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## SECTION 300 - PRELIMINARY DESIGN

Preliminary design defines the general project location and design concepts. It includes, but is not limited to, preliminary engineering and other activities and analyses, such as environmental assessments, topographic surveys, metes and bounds surveys, geotechnical investigations, hydrologic analysis, hydraulic analysis, utility engineering, traffic studies, financial plans, revenue estimates, hazardous materials assessments, general estimates of the types and quantities of materials, and other work needed to establish parameters for the final design. Prior to completion of the NEPA review process, any such preliminary engineering and other activities and analyses must not materially affect the objective consideration of alternatives in the NEPA review process.

### 310.00 – PROJECT DEVELOPMENT

The DOH Work Breakdown Structure (WBS) Flow Chart ([Figure 3-1](#)) provides an overview of required project development activities and information, from the planning of a project through advertisement and award of the contract for construction. [Figure 3-1](#) shows the project activities and information for a large expansion type project. Some activities and information are not necessary for some projects, while additional activities and information may be necessary for other projects.

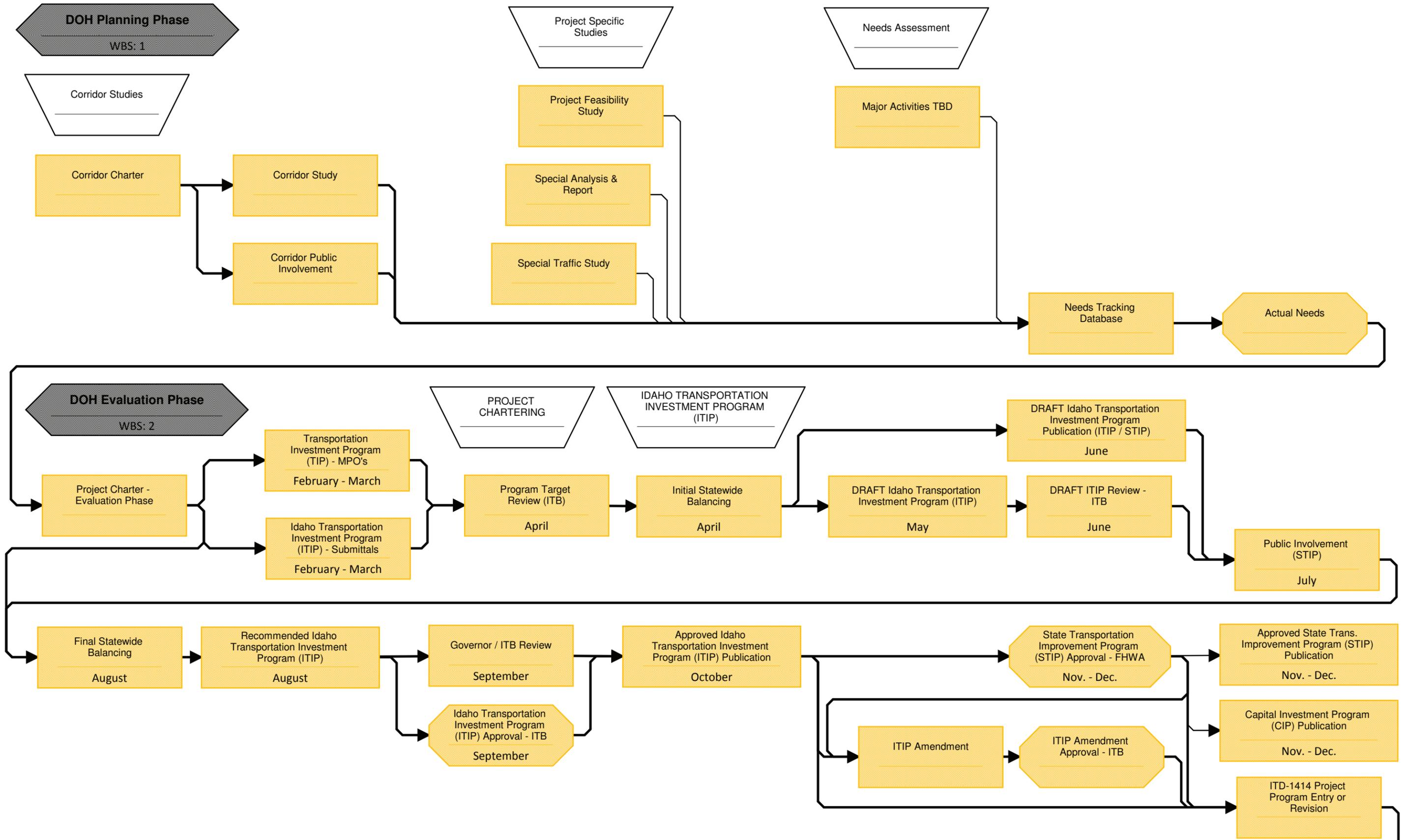
The Project Development Checklist ([Figure 3-2](#)) can also be a useful tool to prevent overlooking a project activity and evaluating the current status of a project. Not all of the items are necessary for every project.

For all projects submitted to HQ SME's for review, three (3) weeks must be allowed from arrival date to the date of the review. Review dates shall be coordinated with the individual SME.

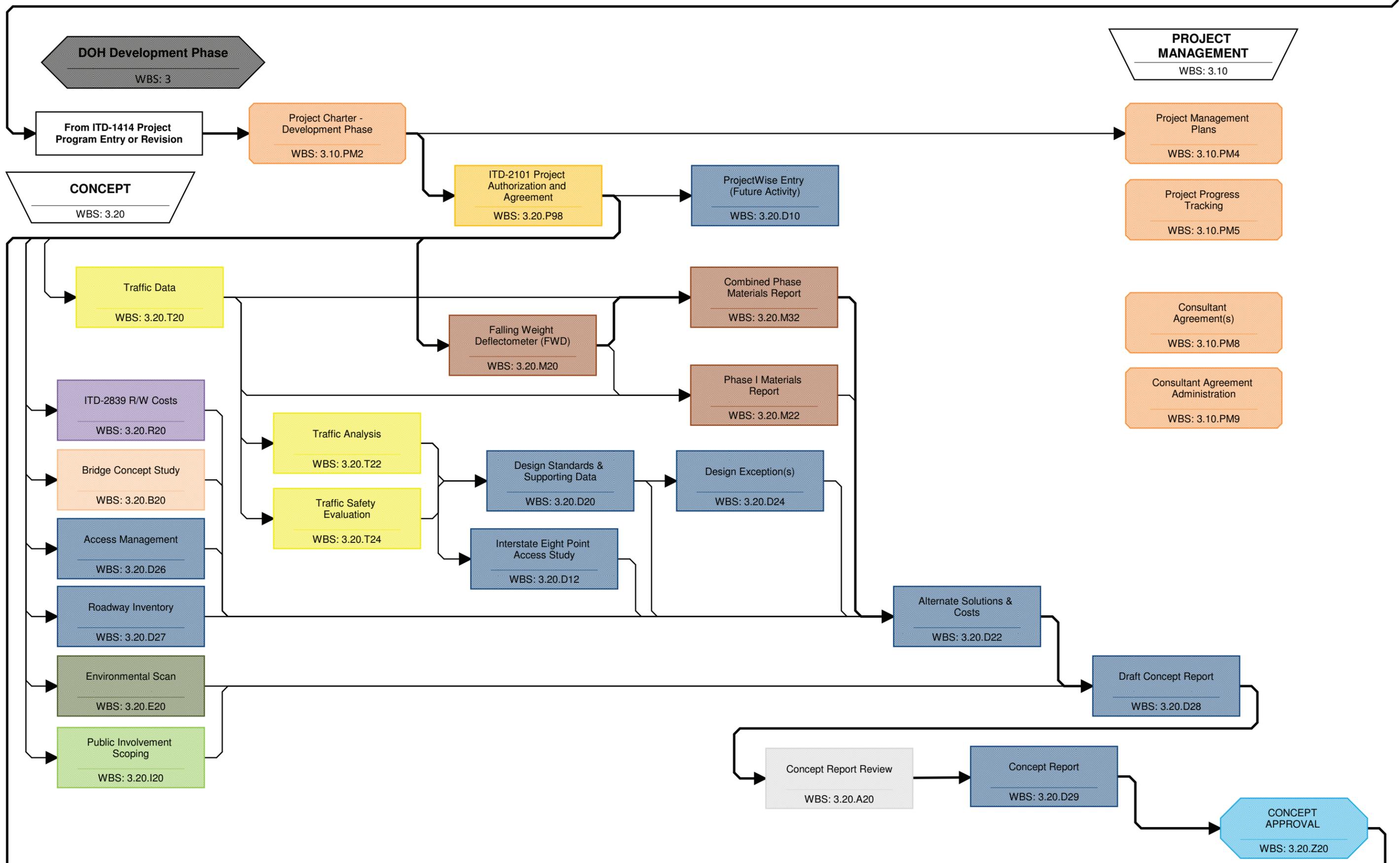
**310.01 Constructability** Constructability reviews are **required** on all projects. A constructability review is a systematic process to ensure that a project possesses clear and feasible construction techniques. The Constructability Review Process starts at the inception of the project and continues throughout project development. Several constructability reviews should be incorporated into the project planning and development. The combination of the reviews makes up the Constructability Review Process.

The purpose of constructability reviews during project development is to ensure that projects are biddable, buildable, cost-effective and maintainable. Constructability reviews involve the optimum use of construction knowledge and experience in the planning and development of a project. (See Constructability Review Guidelines)

**DOH Work Breakdown Structure (WBS) Flowchart**

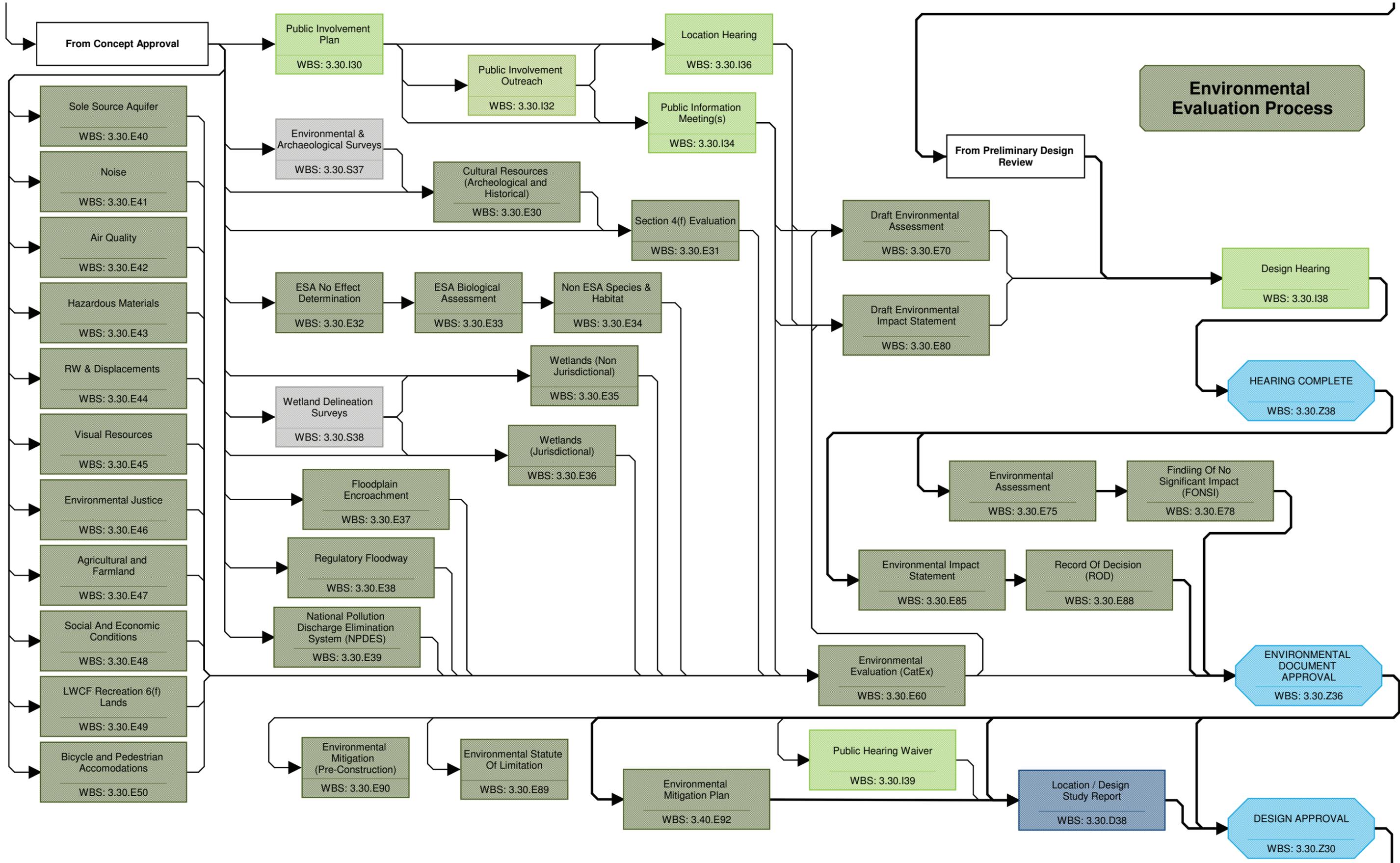


**DOH Work Breakdown Structure (WBS) Flowchart**



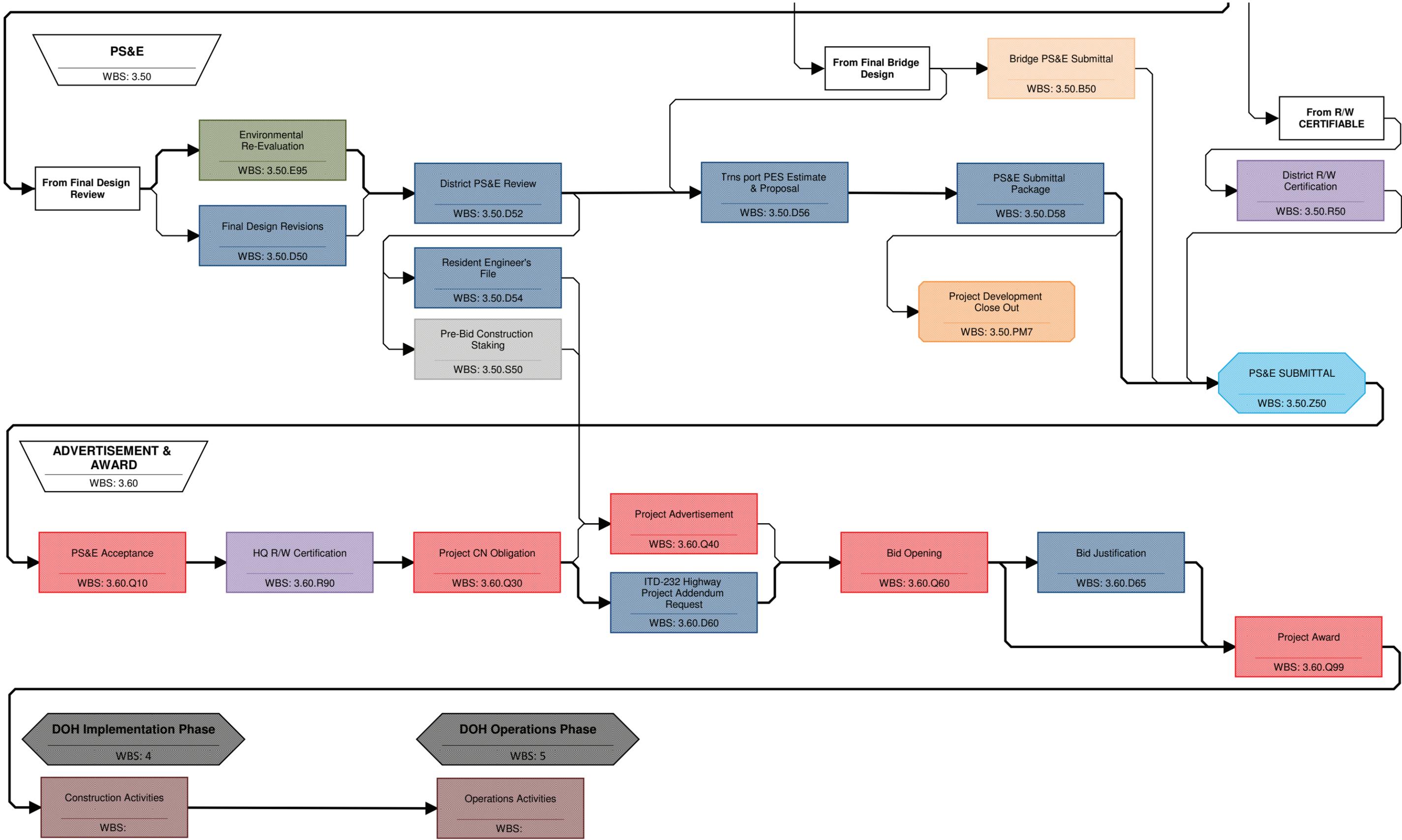


**DOH Work Breakdown Structure (WBS) Flowchart**





**DOH Work Breakdown Structure (WBS) Flowchart**



## PROJECT DEVELOPMENT CHECKLIST

PROJECT NAME:

PROJECT NUMBER:

KEY NUMBER:

	Submittal Date	Approval Completion Date
<b>Project Planning and Programming</b>		
Evaluation Charter completed and approved		
Complete and Submit required Programming Information		
Initiate <a href="#">ITD 2101</a> , Project Authorization and Agreement. (District requests and approves funding for preliminary engineering).		
<b>Preliminary Design</b>		
Proceed with Development Charter Process		
Request for Survey Work, <a href="#">ITD 2865</a> . (Assure that all property monuments are located, marked, and referenced)		
Complete and approve Development Charter; Design Standards, Alternate Solutions and Costs (if needed) and Proposed Design Exceptions.		
Complete Materials Phase I Report, Geological Reconnaissance Report with Pavement Life Cycle and Cost Analysis, and Corridor Defined.		
Initiate <a href="#">ITD 1151</a> , Traffic Data Request Capacity Analysis		
Complete <a href="#">ITD 654</a> , Preliminary Environmental Evaluation; <a href="#">ITD 652</a> , Hazardous Waste/Material Initial Site Assessment Checklist; and <a href="#">ITD 2784</a> , NPDES Storm Water Permit Project Checklist for Construction, after receiving approval on <a href="#">ITD 1414</a> .		
Initiate NEPA/404 Permit Merger Process, if 404 Permit Required		
Initiate <a href="#">ITD 1500</a> , Archaeological Reconnaissance, by Environmental Planner (requires 2-3 months lead time). Bridge Inspection Reports and Deck Studies.		
Prepare Public Involvement Plan		

**PROJECT DEVELOPMENT CHECKLIST**

PROJECT NAME:

	Submittal Date	Approval Completion Date
<b>Preliminary Design</b>		
Proceed with Preliminary Design Activities		
Complete <a href="#">ITD 210</a> , Hydraulic Structure Study.		
Initiate Preliminary Materials Phase II Report		
Initiate Materials Phase IV Report — Foundation Investigation Report (requires situation layouts and hydraulics report).		
Initiate Traffic Design/Traffic Control Plan — signs, signals, illumination, and pavement markings.		
<a href="#">Determine and document</a> Access Control.		
Complete Draft Environmental Report/Categorical Exclusion, Draft Environmental Impact Statement(EIS) or Environmental Assessment(EA)		
Initiate Utility Process		
Make Initial Owner contacts (see R/W Procedures Manual)		
Complete <a href="#">ITD 759</a> , Field Inventory.		
Complete <a href="#">ITD 602</a> , Crossing Evaluation (railroad) and Airport Clearance		
Complete Preliminary Design Review and Complete Approval Letter to File		
Initiate R/W process (Plan Development)		
Initiate Materials Phase III and V Reports		
Complete Waivers of Public Hearing; <b>OR</b> prepare hearing plans and request a Public Hearing.		
Hold Location/Design Hearing.		
Complete Design Study Report, including <a href="#">ITD 1414</a> if costs increases		
Update <a href="#">ITD 1150</a> , Cost Estimate Summary Sheet.		
Complete Charter Change Request if need & Update <a href="#">ITD 2101</a>		
Complete Final Environmental Document — CE, EIS or FONSI		
Submit Utility Plans to Utility Companies		
Make Final Owner Contacts		
Submit Official R/W Plans		

Obtain Design Approval		
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Figure 3-2  
Sheet 3 of 3

## PROJECT DEVELOPMENT CHECKLIST

PROJECT NAME:

	Submittal Date	Approval Completion Date
<b>Final Design</b>		
Proceed with Final Design Activities		
Initiate Permits ( <a href="#">Section 358</a> )		
Obtain Approved Phase II, III, IV, V Materials Reports		
Proceed with Right of Way Purchase Process		
Receive Final Traffic Plans		
Initiate Agreements with LPA (Cooperative, Road Closure and Maintenance) Utilities, Railroads, Irrigation companies, etc.		
Obtain Material Source Plats		
Complete NPDES Storm Water Plan		
Complete Sediment and Erosion Control Plan		
Conduct Final Design Review and Plan in Hand Field Review		
Submit official Utility Plans — Utility agreements as needed will be obtained by the Utility Coordinator or the districts and approved by the DE, DA or delegate.		
Compare right of way agreements with project plans for compliance		
Prepare Environmental Mitigation Plan Report		
Complete Final Design Letter and make plan corrections		
Complete district PS&E Review in district		
Finalize agreements with LPA, utilities, railroads, irrigation companies		
Obtain Right of Way Certificate		
Update <a href="#">ITD 1414</a> , Program Entry or Revision if cost increases		
Update <a href="#">ITD 1150</a> , Cost Estimate Summary Sheet		
Complete PS&E Package and send to DMC		
Send Resident Files to Resident Engineer		
Prepare and Complete Bidding Process by DMC		

## 315.00 – PROJECT DEFINITIONS

**315.01 Short Projects.** Short projects are projects that meet the following criteria and are not on the interstate and do not require a preliminary design review. Therefore, intersection improvements, turn bays, bridge rehabilitation, etc. do not qualify.

- NEPA Analysis is not expected to be with an EA or EIS
- The project does not have or expect to involve public controversy
- The project does not require a Public Hearing
- The project does not require a System Action

Short projects may follow the abbreviated procedures shown in [Subsection 315.17](#) and [Figure 3-4](#). The memo, written to the project file and signed by the District Engineer, granting design approval must include an explanation of why the project should be exempt from full design reviews.

**315.02 Special Projects.** Special projects as outlined in 23 CFR 771.117(c) include landscaping, construction of bicycle and pedestrian facilities, fencing, signs, traffic signals, railroad warning devices, pavement markings, acquiring scenic easements, and improvements to existing rest areas and weigh stations. Many project procedures that are used for standard federal-aid projects are not applicable for special projects. Most Special Projects will use the abbreviated procedures shown in [Subsection 315.17](#) and [Figure 3-4](#).

For ITS Projects containing networking communications, Headquarters Information Services should be consulted.

**315.03 4R New Construction.** This action involves the construction of a new highway facility where nothing of its type currently exists.

**315.04 4R Reconstruction.** This typically involves a major change to an existing facility within the same general right of way corridor. Reconstruction may involve making substantial modifications to horizontal and vertical alignment in order to eliminate safety and crash problems or making substantial modifications to the pavement section to correct structural deficiencies. These projects can be as complex as new construction and they can present more challenges because of the constraints involved with work within the existing facility and under traffic.

**315.05 3R Resurfacing, Restoration, Rehabilitation.**

3R Projects (NHS and Interstate) are intended to extend the service life of the existing highway and, at the same time, improve highway safety by making selective improvements to highway geometry and roadside features. The integrity of the existing ballast is maintained. The types of

improvements to existing federal aid highways include: resurfacing, cold-mill-inlay/overlay, overlay, bridge deck rehabilitation, modifying bridge rail, pavement structural and joint repair, minor lane and shoulder widening, minor alterations to vertical grades and horizontal curves, and removal or protection of roadside obstacles. A project meeting the 3R NHS standard can have as little as an 8 year design life, but any less than a 20 year design life must be justified.

**315.06 1R Pavement Rehabilitation.** Pavement rehabilitation projects are intended to restore the riding surface and preserve the integrity of the existing roadway while not doing other improvements associated with non-pavement related items except for High Accident Locations, substandard end sections and grossly substandard rail. The types of improvements include: cold-mill and inlay, thick overlay (0.15' or greater), cold-in-place or hot-in-place recycle with overlay. Design life of the pavement for Pavement Rehabilitation (1R) projects will be a minimum of 8 years. The primary goal of the 1R standard is to rehabilitate pavements where a maintenance treatment would not be cost effective, but has not yet deteriorated to the point of needing major treatment or reconstruction. These projects do not decrease the existing geometrics conditions.

Note that hot-in-place recycling and cold in place recycling projects do not meet the minimum eight year life requirement for federal aid.

**315.07 PP Pavement Preservation.** Pavement preservation consists of a series of treatments or strategies that cover a full range of activities from preservation to minor rehabilitation. Pavement Preservation activities preserve, rather than improve, the structural capacity of the pavement structure. Activities most closely associated with traditional maintenance, include roadway activities that are non-structural such as thin plant mix overlay, seal coating, fog coating, flexible pavement crack sealing, concrete pavement joint repair, grooving and grinding, pavement patching, shoulder repair and restoration of drainage systems. These types of applications normally take place early in the life of a pavement while they are still in good condition and before the onset of serious damage. It is very important for the pavement designer to know as much as possible about the pavement being treated to get the “right treatment at the right time on the right road.” Pavements with significant structural deterioration are not candidates for pavement preservation.

**315.07.01 Interstate Pavement Preservation:** Project development procedures on interstate pavement preservation projects may follow the abbreviated procedures shown in [Subsection 315.17](#) and [Figure 3-4](#) (Project Development Flow Chart) and must include the following:

All work performed on interstate pavement preservation projects must meet AASHTO standards, but other previously built areas of the roadway do not need to be brought to current standards.

Most of these projects will be classified as a categorical exclusion.

All interstate pavement preservation projects are typically exempt from FHWA oversight on all design work.

**315.07.02 Non-Interstate Pavement Preservation.** If the district determines that design reviews are not required, the project may follow these milestones:

- Charter approval
- Environmental Approval
- PS&E submittal

It is required that a district review be completed on all projects prior to PS&E submittal.

**315.10 ST (State-funded) Projects.** Small non-NHS 1-R type ST projects, as determined by the District Engineer, may follow these milestones:

- Charter approval
- PS&E submittal

Large, New/Reconstruction/3-R type, non-NHS ST projects should follow these milestones:

- Development Charter approval
- Preliminary Design Review
- Final Design Review
- PS&E Submittal

For state contract maintenance (STM/STKP) projects, including those on the NHS, submittal for advertisement is required as shown below as long as there will be no reconfiguration of the lanes when striping is done.

**315.11 Rest Area/Port of Entry Caretaker Services** Rest Area/Port of Entry Caretaker Services may be contracted through Business and Support Management (BSM) like any other service contract. An ITD 2101, Project Authorization and Agreement, **is not required** because the contract is paid from district operating funds or Port of Entry operating funds, as appropriate. The district or Port of Entry will verify availability of funds and encumber funds with the ITD 2379, Supply Request. The Office of Highway Operations and Safety (OHS) or Port of Entry, as appropriate, shall review and approve the contract package prior to advertisement and notify Financial Services at completion of work.

**NOTE:** The Office of Transportation Investment and DMC have no involvement with these projects.

**315.12 Building and Yard Projects** The districts and Building Services shall submit an ITD 2906, Building and Yard Project Authorization, to the Facilities Manager for review. If the project requires a new building or yard number, the districts shall request a location number (ITD 0030) from the Financial Services, Fixed Asset Administrator. The Facilities Manager (FM) shall review and approve the ITD 2906 and then forward the form to the Financial Services Controller (FSC) for Aeronautics projects and to the Highways Operations Engineer (HOE) for all other projects. The FSC or HOE, as appropriate, reviews, approves and forwards the approved ITD 2906 to Financial Services, Project Accounting and Fixed Asset Administrator for assignment of a work authorization number. Plans are submitted to the FM for review and approval. The approved plans are submitted to Business and Support Management (BSM), who will issue an ITD 2379, and prepare the bid package for advertisement. Business and Support Management will also notify the FM or the FSC (for Aeronautics projects) of the award, and notify Financial Services at completion of work.

The purchase order or contract is issued after the bid is awarded and entered into the financial system to encumber the funds. Business and Support Management prepares the vouchers to pay the vendor. Facilities Management tracks project development and progress and tracks project costs. District Supply operations should be notified upon award of bid.

NOTE: Office of Transportation Investment (OTI) and DMC have no involvement with Building and Yard projects.

**315.13 Minimal Contract Maintenance Projects (STM/STKP)** Contract maintenance projects (STM/STKP) shall be advertised through Business and Support Management when the service or supply projects are simple in nature – have few bid items, simple special provisions, and require minimal inspection and/or quantity verification. Minimal contract maintenance projects include sweeping, mowing, herbicide application, ditch cleaning, litter pickup, and aggregate stockpiles where the material is purchased from existing commercial inventory. Minimal contract maintenance projects shall be developed according to the procedures outlined in the ITD Design Manual, except that an ITD 2101 is not required.

The district submits the completed PS&E package (see ITD Design Manual, Section 900) and an ITD 2379 to Business and Support Management for advertisement. The Program Number for the appropriate project type **must be listed** on the ITD 2379. A separate ITD 2379 should be used for each type of project, unless more than one type of project will be contracted by the same vendor. In that case, list each project type on separate lines of the ITD 2379. If a multi-year contract is requested, only the amount the district intends to purchase in the current contract maintenance program year should be put on the ITD 2379. To purchase from the same Business and Support Management contract the following year, a separate ITD 2379 will need to be completed for the future year purchase. The district shall notify Financial Services at completion of work.

Contract specifications shall require 100% payment and 100% performance bonds. The invitation for bid shall include a statement requiring construction payment and performance bonds.

The contract specifications shall also require the Contractor to furnish a certificate of insurance for Comprehensive General Liability Insurance, Automobile Liability Insurance, and Worker Compensation Insurance in accordance with the current version of the Standard Specifications for Highway Construction 107.10.

**315.14 Multifaceted Contract Maintenance Projects (STM/STKP)** Multifaceted contract maintenance projects (STM/STKP) and aggregate stockpile projects that require crushing and/or an advanced level of quality control shall be advertised through DMC. These projects would not normally be obtained from an existing commercial inventory, would have multiple bid items, complex special provisions, require an advanced level of inspection and quality control, and in the case of aggregate stockpiles, require crushing. These multifaceted contract maintenance projects shall be developed according to the procedures outlined in the ITD Design Manual and follow the normal project development process, including submittal of an ITD 2101. The district shall notify Financial Services at completion of work.

**315.15 Congestion Mitigation and Air Quality (CMAQ) Projects.** The Idaho Transportation Department's (Department) Congestion Mitigation and Air Quality Improvement Program (CMAQ) is a statewide competitive program that provides federal transportation funds to implement cost-effective activities, plans, and projects that are mutually beneficial to transportation and air quality. CMAQ projects should demonstrate the highest potential for preventing or relieving a community's particular air quality problem. Planning activities can also be funded to develop a strategic plan which identifies additional projects and programs that will reduce a community's transportation-related air quality problems. For complete information on this program including application requirements go to:

<http://www.itd.idaho.gov/cmaq/>

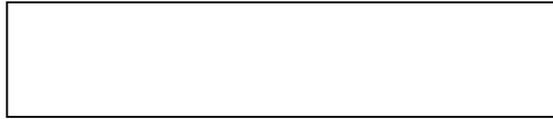
For basic project development activities see [Section 310.00](#). For an in-depth project development activity flowchart contact the Transportation Performance Section contact shown in the above web site.

**315.16 Non-Bid Projects.** Non-Bid Project is a project that is not advertised for bids since all work will be done by entity(ies) like railroad, utility, local agency, etc., in accordance with agreement(s) executed with the Department that are developed by the appropriate section, i.e. Resource Center - Rail Road Coordinator for Rail Projects and Headquarters Right of Way - Utilities Coordinator for Utility work. The funding may be federal (FHWA, HUD, etc.) and/or State (ITD, Parks & Recreation, grant, etc.). The following procedures apply to Non-Bid Projects:

Project programmed for a specific fiscal year with appropriate funding in accordance with the programming procedures.

- Agreement(s) executed with appropriate entity(ies). The agreement(s) will describe work to be done, who is to do work, cost of the work, and how payment is to be made. Plans and appropriate documents (estimate of cost from entity, insurances, special project requirements, etc.) will be included as attachments to the agreement(s).
- Funding obligated by [ITD 2101](#) regardless of source of funding.
- Copies of executed agreement(s) and approved [ITD 2101](#) are distributed by cover letter (see Figure 3-3).

## Non-Bid Project Cover Letter

**TRANSPORTATION DEPARTMENT****Date****Name of Person****Title of Person****Name of Company**

Mailing Address of Company

**City, State Zip Code**Re: Project No. ----, **Highway, Project Name**, ---- County

Key No. ----

Dear (**Name of Person**):

This is a Non-Bid Project that was not advertised for bids since all work will be done by (**list name of railroad, utility, etc.**) in accordance with the attached three copies of the agreements/plans executed with the Idaho Transportation Department and approved funding by the attached approved ITD-2101.

The Resident Engineer will provide notification to proceed with the work. Please coordinate all work schedules and send billings to the Resident Engineer at:

**Name**, Resident EngineerIdaho Transportation Department District **Number****Address****City, ID zip code****Telephone number**

Sincerely,

RCE

cc: **(list name of railroad, utility, etc.)** w/3 attach.

Attachments:3 agreements/plans, [ITD 2101](#)

bcc: District- w/4 attach.

RI- w/attach.

RE- **(Name of RE)** w/5 attach.

FS w/agreement without attachments

RC (Rail Road Coord) w/attach. **If railroad agreement**

DMC

RC (Mead) w/attach.

R/W(Utilities Coord)

**315.17 Abbreviated Project Development Procedures** Abbreviated procedures have been approved for interstate pavement preservation projects, short projects, and special projects (see [Figure 3-4](#), Abbreviated Project Development Flow Chart). The following is a brief overview of these abbreviated procedures:

- Step 1. The district prepares and submits an evaluation charter and a [ITD 1414](#), Project Program Entry or Revision to the Office of Transportation Services (OTI) to add the project to the Idaho Transportation Investment Program (ITIP).
- Step 2. After the project is approved for the ITIP and when the district is ready to begin development of the project, the district submits an [ITD 2101](#), Project Authorization and Agreement. The request is processed and the work authorization number is assigned before beginning the preliminary engineering. All of the preliminary engineering money scheduled in the current year can be requested, noting that the request is for “Preliminary Engineering for Design of the Project.”
- Step 3. The district completes the development charter including the Phase I Materials Report and the life cycle cost analysis if appropriate.
- Step 4. The district submits an [ITD 654](#), Preliminary Environmental Evaluation, and a map to Environmental for an environmental determination and clearance. Note in the transmittal that this project is a pavement preservation, short, or special project.
- Step 5. When the charter is complete and approved and the environmental document is cleared and it is determined that no hearing is required, the district shall complete a memo to project file signed by District Engineer ([Figure 3-5](#), Sample Waiver and Design Approval Memorandum) indicating that the environmental clearance is complete, hearing is waived, no preliminary design review will be held and why, and granting design approval.
- Step 6. A formal final design review will be required, which can be completed within the district, and should follow procedures outlined in [Section 400](#). At this time, the project will be evaluated by the district to ensure that the environmental clearance remains valid.
- Step 7. PS&E submittal to DMC will follow procedures outlined in [Section 900](#).

Figure 3-4

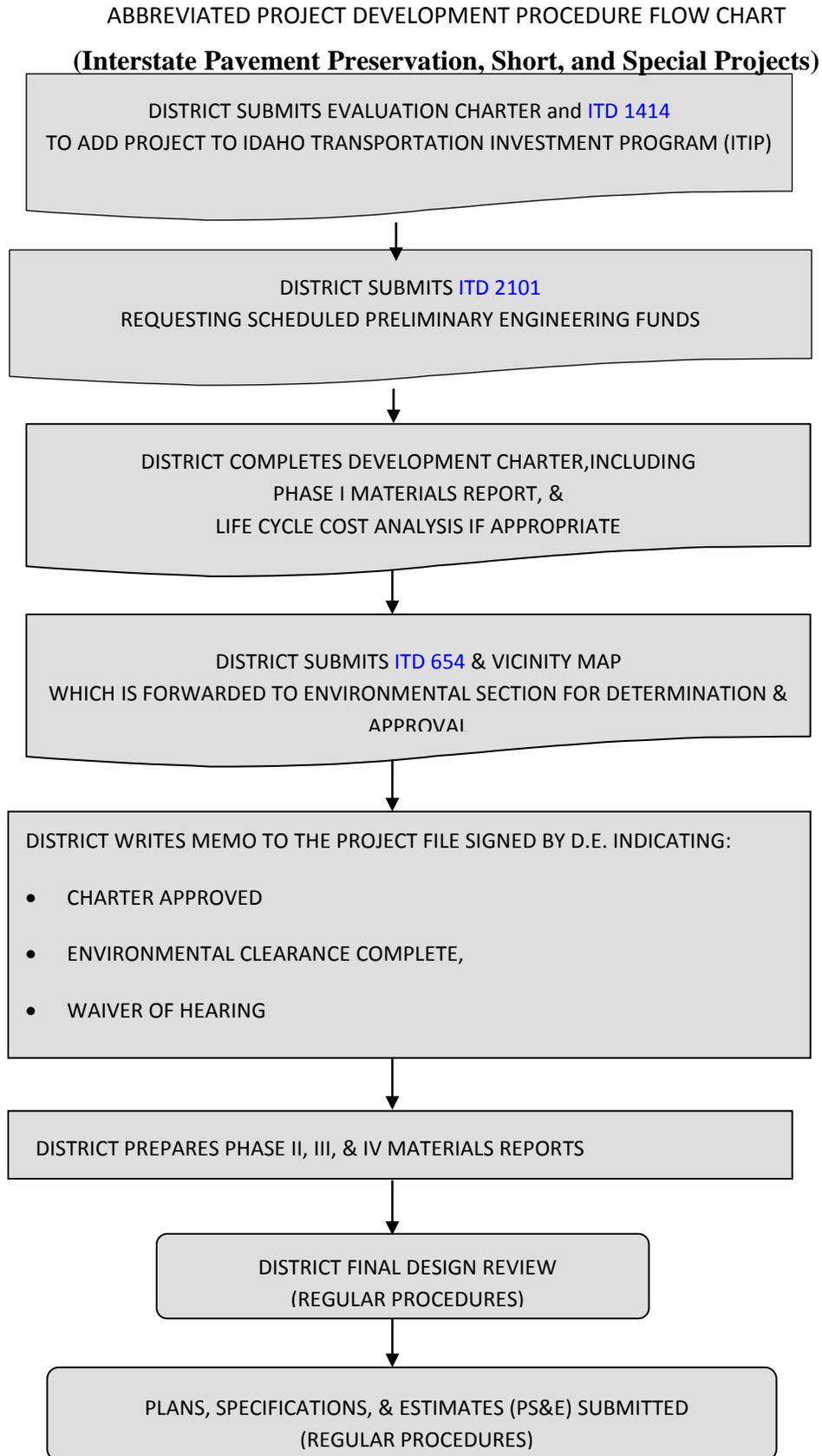


Figure 3-5

ITD 0500 (Rev.10-07)

**Department Memorandum**  
Idaho Transportation Department**DATE:** 03-02-12**Program Number(s)** A012(297)**TO:** Fran Hood, PE  
Design/Materials/Construction Engineer**Key Number(s)** 12297**FROM:** Damon Allen, PE   
District 1 Engineer**Program ID, County, Etc.** FY13 D1 BRIDGE  
DECK LIFE  
EXTENSION**RE:** Design Approval and Waiver of Public Hearing

Design approval and Waiver of Public Hearing are hereby granted for this project.

The Concept was approved on December 1, 2011. The Categorical Exclusion was approved February 16, 2012.

No Preliminary Design Review will be held.

The project will not require new right-of-way acquisition; the layout or function of connecting roadways will not be changed; no significant adverse impact on abutting property, no litigation or public controversy, and no significant social, economic, or environmental affect to the surrounding area are anticipated.

The District will proceed with project development.

If significant changes occur during final design, this waiver and design approval will be re-evaluated.

JV

cc: CE

DE-1

EM-1

PDE

## 320.00 – DESIGN STANDARDS

Design standards for a project dictate the requirements for both the horizontal and vertical alignments. Design standards include design speed, roadway width, horizontal and vertical curvature, grade, clear zone width, foreslope, super-elevation, design vehicle, minimum vertical clearance, level of service, etc. Selection of the appropriate design standards for a project is initially dependent upon knowledge of the functional classification, access control, terrain, traffic volumes, level of service, speed design, and super-elevation for the project route.

As early as possible, the designer needs to know what standards will apply to the project. The completion of the charter will aid the designer in determining the design standards.

The general policy of the department is that all design criteria will be met. The policies and standards are to serve as a basic guide in design work, however, they are not to be considered as inflexible, and are not intended as a substitute for engineering knowledge, experience, or judgment.

FHWA has adopted the Green Book (*A Policy on Geometric Design of Highways and Streets*) for new/reconstruction projects on the National Highway System (NHS). For Interstate System highways, the current Interstate Policy (*A Policy on Design Standards - Interstate System*) also applies. In the absence of criteria in the Interstate Policy, the values in the Green Book should be used for design of Interstate System projects.

The specified standards related to design speed, lane and shoulder widths, bridge widths, structural capacity, horizontal and vertical alignments, grades, stopping sight distance, cross slopes, super-elevation, and horizontal (not clear zone) and vertical clearances as referenced in [23 CFR 625](#), are the **controlling criteria** and require formal design exceptions when not met. The roadway widths indicated in any approved corridor plans shall be met unless an exception is approved through the design exception process.

**320.01 Design Policies, Standards, Guides, and References.** All of the following policies, standards, guides, and references are to be used in conjunction with this manual. In those instances where this manual reflects the policies of the Department and does not equal or exceed FHWA standards, documentation will be required.

**320.01.01 Standards and Policies for the Design of Roadways and Appurtenances.** defines which standards to use related to routes. Design speeds should be selected to achieve the desired degree of safety, mobility and efficiency within the constraints of environmental quality, economics, and social or political impacts. Projects shall be designed and constructed according to the following standards:

## Interstate

New/Reconstruction = AASHTO - Interstate Policy (*A Policy on Design Standards - Interstate System*) and the Green Book — *A Policy on Geometric Design of Highways and Streets*

3R Standards = [Appendix A.05](#)

1R Standards = [Appendix A.20.01](#)

## NHS (Non-Interstate)

New/Reconstruction = AASHTO - The Green Book — *A Policy on Geometric Design of Highways and Streets*

3R Standards = [Appendix A.10](#)

1R Standards = [Appendix A.20.02](#)

## Non-NHS (including LPA projects)

New/Reconstruction = State Standards - [Appendix A.15](#)

3R Standards = [Appendix A.15](#)

1R Standards = [Appendix A.20.03](#)

Deviations from these standards require Design Exception approval. FHWA approval may also be required. (See [Section 330.00](#) for further details.)

**320.01.02 Guides and References.** Deviations from these designated guides and references do not require approval of a design exception.

*Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT < 400)*

*Erosion and Sediment Control on Highway Construction Projects (FHWA, 23 CFR 650, Subpart B)*

*Location and Hydraulic Design of Encroachments on Flood Plains (FHWA, 23 CFR 650, Subpart A)*

*Procedures for Abatement of Highway Traffic Noise and Construction Noise (FHWA, 23 CFR 772)*

*An Informational Guide for Roadway Lighting (AASHTO)*

*Highway Safety Design and Operational Guide (AASHTO)*

*Highway Capacity Manual (Transportation Research Board)*

*Roadside Design Guide (AASHTO)*

*Pavement Management Guide (AASHTO)*

*Standard Specifications for Transportation Materials and Methods of Sampling and Testing (AASHTO)*

*A Guide for Development of Rest Areas on Major Arterials & Freeways (AASHTO)*

*Guide for the Development of Bicycle Facilities (AASHTO)*

*Guide Specifications for Highway Construction (AASHTO)*

*Highway Drainage Guidelines, (AASHTO)*

*Erosion & Sediment Control Manual (ITD)*

*A Guide for Achieving Flexibility in Highway Design (AASHTO)*

*Guide for Utility Management (ITD)*

*Railroad Guide (ITD)*

*Context Sensitive Solutions Guide (ITD)*

**320.02 Interchange Access Requirements** ITD owns and operates the Interstate System, FHWA is required to approve all new access or changes in access points pursuant to 23 U.S.C. 111. Due to the complexity of adding or revising Interstate access, FHWA has developed an Interstate System Access Information Guide (ISAIG) that defines and explains what should be included in the Interchange Access Justification Report submitted by ITD to the FHWA Division Office. The Guide is available via the link provided in 320.03.04 of this section.

The submitted report may be an Interchange Justification Report (IJR), Interchange Modification Report (IMR), Interstate Access Report (IAR), or Interchange Operational Analysis Report (IOAR). The appropriate documentation/report required will be determined through a meeting between FHWA and ITD representatives.

**320.02.01 Interchange Access Justification Report Required** The following changes to Interstate facilities require FHWA access approval:

- New freeway-to-freeway interchange.
- New service interchanges providing access between a non-freeway local roadway network (arterial, collector, or local road) and the Interstate.
- Modification of freeway-to-freeway interchange configuration; for example, adding new ramp(s), abandoning/removing ramp(s), completing basic movements, and reconstruction of structures.
- New partial interchanges or new ramps to-from continuous frontage roads that create a partial interchange.
- Modification of existing interchange configuration, such as adding a loop to a diamond interchange.

- Completion of basic movements at partial interchange, for example, completing a partial diamond interchange by adding a ramp.
- Locked gate access, for example, access via locked gates for emergency response.
- Abandonment of ramps or interchanges.
- Access to special use lanes such as high occupancy vehicle (HOV), high-occupancy toll (HOT) or truck only lanes (from the street network) within the Interstate System should be treated similar to any other access.
- Relocation of a terminal of a ramp to a different intersecting road.
- Changes in operation of managed-lane access to general-purpose access to the Interstate.

If the proposed changes fall under the categories listed above, coordination with FHWA for determining the level of documentation needs to be initiated. This will involve:

- (1) a meeting scheduled early in project scoping process between FHWA Division representatives and ITD representatives to explicitly define the purpose and need, project goals and objectives, and establish the project study framework;
- (2) a meeting at the draft report stage between FHWA Division representatives, ITD representative, and the Project Manager to properly discuss the progress and answer questions;
- (3) response to the Eight Policy Requirements (ISAIG, Section 2.7) in the report that will be submitted to FHWA for review.

Final approval of access cannot precede the completion of NEPA, even if no Federal funds are used. Once NEPA has been completed, approval of access is granted as long as there are no changes to the location or design of the accepted concept/charter.

**320.02.02 Interchange Access Justification Report May Not Be Required** Although access approval may not be needed for the categories listed below, coordination with FHWA Division Office is recommended to determine if any analysis is required based on the context of the project. If it is determined these changes may require an analysis of the planning, environmental, design, safety, and operations of the proposed improvements, ITD will coordinate with the FHWA Division Office to determine the type and extent of analysis required.

- Modification or reconstruction of intersections (i.e. Roundabouts, Diverging Diamond) at the ramp terminus may not require an Access Justification Report; however, based on coordination with FHWA, analysis of the potential consequences of this change on the safety and operational performance of the Interstate may be required.
- Shift of a ramp's location within the same interchange configuration, which results in ramp spacing that meets FHWA's design criteria. If the interchange is reconfigured in

- such a way that the travel patterns change with the same number of access points, coordination of the project should be performed with FHWA.
- Division Office to determine the type of review and process to be considered. Changing the location of a ramp could result in changes to the safety and operational performance of the Interstate System.
  - Addition of lanes to an on-ramp may not require an Interstate System Access Change Request be submitted; however, based on coordination with FHWA, analysis of the potential consequences of this change on the safety and operational performance of the Interstate may be required.
  - Addition of left-turn storage lanes, right-turn storage lanes, and through travel lanes at the terminus of existing ramps.
  - Relocation or shifting of the existing on-ramp or off-ramp termini (i.e., moving the ramp end that connects with the intersecting road) along the same roadway.
  - Addition of a single auxiliary lane between two adjacent interchange ramps where the single auxiliary lane does not function as a mainline travel lane.
  - Modification of the length of acceleration or deceleration lanes involved with any ramp.
  - Improvement of traffic signals at ramp termini should be reviewed to ensure that the changes in the signalization do not result in queue spillback into the mainline lanes of the Interstate and that sufficient storage is provided.
  - Implementation of ramp metering or other active control of vehicles entering the Interstate System.
  - Construction of new signing, striping, and/or resurfacing of an Interstate on-ramp or off-ramp, where geometric features are not changed.
  - Installation of roadside guardrail and concrete barriers (such as for resurfacing and safety projects).
  - Construction of overpasses or grade separation structures without ramps along Interstate facilities. The approval of air-rights over Interstate facilities is addressed as part of the location and design concept acceptance with the NEPA process and approval of plans, specifications, and estimate.

- Changes in access between managed lanes and general purpose lanes on the Interstate

Chapters 7 and 8 of the ISAIG discuss the safety and operational considerations respectively. These chapters describe in detail the analysis that may be required to verify the performance of the Interstate based on the proposed change.

**320.02.03 Future Interstate** In the event that a route has been approved for future interstate designation, ITD shall contact the FHWA Division representative to determine what may be necessary to ensure compliance with the interstate access requirements. Each project will be reviewed on a case-by-case basis.

#### **320.02.04 Interchange Requirements Guides and References**

*Federal Register: August 27, 2009 (Volume 74, Number 165, Page 43743-43746)*

<http://www.gpo.gov/fdsys/pkg/FR-2009-08-27/html/E9-20679.htm>

*FHWA Interstate System Access Information Guide*

<http://www.fhwa.dot.gov/design/interstate/pubs/access/>

*FHWA Idaho Division Standard Operating Procedure (SOP), for New or Revised Interstate Access Points*

*NCHRP Report 687, Guidelines for Ramp and Interchange Spacing*

[http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_687.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_687.pdf)

For additional information on Interchanges, Interstate/Expressways, see [Appendix A.50](#).

**320.03 Application of Design Standards.** The design standards contained herein generally represent minimum values and should be considered the lowest acceptable limits in design. The policies and standards are to serve as a basic guide in design work. However, they are not to be considered as inflexible and are not intended as a substitute for engineering knowledge, experience, or judgment. Designs will embody the highest values possible, commensurate with conditions and that minimum values should be utilized only in those cases where inordinately high costs would result or where other factors must be considered. ITD's philosophy is to build cost-effective projects to achieve a good, safe and efficient transportation system. See ITD's Practical Solutions for Highway Design.

While maintaining sound safety and geometric design standards, project designers shall, to the extent practicable, locate alignments and facilities to avoid the following considerations:

- Hazardous wastes
- Wetlands
- Floodways

- Public parks/recreation areas
- Wildlife/waterfowl refuges
- Historic/archeological sites
- Displacements

Designers shall consult with environmental staff and district environmental planners regarding the location of areas of concern. Any unavoidable encounters involving the areas listed above require consideration of all practicable design measures to minimize harm (e.g., spanning a floodway). In addition, designers shall coordinate with environmental staff regarding other environmental issues that may arise and affect project design or location (e.g., noise abatement walls, bald eagle nesting sites, etc.).

**320.04 Guidelines for Considering Alternate Routes.** Alternate routes must be considered in the following corridors during development of plans or projects:

- On a Board-approved “Intrastate Priority Corridor” or
- A highway classified as “rural principal arterial” to support and enhance the [Board Policy 4005 - Management of Department Owned Property](#).

When evaluating alternative routes consideration should be given to the following factors:

- Environmentally feasible – The project must be supportable through the NEPA process.
- Cost-effectiveness – This item may include rebuilding “Main Street” whether the local jurisdiction assumes responsibility of the rebuilt road or not.
- Existing access control – Access control on the State Highway System is based on the type of facility, functional classification, highway safety, vehicle operations, preservation of highway utilities, zoning, and route consistency.
- Traffic volume and destination – The benefits to be derived from bypassing a city is directly related to the volume of traffic that is being delayed by operational constraints within the city.
- Population of the community – The community’s ability to adjust to economic change is a factor in any consideration to build an alternate route. The number of through trips is a function of the city population.
- The percentage of through traffic approaching a city decreases as the city size increases. Economic benefits realized from bypass construction are reflected in improved accessibility and decreased vehicle-operating costs.
- Local community desire for the alternate route – This issue should be discussed thoroughly in the Public Involvement Process.

- Existing facility capacity – The level of service issue for arterials entering a community is an important factor for efficient and safe travel.
- Distance from town of the proposed alternate route – Access to traveler services is a factor for the traveling public.
- Safety/Crash rates – Will the alternate route significantly increase safety or reduce crash rates?
- Signing of new route – Local communities should be assured that adequate and proper signing will be provided on the alternate route to encourage the traveler to use local businesses and services.

**320.05 Context Sensitive Solutions.** To “protect and enhance the natural environment and communities affected by highway transportation”, ITD will seek opportunities to implement innovative measures that will help our projects fit within the community and natural environment in which they are located. An example of such an opportunity is the integration of context sensitive solutions and design (CSS/CSD) within the NEPA and project development process. The context sensitive solutions approach is a collaborative, interdisciplinary approach that involves all stakeholders in the development of a transportation proposal so the project will fit in with the physical setting and preserve scenic, aesthetic, historic, and natural environmental resources, while maintaining safety and mobility. See ITD’s Context Sensitive Solutions Guide.

**320.06 Practical Solutions.** Practical Design is intended to challenge traditional standards and develop safe and efficient solutions to solve today’s project needs. ITD’s philosophy is to build cost-effective projects to achieve a good, safe and efficient transportation system. Innovation, creativity and flexibility are necessary for us to accomplish our growing transportation challenges. Idaho’s Practical Design initiatives are parallel to and mutually support our Context Sensitive Solutions approach to project development. The goal is to get the best value for the least cost without compromising safety. See ITD’s Practical Solutions for Highway Design.

## 325.00 – CHARTER REQUIREMENTS

The charter is a living document that provides a high level project description, defines specific project parameters and will be utilized throughout the life of the project – from the Evaluation Phase to the Development Phase and into the Implementation Phase. In addition, it serves as a contract between the Project Team and the Project Sponsors, stating what will be delivered according to the budget, time constraints, risks, resources and standards agreed upon for the project. The charter consists of scope and strategic goals, design standards, alternate solutions and costs if appropriate, and a Phase I Materials Report if appropriate. For charter requirements, see the most recently published [Charter Guide](#).

**325.01 Pedestrian and Bicycle Facilities.** Vehicle, bicycle and pedestrian requirements shall be individually discussed and documented during the chartering stage of the project. In accordance with Administrative Policy A-28-04, all projects need to be analyzed to see if a need for bicycle and pedestrian facilities exist. Areas to be covered include potential usage of the corridor by bicyclists (adjacent or within populated areas), ability of highway to accommodate bicyclists (wide shoulders), coordination with local communities and plans, etc. Provide either a plan to include bicycle facilities or justification as to why not. Any issues concerning bike path standards will be addressed to the Geometrics Engineer in the Resource Center.

See [Appendix A.40](#) for the design criteria for bicycle facilities.

**325.01.01 Americans with Disabilities Act.** Maintenance projects such as signing, striping, crack sealing, and seal coating do not require American with Disabilities Act (ADA) updates for existing features. Existing traversable cross-slopes, grades, gutter lips and other features need to be maintained such that no new ADA issues are introduced by the project.

All other projects are to meet Americans with Disabilities Act requirements, regardless of funding source. Included are rehabilitation projects that are being done in urban type areas. Curb ramps will be updated to meet standards on all projects, except non-resurfacing, with pre-existing curbs and sidewalks.

**325.02 Intelligent Transportation Systems (ITS).** Deployment of ITS technologies shall be considered on all projects as a method of addressing project goals, motorist needs, and the goals of Idaho's ITS program. For more information see [Appendix A.45](#).

**325.04 Charter.** An evaluation, and development if required, charter will be approved prior to the preliminary design review. Development charters for FHWA Projects of Interest projects will also be submitted to FHWA for review.

The project charter shall be completed in accordance with the Charter Guide.

**325.05 Charter Approval for Pavement and Bridge Preservation, 3R Minor Widening and Pavement Preservation Projects.** Normally, these projects do not require as much detail in the charter as other projects. Therefore, the Evaluation Charter approval serves as Concept Approval for these projects. Rules of responsibility to the public for professional engineering always apply.

## 330.00 – DESIGN EXCEPTIONS

The general policy of the department is that all design criteria will be met. Where both minimum and desirable values are provided, every reasonable effort should be made to achieve the desirable standards.

Whenever necessary or desirable to deviate from the design policies, standards and from the 13 controlling design criteria: design speed, lane and shoulder widths, bridge widths, structural capacity, horizontal and vertical alignments, grades, stopping sight distance, cross slopes, super-elevation, and horizontal (not clear zone) and vertical clearances as referenced in [23 CFR 625](#), a design exception shall be required. When exceptions to standards are required during the course of project development, the district shall document the design exceptions using the [Project Scheduling System \(PSS\)](#), [the development charter](#) and [the corresponding Project Workspace](#). Non-NHS design exceptions are approved by the District Engineer. NHS and FHWA Projects of Interest Design Exceptions are recommended for the State by the District Engineer. DE recommended FHWA Projects of Interest and NHS design exceptions shall be sent to FHWA for approval with a copy to DMC.

The districts may request approval through the Design Exception Committee review. The committee includes the Design Engineer, the Traffic Services Engineer, the Bridge Engineer and the FHWA Field Operations Engineer.

Copies of all Design Exception documentation will be sent to DMC for record keeping purposes.

The most common design exception request is for width. When the approved standard is met, but the corridor plan is not met, a design exception is required.

All design exceptions must be documented and justified. A design exception request should include a description of what standard is being reduced, to what extent the reduction will be, where the reduced standard will be applied, two or more justifications for reducing the standard, and the full cost to obtain the standard. Whenever possible, the deviation from the standards should be as little as possible. (Requests for exception should be justified in engineering terms rather than economic terms, since the argument that the state needed to save tax dollars is not usually a persuasive justification.)

The justification should completely describe the physical and environmental factors that make the exception necessary. Justifications should follow along those reasons that would be

considered good engineering judgment such as effect of the variance on the safety and operation of the facility, compatibility with adjacent sections of the roadway, functional classification, amount and character of traffic, type of project (new construction, reconstruction, or 3R), crash history, resultant environmental impacts, and future improvements programmed. Cost-effective justifications should be used whenever applicable and should always be used whenever standards are reduced significantly or large costs are involved. (See the following, Guidelines for Preparing a Request for Design Exception.)

**330.01 Guidelines for Preparing a Request for Design Exceptions.** The appropriate justification and documentation must accompany every request for a design exception. Each design exception request must be based upon a comparison of what is proposed versus the appropriate standard. Generally, the following three items should be considered in any analysis:

- a. What is the degree to which the standard is being reduced?
- b. Will the exception affect other standards?
- c. Are there additional features being introduced, such as signing or delineation, which would mitigate the exception?

At least two justifiable reasons must be presented for each exception.

Most requests for roadway width exception are actually for a shoulder width exception. An example of this is a request to construct a 28 feet wide roadway in lieu of the 36 feet wide AASHTO standard. Since the 28 feet roadway typically has two 12 feet lanes and two 2 feet shoulders, and a 36 feet roadway typically has two 12 feet lanes and two 6 feet shoulders, the exception is really to construct the roadway with 2 feet instead of 6 feet shoulders. At least six arguments can support this width exception.

- a. Recommended roadway widths based on completed corridor plans or by applicable standards. A design exception must be approved for exceptions to recommended widths established in a corridor plan. Although reference to a corridor plan should be noted for any applicable projects, the request for a width design exception to AASHTO standards cannot be based solely on this justification.
- b. Capacity — a roadway width exception should not be requested unless the proposed roadway width will provide adequate capacity in the design year. An analysis that shows that adequate capacity can be attained without the full standard width is not by itself adequate justification for a design exception, but can help support other arguments.
- c. Continuity of Width with Adjacent Roadway Sections — if roadway sections adjacent to the proposed project have been constructed to a lesser width than the AASHTO standard, there is often no benefit to be derived from building the proposed project to the full standard width. (Example: A project is proposed for a 22 feet section of an existing 24 feet roadway. The existing roadway at the south end of the project was constructed eight years ago to 28 feet; and the roadway at the north end of the project was constructed four years ago to a 28 feet width. Even though the AASHTO standard may call for a 36 feet roadway, no benefit will be gained by constructing to this width as long as there are no safety or capacity problems.
- d. Crash History — The crash history of the roadway section should be examined to determine if there have been a significant number of crashes that can be attributed to inadequate

roadway width or shoulder width. Lack of such crashes can be cited as support for no additional widening of the section.

- e. Shoulder width for local roads and collectors and a minimum “usable” shoulder width for arterials. The terms “graded” and “usable” are defined in the Green Book. The pavement foreslope may be considered part of the “graded” or “usable” shoulder if the foreslope is 6:1 or flatter. Assuming a pavement depth of 3.5”, a 6:1 foreslope would give an additional 2 feet of shoulder on each side of the roadway. This would mean that a roadway constructed to meet a width requirement of 36 feet, with two 12 feet lanes and two 6 feet shoulders, could also be considered to meet an AASHTO requirement of 8 feet shoulders if the foreslope was 6:1 or flatter. The use of the 6:1 paved foreslope as part of the “graded” or “usable” shoulder must be documented in the [charter](#).
- f. Cost-Effectiveness of Incremental Changes in Cross-Section Design —widening a substandard width roadway shoulder will usually result in a reduction in the crash rate for that section of road. The cost effectiveness of widening a substandard width shoulder to a greater width can be estimated from the cost effectiveness of incremental changes in cross-section design. For certain existing shoulder widths, the safety benefit gained by widening is less than the cost of the widening itself and therefore not cost effective, thus a width design exception can be supported. Often an interim shoulder width will be more cost effective than widening to full standards.

Additional considerations — Such as environmental impacts, can be included as justification for certain width exceptions.

**330.02 Cost Effectiveness.** The term “cost effectiveness,” is meant to apply to the general consideration of the relative worth of a highway project or individual design elements of a highway project. Are the highway projects or design elements worth the estimated costs in terms of returning to the public a benefit commensurate with the taxpayer's investment?

Cost effectiveness, benefit/cost ratio, rate of return, and payback period are some of the analytical methodologies used to quantitatively calculate the value of a proposed highway project or design element. The objective is to analyze all possible alternatives of providing the facility that will render the desired service and is used as an aid to reach the final decision on what course of action to take. Because of the objective nature of cost-effective studies, only those impacts that are quantifiable and which can be assigned a realistic monetary value can be considered. Cost effectiveness does not incorporate the impacts of such considerations as general design consistency, aesthetics, land values and uses, access, driver convenience and comfort, social ramifications, and environmental consequences. The final choice must also reflect these other considerations when given their proper weight.

In theory, design criteria generally reflect cost-effective considerations. However, because of the need to develop design criteria for widespread application, some criteria inherently assumes typical benefits and costs that would normally be encountered in the selection and design of a highway project. Obviously, what is actually encountered in the design process for a specific project may vary widely in terms of expected benefits and expected costs and therefore the cost

effectiveness of normal design criteria must be considered based on the individual project and site.

**330.03 Cost-Effective Analyses.** Cost-effective analyses are conducted at many levels; the most common of which is the exercise of good engineering judgment. A rough estimate of construction and maintenance costs is usually available and when intuitively compared to the expected benefits based on a designer's perception of past experience, it is often obvious whether or not a design element is cost effective. In many cases, simple analysis is the most practical in the interest of time. However, when the project represents a large dollar amount, or the actual costs and benefits cannot be reasonably estimated through judgment, or the project and its design become controversial, an in-depth cost-effective analysis is warranted. In these cases, the time and effort spent on conducting a detailed cost-effective study may be minimal when compared to the increased economies realized in the final product.

Cost-effective methodologies can calculate:

- a. *User benefits and costs* for a highway project as a whole or for an individual design element within a highway project.
- b. *Safety benefits* and construction costs for a highway safety project based on actual *crash experience* and the anticipated crash reduction of the proposed countermeasure.
- c. *Safety benefits* and construction costs for a proposed highway safety countermeasure **based on the potential for crashes**. This methodology is applied to roadside obstacles.

Numbers 2 and 3 above are actually subsets of number 1 since crashes and safety are considered in the assessment of total user benefits and costs.

Separate cost-effective methodologies for highway safety have evolved because 1) the increased emphasis on highway safety has resulted in the designation of highway funds that are strictly for the purpose of reducing the potential for highway crashes; and 2) the "crash" information element offers an identifiable unit that is measurable, lends itself to data collection and statistical analysis, and has undergone extensive research to realistically establish social costs.

**330.03.01 Cost Effectiveness Computer Programs.** Use of cost effectiveness applications related to accident or crash data must use the appropriate crash cost (see Administrative Policy A-38-02). These values are found in the current release of the Idaho Traffic Crashes report published by the Department's Office of Highway Safety. The following is a list of nationally recognized analysis tools for doing safety benefit cost comparisons on roadway projects.

**Roadside Safety Analysis Program (RSAP):** Cost effective analysis tool for assessing roadside safety treatments to point locations and sections of roadway.

**Interactive Highway Safety Design Model (IHSDM):** The IHSDM is a suite of analysis tools for evaluating safety and operational effects of geometric design decision on highways. The suite of tools include crash prediction, design consistency, intersection review, policy review, and traffic analysis.

**Highway Safety Manual (HSM):** Analysis tools for quantifying potential reductions in crash frequency and severity related to transportation facilities

**330.04 User Benefit and Cost Analysis.** Many methodologies have been developed and many references exist that address cost effectiveness for highway projects as a whole and for individual highway design elements. The basic approach is summarized in the following steps:

- Update user cost factors. Approximately every one or two years, the highway user costs for items such as time, fuel, and vehicle maintenance and depreciation should be updated.
- Select an economy study model to measure the cash outward and inward flows in equivalent dollars by use of a compound interest formula. AASHTO recommends the use of a discount rate to calculate present values.
- Estimate project costs.
- Calculate unit user costs. The user costs, as a function of traffic characteristics and highway geometry, should be estimated for the alternative designs including the "do-nothing" alternative.
- Calculate user benefits. The benefits for savings in vehicle operating costs, travel time, crash costs, and fares should be estimated.
- Estimate residual value. At the end of a facility's or design element's service life, some value will likely remain. This value should be estimated and its worth included in the methodology to offset project costs.
- Determine present values and economic desirability. The stream of user benefits and user costs over the design service life must be converted to a present value for comparisons between the two.

**330.05 Safety Benefits Based on Crash Experience.** Crash experience is usually the best indicator of future crashes. Therefore, if the data is available and given certain other information, the cost effectiveness of a proposed highway safety countermeasure can be accurately measured. This methodology is most frequently used for proposed projects that will be funded with money explicitly set aside for highway safety projects. However, the methodology is applicable to assess the cost effectiveness of a highway design element that is intended to reduce the frequency and severity of crashes.

A methodology for highway safety projects similar to the one presented in NCHRP 162 Methods for Evaluating Highway Safety Improvements is summarized in the following steps:

- Identify hazardous locations. By applying statistical analyses to accumulated crash data, locations can be identified that have crash rates higher than what can be attributed to chance (usually 95%).

- Identify the nature of the established crash pattern. By use of a collision diagram, the crash pattern can be established as it relates to the type of crash, weather conditions, and time of day.
- Select alternative improvements. Several countermeasures may be proposed to reduce the frequency or severity of crashes.
- Evaluate the estimated effectiveness of each alternative. Crash reduction factors can be applied for each countermeasure to estimate the impact of the countermeasure on the crash problem.
- Estimate project benefits. Based on the number and severity of the crashes, a dollar benefit can be assigned to each countermeasure.
- Estimate project costs.
- Convert project benefits and costs to an equivalent monetary value. The recommended method is to convert to an equivalent uniform annual cost over the estimated service life of the proposed countermeasure.
- Calculate a B/C ratio. A B/C ratio should be calculated for each countermeasure with the highest B/C usually considered the preferred alternative. Normally, a minimum B/C of 1.0 is used to decide whether or not a project should be undertaken.

**330.06 Safety Benefits Based on the Potential for Crashes.** It is unusual for a roadside location to have a sufficiently high crash experience to estimate potential crashes; however, run-off-the-road crashes represent a high proportion of highway fatalities and injuries. Therefore, roadside hazard improvements warrant consideration even if a particular location has never experienced a crash.

## 335.00 – PRELIMINARY DESIGN ANALYSIS

Design alternatives need to be reviewed showing the various design options with benefit/cost determinations and recommendations. The Phase I Materials Report, complete with the life cycle cost analysis, shall be included when applicable. Nonstandard design features or deviation from AASHTO and state standards that are known at this time will require approval.

Alternatives to longitudinal encroachments on 100-year flood plains shall be documented. If the design alternative will be selected through the NEPA Process, it shall be documented in the Alternate Solutions and Costs.

**335.01 Environmental Activities.** Project development activities may begin as soon as the project is placed on the Idaho Transportation Improvement Program (ITIP). To determine the level of environmental documentation that is needed for the project, the evaluation charter should be reviewed.

District Design staff shall consult with the District Environmental Planner early in the project development process to determine if coordination with Idaho Department of Fish and Game (F&G), US Fish and Wildlife Service (USFW) or National Oceanic and Atmospheric Administration – Fisheries (NOAA) is needed. Appropriate review times for these coordination activities shall be included in the project schedule. District design staff shall provide the necessary project information to District Environmental to assist in the interagency coordination efforts.

Items identified during the project development stage as necessary for the preservation or enhancement of fish and game resources will be included in the environmental document. ITD will, to the extent possible, incorporate resource agency comments. Required items will be identified as a project commitment or mitigation, and shall be included in the project plans and specifications. Items not required, but desirable, may be added to the plans as determined by the district project team (design and environmental) in coordination with the other agencies.

The project team is encouraged to consult early with HQ Environmental Cultural Resources to determine if the cultural resource work can be accomplished either in-house or under programmatic agreement. The district may also request assistance with the scope of work for cultural resource activities.

**335.02 Traffic Volume.** For all rural roads other than freeways and arterials, the current year ADT (two years beyond the program year) may be used for determining standards unless the design hourly volume (DHV) is greater than 100. If the DHV is greater than 100, then the projected DHV for 22 years after the programmed year should be used.

For rural freeways and arterials, the DHV (30th highest hourly volume) for 22 years after the programmed year should be used. Routes with a high percentage of recreational traffic (where the 30th highest hourly volume is greater than 15% of the ADT) may be designed with the 200th

highest hour as the DHV if the expected maximum hourly traffic does not exceed the capacity of the highway.

Traffic volumes should be requested from the Roadway Data Unit on an [ITD 1151](#), Traffic Data Request, for 2 years and 22 years beyond the year in which the project is programmed. The request for traffic data, including any necessary turning movements, should be made as soon as the initial [ITD 1414](#), Project Program Entry or Revision, is approved for preliminary design and environmental studies.

**335.03 Functional Classification.** The functional classification for a project should be obtained from Planning/Program Management (2PM) who is responsible for the establishment of urban boundaries and the functional classification of all public roads.

**335.04 Access Control.** The control of highway access shall be considered on all new highway improvements.

See - [Board Policy 4005](#) - Management of Department Owned Property

Location public hearings will include a discussion of access control that applies to the alternatives under consideration. An existing access that is allowed to remain during a highway project and does not meet criteria for the newly established access control type must be documented and shown on the "As Constructed" plans.

Any existing access removed during a highway project shall be documented on the right of way documents and the "As Constructed" plans.

Adequate right of way for frontage roads should be obtained.

To maintain system capacity, safety and efficiency, maximize signal progression, and minimize delays to the traveling public, all approaches and signals shall be spaced in accordance with [Board Policy 4005](#) - Management of Department Owned Property. Variances to the spacing standards shall not be permitted unless a need can be demonstrated for the variance. Any variance must be fully documented.

For Type V Access See FHWA Access Policy at <http://www.fhwa.dot.gov/programadmin/fraccess.html>

**335.05 Terrain.** The selection of the appropriate terrain type is difficult because a project can encompass portions of two or sometimes all of the three terrain types.

**LEVEL                      ROLLING                      MOUNTAINOUS**

Refer to the Vertical Alignment section of the Green Book for guideline definitions of the three terrain types. The Highway Capacity Manual also contains general terrain definitions. Sound engineering judgment involving consideration of all factors should be applied.

**335.06 Level of Service.** Recommended minimum levels of service are:

Highway Type	Type of Area and Appropriate Level of Service			
	Rural Level	Rural Rolling	Rural Mountainous	Urban/Suburban
Freeway	B	B	C	C
Arterial	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

(From the Green Book Level of Service section)

In some cases, the cost of construction for the recommended level of service becomes prohibitive and a lower level of service is acceptable for economic reasons. Justification for the reduced level of service must be documented.

When comparing levels of service, each highway type uses a different methodology and criteria for determining the level of service.

**335.07 Design Speed.** Once the functional classification, terrain, and traffic volumes have been determined, the design speed can be selected from the appropriate section of Appendix A (3R NHS Routes, Non-NHS State system and local roads) and AASHTO publications (reconstruction or new construction on NHS and Interstate routes).

**335.08 Super-elevation.** Chapter 3 of the Green Book discusses two predominate methods of for selecting superelevation rates on horizontal curves:

Method 2: The superelevation rate is such that the lateral force is equal to the maximum side friction value.

Method 5: Superelevation and side friction have a curvilinear relation with the inverse of the radius of the curve such that side friction and superelevation are gradually increased until a maximum superelevation rate and maximum side friction are reached.

Method 2 is appropriate to use in:

Low speed urban situation where it is anticipated there will be a high level of stop and go traffic. Values for superelevation using this method are shown in the Green Book, chapter 3, Minimum Radii and Superelevation for Low-Speed Urban tables.

Low-volume roadways that have ADTs less than 400 ADT. Method 2 is the prescribed method used in the 2001 AASHTO Guidelines for Geometric Design of Very Low-Volume

Local Roads (ADT  $\leq$  400). For these very low-volume roads superelevation tables are provided for recreational, agricultural or commercial type roadways.

Temporary road construction. Engineering judgment needs to be employed particularly when using Method 2 on a route that would normally be designed to Method 5. When selecting a method, construction duration, type of traffic, traffic volume and speed of route need to be taken into consideration. Longer construction durations, higher volumes and higher speeds should favor design practices that are consistent with the permanent route design. For further guidance see NCHRP Report 581, Design of Construction Work Zones on High-Speed Highways.

Method 5 is the prescribed method for rural highways, urban freeways and high-speed urban streets. This method involves picking an appropriate maximum superelevation ( $e_{max}$ ) value from Section 535.01 Maximum Superelevation that is consistent with the route features. Using the design speed and radius the superelevation rate can be determined from the appropriate  $e_{max}$  table within chapter 3 of the Green Book.

When using Method 5, the  $e_{max}$  value and the associated minimum radius are to be documented in the charter. When using Method 2, the rational and standard used are to be documented in the charter.

**335.09 Roadside Hazards.** Chapter 2, Roadside Safety and Economics, and Appendix A in the AASHTO Roadside Design Guide presents the approved method for evaluating countermeasures for identified roadside hazards. The analysis includes provisions for different design speeds, different roadway geometrics, and the ability to incorporate an estimated traffic growth rate. The procedure outlined assesses the potential for a given hazard to be struck and assigns a cost to the hazard. By evaluating different options, the most cost-effective option can then be selected and establishes the following countermeasures in order of desirability:

- a. Remove the obstacle or redesign so obstacle can be safely traversed.
- b. Relocate the obstacle to a place where it is less likely to be struck.
- c. Reduce the impact severity by using an appropriate breakaway device.
- d. Redirect a vehicle by shielding the obstacle with a longitudinal traffic barrier and/or crash cushion.
- e. Do nothing, i.e., leave the hazard unshielded.

**335.10 Warrants for Traffic Barriers.** Chapter 5 in the AASHTO Roadside Design Guide presents the warrants for Roadside embankment barriers. These warrants are based on the relative severity between the hazard and the traffic barrier, but do not address the question of whether or not a traffic barrier installation is cost effective. To assess the necessity of a traffic barrier:

- Assess the potential striking the hazard by estimating the lateral placement, width and length of the hazard, traffic volumes, highway alignment (geometry), design speed, and, likely, encroachment frequency.

- Calculate the average annual cost of the existing hazard by assigning a dollar value to the crash, and the initial and maintenance costs.
- Calculate the average annual cost for each appropriate countermeasure to establish the annual cost for a modification of the hazard or for installation of a barrier (which is also analyzed as a hazard). (The calculation of the annual cost for the existing hazard represents the cost of the do-nothing alternative.)
- Compare annual costs for each countermeasure to the annual cost for the do-nothing alternative to indicate which of the alternatives will extract the least cost from the highway user.

### **335.11 Rumble Strips.**

#### **Shoulder Rumble Strips**

Rumble strips are an extremely cost-effective means of reducing single-vehicle run-off-the-road crashes. Because of this, all projects need to be analyzed to see if a need for installation of milled-in shoulder rumble strips exists and should be added to the charter under the alternatives. The following items should be considered:

**Type of project.** It does not make sense to include rumble strips in certain types of projects such as some Transportation Alternatives (TA), CMAQ, Bridge, ITS, etc., nor with spot location improvements.

**Single-vehicle run-off-the-road (ROR) crash rate.** Calculate the Safety Index following the procedures in the Highway Safety Manual. Rumble strips will not provide a benefit where there are few incidences of ROR crash.

**Bicycle usage.** Refer to Appendix A.40, Pedestrian and Bicycle Facilities, and check with the Program Planning and Development Specialist in ITD Transportation Performance.

**Shoulder width.** Rumble strips installations should have a minimum 4 ft paved shoulder width.

**Shoulder condition.** If the shoulder is in poor condition and the project does not include an overlay, rumble strips should not be included.

**Residential roadside development.** Consider the effect of increased exterior noise levels from rumble strips.

#### **Centerline Rumble Strips**

Centerline rumble strips can be effective in reducing head-on and sideswipe crash rates in areas with curvilinear alignments. The use of centerline rumble strips should be considered where the rates for these types of crash are higher than the statewide average. Special drawings will be

required to depict the rumble strip locations and configuration. Centerline rumble strips should be no wider than 1'.

- 1) Apply the following criteria when evaluating the appropriateness of centerline rumble strips:
- 2)
  - Perform an engineering analysis of the crossover collision. Review the collision history analysis to determine the frequency of collisions with contributing circumstances such as inattention, apparent fatigued, or drifting.
  - Centerline rumble strips are inappropriate when the combined lane and shoulder widths in each direction are less than twelve feet.
  - Determine if the roadway pavement is structurally adequate to support milled rumble strips.
  - Centerline rumble strips are not appropriate where there are two-way left-turn lanes.
  - Centerline rumble strips are not appropriate in areas where passing is allowed.

**335.12 Project Limit Designation.** Project limit designations include all major work to be performed. Isolated improvements outside the work termini of the principal work, or isolated improvements which are combined to form a project, shall be included within the project limits. Construction limits may extend beyond project limits so as to include temporary connections, transitions, and other minor work items. If project limits change during the development of a project, document why and e-mail the Office of Transportation Investments the revised milepost limits.

## 337.00 – SURVEY/LOCATION OF HIGHWAY PROJECTS

The location of most highway projects shall be mathematically tied to the Idaho State Plane Coordinate System, existing geodetic survey monuments, and property land corners through surveying methods and must comply with Idaho Code.

**337.01 Land Surveying Required.** Idaho Code requires that any department surveying for rights of way, material sources, tracts of land, or other property boundary determinations comply with the requirements for “land surveying.” The term “land surveying” includes the responsible supervision of areas for their correct determination and descriptions and for conveyance, establishment, or reestablishment of land boundaries and the plotting of lands and subdivisions. Any ITD surveys involving property boundary determinations or rights of way acquisition requires that a Land Surveyor supervise the land surveys and sign and seal related documents. Projects involving 3R type of work, maintenance projects, and other projects not having right of way acquisition can usually be excluded from land surveying requirements.

**337.02 Corner Perpetuation and Survey Monuments Required.** Corner perpetuation and filing (Idaho Code, Section 55-16) is required so that all property monuments within highway rights of way or those adjacent thereto are protected and preserved. Land survey monuments must be shown on all project plans. Idaho Code, Section 55-1612, makes engineers subject to disciplinary action by the Board if they do not indicate on their plans the presence of land survey monument that appear on a corner perpetuation record, BLM or GLO plat, record of survey, or subdivision plat. Anyone who prepares plans that do not indicate the presence of land survey monuments and the construction of the facility results in the destruction of a land survey monument are also liable for civil penalties.

**337.03 Flagging Colors.** On all preliminary surveys, the following flagging colors should be used:

Control Survey	Fluorescent
Centerline Alt	Red
Centerline Alt 2	Blue
R/W Alt 1	Yellow
R/W Alt 2	White

**337.04 Control Surveys.** The purpose of a control survey is to establish the position of the points required to locate the position of the highway facilities. This permanent project control network serves the following advantages:

Provides a control system of horizontal and vertical survey data for establishment of photogrammetric points.

Provides a convenient network of high order horizontal and vertical control points for subsequent construction surveys.

Control surveys are generally based on the network of horizontal and vertical monuments established by the United States National Geodetic Survey (NGS) and existing established land corners. Information relative to specific NGS survey monuments and the NAD83 Idaho Coordinate System is available by calling the NGS at (301) 713-3242.

**337.05 Idaho State Plane Coordinate System.** The Idaho State Plane Coordinates (ISPC) shall be used and the following information must be furnished for incorporation onto the plan sheets:

- A note indicating that ISPC (adjusted or unadjusted) were used. Show on the first plan sheet in the upper left corner the Coordinate Datum, Idaho Zone number (Western, Central or Eastern), Combination Factor, and a statement that bearings are Grid Bearings.
- Show Grid Bearings on each tangent and on other parts of the plan, where required, in a standard manner.
- Show ISPC for highway control points, such as P.I.'s, section corners, major monuments, etc., and at the beginning and end of the project. There must be at least two coordinate control points for each tangent to establish the azimuth or bearing of the line on the grid.
- Show gamma correction once for each plan sheet. If property extends from one sheet to the next, calculate a delta-alpha correction for the point of beginning.

**337.06 ITD Project Coordinate System.** The ITD Project Coordinate System is a grid system of rectangular Northing and Easting coordinates that are used to define the location of any point in Idaho and provides a standard procedure based on a common datum referenced to a common origin. The coordinate system, based on NAD83, shall be used with coordinate points calculated for all project control survey points. All property monuments on the project should be located, marked, and referenced as part of the project control surveys. If construction will remove or disturb the property monuments, they shall be reestablished and monumented as part of the construction project by a licensed Land Surveyor.

**337.07 Project Topographic Data.** The project topographic data can be obtained from field surveys or photogrammetric methods. On small projects (minor structure, intersection, railroad grade crossing improvement, or small materials source), a field topographic survey is usually faster and more convenient in obtaining the field data for design purposes. On larger projects, photogrammetric surveys are recommended to provide data compatible with the ITD Computer-Aided Drafting and Design System and to allow photogrammetric re-measure applications.

Advance planning is required to establish a survey control network and photogrammetric picture points, obtain aerial photography, and digitize data for mapping. Allow at least **24 months** prior to any need for topographic data for project design activities.

The project control network traverse should be tied to two (2) separate survey control points off the project to facilitate correction and adjustment of errors of the traverse. All points of the control network should be established as permanent points of horizontal and vertical control and located so they will not be disturbed by the project construction. The specifications for traverse, triangulation, and leveling are given in the FHWA's Surveying and Mapping Manual. The survey points for the project control network shall normally be Second Order Level of Accuracy with appropriate surveying ties to NGS monuments and existing land corners. For all other survey points (photogrammetric picture points, structure control points, location surveys, and project details), a Third Order Level of Accuracy is sufficient. (See Figure 3-6, Survey Orders of Accuracy.)

Figure 3-6

## SURVEY ORDERS OF ACCURACY

TYPE OF WORK	ORDER OF SURVEY			
	First	Second	Third	Lower
ADVANCE PLANNING SURVEY				XX
PRELIMINARY LOCATION SURVEY			XX	XX
MAPPING (large and high-density areas)	XX	XX		
PRIMARY CONTROL	XX	XX		
MAJOR STRUCTURES	XX	XX		
MINOR STRUCTURES		XX		
CENTERLINE SURVEY (high-density urban area)		XX		
FINAL LOCATION SURVEY			XX	

**337.08 Record of Surveys.** The record of surveys ([Idaho Code, 55-19](#)) by ITD that define the project rights of way and adjacent property boundaries shall be filed with the applicable County Recorder.

The survey map shall meet the requirements defined in Idaho Code, [55-1905](#), and shall provide the data outlined therein. The map shall contain a certificate of survey and a seal and shall be signed by a licensed Land Surveyor. (Right of way plans contain all the information necessary to prepare property descriptions, but do not contain all of the requirements for records of survey, so a separate record of survey must be prepared.)

A special record of survey may be required for material sources, maintenance sites, or small projects where only a few parcels are involved and normal rights of way plan sheets are not required. In these cases, a record of survey shall be prepared and filed.

## 340.00 – FLOOD CONSIDERATIONS

If the proposed route encroaches on a 100-year flood plain that has been identified by FEMA and is shown on their map, The districts must evaluate the flood hazards of the new location and various alternatives to longitudinal encroachments, and as far as practical, shall preclude the uneconomic, hazardous, or unnecessary use of the flood plain by this route.

## 345.00 – PRELIMINARY STRUCTURES STUDIES

All structure locations shall be studied for various points such as foundation conditions, skew possibilities, relative grade line separation, structure types, avoidance of regulatory floodways, etc. The district shall conduct these studies and may request assistance from Bridge for aid in the field studies. Contact with the Idaho Fish and Game Department's local representatives for input is essential. See [Section 600.00](#) and [Appendix B](#) for additional information on hydraulic data and structures.

## 350.00 – PRELIMINARY DESIGN REVIEW

The purpose of the preliminary design review is to initiate, resolve, and approve the overall design aspects. Actions that are included in the preliminary design review are design considerations, opportunity to attend, review topics, and the preliminary design review summary report.

An evaluation, and development if required, charter will be approved prior to the preliminary design review. The [ITD 759](#), Roadway Inventory that itemizes existing conditions, may be completed with the preliminary design review submittal. Depending on the design constraints, approval of Phase II Materials Report may be obtained prior to, concurrent with, or subsequent to the preliminary design review. Approval of the Phase II Materials Report is required prior to approval of final design.

**350.01 Design Considerations.** The plans, rough sketches and drawings should be prepared showing:

- Project limits, including the station and milepost,
- Length of transitions,
- Basic design vehicle at intersections (Select the design vehicle to be used in geometric design of intersections and pavement markings.),
- Number of lanes at the intersection approaches, including auxiliary lanes for turning and turning movements in design hourly volume (DHV),
- Typical Sections,

- Structure coordination,
- Passing opportunity,
- Existing utility facilities, and
- Right of Way requirements.

Potential environmental impact shall also be considered. For bridge plans and other data requirements, consult Bridge and the Bridge manual.

**350.02 Opportunity to Attend.** The affected district sections and Headquarters' Subject Matter Experts (SME's) that are requested to provide reviews should be notified of and offered the opportunity to attend the preliminary design review. On projects involving local public agencies and their consultants, an opportunity should be given to review plans and attend the review for their input. The Port of Entry Manager shall be involved in the review of all projects that affect a port of entry building or scale.

**350.03 Review Topics.** Review topics should include:

- Hearing and plan requirements,
- Available environmental documents (All environmental, Section 4(f), and historic property constraints must be identified.),
- General standards of the design that are appropriate for the conditions and the programmed cost of the project,
- Context Sensitive Solutions
- Discuss materials issues and Material Reports requirements,
- Plans for compliance to local ordinances, planning, zoning, building setback, building restrictions, fire codes, school restrictions, flood plain limits, and any other regulations that have an effect on the proposed design and right of way acquisition,
- Effects and evaluation of relocation assistance actions, and
- Recommendations and suggestions from headquarters and outside agencies.

**350.04 Report on Recommendations/Suggestions.** The district prepares a letter summarizing the decisions in regard to the comments and suggestions presented at the preliminary design review. Copies of this letter shall be furnished to all parties concerned.

**350.05 Design Plans for the Preliminary Design Review.**

Design plans that are required for the preliminary design review are a set of 11" x 17" black and white plans and are to be sent to the affected district sections and Subject Matter Experts (SME) that have been asked to provide reviews. The data supplied shall be complete enough so line, grade, and general design concepts may be approved. Show mileposts on the plan sheets at the

beginning and ending of each roadway project and equate mileposts and stationing on all projects when both are used for project control.

For signal projects, show either mileposts or the stations of intersections and ties with the existing cross streets where possible. Note on the plans the type, location, and general design features of all existing and planned facilities such as signing, illumination, intersection data and features, and other related items that will affect the project design. Detour requirements and development of the TCPs should also be shown.

**350.06 Plan Sheet Checklists.** The following can be used as a checklist for the usual plan sheets that are required for the preliminary design review. Also, see [Figure 9-1](#).

### **Roadway Group**

- **Title Sheet.** The title sheet shall be part of the preliminary design review requirements for plans and should also be used for the hearing plans.
- **Total Ownership Maps.** Preliminary total ownership maps are based on the project's preliminary design information obtained from the county tax assessor's records. The maps are used for reference by title companies in title searches and preliminary property studies involving damage and severance, economic impacts, and preliminary relocation assistance studies. The preliminary total ownership map does not require all of the ownership to be shown, but must show sufficient dimensional and graphic data to permit ready identification and correlation with the legal description of all effected ownerships. The map must show alignment, property lines (estimated), and planimetric features and topography.
- **Typical Sections.** Draft form is acceptable.
- **Plan and Profile.** Include bearings, grades, curve data, super-elevations, and R.L. and Z distance.

### **Special Drawings Group**

**Drainage.** Include wetlands and flood plain limits.

- **Minor Structures.** Minor structures are structures with a span of 20' or less (headwalls, retaining walls, etc.) that may be designed by Bridge, but will be included in the roadway summary items.
- Headwalls for pipes and arches larger than 48" and bottomless arches with footings must be submitted to Bridge for design or verification of design and, therefore, require submittal of a contour map; Phase IV Materials Report; channel cross sections; an [ITD 210](#), Hydraulic Structures Survey; and a situation and layout sheet.
- Standard Drawings D-7 through D-9 should be used for pipes and arches 48" or smaller.

### **Traffic Group**

**Delineation.** Determine the extent for no delineation; partial, public road approaches and transitions only; partial, horizontal curves, and public road approaches; full delineation per Standard Drawing G-3 and the Traffic Manual; and snow poles.

- **Signing.** Show the intent legend and the approximate location of signs (existing to be retained, temporary, and permanent).
- **Illumination.** Show areas and discuss the intent to be covered, proposed intensity, minimum uniformity ratio, and type of illumination.
- **Railroad Crossings.** See [Subsection 360.00](#).
- **Pavement Markings.** Show the location and extent, including edge lines planned; transitions lengths; stop bars and crosswalks; two-way turn lanes; turn bays – right and left; channelizing lines; bike lanes, and center lane lines. (The type of material, color, width of lines, and other minor details may be shown later. For scales of pavement marking plans, see [CADD Standards Manual](#).)
- **Traffic Control Plans.** See [Section 355.00](#).
- **Minor Intersections.** Show the number of lanes of each approach and the width of the approach; corner radii; design vehicles used; and signal warrant worksheet (if applicable).
- **Major Intersections or Traffic Signals.** Projects that involve intersections of major streets or highways and intersections with signal warrants within the design year should include an individual site plan showing the existing conditions. Where approach speeds are less than 40 mph, the site plan scale should be 1"=20' and should extend at least 150 feet on each approach. Where approach speeds are 40 mph or more, the scale should either be 1"=20' or 1"= 40' and should extend at least 350 feet on each approach.

### Site Plan Requirements

The following should be included on any site plans:

- Show north arrow.
- Show street names, route numbers, and stationing.
- Show edge of existing surfacing, lane and shoulder widths, all pavement markings, right of way and property lines, approximate grades, drainage pipes and inlets, intersection radii (curbed or uncurbed), driveways, and barriers.
- Show utility poles, street lighting, traffic islands, traffic signal poles, vehicular detectors, signal heads, and controller, if any.
- Locate no parking and restricted parking zones, hours, etc., bus stops, and direction of one-way streets, if any.
- Show all traffic control signs and the speed limits on each approach.

- Show existing buildings and locate any obstruction to sight distance for the driver approaching the intersection including trees, shrubbery, fences, billboards, walls, etc.
- Show location of any railroad grade crossings within 300' of the intersection. Give the name of the railroad company. Indicate the existing protection and whether the railroad is a siding, mainline, etc.
- Indicate distance to the nearest existing traffic signal on each approach if 1 mile or less. Show municipal boundaries if within the area of the plan and identify the municipality.
- Show condition of pavement on all approaches where loop detection is proposed.
- Locate overhead wires, underground utilities, fire hydrants, basements, and any other appurtenances that could influence the signal design.
- Supplemental photos often furnish additional information in addition to that shown on the plan sheet. Two photos taken from each street approach, one from fairly close and the second from about 100 feet back, make a good reference for intersection details.
- Right of Way Group
  - Right of Way. Show existing right of way lines and the proposed (approximating is acceptable) right of way lines for the project, meeting design requirements.
  - For Railroad encroachments see [Subsection 360.00](#).

### **Major Structure Group**

Major structures are structures with a span over 20 feet in length and will be included in bridge summary items. Preliminary bridge plan preparation consists of a situation and layout sheet and a foundation investigation sheet (see Bridge Office Standards for situation and layout sheet requirements). Sketches or views of out-of-the-ordinary structure details should also be included in the submittal on additional sheets if necessary. The submittal should be accompanied by district approved roadway profile and alignment data.

Plan preparation will always include a separate roadway sheet showing the plan and profile for the bridge location and all related items and a typical section sheet showing the existing and proposed work to be done, even if it's by the county or others. This requirement applies especially to "bridge only" projects. The bridge situation and layout sheet does not replace the separate plan and profile sheet requirement.

A Foundation Plat, prepared in accordance with [Section 250](#) of the Materials manual and showing test hole locations, should also be included.

### **Guardrail Requirements**

Guardrail requirements are based upon an economic analysis that considers:

- The cost of right of way and grading to preclude the need for guardrail.
- The cost of the guardrail.

- The crash costs.

## 355.00 – TRAFFIC CONTROL PLAN (TCP)

A TCP shows ways of handling traffic through a specific highway or street work zone or project. The TCP may range in scope from a very detailed plan designed solely for the specific project to standard plans, from the [Manual of Uniform Traffic Control Devices](#), or from a standard highway agency manual. The detail in the TCP will depend on the project complexity and traffic interference with construction activity.

Consideration should be given to the safe storage of materials and equipment during construction. Include designated storage and staging areas when limitations exist inside the right of way. See [Figure 5-7](#) and [Figure A-2](#).

**355.01 Public Convenience Measures.** Public convenience must be considered on every project. All contract construction plans will include a traffic control plan with public convenience being considered. Public convenience measures can be optional (not required) if the level of service is C or better under the construction restriction and if the daily road user cost is less than liquidated damages. To minimize inconvenience to the motorist and maintain property owner access at all times, consider the following measures.

Analyze the capacity of the highway during construction to determine construction traffic control needs and detours. Use two-lane two-way detours when the ADT exceeds 6,000 or DHV exceeds 1,000. Projects should contain lane rental provisions when the roadway is near capacity with the number of lanes provided in each direction.

Use restrictive specifications on commuter routes with high directional split or high peak hour volumes. Schedule traffic-delaying work (use a contractor's note) to avoid rush hour commuter traffic in major urban areas, heavy holiday traffic, and events that may cause peaks and associated congestion. Consider requiring nighttime construction operations.

Consideration should be given to access for emergency vehicles on projects with considerable traffic control and narrow work zones and detours. Also, pullouts on .5 mile intervals should be created for disabled vehicles and staging of incident management and law enforcement vehicles. For large projects in congested areas controlled access areas, motorist guidance programs and contractor furnished courtesy patrols should be considerations.

Use incentive provisions for early completion on projects that are in urban areas (highways where traffic exceeds 3,000 ADT on a 2-lane or 6,000 ADT on a 4-lane) or on projects that will significantly impact traffic and do not have practical detours. Incentive provisions should not exceed five percent (5%) of construction costs on major projects. Incentives on intersections, small bridges, and other minor projects should only be considered on a case-by-case basis.

Incentives should not be specified for minor projects if either the short duration of the project or the value of the contract would make the incentive infeasible.

**Do not** use incentives if utility work by others will interfere with construction, if construction is anticipated to extend through more than one construction season, if moisture-sensitive soils may be encountered during wet-weather construction, or if there is uncertainty about subsurface materials.

**355.02 Development.** A TCP shall be developed and included in the contract plans for all federal-aid highway projects and should be developed for non-federal-aid projects where significant interference is expected. The scope of the TCP should be determined in the preliminary design stage of a project and the TCP should be completed and included in the plans prior to the final design review. Separate TCPs should be prepared for each stage of construction.

TCPs for interstate projects should provide for minimum interference with the free flow of the traffic. Stopping interstate traffic should be avoided unless no other feasible alternative exists. If traffic must be stopped on interstate projects, traffic signals are recommended. Consideration should also be given to access for emergency vehicles, pullouts for disabled and emergency vehicles, motorist guidance programs, and courtesy patrols.

Contractors may develop and use their own TCPs if approved by the department and determined to be as good as or better than those provided in the contract.

**355.03 Widths.** Construction zones should be wide enough to handle 18 feet wide loads. If the construction zone restricts below the 18 feet, the contractor must notify the Port of Entry Over-Legal Permit Unit at (208) 334-8418 at least seven days prior to opening the roadway to traffic. Further instructions should be covered in the Special Provisions.

**355.04 Two-Lane, Two-Way Operation (TLTWO).** Guidelines for proposing the use of TLTWO of traffic on one roadway of a normally divided highway are as follows:

- TLTWO shall be used only after careful consideration of other available methods of traffic control.
- The desirable length of TLTWO is 3 miles or less and should not exceed 5 miles.
- The safe speed of median crossovers for TLTWO should equal the design speed of the highway facility.
- Consideration for emergency vehicles access to all lanes of traffic should be given.
- Pullouts on 1 mile intervals are recommended for disable vehicles, staging of incident management and law enforcement vehicles.
- Courtesy patrols for disable vehicles and incident management should be considered.

- If the TL TWO is proposed, the TCP shall meet the required specifications in the Traffic Manual for appropriate durations.

**355.05 Signing and Channelization.** Sequential arrow boards may be used in addition to the other signing and delineation whenever closure of lanes is necessary on rural multilane highways.

***Auxiliary advisory speed signs shall not be used alone.*** Auxiliary speed signs may be used when mounted under standard warning signs.

The Slow to "XX," signs, may be used when necessary to advise traffic that a given speed is desirable at that location.

If reduced speed limits are necessary, speed limit signs may be used, provided that the speed zones are properly established and approved in accordance with the Construction manual, Regulatory Speed Control Zones.

When concrete guardrail is used adjacent to traffic lanes, the guardrail should be adequately delineated so as to be highly visible to nighttime drivers.

Pavement markings (temporary tape, painted lines and symbols, thermoplastic markings, and raised markers) that are no longer applicable and that might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as possible.

**355.06 Construction Crossovers.** Construction crossovers for use by the traveling public should be designed to the speed of the roadway and anticipated volume of traffic during construction. The crossover shall be located at logical project termini and shall be left in place for future projects. A positive restriction (earth berms, concrete guardrail, etc.) shall be placed on the crossovers to prevent random use when the project is completed.

**355.07 Bid Items.** Item 626-100A, Rent Incidental Traffic Control Item, Item 626-105A, Traffic Control Maintenance, and other items in Sections 626 or 630 in the Standard Specifications shall be used as payment coding for:

Incidental traffic control devices and hardware that is not included in other pay items;

Relocation and maintenance of devices paid for or rented under other bid items; and

Costs associated with providing, monitoring, and supervising traffic control devices.

## 358.00 – GOVERNMENTAL PERMITS

Projects may require one or more permits from state, federal, or local agencies. Permits are normally obtained through an application process. Project approvals are obtained through coordination and negotiation with the approving agency. Most permits are related to environmental documentation and can also require supplemental materials. A table with regulatory provisions is outlined in [The Environmental Process Manual](#), Government Permits.

## 360.00 – RAILROAD ENCROACHMENTS – GENERAL

ITD has developed the “[Railroad Guide](#)” with information and procedures regarding highway projects impacting railroads.

Most highways encroach onto railroad property by easements granted from the railroad companies. Refer to [Section 400](#) of the latest version of the “[Railroad Guide](#)” for information of acquiring property rights from railroads. Refer to [Section 500](#) of the latest version of the “[Railroad Guide](#)” for information concerning the design process involving railroad.

## 365.00 – AIRPORT CLEARANCE REQUIREMENTS

Any proposed new construction or alteration of an existing facility that may impose an obstruction to present or future air navigation must be coordinated with the Federal Aviation Administration (FAA) and with the department’s Division of Aeronautics (Aeronautics). The FAA and Aeronautics require notification of proposed construction or alteration that contain vertical elements exceeding limitations established in Federal Aviation Regulations Part 77. The federal regulations ensure that the expenditure of public funds is in the public interest, coordinate airport expansion and highway construction, provide for safety of the public in the air and on the ground, and inform FAA and Aeronautics of potential hazards so as to prevent or minimize the hazard. Construction that does not exceed the general limitations are considered to have little or no potential for a hazard to air navigation. Additional reference material on airport clearance can be found in:

FHWA, Highway Improvements in the Vicinity of Airports

Federal Aviation Regulations Part 77, Objects Affecting Navigable Air Space

Division of Aeronautics, Marking of Obstructions to Air Flight, *Idaho Airport Facilities Directory*, Idaho Aeronautical Chart, and IDAPA Rule 39.04.01

[Idaho Code 21-513 through 21-520](#)

**Coordination with Local Airport Officials**

Projects within 2 miles of an airport will be carefully examined. If FAA and Aeronautics must be notified of the proposed construction, or for any project when considered appropriate, the district will contact the local airport authority. Planned or probable expansion of the airport that may cause substandard clearances to the highway project should be discussed. Proposals to eliminate conflicts should be initiated by the district when practical. Unusual or controversial highway-airport situations will be brought to the attention of the FHWA.

### **Conditions Requiring Notification**

Aeronautics requires notification of any structure that would be 150 feet above the ground or water surface. FAA requires notification of any structure that would be 200 feet above the ground or water surface. Aeronautics and FAA also require notification of any proposed construction or alteration of a greater height than an imaginary surface sloping outward and upward at one of the following slopes around runways and heliports:

- 100 to 1 for a horizontal distance of 2,000 feet from the nearest runway for airports or seaplane bases with at least one runway longer than 3,200 feet.
- 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway for airports or seaplane bases with no runway longer than 3,200 feet.
- 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of heliports.

Vertical elements for a highway include the height of the vehicles using them and any structure elements such as signs, lights, and signals. The height of vehicles is 17 feet on interstate highways, 15 feet on other public roads, and 10 feet or the height of the highest mobile object expected to use private roads and driveways.

Notification requirements apply to military bases and airports that are available for public use and are listed in the Airport Directory of the current *Airmen's Information Manual or the Idaho Airport Facilities Directory* published by the Idaho Transportation Department.

### **Exceptions to Notification Requirements**

Notification is not required for the following:

- Airports available for private use only.
- Highway projects on which structures, the highway, and mobile objects would be shielded by existing structures of a permanent and substantial character or by natural terrain or topographic features of equal or greater height.
- Highway projects on which structures would be located in the congested area of a city, town, or settlement where it is evident beyond all reasonable doubt that the structure so shielded that it will not adversely affect safety in air navigation.
- Projects that may be considered stage construction of projects previously coordinated with FAA and Aeronautics.
- Minor improvements such as pavement overlays, seal coats, updating signing, or guardrail unless vertical elements such as lights, signals, overhead signs, or relatively tall construction equipment are involved.

The district shall place a memo in the project file stating that notification is not required and how the “no notification” determination was made.

### **Procedures for Notification**

When FAA and Aeronautics notification is required, the district will prepare a *FAA Form 7460-1, Notice of Proposed Construction or Alteration*, for projects originating in the district. Outside agencies involved in plan preparation may prepare this form and submit it with the required project data to the District. The FAA Form 7460-1 is a five-page packet with carbons that can be obtained by contacting the Idaho Transportation Department, Bureau of Aeronautics, 3483 Rickenbacker Street, Boise, Idaho, 83705; telephone number (208) 334-8775. The notification must use an original of the form, not a reproduction.

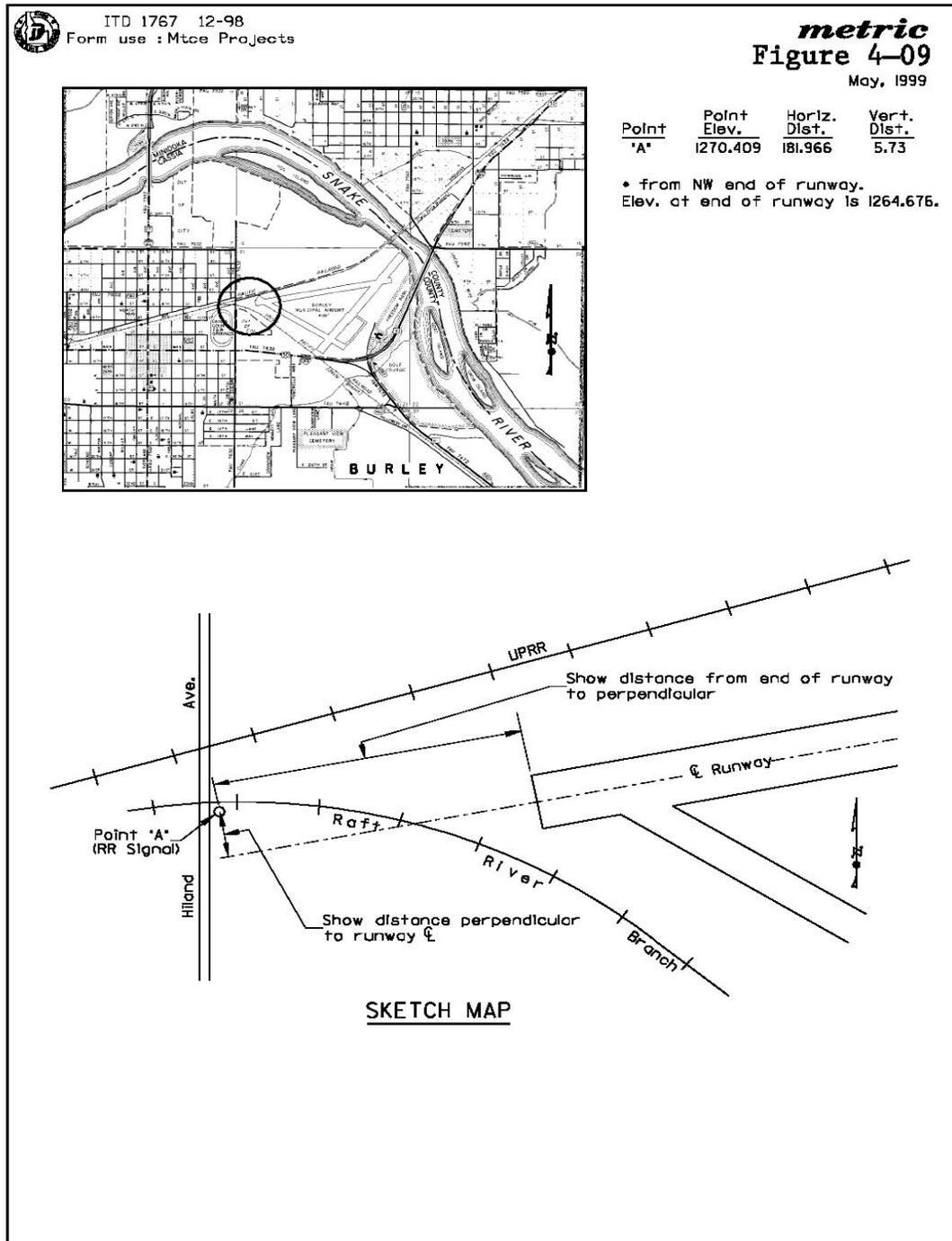
Complete the form and create a highway map or drawing showing the airport and the construction, as shown on the Sketch Map ([Figure 3-7](#)). The map or drawing may be made on county or city maps or on separate sketches and shall be sufficiently detailed both vertically and horizontally to show the effect of the highway project on the airport and the effect of the airport on the highway project.

Once complete, the form and map will be sent by the district to FAA’s Northwest Mountain Regional Office in Renton, Washington and a copy will be sent to Aeronautics. FAA or Aeronautics will determine if the highway project will be a hazard to air navigation and require any special lighting or marking. When considered appropriate, additional study may be required.

**365.01 Cooperation with Aeronautics and Public Transportation.** Aeronautics will receive copies of all construction programs, including state maintenance and stockpiles. When requested by Aeronautics and approved by the District Engineer, the district will include airport paving, seal coats, or crushed aggregate for airport construction or maintenance with ITD projects for similar work.

Figure 3-7

SKETCH MAP



## 370.00 – UTILITIES – GENERAL

Utility facilities shall mean all privately, publicly, or cooperatively owned lines, facilities, and systems for producing, transmitting, or distributing communications, cable television, electricity, light, heat, gas, oil, crude products, ore, water, steam, waste, storm water not connected with highway drainage, and other similar items. Idaho Code grants Utility Companies the right to occupy public right of way with their facilities and authorizes the Idaho Transportation Board to control the use of the right of way.

ITD has developed the “*Guide for Utility Management*” with information and guidance regarding the coordination and administration of utility facilities installation, relocation and adjustment within the right of way of the State Highway System and for highway improvement projects using Federal-Aid funds. Refer to Section 400 of the latest version of the “*Guide for Utility Management*” for information concerning the design process incorporating utility facilities.

## 375.00 – PUBLIC INVOLVEMENT

ITD’s public involvement is the process of including stakeholders in the development of transportation projects. “The U.S. Department of Transportation defines public involvement as “two-way communication aimed at incorporating the views, concerns and issues of the public into the decision-making process.”

For ITD’s Guide to Public Involvement for Programs, Planning and Projects go to:

<http://itd.idaho.gov/POP/assets/Plguide.pdf>

ITD has developed an interactive online tool called the Public Outreach Planner (POP) that assists staff in analyzing and quantifying public outreach needs. Through the POP, staff can determine what public involvement methods and tools are the best fit for their project and budget, and learn more about how to effectively design, develop and execute them. The POP can be found online at <http://itd.idaho.gov/POP>.

**375.01 Public Hearings.** Public hearings provide the department with an opportunity to summarize studies, new developments, and public input on a proposed project. The hearings also give ITD opportunities to share project information with the public and, in turn, receive more input before final design.

**375.01.01 Public Hearing Need** The District Engineer determines whether a hearing will be held based on the following criteria and the results of the public information meetings.

Projects involving federal funds must have a hearing, or an opportunity for hearing, when there is:

- Acquisition of significant amounts of right of way.
- Substantial change to the layout or function of the connecting roadways or of the facilities being improved.
- Significant adverse impact on abutting property or when litigation or public controversy is anticipated.
- Significant social, economic, and/or environmental effect on the surrounding area.

Projects financed totally with state funds must have a public hearing when:

- The state highway serving or traversing any city is to be abandoned, relocated, or replaced.
- There is significant public interest or controversy surrounding the project.

FHWA may request a public hearing when a hearing may be in the public interest.

For complete information on public hearings see ITD's Guide to Public Involvement for Programs, Planning and Projects at:

<http://itd.idaho.gov/POP/assets/Plguide.pdf>

**375.01.02 Waiver of Public Hearing** The District Engineer may waive public hearings when public awareness and support for the project is apparent and non-controversial.

Whether a question about the amount of right of way required is significant or not, a hearing waiver may be solicited from effected property owners. The hearing waiver must be in the form shown in [Figure 3-8](#), Waiver of Public Hearing.

A team of ITD personnel consisting of personnel as the district deems necessary, should make all property owner contacts.

Figure 3-8

**WAIVER OF PUBLIC HEARING**

Project No.: \_\_\_\_\_

Parcel No.: \_\_\_\_\_

I, the undersigned, have been fully informed concerning Project \_\_\_\_\_, including the project's effect on my property.

I am aware of the amount of right of way to be acquired, the relationship to the remainder of my property, and have been informed that I will receive fair compensation for right of way acquisition on the project.

I am aware that I have the right to request a public hearing and I hereby waive said right to a public hearing.

\_\_\_\_\_  
**Property Owner** \_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Address**

## 380.00 – DESIGN or LOCATION/DESIGN APPROVAL

**380.01 Design Approval** Project determination and approvals shall be in accordance with Administrative Policy A-13-02. The District Engineer approves the design for projects that do not require a hearing, no hearing is requested after an opportunity for hearing is given or when the hearing is waived. Design approval shall not be given until environmental documentation is complete.

**380.02 Location and/or Design Study Report Approval** When a hearing is held the District Engineer or HQ appropriate management staff shall prepare a Location and/or Design Study Report. The Location and/or Design Study Report is a formal document that records considerations and conclusions that were reached by the district in the development of a project through environmental documentation, preliminary design, and the public hearing phase. The Location and/or Design Study Report is used to obtain concurrence in preliminary project design. The Location and/or Design Study Report shall be prepared on all federal-aid projects that have a hearing and is required to obtain Design approval.

The Location and/or Design Study Report documents:

- ITD's consideration of transportation needs, socioeconomic, environmental impacts of the project and context sensitive solutions by summarizing significant design considerations and decisions. Included in the report are design criteria changes from the charter approval and preliminary design approval.
- Recommendations and proposed changes that were made as a result of the public hearing testimony. This information must also be included in an environmental re-evaluation.

**380.03 Location and/or Design Study Report Contents.** Essential items that must be included in the Location and/or Design Study Report, and any other information that clarifies the design intentions and improves the understanding of the highway improvement project should be included.

**Essential items** for the Location and/or Design Study Report are:

- A narrative description of the project.
- Vicinity sketch.
- Any changes in project charter (including design exceptions).
- A summary of public hearing testimony, proposed resolutions of identified concerns, and any changes made in design that were based on the hearing.
- Waivers of public hearing or documentation of the hearing being waived by the District Engineer.

- Location and/or Design Study Report Checklist ([Figure 3-10](#)).
- Significant items that have changed since the charter approval that effect the project (include environmental-related commitments).

**Optional items** that can be included at the discretion of the districts are:

- Approval Cover Sheet ([Figure 3-9](#))
- Copy of the approved [charter](#) and alternate solutions and costs,
- Typical sections

Four examples of Location and/or Design Study Reports are included as [Figures 3-11](#) through [3-14](#). The examples are for the following types of projects:

- Non-controversial pavement rehabilitation project with no right of way purchase and no environmental impacts.
- Small structure replacement and approaches project. Temporary easements for detour and approach work.
- Highway relocation project with a public hearing held and environmental assessment prepared. No major controversy or testimony presented.
- Major relocation project with high environmental impacts and several controversial issues addressed in the hearing testimony.

Follow the example that is nearest to the type of project being designed.

The Location and/or Design Study Report shall not be approved until after the:

- Environmental documentation is complete;
- Public hearing transcript has been analyzed and determinations have been made on the issues and concerns addressed at the hearing or until the hearing has been waived; and
- Project determinations and approvals are settled, as outlined in [Administrative Policy A-13-02](#), Public Involvement for Location and Design Determinations.

For FHWA Projects of Interest, the Location and/or Design Study Report will be submitted by the district to FHWA for concurrence of ITD approval with a copy to DMC. Exempt projects shall follow the FHWA Oversight Matrix ([Figure 1-1](#))

Final design of a project cannot commence until Design Approval is given or the Location and/or Design Study Report is approved.

Figure 3-9

**LOCATION AND/OR DESIGN STUDY REPORT**

**PROJECT NO.**

**KEY NO.**

**PROJECT DESCRIPTION**

**LOCATION**

**WORK AUTHORITY**

**COUNTY**

Prepared by: Designer Name      Date: 00/00/01

Approved by: DE Name      Date: 00/00/01

Figure 3-10

**LOCATION AND/OR DESIGN STUDY REPORT CHECKLIST**

Evaluation Charter	_____	Date approved
Development Charter	_____	Date approved
Preliminary Design Review	_____	Date held
Environmental Document	_____	_____
	Type	Date approved
Public Hearing	_____ or _____	_____
	Date held	Date waived
Transcription of Public Hearing Testimony	_____	Date submitted

Figure 3-11

**LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 1**

IR-15-1(102)54  
Inkom to Portneuf  
Bannock County  
Key No. 3720  
WA #I875190

This project consists of pavement rehabilitation of I-15, south of Pocatello, in the travel lane and full width over structures with a full width seal throughout. The project length is 1.5 miles from MP 54.70 to MP 53.20.

The roadway width was originally constructed to current standards of 40 feet in 1969 and 1970 with no widening for guardrail. The last construction was in 1982 with a seal to the travel lane and 1983 with a seal to the passing lane.

The project was approved for rehabilitation and sealing by the Idaho Transportation Board on January 21, 1996, for FY98.

The current ADT is 10,440 with a projected ADT of 16,080 and design hourly volume of 1,790 for the year 2011. The project will be designed to AASHTO Standards for Interstate Systems with no design exceptions. Horizontal and vertical alignment will remain the same. Fill slopes where guardrail removal will occur will be flattened to 4:1 minimum, 6:1 maximum. Full access control was approved under original construction.

Drainage in areas of guardrail removal will be extended appropriately to accommodate the flatter slopes. Detours are not practical for this project but, rather, traffic will be controlled through proper Channelization into one lane.

A revised concept was approved by headquarters on September 21, 1997.

Pavement rehabilitation consists of cold milling and inlaying plant mix pavement in the travel lanes to remove ruts and full width over structures to remove excess dead load and repair deck joints. A full width seal coat will be applied to interstate roadways and ramps, with a scrub and seal in the Inkom Port of Entry and an interchange crossroad. Bridge rail updating will be accomplished by the beam retrofit and some guardrail will be removed or updated on crossroads or selected areas on the interstate.

All proposed construction will be on existing right of way or in state-owned sources. A categorical exclusion for environmental concerns was approved September 2, 1996.

Figure 3-12

**LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 2**

BRF-5152(200)  
Evans Creek Bridge Replacement SH-3  
Kootenai County  
Key No. 1754  
WA #P861140

This section of roadway and bridge was constructed in 1936 under Project WPSS 179-C. Due to the rolling terrain, the alignment along this portion of roadway consists of a 100 curve left, with a substandard vertical curve at the Evans Creek Bridge location. The bridge is a three-span wooden bridge sitting on wood piles. The bridge width is 26 feet out to out with substandard metal guardrail and has a 7.9 sufficiency rating.

Due to the location and the adjacent wetlands, it is not economically feasible to upgrade the entire roadway to AASHTO standards at this time. The district is proposing to replace the existing bridge at the present location with clear-span, pre-stressed box girder/pre-stressed girder bridge having a curb-to-curb width of 32 feet, and upgrading the existing roadway approaches to the bridge. Approximately 800 feet of roadway will be upgraded by widening from 26 feet to 29 feet using 4:1 foreslopes, 1 ½:1 fill slopes, and 7' guardrail posts. The slopes mentioned above were chosen to minimize the impact to the wetland and are part of the wetland mitigation and to stay within the existing right of way. The vertical curve considered will be improved to meet the required standards.

The bridge replacement will require building a detour south of the existing structure. When the detour is no longer needed, the fill material will be removed and used to construct roadway embankment on the future Rose Lake project.

No right of way purchase will be required on this project. Temporary easements will be required from two property owners for the purpose of improving approaches and constructing the temporary detour.

The following changes need to be made in the concept, submitted April 24, 1990. The design speed of 55 mph should be changed to 45 mph. The 6:1 foreslopes on the typical sections should be changed to 4:1, which has been approved.

An exception for the 32 foot bridge width was approved November 9, 1990.

The Archeological Clearance on this project was approved July 16, 1992.

The Idaho Fish and Game have no objection to the replacement of Evans Creek Bridge, but were concerned regarding the detour. No in-stream work is to be done between April 1 and July 1 to protect cutthroat trout spawners, eggs, and fry.

A Preliminary Design Review was held on this project November 4, 1992.

A categorical exclusion was approved on December 30, 1992.

A waiver of public hearing was requested and approved on January 19, 1993.

### LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 3

Project No. F-4113(77)  
Ferdinand-Lawyer's Canyon

The section of roadway proposed for improvements is a portion of U.S. Highway 95 from a point approximately .5 mile southeast of Ferdinand and continuing northerly to a proposed structure over Lawyer's Canyon Creek at the Idaho-Lewis County line. Reconstruction of this section of highway will be part of the improvement program planned for US-95 between Ferdinand and Craigmont, as explained in the Final Environmental Statement dated July 1978 (FHWA-IDA-EIS-77-02-F).

#### EXISTING AREA CONDITIONS

US-95 is the major link between northern and southern Idaho. The highway begins at the southwestern Oregon/Idaho border approximately 30 miles south of Caldwell, Idaho. From this point, the route extends northward approximately 530 miles to the Idaho/Canadian border.

The project area lies in the northern part of Idaho County. The county is rural in nature, being largely public-owned U.S. Forest Service land that supports an extensive timber industry. Large farms and ranches dominate the privately owned land in this county.

The project will begin approximately 0.5 miles southeast of Ferdinand and end at the proposed structure over Lawyer's Canyon Creek. Ferdinand has a few stores and grain elevators and provides basic services for the surrounding rural area. The town had a population of 144 at the 1980 census.

Ferdinand does not have a hospital (Cottonwood, Grangeville, and Lewiston have the nearest medical facilities). During recent years, basic services in the form of schools, full-service grocery outlets, and retail gasoline stations have closed. These services are available in Craigmont, 8.6 miles to the north, and Cottonwood, approximately 8.0 miles to the south. The majority of the school children are transported to Cottonwood; therefore, US-95 serves as a school bus route for the local schools. Improved sight distances and shoulder widths are important for the safe transportation of school children along the route.

The majority of the people living within the project corridor have been residents of the area for many years. The communities have changed very little in the past and no major changes due to roadway improvements are expected in the future.

#### EXISTING ROAD DESCRIPTION

The existing highway is classified as a principal arterial under the 1990 Functional Classification System. Characteristics of the 4 miles of existing highway proposed for improvement are a 22 ft. roadway with no shoulders, a basic right of way width of 80 feet, and an alignment that is well below current standards. Present access control is governed by the Standard Approach Policy.

Figure 3-13  
Sheet 2 of 5

Current maintenance operations on this portion of US-95 include spot patching and seal coating as needed. Should this portion not be reconstructed, maintenance requirements foreseen will include major surface overlays and extensive shoulder rehabilitation for the entire length.

### **REASON FOR IMPROVEMENT**

The project would be the final stage of an overall project to improve approximately 10 miles of US-95 from Ferdinand to Craigmont.

The project is needed to accommodate existing and future traffic volumes and to correct the following deficiencies:

- Slow operating speed due to narrow roadway pavement width, inadequate shoulders, and restrictive passing sight distance.
- Limited safety because of unrestricted access control and dangerous conditions adjacent to the roadway.
- Substandard surfacing that creates hazardous driving in wet or freezing weather and is subject to considerable breakup during freezing and thawing conditions.

The improvement would minimize or eliminate the deficiencies cited and increase the efficiency and safety of the highway for the increasing traffic volumes projected for this section of highway.

### **ALTERNATIVES**

In May 1977, the project was addressed in an environmental impact statement and a location hearing was held in July 1977. As a result of this hearing, the Idaho Transportation Board selected the Existing Improved Alternate. This alignment has changed slightly from the approved one due to Lawyer's Creek Bridge being shifted upstream approximately 500 feet. This was done so the bridge could be constructed on a tangent rather than a curve.

In October 1988, the Idaho Transportation Board directed that the East Alternate from Ferdinand to Lawyer's Canyon be reconsidered, as it is a shorter route and would not involve railroad crossings for US-95.

A No Major Improvement Alternate would not meet current and future transportation needs. Other construction alternatives are not compatible with the selected route from Lawyer's Canyon to Craigmont and only the Existing Improved Alternate and East Alternate are being considered.

### **PROJECT DESCRIPTION**

#### **Existing Improved Alternate**

The Existing Improved Alternate begins 0.5 miles southeast of Ferdinand; crosses the Camas Prairie Railroad with an at-grade, signalized crossing; and then bypasses

Figure 3-13  
Sheet 2 of 5

Ferdinand to the south. The alignment then swings north following the existing US-95 west of Ferdinand. The route then follows the east breaks of Moody Gulch, crosses beneath the Camas Prairie Railroad where an underpass would be built, and then continues north to the bridge over Lawyer's Creek. The overall project length is approximately 4 miles.

This would provide a roadway surface width of 34 feet (consisting of two 12 foot lanes – one in each direction – and two 5 foot shoulders). The subgrade would be built to accommodate a future 40 foot paved surface width.

The horizontal and vertical alignments would result in a design speed of 60 mph. The maximum radius of curve being 1315' with a maximum grade of 4.595 percent. Two truck climbing lanes are included, the first being constructed south of Ferdinand to aid the northbound traffic and the other being south of the new Lawyer's Canyon Creek Bridge to aid the southbound traffic.

A basic right of way width of 200 feet to 425 feet would be needed for the project. Access control for the proposed alignment allows public and private at-grade crossings that would require temporary easements during construction. Access to Ferdinand would be provided by constructing two connections to the existing highway (one from the north and the other from the south of town).

Upon completion of the project, approximately 2.5 miles of existing US-95 would be removed from the state system and relinquished to local jurisdictions for maintenance

### **East Alternate**

The East Alternate route would begin approximately .5 miles southeast of Ferdinand. The route runs northerly, bypasses Ferdinand on the east, and then parallels the Camas Prairie Railroad. The alignment continues northwesterly to the proposed structure over Lawyer's Canyon Creek. The alignment is approximately 3.5 miles in length and would not involve any railroad crossings.

This route would provide a roadway surface width of 34 feet (consisting of two-12 foot lanes and two-5 foot shoulders). The subgrade would be constructed to handle a future 40 foot roadway.

Curvature and sight distance on the finished project would have a design speed of 60 mph. The maximum radius of curve on the alignment would be 1650 feet with a maximum grade of 3.268 percent.

A truck-climbing lane would be built south of the Lawyer's Canyon Creek Bridge and extend approximately 1.3 miles to aid the southbound traffic.

A basic right of way width of 190 feet to 350 feet would be required, with larger widths in larger embankment areas. Access control for the proposed alignment allows for public and private approaches that would require temporary easements during construction. On this improvement, one connection to Ferdinand would be provided by use of an existing road on the south end of town.

Upon completion of the project, approximately 0.5 miles of the existing US-95 would be relinquished to local jurisdictions for maintenance.

### **SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS**

An Environmental Assessment was prepared and approved on August 24, 1989, which addresses the impacts of the project. A copy of this document is attached.

### **SYNOPSIS OF DESIGN HEARING TESTIMONY**

A public location/design and systems action hearing was held in Ferdinand, Idaho on November 8, 1989. There were 67 interested citizens in attendance including Ferdinand Mayor Eugene Kuther, Craigmont Mayor David Boknecht, and Ferdinand Highway District Commissioners Dennis Seubert, Jerry Schwartz, and Donald Bieker. The Idaho Transportation Board was represented by Vice Chairman Marion Davidson and Executive Assistant Mary Detmar.

Both written and oral testimony was given by 72 citizens. By organization of this testimony, 21 favored the Existing Improved Alternate, 41 favored the East Alternate, and 10 offered no preference. Five individuals supported a state-maintained business loop for Ferdinand. Five of those persons favoring the Existing Improved Alternate indicated the loss of prime farmland as a major concern.

Twelve testimonies requested an underpass be furnished on the local farm-to-market roads to provide access to Ferdinand, regardless of the selected alternate. Two petitions were also received supporting the underpass for the east or west city access. The petition for the east underpass had 89 signatures and the petition of the west underpass had 121 signatures.

Other testimonies referred to individual problems relating to specific ownerships such as drainage, access, severance, etc.

### **CONCLUSION**

As requested by the public testimony, the feasibility of underpasses for the public road connections to Ferdinand was investigated for the two alternates.

Based on the AASHTO publication entitled "A Policy on Geometric Design of Highways and Streets, 1984," an underpass is not warranted in this case. The traffic volumes on these local roads are low and no crashes have been recorded at the present at-grade intersections. The proposed projects will provide adequate sight distance and roadway alignment to allow for crossing by the anticipated users.

An underpass structure of the size needed to accommodate farm trucks and equipment would increase the estimated cost of the Existing Improved Alternate by \$173,000 and the East Alternate by \$278,000. If the East Alternate was selected, the underpass would also require approximately two acres of prime farmland for additional right of way. As no warrant for these grade separations is apparent and as safe, adequate at-grade

Figure 3-13  
Sheet 5 of 5

intersections would be provided. It is concluded that expenditure of federal funds for the underpasses probably could not be made. The Ferdinand Highway District has offered to participate in the cost of the structure. If this offer was accepted, the structure could be included in the project.

The removal of the existing US-95 from the State Highway System was addressed at the July 1977 location hearing and a determination was issued by the Idaho Transportation Board on October 16, 1977. This determination was reaffirmed on August 15, 1988, by a letter from Board Chairman John M. Ohman to Ferdinand Mayor Eugene Kuther. Repairs to the existing facility will be negotiated with the city of Ferdinand and will be accomplished prior to the relinquishment of the roadway to the city.

Problems relating to individual concerns will be resolved with minor design corrections or by compensation during the appraisal process.

Based upon public testimony, engineering, and cost considerations, the district recommends that the East Alternate be selected for development and construction.

Figure 3-14  
Sheet 1 of 4

## LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 4

Project No. F-3271(33)  
Eagle Alternate Route

The section of roadway proposed for improvement and new alignment is a portion of SH-44 and SH-55 in and near Eagle, Idaho. The project is located between MP 16.000 and MP 19.45 of SH-44 and MP 17.79 and 18.000 of SH-55.

### EXISTING AREA CONDITIONS

SH-44 goes through downtown Eagle on an east-west route. SH-55 enters from the south and currently joins SH-44 in downtown Eagle. The project is located in Ada County and goes from west of Ballantine Road eastward to the new SH-55 North intersection.

### EXISTING ROAD CONDITIONS

The existing SH-44 is classified as a minor arterial from the west to junction with SH-55 and a principal arterial from that junction to the SH-55 North junction. The existing SH-55 is classified as a principal arterial. All are under the 1995 Functional Classification System. The present SH-44 roadway consists of a two-lane facility with a 40 feet  width in the rural downtown Eagle. The present SH-55 roadway consists of a two-lane facility with a 22 feet  width. Present acc

Policy. Current maintenance operations on these portions of state highways include spot patching and sanding for winter maintenance.

### REASON FOR IMPROVEMENT

The existing roadways are inadequate to handle current traffic volumes and substandard for projected traffic. The current junction has very poor geometrics and sight triangles and is extremely hard for trucks to maneuver even with lane encroachments. The existing SH-44 is a good roadway except through downtown Eagle where additional room is required. The existing SH-55 is deteriorating and is in need of repair. It is also substandard in width.

### PROPOSED IMPROVEMENTS

A public information meeting was held February 1, 1989. The public was presented with seven alternatives. Approximately 120 people attended and the district received 35 report forms back as of April 10, 1989. The forms indicated that 27 favored the Long West Option (see Table 1 for "con" comments and the response), 5 favored the Short West Option, 2 favored the Couplet System Option, and 1 favored the Do Nothing Option.

Figure 3-14  
Sheet 2 of 4

Comment	No. of Comments	Response
This option would be a waste (or irresponsible use) of tax dollars.	7	The additional cost of this option is minimal considering its benefits in improved traffic mobility, gas saving, and travel time reduction. All four alternatives for the project show a positive benefit/cost ratio. For the two that include the Long West Option, the values were 10.7 (Alt. 1) and 13.7 (Alt. 3). The Short West Option costs \$200,000 less than the Long West Option—approximately 3% of total expenditures—but does not offer the transportation and economic growth advantages associated with the Long Option. A west option is needed to avoid extreme traffic congestion in Eagle in the near future.
Consider the high cost of acquiring river front land on the Long West Option. It is not zoned farmland any more and the owners will fight for subdivision prices. Fair value must reflect the residential development potential.	2	The price paid for riverfront land will be based on current use and comparable land values at the time of appraisal. If there has been no capital improvement, there can be no compensation for it.
On the Long West Option, the cost of buying right of way and replacing the Chevron pipeline should be taken into account. These costs may be quite high.	1	The cost of buying right of way will be as described above. The Chevron pipeline was taken into account in the design of the roadway location.
The Long West Option serves populated areas (at the expense of rural landowners). It puts unwanted congestion in the rural area.	1	This is a recognized impact of the project. However, without the project, traffic congestion will increase to intolerable levels in the near future that would also affect rural landowners.

Four alternatives were presented to the public at a combined design location hearing held March 13, 1991, at Centennial High School auditorium. These alternatives were two directional, five-lane sections requiring 140 feet of right of way, 70 feet on either side of the centerline on new alignment, and an existing right of way of 119 feet with 60 feet on both sides of the centerline.

Figure 3-14  
Sheet 3 of 4

### **Option 1: Long West North**

This option would leave existing SH-44 near Ballantine Road on the west at MP 16.223, proceed southeasterly, and cross existing SH-55 approximately 1800 feet south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue in an easterly direction to an intersection with existing SH-44 approximately 1000 feet east of Edgewood Lane at MP 18.952.

This would involve removal of 2.8 miles of SH-44 and 0.28 miles of SH-55 from the State Highway System. It would also involve an addition of 2.7 miles to SH-44 along the new alignment. The net result is a decrease of .38 miles.

### **Option 2: Short West North**

This option would leave existing SH-44 just east of the Dry Creek Bridge at MP 16.852, proceed southeasterly, and cross existing SH-55 approximately 0.5 mile south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue in an easterly direction to an intersection with existing SH-44 approximately 0.19 miles east of Edgewood Lane at MP 18.952. This would involve removal of 2.1 miles of SH-44 and 0.3 miles of SH-55 from the State Highway System. It would also involve an addition of 2.15 miles to SH-44 along the new alignment. The net result is a decrease of 0.34 miles.

### **Option 3: Long West South**

This option would leave existing SH-44 near Ballantine Road on the west at MP 16.223, proceed southeasterly, and cross existing SH-55 approximately 0.34 miles south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue easterly and south of the trailer park at MP 19.0 to an intersection with existing SH-44 at MP 19.401. This would involve removal of 3.2 miles of SH-44 and 0.3 miles of SH-55 from the State Highway System. It would also involve an addition of 3 miles to SH-44 along the new alignment. The net result is a decrease of 0.34 miles.

### **Option 4: Short West South**

This option would leave existing SH-44 just east of the Dry Creek Bridge at MP 16.852, proceed southeasterly, and cross existing SH-55 approximately 0.34 miles south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue easterly and south of the trailer park at MP 19.0 to an intersection with existing SH-44 at MP 19.401. This would involve removal of 2.6 miles of SH-44 and 0.34 miles of SH-55 from the State Highway System. It would also involve an addition of 2.5 miles to SH-44 along the new alignment. The net result is a decrease of 0.5 miles.

Figure 3-14  
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## CONCLUSIONS

With any of these options, there would be connector roads constructed to provide adequate access to Eagle and meet all current geometric standards.

All horizontal curve super-elevation rates would meet current standards according to ITD and AASHTO requirements.

Signing would be new except where existing signs are deemed current with ITD policy and MUTCD requirements.

An Environmental Assessment was published February 11, 1991.

In addition to the new route selected in the System Action decision, it was agreed that the existing SH-44 between Alternate Route connections will receive a new pavement overlay before being turned over to the Ada County Highway District.

The district submitted all testimony from the combined design location hearing to the Idaho Transportation Board. As a result of the combined hearing testimony, a few changes were incorporated into the district's recommendations to the Idaho Transportation Board.

The district agreed that with no access allowed from the new route, a full 14 foot median was not required and that a 4.0 feet median will meet all AASHTO and ITD minimums. This recommendation reduces pavement width from 80 feet to 70 feet and will help contain costs. One other change was recommended to the Idaho Transportation Board: The removal of the two-way turn lane on Eagle Road between the new intersection and State Street. A near unanimous response to remove it was included in the district's recommendations. The district formally recommended Option 3 to the Idaho Transportation Board.

The Idaho Transportation Board initially selected Option 4, but left a loophole for the city of Eagle to alter the decision with a written request within 30 days. The city of Eagle did make a formal request that the Idaho Transportation Board change their decision. On July 9, 1991, the Board issued the revised decision adopting Alternate 3 (South Option and Long West Option) for the Eagle Alternative.

The Idaho Transportation Board, in its decision of July 9, 1991, further ordered a committee to study wetland, noise mitigation, river access, bike paths, wildlife protection, and natural preservation. This committee held an information meeting in Eagle on October 3, 1991. The results of that meeting and the committee recommendation were presented to the Idaho Transportation Board at their November 1991 meeting. The Board approved the committee's recommendation on November 15, 1991