

Appendix B: Alternatives Evaluation Methodology



Phase 2

Alternatives Evaluation Methodology



PASCO COUNTY METROPOLITAN PLANNING ORGANIZATION

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Background & Purpose

The Pasco County Vision 54/56 Corridor Study was conceived to develop a transportation vision for the SR 54/56 corridor and an implementation plan for addressing congestion, safety, and mobility within the SR 54/56 corridor.

At the request of the MPO Board, MPO staff developed and conducted a Phase 1 planning study to initiate the development of a vision for the SR 54/56 corridor. The corridor was broken up into 3 key segments, including:

- Segment 1: US 19 to West of US 41 (included in Phase 1)
- Segment 2: West of US 41 to Bruce B. Downs Boulevard (included in Phase 1)
- Segment 3: Bruce B. Downs Boulevard to US 301 (not included in Phase 1)

Based on the priorities established by MPO and County staff, the Phase 1 scope of services focused on Segments 1 and 2. The key outcome of Phase 1 was a reduction in the number of major alternatives from 20+ alternatives down to 12 alternatives, including:

- 6 major roadway and transit alternatives
- 5 complementary alternatives, such as Alternative Intersection Design, frontage/bypass roads
- 1 no-build alternative

The project approach and work plan for Phase 2 builds upon the outcomes of Phase 1. The Phase 2 effort continues the evaluation as one aggregated segment from US 19 to Bruce B. Downs Boulevard (previously segments 1 and 2). Consistent with Phase 1, the segment from Bruce B. Downs Boulevard to US 301 is not included in the Phase 2 evaluation. The two Task Forces are merged into a single Task Force that is being used to guide the Phase 2 work effort.

The Alternatives Evaluation Methodology assumes a 2-step approach and is summarized in this memorandum. Due to funding constraints, Phase 2 is being completed incrementally, with Step 1 being funded by the MPO.

Phase 2 Alternatives

Based on the recommendations of the Task Forces in Phase 1 and some additional clarification of the complementary alternatives, the following alternatives were recommended to and approved by the Phase 2 Task Force to move forward in the Phase 2 evaluation.

Major Roadway and Transit Alternatives (6 Alternatives)

- Alternative B (elevated lanes at major intersections; bus or rail in separate lanes)
- Alternative C (elevated express lanes; no bus service in elevated lanes)
- Alternative D (elevated express lanes; bus service in express lanes)
- Alternative F (modified) (elevated express lanes at major intersections; express lanes on the ground for remainder; bus service in express lanes)
- Alternative G (modified) (elevated express lanes at major intersections; express lanes on the ground for remainder; bus or rail in separate lanes)
- Alternative H (bus or rail in separate lanes on the ground)

Complementary Alternatives (5 Alternatives)

- Continuous Flow Intersection (CFI) (Alternative Intersection Design to be considered for the US 41/SR 54 and Little Road/SR 54 intersections)
- Parallel Flow Intersection (PFI) (Alternative Intersection Design proposed during the public involvement process of the Phase 1 study of the SR 54/56 corridor and to be considered for the US 41/SR 54 and Little Road/SR 54 intersections)
- Frontage/bypass roads
- Optimal Alternative Intersection Design combined with elevated lanes at both intersections (Little Road and US 41)
- At-grade intersection improvements (triple-left turns and single right turn at all approaches as analyzed and provided by FDOT District 7 for additional consideration in this scope of services)

No-Build Alternative (1 Alternative)

- No-Build alternative (maintain existing 6 lanes on the ground)

Phase 2 Evaluation Process

The Phase 2 Evaluation Process is organized into 2 key steps:

- Step 1 – Evaluation of 12 Alternatives at 2 Selected Intersection (SR 54/US 41 and SR 54/Little Road)
- Step 2 – Evaluation of Alternatives (recommended from Step 1) for SR 54/56 Corridor (from US 19 to Bruce B. Downs Boulevard)

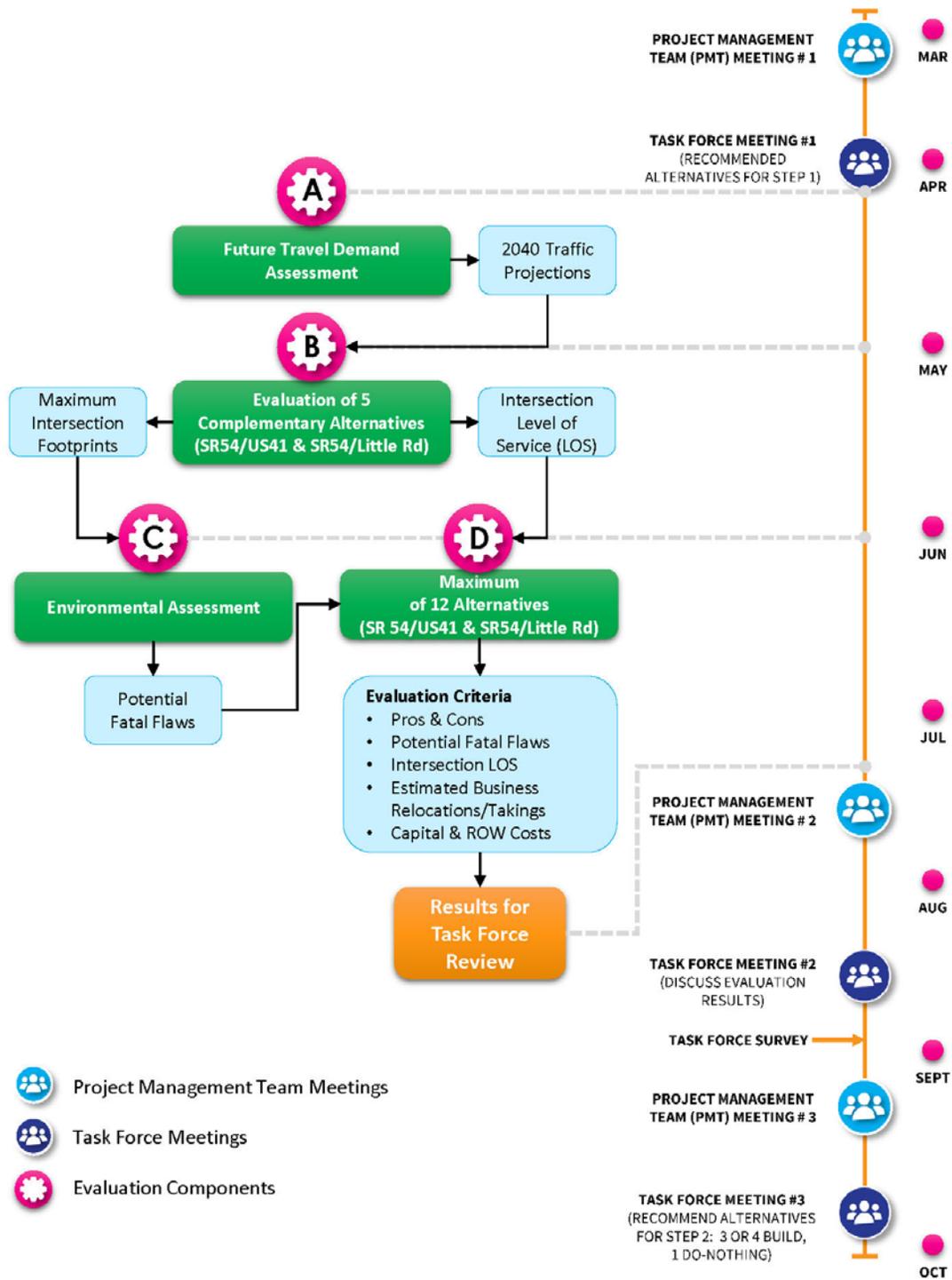
Step 1 – Evaluation of 12 Alternatives at 2 Selected Intersections (SR 54/US 41 and SR 54/Little Road)

In Step 1, the intersections of SR 54/US 41 and SR 54/Little Road were selected for the comparative evaluation of the alternatives since US 41 is the most congested intersection and Little Road is more representative of an average intersection along the corridor (in terms of traffic congestion and right-of-way availability). The Step 1 Evaluation Process and Timeline is illustrated in Figure 1 and is comprised of 4 key elements:

- Future Travel Demand Assessment – The Tampa Bay Regional Planning Model (TBRPM) version 8.1.1 will be used to obtain the projected 2040 travel demand. The TBRPM will be used to perform 4 model runs with the purpose of projecting 2040 travel demand at the representative intersections.
 - First, the no-build 2040 model will be used to derive the 2040 traffic volumes approaching the study intersections for evaluating the CFI and PFI alternatives. The TBRPM 8.1 2040 Cost Feasible model scenario will be used for this alternative.
 - Second, the 2040 model network will be coded and run for the frontage/by-pass road concept. This model alternative will need to at least include frontage/by-pass roads for all the roadway segments feeding the intersections being evaluated. The TBRPM 8.1 2040 Cost Feasible model scenario will be used as the base network for this alternative. Presence and length of frontage roads in this model scenario will be determined based on the adjacent land uses and accessibility needs. Frontage roads would be assumed to be two directional lanes on either side of SR 54/56 (i.e., 2 westbound lanes on the north and 2 eastbound lanes on the south).
 - Third, a 2040 model run will be required for the elevated roadway concept. This alternative will consist of four limited access lanes and six at-grade, signalized lanes along SR 54/56. The TBRPM 8.1 2040 Cost Feasible model scenario will be used as the base network for this alternative, with additional coding to accommodate the elevated/express lanes and access ramps.

Figure 1

Phase 2/Step 1 Evaluation Process and Timeline



- d. Fourth, a 2040 model run will be required for the elevated intersection concept. This alternative will consist of six through-lanes elevated over the study intersections, and four at-grade lanes accessing the intersections along SR 54. The TBRPM 8.1 2040 Cost Feasible model scenario will be used as the base network for this alternative, with additional coding to accommodate the elevated intersection configuration.

Although Step 1 only requires travel demand projections at the 2 intersections, the 4 model runs (only three build concepts) will be coded along the length of the corridor and retained to also potentially support the evaluation of alternatives in Step 2.

Outcome: 2040 Traffic Projections to support the evaluation of 12 alternatives in Step 1

- B. Evaluation of 5 Complementary Alternatives – Operational analysis will be performed on the 5 complementary alternatives as appropriate to define the footprint of the alternatives at the Little Road and US 41 intersections. A traffic methodology statement was prepared to describe the procedures and factors that will be used to convert model volumes to design traffic and the overall approach to the operational analysis (see Appendix A).

This methodology was submitted to MPO and FDOT staff for review and comments were addressed before moving forward with the evaluation. The evaluation of the 5 complementary alternatives for the two selected intersections will determine the intersection layout and geometries. A reasonable maximum number of travel lanes will be used to evaluate the intersection in order to have comparable results for considering impacts and benefits provided by the alternatives.

Outcome: Footprint and Intersection delay measures for each of the 5 complementary alternatives

- C. Environmental Assessment – The FDOT Environmental Screening Tool (EST) will be run for the 2 intersections, given the intersection footprints determined for each alternative in part B. The Area of Interest Tool will be used to identify socio-cultural and environmental resources for future consideration. This assessment will be used to identify potential fatal flaws (if any) or potential risks that should be further considered for impact or mitigation during this and subsequent evaluations. The intersection findings and environmental analysis from the recent FDOT US 41/SR 54 PD&E study also will be considered as part of this analysis.

Outcome: Potential Fatal Flaws identified through the FDOT Environmental Screening Tool

- D. Evaluation of 12 Alternatives – Using the results of A, B, and C, the footprint at the representative intersections (including retention ponds and other drainage features) will be established for the 12 alternatives to support the Step 1 evaluation. Preliminary plan views/cross sections will be developed for each of the alternatives considered at the 2 representative intersections. Once the

complementary alternatives are sufficiently defined, Step 1 assumes the following evaluation criteria:

- Pros and cons (qualitative assessment based on industry literature)
- Pedestrian & Bicycle Safety
- Potential fatal flaws from the Environmental Assessment
- Intersection delay for the forecast 2040 traffic
- Estimated Business Relocations/Takings – To be measured by establishing the assumed cross section for each alternative at the 2 intersections included in the analysis and then overlaying the cross section to identify the potential businesses impacted by the alternative. The number of businesses with potential business impacts will be estimated for each alternative at both intersections. The determination of business taking and potential need for business relocation will be made in cooperation with MPO and Pasco County staff.
- Planning Level Capital and Right-of-Way Costs – A range of planning level capital costs will be developed for each of the alternatives based on unit costs readily available from FDOT District 7 and/or other unit costs needed for the alternatives that include transit investments. A range of right-of-way costs will be estimated based on coordination with FDOT District 7 and information available from the Pasco County Property Appraiser. Note that business damages (in dollars) resulting from right-of-way takings are beyond the scope of this planning study and are excluded from this analysis. A benefit/cost analysis will be performed on each of the 5 complementary alternatives to determine the utility of each.

The results of the Step 1 Evaluation Process will be summarized for presentation to and discussion with the Task Force at their 2nd meeting of Phase 2. Following the Task Force meeting, a survey of Task Force members will be conducted to help facilitate the discussion at the 3rd Task Force meeting. The ultimate objective of Step 1 is for the Task Force to recommend 3 to 4 alternatives and the no-build alternative to the MPO Board to move forward into Step 2 of the Phase 2 evaluation.

Step 2 - Evaluation of Alternatives (recommended from Step 1) for SR 54/56 Corridor (from US 19 to Bruce B. Downs Boulevard)

The preliminary evaluation process for Step 2 has not been finalized since it is not fully funded. FDOT District 7 has agreed to fund the next step of the evaluation for only the SR 54/US 41 intersection and will consider recommendations of the Task Force and the MPO Board as they move forward with the evaluation at this intersection. The MPO is exploring opportunities to fund the Step 2 evaluation for the remainder of the corridor.

Although subject to change, the following criteria were initially established for application in the Step 2 evaluation of alternatives.

- Estimated Business Relocations/Takings – This will be measured by extending the efforts in Step 1 to the entire corridor by establishing the assumed corridor cross section for each alternative and then overlaying the cross section to identify the businesses impacted by the alternative. The corridor cross section will be developed based on the selection of 4 points along the corridor, including the 2 intersections from Step 1. Additional services may be needed to evaluate up to 4 additional intersections to support the development of cross sections for the build alternatives.
- Capital, Operating/Maintenance, and Right-of-Way Costs – A range of capital and operating/maintenance costs, net of user fees such as tolls and transit fares, will be developed for each of the alternatives based on unit costs readily available from FDOT District 7 and other units costs needed for the alternatives that include transit investments. A range of right-of-way costs will be estimated based on information available from the Pasco County Property Appraiser and FDOT. As appropriate, toll revenue assumptions will be drawn from the Pasco County MPO study, “SR 54/56 Transit/Managed Lanes and Toll Feasibility Study” (January 2014).
- Travel Time/Level of Service – This will be measured using the regional travel demand model. In addition to the 2040 model runs from Step 2, additional model runs may be necessary to accommodate changes made since the initial model runs were performed in Step 1. Data derived from these runs can support the estimation of travel time and level of service for all the alternatives along the corridor. Automobile travel time runs will be completed to calibrate the results of the travel demand model. Travel time run data will be collected and averaged over three days. A methodology will be developed and submitted for approval to allocate trips to the transit modes and express lanes among all the alternatives.
- Noise Impacts – For each Step 2 alternative, the number of sensitive sites within the corridor that would be impacted by traffic noise will be derived based on the Federal Highway Administration’s (FHWA) Traffic Noise Model (TNM). See Appendix B for a detailed description of the methodology and data needs proposed for the highway traffic noise methodology to be conducted during Step 2.
- Safety – Safety for motorists, bicyclists, and pedestrians will be assessed for each of the alternatives. This will be measured based on industry literature on crash data and rate statistics by type of roadway.
- Economic Impact (to be led by the Center for Urban Transportation Research under separate contract with Pasco County – see Appendix B for the CUTR scope of work) – The economic impact assessment will be performed for up to 4 alternatives and will report:
 - User travel time-savings measured in time and value of time.

- Changes in business activity levels by industry category (employment and gross sales), aggregated at the two digit levels following North American Industry Classification System (NAICS).
- Changes in property values.

Similar to the Step 1 evaluation, the Step 2 results will be summarized for presentation to the Task Force to facilitate discussion. Following the Task Force discussion, a survey of Task Force members will be conducted to help facilitate the discussion and selection of preferred alternatives that support the vision and purpose and need statement for the corridor. The preferred alternatives will be recommended for consideration by the MPO Board.

Vision 54/56 Task Force

The evaluation methodology presented In this memorandum was reviewed and approved by the Task Force at their first meeting of Phase 2 (April 20, 2017).

Appendix A

Traffic Methodology Statement

Appendix B Noise Analysis Methodology Statement

The highway traffic noise analysis will identify the potential for the Phase 2/Step 1 recommended alternatives, including the no-build alternative, to result in traffic noise levels that would approach, meet, or exceed the Federal Highway Administration’s (FHWA’s) and Florida Department of Transportation’s (FDOT’s) Noise Abatement Criteria (NAC). The analysis, conducted during Phase 2/Step 2 of the Vision 54/56 Study, will also provide a distance from each alternative’s edge-of-travel lane in which noise sensitive land uses should not be constructed in the future.

For the purpose of identifying impacted land uses, project-specific data will be used as input for the FHWA’s Traffic Noise Model (TNM-Version 2.5). The TNM models both constant-flow and interrupted-flow traffic for five standard vehicle types—automobiles, medium trucks, heavy trucks, buses, and motorcycles. The results from the model, expressed in decibels on the A-weighted scale (dB(A)), will provide distances from each roadway segment within each alternative at which the traffic noise levels listed below would be predicted to occur (levels for land uses categorized as being “Activity Categories”). These distances will be used to delineate noise “contours” (i.e., isopleths) on project aerials for each roadway segment within each project alternative.

- 66 dB(A) – The NAC for land uses that include residences, active sports areas, parks, recreational areas, and medical facilities (exterior traffic noise levels).
- 51 dB(A) – The NAC for land uses that include places of worship and public meeting rooms (interior traffic noise levels).
- 71 dB(A) – The NAC for land uses that include restaurants/bars and other developed lands (exterior traffic noise levels).

Project-specific noise-sensitive land uses will be identified by conducting a windshield survey of the corridor and reviewing available information from Pasco County’s online databases. The land uses, as well as the noise sensitive area of each land use, will also be identified on the project aerials. The number of land uses within each Activity Category will then be identified in matrix format.

Data needed to conduct the Phase2/Step 2 noise analysis includes

- Level of service C traffic volumes
- Fleet mix data (classified as cars (two axles and four tires), medium trucks (two axles and six tires), heavy trucks (three or more axles), buses and motorcycles.
- Posted speeds
- Typical sections
- Elevation data

Availability of this data will be assessed prior to the initiation of the Phase 2/Step 2 analysis. Additional data collection and refinement may be necessary in order to conduct the noise analysis.