STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

PRACTICAL DESIGN HANDBOOK

FDOT's Approach to Achieving Practical Design

OFFICE OF DESIGN
11/13/2014

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Introduction

FDOT is increasingly expected to produce projects more efficiently. Given limited budgets, FDOT must maintain its current infrastructure, while also meeting the demand for increased mobility of people and freight. To achieve this goal, FDOT has implemented Practical Design.

Practical Design is a philosophy which maximizes improvements to the transportation system by focusing resources on project needs that deliver the highest return on investment.
This objective is accomplished in two parts:

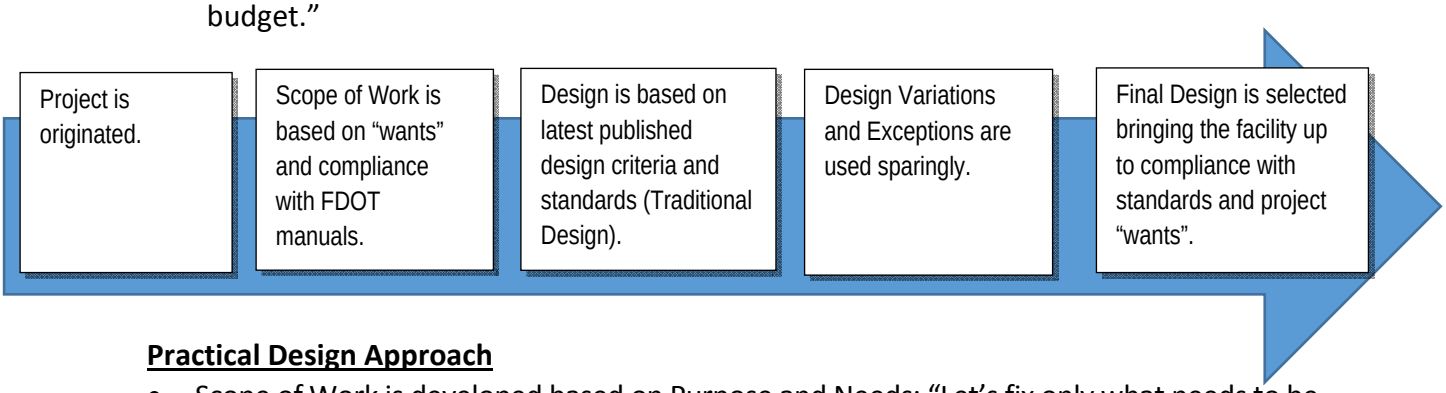
- Developing the scope of work to meet the project's Purpose and Needs.
- Utilizing design flexibility based on safety and operational performance.

The intent of this handbook is to provide basic guidance for implementation of a Practical Design approach. Practical Design demands that the engineer make use of empirical evidence, science, and engineering judgment. This differs from traditional design, which is based on experience, standards, and manuals.

Traditional Design Approach

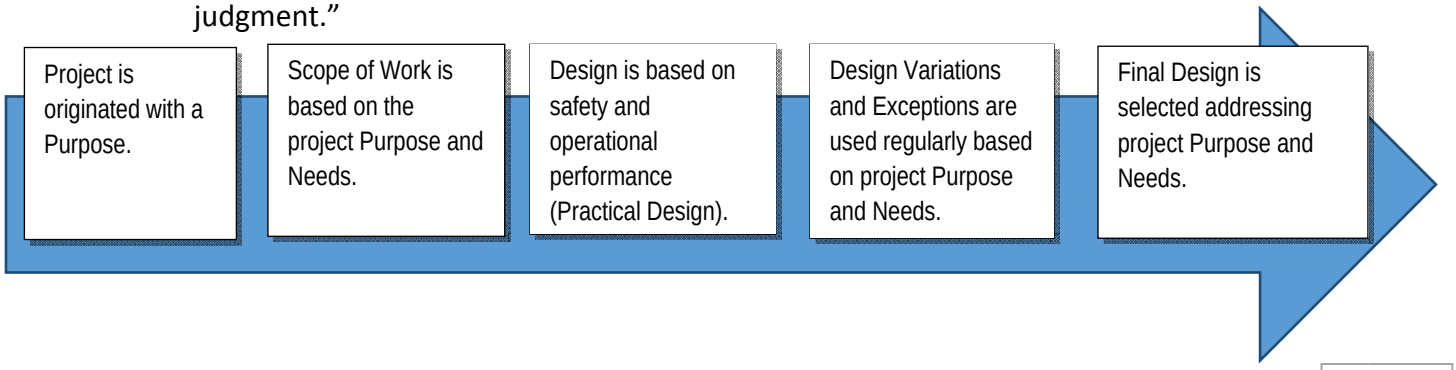
Scope of Work is developed based on "wants" and FDOT manuals: "Let's fix it now while we're out there."

- Design flexibility is not fully utilized: "Build it to the standard if it will fit within the budget."



Practical Design Approach

- Scope of Work is developed based on Purpose and Needs: "Let's fix only what needs to be fixed."
- Design flexibility is utilized based on previous or expected performance: "Build a design that will produce the best return, based on empirical data, science, and engineering judgment."



Although the expected product of a Practical Design is cost efficiency, the decision making of Practical Design is ultimately based on Performance, Purpose, and Needs.

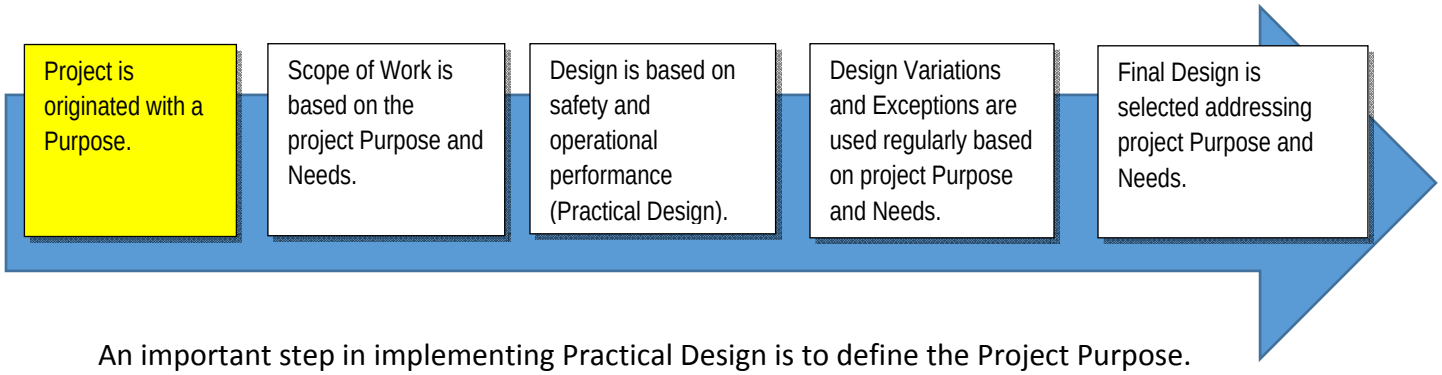
Summary

Practical Design seeks to limit improvements to only those that are necessary to meet the Project Purpose and Needs. This is achieved by developing the scope of work for the project, and completing the design by using the appropriate design criteria. With this, the engineer has more flexibility to maximize the value received for every public dollar spent on a given project.

Practical Design is a design philosophy that encourages design flexibility based on purpose and needs. To this end, FDOT is actively encouraging engineers to utilize good engineering judgment and prudent risk-taking in developing “bold and innovative” engineering solutions.

Chapter 1
The Practical Design Approach

Step 1: Develop the Project Purpose



An important step in implementing Practical Design is to define the Project Purpose. Projects originate from different sources. For example, Resurfacing, Restoration and rehabilitation (3R) projects typically originate from the District's Pavement Management Engineer, whereas safety projects often originate from the District's Safety Engineer. The originator of a given project should be able to properly define the Project Purpose.

Define the Project Purpose

The Project Purpose describes the intended objective that the project is expected to achieve, and defines the project limits. There should also be a justification provided that describes how the objective relates to FDOT's Business Plan.

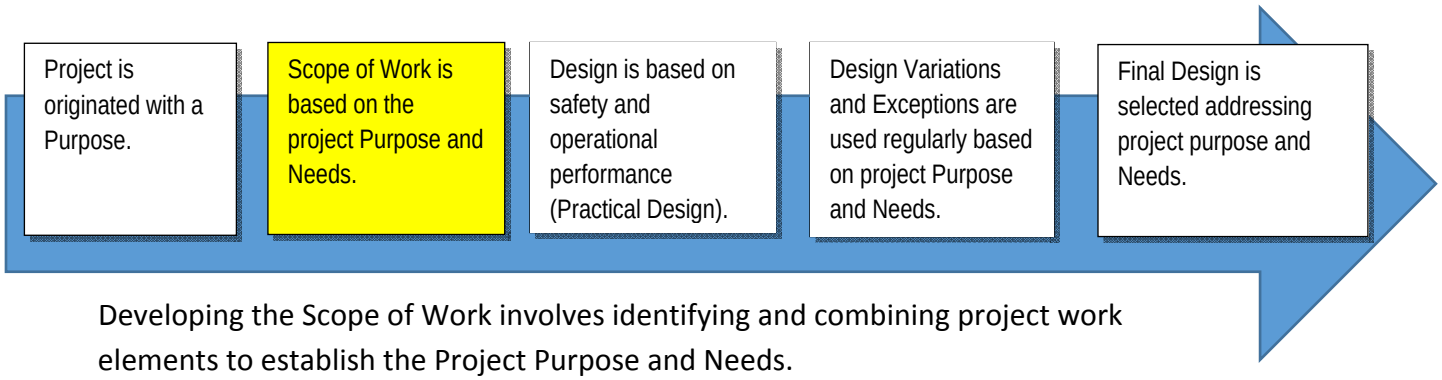
The following is an example of what may be provided to define the Project Purpose:

Objective	Justification
Section wide crash reduction on SR 60 from MP 6.172 to 7.232.	This section is on the high crash list based on the current crash rate of 6.9 being greater than the average of 2.6 for comparable roadway sections.

In addition to the objective, it is also important to establish the desired performance.
In the example above, the objective is to improve safety for this particular section of roadway. The performance that would consider the project a success would be a targeted future crash rate.

One practice being utilized is to document the project objective and justification in a one page report. This can serve as the basis for decision makers to authorize and prioritize the project. Only very preliminary information is needed at this stage of the process. A sample from District 7 is provided in Appendix B.

Step 2: Develop the Scope



Developing the Scope of Work involves identifying and combining project work elements to establish the Project Purpose and Needs.

Filter the "Needs" from the "Wants"

This stage of the project should involve a multi-disciplinary team of people to help identify Needs not anticipated by the Project Originator. This group should not be limited to Department staff, but should also include project stakeholders and local agencies. It is critical that these additional Needs be associated with the Project Purpose.

Distinguishing the "Needs" from "Wants" is important during this step. To do this, the team should make use of available data such as (but not limited to) maintenance cost, pavement condition data, and crash reports. Project elements added to improve performance should be supported by an analysis or justification that the current performance measure is below an acceptable threshold. The definition of an acceptable threshold may differ for different decision makers. Therefore, a dated record should be kept documenting which discipline originated each need and justifying those work elements added to the scope of work.

A work element may be a "Need" by meeting the Project Purpose, but may not be justified based on its current or predicted performance. For example, shoulder widening may meet the Project Purpose to enhance safety, but the historical or predicted safety level for the facility (in regard to shoulder width) may be well above an acceptable threshold. Once all additional wants and needs have been vetted, the Scope of Work would now be complete, inclusive of a comprehensive Project Purpose and Needs.

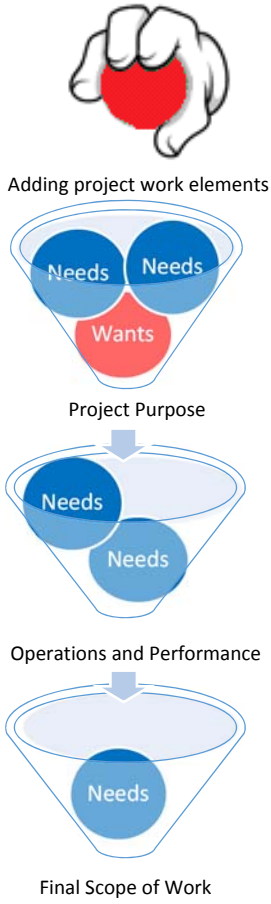


Figure 1. Two filters are in place during this step to ensure the "Needs" are based on Purpose, and are justified based on operations and performance.

Overall Vision

Although Practical Design utilizes operations and performance to filter project "Wants", engineering analysis alone does not fully take all impacts into account. Transportation improvements often have multiple intangible impacts and consequences to the environment. Under Practical Design, the overall vision (often referred to as context) for the corridor should be considered as well.

For example, as part of the initial efforts on a 3R project, the crash history analysis identified a safety "Need" to protect pedestrians as they crossed a bridge over a bay. The 5-year crash history identified pedestrian conflicts which could possibly be removed or mitigated through barrier improvements.

AASHTO states that a pedestrian barrier should be at least 42 inches high to shield pedestrians from steep drop-offs. However, the local community had a "Want" to maintain the view of the bay for vehicular traffic. Through deeper investigation of the pedestrian shielding requirements, the engineer realized that a standard concrete bridge railing was not needed for this bridge.

The proposed alternative solution was a non-standard (TL-4 California Design) bridge railing meeting MASH test criteria, which also included an upper rail to meet the 42 inch height for pedestrian protection. The non-standard bridge railing also provided passing vehicles with a view of the bay, just as they had always enjoyed. By considering the context of the corridor, the Department was able to deliver the best solution to the local community.

Cost

At this point, the scope of work will be mature enough for estimating cost. The Department uses the Long Range Estimate (LRE) system to generate project cost estimates. The originator must coordinate with the District Cost Estimator to ensure that the estimate is prepared in accordance with FDOT policy. These estimates can be broken into Project Versions, Sequences, and Component lists to evaluate multiple alternatives that are developed.

ROADWAY:	$10,884,646.05
SIDEWALKS:	$784,225.84
BRIDGE:	$2,473,968.43
SIGNALS & ITS:	$204,791.43
LIGHTING:	$1,106,241.24
SIGNS & MARKINGS:	$761,184.22
DRAINAGE:	$5,459,511.77
WALLS:	$3,207,875.72
TURN LANES:	$1,146,757.21
M.O.T.:	$1,501,460.10
MOBILIZATION:	$2,207,146.34
UNKNOWNS 10%:	$3,373,780.84
GRAND TOTAL:	**$33,111,589.19**

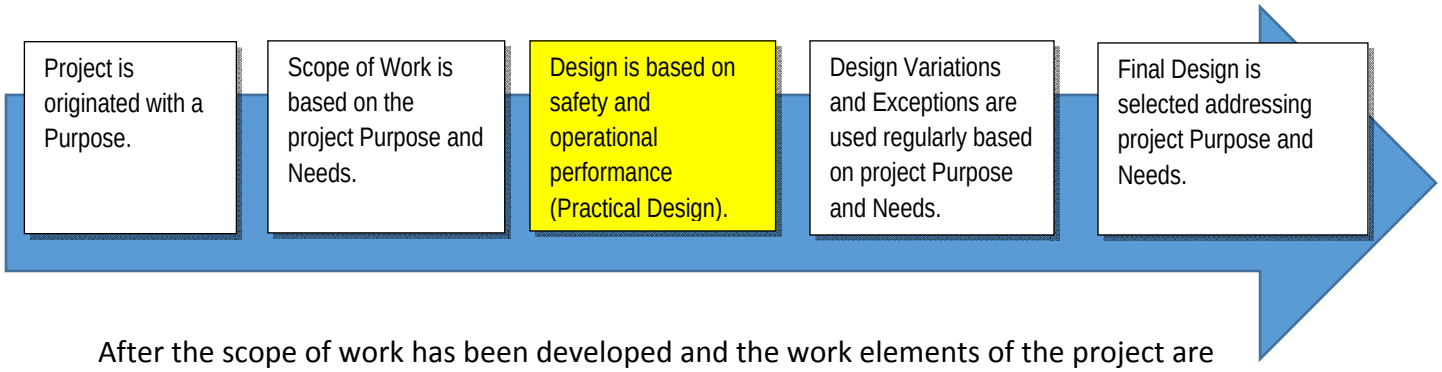
Figure 2. Project Component List

At the conclusion of this step, enough information should have been compiled to generate a Project Concept Report (PCR). A PCR will clearly identify the complete project scope of work and establish a realistic budget and schedule. PCR's should be developed on all non-PD&E projects. These generally include RRR, Safety, Drainage, and Intersection Improvement Projects. This report defines the

Purpose and Needs of the project (Link to PCR Template). The PCR should include design decisions and commitments to be made on a project, but may not define the actual solution.

For example, the PCR may identify a project Need such as intersection improvements to improve pedestrian crossing safety, but may not identify the design criteria needed to make this improvement.

Step 3: Design



After the scope of work has been developed and the work elements of the project are defined and documented, the Design Phase begins. This is a crucial step, as the previous steps only identified the project Purpose and Needs. The Design phase will now establish criteria to meet the Purpose and Needs and evaluate the performance outcomes of the criteria selected. A "Change Control" meeting should be scheduled to transition from Project Scoping to Design.

Alternatives

Once the Purpose and Needs have been defined, the design team should consider multiple design alternatives. Since the work elements and alternatives are often proposed by a multi-disciplinary team, the project originator will verify that each alternative satisfactorily meets the project's Purpose and Needs as defined in the PCR.

One example of an alternative improvement in a 3R project is cross slope correction. Pavement cross slope can be corrected by using overbuild, through milling only, or through a combination of milling and overbuild. Cross slope correction by milling typically uses less asphalt than through the use of overbuild, but all options should be considered before making a selection. Performance should also be considered as part of the comparison. One alternative may involve a reduced milling depth, and while this may be the more economical option, the reduced depth may not meet the desired performance in terms of design life.

Safety is still Priority One

Under Practical Design, safety is not compromised. By utilizing nominal design standards, safety performance expectations can only be derived presumptively. By utilizing Practical Design strategies, the safety performance can be derived in a more

context-sensitive way. This method relies on engineering tools such as RSAP (Roadside Safety Analysis Program), the AASHTO Highway Safety Manual, and Historic Crash Data Analysis. Every project should either make the facility safer, or maintain the existing safety performance for that facility. Under no circumstances should an individual project be allowed to degrade the overall safety of the corridor or system.

For example, a 3R project's Purpose was to extend the service life of an existing highway and to enhance highway safety. During a field review, it was observed that several trees were located in close proximity to the edge of the traveled way. Operationally, the road functioned as a connector linking an arterial to a small rural community. The highway was a two-lane, undivided rural typical section with a 55 mph design speed and a posted speed of 45 mph. The location of the trees violated the 30 ft clear zone criteria for a Design Speed of 55mph. The engineer reviewed historic data and found that the historic rate of encroachment for this segment was below predicted values. The engineer then further evaluated the crash long forms to determine how many vehicles had run off the road. The data revealed the historic maximum distance of encroachment to be 15 ft. Based on this, the engineer determined that a clear zone based on a design speed less than 45 mph would be more appropriate. The engineer then requested a Design Exception for horizontal clearance to utilize a reduced clear zone instead of 30 ft.

Only one tree remained within the newly established clear zone which could be mitigated by shielding and delineators. The engineer had selected the appropriate design criteria based on Purpose and Need, but still put safety first. Although there was no history of any trees being hit, the engineer was still considering future risk in the design. This reduced clear zone met both the safety and operational performance "Needs" of the roadway.

Be Innovative in Selecting the Criteria

Progress does not occur if the status quo is never challenged. The engineer is encouraged to explore the potential for adding value outside of FDOT's published criteria and standards. This should not be considered as a deviation from policy, but rather an invitation to add practicality to the design.

A primary focus of criteria selection should be the performance. The project's Purpose and Needs should have identified which of these five are to be targeted per work element to consider the project a success. Establishing the performance focus and expectations allows for a balanced selection of appropriate design criteria. This balance may be more or less conservative than FDOT's published criteria and standards.

The Component List can be broken down into a Pareto chart to better determine what design elements offer the greatest opportunity for value. The chart in Figure 3 was created from the component list in Figure 2. In this format, it can be clearly seen that Roadway and Drainage are both estimated at a significant percentage of the project and may be worth the additional staff hours to consider Practical Design alternatives.

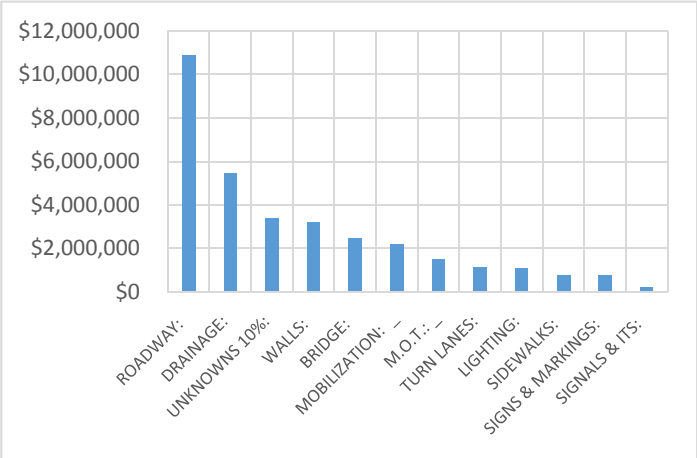


Figure 3. Component List broken into a Pareto chart

Step 4: Design Variations and Exceptions

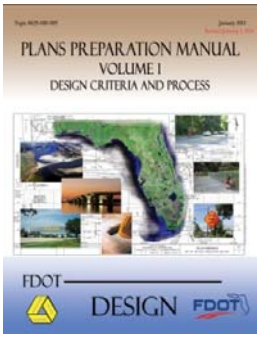
Project is originated with a Purpose.

Scope of Work is based on the project Purpose and needs.

Design is based on safety and operational performance (Practical Design).

Design Variations and Exceptions are used regularly based on project Purpose and Needs.

Final Design is selected addressing project Purpose and Needs.



FDOT's design criteria are listed in the Plans Preparation Manual (PPM). There is often reasonable design flexibility to operate within the parameters of the PPM. However, most projects still offer further opportunities for deviations from criteria to achieve a "Practical Design". Design Exceptions and Design Variations provide engineers a process to make these modifications.

Practical Design encourages engineers to maximize the use of Design Exceptions and Variations while also ensuring that those modifications are based on safety, cost feasibility, and operational performance. These factors help determine the best criteria for a project's site specific conditions. The Documentation required for preparing Design Exceptions and Variations is outlined in Chapter 23 of FDOT's Plan Preparation Manual, Volume 1.

Collaborate

Project specific design criteria developed using a Practical Design approach will be subject to FDOT's Design Variation and Exception approval process. Collaboration is a key element of this process. Project personnel need to include all stakeholders early in developing potential

solutions and receiving approval for deviations from FDOT criteria. Every effort should be made to ensure that all parties involved are kept within the "collaboration circle" during the process.

Figure 4. Collaboration circle

Under a traditional design approach, a single group navigates through each stage of the design process. For a Practical Design approach to succeed, all groups need to communicate and take ownership of their responsibilities during each stage of the process. This means that the Project Originator (who may not be a Designer) and the Approval Authority are made part of the Review and Approval "collaboration circle." This will ensure all decision are made to achieve shared goals.

Consider all Costs

Practical Design, as with any design, should ensure a quality facility. Practical Design alternatives should be coordinated with the Maintenance Office and should not result in a legacy of maintenance problems. For this reason, it is important to consider both the safety impact of the proposed design, and also consider the impacts on future reliability and service life. The engineer should not only consider the actual installation costs associated with proposed improvements, but also all costs affected by those improvements.

Three basic approaches for considering the cost of different alternatives are:

- Total construction and maintenance cost of alternatives
- Cost effectiveness of alternatives
- Benefit/cost ratio of alternatives

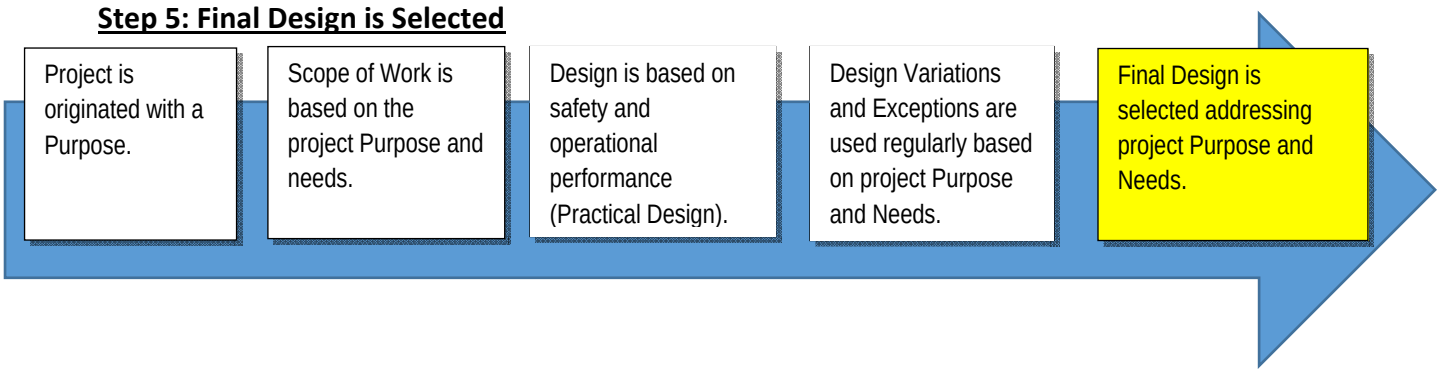
For a given alternative, the total construction and maintenance cost can be estimated and compared to the funding available. If the alternative meets the desired performance measures based on the analysis in the Design Variation or Exception and funding is available to implement it, then in some instances this may be sufficient.

In other instances, multiple alternatives may meet an acceptable range of funding, therefore the cost effectiveness of each alternative may need to be determined. This is achieved by estimating the cost of constructing and maintaining each alternative and comparing that to the preferred performance measure. For example, if alternative A is estimated to reduce two

crashes every five years at an annual cost of $8,000, then its cost effectiveness is $20,000 per mitigated crash.

The third approach is to use a benefit/cost ratio. Benefit/cost ratios greater than 1.0 indicate the benefits outweigh the costs of the alternative and therefore are a reasonable potential investment. A key consideration for calculating benefit/cost ratios is converting the five performance measures to a monetary value. When considering the primary performance some, such as improving livability, may be considered intangible for a specific project and would be addressed as part of the overall vision rather than as part of the cost. It is understood the ultimate design decisions may be influenced by one of these or other intangible performance measures that cannot be converted into a monetary value.

Step 5: Final Design is Selected



Based on the performance criteria documented in the Design Variation/Exception, a decision will be made to select the preferred alternative or decide to further refine and re-evaluate. The following questions should be asked before proceeding with a selection:

1. Does the documentation demonstrate making progress towards the Project Purpose and Needs?
   (If no, go back to step 3. Revise the alternatives, and re-evaluate the performance.)
2. Can reasonable adjustments be made to the design criteria that can further improve the project performance?
   (If yes, consider refining the selected alternative to include further adjustment.)
3. Does the Design Exception/Variation clearly differentiate between alternatives considered?
   (If no, go back to step 4. Consider additional performance measures or cost comparison to differentiate among the alternatives.)

The ultimate design decisions still reside at the discretion of the designer, engineer, planner, or transportation professional in charge of the project. However by utilizing a Practical Design approach the project should result in a more balanced design based on the project's specific Purpose and Needs.

Chapter 2
3R Projects

Practical Design is based on two parts:

- Developing the project scope of work to meet the Project's Purpose and Needs.
- Utilizing design flexibility based on operational performance.

Practical Design will be applied differently to 3R projects than New Construction projects. 3R projects will typically involve more practical design decisions while developing the project scope.

Developing the Scope of Work based on Project Purpose and Needs

Chapter 25 of the Plans Preparation Manual, Volume 1 offers the following statement as a starting point for defining a 3R project Purpose: "Resurfacing, restoration and rehabilitation (3R) work is defined as work undertaken to extend the service life of an existing highway and/or enhance highway safety."

This statement covers a broad range of operational factors which may include:

1. Preserve or extend the life of the existing pavement.
2. Improve capacity (without adding continuous through lanes).
3. Improve operating characteristics.
4. Site-specific crash reduction.
5. Section-wide crash reduction.
6. General safety modifications.

While all the factors above are considered equally important, the project is typically initiated by one of these factors. That one factor should be retained as the project's primary Purpose.

Once this primary Purpose is defined, the project Needs must also be identified. To assist the engineer with assessing what 3R improvements are needed, FDOT has developed a list of Best Practices for 3R projects. These Best Practices are separated into three categories:

1. Work Elements not to be Included on 3R projects.
   (Complete during scoping.)
2. Work Elements to remain in 3R projects.
   (Complete during scoping.)
3. Work Elements that can remain at the engineer's discretion.
   (Complete prior to phase II submittal.)

These Best Practices can be found in Appendix A of this document.

3R Best Practices Clarification

The 3R Best Practices found in Appendix A was developed to serve as guidance. It is not an absolute list, but rather a starting point for implementation of Practical Design on 3R projects. There are many similar issues that should be evaluated that are not on the list. The following section is intended to provide clarification and discussion of 3R Best Practices.

Pavement related Work Elements

Primary Clarification

- Engineer should attempt to eliminate the use of FC-5 in locations such as turn lanes, median cross overs, and gore areas.
- Cross slope and superelevation correction should only be performed if justified by crash history or determined to be a high risk for future crashes.
- Limits of milling and resurfacing on side streets should be limited to the end of the return radius, unless additional length is needed for constructability.

Discussion

Minimizing the use of open graded friction course has been identified as a major contributor to Practical Design on a resurfacing project. The FDOT Flexible Pavement Design Manual provides guidance on the use of this material. Open graded friction courses do improve frictional characteristics under wet conditions, but they also have a shorter service life than dense graded friction courses. Their texture reduces the potential for hydroplaning, improves visibility, and reduces splash back.

The elimination of the FC-5 in select locations will result in a ¾ inch height difference between the travel lane and the crossover. This ¾ inch difference should be considered a safe and traversable drop off between the travel lane and shoulder or crossover area.

Roadway related Work Elements

Primary Clarification

- Cross drain extensions to eliminate clear zone violations should only be performed if justified by crash history or determined to be a high risk for future crashes.
- Other than meeting detectable warning and curb ramp requirements, existing sidewalks and flared driveway turnouts are not required to be upgraded for the sole purpose of meeting ADA requirements. If new sidewalk is to be constructed, non-conforming driveways are not required to be upgraded.
- Abandoned driveways with deficient sidewalk cross slope should be removed when possible. This includes construction of new curb and gutter and reconstruction of

the sidewalk portion of the driveway. (All Access closures should be verified with the Right of way office.)

- Guardrail end treatments and crash cushions not meeting MASH criteria should be upgraded.
- Radius improvements at side road turnouts should be performed if evidence of off-tracking exists.
- The addition or widening of paved shoulders should be evaluated and justified based on safety, capacity, or bicycle/pedestrian warrants.
- Correcting deficient side slopes should only be performed if justified by crash history or determined to be a high risk for future crashes.

Discussion

Providing adequate clear zone allows a majority of vehicles that leave the roadway to safely return to the roadway or come to a controlled stop. Meeting FDOT Clear Zone criteria can, at times, be difficult to achieve. Other roadside features such as shoulder, side slope, etc, influence the effectiveness of clear zone. The influence of these other features provides flexibility to compare alternatives which could provide an equivalent measure of safety in the most cost effective way.

When Hazardous conditions exist, guardrail systems can serve as protective devices to restrain and/or redirect passenger vehicles away from these areas. It is the Department's objective to preserve and maintain existing guardrail systems so they function as intended.

Structures Elements

Primary Clarification

- Retrofitting or replacing existing continuous post-and-beam bridge railings should only be included in a 3R project when justified by crash history or determined to be a high risk condition.
- Retrofitting or replacing existing continuous post-and-beam bridge railings should always be included in bridge widening or bridge rehabilitation projects.

Drainage Elements

Primary Clarification

- Erosion control measures are intended to be the contractor’s responsibility and should not be specified in the plans, unless warranted or required for an environmental permit.
- Maintenance activities that may cause a significant operational constraint should be addressed by the Maintenance office ASAP rather than waiting to be included on a project.

- Drainage structures with minor damage or not meeting current standards should be left in place if considered functional.

Discussion

Maintenance of drainage infrastructure has been a consistent target for practical design. Numerous maintenance activities such as ditch clearing or desilting pipes need to be evaluated to determine if it is more cost effective to be addressed through existing maintenance contracts, or left as part of the design.

A roadside ditch can also have a major impact on roadside safety. While steep slopes produce greater hydraulic efficiency, they also have an adverse impact on safety. Alternative slope combinations should be evaluated to determine a design that provides the best overall balance.

Traffic Operations Elements

Primary Clarification

- Access management adjustments should only be performed when warranted by crash history.
- The State Traffic Operations Office and the State Roadway Design Office have directed not to replace serviceable signs to meet updated signing criteria as part of design projects, unless there is a specific safety issue that can be corrected by replacing a sign.
- When a sign is no longer serviceable and is planned to be replaced, consideration should be given to using the pay item for sign panel replacement. (Assuming the sign post and assembly are serviceable and meet current design criteria.)
- Sign replacements/upgrades should be based on structural adequacy. Structures do not require replacement simply due to new design specification requirements. Refer to Plans Preparation Manual Volume I, Chapter 25.4.26 (Existing Structures-Without and With Planned Additional Loading) for clarification.
- Use post mounted signs to replace/upgrade signing on conventional roads at approaches to interchanges where cantilevers are not warranted by operational conditions.

APPENDIX A

3R BEST PRACTICES

Project No.: Letting Date:
EOR: Report Prepared by:

PART 1 – Work Elements not to be Included on All Resurfacing Projects

N/A	Not Included	Included	Items not to be Included
			Pavement
☐	☐	☐	Milling and resurfacing of travel lanes in areas where the only deficiency is due to ride. (We have ride only projects that can be programmed to address ride only.)
☐	☐	☐	Placing FC-5 in median crossovers of multi-lane, high-speed facilities. (This practice is currently optional. The preferred alternative would be to bring the structural course up to match the FC-5 to prevent the "mini drop-off").
☐	☐	☐	Paving gore areas with FC-5.
☐	☐	☐	Milling and resurfacing paved side streets beyond the return radius/right-of-way line unless needed for harmonization of public side streets, (but not greater than 50'.)
☐	☐	☐	Minor cross slope correction. (See PPM Chapter 25 for flexibility.)
			Roadway Criteria
☐	☐	☐	Cross drain extensions that are beyond shoulder standards but within the clear zone and have no significant crash history.
			Structures
☐	☐	☐	Continuous post-and-beam concrete bridge railing thrie-beam retrofits. (When analysis of the previous five year crash history results in low risk of encroachment probability and severity.)
☐	☐	☐	Barrier selection for aesthetic, not safety reasons (e.g., choosing to install barrier wall instead of guardrail because it is more aesthetically pleasing. In addition, guardrail reduces g-forces experienced by drivers when impacted.)
			Drainage
☐	☐	☐	Rock bags for inlet protection in curb and gutter areas. (See new Erosion and Sediment Control Manual.)
☐	☐	☐	Removing nonstandard drainage structures and slope protection that are still functioning.
☐	☐	☐	Side drain safety upgrades. (Sometimes included where side drains are located within 30' of each other; typically involving replacement with pipe and a ditch bottom inlet).
☐	☐	☐	Replacing functional ditch pavement.
☐	☐	☐	Repairing concrete spalls at curb inlets, MESs, headwalls, etc. (unless these create a hazard themselves).
			Traffic Operations
☐	☐	☐	Project-wide sign replacement without evaluation.
☐	☐	☐	Upgrade of functioning pedestrian detectors (push-buttons) with newer models (unless we are changing the ped heads/ped poles for another reason, then ADA kicks in).
			Other
☐	☐	☐	Upgrades at driveway flares when not required.
☐	☐	☐	Construction of curb ramps in areas without sidewalk.
☐	☐	☐	Enhanced landscaping.
☐	☐	☐	Patterned pavement crosswalks (unless the funding and maintenance of these are the local agency's responsibility.)
☐	☐	☐	Mowing and litter removal on pavement-only projects.
☐	☐	☐	Upgrade of existing Pipe Guiderail to Pedestrian/Bicycle Railing when drop-off hazard is less than 60" (continuous Pedestrian/Bicycle Railing is acceptable if the drop-off hazard varies and is at least 60" in height at some locations.)

For each of the above work elements identified as not to be included in the project, provide an estimate of the construction cost (Cost Savings) if the work element had been included in the project. The items identified should be a result of work eliminated during the development of the project, or not included as a result of a refined project scope through implementation of a practical design approach.

For any work element on this list which is to be included in the project, provide the justification for it to remain. For example, the re-design/plans-updating cost is greater than the savings from the removal of the item.

PART 2 – Work Elements to Remain in Resurfacing Projects

N/A	Not Included	Included	Items To Remain
			Pavement
☐	☐	☐	Requiring FC-5 on curb & gutter facilities w/ DS = 50 mph. (For multi-lane facilities, FC-9.5 and FC-12.5 may be considered for PS ≤ 45)
☐	☐	☐	Paving turn lanes with FC-5 where the travel lanes are paved with FC-5.
☐	☐	☐	Milling and resurfacing of paved shoulders that are still in good condition on non-limited access facilities. 1. This would create a joint between the travel lane and the shoulder that would allow water to infiltrate. 2. When the travel lanes and shoulders are on different pavement lifecycles, stand-alone projects may be needed in order to resurface shoulders.
☐	☐	☐	Correcting dips in the pavement (Identify need if the dip is large enough to cause water to pond or to affect ride quality).
			Roadway Criteria
☐	☐	☐	Upgrade of existing guardrail end treatments that do not meet MASH.
☐	☐	☐	Upgrade of existing crash cushions that do not meet MASH to newer models.
☐	☐	☐	Installation of bullet rail on bridges (Identify need to meet minimum height requirements for protection of cyclists and pedestrians using facilities on bridges.)
☐	☐	☐	Radius improvements at side-road turnouts due to evidence of off-tracking.
☐	☐	☐	Re-working shoulders to avoid drop-offs greater than 1”. (although covered through the FDOT MRP, these spot locations could worsen over the design phase and create a roadway departure hazard).
			Structures
☐	☐	☐	Replacement of discontinuous post-and-beam concrete bridge railing.
			Drainage
☐	☐	☐	Installation of silt fence in areas of curb ramp replacement (The FDOT/FDEP Erosion & Sediment Control Manual make these details the contractor’s responsibility.)
☐	☐	☐	Repair/lining of leaky pipes.
☐	☐	☐	Installation of new drainage systems or upgrade of existing systems to address flooding complaints.
☐	☐	☐	Pipe de-silting (but if hydraulic opening is significantly constrained, this should be done by Maintenance ASAP and not delayed potentially for years).
☐	☐	☐	Re-grading ditches (if hydraulic area has been significantly reduced, this should be done by Maintenance ASAP and not delayed potentially for years).
☐	☐	☐	Fixing eroded areas around headwalls (this should not be an immediate safety concern and can wait on the project).
			Traffic Operations
☐	☐	☐	Construction of sound walls (Where construction or need is governed by statute).
☐	☐	☐	Installation of lighting (only occurs when a safety study or marked crosswalk indicates need).
☐	☐	☐	Emergency vehicle pre-emption at signals (safety issue related to emergency response time; Department should continue to fund as long as the local agency agrees to maintain).
☐	☐	☐	Signal synchronization (repair of existing).
☐	☐	☐	Video Detection at signals instead of loops. (Both should be considered)
☐	☐	☐	Replacing existing pedestrian heads with count-down type heads.
☐	☐	☐	Marking crosswalks for all legs of an intersection (NOTE: only Standard, not Special-Emphasis, Markings are required on controlled approaches).
			Other
☐	☐	☐	Abandoned driveway closures in urban/curb & gutter sections to improve ADA accessibility/sidewalk (not access management).
☐	☐	☐	Upgrading curb ramps to meet ADA.
☐	☐	☐	Construction of multi-use trails.
☐	☐	☐	Installation of Pedestrian/Bicycle Railing (Indexes 850/860) in areas with drop-offs greater than 60”.
☐	☐	☐	Mowing and litter removal during construction (on non-pavement only projects).
☐	☐	☐	Upgrading railroad crossings (if project uses federal funds. Maybe need to fund a special project if upgrade is extensive).

Provide any additional clarification, if necessary, for any of the work element to be included in the project. For any applicable work element not included in the project, provide a brief explanation for not including the work.

PART 3 – Work Elements To Remain in Resurfacing Projects at the Engineer's Discretion

N/A	Not Included	Included	Items To Remain at the Engineer's Discretion
			Pavement
☐	☐	☐	Placing FC-5 across the full shoulder width of multi-lane, high-speed facilities (identify the need based on bicycle and motor vehicle usage).
☐	☐	☐	Placing FC-5 on limited access on- and off-ramps (ramp design speed controlling factor of limit).
			Roadway Criteria
☐	☐	☐	Horizontal clearance/clear zone intrusions (shielding or relocation) that have no significant crash history.
☐	☐	☐	Correct driveways that do not meet design standards.
☐	☐	☐	Paved shoulders where none exist or widening of existing paved shoulders where there is no need for either: • Motorist safety (roadway departure crashes should instead be mitigated by a combining an existing unpaved shoulder with audible/vibratory pavement marking and a Safety Edge); • Or bicycle/pedestrian facilities that are not statutorily required (and so documented).
☐	☐	☐	Bicycle keyholes at right turn lanes, constructed by widening the existing right turn lane that are not statutorily required and so documented. Instead, investigate the possibility of eliminating paved shoulders in right turn lanes or otherwise narrowing the turn lanes.
☐	☐	☐	Replacement of crash cushions that have been impacted (these cushions may need to be replaced, or they may be able to be repaired – see manufacturer's directions).
☐	☐	☐	Flattening of front slopes that have no significant crash history.
☐	☐	☐	Widening of curb and gutter sections for bike lanes may be appropriate on corridors where the localized widening would cost effectively establish bike lane connectivity with existing contiguous bike lanes adjacent to RRR project.
☐	☐	☐	Construction of new sidewalks that are not statutorily required and so documented (both sides of the street, connecting transit facilities, where MPO shows no planning during life of facility).
☐	☐	☐	Construction of new transit/bus amenities (bus bays, pads for bus shelters, bus stop pads, etc.).
☐	☐	☐	Curb ramps (replace because of ADA or radius) – ADA needs may be met using other than the typical curb cut ramps shown in index. Often in older urban areas existing drainage structures and/or utilities need to be relocated to accommodate these standard ramps but there are other alternatives.
☐	☐	☐	Construction of new turn lanes to projected need only (length of turn lane).
☐	☐	☐	Lengthen/revise existing turn lanes at signalized intersections due to documented operational issues. Any intersection could be revised as needed based on verified crash history.
			Drainage
☐	☐	☐	Removing abandoned pipe systems (can remain in place – grout filled).
			Traffic Operations
☐	☐	☐	Backlit street signs in urban areas (beneficial to older drivers; should the Department continue to fund them as long as local agency agrees to maintain them?).
☐	☐	☐	Access management changes will only be done based on verified crash history with supporting safety study or other documented needs.
☐	☐	☐	Replacement of strain poles with mast arms considering ramifications of failure (keep strain poles and add new pivoting hangers). Signal replacement process is based on maintenance evaluation and vertical, horizontal, and safety criteria.
☐	☐	☐	Video detection at signals instead of loops (video detection is the Department's preferred method of detection).
			Other
☐	☐	☐	Replacing broken sidewalk slabs that otherwise meet ADA specifications.
☐	☐	☐	Irrigation for landscaping (if landscaping will not be maintained by local agency. If it will be, then we should provide the infrastructure to do so to protect our investment).
☐	☐	☐	Upgrade existing Type fencing to 10' wildlife fence on interstate projects (rural interstates typically need fences higher than our standard 6' fence to prevent deer from leaping over it).

For each of the above items identified as included in the project, provide information to support or explain the reason for including the item of work in the 3R project.

For each of the above items identified as not included in the project, provide information to support or explain the reason for excluding the item of work and provide an estimate of the construction cost if the item had been included in the project. (Cost Savings)

PART 4 – Additional Items Evaluated by the Engineer for Inclusion in Resurfacing Projects

Identify any additional "optional" items of work not included on the previous lists which were evaluated to determine if the work was to be included in the project. If the optional item is included in the project, provide the rational for inclusion. If the optional item was not included or removed, provide an estimate of the construction cost if the item had been included in the project. (Cost Savings)

APPENDIX B

PRELIMINARY PROJECT REPORT (D7 Sample)

*DISTRICT SEVEN DEPARTMENT OF TRANSPORTATION PRELIMINARY PROJECT REPORT (PPR)

FDOT

LRE VERSION:

FINANCIAL PROJECT NUMBER:

PROJECT DATA: INITIAL VERSION

COST INDEX:

BY:

ORIGINATING OFFICE/PM APPROV _____ Date
(signature required on initial version) (type name here)

DEPT. HEAD APPROVAL: _____ Date
(initial version only; requires signatur (type name here)

PS&E APPROVAL: Elizabeth Russell Date
(revised versions only)

DIRECTOR APPROVA _____ Date
(initial version after July 15th)

PRODUCTION MANAGER APPROVAL: Ana E. Gonzalez Date
(revised versions only)

WORK PRGRM APPROV Renee Calo Date
(REVISED VERSIONS ONLY)

DISTRICT: 7 COUNTY: _____ COUNTY SECTION NUMBER _____ TRANSPORTATION SYSTEM: _____ CONTRACT CLASS: _____

INTERSTATE/US/SR/CR/LOCAL NAME: _ < 20 character limit, including spaces. No periods; use std. FM abbrev'. PROJ. MANAGER: _____

LIMITS FROM/AT: FROM _ < 25 character limit, including spaces and word "From". No periods, no distances; use only standard FM abbreviations.

LIMITS TO: TO _ < 25 character limit, including spaces and word "To". No periods, no distances; use only standard FM abbreviations.

TOTAL LENGTH: 0.000 SEE ADDITIONAL INFO. SHEET: ? RECORD PAGE UPDATED: ?

BEGINNING POINT : 0.000 ENDING POINT: 0.000 LENGTH: 0.000 BRIDGE NUMBER(S): _____

EXISTING LANES: _____ IMPROVED LANES: ____ ADDED LANES: _____ PROPOSED X-SECTION: ____ ROADWAY SIDE: _____

BEGINNING POINT : 0.000 ENDING POINT: 0.000 LENGTH: 0.000 BRIDGE NUMBER(S): _____

EXISTING LANES: _____ IMPROVED LANES: _____ ADDED LANES: _____ PROPOSED X-SECTION: ____ ROADWAY SIDE: _____

WORK MIX	CODE NUMBER	DESCRIPTION	MEASURE (if applicable)	QUANTITY (if applicable)
MAJOR:				
MINOR:				
MINOR:				
MINOR:				
ADDITIONAL MINOR WORK MIXES: ?				

ITEM GROUP	CODE NUMBER	DESCRIPTION	MEASURE	QUANTITY

Sample

PD&E STUDY REQUIRED: ? RIGHT OF WAY REQUIRED: ? See right margin note DESIGN BUILD: ?

LUMP SUM: NO OTHER ALTERNATIVE CONTRACTING: NO IF YES, METHOD: _____

LEVEL OF SURVEY: _____ LEVEL OF COMMUNITY AWARENESS: 1 FLORIDA GAS TRANSMISSION WITHIN CORRIDOR ?

BIKE LANES _____ DESIGNATED SIDEWALKS _____

LIST POTENTIAL ROW IMPACTS: _____

ROW SOURCES:

CURRENT SCOPE OF WORK (Summary & for each LRE sequence):

Briefly describe typical section for each sequence.

Superseded conditions should appear on the Record Page only.

With each reference to "sequence", specify whether it is FM sequence (10th & 11th FP ID digits) or LRE sequence.

JUSTIFICATION for Project Initiation:

Have you performed the advance coordination and confirmation required by Procedure 360-D20-001-7a? ?

Have you attached to the initial hard-copy PPR a printout of the Item-Segment Overview check for conflicting projects, and resolved? ?

CURRENT LRE/CES AMOUNT: _____ **PDC ESTIMATE FROM:** _____ **TO:** _____ **FY:** _____

*This PPR version may have originated in SharePoint, and may have been superseded by a subsequent revision (including cost estimates). Fiscal Years below may be earliest schedule-producible years, not necessarily programmed years. Not all program-necessary production phases may be shown. For more details and other limitations on use of SharePoint PPRs, see the SharePoint "Guidelines" folder.