

Attachment E

Logistics

for:

Ridge Road Extension Alternatives Analysis

PREPARED FOR:



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Logistics for Ridge Road Extension

Alternatives Analysis

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1.0 General

Pasco County has applied for a permit from the U.S. Army Corps of Engineers (USACE) to construct an extension of Ridge Road from its current terminus at DeCubellis/Moon Lake Road eastward to US 41. The project would construct a new four lane divided roadway known as the Ridge Road Extension (RRE). The project includes ramp connections to an existing overpass at the Suncoast Parkway. Florida's Turnpike Enterprise, a part of the Florida Department of Transportation (FDOT), is a co-applicant for this project.

The purpose of this document is to provide methodology, documentation and results related to an analysis of the logistics/obstacles to construction for each of the alternatives that were analyzed. The geographic limits for the alternatives and determination of logistical impacts is from Starkey Boulevard/Moon Lake Road on the west to US 41 on the east and from SR 52 on the north to SR 54 on the south.

The Clean Water Act Section 404(b)(1) Guidelines (Guidelines) cite *logistics* as one of the considerations in the determination of practicability and whether or not an alternative is "available and capable of being done". There is no definition of *logistics* in the Clean Water Act, nor have USACE or the Environmental Protection Agency (EPA) issued guidance defining this term. For the purpose of this alternatives analysis, *logistics* is defined in the commonly understood way as "the things that must be done to plan and implement a complicated activity". Based on this, two areas of logistical concern will be assessed -- obstacles to construction and relocations.

The logistics consideration under the Guidelines may also relate to feasibility of construction of certain alternatives. No such feasibility of construction constraints were identified for the alternatives being evaluated under this alternatives analysis.

2.0 Alternatives Included

Alternative 1 is no action to the current roadway network therefore it was not included below. The following is a list of the alternatives include in this analysis along with an abbreviated description.

<u>Alt No.</u>	<u>Abbreviated Description</u>
2	4-Lane RRE
3	4-Lane RRE
4	4-Lane RRE
5	4-Lane RRE
6	4-Lane RRE Elevated ¹
7	4-Lane RRE Partially Elevated ¹
8	SR 52 Add 4-Lanes
9	SR 54 Add 4-Lanes

- 10 4-Lane Tower Rd
- 11 SR 54 4-Lane Elevated
- 12 2-Lane Tower Rd & SR 54 Add 2-Lanes
- 13 SR 52 Add 2-Lanes & SR 54 Add 2-Lanes
- 14 2-Lane Tower Rd & SR 52 Add 2-Lanes
- 15 2-Lane RRE & 2-Lane Tower Rd
- 16 2-Lane RRE & SR 52 Add 2-Lanes
- 17 2-Lane RRE & SR 54 Add 2-Lanes

¹ Elevated or partially elevated only within limits of Serenova Preserve.

A more complete description of each of the alternatives, figures showing the conceptual alignments and typical cross sections are included in Attachment A of the Alternatives Analysis.

3.0 Obstacles to Construction

3.1 Methodology

Logistical obstacles to construction were considered as those things that must be done during the planning and design phase of the project to allow for the implementation of an alternative. To evaluate if there are logistical obstacles to construction for an alternative, two elements necessary for the implementation of an alternative were evaluated: 1) consistency with the recommendations of the adopted Pasco County Long Range Transportation Plan (LRTP), a document prepared in compliance with the Federally required transportation planning process and recognized in the overall project purpose; and 2) the ability to obtain permits/approvals from the Florida Department of Transportation (FDOT), the owning/maintaining agency for state highways, for alternatives involving modification to state highways.

Logistical obstacles to construction were determined as a yes or no condition for each alternative based on the two criteria described above. An alternative that is "in accordance with" with the LRTP (as stated in the overall project purpose) will receive a "Yes" rating. Likewise, an alternative that is likely to obtain permits from or the approval of the FDOT to allow for its construction within state controlled right of way will receive a "Yes" rating. The criteria used for determining the likelihood of receiving FDOT permits/approvals are complying with FDOT policy, planning consistency and safety or other traffic operational concerns. A "Yes" rating is given to an alternative if it receives a yes on both of the two determining criteria.

3.2 Findings

3.2.1 Consistency with the LRTP

The preparation of a LRTP by Metropolitan Planning Organizations (MPO) is required under federal and state laws and regulations. The Florida Department of Transportation has developed a MPO Program Management handbook to provide guidance on the preparation of LRTPs (see Appendix E-1). LRTPs must have a planning horizon of no less than 20 years. Pasco County MPO's currently adopted plan is the 2040 LRTP however at the commencement of the alternatives analysis the 2035 LRTP was the current adopted version and has been used for determination of consistency herein (see Appendix E-2 for excerpts). As part of the planning process both a needs plan and a cost affordable plan are developed. The cost affordable plan recognizes that all needs cannot be met due to the limitations in available funding and focusses on higher priority projects. References herein to improvements recommended in the 2035 LRTP refer to the cost affordable plan.

The MPO's 2035 LRTP recommends additional capacity on both the SR 52 and SR 54 corridors in addition to the capacity provided by the parallel routes of the proposed 4-lane extension of Ridge Road from Moon Lake Road to US 41 and the construction of Tower Road from Starkey Boulevard to US 41. On SR 52 the LRTP calls for expanding the highway to a six lane divided facility throughout the study area of this alternatives analysis. On SR 54 the LRTP calls for expanding the highway to a six lane divided facility on segments within the study area where it is not already six lanes. It was recognized in the LRTP that the capacity needs for SR 54 far exceed those of a divided six lane roadway, but the LRTP recognizes that additional lanes beyond 6 general use lanes would be "Managed Lanes" and that the nature of the improvements would be determined by the FDOT. A managed lane is a transportation systems management and operations approach defined as highway facilities or set of lanes within an existing highway facility where operational strategies are implemented and managed in response to changing conditions using various tools. These tools may include accessibility, vehicle eligibility, pricing, or a combination thereof. Some examples of managed lanes are high-occupancy vehicle lanes, truck only lanes, bus rapid transit lanes, reversible lanes and express lanes either tolled or un-tolled.

To determine the nature of the "Managed Lanes" the FDOT and Tampa Bay Area Regional Transportation Authority (TBARTA) undertook a Project Concept Development Study titled Multimodal Transit and Managed Lanes Feasibility Evaluation for SR 54/56 Corridor – US 19 to Bruce B. Downs Boulevard. The study was to evaluate a broad range of multi-modal transportation alternatives for the corridor that provide not only mobility-oriented benefits, but also economic development and environmental benefits as well. In the FDOT/TBARTA study, 18 alternatives were developed that could be divided into two major groupings: elevated (6) and at-grade (12) alternatives. The study recommended the elimination from further consideration

all 12 at-grade alternatives for managed lanes due to negative impacts to existing access, resultant circuitous travel patterns, barriers to movement (both vehicular and pedestrian), and diminished Level of Service (LOS). Five elevated alternatives that included dedicated transit lanes were also eliminated due to inadequate ridership projections, disruption to traffic patterns and pedestrian circulation as well as negatively impacting local businesses due to necessary changes to access. The study concluded that 4 elevated managed or express toll lanes, allowing for both vehicles and buses to operate in the elevated lanes was the most feasible alternative. In summary the relevance of these findings to the RRE Alternatives Analysis is that no at-grade alternatives were recommended that expanded the 6-general use lane configuration of SR 54.

In June 2013, a study funded by the FDOT was undertaken entitled Transit/Managed Lane and Toll Feasibility Study. This study will provide a planning level analysis of estimated costs and potential tolling revenue for the elevated Managed Lane Concept recommended by the previous FDOT/TBARTA study discussed above. Completion of this study was anticipated in December 2014. The relevance of the ongoing study for the elevated Managed Lanes is that the FDOT has stopped planning and the study related to expanding SR 54 beyond six general use or managed at-grade lanes and will not be giving further consideration to at grade improvements to increase capacity.

It is also noted that in December of 2013 the FDOT received an unsolicited proposal from International Infrastructure Partners, LLC to lease right of way owned by the FDOT along the SR 54 corridor for the purpose of designing, constructing, operating and maintaining an elevated toll facility. In May 2014 the FDOT rejected the proposal citing the inability to reach an agreement on the framework of financing the design concept in a manner that would be acceptable to all parties.

The studies, reports and other information related to the above discussion can be viewed at the web site: <http://www.pascocountyfl.net/index.aspx?NID=1537>.

Seven of the 16 Build Alternatives being evaluated by this Alternatives Analysis include adding general use travel lanes on SR 52 and/or SR 54 that are in excess of the six lanes (divided highway with 3 lanes in each direction) shown in the adopted LRTP within the study area. These seven alternatives are not consistent with the LRTP and per the correspondence received from the FDOT (included in Appendix E-4) would not be supported by the FDOT. See Table E-1, Logistical Obstacles to Construction, at the end of this section for a summary of these results.

It is recognized that the LRTP can be revised at any time. Revisions involving major changes to design concepts such as additional capacity lanes are considered major revisions. Major revisions are considered amendments. The process that needs to be followed for an amendment is shown on the flow chart included in Appendix E-1 and

includes opportunities for public input as well as comments from other agencies. Projects proposed for inclusion in the LRTP through the amendment process must consider the same planning factors utilized for development of the original plan. The planning factors that must be considered include but are not limited to whether the project:

- Increases the safety of the transportation system for motorized and non-motorized users;
- Increases the accessibility and mobility of people;
- Promotes consistency between transportation improvements and State and Local planned growth and economic development patterns;
- Enhances the integration and connectivity of the transportation system across and between modes for people and freight.

Revising the LRTP to adopt improvements involving more than six at grade general use lanes on SR 52 or SR 54 would eliminate the logistical obstacle to construction for alternatives that include the expansion of SR 52 or SR 54. However the potential for adoption of such a revision to the LRTP would appear unlikely when considering the planning factors listed above:

- More than six at grade general use lanes do not increase the safety of the transportation system arterial. Historic crash rates available from the FDOT (included in Appendix E-3) show that for non-limited access divided urban, suburban and rural roadways the crash rate increases for six or more lanes compared to four to five lane roadways.
- Wide corridors do not increase the accessibility of people since they make crossing the roadway more difficult for both pedestrian and traffic exiting driveways and non-signalized side streets.
- Including a project with greater than six at grade general use lanes would not be consistent with State and local planning which has ruled out at grade alternatives for managed lanes on SR 54 and is focused on elevated alternatives only. Additionally, the MPO has included a policy statement in the LRTP that states “Future road improvements on non-freeway/expressway roads shall be limited to a maximum of six through-lanes.” Amending the LRTP to include expanding SR 52 and SR 54 to more than six general use lanes would go against this long standing MPO policy and make obtaining approval of such an amendment appear unlikely.
- Adding more general use lanes does not enhance the integration and connectivity of the transportation system between all modes as it just focuses on motor vehicles. On SR 54, FDOT studies have shown that bus transit, bicycle and pedestrian modes would be better served with elevated managed lanes. On SR 52, bicycle and pedestrian needs are also better served by limiting the roadway to six general use lanes.

3.2.2 Obtaining FDOT Approvals/Permits

SR 52 and SR 54 are both owned and maintained by the FDOT. Any construction within FDOT right of way by an entity other than FDOT requires a right of way use permit be issued by the District within which the improvements are to be made. Pasco County is within FDOT District 7 headquartered in Tampa. Eight of the 17 alternatives analyzed in this study involve improvements within FDOT right of way and would require approvals from the FDOT to provide for implementation of the improvements. Of these eight alternatives, only one, Alternative 11, is consistent with the LRTP. The other seven all propose to add general use lanes to SR 52 and/or SR 54 in excess of the six maximum established in the LRTP.

In a letter to Pasco County dated August 27, 2013, FDOT District 7 Secretary Paul Steinman, P.E., reiterates the FDOT's position on the RRE alternatives that was first stated in a letter from the previous District Secretary in 2010, as follows: "the Department does not support any improvements inconsistent with the Pasco County Metropolitan Planning Organization (MPO) LRTP". The LRTP shows SR 54 as having six general use lanes from US 19 to I-75. Secretary Steinman also stated that the Department seldom widens an arterial to 8 lanes or beyond as "research consistently shows a network of roads and a grid system increases capacity and mobility through a region; whereas traffic focused on a limited number of wider corridors results in operational, safety, bicycle, and pedestrian issues."

A selection of research related to the number of lanes and the safety of a facility includes:

Abdel-Aty, M.A., and A.E. Radwan. *Modeling Traffic Accident Occurrence and Involvement*. Accident Analysis and Prevention, Vol. 32, No. 5, 2000, pp. 633-642. Abdel-Aty and Radwan observed that crash rates increase with the number of lanes on urban roadway sections.

Garber, N.J. *The effect of Speed, Flow, and Geometric Characteristics on Crash Rates for Different Types of Virginia Highways*. Virginia Transportation Research Council. Charlottesville, 2000. Garber concluded that accident rates increase with increase in the number of lanes.

Kononov, J., Bailey, B., Allery, B. *Relationship Between Safety and Both Congestion and Number of Lanes on Urban Freeways*. Journal of the Transportation Research Board, No. 2083, Washington D.C., 2008. Kononov concluded that an increase in the number of lanes is associated with an increase in the number of potential lane change related conflict opportunities decreasing safety.

Secretary Steinman further states that the Department supports the LRTP goals of providing mobility and evacuation alternatives through the construction of the Ridge

Road Extension. Correspondence from Secretary Steinman and the previous Secretary, Secretary Skelton are included in Appendix E-4.

The Department did note in their letters that there are two short segments of 8 lane (but no 10 lane) arterials within District 7 in Hillsborough County -- SR 60 (Brandon Boulevard) and SR 582 (Fowler Avenue) both highly commercialized corridors with frequent driveways. The design intent of the outside lanes on these facilities is to serve mainly as a continuous right turn lane for local traffic to accommodate the right turning movements to the numerous driveways and not as general use lanes.

The following table E-1 summarizes the findings of the evaluation of logistical obstacles to construction for each alternative.

Table E-1
Logistical Obstacles to Construction

Alternative No.	Description	Criteria		Policy Consistency/Approval (Yes/No)
		Consistent with LRTP	FDOT Approval Likely	
1	No Action	No	N/A	No
2	4-Lane RRE	Yes	N/A	Yes
3	4-Lane RRE	Yes	N/A	Yes
4	4-Lane RRE	Yes	N/A	Yes
5	4-Lane RRE	Yes	N/A	Yes
6	4-Lane RRE Elevated	Yes	N/A	Yes
7	4-Lane RRE Partially Elevated	Yes	N/A	Yes
8	SR 52 Add 4-Lanes	No	No	No
9	SR 54 Add 4-Lanes	No	No	No
10	4-Lane Tower Rd	Yes	N/A	Yes
11	SR 54 4-Lane Elevated	Yes	Yes	Yes
12	2-Lane Tower Rd SR 54 Add 2-Lanes	No	No	No
13	SR 52 Add 2-Lanes SR 54 Add 2-Lanes	No	No	No
14	2-Lane Tower Rd SR 52 Add 2-Lanes	No	No	No
15	2-Lane RRE 2-Lane Tower Rd	Yes	N/A	Yes
16	2-Lane RRE SR 52 Add 2-Lanes	No	No	No
17	2-Lane RRE SR 54 Add 2-Lanes	No	No	No

4.0 Impacts to Residences and Businesses

The social impacts associated with impacting or relocating homes and businesses is a logistical element of implementing an alternative. In addition to the cost associated with relocations which are accounted for in the cost analysis, the acquisition of right of way must be completed in strict compliance with the Pasco County Real Estate Division's Right of Way Acquisition Process and the various state regulations that must be followed including federal laws / regulations which govern state / federally funded projects. Although both the federal and state laws acknowledge the need for acquisitions of private property for public projects and provide procedures that ensure just compensation for any loss of real or personal property, the federal and state laws do not encourage the acquisition of private property. The federal regulation 42 United States Code (USC) 4625(a) states:

Programs or projects undertaken by a Federal agency or with Federal financial assistance shall be planned in a manner that (1) recognizes, at an early stage in the planning of such programs or projects and before the commencement of any actions which will cause displacements, the problems associated with the displacement of individuals, families, businesses, and farm operations, and (2) provides for the resolution of such problems in order to minimize adverse impacts on displaced persons and to expedite program or project advancement and completion.

4.1 Methodology

Impacts that are adverse to individual residences and businesses are considered a logistical obstacle to the implementation of a project. Impacts to private property were determined in the following manner:

- Typical sections were developed for each alternative to determine the width of the proposed right of way.
- Proposed right of way needs along the alignments were developed based on the widths determined from the typical sections.
- Where an alternative involved adding lanes to an existing facility, the proposed right of way was taken from both sides.
- Where an alternative involved reconstruction of an existing facility the proposed R/W was taken from either the left side or the right side based on an evaluation of which would result in lesser impacts.
- Existing property lines were based on a GIS shape file obtained from the Property Appraiser.
- The existing and proposed right of way lines were imposed on a 2011 aerial image to illustrate locations of the impacts. An impact is where the proposed right of way extends beyond the existing right of way into private property.
- The Pasco County Property Appraiser website was used to differentiate between residential parcels and businesses.

- The Pasco County Property Appraiser website was also used to locate any structures that are newer than 2011 on parcels that appear undeveloped on the aerial.
- If the proposed R/W infringed on a property and was less than 20' from the structure, it was considered a relocation. If the proposed R/W infringed on a property but was more than 20' from the structure, it was considered an impact.
- Findings will be based on the number of impacts and relocations to residences and businesses.

A sample aerial photo based exhibit illustrating how the analysis was performed is provided in Appendix E-5.

4.2 Findings

The findings of the analysis for each alternative are summarized in Table E-2:

Table E-2
Impacts to Residences and Businesses

Alternative No.	Description	Impacts to Residences & Businesses				
		Res/Im	Res/Rel	Bus/Im	Bus/Rel	Total
1	No Action	0	0	0	0	0
2	4-Lane RRE	0	22	0	0	22
3	4-Lane RRE	0	0	0	0	0
4	4-Lane RRE	5	11	0	0	16
5	4-Lane RRE	0	0	0	0	0
6	4-Lane RRE Elevated	0	0	0	0	0
7	4-Lane RRE Partially Elevated	0	0	0	0	0
8	SR 52 Add 4-Lanes	10	10	6	0	26
9	SR 54 Add 4-Lanes	3	0	17	2	22
10	4-Lane Tower Rd	6	14	1	0	21
11	SR 54 4-Lane Elevated	2	0	8	2	12
12	2-Lane Tower Rd SR 54 Add 2-Lanes	10	12	13	1	36
13	SR 52 Add 2-Lanes SR 54 Add 2-Lanes	13	9	16	1	39
14	2-Lane Tower Rd SR 52 Add 2-Lanes	19	21	6	0	46
15	2-Lane RRE 2-Lane Tower Rd	8	12	1	0	21
16	2-Lane RRE SR 52 Add 2-Lanes	11	9	5	0	25
17	2-Lane RRE SR 54 Add 2-Lanes	2	0	11	1	14

5.0 Flood Plain Limits on Existing Roadways

Updated Federal Emergency Management Agency Digital Flood Insurance Rate Maps (DFIRMs) for Pasco County became effective on September 26, 2014. These maps were reviewed to determine if portions of SR 52, SR 54 and Ridge Road between US 19 and the western boundary of the defined study area (SR 52 on the north to SR 54 on the south and Moon Lake Road/DeCubelis/Starkey Road on the west to US 41 on the east) were within the 100 year floodplain. The project purpose includes providing additional roadway capacity and improved routing away from coastal hazard areas in the event of a hurricane or other major weather-related occurrence. The viability of using the existing roadway network to access the improved capacity within the study area is critical to meeting the project purpose. If residents within the coastal hazard areas cannot access the increased roadway capacity to be provided by this project by traveling on the existing network the benefit of the improvement is diminished.

To determine the implications associated with a roadway being within the FEMA established 100 year floodplain, the linear extent and the depth of the flooding was quantified. The linear extent was determined from the extent of coverage based on the DFIRM. The depth of the flooding was determined by comparing the elevation of the roadway determined from 1' contours available from SWFWMD with the established flood elevation from the DFIRM. This comparison of ground surface elevations with the flood elevation is an important step as in some areas the roadway as constructed may provide for one or more lanes above the flood elevation even though the land adjacent to it may be below the flood elevation or it may be less than 1' below the flood elevation and remain passable.

For SR 52, it was determined that approximately 0.1 mile of the roadway immediately east of US 19 are within the 100-year floodplain. Even though the flood depth is up to 2' over the roadway this would have minor impact on routing away from the coastal hazard areas as SR 52 could still be accessed from adjacent population centers via the many intersecting north-south streets east of US 19. Therefore routing to reach the additional capacity to be provided by alternatives improving SR 52 would be relatively unimpeded.

Immediately east of US 19, Ridge Road is within the 100-year floodplain for approximately 0.4 miles of the roadway. Even though the flood depth is up to 2' over the roadway, this would have minor impact on routing away from the coastal hazard areas, as Ridge Road could still be accessed from adjacent population centers via the many intersecting north-south streets east of US 19. Hence, routing to reach the additional capacity to be provided by alternatives improving Ridge Road would be relatively unimpeded.

It was determined that approximately 0.7 miles of SR 54 is within the 100-year floodplain with flood depths up to 2' above the roadway. This flooding occurs approximately 2.5 miles east of US 19 in the vicinity of Rowan Road. There are dense population centers between US 19 and Rowan Road west of the floodplain area. The location of the floodplain is such that it would be an impediment to the routing of these population centers to the additional capacity that would be provided by alternatives improving SR 54 and/or Tower Road. Severe flooding occurred in this area in 2012 when tropical storm Debby stalled over the area. This flooding is described and documented in Appendix E-6.

Table E-3, below, summarizes the location and depth of the 100 year flood above the roadway surface for SR 52, Ridge Road and SR 54. An exhibit that illustrates the location of the 100-year floodplain on the existing roadway network based on the DFIRMs can be found in Appendix E-7. Also included in Appendix E-7 are DFIRM exhibits which can be viewed at www.pascocountyfl.net > Residents > Homeowners > Floodplain Management, then click on Flood Map Viewer.

Table E-3
Extent of 100-Year Floodplain on SR 52, Ridge Road & SR 54

ROAD	FLOOD AREA	STATION	ROAD EL.	FLOOD EL.	FLOOD DEPTH (FT)	LINEAR COVERAGE (MILES)
SR 52	1	0	10	11	1	0.1
		77	9		2	
		220	9		2	
		558	10		1	
		600	11		0	
SR 54	2	12900	17	17.0	0.0	0.7
		13011	17	17.4	0.4	
		13093	17	17.5	0.5	
		13256	16	17.7	1.7	
		13280	16	17.7	1.7	
		13452	17	17.9	0.9	
		13825	17	18.3	1.3	
		13833	16	18.3	2.3	
		13877	16	18.3	2.3	
		14121	17	18.6	1.6	
		14251	18	18.7	0.7	
		14328	18	18.8	0.8	
		14459	17	18.9	1.9	
		14662	17	19.1	2.1	
		14668	18	19.1	1.1	
		14833	18	19.2	1.2	
		14946	19	19.3	0.3	
		15730	19	20.0	1.0	
		15978	20	20.4	0.4	
		16108	19	20.6	1.6	
16174	19	20.7	1.7			
16235	20	20.8	0.8			
16344	20	20.0	0.0			
RRE	3	0	9	11	2	0.4
		538	9		2	
		605	10		1	
		1905	10		1	
		1975	11		0	