Geometric Layouts

Contact

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Forms

- o Layout and Profile Distribution Record Form
- Layout Review Checklist Form
- Layout Review Checklist Guidance for Form

Purpose

The final layout serves as an approved plan and the basis for detail design. Conceptual Layouts are used to look at various alternatives before selection of a Preferred Alternative layout. Study Layouts develop one or more of the selected alternatives. Layouts are used to present design alternatives at public meetings, for evaluating design exceptions, and as the basis for cities to provide Municipal Consent.

What Projects Require Layouts?

Layouts are required for:

- A change in access or access control that causes operational changes.
- The following highway geometric changes:
 - New horizontal and/or vertical alignment,
 - Significant changes in cross-section (addition of lanes, etc.)
 - New or revised intersection geometrics.
- The following safety enhancements:
 - Intersection signalization where lane configuration changes,
 - Channelization (raised or painted)
 - Safety projects that cause operational changes [clarify "operational changes"] or which require more than incidental amounts of right-of-way.

- Projects that require Municipal Consent (see <u>Municipal Consent</u>)
- Projects that have full FHWA oversight, as follows:
 - Design/build projects
 - Major bridges on NHS over \$10 million
 - Interstate construction or reconstruction projects over \$1 million

Layouts may also be needed for:

- The project environmental document
- Project environmental documentation
 - (to show sensitive resources in project area)
- For a public hearing
- Development of the project

What Level of Layout?

There are three layout levels (Level 1, Level 2 and Level 3). Layout level is determined by the type of project. Although different layout levels have different review/approval processes, there is no difference in CADD standards or layout content.

Level 1 Project Types

A Level 1 layout is required for the following Project Types:

- Major Construction or Major Reconstruction on the Interstate, other highspeed multi-lane facility;
- Changes to interstate access; (see Interstate Access Requests)
- Major changes in non-interstate freeway access;
- Major Construction or Major Reconstruction of Class One rest areas
- Design/Build (federally funded)
- Interstate projects
- Projects with Design Exceptions (minimum requirement: area of exception)
- Major Bridges (over \$10 million)
- Projects with Roundabout(s)

Level 2 Project Types

Use a Level 2 Layout if the project includes any of the following, but is not a Level 1 project type:

- Raised Channelization
- Change number of lanes (including adding/converting to center left turn lane)
- Major intersection revisions
- Moderate changes in access

Also use a Level 2 for partial layouts submitted as flaps to an already approved Level 1 or Level 2 layout.

Level 3 Project Types

Use a Level 3 Layout if the project includes any of the following, but is not a Level 1 or Level 2 project type:

- Guardrail work
- Culvert:
 - Extensions
 - Elimination
 - Replacement
- Road work:
 - Overlay only
 - Standard RT lanes
 - Standard LT lanes on divided highway
 - Overlays with widening or left turn lanes
- Removal of obstructions from clear zone
- Minor changes in standard geometrics
- Minor painted channelization
- Minor changes in access
- Minor intersection revisions
- Rest areas on the non-NHS)

Review and Approval of Layouts

Review Levels

FHWA Approval

Required for Full Federal Oversight projects. (See <u>FHWA & Mn/DOT</u> <u>Stewardship Plan</u>)

City Approval

Required for certain projects. (See Municipal Consent).

All Layouts

Review and approval by district staff.

Level 1 Layout Approval

Review by State Geometrics Engineer and approval (signature) by State Design Engineer. If it is a Full Federal Oversight project, it also requires review and approval by FHWA.

Partial layouts submitted as flaps to an approved Level 1 require the State Geometrics Engineer's signature (as well as district staff signatures).

Level 2 Layout Approval

Review by the State Geometrics and State Design Engineer is optional. There is an annual quality assurance review of selected Level 2 layouts.

Level 3 Layout Approval

District staff signatures

Submittals

When submitting for approval, apply the signature and title block to the layout and obtain District signatures first.

Notify other C.O. offices as appropriate that a copy of the layout is being submitted to the Geometric Design Support Unit and is available for review. Together with the layout submit a copy of the Design Memo.

For projects with layouts of Level 2 and 3 transmit a copy of an approved layout accompanied by the Design Memo to the Flexible Design Engineer.

Types of Submittals

- o Concept or Study layout for Review or Comment (or Level 1-3 Concurrence)
- o Request for Assistance with Alternates and Design
- Level 1 layout for Staff Approval
- Reaction to Written Review Comments by the Geometric Design Support Unit
- Distribution of approved and signed layout (Layout Levels 1-3)

Submittal Letter Templates

- o Distribution of approved and signed Layout
- o Level 1 Layout for Staff Approval
- o Concept or Study layout for Review or Comment
- o Request for Assistance with Alternates and Design

Timeline for Review

Four weeks (or less) is the standard layout review period (by the Geometrics Unit). A Comment Letter, Layout Checklist, and possible suggested alternate drawings are returned to the Project Manager When appropriate, layout signatures are obtained and an approval transmittal letter is prepared and sent.

Agencies Involved

FHWA

See FHWA & Mn/DOT Stewardship Plan.

Cities

Input and review throughout the process. <u>Municipal Consent</u> by formal approval of final layout, when required.

Counties and Townships

Input and review throughout the process. No Municipal Consent.

Glossary

Operational changes – (from MUTCD) "Any action that has the potential to adversely affect the area's flow of traffic, roadway and traveler safety, or the environment might be considered to be a significant operational change. Any proposal to significantly adjust the hours of operation, or to convert an HOV lane to a general purpose travel lane, would be considered a significant operational change to the original project design concept or scope." (See MUTCD for examples).

Examples: Change posted speed, change traffic control devices/signals, bus shoulders, HOV/HOT lanes, changing hours or pricing for HOV/HOT lanes; right-turn-on-red ban, change intersection to roundabout, change rail crossing.

Appendix

Quality Control – Checklist and Example Layouts

Use the <u>Layout Review Checklist</u> and <u>Layout Review Checklist – Guidance</u> to assure layout content and general appearance.

Example Layouts

- o Level 1 Urban Interchange
- o Level 1 Single Point Diamond Interchange
- o Level 1 Rural Interchange

Numbering System for Layouts and Profiles

Layout No. 1: Ready for review outside the district preliminary design.

After Layout No. 1, there are two categories in the numbering progression:

- Minor Revisions advance by a letter
 - (Example: Layout 1 to Layout 1A)
- Major Revisions advance by an integer (Example: Layout 1A to Layout 2)

Layout and profile title blocks contain a space for layout or profile number. Record layout number changes in the Layout History, along with other pertinent information. As a project develops and its layout numbers advance, distribute copies to appropriate groups.

Layout Histories

The Layout History documents a projects layout development. Begin with alternatives or concepts and continue through layout staff approval. Use layout number (or concept name) and date for each layout. Document the geometric decisions made and explain alternative proposals studied; include significant profile changes

Examples

- Layout History 1
- o Layout History 2
- <u>Layout History 3</u>
- o Layout History 4