TRANSPORTATION

INTRODUCTION

Since early in 2008 the Applicant for Restoration has worked diligently with the review agencies to refine the Development Plan. As it pertains to the refinements, the majority of the development area has been shifted eastward adjacent to I-95 and, as discussed below in the next section, the plan incorporates Traditional Neighborhood Development (TND) and Transit Oriented Development (TOD) concepts. Below is a discussion regarding the Development Plan refinements and how the traffic analyses were revised to address Plan changes. The 3rd sufficiency response to the DRI contains a complete traffic analysis which should be consulted during this review of the Large Scale Comprehensive Plan Amendment.

MASTER PLAN OVERVIEW

The development of the revised land use and transportation plan for this Restoration project has followed several guiding principles. The revised plan attempts to accommodate different types of homes, neighborhoods, employment, recreational activities, and social interactions in order to enhance the resident's quality of life; and to serve the development by balancing the needs of automobiles, bicycles, pedestrians and transit. The plan facilitates an internal transportation system that encourages increased mobility options, and provides for energy efficient transportation alternatives while minimizing environmental impacts. The desired outcome is to create a safe, accessible, convenient, and efficient transportation system for residents, employees and visitors, in coordination with the needs of land use activities, population densities, housing and employment patterns.

Land Use/Transportation Strategy

The development plan will be implemented through a combination of strategies, including a land use mix strategy, a network connectivity strategy and an urban design strategy. The land use mix strategy provides for the density and intensity of development needed to support mobility alternatives. The network connectivity strategy provides for reduced and more direct travel making walking and cycling more feasible. The urban design strategy provides for a pleasant experience whether on foot, cycle, transit vehicle, or car.

- *Land Use Mix*

The land use mix strategy encourages development that supports all forms of mobility, especially walking, cycling, and future transit use through neo-traditional, New Urbanism, and mixed-use development practices at transit oriented densities. The objective of the land use mix strategy is to support a land use pattern that allows for shorter trip lengths and fewer trips, regardless if transit is implemented on site or not. Daily activities can be located within walking distance of residences over time, resulting in fewer vehicle trips. A greater mix and range of land uses can be located within walking distance of potential future transit stops, thereby improving the convenience of those forms of mobility. Even if trips are made using a vehicle, a greater mix of land uses with the appropriate site design can reduce the number of individual vehicle trips by parking once and conveniently and comfortably walking to multiple destinations in the same district.

- *Network Connectivity*

The network connectivity strategy provides for mobility-enhancing features according to neo-traditional or New Urbanism standards, which characteristically have well-connected street and sidewalk networks. The objectives of the network connectivity strategy are to increase personal route options and allow more direct travel between destinations within the Restoration project. These facilities will provide safe and convenient movement on the development site for all users, particularly pedestrians. As connectivity increases, travel distances decrease. A more accessible system can make non-motorized travel more attractive by improving walking and cycling conditions, particularly when paths provide shortcuts. Shortcuts can make walking and cycling relatively faster than driving to a destination. Shortcuts can also support future transit use by shortening the distance to the potential future transit stop.

- *Urban Design*

The urban design portion of the strategy encourages pedestrian, cycle, and potential future transit use within the Restoration project by including features that create safe, comfortable, and attractive environments for users. The developers will implement street design standards that ensure that major new streets are designed for transportation modal choice. Alternative transportation modes become more viable when both the density of development reaches a critical mass and the safety, comfort, and convenience needs of users are met. The objective of the urban design strategy is to use the design of the built environment to influence peoples' choice of transportation mode. These could include pedestrian features, such as wide sidewalks and canopies over sidewalks, to cyclist features, such as secure and covered bicycle parking. The hope is that residents will consider walking, bicycling, and future transit as realistic options for some of their trips and will choose to exercise these options, based partly upon the development's design that contains amenities meeting their travel needs.

Transit Oriented Development

From a land use standpoint, the development generally follows Transit Oriented Development (TOD) practices and principles. TOD is a strategy that allows moderate to higher density development within easy walking distance to alternative modes of transportation. The mix of development is typically residential, employment and retail, and is designed primarily for pedestrians without excluding automobiles. By promoting TOD, the Restoration development is seeking to align transportation investments with a more livable, mixed use, walkable community. TODs have four basic, essential characteristics that include a greater density than a community average; a mix of uses; a quality pedestrian environment and a defined center. While the overall Restoration project will have a gross density of 1.6 dwelling units per acre, due to the massive environmental restoration and clustering into a compact development, the majority of the development will be in a denser north south corridor paralleling I-95. Taking this into account, the gross density within that higher intensity residential and transit ready area is six dwelling units per acre. The density range within the clustered development will range from 3.5 units per acre to 36 units per acre.

The benefits of TOD are many, and include:

- Provision of mobility choices, especially for the young, old, those without cars and the disabled.

- Increase in utilization of other forms of mobility, including bicycles, pedestrian features and transit, which assists in the provision of transportation system capacity.
- Reduction of Vehicle Miles of Travel (VMT), on a household basis by 20 to 40 percent.
- Increase in disposable household income, though the reduction of driving related costs and potentially, the reduction in the number of cars per household.
- Reduction of air pollution and energy consumption rates.
- Protection of single-family neighborhoods by directing higher density development to appropriate areas.
- Reduction in overall infrastructure costs due to more compact and infill development.

The Restoration development will have a linear corridor that is transit ready, and is aligned with activity centers. Activity centers will be mixed-use, transit-ready areas around employment clusters that integrate mid- to high-density residential uses in and around proposed nonresidential districts. This will achieve a greater balance of land uses in a compact area, promote more efficient use of land and infrastructure, provide opportunities for affordable housing, and encourage more non-automotive modes of travel.

Alternative Forms of Mobility

With the proper land use planning and urban design, pedestrian and bicycle systems are alternative modes of travel to the personal vehicle that can serve to enhance overall mobility. In order to fully realize the potential of these systems as alternative transportation modes, the appropriate mix of land uses must exist within a relatively close proximity, the infrastructure for utilizing these alternative modes must be in place and a viable interface between these alternative modes with other modes of travel, such as the personal vehicle and public transit, must be developed. Restoration has taken great strides in the re-planning of the project in encouraging both pedestrian and bicycle activity, not only as an alternative means of transportation but also as a valuable form of recreation. Finally, the advent of some form of internal transit will shape the development program from initiation of Phase I to potential implementation in Phase III, resulting in higher internal capture rates in the later phases. This higher internal capture will occur with or without the implementation of transit due to the land use density, intensity, site design and mix of use.

- ***Pedestrian Facilities and Access to Transportation***

A pedestrian-friendly environment is crucial to the success of mobility options. Development in Restoration will have the necessary space along the property frontage for the construction of public sidewalk facilities. Pedestrian access from the development sites to public sidewalks, the removal of barriers between properties, and safe and convenient on-site pedestrian circulation are more examples of internal improvements that increase connectivity. Protection from weather extremes is an important consideration when choosing to walk or use alternative forms of transportation. The provision of refuge for walkers, such as awnings within the activity centers will be important. Aesthetic improvements, such as a pleasant streetscape, sidewalk furniture and lighting not only create a sense of place; they also supply additional shade and safety. When the special needs of those with disabilities are properly considered, walking truly becomes the most accessible mode of transportation. With pedestrian facilities providing connections within the Restoration community, walking can become the most desirable mode of transportation.

- ***Bicycle Improvements***

The importance of the bicycle as a transportation choice has not yet been fully explored by the development community in past projects. Bicycles are suitable for both short and longer distance travel. This can make the bicycle a practical alternative to the car, especially if a good network is available, which could be as simple as the provision of a safe street environment. Other potential improvements include the provision of bicycle parking close to the site, or the alteration of walkways to accommodate bicycles. The provision of bicycle connections that "shorten" the distance between land uses can reduce Vehicle Miles of Travel (VMT) and improve overall mobility.

- ***Internal Transit Improvements***

As previously mentioned, the Restoration project will utilize the planned Williamson Boulevard as the north south mobility spine for the project. Williamson Boulevard will also be an important transportation facility for the region. This roadway facility will be heavily landscaped and will have one-way frontage roads with parking within the activity centers. Williamson Boulevard will be designed to accommodate the potential for six lanes of traffic, with the outside lane designated as a potential transit facility. This transit facility, if warranted and feasible, could potentially take the form of either a streetcar or Bus Rapid Transit (BRT) project. In addition, if warranted at the time of analysis, the project could have an internal bus circulator in conjunction with the potential transit facility. Streetcars and BRT are briefly discussed below.

Streetcars are rail transit vehicles that run on rails embedded in the street, designed for local transportation, and powered by electricity received from an overhead wire. In the past, some streetcars, in cities where overhead wires were forbidden, received their electric power from a "slot" in the street.

In addition, a few were powered by storage batteries. There is a current streetcar running in Galveston, Texas that has a diesel engine. However, for the most part, streetcars are powered by electric motors with an overhead wire and a trolley pole. Streetcars are different than buses, and are also different than Light Rail Transit. According to the American Public Transit Association, the main difference is purpose: streetcars are for local transportation, whereas Light Rail Transit may operate ten or twenty miles out beyond the downtown, running at high speeds between suburban stations spaced a mile or more apart. Streetcars operate in an activity center, such as a downtown, with multiple stops, sometimes at every street corner. The streetcar has lower construction and operating costs, due to its construction methods, type of vehicles, and operating characteristics. There has been a renaissance of streetcars, with networks being constructed in cities such as Seattle, Portland, Charlotte and Dallas (which also have Light Rail Transit), and planned in cities such as Atlanta, Miami, and Washington DC. They are also being explored for implementation in new towns and activity centers thought the US. The range of vehicle could be from modern looking streetcars to vintage replica trolleys.

Bus Rapid Transit (BRT) consists of a spectrum of bus transportation investments that include low-cost investments such as traffic signal pre-emption at intersections to higher-cost investments such as exclusive rights-of-way. The magnitude of the investment is generally matched to the conditions of the transportation system, higher demand corridors typically warrant exclusive rights-of-way whereas localized operational problems can generally be solved with signal improvements and bus priority strategies on existing streets. Conceived as an integrated, well-defined system, BRT can provide high operating speeds, reliable and convenient service, and

customer amenities that can match the quality of rail transit when implemented in appropriate settings. In this setting, bus lanes and bus signal priority could be considered for Williamson Boulevard, if warranted in later phases. Bus lanes are a lane on an urban arterial or city street, which is reserved for the exclusive or near-exclusive use of buses. An example is the exclusive bus lane on Magnolia Avenue in downtown Orlando for LYMMO. Bus signal priority is preferential treatment of buses at intersections, which involves the extension of green time or actuation of the green signal at signalized intersections upon detection of an approaching bus. Intersection priority can be particularly helpful when implemented in conjunction with bus lanes. Again, this occurs with the LYMMO system in Orlando. This Williamson facility could utilize modern day buses, or replica trolley buses.

Implications of Master Plan Changes

The revised Restoration land use and transportation plan is unique, and those unique characteristics have an impact on the revised transportation analysis. The major impact is on the anticipated internal capture of the project, which in turn, has an impact on the total amount of estimated external trips. With the previous submittals, the transportation-modeling tool was utilized to estimate internal capture. This was a purely mathematical exercise, and resulted in an internal capture of approximately 34 percent for Phase I, 30 percent for Phase II, and 27 percent for Phase III. Given the nature of the previous land use program, this internal capture was, in all likelihood, technically correct, but intuitively does not make sense for the revised Plan. Due to the revised land use plan and program as well as the resulting transportation plan, it was determined that the transportation planning tool does not take into account the characteristics of applied Transit Oriented Development practices and principles, New Urbanism projects or Traditional Neighborhood Development techniques. Thus, while the model was utilized for Phase I, the internal capture was adjusted for Phases II and III. The resulting internal capture for Phase I is now approximately 28 percent; Phase II is now 35 percent; and Phase III is estimated at 50 percent. This is approximately six percent less for Phase I, five percent more for Phase II, and 23 percent higher for Phase III from the previous submittal.

Furthermore, it is anticipated that these higher internal capture rates will be realized due solely on the impact of the land use and internal transportation network changes to the Restoration Plan. The new compact activity center development concept, with surrounding neighborhoods located on a well connected mobility network, the mix of uses and availability of services will encourage shorter trips and less trip making, resulting in a higher internal capture without the provision of an on-site transit facility or services. The provision of an internal transit service/facility in Phase III, if warranted, could have the potential of driving the internal capture rates for the Restoration development even higher that those utilized in the revised transportation analysis. These rates will be reassessed as part of the future monitoring and modeling program.

TRIP GENERATION

Total Trip Generation

When comparing the latest plan to the previously proposed plans it is important to note that, similar to the previous plans, the development's initial access will only be provided via Indian River Boulevard without any direct connection to S.R. 44. Overall, the mixture of uses is similar to that presented in previous analyses. Retail for Phase I has been reduced by 200,000 square feet to better reflect the real timing of commercial development and relation to residential development. As a result, it can be seen from the attached trip generation table (Table 21-B-1 in

Appendix A) that the revised total PM peak-hour trip generation potential for Phase I of 3,540 trips is approximately 21 percent less than that from Phase I in the last sufficiency response which had a total PM peak-hour trip generation potential of 4,476 trips.

Internal Capture

Additionally, because the new plan embraces Traditional Neighborhood Development (TND), Transit Oriented Development (TOD), and New Urbanism sustainability concepts it can be expected to have increased interaction amongst the various uses. Thus, it is appropriate to expect a higher rate of internal capture under the new plan as compared to the previous plans. However, it is recognized that the benefits of TND and TOD will increase as the development matures and more of the non-residential development is in place. Therefore, for Phase I the internal capture rate of the project was conservatively calculated using the model. This is the same analysis approach as that used in the previous submittals. As can be seen in Table 21-B-1 in *Appendix A*, under the new plan 28.1 percent of the Phase I PM peak-hour trips will be internal as compared to 33.9 percent in the last sufficiency response. As it pertains to new external PM peak-hour trips, the new Phase I program will generate 2,545 trips versus 2,957 trips generated by the Phase I program in the last sufficiency response (a reduction of approximately 14 percent).

As it pertains to Phases II and III, the revised development plan is one of a sustainable nature that incorporates TND, TOD, and New Urbanism concepts such as high densities, a grid network of streets, and walkability. In the end, the Restoration DRI will clearly be a place where one can live, work, and play without the need to get into a vehicle to travel within the development. This will also reduce auto dependence and the extent to which residents of the development travel external to the community. It is clear that this development is incorporating all the necessary concepts to achieve a high level of internal capture. This level of internal capture is not recognized by current models because TND is relatively new. Therefore, the original methodology for determining internal capture for this development is no longer useful. Given the TND plan, internal capture targets have been developed. An internal capture target of 35 percent has been set for Phase II. This is a modest increase compared to Phase I. The goal for Phase III (buildout) is 50 percent. In order to achieve the Phase III development program, typical TND densities will be required causing the project to be better integrated with a higher emphasis placed on mobility as compared to most traditional master-planned communities. The extent to which the development achieves the planned TND/TOD nature and land use balance can be monitored in conjunction with Phase II and Phase III monitoring. Refined project impacts for Phases II and III will be developed in the monitoring studies.

TRIP DISTRIBUTION

As previously mentioned, the extension of Airport Road has been eliminated from the DRI. Thus, for Phase I the only access will be via Indian River Boulevard which is an access scenario previously analyzed. Recognizing this and that the Phase I land-use mix is effectively consistent with previous submittals, with the exception of the reduction in retail square footage, it can be concluded that the external trip distribution of the proposed development as obtained from an updated model is relatively consistent with the trip distribution identified in the previous submittals.

FUTURE CONDITIONS LEVEL OF SERVICE ANALYSES

External Roadway Segments

The project volumes for the study roadways were then added to the background volumes to obtain the total future volumes. Below is a summary of roadway segments significantly and adversely impacted by the proposed development (Williamson Boulevard from Indian River Boulevard to S.R. 44 is addressed in the internal roadways section):

Phase I

- Westbound Taylor Road (S.R. 421) from Dunlawton Avenue/Taylor Road intersection to I-95 Northbound Ramps (PM)

- It should be noted that Indian River Boulevard from Williamson Boulevard to I-95 does not have an assigned capacity, but based on the projected Phase I peak-hour peak-directional volume of 1,424 four lanes will be required for this section.

As it relates to Phases II and III, the operating conditions of the roadway segments were evaluated by comparing the projected volumes to the generalized service volumes. Those roadway segments with projected volumes that exceed the generalized service volume are summarized below. Therefore, for those roadway segments identified below the developer will commit to conducting more refined operational analyses at time of M&M should these roadway segments be significantly impacted by the development. The results of those analyses could reveal that adequate capacity exists, intersection improvements are needed, or roadway widening is required to provide adequate capacity.

Phase II

- S.R. 44 from Glencoe Road to I-95
- I-95 from S.R. 44 to I-4/S.R. 400
- U.S. 1 from Riverside Drive to S.R. 442
- Dunlawton Avenue from Taylor Road to Clyde Morris Boulevard
- Taylor Road (S.R. 421) from Dunlawton Avenue/Taylor Road intersection to I-95
- Taylor Road from Dunlawton Avenue to Clyde Morris Boulevard

Phase III

- S.R. 44 from S.R. 415 to Airport Road (this assumes a rural service standard, which may not be appropriate when Phase III occurs)
- S.R. 44 from I-95 to Mission Drive
- I-95 from S.R. 44 to U.S. 92
- Old Mission Road from S.R. 442 to Josephine Street
- U.S. 1 from Riverside Drive to S.R. 442
- Dunlawton Avenue from Taylor Road to Clyde Morris Boulevard
- Taylor Road (S.R. 421) from Dunlawton Avenue/Taylor Road intersection to I-95
- Taylor Road from Dunlawton Avenue to Clyde Morris Boulevard

Intersections

Based on the roadway segment tables, it is clear that the total volume projections for all study roadways for Phase I are less than the total volume projections in the previous sufficiency response. The previous analyses for the intersections of Dunlawton Avenue/Yorktowne

Boulevard and Dunlawton Avenue/Clyde Morris Boulevard showed these intersections will operate acceptably. Therefore, these intersection analyses have not been updated. However, the intersection analyses for all other locations were updated. Based on the analyses, the following improvement needs were identified at the study intersections:

A. S.R. 44 at Airport Road
   - Signalization

B. S.R. 442 at I-95 Southbound Ramps (see improvement concept in *Appendix E*)
   - Signalization
   - 2nd southbound left-turn lane
   - 2nd eastbound through lane
   - Southbound right-turn lane to be free-flow
   - 2nd eastbound departing/receiving lane for southbound dual lefts

C. S.R. 442 at I-95 Northbound Ramps (see improvement concept in *Appendix E*)
   - Signalization
   - 2nd eastbound through lane
   - Extend eastbound left-turn lane to SB ramps

D. Park Avenue at Old Mission Road
   - Signalization

E. Taylor Road (S.R. 421) at I-95 Southbound Ramps
   - Add 3rd southbound left-turn lane

F. Taylor Road (S.R. 421) at I-95 Northbound Ramps
   - Add 3rd westbound through lane to feed westbound left-turn lane at the southbound ramps

Internal Roadway Segments

The only roadway considered in the internal roadway analysis was Williamson Boulevard from Indian River Boulevard to S.R. 44. The extension of Williamson Boulevard up to S.R. 44 is not required until Phase II.

MITIGATION

The improvement needs for Phase I are those intersection improvements discussed above along with the four-laning of Indian River Boulevard from Williamson Boulevard to I-95. The project's proportionate-share responsibility for Phase I is $9,769,129. It should be noted that the deficiency identified on Taylor Road (S.R. 421) between I-95 and the Taylor Road/Dunlawton Avenue intersection is addressed through the inclusion of an additional westbound lane at the I-95 northbound ramps intersection.

The applicant will coordinate with the City relative to the four-lane extension of Indian River Boulevard from Williamson Boulevard to I-95. The applicant will work with the City regarding responsibility for construction of this section of roadway. Recognizing that it will be a City roadway impacted by multiple developments and that the City of Edgewater has its own transportation impact fees, in accordance with State Statutes, the applicant will coordinate with the City relative to obtaining credits against impact fees for any dollars expended toward Indian River Boulevard.

As it pertains to S.R. 442 at I-95, the developer will coordinate with FDOT relative to whether the applicant will make a proportionate-share contribution to FDOT or actually construct the improvements. Additionally, it should be recognized that some of the development's proportionate-share pertains to mitigating impacts at the I-95/S.R. 421 interchange located approximately 12 miles away. The majority of the trips on which the proportionate-share contribution is based have the other trip end in the vicinity of Port Orange thus the majority of these trips are likely accounted for in the City of Port Orange's concurrency management system. Consideration could be given towards the application of these dollars towards the S.R. 442/I-95 interchange such that the interchange can accommodate additional growth in the City of Edgewater.

Last, recognizing that all the proportionate-share amounts pertain to roadways on the county's impact fee system with the exception of Indian River Boulevard, in accordance with State Statutes, the applicant will coordinate with the County relative to obtaining credits against impact fees for these mitigation dollars.

ADDITIONAL LONG-RANGE PLANNING CONSIDERATIONS

It is recognized that the DRI analysis will be considered along with system-wide long range transportation studies to determine the future needs for the area. The Phase III (2023) analysis is based on a comparison of future volumes to generalized service volumes. The generalized service volumes represent capacities based on generalized assumptions with regard to roadway characteristics and do not necessarily reflect capacities more specific to the study roadways. Additionally, the analyses, in some instances, make use of conservatively high annual growth rates particularly when considering the significant slowdown in the economy as well as the continued increase in gas prices. As such, there is certainly a potential that the 2023 analyses are seriously overstating roadway improvement needs through 2023. Below is a discussion pertaining to three roadway sections and how the identified improvement needs are potentially overstated. The additional assessments below are for informational purposes only and all future needs will be reevaluated in the future in the monitoring and modeling studies.

Old Mission Road from S.R. 442 to Josephine Street – based on a HIGHPLAN analysis which considers actual roadway conditions and 2023 volumes, this section is projected to operate acceptably with two lanes through 2023. Thus the four-laning identified by using generalized service volumes may not be needed by 2023.

S.R. 44 from I-95 to Mission Drive – the capacity identified for this section by Florida Department of Transportation is 1,860 vph. Currently, the majority of this section is free-flow thereby with a likely capacity closer to 2,500. It is recognized that there are likely to be two additional signals on this section by 2023. However, the generalized capacity of 1,860 assumes an average g/c ratio of 0.44 for the major street through movement. Because turning movement information and signal timing information is not available for the future signal locations, we can only provide a qualitative assessment of the future capacity of this section. First, the side-street volumes at most of the signals on this section are expected to be relatively low, thus the g/c ratio for the major street through movement at most signals is likely to be in excess of 0.5. Based on a g/c ratio of 0.5, the capacity of a roadway increases to over 2,100. Therefore, given that the 2023 volume projections are below 2,000, it is reasonable to expect that this section will operate at an acceptable level with the existing four lanes.

U.S. 1, south of S.R. 442 – when considering U.S. 1 south of S.R. 442, a conservatively high annual growth rate of three to four percent was applied whereas the historical annual growth rate is around 0.5 percent. Should traffic volumes grow at a rate more consistent with observed rates, this section will operate acceptably with four lanes in 2023.

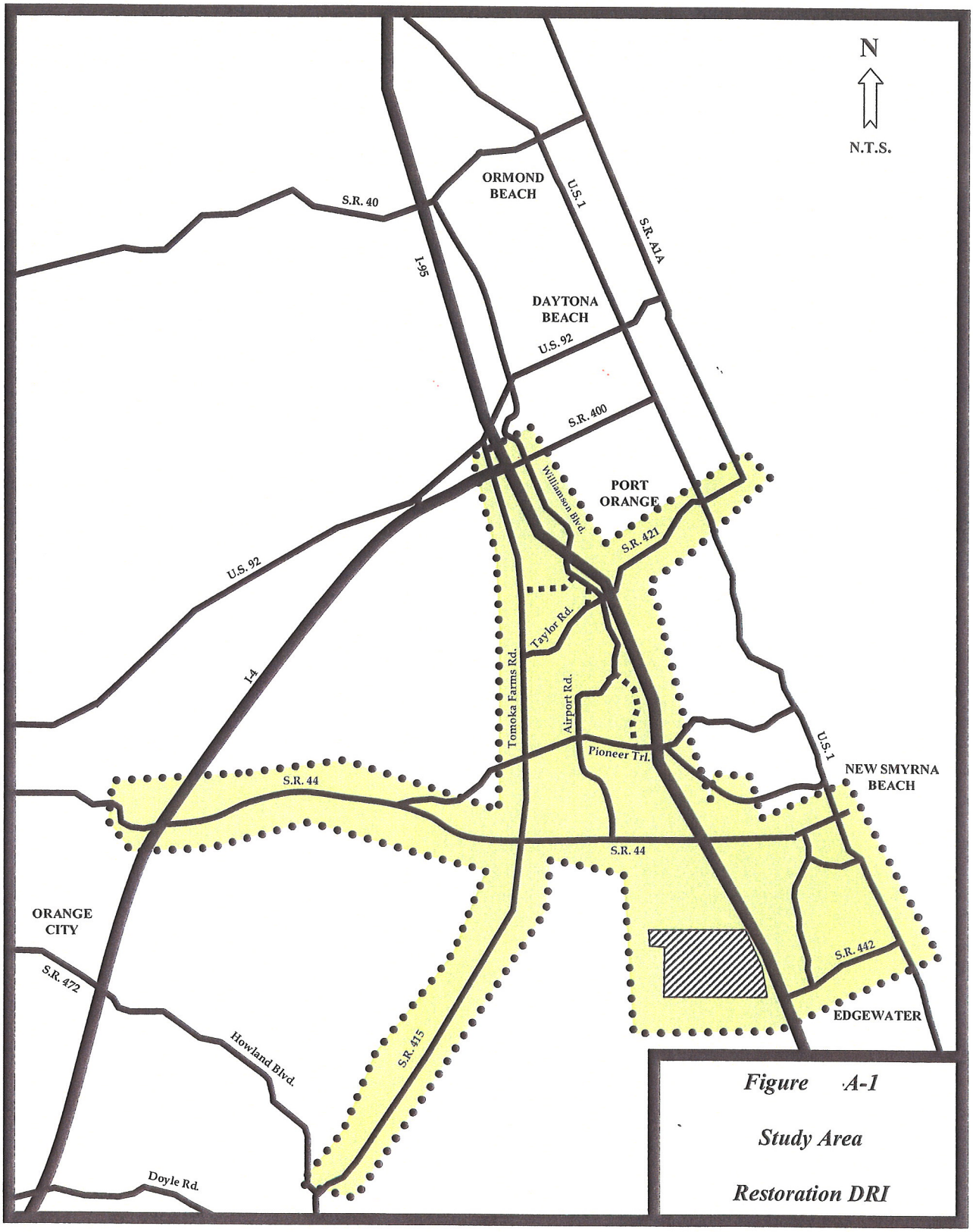

Figure A-1

Study Area

Restoration DRI