

4.0 Alternatives Analysis

This section focuses on the development of the initial alternatives that were analyzed in support of the Wekiva Parkway/SR 46 Realignment PD&E Study. These initial alternatives were analyzed based on their traffic impacts as well as social, economic and environmental impacts. While there were many additional alternatives evaluated as part of the PD&E Study, the initial alternatives chosen for the traffic analysis were generally representative of all the design variations. Through the PD&E study process, these initial alternatives were refined and a comparative analysis was conducted resulting in two Viable Alternatives.

In addition to the corridor analysis for the initial alternatives, specific traffic analyses were also conducted to assist the Project Team in the preliminary design of the alignment alternatives. These traffic analyses and their results are also discussed in this section.

4.1 Initial Alternatives

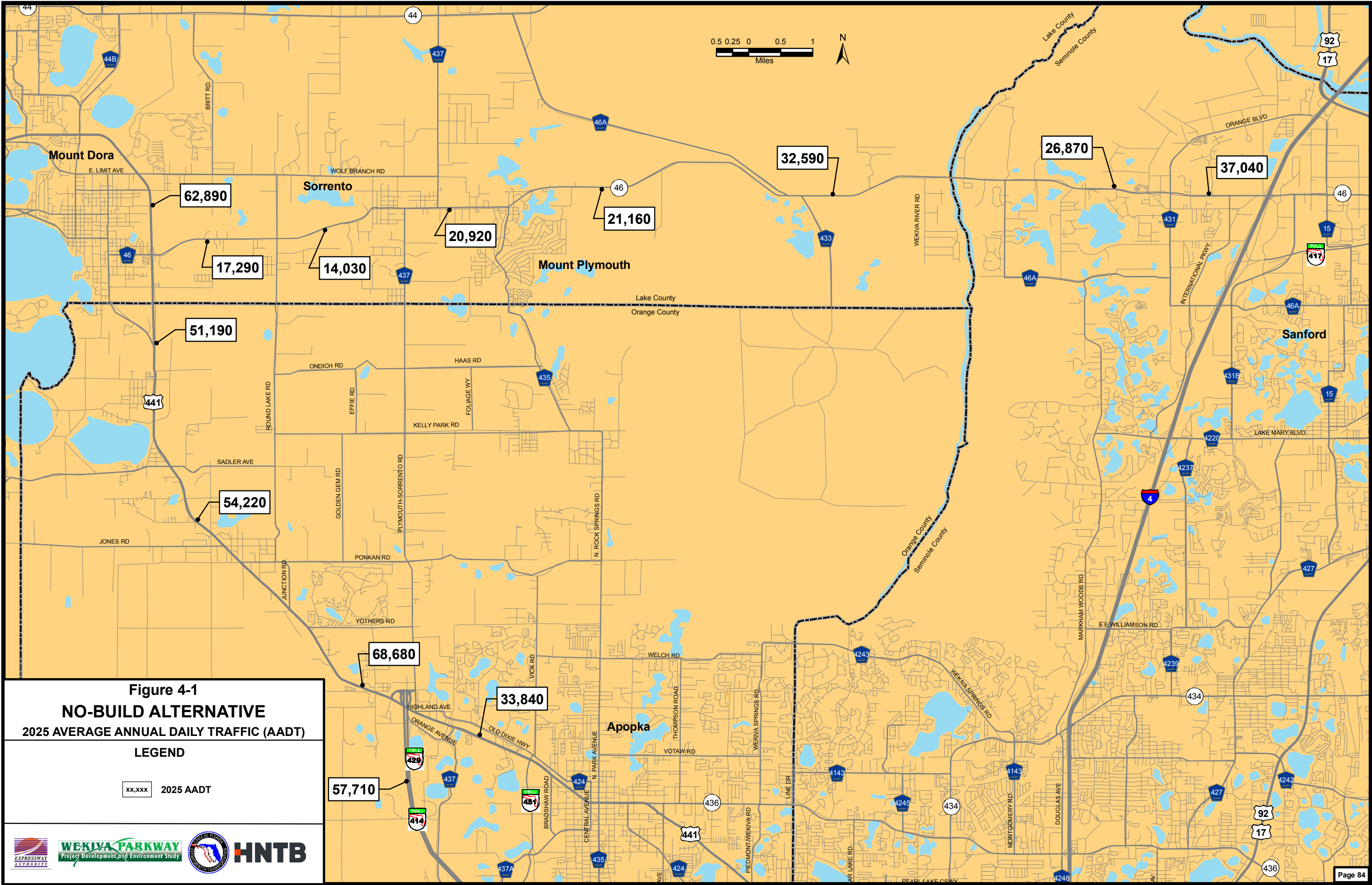
There were six initial alternatives analyzed as part of the PD&E Study, one No-Build Scenario and five Build Scenarios. As the initial alternatives were developed in the beginning stages of the PD&E Study, they were compared and analyzed under 2025 conditions. The six initial alternatives were:

- No-Build Alternative (SR 46 remains a 2 lane arterial)
- Build Alternative 1 (SR 46 as a 4-lane arterial)
- Build Alternative 2 (SR 46 as a 4-lane arterial with bypass)
- Build Alternative 3 (Wekiva Parkway with I-4 Connection at SR 417)
- Build Alternative 4 (Wekiva Parkway with I-4 Connection at SR 46)
- Build Alternative 5 (Wekiva Parkway with I-4 Connection South of St. Johns River Bridge)

4.1.1 No-Build Alternative

Under the No-Build Alternative, traffic conditions within the study area were evaluated with only the planned and programmed improvements assumed to be in place. The planned and programmed improvements within the study area include local roadway improvements adding additional capacity and connections. The planned and programmed improvements are listed in Section 3 of this report. The widening of SR 46 to 4-lanes between US 441 in Lake County to Orange Boulevard in Seminole County is included in the 2025 LRTPs for METROPLAN ORLANDO and the Lake-Sumter MPO. However, this project was not included in the No-Build Alternative as this SR 46 widening project can be considered part of the Wekiva Parkway project, and thus was analyzed separately as a Build Scenario (Build Alternative 1). The 2025 AADTs for the No-Build Alternative are shown in Figure 4-1. Please note that the final traffic volumes and operational characteristics within the study area for the No-Build Alternative are discussed in Section 3.

The No-Build Alternative includes the John Land Apopka Expressway. The John Land Apopka Expressway is the extension of SR 429/SR 414 from SR 414 to the new terminus on US 441 in Orange County. This section of the project was included in the OOCEA Five Year Work Program when the PD&E Study began, however was removed to construction costs. Due to the elimination of the project, it is highly probable that it will only be built if the proposed Wekiva Parkway is constructed.



4.1.2 Build Alternative 1

Build Alternative 1 was developed in order to analyze the impact of the SR 46 widening as described in the METROPLAN ORLANDO and Lake-Sumter MPO LRTPs. Thus, this alternative was developed to be similar to the No-Build Alternative in every way with the exception of the capacity along SR 46. For Build Alternative 1, SR 46 was considered a 4-lane divided arterial from US 441 in Lake County to the existing 4-lane section at Orange Boulevard in Seminole County. The 2025 AADTs for Build Alternative 1 are shown in Figure 4-2.

4.1.3 Build Alternative 2

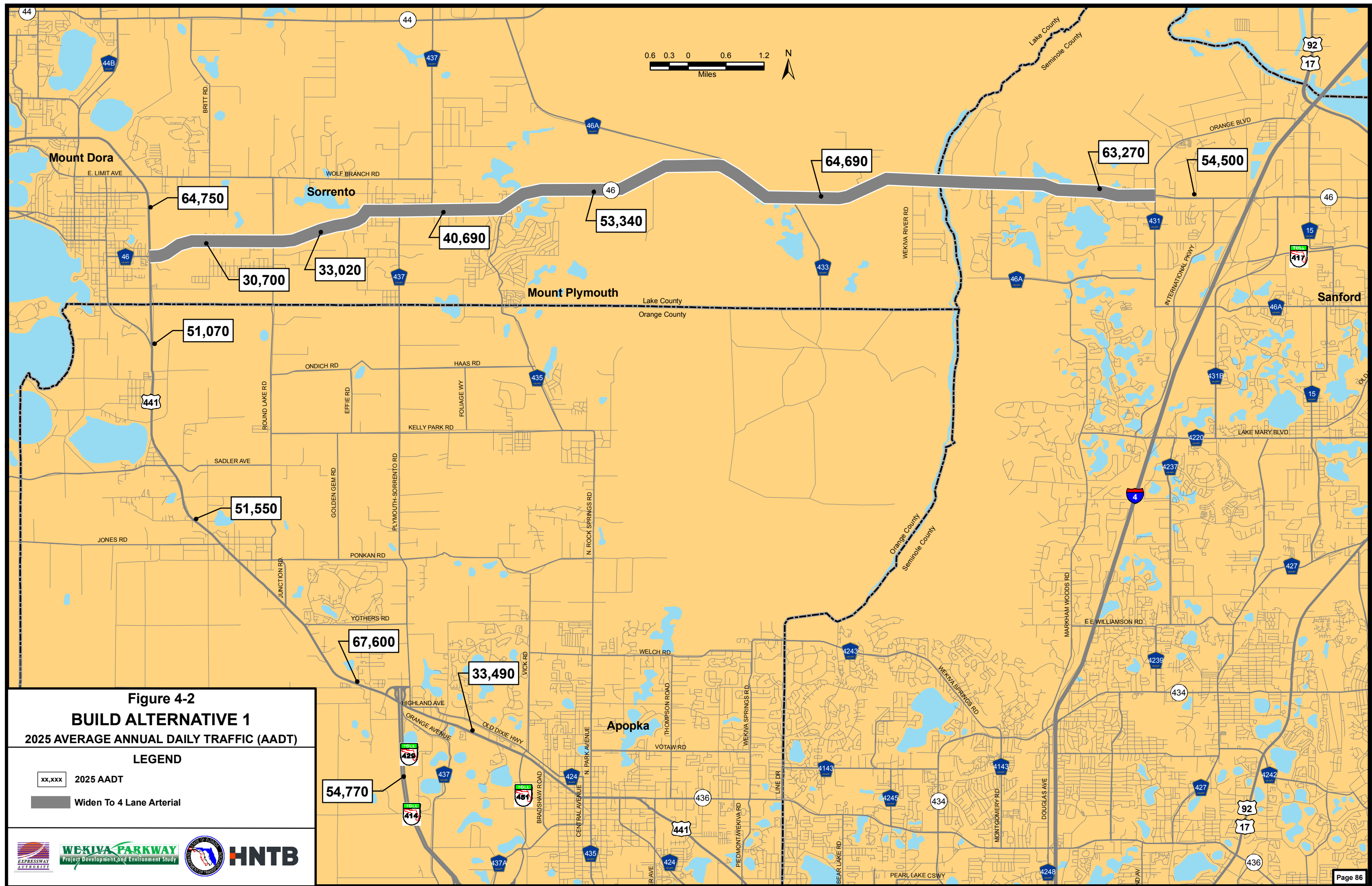
Build Alternative 2 was developed as an option of widening SR 46 to 4-lanes between US 441 in Lake County and Orange Boulevard in Seminole County. Under this alternative, SR 46 is realigned to bypass the towns of Sorrento and Mount Plymouth in Lake County. This alternative reflects the desires of those communities to limit, if possible, the widening of the existing SR 46 corridor through the towns. For this alternative, SR 46 was considered to be widened to 4-lanes along the existing alignment from US 441 to the vicinity of Round Lake Road to the west of Sorrento where it connects to a new 4-lane arterial that will bypass the towns of Sorrento and Mount Plymouth to the south. This new 4-lane arterial bypass reconnects to the SR 46 existing alignment at a location east of Mount Plymouth in Lake County. SR 46 is considered to be widened to 4-lanes from this intersection east into Seminole County. With this alternative, the portion of existing SR 46 through the towns of Sorrento and Mount Plymouth remains a 2-lane roadway. The 2025 AADTs for Build Alternative 2 are shown in Figure 4-3.

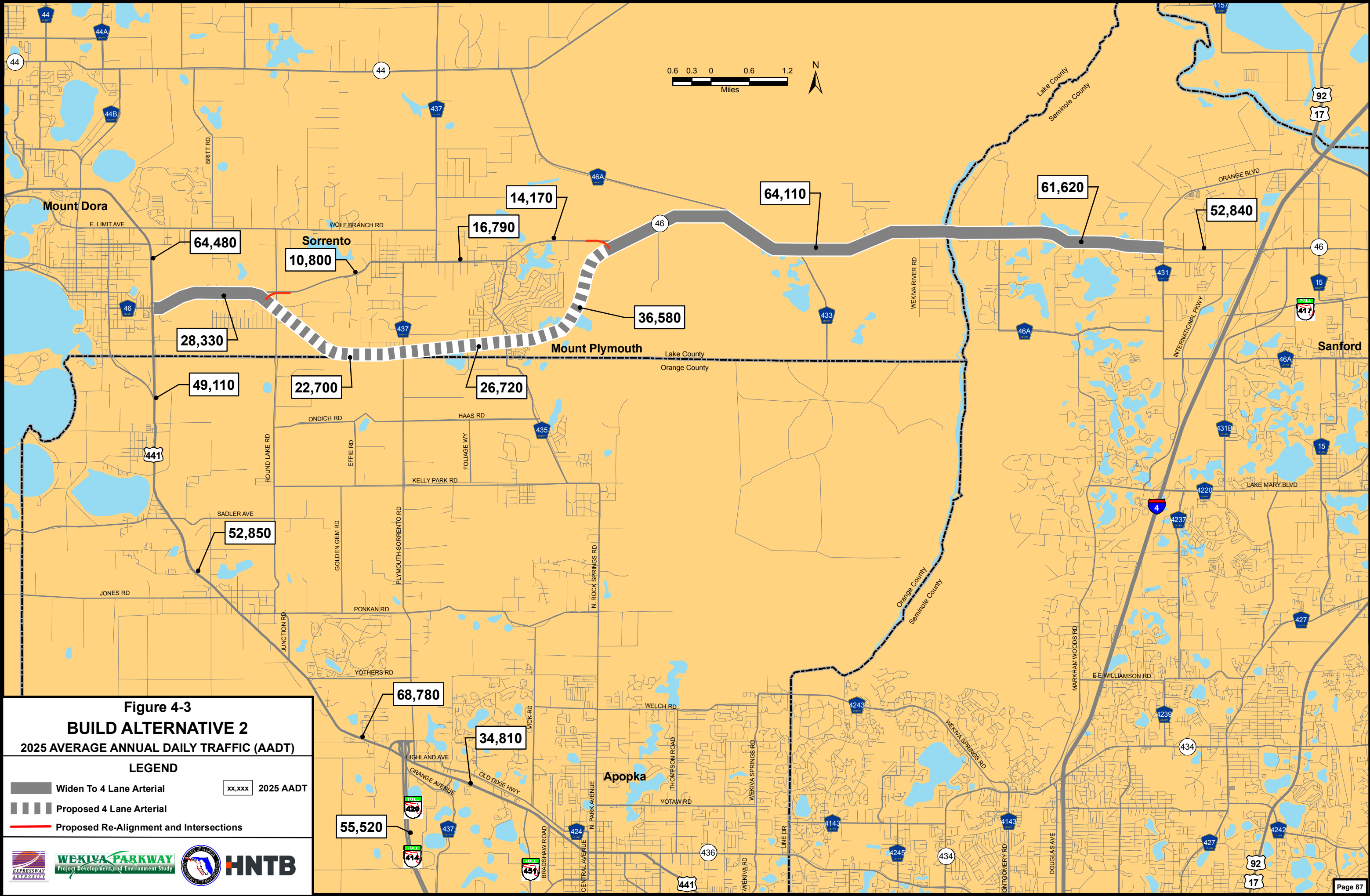
4.1.4 Build Alternative 3

Build Alternative 3 includes both the Wekiva Parkway and SR 46 Realignment projects. This alternative was developed as one of three Build Alternatives that focused on the impacts related to the Wekiva Parkway and SR 46 Realignment projects.

As the proposed expressway extension of SR 429, Wekiva Parkway begins at the planned terminus of SR 414/SR 429 (John Land Apopka Expressway) at an interchange with US 441 in Orange County in the vicinity of CR 437 (Plymouth Sorrento Road). From this interchange, Wekiva Parkway extends to the north along an alignment just to the west of CR 437. As part of legislation related to Wekiva Parkway, only one additional local access interchange is allowed in Orange County. There are two potential interchange locations, Ponkan Road and Kelly Park Road, for the local access interchange in Orange County. For the initial alternatives, the Orange County local access interchange was included in the traffic model at Ponkan Road.

Near the Orange/Lake County Line, the Wekiva Parkway has a systems interchange with the SR 46 Realignment project, then it extends east and northeast into Lake County to the existing SR 46 corridor. In east Lake County, Wekiva Parkway will replace the existing SR 46 between Mount Plymouth and the Wekiva River. Local access to properties and neighborhoods along the existing corridor will be provided with local access interchanges. In the initial alternatives, two local access interchanges were included in east Lake County, one providing access to the remnants of the existing SR 46 and CR 46A roadways just to the east of Mount Plymouth and another providing local access to the properties just to the west of the Wekiva River. As part of the Wekiva Parkway project, CR 46A is expected to be realigned to connect to SR 46 approximately four miles west of its current terminus.





Upon crossing the Wekiva River into Seminole County, the proposed expressway continues east to a connection with I-4 at the existing I-4/SR 417 interchange. Local access to and from Wekiva Parkway within the SR 46 corridor was provided via one-way two-lane frontage roads. The frontage road system in this alternative is generally between the Wekiva River and Orange Boulevard, where Wekiva Parkway leaves the SR 46 corridor to connect to I-4 at SR 417. This alternative did not include an interchange between Wekiva Parkway and International Parkway.

The Orange County portion of Wekiva Parkway was assumed to be a four-lane limited access, tolled expressway. The mainline toll, located between Ponkan Road and Kelly Park Road, was assumed to be \$1.00, while the ramp toll on the Ponkan Road ramps to and from the south had a toll of \$0.75. Within Lake and Seminole Counties, Wekiva Parkway was assumed to be a four-lane limited access expressway without any tolls.

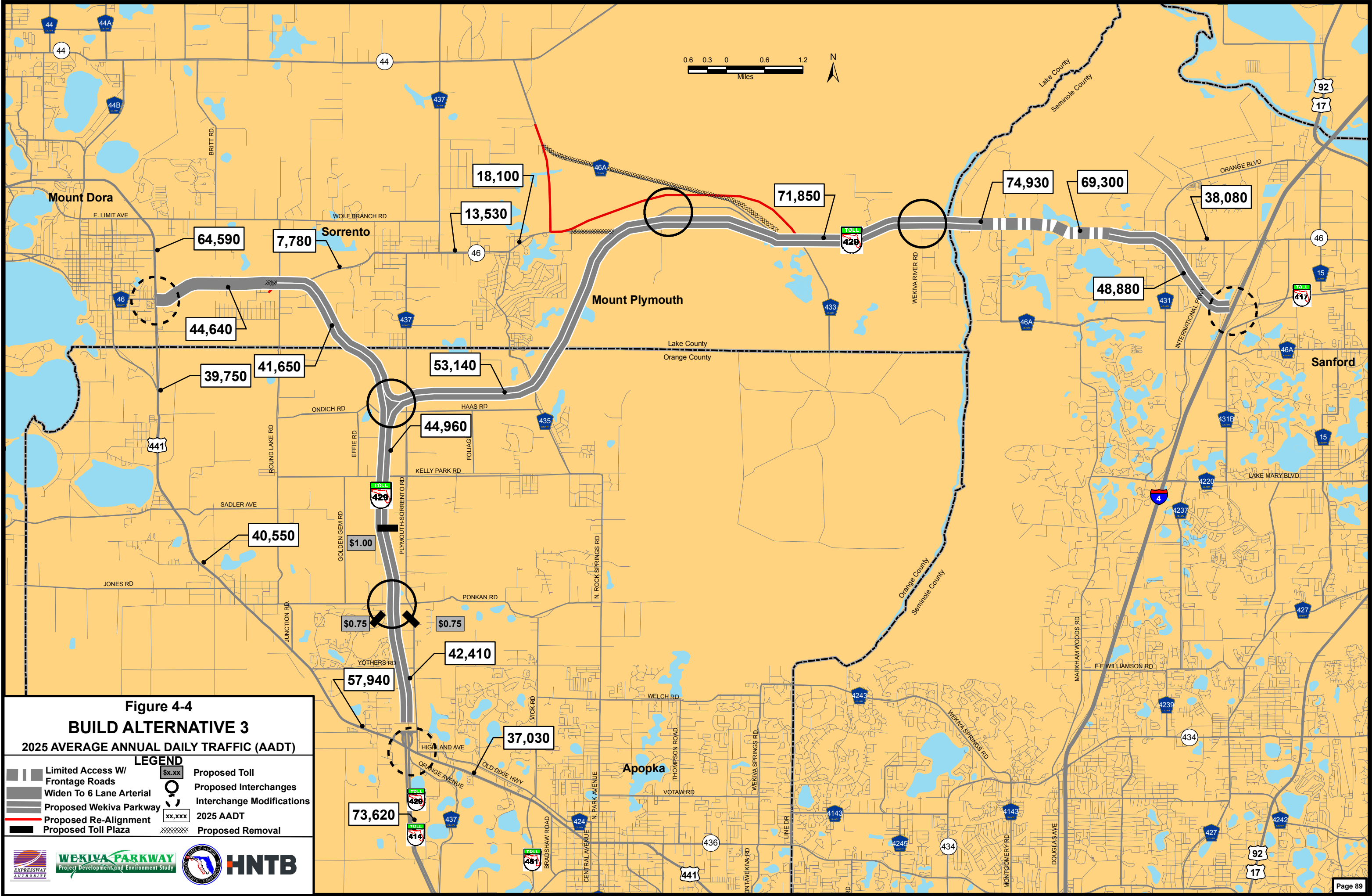
The SR 46 Realignment project, also known as the SR 46 Bypass, provides a connection from SR 46 to the east of Mount Dora with the Wekiva Parkway. This project begins at the US 441/SR 46 interchange in Lake County and extends to the east along the existing SR 46 corridor. Near Round Lake Road, the project turns southeast into Orange County and terminates at a systems interchange with Wekiva Parkway. This project consists of a six-lane divided, controlled access roadway along the existing alignment of SR 46 from US 441 to the vicinity of Round Lake Road. From east of Round Lake Road to Wekiva Parkway, the project is expected to be a four-lane limited access facility. The 2025 AADTs for Build Alternative 3 are shown in Figure 4-4.

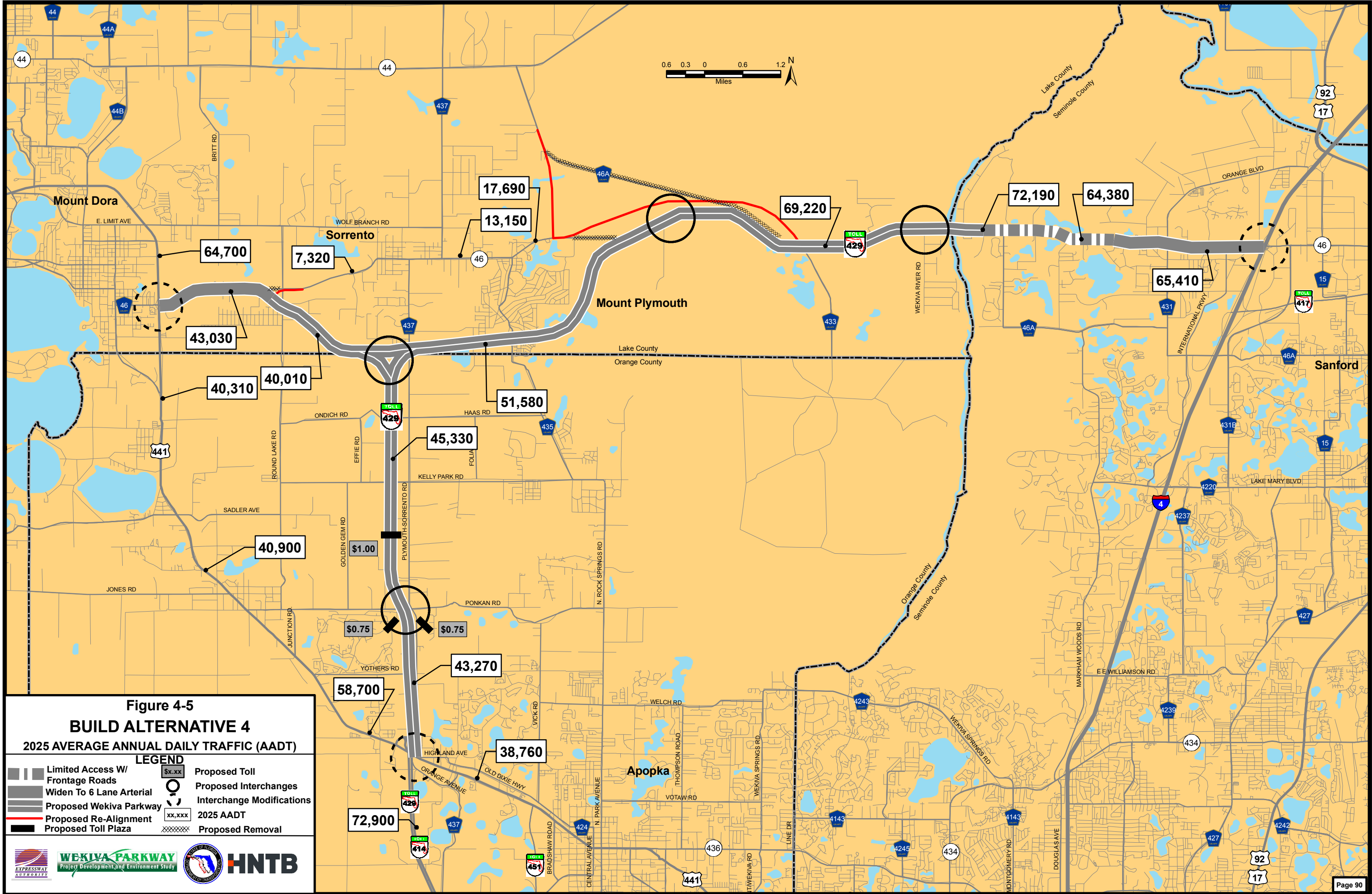
4.1.5 Build Alternative 4

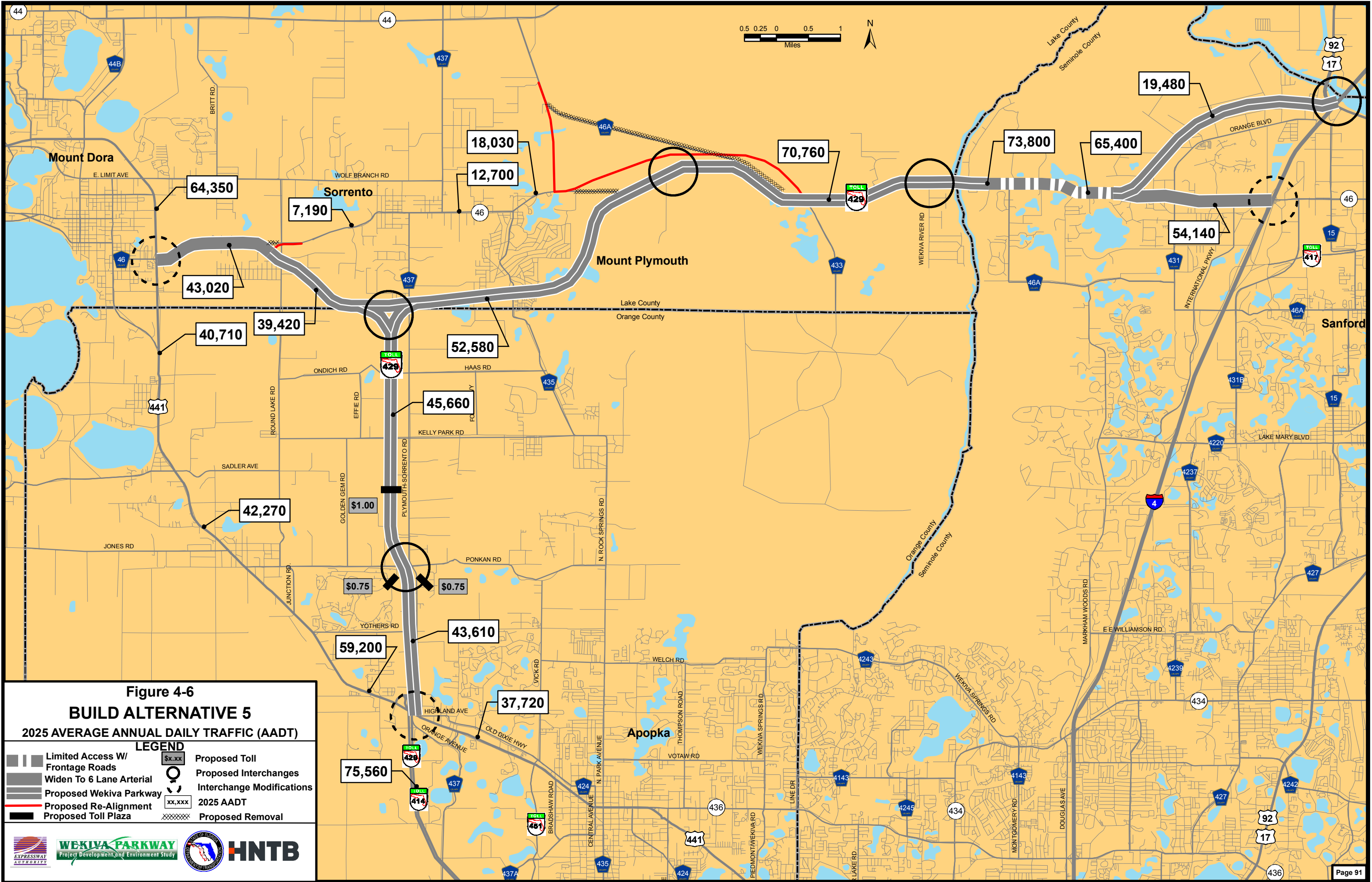
Similar to Build Alternative 3, Build Alternative 4 includes both the Wekiva Parkway and SR 46 Realignment projects. However, in Seminole County, Build Alternative 4 assumes a Wekiva Parkway connection to I-4 at a new systems interchange in the vicinity of the existing I-4/SR 46 interchange. Under this alternative, the one-way two-lane frontage road system in the SR 46 corridor was extended from the Wekiva River to the I-4/SR 46 interchange. The 2025 AADTs for Build Alternative 4 are shown in Figure 4-5.

4.1.6 Build Alternative 5

Similar to Build Alternatives 3 and 4, Build Alternative 5 includes both the Wekiva Parkway and SR 46 Realignment projects. However, this alternative provides for a Wekiva Parkway connection to I-4 just to the south of the St. Johns River Bridge. Under this alternative, Wekiva Parkway leaves the SR 46 corridor just to the west of Orange Boulevard and extends to the northeast, generally north of Orange Boulevard, to an I-4 connection just south of the St. Johns River Bridge. This I-4 interchange would only provide a connection to and from the east on I-4. Wekiva Parkway traffic intending to go to and from the west on I-4 would access I-4 via SR 46 at the existing I-4/SR 46 interchange. In this alternative, the one-way two-lane frontage roads were assumed from the Wekiva River to just west of Orange Boulevard, where Wekiva Parkway extends to the northeast. SR 46 is considered a six-lane divided arterial from just west of Orange Boulevard to I-4 to accommodate the additional traffic due to the presence of Wekiva Parkway. The 2025 AADTs for Build Alternative 5 are shown in Figure 4-6.







4.2 Refined Alternatives

The initial alternatives discussed above were evaluated according to their traffic impacts. As part of this comparative analysis of the initial alternatives, two of the Build Alternatives were dropped from consideration. Build Alternative 2, which included the widening of SR 46 to 4-lanes and a bypass around Sorrento and Mount Plymouth was eliminated as the additional cost of the bypass does not provide additional capacity along the corridor and as a result it would be cost prohibitive compared to Build Alternative 1. In addition, Build Alternative 2 did not alleviate the north-south traffic congestion along US 441, which is one of the objectives of this study. Build Alternative 5 was also dropped from further consideration due to its social impacts and the indirect connection to I-4 for traffic traveling to and from the west on I-4.

The remaining four initial alternatives were refined, as necessary, for further evaluation based on roadway LOS and other traffic impacts. In addition, two additional alternatives were also developed for evaluation. These two additional alternatives, Build Alternatives 6 and 7, included modified alignments for Wekiva Parkway in Seminole County. Alternative 6 included the Wekiva Parkway expressway with one-way two-lane frontage road system from the Wekiva River to Orange Boulevard. Under Alternative 6, Wekiva Parkway and the associated frontage roads drop at Orange Boulevard into a six-lane SR 46 that is carried east to the existing I-4 interchange. Alternative 7 consists of the Wekiva Parkway project ending at the Wekiva River, with SR 46 widened to a six-lane divided arterial from the Wekiva River to the existing I-4/SR 46 interchange. Under Alternative 7, there is not a need for one-way frontage roads in Seminole County.

The major refinements to the initial alternatives were:

- Wekiva Parkway is assumed to be six-lanes from the local access interchange with the existing SR 46 (east of Mount Plymouth) in Lake County to the I-4 connection in Seminole County.
- A Wekiva Parkway local access interchange at Kelly Park Road was included in the traffic model rather than an interchange at Ponkan Road in Orange County.
- The SR 417 extension to International Parkway is included in all No-Build and Build Alternatives, except Build Alternative 3.
- Build Alternative 3 includes a full interchange between Wekiva Parkway and International Parkway in Seminole County. International Parkway traffic does not have access to I-4.
- Three east Lake County local access interchanges replace the two interchanges assumed in the initial alternatives.
- The SR 46 Bypass ties into the existing SR 46 to the east of Round Lake Road. It was assumed to connect west of Round Lake Road in the initial alternatives.

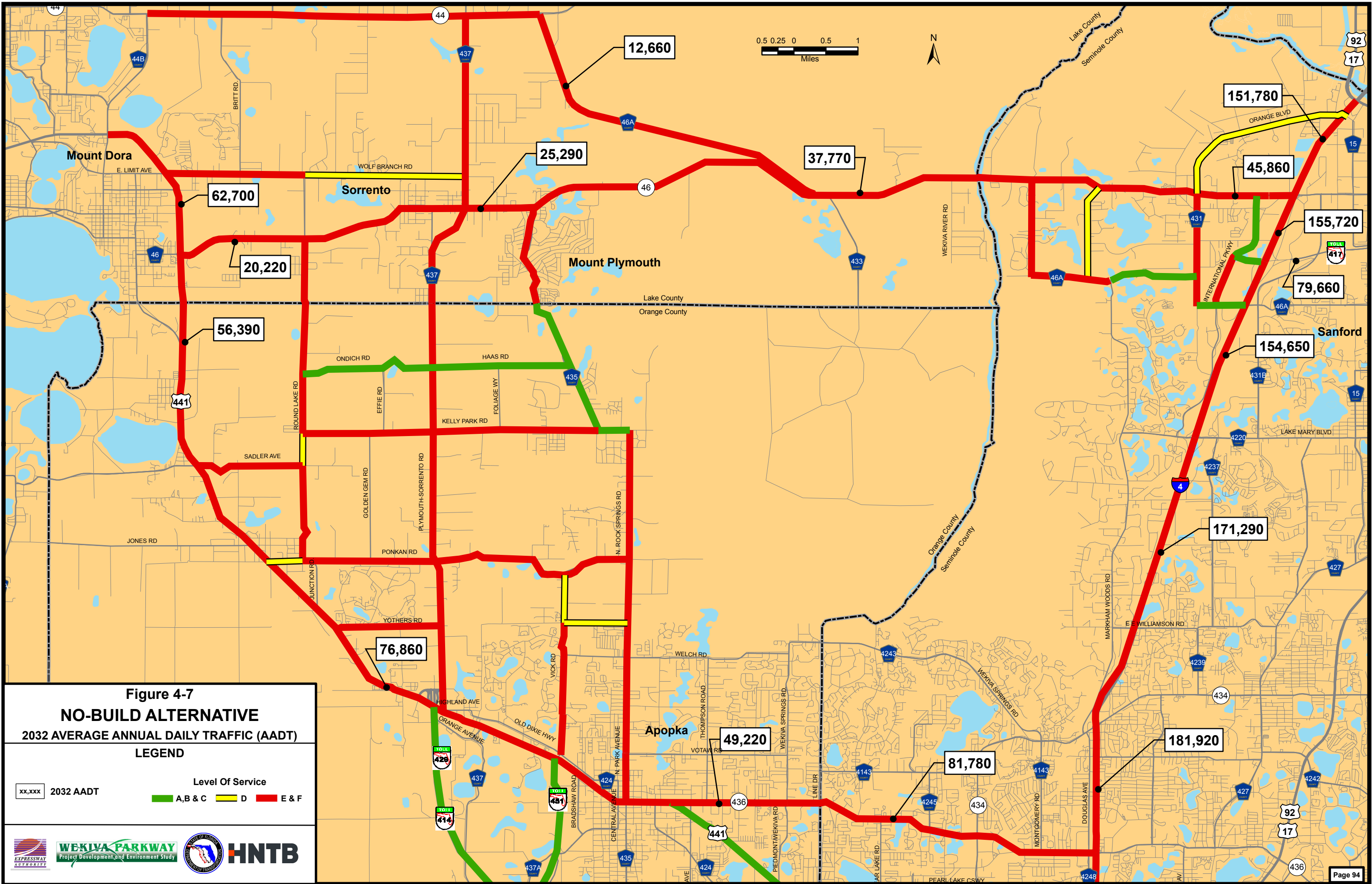
The No-Build Alternative and the five refined Build Alternatives were evaluated under 2032 design year conditions. These 2032 traffic volumes were not the final traffic volumes as determined in other sections of this report but they acted as a guide to the final choice of viable alternatives.

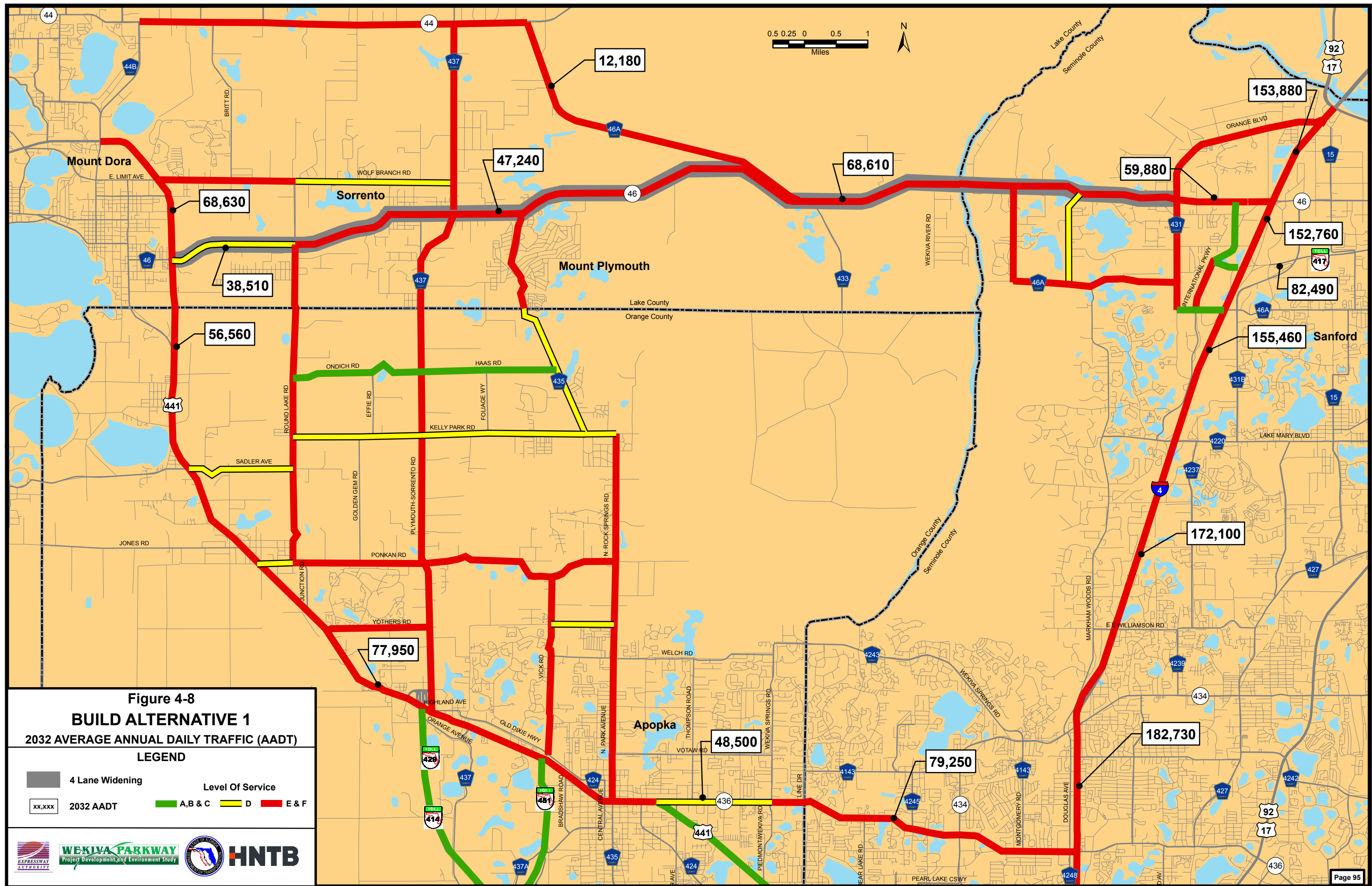
Figure 4-7 shows the 2032 AADTs and LOS on study area roadways under the No-Build Alternative. Likewise, Figure 4-8 shows the 2032 AADTs and LOS on study area roadways under Build Alternative 1. The Build Alternatives that include Wekiva Parkway and the SR 46 Realignment (Build Wekiva Parkway Alternatives) are relatively the same in Orange and Lake Counties. Thus, Figure 4-9 shows representative 2032 AADT and LOS on the study area roadways in Orange and Lake Counties for the four Build Wekiva Parkway Alternatives: Build Alternative 3, Build Alternative 4, Build Alternative 6 and Build Alternative 7. The Build Wekiva Parkway Alternatives differ in their connection of Wekiva Parkway to I-4 in Seminole County. The various Wekiva Parkway connections, the associated AADTs and LOS on Seminole County roadways for each Build Wekiva Parkway Alternative are shown in Figure 4-10.

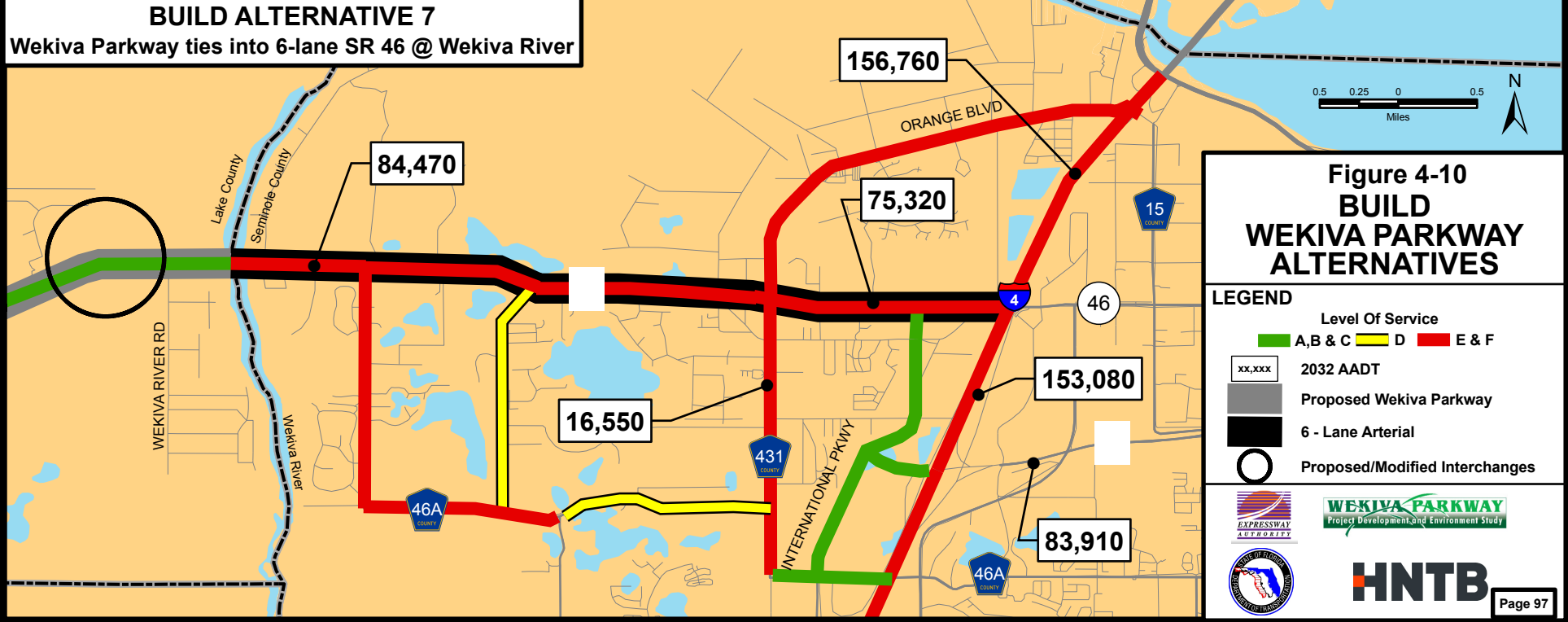
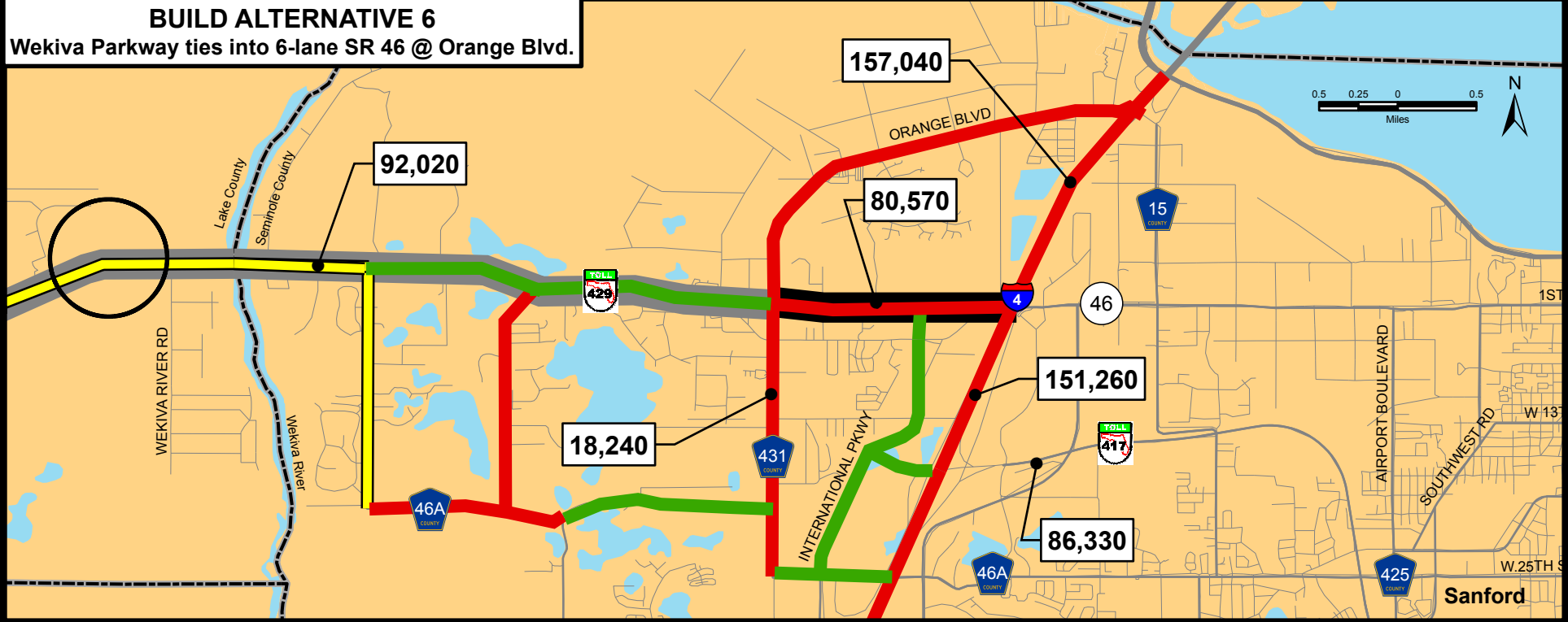
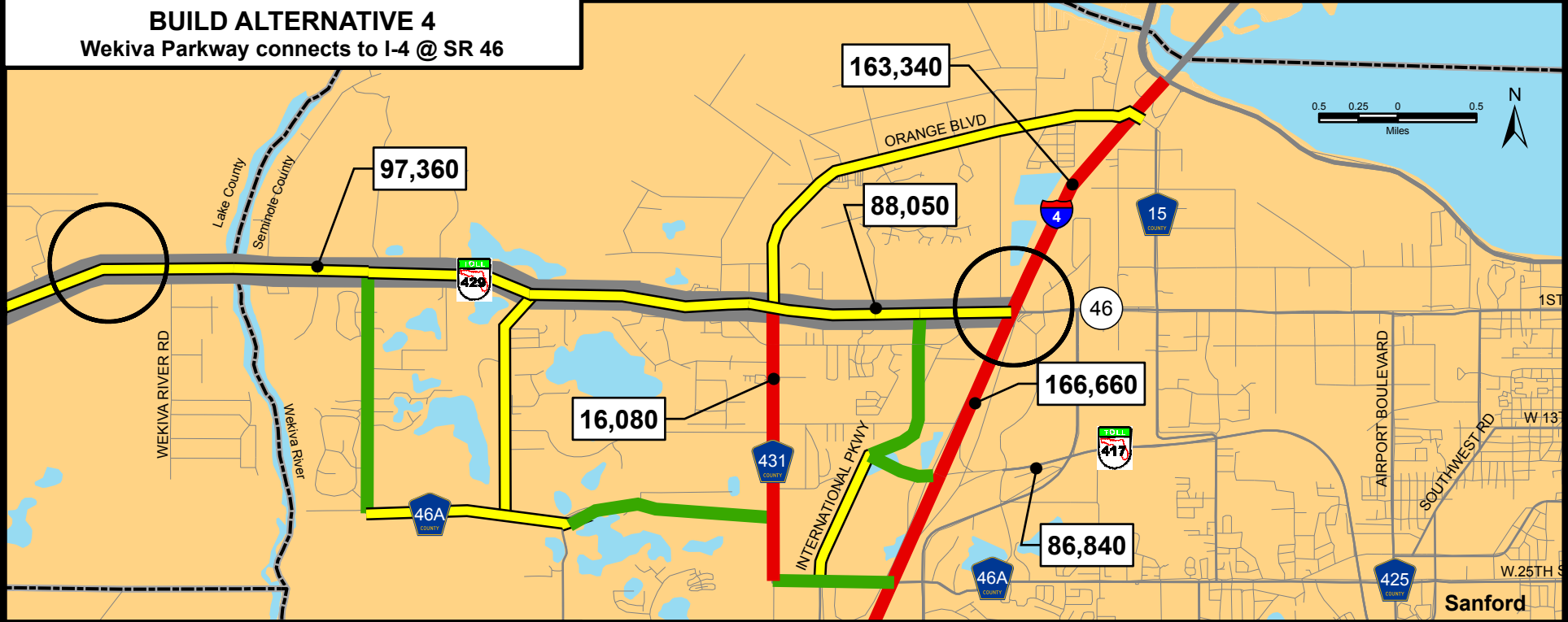
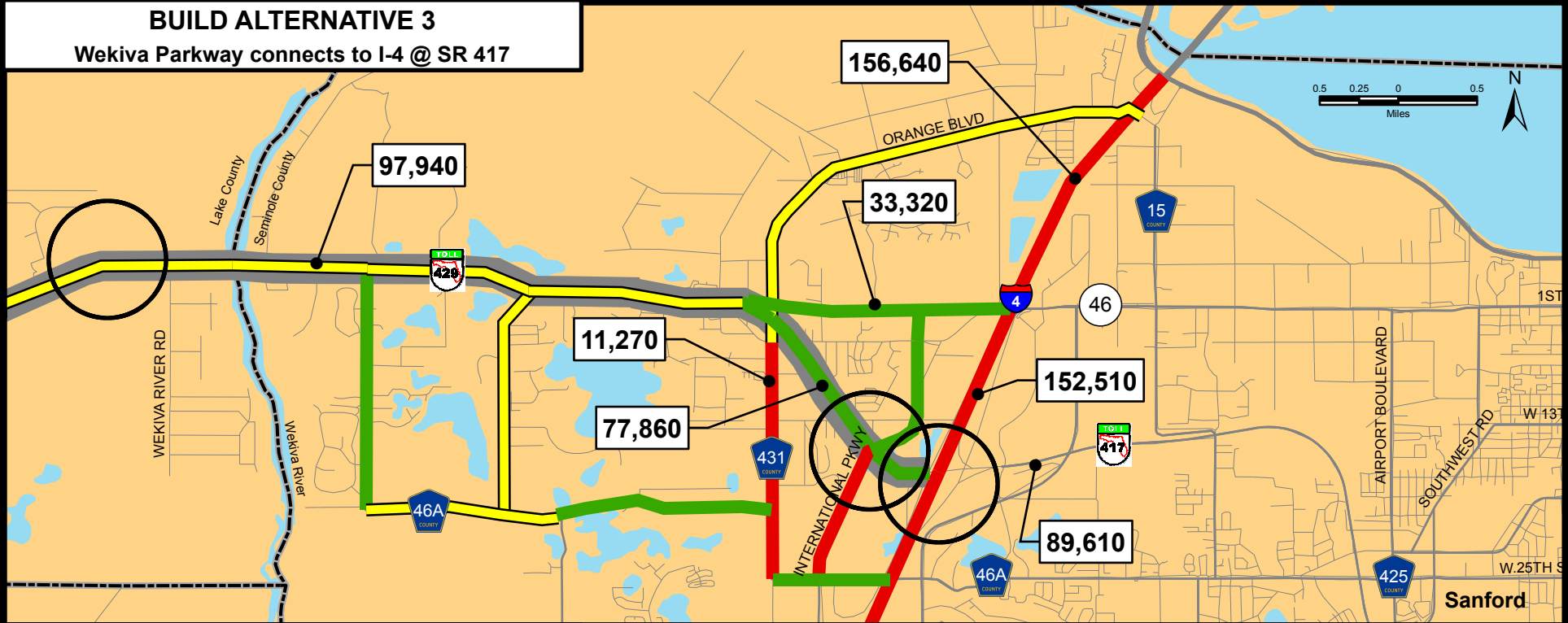
A second comparative analysis was conducted for the No-Build and Build Alternatives. This comparative analysis resulted in these determinations:

- The No-Build Alternative does not meet the transportation needs within the study area. This alternative does not relieve traffic congestion along SR 46 or along US 441.
- Build Alternative 1 does not meet the transportation needs within the study area. Any additional capacity along the SR 46 corridor added with the widening of SR 46 to four lanes is accounted for by the latent demand for east-west travel within the corridor. Thus, even with the widening, SR 46 continues to operate at LOS F. This alternative also does not relieve traffic congestion along US 441.
- The Build Wekiva Parkway Alternatives provide congestion relief along US 441 in Orange County and add additional capacity to meet the LOS needs along the SR 46 corridor in Lake County.
- Build Alternatives 3 and 4 provide congestion relief along the SR 46 corridor in Seminole County and provide a direct connection to I-4.
- Build Alternatives 6 and 7 do not meet the transportation needs along Seminole County roadways and a six-lane SR 46 operates at LOS F under both alternatives. Neither alternative provides a direct connection between Wekiva Parkway and I-4.

Based on the results of the comparative analysis, Build Alternatives 3 and 4 were considered the only viable alternatives to remain in consideration. The traffic conditions and operational aspects of these two viable alternatives are discussed in more detail in Section 5.







4.3 Additional Traffic Analyses

Throughout the PD&E Study, several additional traffic analyses were conducted to assist the Project Team with particular design features of Wekiva Parkway and the SR 46 Bypass. These additional analyses assisted the Project Team in determining the roadway alignment, interchange locations, interchange configurations, as well as the needed laneage along the proposed roadway. Several of these additional traffic analyses are discussed below.

4.3.1 Orange County Interchange Location

As part of the Wekiva Parkway/SR 46 Realignment PD&E Study, it was necessary to determine the location of the local access interchange for Wekiva Parkway in Orange County. Therefore, the traffic impacts related to two different locations for the local access interchange in northwest Orange County were analyzed. The two local access interchange locations were:

- Ponkan Road
- Kelly Park Road

To evaluate the traffic impacts related to the location of the local access interchange in Orange County, future year traffic volumes were developed for each interchange and the adjacent study area roadway network. In addition, the transportation related user benefits for each local access interchange were calculated for comparison. This traffic analysis and its results were summarized in a memorandum that is included in the Appendix B of this document. The significant findings of this evaluation of local traffic impacts under the two local access interchange locations with Wekiva Parkway in Orange County were:

- An interchange at Kelly Park Road provides better local access to Wekiva Parkway as indicated in higher interchange volumes when compared to a Ponkan Road interchange
- An interchange at Kelly Park Road improves mobility in northwest Orange County and east Lake County areas
- An interchange at Kelly Park Road has more transportation user benefits related to it than an interchange at Ponkan Road

As a result of this traffic analysis and other comparative analysis (construction costs, social impacts and environmental impacts) conducted by the Project Team, an interchange at Kelly Park Road was recommended. This interchange is included in all viable alternatives.

4.3.2 US 441/SR 46 Interchange Redesign

An important design characteristic of the Wekiva Parkway and SR 46 Bypass projects is the existing US 441 interchange with SR 46 near Mount Dora. This interchange is the main access point for the Wekiva Parkway and SR 46 Bypass from US 441 and the Mount Dora area in Lake County. Under the future Build conditions, the major travel movement at the existing interchange becomes US 441 north of the interchange to SR 46 east of the interchange. As a result, there is a need in the Build condition for direct ramps between US 441 north of the interchange and SR 46 to the east of the

interchange. With an existing interchange already in place, the direct ramps at the US 441/SR 46 interchange would result in a three level interchange. In addition, current design criteria would result in the need to rebuild the existing interchange to accommodate future traffic volumes at the interchange.

The traffic impacts in the Build Condition for this interchange were analyzed under three different scenarios:

- Scenario 1 - Existing interchange
- Scenario 2 - Existing interchange with a flyover ramp from US 441 Southbound to SR 46 Eastbound and a direct ramp from SR 46 Westbound to US 441 Northbound
- Scenario 3 - At-grade signalized intersection with a flyover ramp from US 441 Southbound to SR 46 Eastbound and a direct ramp from SR 46 Westbound to US 441 Northbound

Under the future year Build conditions, the existing interchange in Scenario 1 fails under the increased traffic volumes and change in traffic movements at the interchange. Scenarios 2 and 3 both operate at acceptable LOS conditions under the future year Build conditions. The traffic analysis associated with these results can be found in a memorandum and additional analysis included in the Appendix B.

Based on the construction cost savings associated with Scenario 3 and its operation at acceptable LOS under the future traffic conditions, the at-grade intersection with direct ramps between US 441 north of the interchange and SR 46 east of the interchange was recommended for the viable alternatives. An at-grade signalized intersection at this location meets the access management standard along US 441.

4.3.3 East Lake County Local Access Interchanges

A significant feature of the proposed Wekiva Parkway is the replacement of the section of existing SR 46 between Mount Plymouth and the Wekiva River with a new limited access facility. While remnants of existing SR 46 could remain, the ability to travel directly between Mount Plymouth and the Wekiva River along the existing portion of SR 46 would be eliminated. Therefore, an additional traffic analysis was also conducted for the proposed local access interchanges in east Lake County. As part of this analysis, three interchange configurations were considered to provide access to Wekiva Parkway at three different locations in east Lake County. The interchange locations in east Lake County were:

- Western Interchange: Neighborhood Lakes area providing access to existing SR 46
- Central Interchange: Existing CR 46A/SR 46 intersection area
- Eastern Interchange: Wekiva Pines Boulevard and Wekiva River Road

The three interchange configurations evaluated for providing access to these three locations included:

- Scenario 1 - Three full interchanges

- Scenario 2 - Collector-Distributor (C-D) roads between the western (Neighborhood Lakes) and central (existing CR 46A/SR 46 area) interchanges with a full interchange at Wekiva Pines Boulevard/Wekiva River Road area
- Scenario 3 - Full interchange at the western (Neighborhood Lakes) interchange with a split diamond interchange between the central (existing CR 46A/SR 46 area) and the eastern (Wekiva Pines Boulevard/Wekiva River Road area) interchange locations. Traffic would travel between the central (existing CR 46A/SR 46 area) and eastern (Wekiva Pines Boulevard/Wekiva River Road area) interchanges via a remnant of existing SR 46

The traffic analysis indicates that the heaviest traffic movement occurs at the western (Neighborhood Lakes) interchange ramps to and from the east. This ramp pair accommodates the traffic originating near Mount Plymouth, Sorrento and the SR 44 areas. In addition, the traffic analysis revealed that the future traffic volumes at the central (existing CR 46A/SR 46 area) and eastern (Wekiva Pines Boulevard/Wekiva River Road area) interchange locations are relatively small due to the limited development potential near these interchanges. Under all scenarios, the interchange configurations accommodate the future traffic volumes.

Based on the results of the traffic analysis and construction cost comparison, the preferred interchange configuration in east Lake County is Scenario 3, which includes a full western (Neighborhood Lakes) interchange and a split diamond interchange between the central (existing CR 46A/SR 46 area) and eastern (Wekiva Pines Boulevard/Wekiva River Road area) interchanges. Under this scenario, traffic desiring to travel westbound on Wekiva Parkway from the eastern interchange would utilize a remnant of existing SR 46 and access Wekiva Parkway at the central interchange. Likewise, traffic desiring to travel eastbound on Wekiva Parkway from the central interchange would utilize a remnant of existing SR 46 and access Wekiva Parkway at the eastern interchange. It is estimated that the 2032 traffic volumes along the remnant of existing SR 46 under Scenario 3 would be approximately 2,500 vehicles per day.

4.4 Summary

As part of the alternatives analysis for the PD&E Study, initial alignment alternatives were developed that were representative of the design variations being considered by the Project Team. There were six initial alternatives chosen, one No-Build and five Build Alternatives. Of the five initial Build Alternatives, three were refined and carried forward for further evaluation. Two additional Build alternatives were also considered with the three initial Build alternatives carried forward in the second phase of comparison. The results of the comparison analysis showed that Build Alternative 3 and Build Alternative 4 were the two viable alternatives for the Wekiva Parkway and SR 46 Realignment projects. Both alternatives are the same except for the connection to I-4 in Seminole County. Build Alternative 3 includes a Wekiva Parkway connection to I-4 at SR 417, while Build Alternative 4 connects to Interstate 4 at the existing SR 46 interchange.

In addition to the alternatives analysis, several additional traffic analyses were conducted to assist the preliminary engineering of the Wekiva Parkway and SR 46 Realignment projects. Additional traffic analysis indicated that the preferred location of a local access interchange in Orange County is at Kelly Park Road. In Lake County the preferred future configuration of the US 441/SR 46 interchange is an at-grade

intersection with direct ramps between US 441 north of the interchange and SR 46 east of the interchange. A separate traffic analysis was conducted for the configurations of the East Lake County interchanges. This traffic analysis and construction cost comparison revealed a preferred configuration of a full local access interchange at the western (Neighborhood Lakes) interchange with split interchanges between the central (existing SR 46/CR 46A area) and eastern (Wekiva Pines Boulevard/Wekiva River Road area) interchanges. Travel between the central (existing SR 46/CR 46A area) and eastern (Wekiva Pines Boulevard/Wekiva River Road area) interchanges would be via a remnant of the existing SR 46.