

## Cost Containment Considerations for Value Assessments

The following list of Design Considerations and Construction Practices have been collected by the Department as an aid to identify potential Cost Containment design and construction changes that can be applied to projects current in development.

### **Design Considerations**

1. Consider utilization of existing drainage where condition and sizing of pipe allows. This may require camera inspection of pipe to determine if retaining is appropriate.
2. Identify opportunities to supplement undersized cross line drainage with additional pipe in lieu of replacing with box culvert.
3. Identify opportunities to rehabilitate and extend existing box culvert/pipes in lieu of replacement. Supplemental pipe to add capacity if needed.
4. Evaluate slopes for opportunity to steepen where feasible to avoid impacts, reduce R/W, or reduce earthwork quantities and eliminate walls.
  - Consider additional guardrail that may be needed when evaluating the cost.
  - Consider paving to the face of the guardrail to reduce maintenance costs.
5. Evaluate pavement structure in curb and gutter sections. For example, asphalt thicknesses are sometimes adjusted up to 7" to match curb thickness when a 5" pavement schedule would work.
  - Consider constructability and maintenance concerns with this change in depth.
6. Design exceptions should be considered overall. If the flexibility desired for the subject project is not provided in recognized guidance, then there needs to be good justification for the design exception. The accident history as it relates to the exception, the characteristics of the corridor outside the project, how the exception relates to the design speed, mitigations, etc. need to be considered as a part of the effort.
7. Design exceptions should be considered for cost reduction for temporary construction and permanent alignment/features. [Note: Th Department is moving to adopt the 10 criteria instead of 13. Sag vertical curves and horizontal clearance (not bridge width) will not require a design exception at that point.
  - Examples include: Is a sag vertical meets standard but creates MOT issues, additional R/W, permitting or culvert extensions – the design exception should be submitted. Exceptions to horizontal curve may reduce project limits and impacts.
8. Design exceptions to bridge deck geometry should be considered as related to certain skew, vertical cure, and crown combinations which can lead to longer structures, more ROW cost, and MOT.
9. Congestion Management has been exploring/recommending potential interchange configurations that were not on the table at the time of the original guidance to plan for loops was developed. Evaluate an alternate interchange, not a traditional clover, if future expansion could be done in smaller diamond interchange.
10. Typically, Congestion tends to lean towards a Parclo B. Consider a diamond and evaluate if the diamond could be designed with the potential for loops in that quadrant.
11. Review the traffic analysis and identify if the design project exceeds the needs of the analysis.
  - If the analysis yields that a one lane flyover is sufficient through the design year, then is it feasible to design a single lane structure with features that would allow for adding

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width in the future if needed (vertical clearances, bent placement, construction joints, etc.).

12. When evaluating horizontal and vertical alignment consider wedging quantities, balancing of earthwork, and overall constructability.
13. Evaluate shoulder berm gutter requirements and determine if they are needed or if earthen shoulder is appropriate.
14. Evaluate ditch liners and stream bank stabilization to determine if an alternate method may reduce quantities of rip rap and reduce cost.
15. In general, are the R/W needs appropriate. Could any R/W or Permanent Drainage Easement be reduced by temporary construction easement?
16. When evaluating R/W impacts, consider impact to parking lots, access, and other issues that increase R/W costs.
  - Example: Can a wall or alignment adjustment avoid an impact?
17. Can the use of narrower lane widths avoid impacts and reduce R/W costs for temporary construction and permanent alignment?
18. Can impacts to wet or dry utilities be avoided to reduce relocations?
19. Review planned maintenance work and identify any areas that will be resurfaced prior to construction. Include both roads that may be used for hauling and roads directly included in the project.
20. For Urban projects with heavy phasing, consider utilizing Class IV subgrade stabilization in lieu of chemical stabilization to prevent multiple mobilizations.
21. When selecting foundations (piles, footings on piles, shafts etc) take into consideration site access, moratoriums, pile hammer, and crane size requirements.
22. When determining span layout and girder type, review the cost related to a shorter span length to reduce the girder type and size versus a longer span length to eliminate bents.
  - Alignment shifts and interchange configurations should be considered for most cost-effective bridge designs or to potentially eliminate bridges.
23. When determining span layout and girder type consider site access, crane sizes, and low posted bridges on haul routes.
24. Designers should be reviewing the Context Classifications in the 2018 AASHTO Greenbook to determine what opportunities for flexibility it provides that can be applied to each project.  
Note: The designer should take care to ensure the Greenbook is applied in proper context and not using statements in isolation.
25. Reviewing recently updated cost estimates to ensure they are accurate, reflective of the true purpose of the project
26. Reducing typical sections dimensions (lane widths, shoulder widths, median widths).  
Reducing full depth paved shoulders to partial depth. Reducing median width from 60 ft to 46 ft. Reduce ROW from 150 ft to 140 ft. Reduce lanes from 6 to 4. Reducing type of curb and gutter
27. Eliminate non-required improvements to intersecting secondary roads
28. Shifting alignments to avoid building impacts
29. Scope reduction back to what was programmed
30. Reconsider level of improvements for adjacent intersections
31. Reevaluating the type of proposed interchange to reduce ROW and construction costs
32. Other examples include reconsidering when 4:1 slopes are required; utilize retaining walls to assist with reducing ROW impacts

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33. Eliminating roundabout intersection to lesser impactful/costly intersection (more standard type improvements)
34. Deciding not to upgrade facility to interstate standards when reduced conflict intersection capacity will suffice for the foreseeable future
35. Looking for other funding sources to assist in offsetting cost increases

### **Construction Practices**

1. Evaluate cross line drainage for appropriate installation method. Jack and Bore versus open trench and the impact to MOT.
2. Can long term closures accelerate construction, and should they be considered to reduce construction duration and cost?
3. Review possibility of reduced or eliminated phased construction.
4. Review the cost of an off-site detour (user cost) versus on-site detour (construction cost). Consider public perception and/or stakeholder engagement.
5. Have wet or dry utility relocations been considered with the project phasing?
6. If the project has a RR bridge, can the RR bridge be removed from the critical path?
7. Evaluate the amount of shoring that will be needed and ensure is accounted for in the design and contract.
8. Identify ways for utility relocation impacts to be reduced.
  - Example: Phase project based on relocation; require SUE in heavy utility corridors; recommend a full-time utility coordination.