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4. Developing and Evaluating Potential Improvements

During project planning, potential transportation improvements can be developed and evaluated to streamline alternatives development and analysis during subsequent phases of project development and to support efficient project delivery. **The intent of the alternatives development and evaluation process is to identify and screen a reasonable range of alternatives.** If the resulting recommended alternative(s) for further study and/or elimination are intended to be incorporated into the PD&E phase, the alternatives analyses process must satisfy all applicable requirements outlined in **Section 2.3 Incorporating Planning into PD&E** and the *FDOT Questionnaire for Linking Planning and Environment Review* (PEL Questionnaire) should be completed as described in **Section 2.3.4 Adoption of Planning Study.**

The process of developing potential improvements begins after the transportation needs are identified as a result of the existing conditions analysis and development of the project purpose and need, as described in **Chapter 3: Defining the Problem**. This is an iterative process in which data and input from stakeholders continuously inform and help to refine concepts as project planning advances. In subsequent project phases, potential transportation improvements may be further developed and evaluated to inform the identification of a preferred alternative for the project (where applicable).

4.1 Alternatives Development

4.1.1 Identifying Potential Types of Alternatives

The project planning study should analyze a reasonable range of alternatives to meet the project purpose and need and support the role of the roadway, as described in **Section 3.2.3 Roadway Context Classification and Identifying Roadway Users**, in comparison to the No-Action (No-Build) Alternative.

Based on the FDOT **PD&E Manual**, there are different types of transportation alternatives to be considered including the No-Action (No-Build) Alternative, Transportation Systems Management and Operations (TSM&O) Alternative, Multimodal Alternative, and Build Alternative(s), as described in ***Table 4.1 Types of Alternatives*** and in the section below.

No-Action (No-Build) Alternative

The No-Action (No-Build) Alternative is defined as the alternative in which a proposed project would not occur. The No-Action Alternative does include programmed improvements already proposed as part of related projects. For example, if an intersection improvement is already programmed in a local Transportation Improvement Program (TIP), it would be included in the No-Action Alternative. **The No-Action Alternative serves as a baseline for comparison to any Build Alternative(s)** and must be

identified during alternatives development and analyzed during alternatives evaluation. The No-Action Alternative is carried forward and remains under consideration throughout the project planning study and PD&E phase.

Table 4.1 Types of Alternatives

Type of Alternative	Description
No-Action (No-Build) Alternative	The alternative in which a proposed project would not occur. Serves as the baseline for comparison to any other alternatives.
TSM&O Alternative	Provides operational improvements that extend the service life of the existing facility.
Multimodal Alternative	Includes motorized (such as transit and rail) and non-motorized (such as pedestrians and bicyclists) facilities to meet the purpose and need for the project.
Build Alternative(s)	Improvements such as widening, new roadway segments, intersection improvements, etc.

TSM&O Alternative

TSM&O alternative(s) should be considered in the Planning phase, prior to evaluating Build Alternatives, and engineering analysis must demonstrate that maximization of the existing system through various TSM&O strategies will not meet the purpose and need for the project. If the TSM&O alternative does not meet the purpose and need for the project, the project planning study must briefly explain why. The TSM&O Alternative should focus on **operational improvements that extend the service life of the existing facility**. TSM&O improvements include strategies that optimize the performance and utilization of existing infrastructure to preserve capacity and enhance the security, safety, and reliability of the transportation system.

TSM&O strategies to be considered may include enhancements to the existing facility, such as ramp metering, traffic management systems, traffic control strategies, traffic incident management, parking management, transit signal priority systems, and other activities identified in the **TSM&O Strategic Plan**.

Multimodal Alternative

Multimodal alternative(s) may be considered in the Planning phase. The Multimodal Alternative includes motorized (such as transit and rail) and non-motorized modes (such as pedestrian and bicycle facilities) to meet the purpose and need for the project. Any multimodal projects included in the Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP), TIP, or Transit Development Plan should be considered in the project planning study and, if they are consistent with the project's purpose and need, they should be developed and analyzed as Build Alternative(s). Coordination with the District Transit or Modal Office is important when identifying and evaluating multimodal alternatives.

Build Alternative(s)

The Build Alternatives are proposed to meet the purpose and need of the project. Each Build Alternative must include:

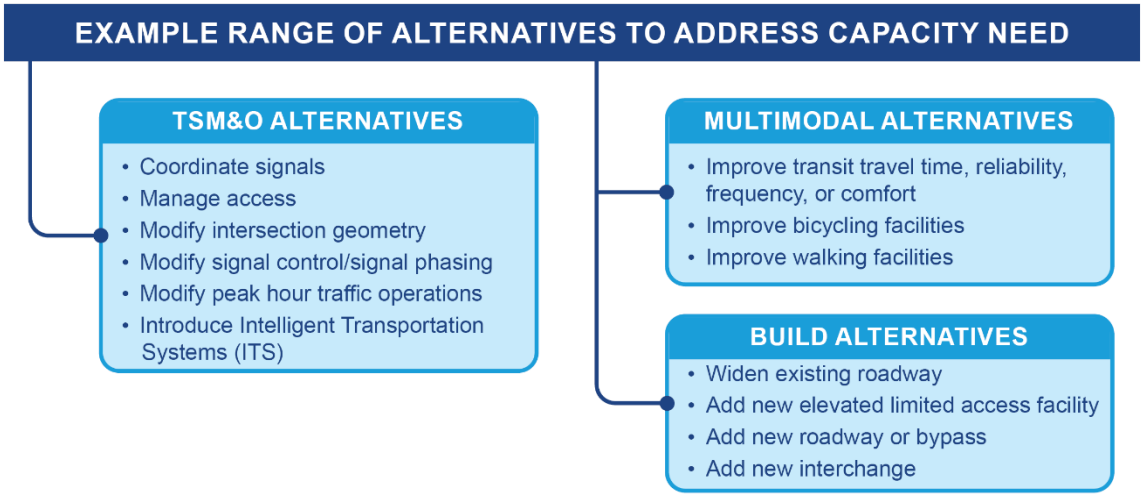
- Logical termini with sufficient length to meet the purpose and need and address environmental factors on a broad scope
- Independent utility to function as designed and be a reasonable expenditure if no additional transportation improvements are made in the area
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements

Analysis of Limited Access Facilities

In accordance with Section 334.63, F.S., project planning studies for capacity improvement projects on limited access facilities must include the evaluation of alternative(s) that provide transportation capacity using elevated roadway above existing lanes.

For example, if a project includes capacity as the purpose and need, the range of alternatives may include TSM&O, Multimodal, and/or Build Alternatives as shown in the figure below.

Figure 4.2 Example Range of Alternatives to Address Capacity Need

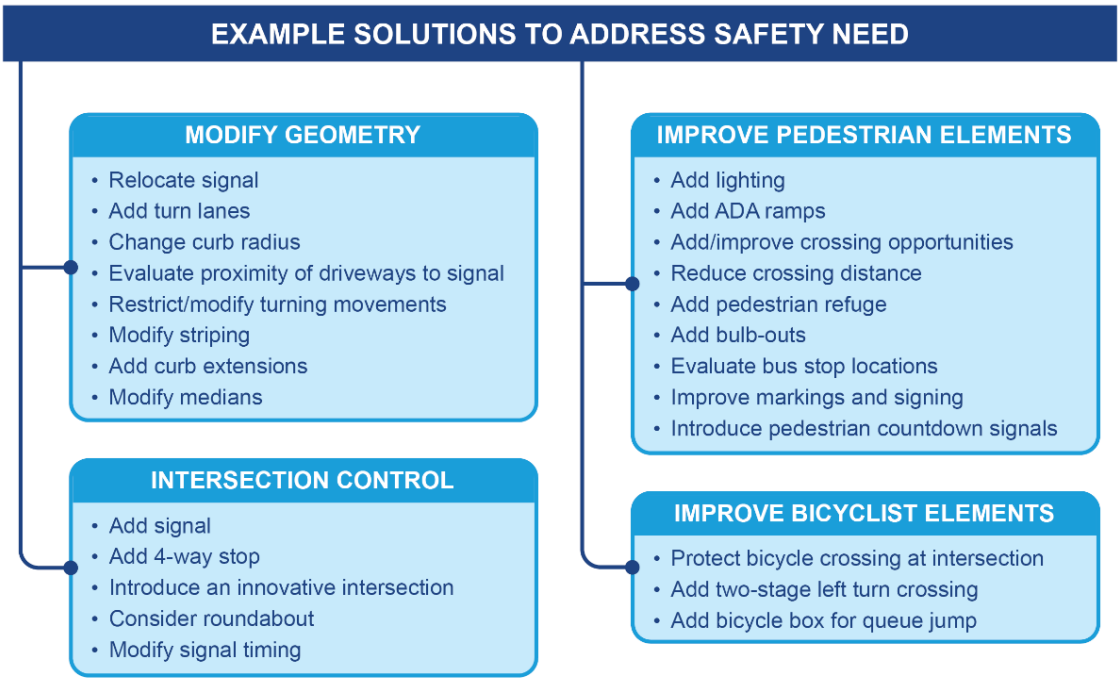


An initial qualitative screening of these types of alternatives can be conducted early in project planning to evaluate how well they meet the project's purpose and need. **If an alternative does not meet the purpose and need, it can be eliminated as unreasonable during the planning phase, and the reason why it was not carried forward should be briefly documented.** See **Section 4.2 Alternatives Analysis** for more detail on this initial screening.

4.1.2 Developing a Range of Alternatives

Once the appropriate alternative(s) have been determined, additional detail can be developed for each alternative to be used in the alternatives analysis, as described in **Section 4.2 Alternatives Analysis**. The number of alternatives to be analyzed during project planning is based on the purpose and need and should be relative to the size and complexity of the project. There may also be opportunities to develop detailed alternatives that incorporate TSM&O strategies and/or multimodal improvements within a Build Alternative to meet the project's purpose and need. During the development of alternatives, there may also be opportunities to identify minor projects that can be implemented in the shorter term (e.g., maintenance projects or traffic operations changes). ***Figure 4.2 Example Solutions to Address Safety Need*** illustrates typical safety-related improvements that can be considered when developing alternatives. These example improvements may be incorporated into a Build Alternative or into a project for which safety is either the primary purpose and need or a project goal.

Figure 4.2 Example Solutions to Address Safety Need



The No-Action Alternative is retained throughout the alternatives evaluation process as described in Section 4.2 Alternatives Analysis and used as the baseline for comparison of all other alternatives, even if it does not fully meet the project's purpose and need. The development and refinement of alternatives should be coordinated with agency stakeholders, the public, and FDOT technical staff to ensure input from all relevant parties is considered.

4.1.3 Engineering Considerations

The level of detail needed for alternatives definition will vary based on the project's level of complexity and the type of study. For this manual, "level of complexity" refers to the degree of effort and coordination needed to complete the future National Environmental Policy Act (NEPA) analysis, considering factors such as the number of environmental resources affected, the level of public and agency input, the potential for significant impacts, and the anticipated number of future permitting agencies.

Engineering analyses conducted during project planning are intended to support decision-making, not to reach the level of conceptual design required during the PD&E phase. During project planning, **the engineering analysis should be performed to a level of detail that is sufficient to define and compare the alternatives to one another, in consideration of community effects and the cultural, natural, and physical environment**. For a defensible comparison, each alternative retained for comparative evaluation should be developed to a comparable level of detail for relevant engineering considerations. For example, project planning usually involves the evaluation of typical sections for capacity projects. The engineering analysis for a roadway alternative may address horizontal alignment only, and vertical alignment may be evaluated only if profile or structural considerations are critical to the comparison of alternatives.

When developing alternatives, opportunities to avoid and minimize impacts to environmental resources should be applied consistently to all alternatives compared to each other (as feasible based on each alternative concept).

4.1.4 Traffic Analysis to Inform Alternatives Development

Existing and future project traffic analyses are typically initiated while defining the problem and developing the project's purpose and need, as discussed in **Section 3.3.9: Traffic Analysis and Forecasting**. As project planning progresses to defining and evaluating project alternatives, additional and iterative traffic analysis may be needed to guide typical section and concept plan development. These analyses involve evaluating which alternatives are likely to address existing and future traffic demands based on how each alternative may perform under existing and future traffic scenarios. Traffic analysis can identify existing and projected vehicular LOS or other performance measures (delay, volume to capacity ratio, travel time, density, and reliability), which are used when comparing alternatives and their ability to meet the purpose and need. Additional analyses may be needed for project-specific conditions. For example, a corridor experiencing increasing freight traffic should include analysis of heavy-vehicle volumes and identification of regional freight routes. The methodology for additional traffic analysis should be developed in coordination with the FDOT District and based on the **FDOT Traffic Analysis Handbook**. Traffic analysis should be documented so that the methodology, input values, and analysis results are easily understood.

4.1.5 Concept Development

High-level concept plans and conceptual typical sections can be developed to illustrate each alternative and aid in the visualization of project features. **Conceptual typical sections** are prepared to show the geometric features of the existing condition and each project alternative. Common elements of the typical sections developed for a project planning study may include:

Typical Section

The primary purpose of the typical section is to provide depictions of the roadway, bridge, and other elements that illustrate "typical" conditions within the project limits.

- Existing and proposed right-of-way or easements
- Travel lane widths (total and individual lanes)
- Median width and type
- Bicycle lanes
- Sidewalk, shared use path, and urban side path locations and widths
- On-street parking

Development of typical sections is based on the roadway's geometric design and configuration, which are governed by the **FDOT Design Manual** (FDM) roadway design criteria, with **design speed serving as a key controlling factor.** Design speed dictates items such as the horizontal alignment, superelevation, stopping sight distance, and lane widths, and influences the location and design of driveways and curb radii, making it an important factor to evaluate during the alternatives development stage of project planning. Design speed should be evaluated in relation to context classification as set forth in the **FDM, Part 2, Chapter 201, Design Controls**. The FDM also sets out different lane widths, sidewalk widths, turning lane widths, median widths, bike lane configuration, and speed management strategies based on context classification.

Additional information on typical section development can be found in the **FDM, Part 2, Chapter 913, Typical Sections** and **FDM, Part 1, Chapter 120, Design Submittals**.

High-level concept plans can then be developed based on the conceptual typical sections and should build on the existing and future conditions analysis, documented as described in **Section 3.3.10: Documenting the Analysis**. Previous documentation may include base maps displaying the collected data within the study area, which can serve as the starting point for developing alternative concepts.

4.2 Alternatives Analysis

Once the range of alternatives has been developed, the next step is to conduct alternatives analysis to evaluate each alternative, determine its feasibility, and identify which alternatives should be carried forward for further evaluation or eliminated from consideration. The alternatives analysis supports Planning and Environment Linkages (PEL) objectives by narrowing the number of alternatives to be carried forward to future phases and can result in the identification of a recommended alternative(s) for evaluation in the PD&E or Design phases.

Goal of Alternatives Analysis

At the end of project planning, the goal is to recommend alternative(s) for the next phase (PD&E or Design) that are feasible from an engineering, environmental, and cost standpoint and that are supported by the community.

During project planning, alternatives analysis is used to:

- Determine the feasibility of each alternative, based on engineering considerations, potential environmental impacts, and funding opportunities.
- Evaluate potential involvement with environmental resources.
- Identify potential avoidance, minimization, and mitigation opportunities.
- Eliminate unreasonable alternatives and narrow the range of alternatives to be evaluated in future phases.
- Highlight key issues to be further addressed during the PD&E phase.
- Determine funding needs and a potential implementation plan for programming future phases through Construction, in compliance with FDOT's Project Development Policy.
- Develop a planning product and PEL Questionnaire that may be adopted or incorporated by reference into a subsequent environmental review process when applicable requirements and agency determinations are satisfied.

Reasonable Alternative

Alternatives that are technically and economically feasible and meet the purpose and need for the proposed action.

The alternatives evaluation process should be conducted during project planning to adequately evaluate and compare the alternatives against the project's purpose and need, study area considerations, and public input while maintaining the PEL objectives outlined in Section 2.3 Incorporating Planning into PD&E.

The alternatives analysis process should begin with a high-level screening of the potential improvements to eliminate unreasonable alternatives, such as those that do not meet the project's purpose and need, from further detailed analysis.

Next a screening of the remaining alternatives can be completed to identify and eliminate unreasonable alternatives. Further analysis should evaluate the remaining alternatives based on factors such as community effects, environmental impacts, or project costs of an extraordinary magnitude compared to other reasonable alternatives.

Eliminating Unreasonable Alternatives

Alternatives screening should identify unreasonable alternatives as early as practical in project planning to improve efficiency.

For example, an alternative is considered unreasonable if it is not technically feasible based on engineering criteria or sound engineering judgement.

Alternatives that remain after this screening are then evaluated in greater and equal detail to determine the extent to which they perform in satisfying the purpose and need, achieve engineering criteria requirements, avoid and minimize environmental impacts, resolve public controversy, and overall project costs.

The alternatives analysis process should employ a formal evaluation framework using qualitative and/or quantitative methods and may follow a multi-step process. For example, an initial screening may focus solely on evaluating the alternatives' comparative success in meeting purpose and need, followed by additional screening steps based on agreed-upon criteria established using recent, relevant, and accepted data sources. For the planning decisions determined by these analyses to be adopted into future phases, alternatives at each step must be developed to a comparable level of detail of detail to support a defensible comparison. This process should be well-documented and provide an objective, transparent, and reproducible evaluation of the alternatives. Further details on this process are included in the remainder of this chapter and in the **PD&E Manual Part 2, Chapter 3A, Alternatives Analysis**.

The project planning study must document the analysis process and results in sufficient detail to support decisions made during alternatives analysis, including the rationale for alternatives that are retained or eliminated.

4.2.1 Development of the Evaluation Criteria

A key factor in the alternatives analysis process is defining the criteria that will be used to evaluate whether an alternative is considered in comparison to the other alternatives and how well each alternative meets the project's purpose and need. Alternatives should be evaluated using a consistent set of criteria that use recent, relevant, and accepted data sources throughout the screening process. To meet PEL requirements, the alternatives must be evaluated in consideration of the balance among environmental impacts, engineering and operational considerations, project costs, and public and stakeholder input. Therefore, potential categories of evaluation criteria are described in the following sections and include:

- Purpose and Need
- Engineering Considerations

- Community Effects
- Environmental Impacts
- Traffic Operations and Safety
- Project Costs

Qualitative and quantitative criteria can be used to compare alternatives. However, potential future permitting requirements and environmental regulations often require quantitative analysis to substantiate recommending an alternative with greater environmental impacts than another or eliminating an alternative with fewer environmental impacts.

The following evaluation criteria provide the foundation for a defensible and adoptable alternatives analysis, must utilize recent, relevant, and approved sources, and may be modified or expanded on a project-by-project basis. Once identified, these evaluation criteria should be documented in an evaluation matrix, as described in **Section 4.2.9 Evaluation Matrix**, and shared with agencies, the public, and other stakeholders for review and comment.

4.2.2 Purpose & Need Satisfaction

This set of criteria is used to assess how each alternative addresses and/or supports the purpose and need statement and is the foundational basis for the defensibility of the alternatives analysis. Potential alternatives should be evaluated to determine whether each meets the primary purpose and need. **An alternative that does not meet the primary purpose and need is considered unreasonable and must be eliminated.** The remaining alternatives can then be evaluated to determine the extent to which each alternative meets the purpose and need, using qualitative or quantitative measures depending on the project context. Additionally, secondary goals and objectives (as discussed in **Section 3.4.2 Defining Purpose and Need**) can be used to compare alternatives that meet the primary purpose and need.

For example, a project is a multi-use trail with the purpose of providing regional connectivity and enhancing the existing trail network, including connections to regional facilities, communities, and features, such as cultural and heritage sites, parks, preserves, wildlife corridors, and agricultural lands. The following criteria could be used to analyze how well the proposed alternatives meet the purpose and need:

- Provides access to local parks
- Provides access to state or federal parks, preserves, forests, and/or wildlife management areas
- Provides access to historic and/or cultural sites
- Connects to or through existing and/or candidate trail towns

As discussed in **Section 3.4.1 Applicability for Project Development**, FDOT uses the Efficient Transportation Decision Making (ETDM) process to obtain input from resource agencies and local and regional planning organizations on the purpose and need for projects that are screened through the Environmental Screening Tool (EST). If a project has been screened using ETDM, any comments

received related to purpose and need should be considered for incorporation into this evaluation. For more details on purpose and need, refer to **Section 3.4: Developing and Refining the Project Purpose and Need**.

4.2.3 Engineering Considerations

The engineering considerations used to evaluate alternatives should be clearly documented and applied consistently for each alternative. The following are key engineering considerations for analyzing and comparing alternatives:

- **Horizontal and Vertical Geometry:** Provide an appropriate level of geometric detail for comparing alternatives. Vertical geometry is not typically required during project planning unless structural or profile considerations are critical to evaluating the alternatives.
- **Typical Sections:** Graphic typical sections are recommended to clearly depict the proposed alternative(s) and to compare the alternatives to the existing condition.
- **Potential Right-of-Way (ROW) Impacts (Residential and Business):** Estimate ROW needs (acres and/or number of impacted parcels), the number of potential residential relocations, and the number of potential business relocations.
- **Context Classification:** Use to provide the framework for context-based design.
- **Multimodal Accommodation:** Consider bicycle and pedestrian accommodations and other modes of transportation such as freight, transit, rail, and aviation, as applicable to the project.
- **Structures:** Identify the number and type of existing structures within the project study area that may be impacted. If applicable, document the condition (structural rating, suitability for widening or retrofitting) of the structure and identify proposed structural improvements.
- **Access Management:** Evaluate the corridor's existing and proposed access management classification.
- **Drainage and Floodplain Impacts:** Provide an appropriate level of detail for alternatives comparison. This may range from a high-level discussion of drainage needs for project (such as additional ponds and floodplain compensation) to more detail estimates of the number of acres impacted. Conduct Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS) analysis to identify potential project stormwater impacts, partners, and stormwater management solutions.
- **Utility and Railroad Impacts:** Identify the number and type of utilities and/or railroads that may be impacted.
- **Constructability:** Describe the major constraints or challenges related to construction (such as maintenance of traffic and potential major road closures or detours).
- **Project Costs:** Evaluate the costs of PD&E, Design, ROW, Construction, and Operations and Maintenance phases.

Additional information on engineering considerations is detailed in the **PD&E Manual Part 2, Chapter 3, Engineering Analysis**, however the analysis is not expected to reach the level of detail required during the PD&E phase.

4.2.4 Community Effects

Evaluating potential impacts to the community begins with the data collection that was conducted while defining the problem, as described in **Section 3.3.8 Community Characteristics and Key Stakeholders**. Building from this data, a community impact assessment evaluates how each alternative affects the community and should consider the following elements:

- Social
- Economic
- Land use changes
- Movement of people and goods
- Aesthetic effects
- Relocations (business and residential)
- Farmlands

The community impact assessment should be closely tied to the public involvement process (see **Section 4.3 Public Involvement & Agency Coordination**) to ensure that community values and concerns are considered and that no population groups are disproportionately affected by the project. For more detailed information regarding the analysis of community impacts, refer to the **PD&E Manual Part 2, Chapter 4, Community Impact Assessment**.

4.2.5 Environmental Impacts

Environmental analyses conducted during project planning are intended to shape alternatives, identify major constraints, and support decision-making. The environmental analyses during planning is intended to be **comprehensive, defensible, and must utilize recent, relevant, and approved data sources** in order to achieve a repeatable effort that can enable planning decisions to be adopted into future project development phases, when applicable. However, **the environmental analyses in the planning phase is not expected to reach the level of detail required during the PD&E phase**. The project planning study should summarize the environmental characteristics of the study area, focusing on how they influence the project alternatives. Identifying environmental resources during project planning is also beneficial for **identifying constraints that shape avoidance, minimization, and mitigation opportunities** to be considered during the development and evaluation of potential improvements. The presence and general extent of the following environmental resources should be identified, applicable to the study area:

- **Wetlands and surface waters**: General location and extent of wetlands and other surface waters potentially affected by the project, including proximity to the corridor and any obvious areas where impacts may be difficult to avoid (see the **PD&E Manual, Part 2, Chapter 9, Wetlands and Other Surface Waters**).

- **Floodplains**: Floodplain areas (e.g., FEMA mapped flood zones) adjacent to or intersecting the project, especially where improvements may affect flood storage or conveyance (see the **PD&E Manual, Part 2, Chapter 13, Floodplains**).
- **Conservation and mitigation areas**: Publicly or privately managed conservation lands, preserves, or other protected natural areas near the project that may constrain alignment options.
- **Protected species and habitats**: Known or potential occurrences of listed species and associated habitats, based on mapped data and existing information (see the **PD&E Manual, Part 2, Chapter 16, Protected Species and Habitat**).
- **Cultural and historical resources**: Known historic properties or archaeological resources in or near the study area, including sites with Tribal significance, and sites listed or eligible for listing on the National Register of Historic Places (NRHP), such as historic districts, structures (including bridges), objects, or archaeological remains (see the **PD&E Manual, Part 2, Chapter 8, Archaeological and Historical Resources**).
- **Parks and recreation areas**: Public parks, recreation areas, trails, and similar facilities, including resources that may be subject to special protection (e.g., potential Section 4(f) considerations in later phases). See the **PD&E Manual, Part 2, Chapter 7, Section 4(f) Resources**.

Section 4(f) Resources

Protected properties and land from publicly owned parks and recreation areas, wildlife and waterfowl refuges, and publicly or privately owned historic sites as codified in 23 USC 138 and 49 USC 303.

- **Contamination**: Known or potential contamination sites (e.g., leaking underground storage tanks, hazardous materials sites, landfills) that could affect alignment decisions (see the **PD&E Manual, Part 2, Chapter 20, Contamination**).
- **Noise:** Noise-sensitive land uses (e.g., residential areas, schools, hospitals, parks) located adjacent to or near the corridor (see the **PD&E Manual, Part 2, Chapter 18, Highway Traffic Noise**).

Integrating environmental data from multiple GIS and database sources, (e.g., ETDM EST, agency GIS layers, aerial imagery, limited field reviews, and prior studies) helps provide sufficient information to determine whether there are any fatal flaws and to identify environmental constraints. Data should be compiled and information maintained in a manner that will support later project development phases.

Environmental Screening Tool (EST)

The EST is an internet-based interactive database and mapping application that supports early coordination with agencies and communities through the ETDM Planning and Programming Screens.

Once sufficient detail is available for the proposed alternatives, as described in **Section 4.1: Alternatives Development**, it may be appropriate to conduct the ETDM Planning Screen for qualifying projects (described in **Section 1.1.1 Applicability**). The information needed to enter projects into the ETDM Planning Screen includes a project overview, description, preliminary purpose and need, and a Preliminary Environmental Discussion (PED) that addresses, at a minimum, social and economic conditions, land use, mobility, aesthetic considerations, relocations, farmlands, cultural and tribal resources, natural resources (wetlands, water resources, floodplain, protected species, etc.), and physical resources (such as noise, air quality, contamination, and other categories). The ETDM Planning Screen may employ a focused PED, allowing for the selection of specific topics for review and consideration. As a result, not all items in the PED topic list are required to be addressed for every project.

Streamlining Opportunity – Environmental Data

Early collection of key environmental resource data in the planning phase - aligned with the ETDM and PD&E Manual - can streamline subsequent PD&E activities.

For planning projects that are intended to meet PEL standards the completion of the ETDM Planning Screen is a significant opportunity as it meets the requirement for presenting the project to the national, regional, and local environmental and planning agencies. Additional information about the EST and the ETDM Planning Screen process is documented in the **ETDM Manual**.

4.2.6 Traffic Operations & Safety

This element focuses on evaluating how each alternative will affect overall transportation performance and safety under both existing and future conditions. The key factors listed below provide a planning-level framework for comparing alternatives in terms of operational efficiency, reliability, and safety outcomes.

- Existing and future levels of service (LOS)
- Intersections/signal level of service or delay
- Multimodal quality of service
- Safety/crash frequency
- Traffic volumes/throughput
- Travel time/travel time savings
- Speed/percentage speed above target speed
- Delay
- Emergency response
- Hurricane evacuation

For the alternatives analysis, these factors can be used to qualitatively and, where data allows, quantitatively assess the relative benefits and impacts of each alternative. By applying common performance metrics (e.g., LOS, travel time savings, crash trends) across all alternatives, the analysis will identify which concepts best improve operations, enhance safety, support multimodal access, and maintain critical functions such as emergency response and evacuation, thereby informing a more objective and defensible selection of alternatives recommended to move into the next phase of project development.

4.2.7 Project Cost

During project planning, preliminary costs are typically developed to support work program development, compare alternatives, and evaluate cost-feasibility. Each alternative should be evaluated for the full cost to implement the project, including PD&E, design, right-of-way acquisition, construction, operations, and maintenance. When using cost as a screening factor, clear parameters for comparing alternatives should be established. For example, cost-feasibility can be evaluated in the context of the overall transportation funding available in the state or region, as well as the specific amounts programmed for this project through the transportation planning process.

Planning-level costs are high-level, order-of-magnitude estimates prepared using historical, industry-average costs for major components (such as per-mile roadway construction costs). The construction cost for each Build Alternative may be developed using FDOT's Long Range Estimate (LRE) program tool or another acceptable cost estimation method, however, at a minimum, the LRE should be developed for the recommended alternative if it has been identified. These planning-level costs are used for comparative purposes and feasibility evaluations, and to support programming and phasing of future project development phases. Preliminary costs can help identify phasing strategies needed to implement alternatives, particularly those with higher costs or long-term implementation timeframes.

As the project advances into future project development phases and more detail is known about project components (such as structures, drainage, signals, signing and pavement marking, and landscaping), FDOT's LRE unit costs and detailed cost models are used to refine and update the preliminary costs. The planning-level costs should be documented in the project planning study (or planning product), including a description of the assumptions and limitations and acknowledgment that these preliminary costs will be refined and updated as more detailed concepts are developed in subsequent project development.

4.2.8 Other Considerations

Additional factors may be incorporated as evaluation criteria applied to the alternatives analysis. They may include impacts to economic development, ease of implementation, permitting requirements, and security, among others.

4.2.9 Evaluation Matrix

Comparing alternatives at the planning level helps identify and evaluate the relative advantages and disadvantages of each alternative. The results of the alternatives comparison play a significant role in the selection of alternative(s) to move forward in the project development process; therefore, it is important to have a well-organized and transparent method for illustrating these results. The results of the analyses should be summarized through the use of an evaluation matrix that illustratively compares the proposed alternatives. It is an effective method of documentation and a tool to solicit public feedback and

agency/stakeholder input. An example evaluation matrix is provided in ***Figure 4.3 Example Evaluation Matrix***.

The **PD&E Manual, Part 2, Chapter 3A Alternatives Analysis** provides more information on developing an alternatives evaluation matrix. This information can be used as a guide when developing the evaluation matrix for planning phase considerations.

Figure 4.3 Example Evaluation Matrix

Evaluation Criteria	PROJECT ALTERNATIVES			
	No Build	Alternative 1	Alternative 2	Alternative 3
Purpose & Need				
Accommodates Future Traffic Demand	No	Yes	Yes	Yes
Safety Improved	No	Yes	Yes	Yes
Community Impacts				
Number of Parcels Impacted				
Residential	0	73	56	49
Commercial	0	16	9	14
Governmental	0	6	6	6
Agricultural	0	1	1	1
Other	0	7	5	5
Total	**0**	**103**	**77**	**75**
Potential Relocations				
Residential	0	14	8	10
Commercial	0	2	0	3
Governmental	0	0	0	0
Agricultural	0	0	0	0
Other	0	0	0	0
Total	**0**	**16**	**8**	**13**
Right-of-Way Required (acres)				
Residential	0.000	16.209	16.150	16.065
Commercial	0.000	2.712	2.654	2.813
Governmental	0.000	8.509	8.454	8.767
Agricultural	0.000	1.188	1.210	0.944
Other	0.000	3.379	3.382	3.376
Total	**0.000**	**31.997**	**31.850**	**31.964**
Utility Impacts (Low/Moderate/High)	None	Moderate	Moderate	Moderate
Potential Historic/Archaeological Impacts (Low/Moderate/High)	None	High	High	High
Environmental Impacts				
Wetlands (Acres)	0	18.254	18.292	18.352
Floodplains (Acres)	0	30.393	30.393	30.393
Threatened & Endangered Species (Low/Medium/High)	None	Medium	Medium	Medium
Potential Contamination Sites (Low/Medium/High)	X	X	X	X
Project Cost				
Final Design[1]	$ 0	$ 7M	$ 7M	$ 7M
Right-of-Way Acquisition	$ 0			
Roadway Construction[2]	$ 0	$ 61.04 M	$ 61.04 M	$ 61.04 M
Total Costs	**$ 0**			

[1] Amount reflects FDOT Five Year Work Program 2022-2026 Adopted
[2] Roadway construction cost developed using FDOT's Long Range Estimates (LRE) tool

4.3 Public Involvement & Agency Coordination During Alternatives Analysis

Refer to **Section 3.5 Public Involvement & Agency Coordination** for detailed information on key principles and objectives when conducting public involvement and agency coordination as well as effective engagement strategies that apply throughout the project planning study.

4.3.1 Public Involvement

Public engagement during the alternatives analysis phase builds on the shared understanding of the project purpose and need developed during problem definition (see **Section 3.5 Public Involvement & Agency Coordination**) and shifts to exploring solutions and inform project decision-making. The overarching goals of engagement activities at this stage are to obtain feedback on the range of viable solutions under consideration, identify constraints and potential fatal flaws early, and support thoughtful evaluation of alternatives based on the project's purpose and need, community values, and agency input.

During alternatives analysis, engagement should invite the public, stakeholders, and agencies to react to draft concepts, suggest additional ideas or refinements, and highlight local conditions and community goals that technical work alone may miss. **Engagement activities should be designed to help participants understand tradeoffs between alternatives, including benefits, impacts, costs, and feasibility, so that feedback is grounded in a realistic picture of what each option can and cannot achieve.** ***Table 4.2 Key Aspects of Public Involvement During Alternatives Analysis*** describes coordination that is useful for specific outreach priorities and the desired outcomes and methods for documentation during the alternatives analysis phase.

Because conclusions at this stage are based on planning-level analysis, the methodologies and assumptions used during evaluations should be communicated clearly and transparently. This clarity helps stakeholders understand what can (and cannot) be recommended at this stage and sets appropriate expectations for subsequent phases. The evaluation of alternatives should result in a documented set of alternatives, a transparent screening process, and a clear rationale for which alternatives are recommended for further consideration or eliminated. The results of the alternative analysis must be documented and made available for public review.

Table 4.2 Key Aspects of Public Involvement During Alternatives Analysis

Outreach Priorities	Participants and Agency Coordination	Desired Outcomes	Documentation
• Confirm points of contact • Confirm consistency with local plans/policies • Generate and refine alternatives (including multimodal, operational, safety, and context sensitive approaches) • Discuss benefits/impacts • Identify environmental constraints, permits and approvals likely needed, and data gaps • Confirm evaluation measures and weighting, where applicable • Describe implementation considerations, risks, and key assumptions • Present findings and recommendations • Confirm next steps (e.g., ETDM Programming Screen, PD&E scope needs, additional technical work, or follow-on planning)	• Community members and corridor users • Local governments • MPO/TPO staff • Public transportation providers • Freight and business interests • Emergency services • Schools and major institutions • Advocacy groups • Resource/permitting agencies as appropriate to the setting (including through ETDM coordination when applicable) • For more information, see the **FDOT Public Involvement Handbook Chapter 300: Identifying the Public**	• Documented range of alternatives • Screening results • Identification of alternatives recommended for further study • Identify practical design/ operations considerations (e.g., access management, public transportation, freight needs). Where applicable, use ETDM process and the Environmental Screening Tool (EST) to support early issue identification and interagency input • Identify anticipated permits and key issues to be addressed in PD&E • Document any agency concurrence or feedback received at a planning level • Information that supports programming and/or scoping of the next phase	• Meeting summaries, comments, and responses • Alternatives decision log that ties key decisions back to input and planning-level analysis • Summary of stakeholder and agency coordination and input, including comment/ response summary (as applicable) • Clear cross references to technical memoranda, mapping, and decision point • Final engagement summary (or equivalent documentation), documenting recommendations and rationale

4.3.2 Agency Coordination

Agency coordination emphasizes early identification of regulatory, technical, operational, and funding considerations that may affect project development and delivery. Engaging partner agencies can provide input on funding, operations, maintenance, or permitting needs, allowing project planning studies to produce recommendations that are more realistic and actionable. The level and timing of coordination with each agency identified, as described in **Section 3.5.3.1 Identifying Agency Partners,** should be scaled to the study's decision needs and implementation risks, with emphasis on those partners whose involvement is critical to advancing recommendations into subsequent phases.

4.3.2.1 ETDM Considerations

The ETDM Planning Screen can be used to facilitate review of project planning studies by the Environmental Technical Advisory Team (ETAT). The ETAT is a standing group of resource and regulatory agencies with expertise in natural, cultural, and community resources that can provide early technical input on potential constraints, data needs, and issues that may warrant further analysis. At this stage, ETAT input is advisory and planning level in nature, intended to inform alternatives development and issue identification. In addition, when the ETDM Planning Screen Summary is published, interested public are notified that the report is available and have the opportunity to comment through the ETDM Public Access Site at **https://etdmpub.fla-etat.org**. For more information, refer to the **FDOT ETDM Manual**.

4.3.3 Documenting Public Involvement and Agency Coordination to Support PEL

If a project planning study is intended to be adopted or incorporated by reference in a future PD&E study, the public involvement and agency coordination activities should be documented in a way that is transparent, traceable to decisions, and easy for the next phase to reuse. Project planning studies should follow applicable PEL guidance (described in **2.3 Incorporating Planning into PD&E**) and coordinate early with the FDOT Office of Environmental Management (OEM) and District environmental teams to confirm expectations for PEL-ready documentation. Additional elements and considerations for documentation include the following:

- **Engagement summary:** Description of methods used (meetings, workshops, pop-ups, surveys, online engagement). Include dates, locations/formats, materials shared (presentations/handouts), attendance (as appropriate), and summaries of input received.
- **Stakeholder and agency list:** Identification of stakeholders and agencies contacted, points of contact (as appropriate), and the purpose of coordination.
- **Comments and responses:** Summary of themes and how comments were considered; where feasible, document responses to substantive comments and how they influenced decisions.
- **Decision traceability:** Clear linkage between input and key planning decisions (problem statement, purpose and need).
- **Agency coordination outcomes:** Summary of coordination meetings and feedback, identification of key issues raised, and any written correspondence or planning-level concurrence received. Where the ETDM Planning Screen is used, summarize key ETDM/EST records (e.g., agency comments and applicable summary reports) and clearly describe how they informed planning decisions.
- **Limitations and next-phase needs:** Statement of planning-level assumptions and known gaps; list of topics requiring further analysis or consultation as the project progresses.

4.4 Elimination of Alternatives

The elimination of alternatives is the decision that has the greatest potential for controversy when moving from planning into future project development phases and must be done with great care. In general, the PD&E phase should result in final determination regarding eliminated and preferred alternatives. When alternatives are eliminated during project planning prior to PD&E, the following steps are required if the results of the alternatives analysis are intended to be adopted into PD&E:

- **Evaluate all alternatives equally** against a set of criteria that are specific to the project's purpose and need, and also include transportation impacts; capital and operating costs; social, economic, and environmental impacts; and other project-relevant considerations.
- Utilize data sets from **recent, relevant, and approved sources.**
- Conduct a **public and stakeholder involvement/engagement** process.
- **Involve appropriate** federal, state, and local resource agencies.
- Prepare a **summary and explanation of the rationale** for eliminating each alternative.

As described in Section 4.2 Alternatives Analysis, elimination of alternatives can be conducted in steps starting with a high-level screening of the potential improvements to eliminate unreasonable alternatives, such as those that do not meet the purpose and need. Further analysis of the remaining alternatives may result in elimination of alternatives due to fatal flaws, such as lack of feasibility from an engineering or operations perspective, significant environmental impacts that can be avoided through a different alternative, or financial feasibility concerns. An unreasonable alternative may also be eliminated during project planning if it has one or more deficiencies that prevent it from being successfully implemented. Considerations for screening alternatives include, but are not limited to:

- Project purpose and need
- Quantification of environmental impacts
- Project and environment longevity considerations
- Environmental controversy based on impacts to social, cultural, natural, or physical environment
- ROW and relocation impacts
- Safety and emergency response issues
- Limited access highways elevated section (per Section 334.63, F.S.)
- Agency and local government feedback
- Design constraints
- Constructability issues
- Construction costs
- Operational benefits

It should be noted that an alternative may still be considered reasonable even if it is not desired by the project sponsor or requires legislative change. Alternatives that were eliminated in the planning phase may need to be reconsidered during future project development phases due to reasons such as changes in existing or future conditions, regulatory changes, or changes in priorities. However, if clear coordination is maintained throughout planning and alternatives screening with key federal and state environmental agencies, the likelihood of having to reconsider the planning level determinations will be greatly reduced.

4.5 Alternatives Recommended for Project Programming

The project planning study may result in:

- **A single alternative** that advances directly into future project development phase,
- **Multiple alternatives** that require additional evaluation during the next phase of project development, and/or
- **No improvements** (No-Action Alternative).

In some cases, a recommended alternative can be selected in planning to streamline the PD&E phase once analysis shows clear benefits in comparison to other alternatives. Overall, the recommended alternative(s) identified in project planning provides the framework for the alternatives analysis to be conducted in the PD&E phase or identification of scope activities for the Design phase.

4.5.1 Next Steps

4.5.1.1 Recommended Alternative

Once an alternative is recommended, its implementation can take several years depending on context, scale, scope of the project, prioritization, and funding. Advancement to the PD&E phase depends upon various factors including agency coordination, project scope, design year, schedule, and funding. Therefore, an implementation plan or strategy that meets the **FDOT's Project Development Policy (Document No.: 000-525-055)** should be developed to support the advancement of project planning recommendations. This includes a schedule, review of funding options, and phasing of alternatives/improvements. A well-defined implementation approach is critical to help ensure a successful transition through the project development process.

General considerations and tasks for developing the implementation plan and identifying future project development activities. (further discussed in **Section 5.2 Linkage to Future Project Development Activities**) include:

- Review results of needs assessment to confirm phasing strategies.
- Identify key environmental resources or issues that affect the project scope.
- Document if additional agency coordination is necessary in the subsequent project phase.

Project prioritization and funding availability may result in a delay in programming the next phase of project development. However, the project planning study age threshold (as described in **Section 2.4 Timing of Project Planning Studies**) should be considered to allow the planning products to meet PEL requirements and reduce duplication of efforts between the Planning and PD&E phases. The project planning recommendations may also identify near-term and low-cost project planning activities that could support future project delivery. If it is determined that the project recommendations are needed but cannot

be funded within the FDOT Five-Year Work Program, the project should be coordinated with the MPO to inform the statewide, metropolitan and local planning processes and be included in the LRTP Unfunded Needs Plan. The implementation plan should also determine if any amendments or updates are required in local agency planning documents (for example, Comprehensive Plan).

The implementation plan should also identify any recommended activities prior to advancement to the next phase of project development. For example, Districts may choose to complete the Project Traffic Analysis Report (PTAR) through an existing contract prior to the start of the PD&E Phase. If the PTAR meet the PEL requirements as described in **Section 2.3 Incorporating Planning into PD&E** this analysis can be incorporated in the PD&E phase.

4.5.1.2 No-Action Alternative

As described in **Section 4.2 Alternatives Analysis**, the No-Action Alternative is carried forward and remains under consideration throughout the project planning study. If the project planning study results in the recommendation of the No-Action Alternative, the transportation planning process will shift from project development to system monitoring and incremental management. The final decision will be documented in the final planning study documents, the No-Action decision will be communicated to stakeholders and the public, and if necessary, updates will be made to any LRTP or TIP to reflect that the project will not advance.

After this, it is up to the agency with jurisdiction over the project area to monitor traffic operations, safety performance, and land use changes. The agency may decide to implement lower-cost operational or safety strategies as needed. The study area may be periodically re-evaluated in future planning cycles to determine whether changing conditions warrant revisiting the need for a Build Alternative.