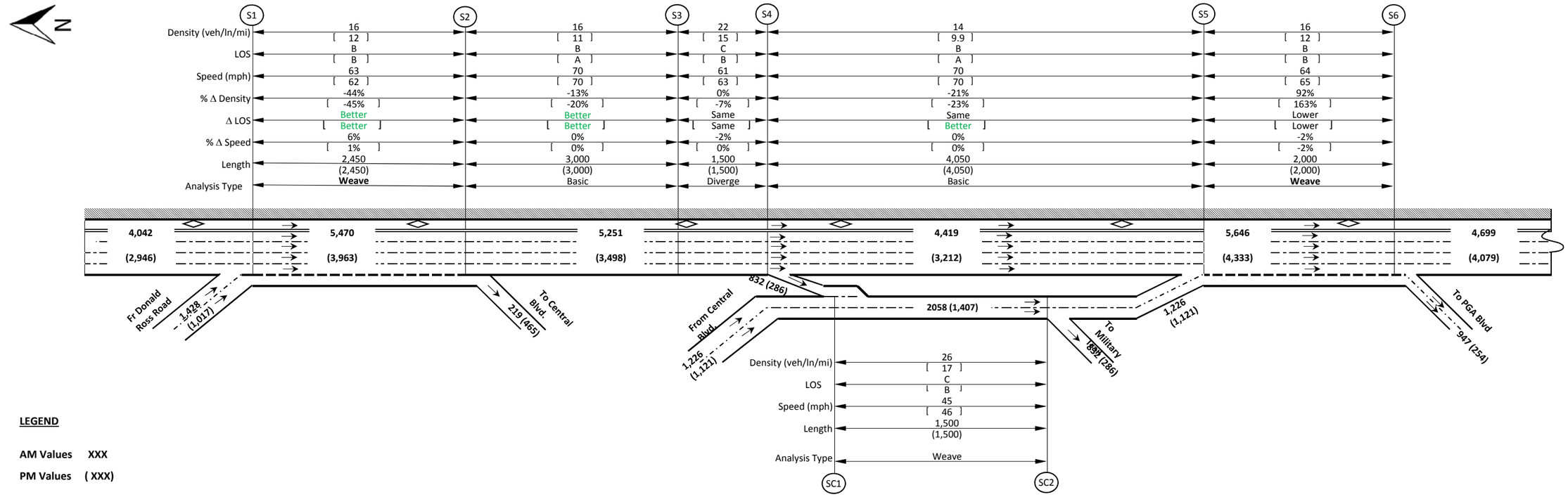

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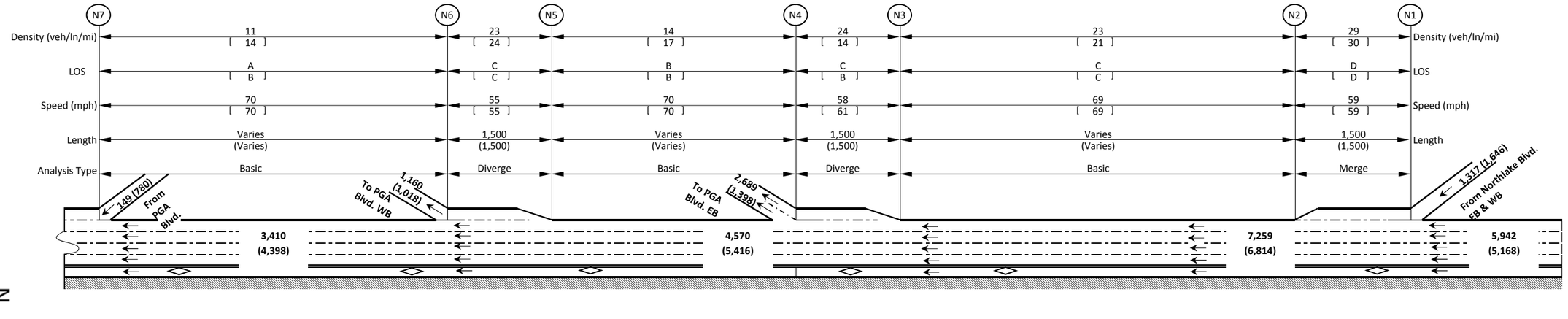
AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 2 vs No-Build (Southbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-17-2** *Page No.* *Date:* 09/17/15

NORTHBOUND

2030 NO-BUILD



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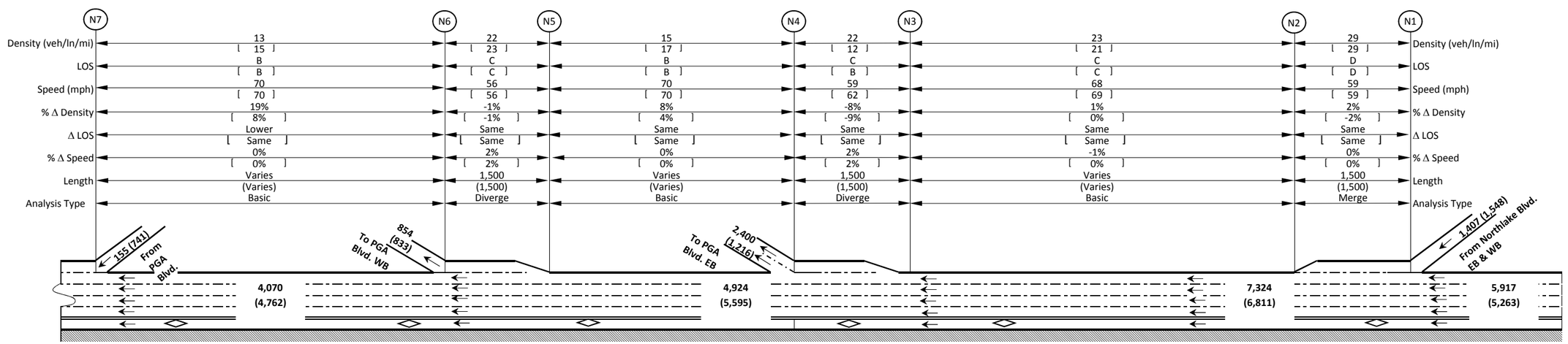

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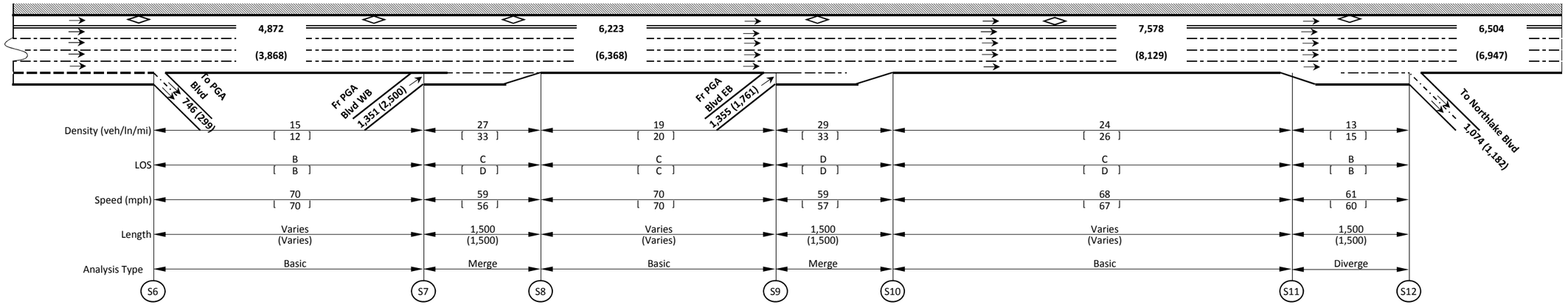
AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 2 vs No-Build (Northbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-17-3** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2030 NO-BUILD



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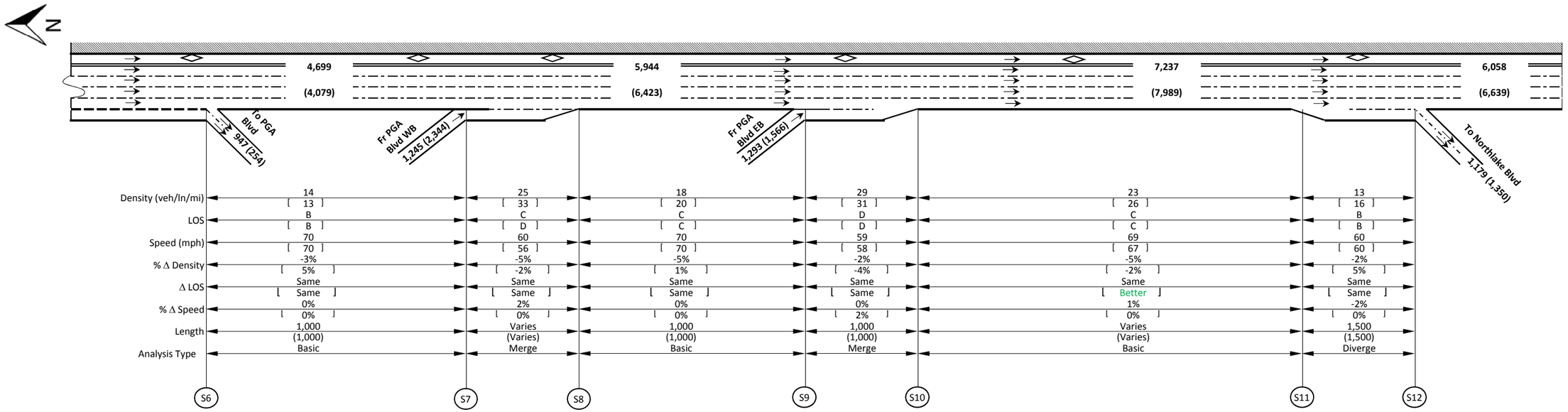

LEGEND

AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 2 vs No-Build (Southbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-17-4** *Page No.* *Date:* 09/17/15

Table 7-12 - Alternative 2 2040 HCS Analysis

Freeway Operational Assessment - SR 9 (I-95) Between Northlake Boulevard and Donald Ross Road

Direction	2040 NO-BUILD								2040 Build (Alternative 2)								2040 Build Alt. 2 Vs 2040 No-Build						
		Analysis								Analysis								Change in Density		Change in Speed			
	I-95 Segment Description	Type	Limits[1]	Period	DDHV	Density	Speed (MPH)	LOS	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS	Peak Period	Δ Value	Δ %[1]	Δ Value	Δ %[1]	Change in LOS?	Significant & Adverse?[2]
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,858	30.2	58.0	D	**Between** On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Central Boulevard EB & WB	Weave	S1 - S2	AM	5,942	17.3	62.0	B	AM	(12.9)	-42.7%	4.0	6.0%	Better	No
				PM	1,338	22.9	61.0	C				PM	4,385	12.9	61.3	B	PM	(10.0)	-43.7%	0.3	0.0%	Better	No
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	6,512	20.1	70.0	C	**Between** Off-Ramp to Central Blvd. EB & WB **and** Off-Ramp to Military Trail/CD Road	Basic	S2 - S3	AM	5,702	17.5	70.0	B	AM	(2.6)	-12.9%	0.0	0.0%	Better	No
				PM	4,829	14.8	70.0	B				PM	3,874	11.9	70.0	B	PM	(2.9)	-19.6%	0.0	0.0%	Same	No
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	410	24.2	62.0	C	**At** Off-Ramp to Military Trail/CD Road	Diverge	S3 - S4	AM	905	24.1	61.0	C	AM	(0.1)	-0.4%	(1.0)	-1.6%	Same	No
				PM	218	18.4	63.0	B				PM	316	15.5	63.0	B	PM	(2.9)	-15.8%	0.0	0.0%	Same	No
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	6,102	18.8	70.0	C	**Between** Off-Ramp to Military Trail/CD Road **and** On-Ramp from Central Blvd/CD Road	Basic	S4 - S5	AM	4,797	14.7	70.0	B	AM	(4.1)	-21.8%	0.0	0.0%	Better	No
				PM	4,611	14.1	70.0	B				PM	3,558	10.9	70.0	A	PM	(3.2)	-22.7%	0.0	0.0%	Better	No
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	810	9.9	65.0	A	**Between** On-Ramp from Central Blvd/CD Road **and** Off-Ramp from to PGA Blvd EB & WB	Weave	S5 - S6	AM	6,145	17.6	63.1	B	AM	7.7	77.8%	(1.9)	-2.9%	Lower	No
				PM	331	6.1	66.0	A				PM	4,790	13.4	64.3	B	PM	7.3	119.7%	(1.7)	-2.6%	Lower	No
									CD Road: Between On-Ramp to Military Trail and Off-Ramp to Military Trail	Weave	SC1 - SC2	AM	2,253	28.2	44.0	C						
												PM	1,548	18.6	46.0	B							
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	5,292	16.2	70.0	B	**Between** Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	5,116	15.7	70.0	B	AM	(0.5)	-3.1%	0.0	0.0%	Same	No
				PM	4,280	13.1	70.0	B				PM	4,509	13.8	70.0	B	PM	0.7	5.3%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,467	28.3	59.0	D	**At** On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,351	27.3	59.0	C	AM	(1.0)	-3.5%	0.0	0.0%	Better	No
				PM	2,766	36.6	52.0	E				PM	2,593	35.7	53.0	E	PM	(0.9)	-2.5%	1.0	1.9%	Same	No
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	6,759	20.9	69.0	C	**Between** On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	6,467	20.0	70.0	C	AM	(0.9)	-4.3%	1.0	1.4%	Same	No
				PM	7,046	22.0	69.0	C				PM	7,102	22.2	69.0	C	PM	0.2	0.9%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,473	31.4	58.0	D	**At** On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,406	30.2	58.0	D	AM	(1.2)	-3.8%	0.0	0.0%	Same	No
				PM	1,949	35.6	54.0	E				PM	1,733	34.0	56.0	D	PM	(1.6)	-4.5%	2.0	3.7%	Better	No
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	8,232	26.7	66.0	D	**Between** On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	7,873	25.2	67.0	C	AM	(1.5)	-5.6%	1.0	1.5%	Better	No
				PM	8,995	30.3	64.0	D				PM	8,835	29.5	64.0	D	PM	(0.8)	-2.6%	0.0	0.0%	Same	No
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,167	15.1	60.0	B	**At** Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,282	14.9	60.0	B	AM	(0.2)	-1.3%	0.0	0.0%	Same	No
				PM	1,308	17.3	60.0	B				PM	1,494	18.2	59.0	B	PM	0.9	5.2%	(1.0)	-1.7%	Same	No
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,468	31.0	58.0	D	**At** On-Ramp from Northlake Blvd. EB & WB	Merge	N1 - N2	AM	1,569	31.8	57.0	D	AM	0.8	2.6%	(1.0)	-1.7%	Same	No
				PM	1,796	31.9	57.0	D				PM	1,689	31.3	58.0	D	PM	(0.6)	-1.9%	1.0	1.8%	Same	No
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	8,086	26.0	67.0	D	**Between** On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	8,159	26.4	67.0	D	AM	0.4	1.5%	0.0	0.0%	Same	No
				PM	7,438	23.4	68.0	C				PM	7,434	23.4	68.0	C	PM	0.0	0.0%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,996	27.3	57.0	C	**At** Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,674	25.2	58.0	C	AM	(2.1)	-7.7%	1.0	1.8%	Same	No
				PM	1,526	15.8	61.0	B				PM	1,327	14.4	62.0	B	PM	(1.4)	-8.9%	1.0	1.6%	Same	No
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	5,090	15.6	70.0	B	**Between** Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	5,485	16.8	70.0	B	AM	1.2	7.7%	0.0	0.0%	Same	No
				PM	5,912	18.2	70.0	C				PM	6,107	18.8	70.0	C	PM	0.6	3.3%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	1,292	25.1	54.0	C	**At** Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	951	23.6	55.0	C	AM	(1.5)	-6.0%	1.0	1.9%	Same	No
				PM	1,111	25.9	55.0	C				PM	909	25.5	56.0	C	PM	(0.4)	-1.5%	1.0	1.8%	Same	No
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,798	11.7	70.0	B	**Between** Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	4,534	13.9	70.0	B	AM	2.2	18.8%	0.0	0.0%	Same	No
				PM	4,801	14.7	70.0	B				PM	5,198	15.9	70.0	B	PM	1.2	8.2%	0.0	0.0%	Same	No
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	166	14.2	62.0	B	**Between** On-ramp from PGA EB & WB **and** Off-ramp to Central Blvd/CD Road	Weave	N7 - N8	AM	4,707	13.4	63.3	B	AM	(0.8)	-5.6%	1.3	2.1%	Same	No
				PM	852	22.4	61.0	C				PM	6,008	18.6	58.2	B	PM	(3.8)	-17.0%	(2.8)	-4.6%	Better	No
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	3,964	12.2	70.0	B	**Between** Off-ramp to Central Blvd/CD Road **and** On-Ramp From Military Trail/CD Road	Basic	N8 - N9	AM	3,481	10.7	70.0	A	AM	(1.5)	-12.3%	0.0	0.0%	Better	No
				PM	5,653	17.3	70.0	B				PM	4,660	14.3	70.0	B	PM	(3.0)	-17.3%	0.0	0.0%	Same	No
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	130	14.4	62.0	B	**At** On-Ramp From Military Trail/CD Road	Merge	N9 - N10	AM	178	13.5	62.0	B	AM	(0.9)	-6.3%	0.0	0.0%	Same	No
				PM	653	22.6	61.0	C				PM	1,082	23.9	60.0	C	PM	1.3	5.8%	(1.0)	-1.6%	Same	No
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	4,094	12.6	70.0	B	**Between** On-Ramp From Military Trail/CD Road **and** On-Ramp from Central Boulevard EB & WB	Basic	N10 - N11	AM	3,659	11.2	70.0	B	AM	(1.4)	-11.1%	0.0	0.0%	Same	No
				PM	6,306	19.4	70.0	C				PM	5,742	17.6	70.0	B	PM	(1.8)	-9.3%	0.0	0.0%	Better	No
									CD Road: Between On-Ramp From Military Trail and Off-Ramp to I-95	Weave	NC1 -NC2	AM	1,404	16.7	46.0	B						
												PM	2,430	30.8	44.0	C							
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,418	9.6	60.0	A	**Between** On-Ramp from Central Boulevard and Off-Ramp to Donald Ross Road	Weave	N11 - N12	AM	4,034	11.7	62.4	B	AM	2.1	21.9%	2.4	4.0%	Lower	No
				PM	1,933	17.2	58.0	B				PM	6,167	18.4	60.7	B	PM	1.2	7.0%	2.7	4.7%	Same	No

Notes:

1. According to guidelines contained in the 2010 Highway Capacity Manual (HCM), "Chapter 7/Interpreting HCM and Alternative Tool Results" , HCM model inputs and outputs can be expected to be accurate to only within 5% or 10% of the "true value" given the inherent variability of the field data on which they are based. As a consequence, only speed changes that are outside a +/- 10% change when comparing the statistics from the build condition to the no-build condition, were deemed significant taking into account the accuracy levels of model outputs as promulgated by the 2010 HCM.

*2. Impacts were considered to be "Significant & Adverse" when comparing the Build Alternate to the No-Build Alternate only if there was a degradation in speed that exceeded -10% **and** the level of service fell below the adopted LOS "D" threshold which is the minimum adopted level of service standard for I-95 within the study area according to Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.*

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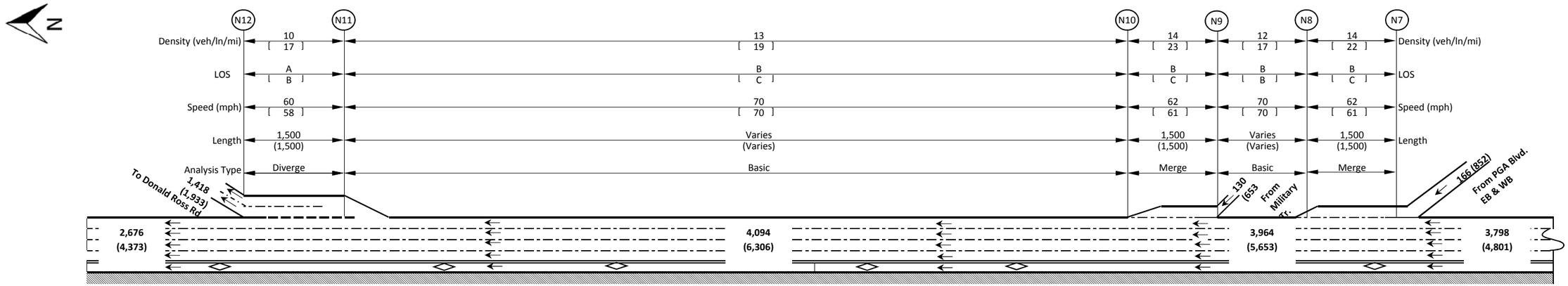
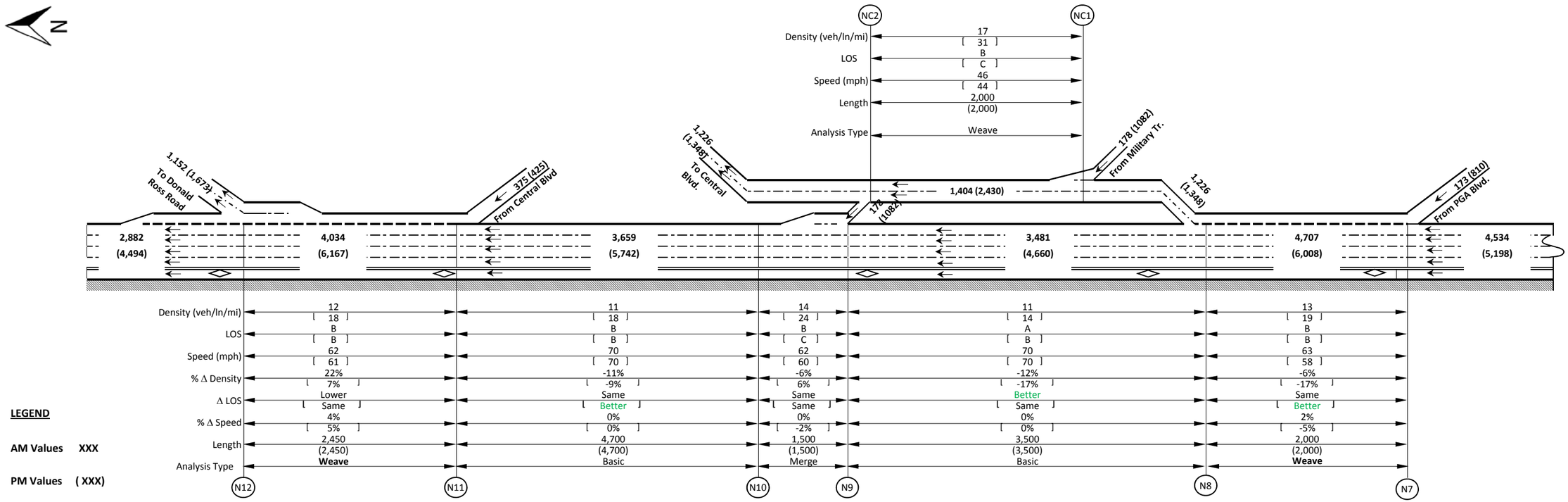
NORTHBOUND

2040 NO-BUILD



2040 BUILD



LEGEND

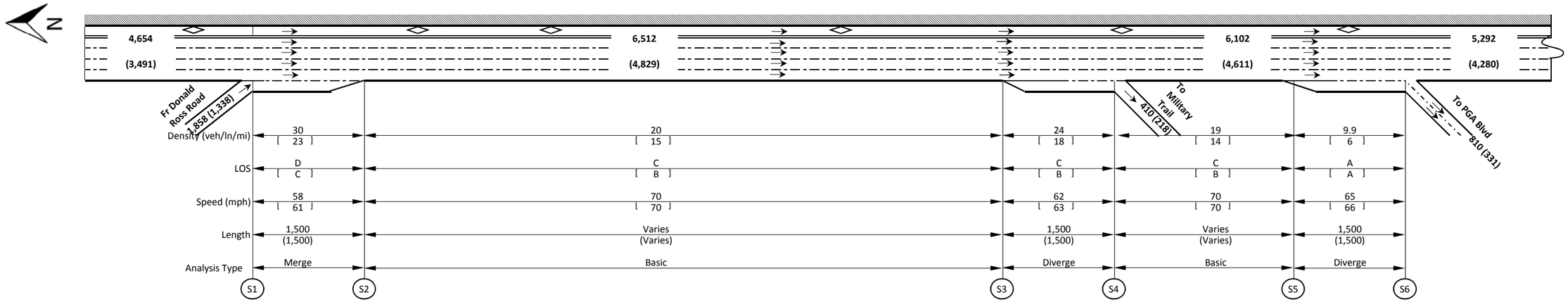
AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 2 vs No-Build (Northbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-18-1** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2040 NO-BUILD



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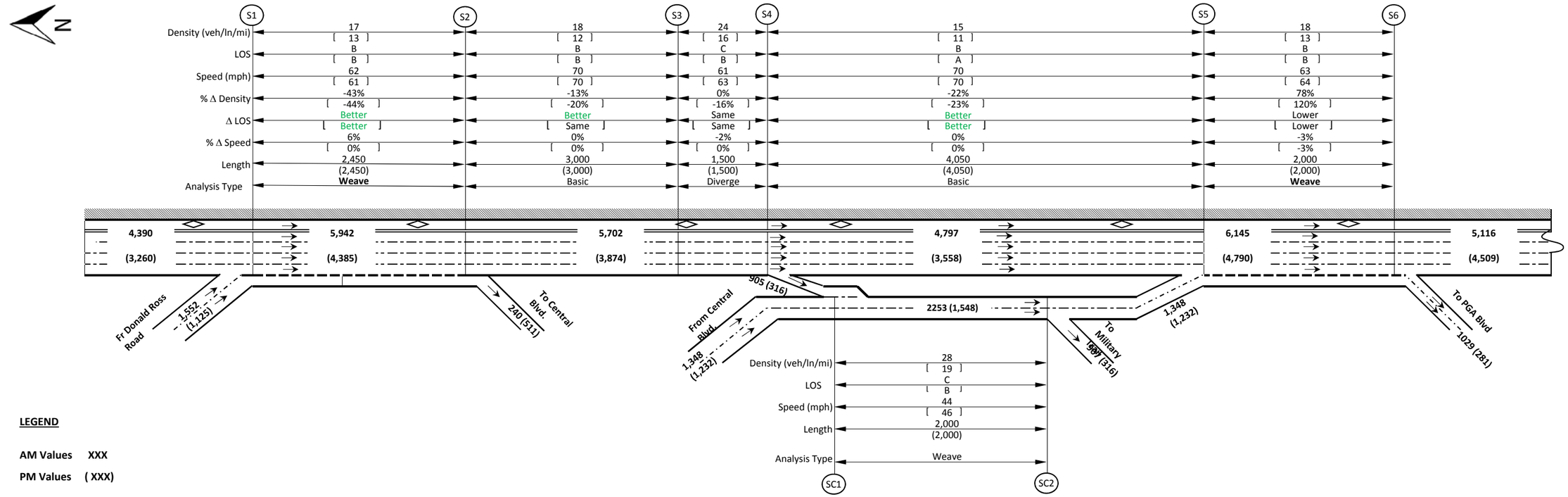


LEGEND

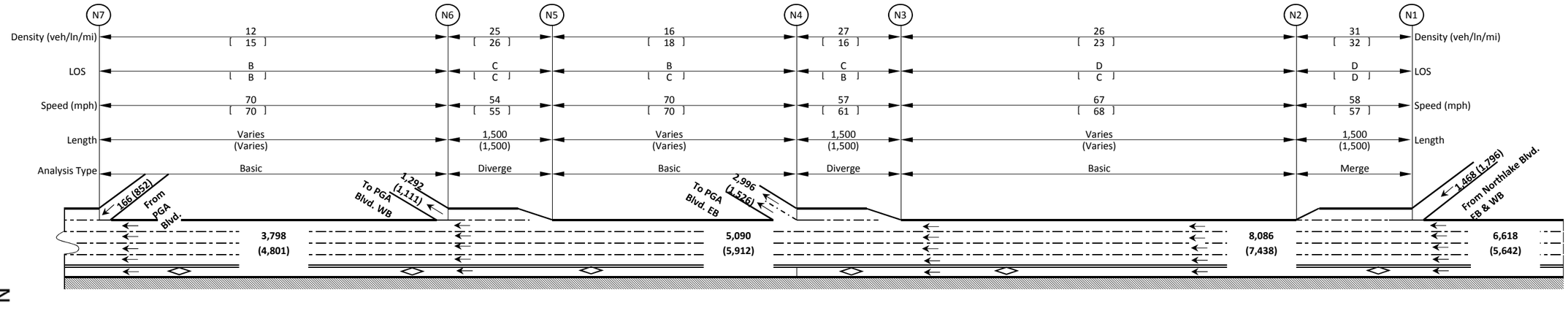
AM Values XXX

PM Values (XXX)

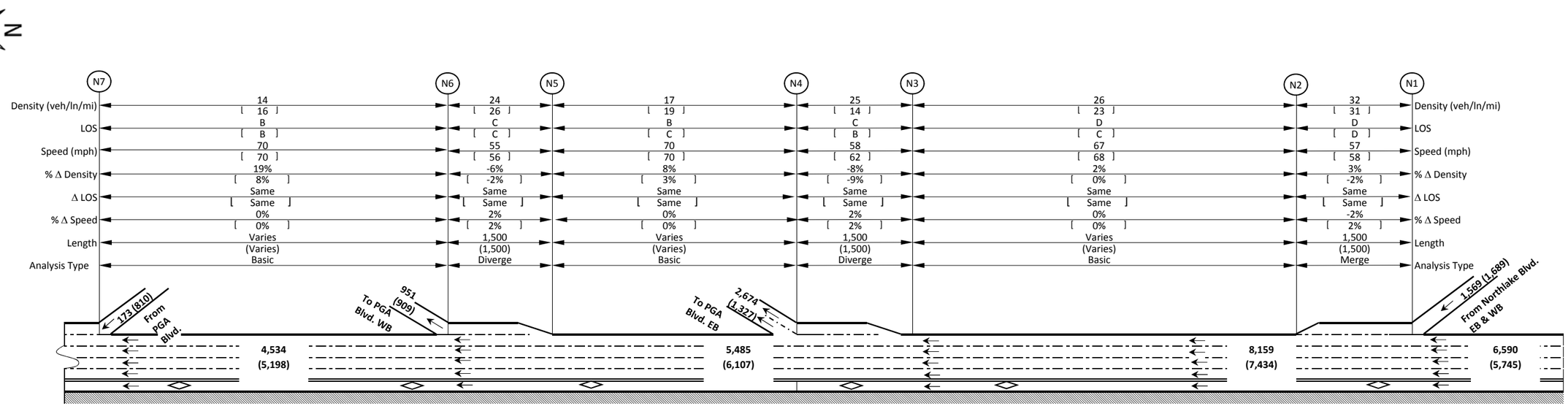
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 2 vs No-Build (Southbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-18-2** *Page No.* *Date:* 09/17/15

NORTHBOUND

2040 NO-BUILD



2040 BUILD



LEGEND

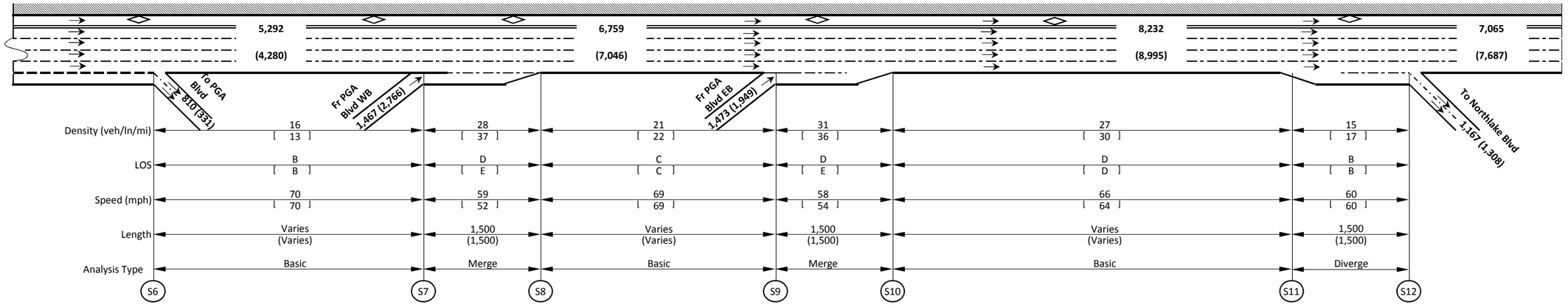
AM Values XXX

PM Values (XXX)

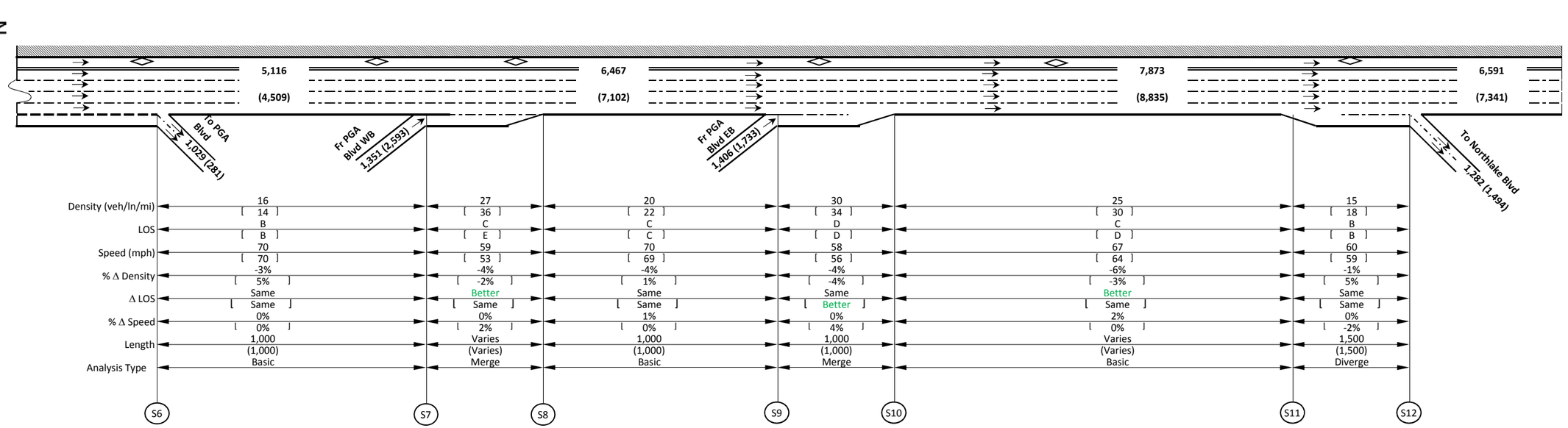
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 2 vs No-Build (Northbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-18-3** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2040 NO-BUILD



2040 BUILD



LEGEND

AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 2 vs No-Build (Southbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-18-4** *Page No.* *Date:* 09/17/15

7.4.3 Alternative 3 Freeway Facilities Analysis

Tables 7-13 through 7-15 display in tabular form the volumes and MOEs for Alternative 3 for the years 2020, 2030, and 2040 respectively. Figures 7-19 through 7-21 display the information graphically for the years 2020, 2030, and 2040 respectively.

Table 7-13 - Alternative 3 2020 HCS Analysis

Freeway Operational Assessment - SR 9 (I-95) Between Northlake Boulevard and Donald Ross Road

Direction	2020 NO-BUILD								2020 Build (Alternative 3)								2020 Build Alt. 3 Vs 2020 No-Build						
		Analysis								Analysis							Peak Period	Change in Density		Change in Speed		Change in LOS?	Significant & Adverse?[2]
	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS		Δ Value	Δ %[1]	Δ Value	Δ %[1]		
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,577	26.1	60.0	C	**Between** On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Central Boulevard EB & WB	Weave	S1 - S2	AM	5,046	14.4	63.1	B	AM	(11.7)	-44.8%	3.1	5.2%	Better	No
				PM	1,080	19.1	61.0	B				PM	3,540	10.2	62.7	B	PM	(8.9)	-46.6%	1.7	2.8%	Same	No
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	5,530	17.0	70.0	B	**Between** Off-Ramp to Central Blvd. EB & WB **and** Off-Ramp to Military Trail/CD Road	Basic	S2 - S3	AM	4,847	14.9	70.0	B	AM	(2.1)	-12.4%	0.0	0.0%	Same	No
				PM	3,899	12.0	70.0	B				PM	3,123	9.6	70.0	A	PM	(2.4)	-20.0%	0.0	0.0%	Better	No
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	348	20.5	63.0	C	**At** Off-Ramp to Military Trail/CD Road	Diverge	S3 - S4	AM	768	21.4	61.0	C	AM	0.9	4.4%	(2.0)	-3.2%	Same	No
				PM	176	14.8	63.0	B				PM	255	13.7	63.0	B	PM	(1.1)	-7.4%	0.0	0.0%	Same	No
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	5,182	15.9	70.0	B	**Between** Off-Ramp to Military Trail **and** On-Ramp from Central Blvd	Basic	S4 - S5	AM	4,079	12.5	70.0	B	AM	(3.4)	-21.4%	0.0	0.0%	Same	No
				PM	3,723	11.4	70.0	B				PM	2,868	8.8	70.0	A	PM	(2.6)	-22.8%	0.0	0.0%	Better	No
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	688	7.0	65.0	A	**Between** On-Ramp from Central Blvd **and** Off-Ramp from to PGA Blvd EB & WB	Weave	S5 - S6	AM	5,194	14.7	63.8	B	AM	7.7	110.0%	(1.2)	-1.8%	Lower	No
				PM	267	4.5	66.0	A				PM	3,873	10.8	65.0	B	PM	6.3	140.0%	(1.0)	-1.5%	Lower	No
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,494	13.8	70.0	B	**Between** Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,320	13.3	70.0	B	AM	(0.5)	-3.6%	0.0	0.0%	Same	No
				PM	3,456	10.6	70.0	A				PM	3,646	11.2	70.0	B	PM	0.6	5.7%	0.0	0.0%	Lower	No
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,246	24.8	60.0	C	**At** On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,148	23.6	60.0	C	AM	(1.2)	-4.8%	0.0	0.0%	Same	No
				PM	2,233	30.1	58.0	D				PM	2,094	29.4	58.0	D	PM	(0.7)	-2.3%	0.0	0.0%	Same	No
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,740	17.6	70.0	B	**Between** On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,468	16.8	70.0	B	AM	(0.8)	-4.5%	0.0	0.0%	Same	No
				PM	5,689	17.5	70.0	B				PM	5,740	17.6	70.0	B	PM	0.1	0.6%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,250	27.7	59.0	C	**At** On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,193	26.5	60.0	C	AM	(1.2)	-4.3%	1.0	1.7%	Same	No
				PM	1,574	30.2	58.0	D				PM	1,400	28.9	59.0	D	PM	(1.3)	-4.3%	1.0	1.7%	Same	No
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	6,990	21.8	69.0	C	**Between** On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	6,661	20.6	69.0	C	AM	(1.2)	-5.5%	0.0	0.0%	Same	No
				PM	7,263	22.8	69.0	C				PM	7,140	22.3	69.0	C	PM	(0.5)	-2.2%	0.0	0.0%	Same	No
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	991	11.4	61.0	B	**At** Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,088	11.2	61.0	B	AM	(0.2)	-1.8%	0.0	0.0%	Same	No
				PM	1,057	12.2	61.0	B				PM	1,208	12.9	60.0	B	PM	0.7	5.7%	(1.0)	-1.6%	Same	No
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,178	26.0	60.0	C	**At** On-Ramp from Northlake Blvd. EB & WB	Merge	N1 - N2	AM	1,259	26.6	60.0	C	AM	0.6	2.3%	0.0	0.0%	Same	No
				PM	1,480	27.1	59.0	C				PM	1,392	26.6	60.0	C	PM	(0.5)	-1.8%	1.0	1.7%	Same	No
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	6,492	20.0	70.0	C	**Between** On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	6,550	20.2	70.0	C	AM	0.2	1.0%	0.0	0.0%	Same	No
				PM	6,132	18.9	70.0	C				PM	6,129	18.8	70.0	C	PM	(0.1)	-0.5%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,405	20.9	59.0	C	**At** Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,146	18.4	59.0	B	AM	(2.5)	-12.0%	0.0	0.0%	Better	No
				PM	1,258	12.1	62.0	B				PM	1,094	10.9	62.0	B	PM	(1.2)	-9.9%	0.0	0.0%	Same	No
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,087	12.5	70.0	B	**Between** Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,404	13.5	70.0	B	AM	1.0	8.0%	0.0	0.0%	Same	No
				PM	4,874	15.0	70.0	B				PM	5,035	15.4	70.0	B	PM	0.4	2.7%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	1,038	20.1	55.0	C	**At** Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	764	19.8	56.0	B	AM	(0.3)	-1.5%	1.0	1.8%	Better	No
				PM	916	22.3	56.0	C				PM	749	22.0	56.0	C	PM	(0.3)	-1.3%	0.0	0.0%	Same	No
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,049	9.4	70.0	A	**Between** Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,640	11.2	70.0	B	AM	1.8	19.1%	0.0	0.0%	Lower	No
				PM	3,958	12.1	70.0	B				PM	4,286	13.1	70.0	B	PM	1.0	8.3%	0.0	0.0%	Same	No
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	134	12.0	62.0	B	**Between** On-ramp from PGA EB & WB **and** Off-ramp to Central Blvd	Weave	N7 - N8	AM	3,780	10.6	64.2	B	AM	(1.4)	-11.7%	2.2	3.5%	Same	No
				PM	702	19.0	61.0	B				PM	4,953	14.9	60.1	B	PM	(4.1)	-21.6%	(0.9)	-1.5%	Same	No
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	3,183	9.8	70.0	A	**Between** Off-ramp to Central Blvd **and** On-Ramp From Military Trail	Basic	N8 - N9	AM	2,766	8.5	70.0	A	AM	(1.3)	-13.3%	0.0	0.0%	Same	No
				PM	4,660	14.3	70.0	B				PM	3,853	11.8	70.0	B	PM	(2.5)	-17.5%	0.0	0.0%	Same	No
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	104	12.1	62.0	B	**At** On-Ramp From Military Trail	Merge	N9 - N10	AM	143	11.3	62.0	B	AM	(0.8)	-6.6%	0.0	0.0%	Same	No
				PM	539	19.5	61.0	B				PM	893	20.3	61.0	C	PM	0.8	4.1%	0.0	0.0%	Lower	No
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	3,287	10.1	70.0	A	**Between** On-Ramp From Military Trail **and** On-Ramp from Central Boulevard EB & WB	Basic	N10 - N11	AM	2,909	8.9	70.0	A	AM	(1.2)	-11.9%	0.0	0.0%	Same	No
				PM	5,199	15.9	70.0	B				PM	4,746	14.6	70.0	B	PM	(1.3)	-8.2%	0.0	0.0%	Same	No
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,139	6.6	60.0	A	**Between** On-Ramp from Central Boulevard and Off-Ramp to Donald Ross Road	Weave	N11 - N12	AM	3,219	9.2	63.4	A	AM	2.6	39.4%	3.4	5.7%	Same	No
				PM	1,594	12.6	59.0	B				PM	5,093	14.8	62.1	B	PM	2.2	17.5%	3.1	5.3%	Same	No

Notes:

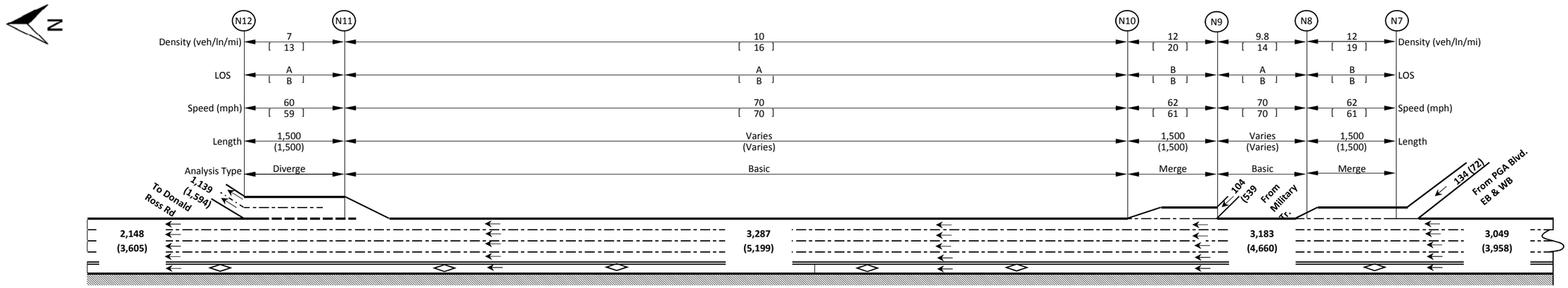
1. According to guidelines contained in the 2010 Highway Capacity Manual (HCM), "Chapter 7/Interpreting HCM and Alternative Tool Results" , HCM model inputs and outputs can be expected to be accurate to only within 5% or 10% of the "true value" given the inherent variability of the field data on which they are based. As a consequence, only speed changes that are outside a +/- 10% change when comparing the statistics from the build condition to the no-build condition, were deemed significant taking into account the accuracy levels of model outputs as promulgated by the 2010 HCM.

*2. Impacts were considered to be "Significant & Adverse" when comparing the Build Alternate to the No-Build Alternate only if there was a degradation in speed that exceeded -10% **and** the level of service fell below the adopted LOS "D" threshold which is the minimum adopted level of service standard for I-95 within the study area according to Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.*

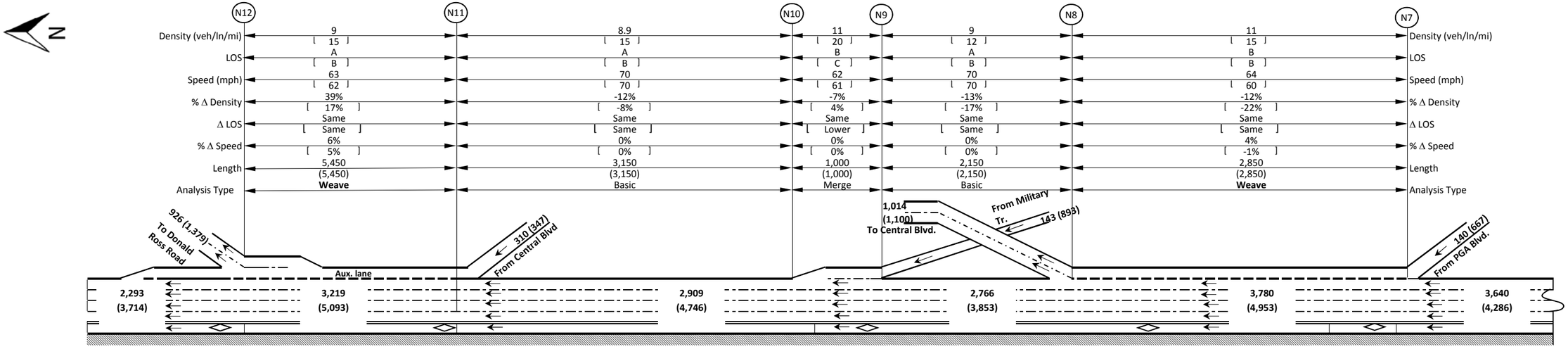
Z:\Projects\0130151 I-95 at PGA PDE\PHASE 2 - PD&E Study\Traffic\Reanalysis\HCS\2020\[Freeway_Analysis_Summary_2020.xlsx]Summary_Sheet_alt3

NORTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

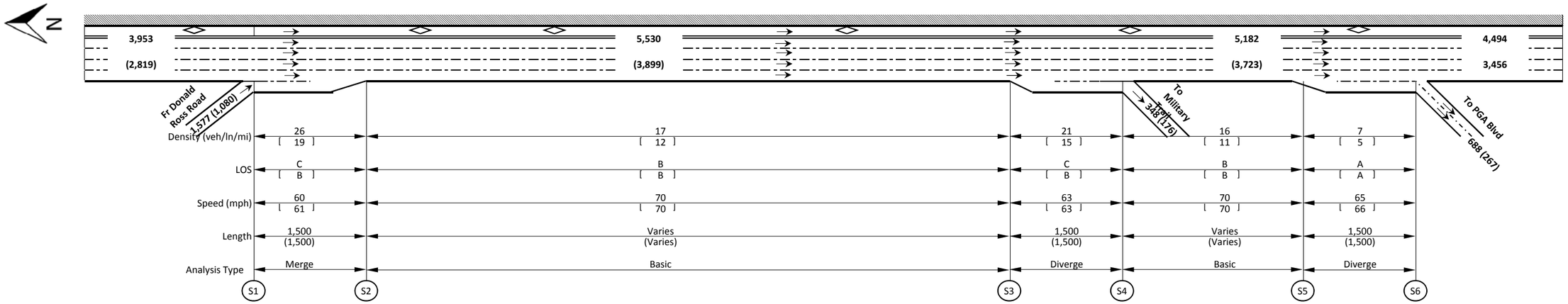
AM Values XXX

PM Values (XXX)

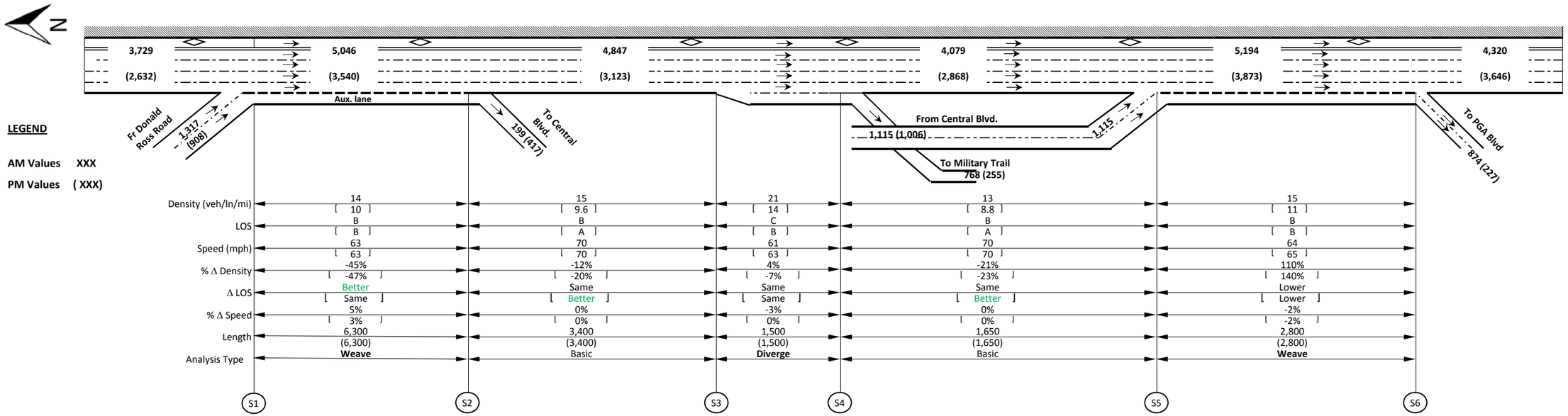
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 3 vs No-Build (Northbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-19-1** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2020 NO-BUILD



2020 BUILD



Project Name:

SR 9 / I-95 at PGA Boulevard/ Central Boulevard
Project Development & Environmental Study
FM No. 413265-1-22-01

Figure Name:

2020 Freeway Operations Analysis Alternate 3 vs No-Build (Southbound - North Section: PGA Blvd to Donald Ross)

Report Title:

Interchange Justification Report

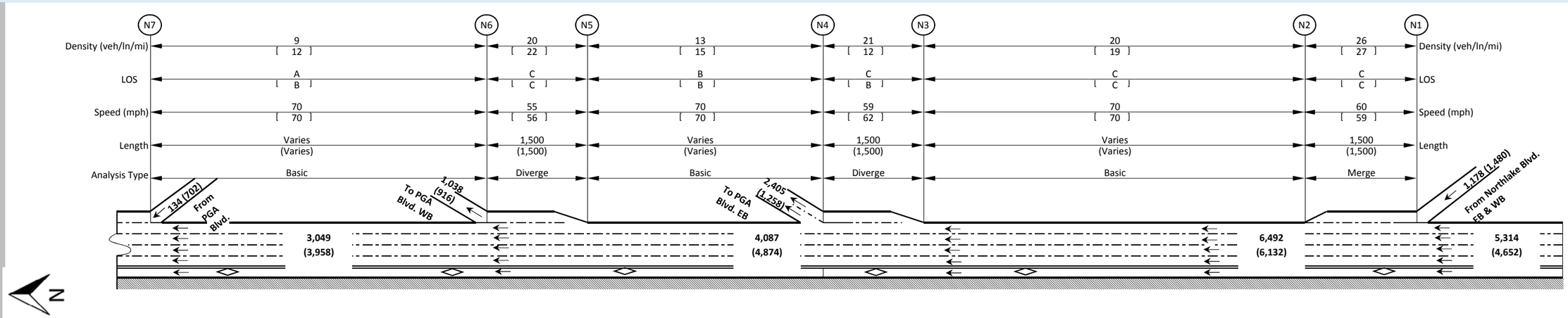
Figure No. **7-19-2**

Page No.

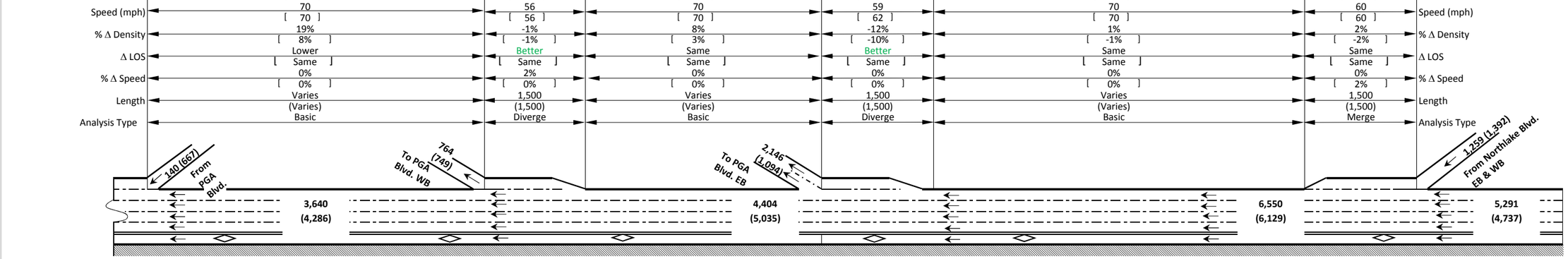
Date: 09/17/15

NORTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

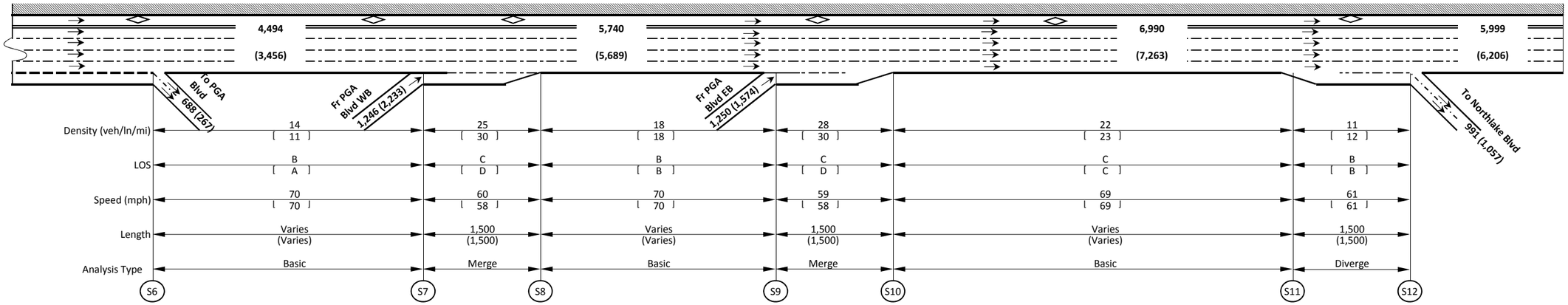
AM Values XXX

PM Values (XXX)

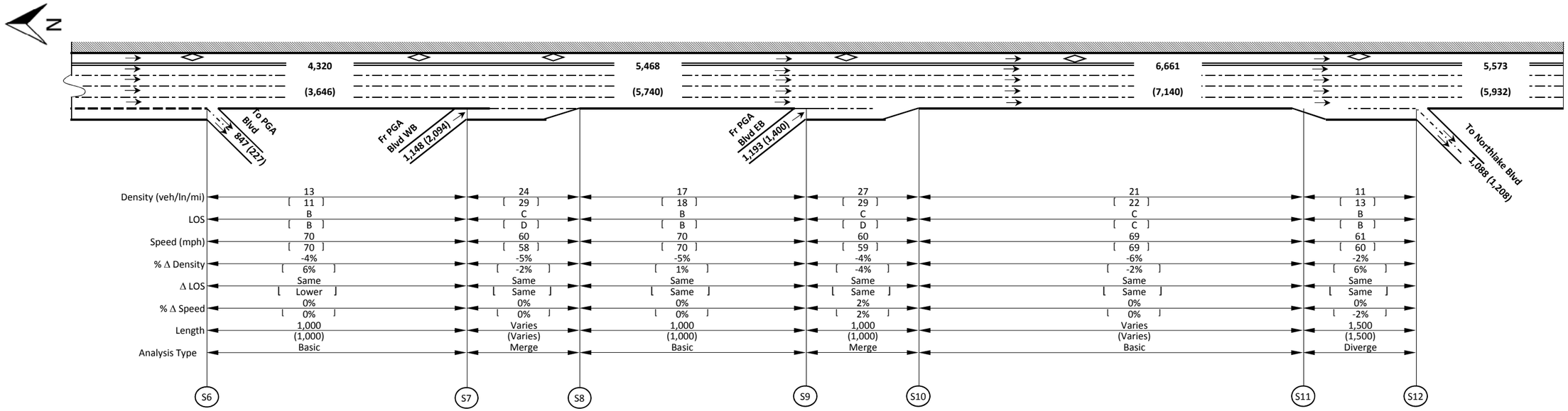
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 3 vs No-Build (Northbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-19-3** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2020 NO-BUILD



2020 BUILD



LEGEND

AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2020 Freeway Operations Analysis Alternate 3 vs No-Build (Southbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-19-4** *Page No.* *Date:* 09/17/15

Table 7-14 - Alternative 3 2030 HCS Analysis

Freeway Operational Assessment - SR 9 (I-95) Between Northlake Boulevard and Donald Ross Road

Direction	2030 NO-BUILD								2030 Build (Alternative 3)								2030 Build Alt. 3 Vs 2030 No-Build						
		Analysis								Analysis							Peak Period	Change in Density		Change in Speed		Change in LOS?	Significant & Adverse?[2]
	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS	I-95 Segment Description	Type	Limits	Period	DDHV	Density	Speed (MPH)	LOS		Δ Value	Δ %[1]	Δ Value	Δ %[1]		
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,710	28.0	59.0	D	**Between** On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Central Boulevard EB & WB	Weave	S1 - S2	AM	5,470	15.8	62.6	B	AM	(12.2)	-43.6%	3.6	6.1%	Better	No
				PM	1,209	21.0	61.0	C				PM	3,963	11.5	62.1	B	PM	(9.5)	-45.2%	1.1	1.8%	Better	No
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	5,995	18.4	70.0	C	**Between** Off-Ramp to Central Blvd. EB & WB **and** Off-Ramp to Military Trail/CD Road	Basic	S2 - S3	AM	5,251	16.1	70.0	B	AM	(2.3)	-12.5%	0.0	0.0%	Better	No
				PM	4,364	13.4	70.0	B				PM	3,498	10.7	70.0	A	PM	(2.7)	-20.1%	0.0	0.0%	Better	No
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	377	22.3	62.0	C	**At** Off-Ramp to Military Trail/CD Road	Diverge	S3 - S4	AM	832	22.2	61.0	C	AM	(0.1)	-0.4%	(1.0)	-1.6%	Same	No
				PM	197	16.6	63.0	B				PM	286	15.4	63.0	B	PM	(1.2)	-7.2%	0.0	0.0%	Same	No
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	5,618	17.2	70.0	B	**Between** Off-Ramp to Military Trail **and** On-Ramp from Central Blvd	Basic	S4 - S5	AM	4,419	13.6	70.0	B	AM	(3.6)	-20.9%	0.0	0.0%	Same	No
				PM	4,167	12.8	70.0	B				PM	3,212	9.9	70.0	A	PM	(2.9)	-22.7%	0.0	0.0%	Better	No
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	746	8.4	65.0	A	**Between** On-Ramp from Central Blvd **and** Off-Ramp from to PGA Blvd EB & WB	Weave	S5 - S6	AM	5,646	16.1	63.5	B	AM	7.7	91.7%	(1.5)	-2.3%	Lower	No
				PM	299	4.6	66.0	A				PM	4,333	12.1	64.6	B	PM	7.5	163.0%	(1.4)	-2.1%	Lower	No
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,872	14.9	70.0	B	**Between** Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	4,699	14.4	70.0	B	AM	(0.5)	-3.4%	0.0	0.0%	Same	No
				PM	3,868	11.9	70.0	B				PM	4,079	12.5	70.0	B	PM	0.6	5.0%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,351	26.6	59.0	C	**At** On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,245	25.3	60.0	C	AM	(1.3)	-4.9%	1.0	1.7%	Same	No
				PM	2,500	33.3	56.0	D				PM	2,344	32.6	56.0	D	PM	(0.7)	-2.1%	0.0	0.0%	Same	No
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	6,223	19.1	70.0	C	**Between** On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	5,944	18.2	70.0	C	AM	(0.9)	-4.7%	0.0	0.0%	Same	No
				PM	6,368	19.6	70.0	C				PM	6,423	19.8	70.0	C	PM	0.2	1.0%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,355	29.2	59.0	D	**At** On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,293	28.6	59.0	D	AM	(0.6)	-2.1%	0.0	0.0%	Same	No
				PM	1,761	32.8	57.0	D				PM	1,566	31.4	58.0	D	PM	(1.4)	-4.3%	1.0	1.8%	Same	No
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	7,578	24.0	68.0	C	**Between** On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	7,237	22.7	69.0	C	AM	(1.3)	-5.4%	1.0	1.5%	Same	No
				PM	8,129	26.2	67.0	D				PM	7,989	25.6	67.0	C	PM	(0.6)	-2.3%	0.0	0.0%	Better	No
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,074	13.1	61.0	B	**At** Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,179	12.9	60.0	B	AM	(0.2)	-1.5%	(1.0)	-1.6%	Same	No
				PM	1,182	14.8	60.0	B				PM	1,350	15.6	60.0	B	PM	0.8	5.4%	0.0	0.0%	Same	No
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,317	28.8	59.0	D	**At** On-Ramp from Northlake Blvd. EB & WB	Merge	N1 - N2	AM	1,407	29.4	59.0	D	AM	0.6	2.1%	0.0	0.0%	Same	No
				PM	1,646	29.5	59.0	D				PM	1,548	28.9	59.0	D	PM	(0.6)	-2.0%	0.0	0.0%	Same	No
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	7,259	22.8	69.0	C	**Between** On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	7,324	23.0	68.0	C	AM	0.2	0.9%	(1.0)	-1.4%	Same	No
				PM	6,814	21.1	69.0	C				PM	6,811	21.1	69.0	C	PM	0.0	0.0%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,689	23.6	58.0	C	**At** Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,400	21.7	59.0	C	AM	(1.9)	-8.1%	1.0	1.7%	Same	No
				PM	1,398	13.7	61.0	B				PM	1,216	12.4	62.0	B	PM	(1.3)	-9.5%	1.0	1.6%	Same	No
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,570	14.0	70.0	B	**Between** Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	4,924	15.1	70.0	B	AM	1.1	7.9%	0.0	0.0%	Same	No
				PM	5,416	16.6	70.0	B				PM	5,595	17.2	70.0	B	PM	0.6	3.6%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	1,160	22.5	55.0	C	**At** Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	854	22.2	56.0	C	AM	(0.3)	-1.3%	1.0	1.8%	Same	No
				PM	1,018	23.7	55.0	C				PM	833	23.4	56.0	C	PM	(0.3)	-1.3%	1.0	1.8%	Same	No
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,410	10.5	70.0	A	**Between** Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	4,070	12.5	70.0	B	AM	2.0	19.0%	0.0	0.0%	Lower	No
				PM	4,398	13.5	70.0	B				PM	4,762	14.6	70.0	B	PM	1.1	8.1%	0.0	0.0%	Same	No
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	149	13.1	62.0	B	**Between** On-ramp from PGA EB & WB **and** Off-ramp to Central Blvd	Weave	N7 - N8	AM	4,225	11.9	63.8	B	AM	(1.2)	-9.2%	1.8	2.9%	Same	No
				PM	780	20.8	61.0	C				PM	5,503	16.8	59.3	B	PM	(4.0)	-19.2%	(1.7)	-2.8%	Better	No
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	3,559	10.9	70.0	A	**Between** Off-ramp to Central Blvd **and** On-Ramp From Military Trail	Basic	N8 - N9	AM	3,110	9.5	70.0	A	AM	(1.4)	-12.8%	0.0	0.0%	Same	No
				PM	5,178	15.9	70.0	B				PM	4,276	13.1	70.0	B	PM	(2.8)	-17.6%	0.0	0.0%	Same	No
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	116	13.2	62.0	B	**At** On-Ramp From Military Trail	Merge	N9 - N10	AM	159	12.4	62.0	B	AM	(0.8)	-6.1%	0.0	0.0%	Same	No
				PM	599	21.0	61.0	C				PM	992	22.2	61.0	C	PM	1.2	5.7%	0.0	0.0%	Same	No
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	3,675	11.3	70.0	B	**Between** On-Ramp From Military Trail **and** On-Ramp from Central Boulevard EB & WB	Basic	N10 - N11	AM	3,269	10.0	70.0	A	AM	(1.3)	-11.5%	0.0	0.0%	Better	No
				PM	5,777	17.7	70.0	B				PM	5,268	16.2	70.0	B	PM	(1.5)	-8.5%	0.0	0.0%	Same	No
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,273	8.5	60.0	A	**Between** On-Ramp from Central Boulevard and Off-Ramp to Donald Ross Road	Weave	N11 - N12	AM	3,610	10.4	63.0	B	AM	1.9	22.4%	3.0	5.0%	Lower	No
				PM	1,771	15.0	59.0	B				PM	5,655	16.6	61.5	B	PM	1.6	10.7%	2.5	4.2%	Same	No

Notes:

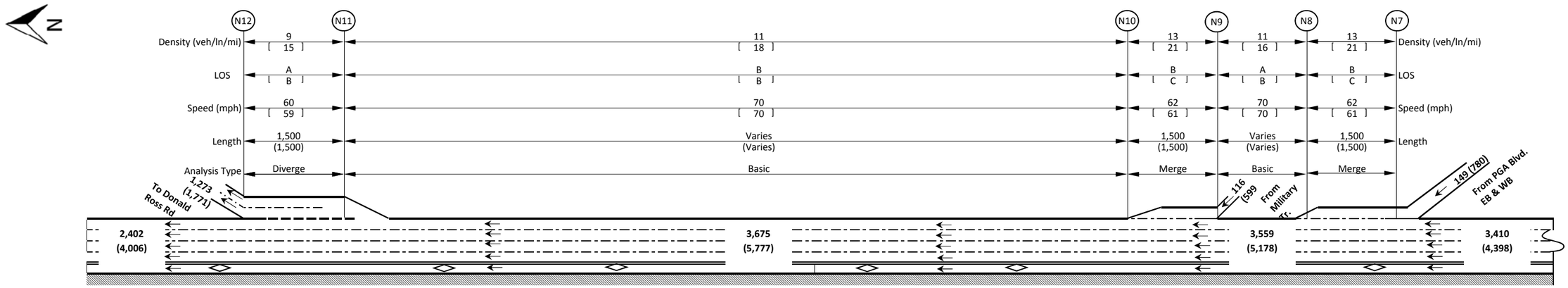
1. According to guidelines contained in the 2010 Highway Capacity Manual (HCM), "Chapter 7/Interpreting HCM and Alternative Tool Results" , HCM model inputs and outputs can be expected to be accurate to only within 5% or 10% of the "true value" given the inherent variability of the field data on which they are based. As a consequence, only speed changes that are outside a +/- 10% change when comparing the statistics from the build condition to the no-build condition, were deemed significant taking into account the accuracy levels of model outputs as promulgated by the 2010 HCM.

*2. Impacts were considered to be "Significant & Adverse" when comparing the Build Alternate to the No-Build Alternate only if there was a degradation in speed that exceeded -10% **and** the level of service fell below the adopted LOS "D" threshold which is the minimum adopted level of service standard for I-95 within the study area according to Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.*

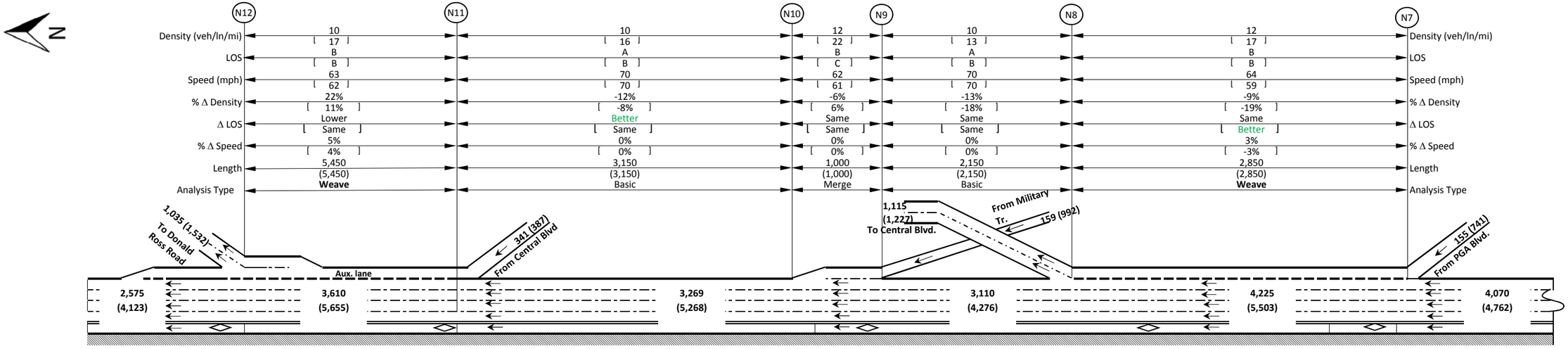
Z:\Projects\0130151 I-95 at PGA PDE\PHASE 2 - PD&E Study\Traffic\Reanalysis\HCS\2030\[Freeway_Analysis_Summary_2030.xlsx]Summary_Sheet_alt3

NORTHBOUND

2030 NO-BUILD



2030 BUILD



LEGEND

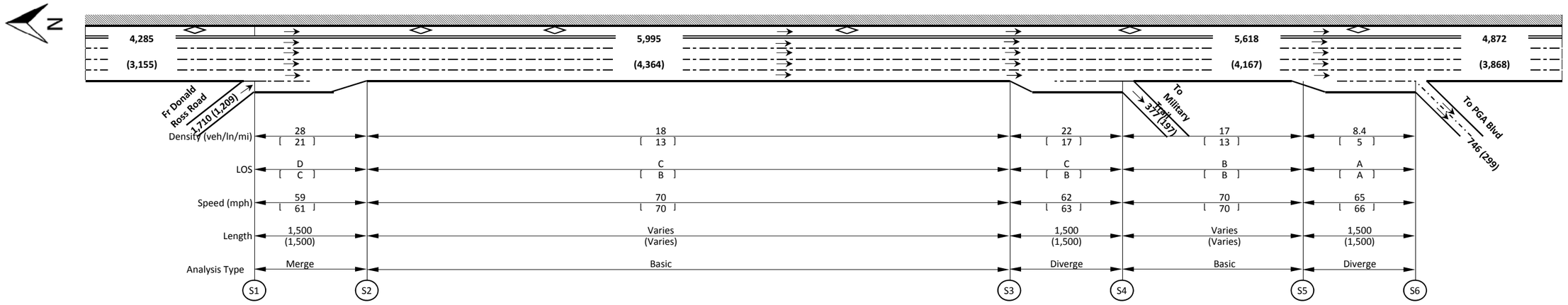
AM Values XXX

PM Values (XXX)

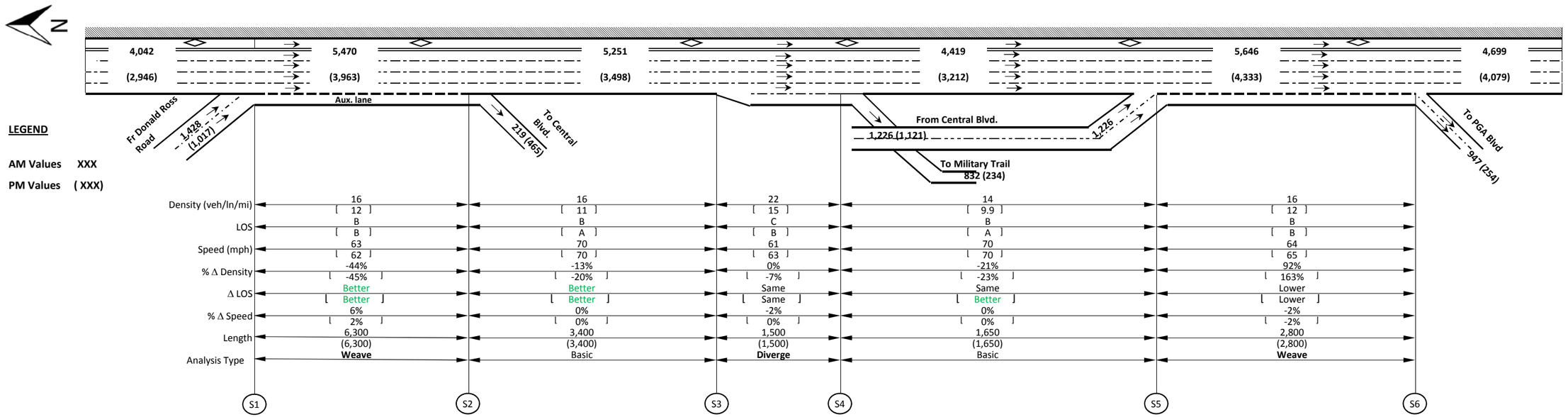
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 3 vs No-Build (Northbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-20-1** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2030 NO-BUILD



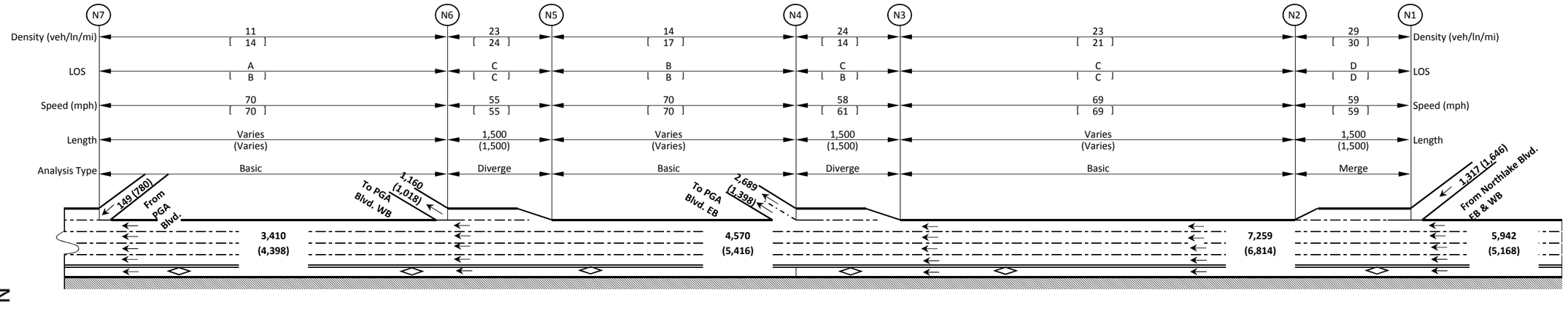
2030 BUILD



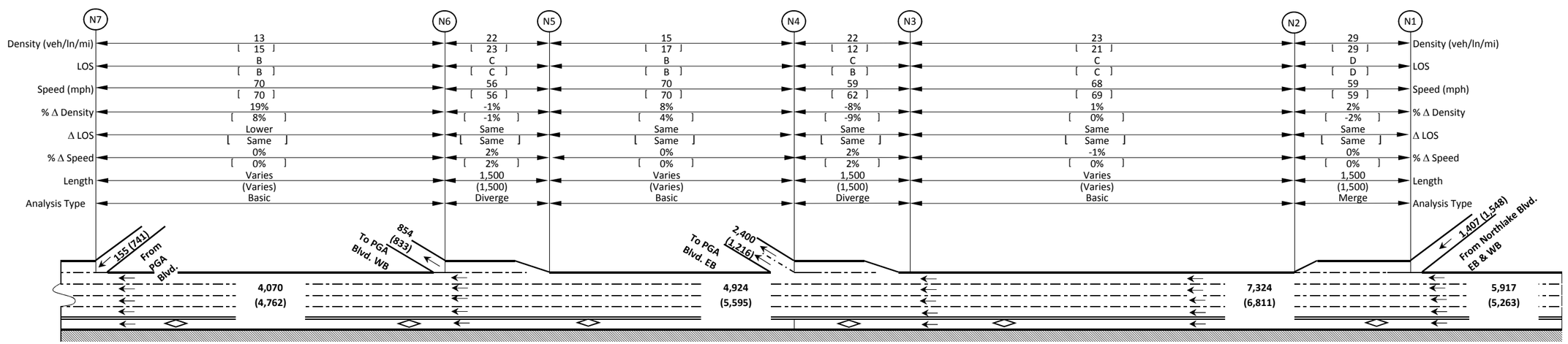
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 3 vs No-Build (Southbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-20-2** *Page No.* *Date:* 09/17/15

NORTHBOUND

2030 NO-BUILD



2030 BUILD



LEGEND

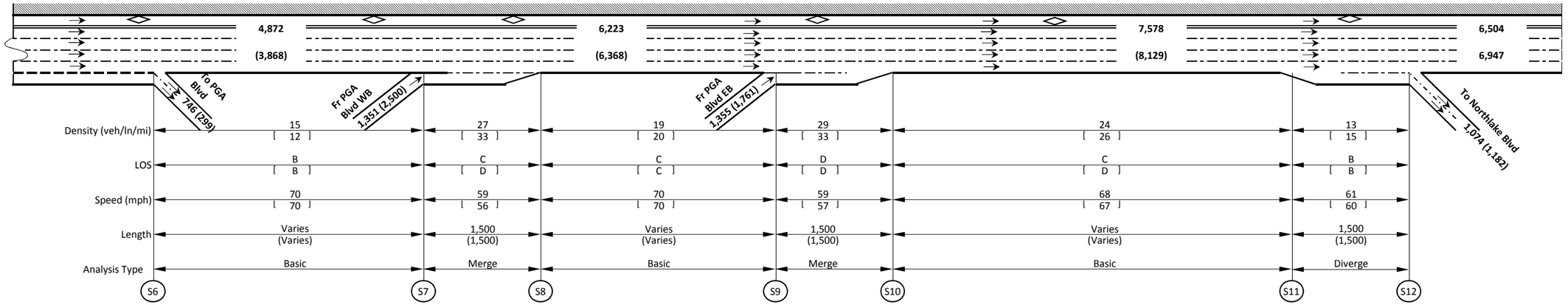
AM Values XXX

PM Values (XXX)

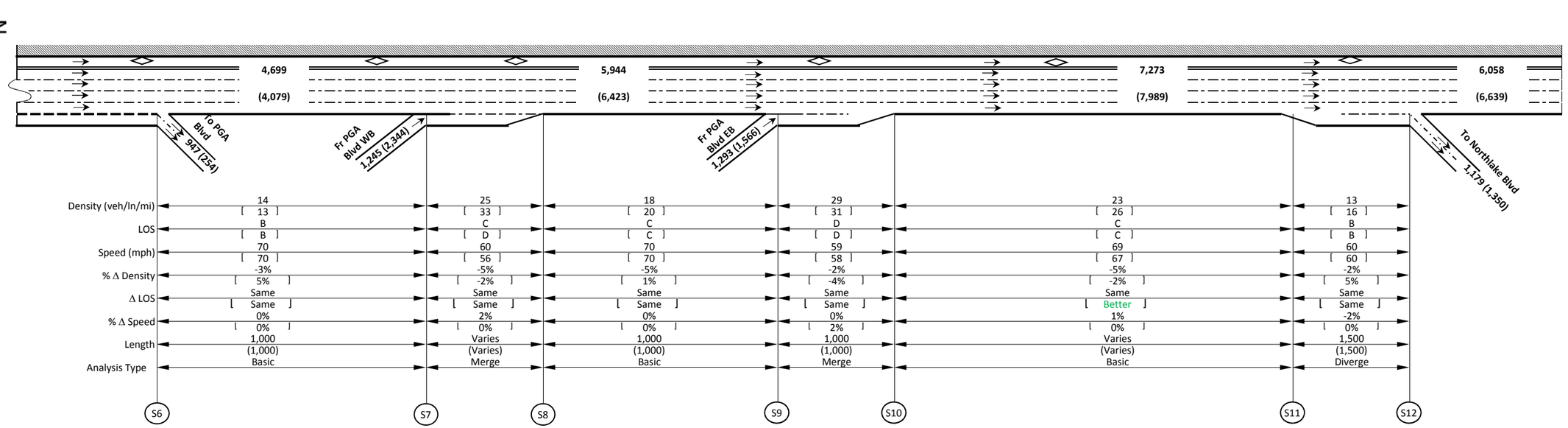
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 3 vs No-Build (Northbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-20-3** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2030 NO-BUILD



2030 BUILD



LEGEND

AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2030 Freeway Operations Analysis Alternate 3 vs No-Build (Southbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-20-4** *Page No.* *Date:* 09/17/15

Table 7-15 - Alternative 3 2040 HCS Analysis

Freeway Operational Assessment - SR 9 (I-95) Between Northlake Boulevard and Donald Ross Road

Direction	2040 NO-BUILD								2040 Build (Alternative 3)								2040 Build Alt. 3 Vs 2040 No-Build						
		Analysis								Analysis							Peak Period	Change in Density		Change in Speed		Change in LOS?	Significant & Adverse?[2]
	I-95 Segment Description	Type	Limits[1]	Period	DDHV	Density	Speed (MPH)	LOS	I-95 Segment Description	Type	Limits[1]	Period	DDHV	Density	Speed (MPH)	LOS		Δ Value	Δ %[1]	Δ Value	Δ %[1]		
SOUTHBOUND	**At** On-Ramp from Donald Ross EB & WB	Merge	S1 - S2	AM	1,858	30.2	58.0	D	**Between** On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Central Boulevard EB & WB	Weave	S1 - S2	AM	5,942	17.3	62.1	B	AM	(12.9)	-42.7%	4.1	7.1%	Better	No
				PM	1,338	22.9	61.0	C				PM	4,385	12.9	61.6	B	PM	(10.0)	-43.7%	0.6	1.0%	Better	No
	Between On-Ramp from Donald Ross EB & WB **and** Off-Ramp to Military Trail SB	Basic	S2 - S3	AM	6,512	20.1	70.0	C	**Between** Off-Ramp to Central Blvd. EB & WB **and** Off-Ramp to Military Trail/CD Road	Basic	S2 - S3	AM	5,702	17.5	70.0	B	AM	(2.6)	-12.9%	0.0	0.0%	Better	No
				PM	4,829	14.8	70.0	B				PM	3,874	11.9	70.0	B	PM	(2.9)	-19.6%	0.0	0.0%	Same	No
	At Off-Ramp to Military Trail SB	Diverge	S3 - S4	AM	410	24.2	62.0	C	**At** Off-Ramp to Military Trail/CD Road	Diverge	S3 - S4	AM	905	24.1	61.0	C	AM	(0.1)	-0.4%	(1.0)	-1.6%	Same	No
				PM	218	18.4	63.0	B				PM	316	15.5	63.0	B	PM	(2.9)	-15.8%	0.0	0.0%	Same	No
	Between Off-Ramp to Military Trail **and** Off-Ramp to PGA Blvd EB & WB	Basic	S4 - S5	AM	6,102	18.8	70.0	C	**Between** Off-Ramp to Military Trail **and** On-Ramp from Central Blvd	Basic	S4 - S5	AM	4,797	14.7	70.0	B	AM	(4.1)	-21.8%	0.0	0.0%	Better	No
				PM	4,611	14.1	70.0	B				PM	3,558	10.9	70.0	A	PM	(3.2)	-22.7%	0.0	0.0%	Better	No
	At Off-Ramp to PGA Blvd EB & WB	Diverge	S5 - S6	AM	810	9.9	65.0	A	**Between** On-Ramp from Central Blvd **and** Off-Ramp from to PGA Blvd EB & WB	Weave	S5 - S6	AM	6,145	17.6	63.2	B	AM	7.7	77.8%	(1.8)	-2.8%	Lower	No
				PM	331	6.1	66.0	A				PM	4,790	13.4	64.3	B	PM	7.3	119.7%	(1.7)	-2.6%	Lower	No
	Between Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	5,292	16.2	70.0	B	**Between** Off-Ramp to PGA Blvd EB & WB **and** On-Ramp from WB PGA Blvd	Basic	S6 - S7	AM	5,116	15.7	70.0	B	AM	(0.5)	-3.1%	0.0	0.0%	Same	No
				PM	4,280	13.1	70.0	B				PM	4,509	13.8	70.0	B	PM	0.7	5.3%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,467	28.3	59.0	D	**At** On-Ramp from PGA Blvd WB	Merge	S7 - S8	AM	1,351	27.3	59.0	C	AM	(1.0)	-3.5%	0.0	0.0%	Better	No
				PM	2,766	36.6	52.0	E				PM	2,593	35.7	53.0	E	PM	(0.9)	-2.5%	1.0	1.9%	Same	No
	Between On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	6,759	20.9	69.0	C	**Between** On-Ramp from WB PGA Blvd **and** On-Ramp from EB PGA Blvd	Basic	S8 - S9	AM	6,467	20.0	70.0	C	AM	(0.9)	-4.3%	1.0	1.4%	Same	No
				PM	7,046	22.0	69.0	C				PM	7,102	22.2	69.0	C	PM	0.2	0.9%	0.0	0.0%	Same	No
	At On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,473	31.4	58.0	D	**At** On-Ramp from PGA Blvd EB	Merge	S9 - S10	AM	1,406	30.2	58.0	D	AM	(1.2)	-3.8%	0.0	0.0%	Same	No
				PM	1,949	35.6	54.0	E				PM	1,733	34.0	56.0	D	PM	(1.6)	-4.5%	2.0	3.7%	Better	No
	Between On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	8,232	26.7	66.0	D	**Between** On-Ramp to PGA Blvd EB **and** Off-Ramp to Northlake Boulevard EB & WB	Basic	S10 - S11	AM	7,873	25.2	67.0	C	AM	(1.5)	-5.6%	1.0	1.5%	Better	No
				PM	8,995	30.3	64.0	D				PM	8,835	29.5	64.0	D	PM	(0.8)	-2.6%	0.0	0.0%	Same	No
	At Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,167	15.1	60.0	B	**At** Off-Ramp to Northlake Boulevard EB & WB	Diverge	S11 - S12	AM	1,282	14.9	60.0	B	AM	(0.2)	-1.3%	0.0	0.0%	Same	No
				PM	1,308	17.3	60.0	B				PM	1,494	18.2	59.0	B	PM	0.9	5.2%	(1.0)	-1.7%	Same	No
NORTHBOUND	**At** On-Ramp from Northlake Boulevard EB & WB	Merge	N1 - N2	AM	1,468	31.0	58.0	D	**At** On-Ramp from Northlake Blvd. EB & WB	Merge	N1 - N2	AM	1,569	31.8	57.0	D	AM	0.8	2.6%	(1.0)	-1.7%	Same	No
				PM	1,796	31.9	57.0	D				PM	1,689	31.3	58.0	D	PM	(0.6)	-1.9%	1.0	1.8%	Same	No
	Between On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	8,086	26.0	67.0	D	**Between** On-Ramp from Northlake Blvd. EB & WB **and** Off-Ramp to PGA Blvd EB	Basic	N2 - N3	AM	8,159	26.4	67.0	D	AM	0.4	1.5%	0.0	0.0%	Same	No
				PM	7,438	23.4	68.0	C				PM	7,434	23.4	68.0	C	PM	0.0	0.0%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,996	27.3	57.0	C	**At** Off-Ramp to PGA Blvd. EB	Diverge	N3 - N4	AM	2,674	25.2	58.0	C	AM	(2.1)	-7.7%	1.0	1.8%	Same	No
				PM	1,526	15.8	61.0	B				PM	1,327	14.4	62.0	B	PM	(1.4)	-8.9%	1.0	1.6%	Same	No
	Between Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	5,090	15.6	70.0	B	**Between** Off-Ramp to PGA Blvd EB **and** Off-Ramp to PGA Blvd WB	Basic	N4 - N5	AM	5,485	16.8	70.0	B	AM	1.2	7.7%	0.0	0.0%	Same	No
				PM	5,912	18.2	70.0	C				PM	6,107	18.8	70.0	C	PM	0.6	3.3%	0.0	0.0%	Same	No
	At Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	1,292	25.1	54.0	C	**At** Off-Ramp to PGA Blvd. WB	Diverge	N5 - N6	AM	951	23.6	55.0	C	AM	(1.5)	-6.0%	1.0	1.9%	Same	No
				PM	1,111	25.9	55.0	C				PM	909	25.5	56.0	C	PM	(0.4)	-1.5%	1.0	1.8%	Same	No
	Between Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	3,798	11.7	70.0	B	**Between** Off-Ramp to PGA Blvd WB **and** On-ramp from PGA EB & WB	Basic	N6 - N7	AM	4,534	13.9	70.0	B	AM	2.2	18.8%	0.0	0.0%	Same	No
				PM	4,801	14.7	70.0	B				PM	5,198	15.9	70.0	B	PM	1.2	8.2%	0.0	0.0%	Same	No
	At On-ramp from PGA EB & WB	Merge	N7 - N8	AM	166	14.2	62.0	B	**Between** On-ramp from PGA EB & WB **and** Off-ramp to Central Blvd	Weave	N7 - N8	AM	4,707	13.4	63.4	B	AM	(0.8)	-5.6%	1.4	2.3%	Same	No
				PM	852	22.4	61.0	C				PM	6,008	18.5	58.6	B	PM	(3.9)	-17.4%	(2.4)	-3.9%	Better	No
	Between On-ramp from PGA EB & WB **and** On-ramp from Military Trail NB & SB	Basic	N8 - N9	AM	3,964	12.2	70.0	B	**Between** Off-ramp to Central Blvd **and** On-Ramp From Military Trail	Basic	N8 - N9	AM	3,481	10.7	70.0	A	AM	(1.5)	-12.3%	0.0	0.0%	Better	No
				PM	5,653	17.3	70.0	B				PM	4,660	14.3	70.0	B	PM	(3.0)	-17.3%	0.0	0.0%	Same	No
	At On-ramp from Military Trail NB & SB	Merge	N9 - N10	AM	130	14.4	62.0	B	**At** On-Ramp From Military Trail	Merge	N9 - N10	AM	178	13.5	62.0	B	AM	(0.9)	-6.3%	0.0	0.0%	Same	No
				PM	653	22.6	61.0	C				PM	1,082	23.9	60.0	C	PM	1.3	5.8%	(1.0)	-1.6%	Same	No
	Between On-ramp from Military Trail NB & SB **and** Off-Ramp from Donald Ross EB & WB	Basic	N10 - N11	AM	4,094	12.6	70.0	B	**Between** On-Ramp From Military Trail **and** On-Ramp from Central Boulevard EB & WB	Basic	N10 - N11	AM	3,659	11.2	70.0	B	AM	(1.4)	-11.1%	0.0	0.0%	Same	No
				PM	6,306	19.4	70.0	C				PM	5,742	17.6	70.0	B	PM	(1.8)	-9.3%	0.0	0.0%	Better	No
	At Off-Ramp to Donald Ross Road EB & WB	Diverge	N11 - N12	AM	1,418	9.6	60.0	A	**Between** On-Ramp from Central Boulevard and Off-Ramp to Donald Ross Road	Weave	N11 - N12	AM	4,034	11.7	62.6	B	AM	2.1	21.9%	2.6	4.3%	Lower	No
				PM	1,933	17.2	58.0	B				PM	6,167	18.3	60.9	B	PM	1.1	6.4%	2.9	5.0%	Same	No

Notes:

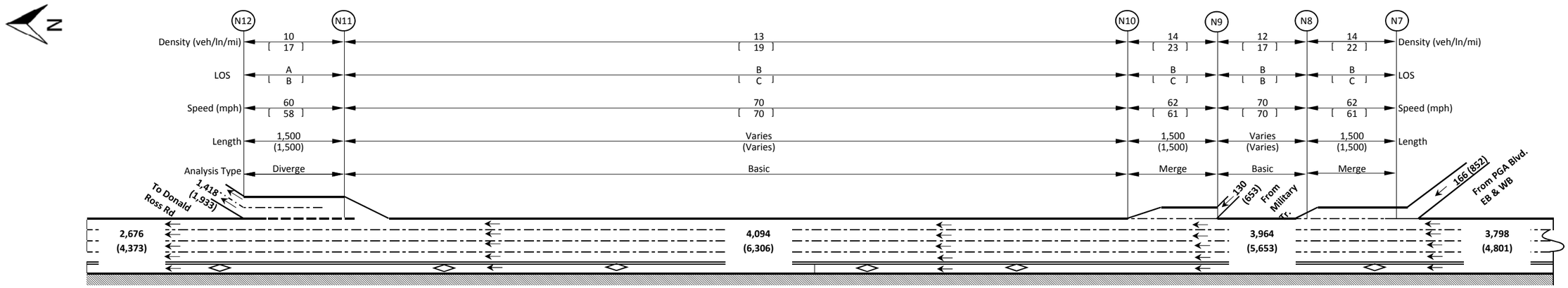
1. According to guidelines contained in the 2010 Highway Capacity Manual (HCM), "Chapter 7/Interpreting HCM and Alternative Tool Results" , HCM model inputs and outputs can be expected to be accurate to only within 5% or 10% of the "true value" given the inherent variability of the field data on which they are based. As a consequence, only speed changes that are outside a +/- 10% change when comparing the statistics from the build condition to the no-build condition, were deemed significant taking into account the accuracy levels of model outputs as promulgated by the 2010 HCM.

*2. Impacts were considered to be "Significant & Adverse" when comparing the Build Alternate to the No-Build Alternate only if there was a degradation in speed that exceeded -10% **and** the level of service fell below the adopted LOS "D" threshold which is the minimum adopted level of service standard for I-95 within the study area according to Florida Rule 14-94.003 Statewide Minimum Level of Service Standard.*

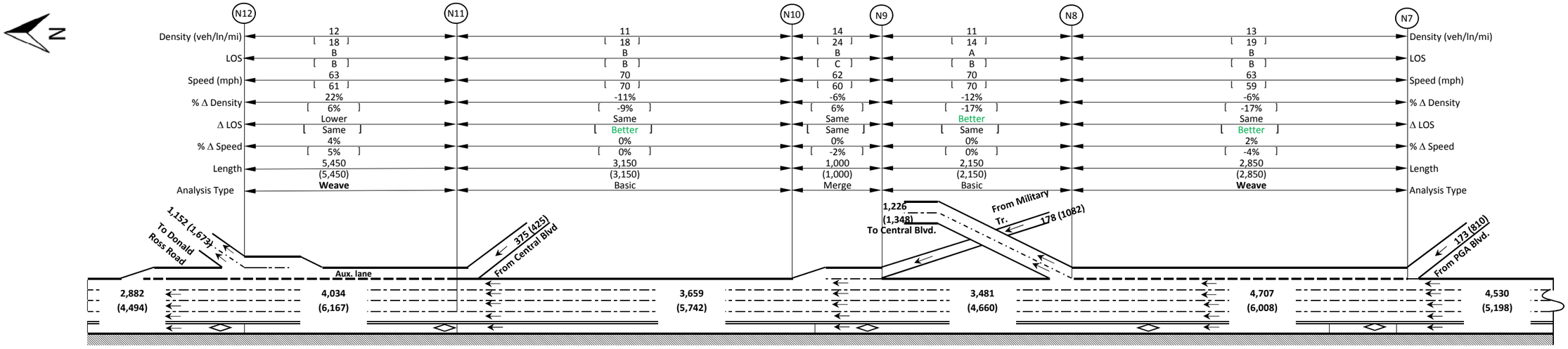
Z:\Projects\0130151 I-95 at PGA PDE\PHASE 2 - PD&E Study\Traffic\Reanalysis\HCS\2040\[Freeway_Analysis_Summary_2040.xlsx]Summary_Sheet_alt3

NORTHBOUND

2040 NO-BUILD



2040 BUILD



LEGEND

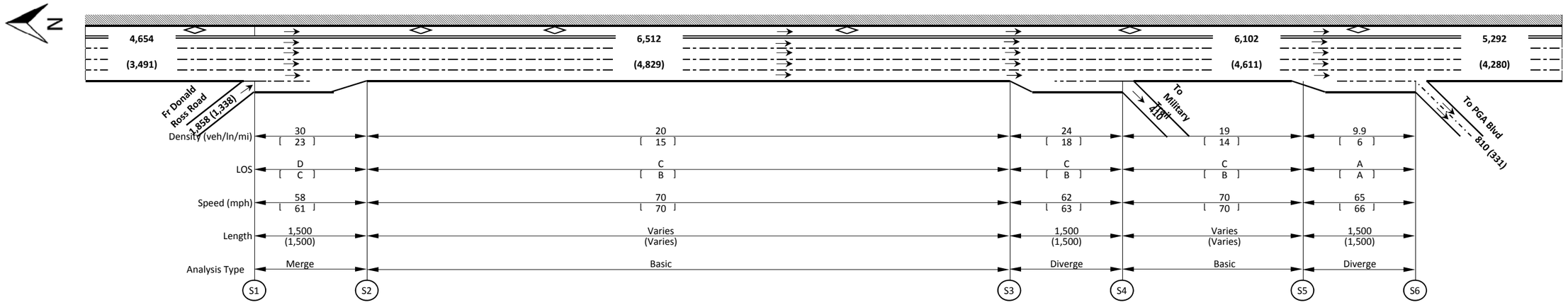
AM Values XXX

PM Values (XXX)

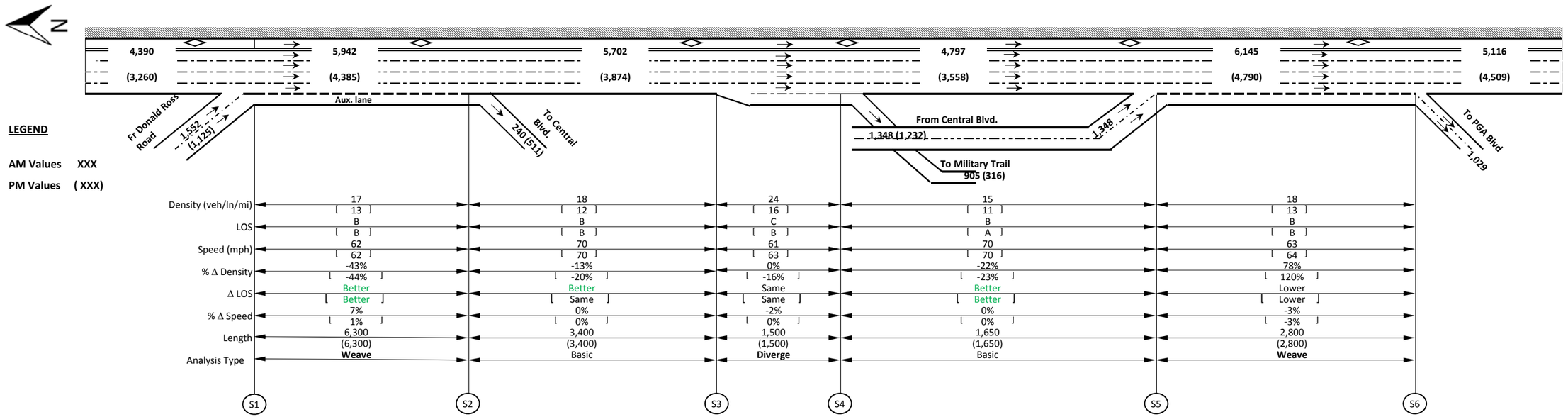
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 3 vs No-Build (Northbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-21-1** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2040 NO-BUILD



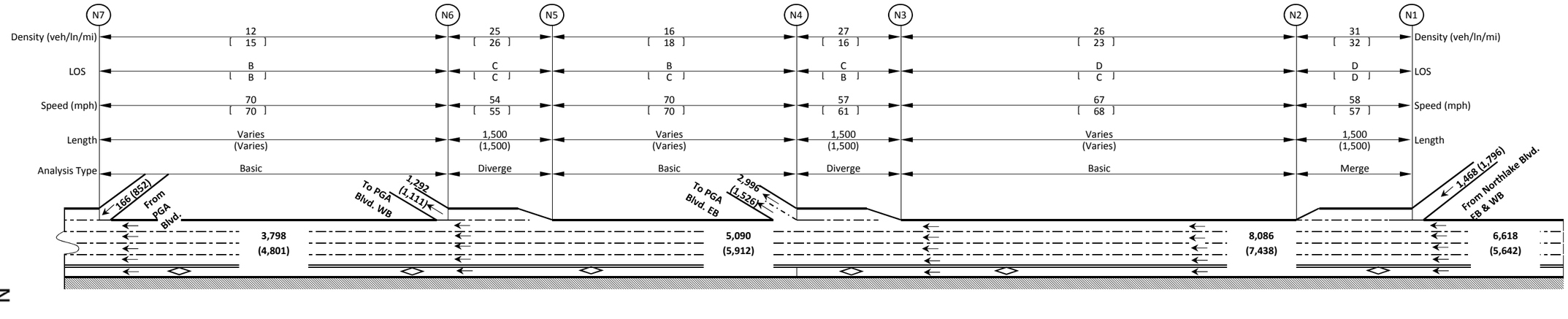
2040 BUILD



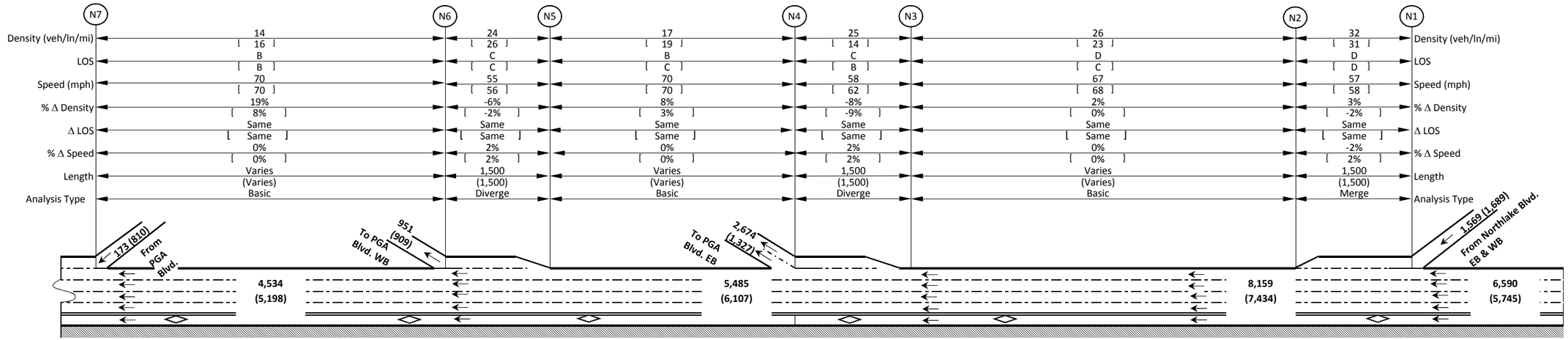
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 3 vs No-Build (Southbound - North Section: PGA Blvd to Donald Ross)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-21-2** *Page No.* *Date:* 09/17/15

NORTHBOUND

2040 NO-BUILD



2040 BUILD



LEGEND

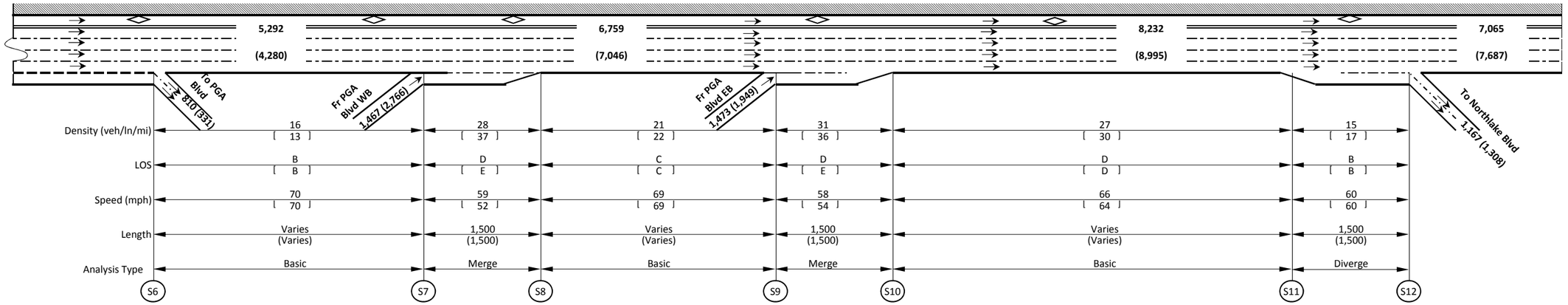
AM Values XXX

PM Values (XXX)

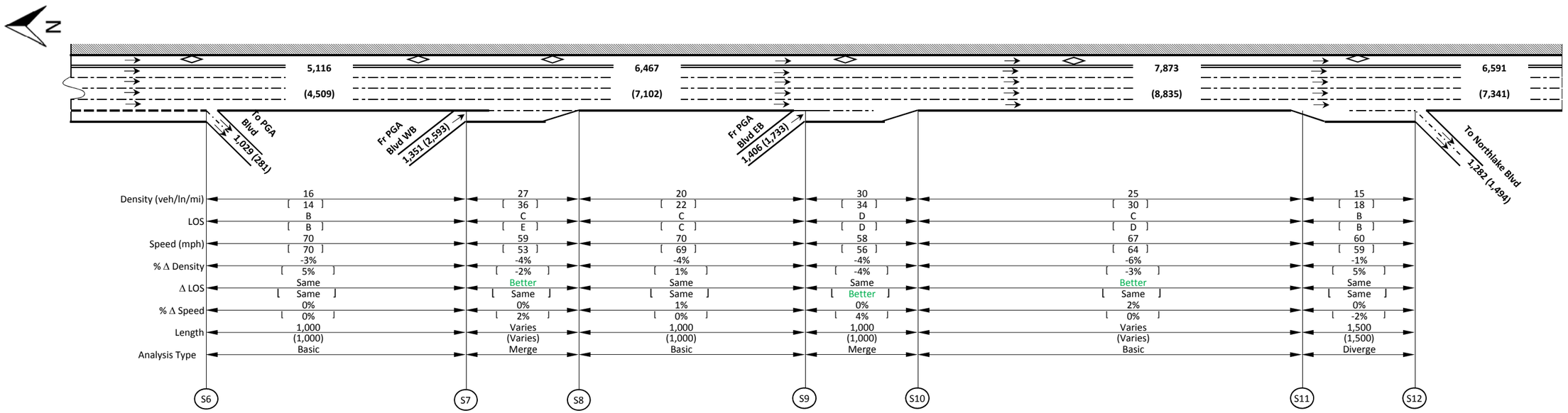
Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 3 vs No-Build (Northbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-21-3** *Page No.* *Date:* 09/17/15

SOUTHBOUND

2040 NO-BUILD



2040 BUILD



LEGEND

AM Values XXX

PM Values (XXX)

Project Name: SR 9 / I-95 at PGA Boulevard/ Central Boulevard Project Development & Environmental Study FM No. 413265-1-22-01	*Figure Name:* **2040 Freeway Operations Analysis Alternate 3 vs No-Build (Southbound - South Section: Northlake to PGA Blvd)**	*Report Title:* **Interchange Justification Report**	*Figure No.* **7-21-4** *Page No.* *Date:* 09/17/15

7.4 Environmental Impacts

The two alternatives under consideration for this proposed interchange at Central Boulevard and I-95 have similar footprints and potential environmental impacts. Table 7-16 below summarizes the anticipated environmental impacts for each alternative as detailed in section 3.5 of this report.

Table 7-16 - Potential for Significant Environmental Impact

Area of Potential Environmental Impact	**Alternative 2** Tight Diamond Interchange at Central Boulevard and I-95 with Collector-Distributor Roadway Connecton to Military Trail	**Alternative 3** Tight Diamond Interchange at Central Boulevard and I-95 with Braided Ramps
Land Use	Unlikely to be significant	Unlikely to be significant
Social	Unlikely to be significant	Unlikely to be significant
Economic	Unlikely to be significant	Unlikely to be significant
Mobility	Unlikely to be significant	Unlikely to be significant
Aesthetics	Unlikely to be significant	Unlikely to be significant
Relocation	Unlikely to be significant	Unlikely to be significant
Cultural Resources	Unlikely to be significant	Unlikely to be significant
Section 4(f)	Unlikely to be significant	Unlikely to be significant
Wetlands and Other Surface Waters	Unlikely to be significant	Unlikely to be significant
Water Quality	Unlikely to be significant	Unlikely to be significant
Wildlife & Habitat	Unlikely to be significant	Unlikely to be significant
Permits	Unlikely to be significant	Unlikely to be significant
Farmlands	Unlikely to be significant	Unlikely to be significant
Noise	Unlikely to be significant	Unlikely to be significant
Air	Unlikely to be significant	Unlikely to be significant
Construction	Unlikely to be significant	Unlikely to be significant
Contamination	Unlikely to be significant	Unlikely to be significant

7.5 Conclusions

The content of this Interchange Justification Report provides a much needed analysis of the existing and future conditions of I-95 from south of SR 786/PGA Boulevard interchange to the Donald Ross Road interchange. It is also provides a picture of the existing and future area wide performance of the major arterial roadways within the project's study area, that includes PGA Boulevard from Florida's Turnpike to Lake Victoria Road, Military Trail from PGA Boulevard to Donald Ross Road and Central Boulevard from PGA Boulevard to Donald Ross Road. The build alternatives summarized below are depicted in Appendix O.

No Build – No improvements are considered.

Alternative 2 –. Alternative 2 includes a new diamond interchange at Central Boulevard. It also creates a collector-distributor roadway system adjacent to northbound and southbound SR 9/I-95. This alternative removes the direct connection of the ramps at Military Trail to I-95. Northbound Military Trail on ramp traffic merges with northbound Central Boulevard off ramp traffic and the weaving movement between the two occurs on the northbound collector road. Similarly, Central Boulevard southbound on ramp traffic merges with southbound Military off ramp traffic and the weaving movement between the two occurs on the on the southbound collector road.

Alternative 3 - Alternative 3 includes a new diamond interchange at Central Boulevard. It also includes braided ramps between Military Trail and Central Boulevard to eliminate the weaving sections there. In both directions the Central Boulevard ramps (northbound off, southbound on) pass over top of the Military Trail ramps (northbound on, southbound off).

A preliminary examination of signing issues reveals no areas for concern, and preliminary recommendations regarding signing are depicted in Appendix O.

7.5.1.2 Intersection and Arterial Delay Analysis

In addition to examination of I-95 operating conditions, the arterial intersection and link performance within the study area were also examined. It has been well documented that mobility within the study area currently and into the future will suffer from severe congestion without improvements. For this analysis the following arterials and associated intersections were analyzed to determine the amount of vehicular delay that occurs during the peak periods of the day. Both build alternatives are considered to be identical in their effect on arterial delay (since the differences between them concern only interstate ramp movements and weaving sections).

For all intersections, the 2040 vehicular delay was calculated for the no build condition as well as for the two build alternatives, shown in Table 7-17. The delay associated with the build alternatives was then compared to the 2040 No Build delay. This comparison was done separately for the ramp terminal intersections only.

To obtain the daily delay in hours shown in Table 7-17, the total delay projected for each peak hour was divided by the diurnal factor described in Chapter 2 to better estimate the total delay experienced in each peak period. Remember that the AM and PM diurnal factors chosen were 0.357 and 0.334 respectively, suggesting an almost uniform level of traffic volume and delay throughout each 3 hour peak period.

Table 7-17 - Arterial Delay Savings for the Build Alternatives

		2040 No-Build				2040 Build				Ramp Terminals	
Corridor	Intersection	Peak Period	Delay (s/veh)	Σ Inter-section Approach Volumes (vph)[1]	Total Delay (Secs)[2]	Peak Period	Delay (s/veh)	Σ Inter-section Approach Volumes (vph)[1]	Total Delay (Secs)[2]	2040 No-Build Total Delay (Secs)[2]	2040 Build Total Delay (Secs)[2]
CENTRAL BOULEVARD	- Victoria Falls Boulevard	AM	1.2	3,157	3,788	AM	23.1	4,486	103,627		
		PM	0.9	3,467	3,120	PM	45.5	4,845	220,448		
	- I-95 SB Ramps	AM	-	-		AM	22.8	3,621	82,559		82,559
		PM	-	-		PM	18.0	3,758	67,644		67,644
	- I-95 NB Ramps	AM	-	-		AM	30.0	4,585	137,550		137,550
		PM	-	-		PM	33.2	4,628	153,650		153,650
	- 117th Court	AM	13.1	2,860	37,466	AM	13.5	2,870	38,745		
		PM	13.4	2,844	38,110	PM	11.4	2,642	30,119		
DONALD ROSS ROAD	- 64th Drive NE Pointe Court	AM	1.5	1,486	2,229	AM	1.5	1,420	2,130		
		PM	1.7	1,773	3,014	PM	1.5	1,644	2,466		
	- I-95 West Ramps	AM	53.3	3,926	209,256	AM	34.8	3,367	117,172	209,256	117,172
		PM	31.7	3,118	98,841	PM	26.0	2,769	71,994	98,841	71,994
	- I-95 East Ramps	AM	38.2	4,752	181,526	AM	19.8	3,900	77,220	181,526	77,220
		PM	29.1	5,585	162,524	PM	9.6	4,966	47,674	162,524	47,674
	- Parkside Drive	AM	79.2	6,923	548,302	AM	57.2	5,607	320,720		
		PM	99.5	7,352	731,524	PM	83.0	6,712	557,096		
	- Central Boulevard	AM	79.6	6,199	493,440	AM	54.7	6,034	330,060		
		PM	108.8	7,241	787,821	PM	65.8	7,309	480,932		
	- N Military Trail	AM	51.6	6,204	320,126	AM	48.2	5,799	279,512		
		PM	71.5	6,368	455,312	PM	52.6	6,688	351,789		
HOOD ROAD	- East Pointe Boulevard	AM	1.1	1,493	1,642	AM	0.9	1,151	1,036		
		PM	1.8	1,542	2,776	PM	1.2	1,221	1,465		
	- Central Boulevard	AM	37.7	4,208	158,642	AM	79.1	5,188	410,371		
		PM	33.9	4,771	161,737	PM	68.1	5,590	380,679		
	- N Military Trail	AM	66.3	4,709	312,207	AM	41.7	4,629	193,029		
		PM	54.2	4,585	248,507	PM	41.6	4,474	186,118		
NORTHLAKE BOULEVARD	- Keating Drive	AM	46.4	4,963	230,283	AM	33.7	4,779	161,052		
		PM	34.8	5,760	200,448	PM	17.8	4,893	87,095		
	- I-95 West Ramps	AM	46.4	6,306	292,598	AM	33.9	5,919	200,654	292,598	200,654
		PM	105.3	7,434	782,800	PM	36.1	6,732	243,025	782,800	243,025
	- I-95 East Ramps	AM	50.5	6,664	336,532	AM	25.8	6,343	163,649	336,532	163,649
		PM	87.9	8,031	705,925	PM	40.3	7,454	300,396	705,925	300,396
	- Roan Lane	AM	2.6	4,902	12,745	AM	2.9	4,558	13,218		
		PM	4.6	6,201	28,525	PM	5.3	5,979	31,689		
	- Sandtree Drive	AM	38.6	5,239	202,225	AM	49.7	4,834	240,250		
		PM	83.2	6,459	537,389	PM	64.8	6,011	389,513		
PGA BOULEVARD	- Florida Turnpike	AM	80.8	5,326	430,341	AM	72.2	5,345	385,909		
		PM	116.9	5,637	658,965	PM	105.7	5,985	632,615		
	- Central Boulevard	AM	77.6	5,803	450,313	AM	44.6	5,948	265,281		
		PM	188.3	6,391	1,203,425	PM	55.0	6,523	358,765		
	- N Military Trail	AM	113.0	7,970	900,610	AM	62.2	7,192	447,342		
		PM	127.2	9,268	1,178,890	PM	95.8	8,707	834,131		
	- I-95 West Ramps	AM	40.5	5,396	218,538	AM	11.7	5,015	58,676	218,538	58,676
		PM	113.9	6,321	719,962	PM	36.8	5,214	191,875	719,962	191,875
	- I-95 NB Off Ramps	AM	181.8	6,563	1,193,153	AM	109.8	5,952	653,530	1,193,153	653,530
		PM	35.8	5,750	205,850	PM	15.2	4,701	71,455	205,850	71,455
	- NB On Ramps	AM	-	5,429		AM	-	5,060			
		PM	-	5,335		PM	-	4,429			
	- RCA Boulevard	AM	201.4	6,100	1,228,540	AM	0.9	5,654	5,089		
		PM	2.8	6,187	17,324	PM	0.1	5,007	501		
	- Lake Victoria Gardens	AM	38.0	5,804	220,552	AM	19.2	5,581	107,155		
		PM	127.2	6,313	803,014	PM	35.5	5,836	207,178		
PGA Passage at Lake Victoria Gardens		AM	14.2	552	7,838	AM	15.7	552	8,666		
		PM	30.5	889	27,115	PM	21.1	889	18,758		
MILI-TARY	- Kyoto Gardens Drive	AM	43.5	3,779	164,387	AM	17.7	3,770	66,729	164,387	66,729
		PM	32.4	4,621	149,720	PM	19.0	4,542	86,298	149,720	86,298
				TOTAL DELAY Seconds AM Peak Hour	8,157,281			TOTAL DELAY (AM/PM)[3]	4,870,930	2,595,991 0	1,557,738
				TOTAL DELAY Seconds PM Peak Hour	9,912,635				6,005,367	2,825,622 0	1,234,011
				TOTAL DELAY Seconds AM Peak Period[3]	22,849,526				13,644,062	7,271,682	4,363,412
				TOTAL DELAY Seconds PM Peak Period[3]	29,678,548				17,980,139	8,459,945	3,694,644
				TOTAL DELAY Seconds Daily	52,528,074				31,624,202	15,731,627	8,058,055
				TOTAL DELAY Hours Dailly	14,591			TOTAL DELAY Hours Daily	8,785	4,370	2,238
				DELAY (Reduction in Hours)				-5,807		-2,132	
				% DELAY (Reduction)				-40%		-49%	

Notes:
1. Represents the sum of the Approach volumes at the intersection.
2. Represents Approach volumes at the intersection times the overall intersection delay (seconds per vehicle).
3. AM Peak Hour Delay divided by Diurnal Factor of 0.357, PM Peak Hour Delay divided by Diurnal Factor of 0.334

The delay savings in hours from Table 7-17 was monetized using a value per hour of time saved used elsewhere by the Department that incorporates auto occupancy. While similar in appearance to Table 6-5, Table 7-18 contains a subset of the alternatives provided in that table, and repeats the analysis using the design traffic volumes, whose development was described in Section 2.7. There are no intersections whose volumes or delays differ between the two build alternatives and for that reason the delay and delay savings reported is the same for both of them.

Table 7-18 – Comparison of 2040 Vehicular Delay for Build Alternatives to the 2040 No Build Condition

Corridors	Total Daily Peak Hour Delay (Hours) Difference Between Build Alternatives & No Build					
	No Build		Alternatives 2 and 3			
	Total Study Area	Inter-change Only	Total Study Area		Interchange Only	
			Delay	**Benefit**	Delay	**Benefit**
Total Daily Peak Hour Delay (hrs)	14,591	4,370	8,785		2,238	
Total Daily Peak Hour Benefit (Hrs)				**5,807**		**2,132**
Days of Delay per Year	250	250	250	250	250	250
Annual Delay (hours)	3,647,783	1,092,474	2,196,125	1,451,658	559,587	532,887
Cost per Vehicle-Hour of Delay	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41	$ 23.41
Total Annual Delay Cost	$ 85,394,598	$ 25,574,818	$ 51,411,289		$ 13,099,936	
Total Annual Delay Benefit				**$ 33,983,309**		**$12,474,882**

Table 7-18 establishes the operational benefits of alternatives improvements as the decreased vehicular delay between the 2040 no build and the build alternative. This table shows significant delay benefits from an arterial perspective. This delay benefit would favor regional mobility and the significance of this delay benefit is such that it should be a warranting factor in the decision to add interchange access at Central Boulevard and I-95.

To estimate Benefit-Cost ratios, planning level estimates of construction costs for the two build alternatives are in Table 7 -19 and Table 7-20. They include estimates of Right of Way purchases necessary. The annual monetary benefit in delay savings was converted to a Net Present Value using an annual discount rate of 7 percent, with benefits beginning in 2022 and extending over a 20 year project life. Note that the delay savings in hours was a single estimate using 2040 design traffic volumes. Such delay savings would start lower in the opening year and grow over time, tending to reduce the Benefit Cost ratios estimated. However, the monetary value per hour of delay savings was kept constant, whereas it would normally grow over time, and if modeled as such, would increase the Benefit-Cost ratios estimated. The effect of these two refinements, had they been considered, would tend to cancel each other.

Table 7-19 – Benefit-Cost Analysis of Alternatives – All Study Area Intersections

7% Discount Rate 20 Life of Interchange (years)		Pre-Construction					Construction		
	Year	2014	2015	2016	2017	2018	2019	2020	2021
	Discount Factor	1.000	0.935	0.873	0.816	0.763	0.713	0.666	0.623
	PDC (2013) $Millions								
Estimated Cost									
2 Full Diamond at Central w C/D Roads	$ 34.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3 Full Diamond at Central w Braided Ramps	$ 62.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Estimated Benefits									
2 Full Diamond at Central w C/D Roads	$ 34.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3 Full Diamond at Central w Braided Ramps	$ 34.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

	Life of Improvements (years)																				Net Present Value $Millions
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
Discount Factor	0.582	0.544	0.508	0.475	0.444	0.415	0.388	0.362	0.339	0.317	0.296	0.277	0.258	0.242	0.226	0.211	0.197	0.184	0.172	0.161	
Alternative	**Costs ($Millions)**																				**Total**
2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 34.7
3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 62.7
Alternative	**Benefits ($Millions)**																				**Total**
2	$ 19.8	$ 18.5	$ 17.3	$ 16.1	$ 15.1	$ 14.1	$ 13.2	$ 12.3	$ 11.5	$ 10.8	$ 10.1	$ 9.4	$ 8.8	$ 8.2	$ 7.7	$ 7.2	$ 6.7	$ 6.3	$ 5.9	$ 5.5	$ 224.2
3	$ 19.8	$ 18.5	$ 17.3	$ 16.1	$ 15.1	$ 14.1	$ 13.2	$ 12.3	$ 11.5	$ 10.8	$ 10.1	$ 9.4	$ 8.8	$ 8.2	$ 7.7	$ 7.2	$ 6.7	$ 6.3	$ 5.9	$ 5.5	$ 224.2

Benefit Cost Ratio			
2	Full Diamond at Central w C/D Roads	6.5	Recommend to Move Into PD&E
3	Full Diamond at Central w Braided Ramps	3.6	Recommend to Move Into PD&E

Table 7-20 – Benefit-Cost Analysis of Alternatives – Interchange Intersections Only

7% Discount Rate 20 Life of Interchange (years)		Pre-Construction					Construction		
	Year>>	2014	2015	2016	2017	2018	2019	2020	2021
	Discount Factor	1.000	0.935	0.873	0.816	0.763	0.713	0.666	0.623
	PDC (2013) $Millions								
Estimated Cost									
2 Full Diamond at Central w C/D Roads	$ 34.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3 Full Diamond at Central w Braided Ramps	$ 62.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Estimated Benefits									
2 Full Diamond at Central w C/D Roads	$ 11.9	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3 Full Diamond at Central w Braided Ramps	$ 11.9	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

	Life of Improvements (years)																				Net Present Value $Millions
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
Discount Factor	0.582	0.544	0.508	0.475	0.444	0.415	0.388	0.362	0.339	0.317	0.296	0.277	0.258	0.242	0.226	0.211	0.197	0.184	0.172	0.161	
Alternative	**Costs ($Millions)**																				**Total**
2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 34.7
3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 62.7
Alternative	**Benefits ($Millions)**																				**Total**
2	$ 6.9	$ 6.5	$ 6.1	$ 5.7	$ 5.3	$ 4.9	$ 4.6	$ 4.3	$ 4.0	$ 3.8	$ 3.5	$ 3.3	$ 3.1	$ 2.9	$ 2.7	$ 2.5	$ 2.3	$ 2.2	$ 2.1	$ 1.9	$ 78.6
3	$ 6.9	$ 6.5	$ 6.1	$ 5.7	$ 5.3	$ 4.9	$ 4.6	$ 4.3	$ 4.0	$ 3.8	$ 3.5	$ 3.3	$ 3.1	$ 2.9	$ 2.7	$ 2.5	$ 2.3	$ 2.2	$ 2.1	$ 1.9	$ 78.6

Benefit Cost Ratio			
2	Full Diamond at Central w C/D Roads	2.3	Recommend to Move Into PD&E
3	Full Diamond at Central w Braided Ramps	1.3	Recommend to Move Into PD&E

A summary of the cost benefit analysis of the remaining two build alternatives is shown in Table 7-21. The value of the arterial delay savings over the life of the build alternatives are greater than the planning level estimated cost of all alternatives, when considering the delay reduction at all intersections (B/C ratios of 3.6 to 6.5), and superior for the first two alternatives when considering the delay reduction only at the interchange ramp terminal intersections.

Table 7-21 – Benefit-Cost Relationship of Build Alternatives Based on 2040 Delay Benefits

Alternative	Description of Alternative	Benefit- Cost Ratio		Recommendation
		Total Study Area	Interchanges Only	
2	Full Diamond Interchange at Central Boulevard and I-95 w C/D Roads	6.5	2.4	Consider This Build Alternative Further
3	Full Diamond Interchange at Central Boulevard with Braided Ramps	3.6	1.3	Consider This Build Alternative Further

7.6 Recommendations

Based on the above conclusions, it is recommended that new interchange access be provided at Central Boulevard and I-95. The new access improves area mobility by transferring demand from congested roadways to other roadways with available capacity. The shift in demand to the new interchange reduces almost all ramp volumes at the flanking interchanges; the exceptions being slight increases to volumes on the southbound off ramp and northbound on ramps at the PGA Boulevard interchange in the AM period only, likely indicating those ramps attractiveness to short local trips. This reduction in ramp volumes reduces delay at the existing interchange ramp terminal intersections. Acceptable operating conditions are preserved on the interstate and ramps with the presence of the new interchange. The visual, audible, and safety impacts associated with the increased traffic on Central Boulevard around the new interchange will be the subject of the NEPA study to follow.

The specific interchange that should be implemented should be based on the conclusions reached once a NEPA study is completed. Both build alternatives provide similar transportation mobility benefits, and therefore the environmental issues should drive the decision making between them. Therefore it is recommended that both alternatives move forward into a Project Development & Environmental Study phase of development for analysis and final selection of the preferred alternative.

8.0 JUSTIFICATION

FHWA 8 INTERSTATE ACCESS POLICY CONSIDERATIONS AND REQUIREMENTS FOR INTERSTATE 95 AND CENTRAL BOULEVARD

8.1 The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).

Response:

The primary need for the I-95 and Central Boulevard interchange is to provide improved regional connectivity to the population in northern Palm Beach County (PBC), and it is not being proposed to specifically address an existing or proposed interstate deficiency. The current number and locations of interchanges serving the Palm Beach Gardens area concentrates the demand for access and consequent congestion in the area of the PGA Boulevard interchange. This area is dominated by major commercial and office development east and west of I-95 and adjacent to SR 786/PGA Boulevard. These developments are dense with major shopping malls and other large "big box" shopping centers located east of I-95 and both north and south of SR 786/PGA Boulevard. West of I-95 significant office land uses exist adjacent to the SR 786/PGA Boulevard interchange with I-95. Commercial/retail/leisure land uses exist further west of the I-95 interchange north and south of SR 786/PGA Boulevard. Development along SR 786/PGA Boulevard is near build out, but parcels do exist for additional development, North of SR 786/PGA Boulevard and west of I-95, single-family and multi-family residential properties dominate the land use. This includes a major golf course within the residential areas. This residential land use extends northerly to Donald Ross Road.

This intense mixed land use pattern produces heavy travel demand which exceeds or will exceed capacity within the next five to 15 years. In fact, two of the most

congested roadway links in Palm Beach County fall within the study area. They are SR 786/PGA Boulevard from Florida's Turnpike to the west to Lake Victoria Road to the east of I-95 and Military Trail from PGA Boulevard to Hood Road. PGA Boulevard is on the congested roadway list that Palm Beach County calls CRALLS (Constrained Roadways at Lower Levels of Service). This designation and the absence of PGA Boulevard from the MPO's 2040 Desires Plan acknowledges that avoiding the damage to local businesses that flank the road that would be involved in any further widening must outweigh the congestion relief effect of such widening.

To support the current level of service for the roadways that fall within the study area the Florida Department studied the existing conditions of these roadways in 2011 and published a report (I-95 Areawide Mobility Study) on the existing, short-term and long-term anticipated operating conditions in the area. The report identified several area intersections that would be unable to provide acceptable level of service in the design year 2035 even with additional turn lanes.

The operational analysis conducted as a part of this interchange proposal reinforced the findings of the 2011 report. The area arterials and intersections will be over capacity now or in the near term and ITS, intersection improvements, or transportation system management strategies will not provide sufficient improvement to address this congestion.

In this study, there were no instances identified where adding interchange ramp lanes could benefit arterial congestion. The heaviest ramp volumes that end at signalized intersections show future demand volumes that provide acceptable level of service given their cross section.

In addition to the residential property a large tract of vacant land exists from Hood Road north to Donald Ross Road. This property is planned for development and will include land uses compatible with the medical facilities at the Scripps Research Facility. This development will include research facilities and office space, as well as residential and retail/commercial development to support this area's land use.

An additional benefit of an interchange at Central Boulevard is improved emergency response time for incidents which occur on the stretch of I-95 between the PGA Boulevard and Donald Ross Road.

The No Build (without Central Boulevard interchange) operations analysis for the design (2040) year indicates that several links and intersections in the study area will operate no better than LOS E with a number of the major intersections at LOS F for both AM and PM peak hours. The mainline of I-95 is projected to operate at acceptable levels of service for all sections from PGA Boulevard and Donald Ross Road. Some ramps and ramp terminals for I-95 will show unacceptable levels of service.

Central Boulevard is projected to operate with an acceptable level of service. However, a critical segment is southbound Central Boulevard just north of PGA Boulevard is projected to operate at LOS F for the No Build condition due to the conditions at PGA Boulevard. With intersection improvements at PGA Boulevard the LOS can be improved on Central Boulevard.

While the build alternatives continue to show sections of PGA Boulevard and Military Trail with LOS conditions less than LOS D, the build alternatives do show significant improvements in delay conditions along the study area arterials. The delay in the No Build condition amounts to approximately 3.6 million hours per year. The Build Alternatives improve that to approximately 2.2 million hours, an overall improvement in delay of 1.4 million hours each year. From a cost benefit perspective, this reduced delay provides at least a 3.6 benefit-cost ratio between Build and No Build alternatives. The Build alternative provides a 40 percent improvement in delay over the No Build conditions. These operating conditions demonstrate a significant benefit to regional mobility and warrant the addition of the Central Boulevard interchange.

8.2 The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).

Response:

This north Palm Beach County area has been studied by the Florida Department of Transportation (FDOT) recently. This included a 2011 Mobility Study of I-95 and

the adjacent arterial network. All of these prior studies concluded that the regional arterial network was over-burdened due to land use patterns and that anything short of major widening of these arterials will only lead to short term mobility improvements. The predominant problem discovered by these studies was the SR 786/PGA Boulevard corridor from Florida's Turnpike to east of I-95 suffered significant congestion in both the AM and PM peak periods. There were two improvement strategies that could address this congestion. They include this interchange proposal for new access at Central Boulevard or the widening of SR 786/PGA Boulevard over the entire length of PGA Boulevard within the study area.

Qualitative evaluation of these strategies shows significantly more cost and environmental impact associated with the widening of SR 786/PGA Boulevard as compared to a new interchange in the Central Boulevard location. These impacts associated with widening of PGA Boulevard included significant social impacts related to right-of-way acquisition and business relocation, physical environmental impact associated with potentially contaminated properties. The linear nature of the widening of PGA Boulevard would have miles of impact to one of the most significant corridors in northern Palm Beach County over a more localized improvement such as an interchange with minor right of way impacts.

8.3 An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that [[Page 43745]] the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently

collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

Response:

The analyses conducted for this proposal demonstrate that the proposed interchange at Central Boulevard & I-95 will have an overall improvement in regional mobility. This improvement in regional mobility will include no significant degradation of operating speeds on the mainline of I-95 within the study limits, for either of the two build alternatives evaluated as compared to the 2040 No Build condition. The ramps and ramp terminal intersections with Central Boulevard for the build alternatives will not generate queues that will affect the mainline of I-95, with more than sufficient storage capacity available in the future year to accommodate the anticipated demand.

The operational analyses demonstrate that the proposed ramps and ramp terminal at Central Boulevard will operate at acceptable Levels of Service in the design (2040) year. Further, with the construction of either of the proposed interchange alternatives at Central Boulevard, the operating Levels of Service for the ramp terminals at the adjacent interchanges of SR 786/PGA Boulevard and Donald Ross Road will operate at the same or improved levels of service over the No-Build condition.

Analysis of the area's arterials was also performed to identify the redistribution of traffic that would occur with a new interchange at Central Boulevard and the associated delay benefits. The result of this operational analysis of the arterials indicated that reduction of delay between the 2040 No-Build and Build alternatives will provide significant benefit to the traveling public. The preliminary estimate of the benefit/cost relationship of this delay reduction ranges from 3.6 to 6.5 depending on the Build alternative.

The interchange proposal demonstrates significant diversion of traffic from the congested areas along PGA Boulevard and Military Trail to the northern roadway network accessed by a new interchange at Central Boulevard. This proposed

interchange at I-95 and Central Boulevard improves regional mobility and provides more direct connectivity for northern Palm Beach County, and more specifically, Palm Beach Gardens. Congestion on the arterial network, including SR 786/PGA Boulevard and SR 809/Military Trail, cannot be mitigated by ITS, Transportation System Management techniques or other lane geometric improvements sufficiently to accomplish these goals.

It is well documented in engineering publications (eg. *Highway Safety Improvement Program Manual*) that safety is related to traffic exposure. The area arterials from which traffic is diverted should experience improved traffic safety conditions since both their traffic volumes and congestion levels will be reduced. This reduction in crash exposure should reflect a potential increase in safety along the study corridors.

A secondary but important benefit will be an improved emergency response to incidents along I-95 as well as all other health/safety emergency access time to the surrounding communities. The 40 percent reduction in delay along the area's arterials provides a reduction in travel time for fire and police responders, based on the location of area hospitals and police stations.

8.4 The proposed access connects to a public road only and will provide for all traffic movements. Less than ``full interchanges'' may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).

Response:

The proposed interchange will connect to Central Boulevard, a County Road. The proposed interchange will also provide all traffic movements and be designed and constructed to meet all current and future standards issued prior to the preparation of design plans for the interchange.

8.5 The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised

access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

Response:

Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP)

The Palm Beach County MPO has included an interchange at Central Boulevard as one of its priorities since 2005, and has included it in their last two Long Range Transportation Plans. The proposed interchange was identified as a needed project in the 2035 LRTP, and the interchange is included in the Cost Feasible Plan in the 2040 LRTP adopted in October of 2014.

Funding for design is programmed in the MPO TIP and STIP for the 2015/2016 Fiscal Year (FM# 413265-1).

An interchange at the proposed location is consistent with the Goals and Objectives of the adopted 2040 LRTP. Numerous objectives indicate the need to implement the improvements identified in the LRTP. More specifically the interchange is consistent with the following.

LRTP Goals and Objectives

Goal 1: Provide an efficient and reliable vehicular transportation system

Objective 1.1: Reduce the number of thoroughfare intersections with critical sum > 1400.

Goal 5: Preserve and Enhance Social and Environmental Resources

Objective 5.5: Decrease per capita daily Vehicles Miles Travelled (VMT/person)

Comprehensive Plan

The proposed interchange is consistent with the PALM BEACH COUNTY Comprehensive Plan. More specifically the interchange is consistent with the following Goals, Objectives, and Policies:

Goal – Transportation Element

It is the GOAL of Palm Beach County to provide an interconnected multimodal transportation system which moves people, goods, and services in a safe, efficient, convenient and economical manner with minimal adverse impact to the environment.

Objective 1.1: Level of Service Standards - By 2035, the countywide transportation system shall operate at the adopted Level of Service standard.

Policy 1.1-d: The County shall continue to use FDOT's Generalized Level of Service Tables that address capacity standards

Policy 1.1-e: The County shall utilize the best available data and methodologies for the purpose of determining traffic circulation system needs.

Objective 1.3: Management of Transportation System

Policy 1.3-i: The County will maintain policies and programs which ensure that the overall transportation system meets the County's level of service criteria in order to provide viable alternatives to the Florida Intrastate Highway System & the Strategic Intermodal System, and to protect their interregional and intrastate functions.

Goal 4: Protection of Air Quality

It is the GOAL of Palm Beach County to protect human life and native ecosystems by controlling air pollution through initiatives for the protection of air quality.

Objective 4.1: Air Quality

The County shall maintain federally adopted air quality levels, as identified by National Ambient Air Quality Standards.

Strategic Intermodal System

The proposed interchange is included in the FDOT SIS Cost Feasible Plan, and is consistent with the following Goals and Objectives of the FDOT SIS Strategic Plan:

SIS Goal

A safer and more secure transportation system for residents, businesses and visitors.

The proposed interchange will improve emergency response times to incidents that occur along I-95 between PGA Boulevard and Donald Ross Road. The interchange will also provide an additional opportunity for residents of northern Palm Beach County to access I-95 if an evacuation is ordered.

SIS Goal

A stronger economy through enhanced mobility for people and freight.

Objective: Interregional Connectivity

Interregional trips that involve I-95 do not begin or end on it. The proposed interchange will help support enhanced mobility for freight by providing less congested conditions on the arterial and collector roads in the area used for the portion of interregional trips leading to or from I-95.

Objective: Efficiency

The proposed interchange will promote more efficient use of the Strategic Intermodal System by providing relief to SR-786/PGA Boulevard and SR 809/Military Trail thereby extending its functional integrity, and helping to reduce delay along those facilities.

Objective: Emergency Management

The proposed interchange will provide an additional evacuation route for northern Palm Beach County.

8.6 In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).

Response:

There are no other interchange proposals between SR 786/PGA Boulevard and Donald Ross Road. The only interchange proposal is at Central Boulevard, a Palm Beach County Roadway.

8.7 When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).

Response:

The congested conditions that the study area roadways experience is primarily associated with existing land use. The area has experienced rapid development over the past 20 years with associated transportation improvements trying to keep pace. This growth within the study area has burdened the arterial system and the existing interchanges along I-95 to a point where current capacity is beginning to limit mobility.

The MPO has incorporated land use assumptions for the study area, including near and along Central Boulevard into its 2040 adopted LRTP. The County's Comprehensive Plan includes valid and consistent future land use along Central Boulevard east of I-95 in its Future Land Use Element.

The Comprehensive Plan further acknowledges that alleviating traffic demand along PGA Boulevard and Military Trail is a key component to the County's future plans. This alleviation of demand along these two roadways is facilitated by the inclusion of an additional interchange at Central Boulevard.

The implementation of projects in the MPO's Long Range Transportation Plan could also contribute to correcting the jobs-housing balance. Several projects in the LRTP could facilitate business development in the north and west portions of the study area south of Donald Ross Road. The proposed Central Boulevard I-95 interchange, in particular, could have a sizeable impact on job creation in this northern portion of the study area, given the propensity of businesses to locate at higher volume traffic locations.

The proposed interchange will enhance economic development within the study area in Palm Beach Gardens by redirecting traffic destined for the northern portions of the study areas away from SR 786/PGA Boulevard and SR 809/Military Trail to the Central Boulevard Interchange. This northern redirection of traffic will reduce congestion along PGA Boulevard and Military Trail and allow for more efficient movement of goods and people to these higher travel demand areas in the southern portion of the study area. The County's long term planning and commitment to this area is evident in the existing commercial and industrial businesses already established in the vicinity of PGA Boulevard. The County's commitment to this area is further supported by the 2040 LRTP and the current Comprehensive Plan.

8.8 The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

Response:

The proposal is included in the Project Development and Environment (PD&E) Study which is currently underway and concurrent with the review and approval of the IJR by the FHWA.

SR-9/I-95 at PGA Boulevard/ Central Boulevard PD&E Study

FM No. 413265 1 22 01

FDOT

Submitted to:
Florida Department of Transportation District 4
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