ITD-500 4-93

IDAHO TRANSPORTATION DEPARTMENT

Department Memorandum

DATE: July 25, 2006

Project No.(s): STP-1767(101)

TO: PROJECT DEVELOPMENT ENG.
DISTRICT **5**

Key No.(s): 08116

FROM: WAYNE A HERBEL PE
RD AREA ENGINEER

Project Identification, County, Etc.:
CORRIDOR PLAN, US 91 (Shelley to York Rd)
Bingham / Bonneville Cos. WA #X005320

RE: CONCEPT APPROVAL

Returned herewith is a fully executed ITD-783. Please note pages containing changes made after review. This concept is approved as modified. You may proceed with the design process.

WAH/dpw
encl
cc:
RD w/encl.
BRDG

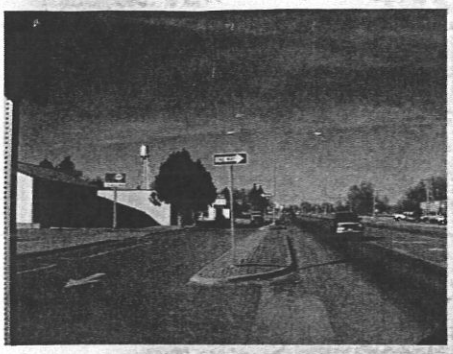
RECEIVED
I.T.D.
JUL 27 2006
DIVISION OF HIGHWAYS
DISTRICT 5

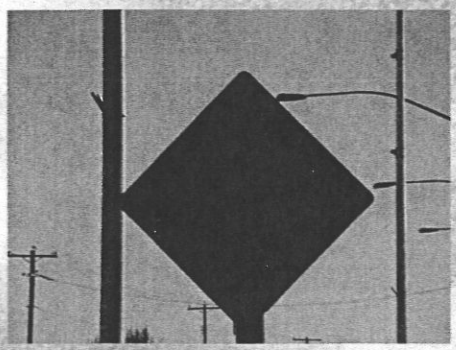
ITD 0096 District 5 Routing

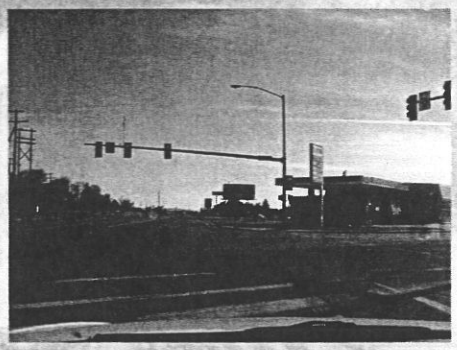
Copy	District 5	Act
✓	**Dist. Engr.**	
	Rec. Inspect	
	Trms. Plan	
	E/S/T	
	Train Spec.	
✓	**ADE**	
	R/W	
	Env. Plan	
	Res. "A"	
	Res. "B"	
✓	**Design**	
	Proj. Mgrs.	
	Local Roads	
	Materials	
	Traffic	
	DBM	
	Mtce. Engr.	
	Mtce. TSEA	

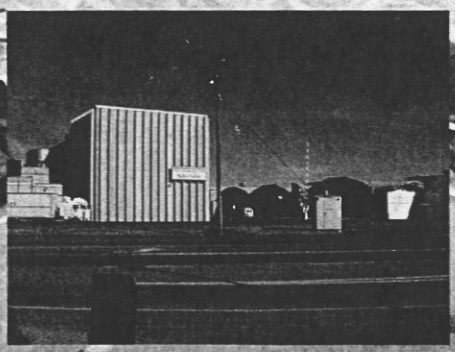
Orig w/ Attch

Watch









91

Shelley To York Road

CONCEPT REPORT

ITD Project No. STP-1767(101), Key No. 8116

March, 2006

RESOLUTION OF ITD COMMENTS ON CONCEPT REPORT
US-91 SHELLEY TO YORK ROAD
PROJECT # STP-1767(101), KEY # 8116

Date of Comments : February 14, 2006		
Commenter	**Comment/Remarks**	**Response To Comments**
Mark McNeese	Within the Technical Memorandum (Alternatives Analysis) analysis, shouldn't there be an option and discussion of a 5-lane cross section? The only reference to five lanes was at the end under the title "Other Considerations: Traffic Operations and Safety on a Five-Lane Roadway." Why even discuss this if it appears that a five-lane option was never discussed or considered (even though the two "alternative solutions and costs" are three-lane and five-lane sections)?	The Technical Memorandum was prepared separately to address comments and specific suggestions made by the public. It should not be considered part of the Concept Report. It included feasibility analysis for options that were not advanced into the Concept Report or the Environmental Evaluation. The District initially proposed only a five-lane alternative and do nothing. The only feasible alternative that was analyzed in the Technical Memorandum was the 3-lane. It was therefore carried forward into the Concept Report.
Bridge Section	• For a 5-lane roadway width of 78'-0", the out-to-out bridge width should be 84'-0" with a concrete parapet. The curb-curb width should be 81'-4". The data for the proposed structure on the Design Standards form should be revised accordingly. • The new structure cost for the 3-lane Project Cost Summary should be based on a 60' bridge width. Using $120/sf, the bridge cost is $403,000. • The new structure cost for the 5-lane Project Cost Summary should be based on an 84' bridge width. Using $120/sf, the bridge cost is $565,000. • The bridge typical section sheet should show an 8' shoulder and a 1'-8" shy distance on each side. The parapet width should be shown as 1'-4". The out-out width should be 84'-0". • A 3'-10" superstructure depth appears adequate for the 52'-5" c-c bearing span length.	Changes have been made as requested. PB has confirmed that the stated standard is a federal standard, not a state one.
Randy Rowell, MACS System	Page 1, Concept Approval – Federal Aid Route box should be • STC 1836 from MP 118.8 to MP 120.561 • STC 6836 from MP 120.561 to MP 122.9	Changes have been made as requested.
Design Standards	**Pg.1** • Project Title, Program name or change program on all sheets (I think he means that 8116 is not called Shelley to York Rd, rather US 91 N Corridor Plan and Environmental Document.) – (DOUG)	The project will be developed under Key No. 9225 at the final design phase. It is currently rolled into the overall corridor plan key number.

RESOLUTION OF ITD COMMENTS ON CONCEPT REPORT
US-91 SHELLEY TO YORK ROAD
PROJECT # STP-1767(101), KEY # 8116

			• Functional Class should show the class that "will be applied to roadway, not necessarily its current classification.", i.e. 'Rural Arterial' - (TED).	Page 1 of the Design Standards has been changed to show the Functional Class as Minor Arterial and the intention to upgrade the functional classification has been included in the General Project Description.
			• Project Type – Should be marked 'State', rather than AASHTO, because US-91 is Non-NHS. On the other hand, Bridges must comply with AASHTO relating to structure design and State for width requirements. "It would be appropriate to mark AASHTO Standards if it is being proposed to raise the standard to AASHTO standards, or the roadway is to be added to the NHS system. – (TED)	The District has selected the State standard, rather than AASHTO, because US-91 is not a National Highway System roadway. The District's intention is to design with the same standard used on Key No. 7750, US-91, Utah Line to Preston, Key No. 7681, US-91 Firth to Goshen; and Key No. 7683, Wooton Way to East Airport Road because it functions in the same way. For this reason, the project will be designed with 8-foot shoulders.
			• General Project Description should include the information that the project proposes to change the functional classification. – (TED)	This information has been included as noted.
			• 'State' Standard be marked, instead of AASHTO, and width would be 74' (with 6' shoulders) – four 12' travel lanes + 14' CTL + two 6' shoulders. Change typicals - (TED)	Although the project is now using the State standard, the District's intention is to design with the same standards as used on previous US-91 projects, as noted above.
			• Clear Zone – State standard is 20 ft (See Ted's notes) 30' may be advisable. Ted notes:	Where not constrained by right-of-way issues, a 30-foot clear zone was achieved. The concept design clear zones are consistent with or exceed State standards for non-NHS classification (i.e. 15' for 50 mph design speed south of Sidwell and 20' for 60 mph design speed north of Sidwell).

RESOLUTION OF ITD COMMENTS ON CONCEPT REPORT
US-91 SHELLEY TO YORK ROAD
PROJECT # STP-1767(101), KEY # 8116

			"This is not to say that it would not be prudent to use a wider clear zone considering the projected ADT along this route. Also, the following note on Table 3.1, page 3-6, page 3-6, 2002 AASHTO Roadside Design Guide can be taken into consideration:" "...Clear zones may be limited to 30 ft for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance." "Be aware the clear zone should be considered in the curb and gutter section, especially at the proposed design speeds. The 2002 Roadside Design Guide, Section 10.1, Need for Initial Study of Sites, page 10-2, states:" "One misconception is that a curb with a 0.5 [1.5 ft] offset behind it satisfies the clear roadside concept. Realistically, curbs have limited redirectional capabilities and only at low speeds, approximately 40 km/h [25 MPH] or lower. Consequently, regardless of curbing, the designer must strive for a wider clear zone that is more reflective of the off-peak operating speed 85th percentile) or design speed, whichever is greater...."	In the urban portion of the project in north Shelley, from New Sweden Road to just south of Sidwell Avenue, the right-of-way is constrained by existing commercial development on the west side, including a large UP&L yard. Throughout the project, the east side of US-91 is constrained by the presence of the Union Pacific Railroad. The existing US-91 lies within the railroad right-of-way. The speed limit from New Sweden Road is posted at 45 mph for approximately one mile north to approximately Country Club Road, where it transitions to 55 mph. No increase in speed limit between New Sweden Road and County Club Road is planned. The 45 mph limit is likely to be extended northward as the Shelley urban area develops. Provision of an 8-foot shoulder on the east side of US-91 in this urban section was not feasible without either encroaching into the UP right-of-way or encroaching into the existing commercial development on the west, including UP&L, with consequent very high additional right-of-way costs. The project transitions to a cross-section with 8 foot shoulders on both sides north of Sidwell Avenue, exceeding State standard of 6 feet for improved safety. Curb and gutter was extended from the existing location at the south end of the project to Sidwell Avenue. This is used to minimize the overall footprint and right-of-way impacts through the urbanized section as the close proximity of the Union Pacific Railroad on the east and the developed commercial strip on the west, including a UP&L facility. Clear zone in the curb and gutter section ranges between 15 to 20 feet. This accommodates a design speed of 50 mph per State standards non-NHS. The extension of curb and gutter to Sidwell Avenue is consistent with the existing and planned commercial land use west of US-91 in this section of the project. A posted speed limit of 45 mph just north of Sidwell for the southbound traffic and posted 55 mph limit north of Sidwell for the the northbound traffic would be appropriate.

RESOLUTION OF ITD COMMENTS ON CONCEPT REPORT
US-91 SHELLEY TO YORK ROAD
PROJECT # STP-1767(101), KEY # 8116

			Pg. 2 Proposed Work - Comment seems to indicate that Bicycle Lanes, Separated Pathway and Traffic Signals should be marked as part of the "Proposed Work"	The project does not include a specific separate bicycle path or lane. The 8-foot shoulder will accommodate bicyclists. The Union Pacific Railroad abuts the east side of US-91 with few opportunities for vehicles and non-motorized users to cross the railroad to access US-91. Existing land use east of US-91 is agricultural. There is no need to provide a sidewalk or trail on this side of US-91. On the west side, the existing land use is primarily agricultural or low density rural residential. As 7 of the existing residences will be acquired for new right-of-way and the District intends to acquire additional access rights, there is no need for a sidewalk on the west side.
			Railroad Crossing Protection – NO COMMENTS on proposed improvements	No action required.
	ITD-0758		Alternate Solutions and Costs: **Pg. 1** Under the "Do Nothing Alternative", Commenter's question: "What about ongoing maintenance costs?" In other words, he is suggesting that 'do nothing' is more expensive than represented.	The on-going maintenance costs for the do nothing would be part of ITD's regular maintenance project. As the Do Nothing alternative does not meet the purpose and need for the project, it is not a feasible alternative.

RESOLUTION OF ITD COMMENTS ON CONCEPT REPORT
US-91 SHELLEY TO YORK ROAD
PROJECT # STP-1767(101), KEY # 8116

			Pg. 3 Alternative Two: Five-Lane ..., Commenter's question: "Is raising the grade a 'development-friendly' thing to do" and "is the recommended consistent with NEPA"? I think the commenter is wondering why we have a recommended if we do not have an approved document, or, if we do, then this should be so noted.	The vertical alignment of US-91 would be raised by 2 to 5 feet for the following reasons: • To minimize cut sections that would result in a wider total footprint; • To improve the existing tie-ins to Country Club Road, Canyon Road, Cotton Road, and Clinger Road; • To facilitate drainage away from roadway pavement section; • To minimize the grade between US-91 and the adjacent Union Pacific rail line at the cross streets; and • To improve the vertical curvature of the cross streets as they cross over the railroad and tie into US-91. The operational characteristics of the railroad crossings and their tie-in to US-91 was cited as problematic by stakeholders, particularly agribusiness. Currently, the highway is relatively undeveloped north of County Club Road, with agricultural uses on the east side of US-91/UPPR railroad, and agriculture and rural residential on the west side. The District is going to purchase Type III Access Control to preserve safety and roadway function, then encourage the use of frontage and/or backage roads to provide access to adjacent development as it occurs. There is no inconsistency with the NEPA process as alternatives were extensively examined in response to public comment and documented in a technical memorandum.
	ITD-00606		<u>Access Control Determination</u>: ITD-00606 **Pg 1.** – Tabbed – No Comment	Under 'Access Control' – 'Type', the "Existing Rural Collector Type I Access" and "Proposed Minor Arterial..." will be deleted and the form will be modified to say only "Type III". In the Remarks section, the words "as a rural collector" have been replaced with the words "is Major Collector".
			Comment on Page 1 of the Alternatives Analysis asks whether or not a 'super-two' configuration was considered as a possible solution on this corridor (comment not in the Concept Report itself).	A Super 2 approach would not meet the Purpose and Need in terms of improving the LOS or addressing the safety issues arising from inadequate storage and poor site distance at the intersections and rail crossings.

CONCEPT REPORT

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1. ITD-0783 SIGNATURE SHEET

2. ITD-0757 DESIGN STANDARDS-COMPLEX

3. ITD-0758 ALTERNATE SOLUTIONS AND COSTS
   - ITD-1150 PROJECT COST SUMMARY SHEETS
   - PROJECT LOCATION

4. ITD-0606 ACCESS CONTROL DETERMINATION

5. ITD-0651 ENVIRONMENTAL EVALUATION

APPENDICES

A. SHELLEY TO YORK ROAD TYPICAL SECTIONS
   - EXISTING ROADWAY TYPICAL SECTION
   - PROPOSED ROADWAY TYPICAL SECTION
   - PROPOSED SNAKE RIVER VALLEY CANAL BRIDGE & TYPICAL SECTION
   - CONCEPT PLAN SHEETS

B. SUMMARY OF TRAFFIC DATA
   HCS 2000 CAPACITY ANALYSIS
   - EXISTING CONDITIONS (2004)
   - NO-BUILD CONDITIONS (2032)
   - BUILD CONDITIONS (2032)

C. ITD- 2658 SAFETY EVALUATION FORM AND BACK UP ACCIDENT DATA
   - Shelley to York Road

ITD 0783 (Rev. 7-04)

Supply # 27-032650-7

Concept Approval
Idaho Transportation Department

Project Number			Key Number
STP-1767(101)			8116
Highway Route	Beginning Mile Post	Ending Mile Post	Federal Aid Route
US-91	118.8	122.9	STC 1836 from MP 118.8 to MP 120.561 STC 6836 from MP 120.561 to MP 122.9
Project Title			WA Number
Shelley to York Road			
Project Category			
☐ ST Simple ☐ ST Complex ☐ FA Simple ☒ FA Complex			

Revisions or additions to these established project concept and design standards shall require appropriate supporting data and Idaho Transportation Department approval.

Recommended By (Local Sponsor)	Date
Recommended/Approved By (District Engineer)	Date 4/7/06
Reviewed By (Roadway Design Engineer)	Date 5-2-06
Approved By (Assistant Chief Engineer, Development)	Date 5/10/06
☐ Design Exception Approved by Committee	Date

D 0757 (Rev. 5-04)

Design Standards

☒ Complex (submit to HQ for approval) ☐ Simple (approve within the District)

Project Identification

Project Number	Key Number	Project Title		Date
STP-1767(101)	8116	SHELLEY TO YORK ROAD		December 2, 2005
County	**Terrain Type**	**Highway Number**	**Milepost to Milepost**	**Functional Class**
BINGHAM/BONNEVILLE	LEVEL	US-91	118.8 122.9	RURAL COLLECTOR

Project Type

Project Standards	☐ AASHTO	☐ 3R	☒ State	☐ ST
Oversight	☐ Full	☒ Exempt	☐ Non-Federal Aid	

General Project Description

The purpose of this project is to improve US-91 from New Sweden Road to York Road for its users by increasing roadway capacity, improving transportation safety, and updating substandard roadway features. The following solutions are planned improvements to the existing roadway: reconstruct intersections, increase shoulder widths, add additional lanes, add median for left turning movements and replace existing Snake River Valley Canal Bridge.

Standards for Pavement Width

AASHTO Standard Width	3R Standard Width	State Standard Width	ITD Standard Width *Corridor Plan (A-14-02)
n/a	n/a	62' w/curb & gutter 74' w/o curb & gutter	n/a

Roadway Widths *(Attach existing and proposed typical sections)*

Milepost	to Milepost	Existing Pavement Width	Proposed Pavement Width
118.8	119.7	30'	68' (see Appendix A)
119.7	122.9	30'	78' (see Appendix A)

☐ Proposed width includes a 2-foot shoe for each side (AASHTO Standards Only)

Proposed Maximum Superevelation	Proposed Design Vehicle	Design Year
Normal Crown – no superelevated sections	WB-62	2032

Traffic ADT				Traffic DHV				Posted Speed	Design Speed
Present	7000	Future	10710	Present	780	Future	1190	45 mph to MP 119.4 55 mph to MP 122.9	50 mph to MP 119.7 60 mph to MP 122.9

Minimum Level of Service *(Attach capacity analysis)*

Milepost	to Milepost	Existing	Proposed
118.8	122.9	C	A

Access Control

Milepost	to Milepost	Existing	Proposed
118.8	122.9	TYPE I COLLECTOR	TYPE IV ARTERIAL

Maximum Grade		Maximum Curve	
Existing +0.8%	Proposed +0.832%	Existing R N/A	Proposed R 20,000'

Proposed Structures *(Attach typical sections)*

Deck Width		Vertical Clearance (Roadway/Q_{50})	Design Load
(C-C) 82'-0"	(0-0) 84'-8"	2'-0"	HL-93 LRFD

Existing Bridge Sufficiency Rating	Rail Type	Clear Zone	
48.4	Concrete Parapet	Cut 15' to MP 119.7 20' to MP 122.9	Fill 15' to MP 119.7 20' to MP 122.9

Proposed Work (*Mark appropriate items*)

☒ Excavation	☐ Bicycle Lanes	☒ Curb and Gutter	☐ Lighting	☐ ITS
☒ Drainage	☐ Separated Pathway	☒ Utilities	☐ Sidewalk	☐ Other
☒ Base	☐ Traffic Signal	☒ Bridge(s)	☐ Seal Coat	
☒ Surfacing	☒ Erosion Control	☒ Guard Rail	☐ Detour	

Traffic Signals

Existing Location (Milepost)	Type of Controller	Proposed Location (Milepost)	Type of Warrant
York Road & US-91 (122.87)	Traffic Signal	N/A	Existing

Railroad Crossing Protection

Existing Location (Milepost)	Type of Protection	Proposed Location (Milepost)	Type of Protection
Country Club Rd. (119.4)	RR signal warning device	Country Club Rd. (119.4)	RR crossing gates and lights
Clinger St. (119.98)	RR Signage	Clinger St. (119.98)	RR Signage
Canyon Road (120.55)	RR Signage	Canyon Road (120.55)	RR Signage
Cotton Road (121.7)	RR signal warning device	Cotton Road (121.7)	RR crossing gates and lights

Accident History

Accident Rate	Accident Base Rate (ACC/MV)	Existing Accident Rate within Project Limits (ACC/MV)
	1.22	1.22

Spot Locations within Project Limits that exceed the Base Rate (list Milepost)

MP 119.4

Proposed Improvements to Reduce Accidents *Attach worksheet for accident reduction, if necessary.

Milepost	Type of Improvements	Estimated Accident Reduction
119.4	Reconstruct intersection, improve sight distance	52%

Environmental

Conceptual Environmental Evaluation (ITD 0651) Complete ☒ Yes – Attach a copy to this form. ☐ No – Explain below

Environmental Checklist for State Funded Projects Complete ☐ Yes – Attach a copy to this form. ☒ No – Explain below

Project is Federally funded

Environmental Concerns

ITD 0758 (Rev. 5-04)

Alternate Solutions And Costs

Various options and cost comparisons should be analyzed. If appropriate, equivalent uniform annual cost should be computed for the expected life of the proposed options.

Project Number	Key Number
STP-1767(101)	8116

Location

Shelley to York Road

Description:

The US-91 Shelley to York project begins at New Sweden Road in the City of Shelley at MP 118.8 and ends at York Road milepost 122.9. Figure 1 (found at the end of this section) illustrates the project location within the State of Idaho and includes a vicinity map for the project. The total length of the project is approximately 4 miles.

The existing roadway characteristics for this section of US-91 are as follows:

- One 12-foot travel lane in each direction provides limited capacity for future traffic volumes.
- 3-foot shoulders on both sides of the road are substandard and do not provide space for oversize vehicles, snow storage, bicycle accommodation, and refuge for stalled vehicles.
- The lack of a center turn lane requires traffic to slow down and queue behind turning traffic, particularly left -turning vehicles. This contributes to poor traffic operations and increased potential for rear-end accidents.
- Slow moving vehicles also hinder traffic flow as following vehicles must wait for gaps in oncoming traffic to pass.
- Intersections of US-91 with Country Club, Canyon, and Cotton Road are skewed, contributing to sight distance problems. Side street crossings of parallel UPRR track have abrupt vertical curvature, contributing to poor sight distance.
- Vehicle storage length at intersections between the railroad tracks and US-91 creates unsafe conditions for long trucks and school busses turning onto US-91.
- Clear zone distance on east side of US-91 (power poles within clear zone distance) is substandard.
- Vertical curvature over Snake River Valley Canal bridge contributes to sight distance problems.
- Bridge structure over the Snake River Valley Canal is narrow with 2.5' shoulder/shy distance to barrier.
- There are no existing bicycle or pedestrian facilities along this section of US-91.

The projected growth on US-91 between Shelley and York Road will require improvements to the existing roadway to accommodate increased traffic volumes, improve safety, and resolve existing operational problems as noted above. Three alternatives were evaluated for US-91 from New Sweden Road to York Road including Do Nothing, a Three Lane Cross-Section, and the Five Lane Cross-Section. Each of these alternatives is discussed below.

Do Nothing Alternative

The Do Nothing Alternative does not provide for any improvements to the existing roadway deficiencies noted above. The substandard shoulder widths, inadequate clear zone, poor intersection geometry, and the lack of passing opportunities will result in decreased safety and poor traffic operations under design year traffic conditions. Although pedestrian and bicycle traffic is minimal along this section of US-91, the Do Nothing Alternative does not accommodate occasional bicycle traffic safely with the existing three foot shoulders. The AASHTO "Guide for the Development of Bicycle Facilities" recommends a minimum paved shoulder width of four feet to accommodate bicycle travel with additional width for roadways with speeds that exceed 50 mph.

Currently, the ITD Corridor Highway Needs Studies identifies a resurfacing with minor shoulder improvements from MP 118.99 to 120.56 in the year 2014 at a cost of $352,000 ($224,200 per mile). This amount includes $6,000 for right-of-way and utilities and $346,000 for construction. Assuming the same cost per mile for US-91 from the Bingham/Bonneville County Line to York Road, the total cost of the Do Nothing Alternative is approximately $920,000. On-going maintenance costs would be at a standard ITD rate.

Alternate Solutions And Costs

Various options and cost comparisons should be analyzed. If appropriate, equivalent uniform annual cost should be computed for the expected life of the proposed options.

Project Number	Key Number
STP-1767(101)	8116

Location

Shelley to York Road

Alternative One: Three Lane Cross-Section

The Three Lane Cross-Section Alternative consists of one travel lane in each direction with a center left turn lane and standard width shoulders. The horizontal and vertical alignments are generally west of existing centerline and three to five feet above existing grade to minimize impacts to railroad right-of-way and minimize the overall footprint while providing for necessary roadway drainage. This alternative requires additional right-of-way from parcels located on the west side of US-91 abutting the existing highway right-of-way. The Three Lane Cross-Section will have the following characteristics:

- The Three Lane Alternative does not provide the needed additional capacity for the projected design year traffic volumes. This alternative operates at a LOS D in the design year. ITD and AASHTO recommended minimum level of service for a rural collector is LOS C.
- Traffic operations will continue to be hindered since motorists are unable to pass slower moving vehicles, since passing is not permitted in the center shared left turn lane.
- The intersections at Country Club Road and Canyon Road will operate at LOS E and D respectively, below ITD and AASHTO minimum of LOS C.
- Standard 8-foot shoulders will help accommodate oversize vehicles, snow storage, bicycle accommodation, and refuge for stalled vehicles.
- The center left turn lane will provide refuge for left turning vehicles eliminating queuing behind turning traffic and decreasing the potential for rear-end accidents.
- Skewed intersections will be improved to the extent possible with minor adjustments to skew angle and vertical curvature.
- Storage length at intersections between the railroad tracks and US-91 will be increased to help accommodate oversize vehicles.
- The Snake River Valley Canal Bridge at milepost 120.277 will be replaced.
- Roadside obstacles will be relocated or removed from the clear zone.
- Widened shoulders will accommodate bicycle travel along this section of US-91.
- No specific design elements are included for accommodating pedestrians.

This alternative provides some safety improvements to US-91 between Shelley and York Road. However, it does not provide the necessary capacity improvements needed in the design year to operate at an acceptable level of service. Design exceptions are not anticipated for the Three Lane Cross-Section alternative.

Estimated Construction Cost: $11,408,000

Estimated Right-of-Way Cost: $350,000

Alternate Solutions And Costs

Various options and cost comparisons should be analyzed. If appropriate, equivalent uniform annual cost should be computed for the expected life of the proposed options.

Project Number	Key Number
STP-1767(101)	8116

Location

Shelley to York Road

Alternative Two: Five Lane Cross-Section

The Five Lane Cross-Section Alternative consists of two travel lanes in each direction with a center left turn lane and standard width shoulders. The horizontal alignment is shifted to the west to avoid impacts to the railroad right-of-way and ballast section and improve intersection operations. The vertical alignment is approximately 3 to 5 feet above the existing profile to facilitate roadway drainage and minimize the overall footprint. This alternative requires 21.0 acres of right-of-way from the parcels on the west side of US-91 abutting the existing highway right-of-way. The Five Lane Cross-Section will have the following characteristics:

- The Five Lane Alternative provides sufficient capacity for the design year traffic volumes. It operates at a LOS A in the design year.
- Traffic operations will be improved as a result of continuous opportunities for passing slower moving vehicles.
- All intersections along this segment of US-91 will operate at an acceptable level of service.
- 8-foot shoulders will help accommodate oversize vehicles, snow storage, bicycle traffic, and refuge for incident management, exceeding State standard, and consistent with other US-91 projects.
- The center left turn lane will provide refuge for left turning vehicles eliminating queuing behind turning traffic and decreasing the potential for rear-end accidents.
- Skewed intersections will be improved to the extent possible with minor adjustments to skew angle and vertical curvature.
- Storage length at intersections between the railroad tracks and US-91 will be increased to help accommodate longer vehicles.
- The Snake River Valley Canal Bridge at milepost 120.277 will be replaced.
- Roadside obstacles will be relocated or removed from the clear zone.
- Widened shoulders will accommodate bicycle travel along this section of US-91.
- No specific design elements are included for accommodating pedestrians.

This alternative provides considerable safety and capacity improvements to US-91 between Shelley and York Road. It is the only alternative evaluated that meets or exceeds the minimum level of service requirement for design year traffic on both the highway and at intersections. This alternative, the 3-Lane Alternative and Do Nothing alternative are all included in the NEPA Environmental Evaluation under review. Design exceptions are not anticipated for the Five Lane Cross-Section alternative.

Estimated Construction Cost: $14,461,000

Estimated Right-of-Way Cost: $757,000

Proposed Design Exceptions

Describe and Justify All Design Exceptions:

Design exceptions are not anticipated.

Design Exception Committee Chairman	Title	
FHWA Committee Member	Design Exception No.	Date

ITD 1150 (Rev. 3-04)

Project Cost Summary Sheet

Round Estimates to Nearest $1,000

Date	Project Number	Key Number
3/10/2006	STP-1767(101)	8116

Location	District
SHELLEY TO YORK ROAD (5-LANE)	5

Segment Code	Begin Mile Post	End Mile Post	Length in Miles
2350	118.8	122.9	4.1

	Previous ITD 1150	Initial or Revise To
1. Preliminary Engineering		$1,500,000
2. Right-of-Way: Number of Parcels 34 Number of Relocations 7		$757,000
3. Utility Adjustments: ☑ Work ☑ Materials ☐ By State ☑ By Others		$1,409,000
4. Earthwork		$1,085,000
5. Drainage and Minor Structures		$975,000
6. Pavement and Base		$3,902,000
7. Railroad Crossing: (See ITD-0757)		$650,000
Grade/Separation Structure _____		
At-Grade Signals ☐ Yes ☐ No		
8. Bridges/Grade Separation Structures:		
☑ New Structure		$565,000
Location Snake River Valley Canal Milepost 120.266		
Length/Width Length 55'-11" Width 84'-0"		
☐ Repair/Widening/Rehabilitation		
Location _____		
Length/Width		
9. Traffic Items (Delineators, Signing, Channelization, Lighting, and Signals)		$250,000
10. Construction Traffic Control (Sign, Pavement Markings, Flagging, and Traffic Separation)		$470,000
11. Detours		
12. Other Items (Roadside Development, Guardrail, Fencing, Sidewalks, Curb and Gutter)		$994,000
13. Cost of Constructions (Items 3 through 12)		$10,300,000
14. Mobilization 8 % of Item 13		$824,000
15. Construction Engineer and Contingencies 30 % of Items 13 and 14		$3,337,000
16. Total Construction Cost (13 + 14 + 15)		$14,461,000
17. Total Project Cost (1 + 2 + 16)		$16,718,000
18. Project Cost Per Mile		$4,078,000

Prepared By:

Jason Bleyl

ITD-2839 27-228070-2

Right of Way Cost Estimate

Date: July 18, 2006

Key No: 8116
Project No: STP-1767(101)
Project Name: Shelley to York Road

No. of parcels requiring acquisitions: 34

Number of parcels requiring relocations: 7

New Alignment: 4.10 miles

Basic R/W Width: 82.00 ft.

Existing Alignment: 4.10 miles

Additional R/W Width: Varies ft.

DIRECT ACQUISITION COSTS:

A. Land only

Agriculture	Irrigated	14.81	acres @	$1,200	/acre	=	$17,772
	Dry		acres @		/acre	=	$0
	n/a	0.00	acres @	$0	/acre	=	$0
Graze	Irrigated	0.00	acres @	$0	/acre	=	$0
	Dry	0.00	acres @	$0	/acre	=	$0
		0.00	acres @	$0	/acre	=	$0
Timber	Income Producing	0.00	acres @	$0	/acre	=	$0
	Harvestable	0.00	acres @	$0	/acre	=	$0
	Non-Harvestable	0.00	acres @	$0	/acre	=	$0
Residential	Developed	5.96	acres @	$18,150	/acre	=	$108,174
	Undeveloped	0.00	acres @	$0	/acre	=	$0
Commercial\Industria	Developed	0.24	acres @	$20,250	/acre	=	$4,860
	Undeveloped	0.00	acres @	$0	/acre	=	$0
Damages Anticipated						=	
Miscellaneous						=	

B. Site Improvements

Agriculture	No. of Structures	0	@	$0	(average)	=	$0
Residential	No. of Structures	0	@	$0	(average)	=	$0
Commercial\Industria	No. of Structures	0	@	$0	(average)	=	$0
Damages Anticipated							
Miscellaneous						=	

C. Relocation

Developed Agricultur	No. Expected	0	@	$0	(average)	=	$0
Developed Residential							
Single Family	No. Expected	7	@	$70,000	(average)	=	$490,000
Multi-Family	No. Expected	0	@	$0	(average)	=	$0
Developed Comm\In	No. Expected	0	@	$0	(average)	=	$0
Miscellaneous						=	

INDIRECT ACQUISITION COSTS:

Appra./Imp.Agri.	No. Expected	0	@	$0	(average)	=	$0
Appra./Imp.Resid.							
2685	No. Expected	0	@	$0	(average)	=	$0
2288	No. Expected	0	@	$0	(average)	=	$0
B & A	No. Expected	0	@	$0	(average)	=	$0
Appra./Imp.Com.-Ind	No. Expected	0	@	$0	(average)	=	$0
Appraisals/Land	No. Expected	0	@	$0	(average)	=	$0
Negotiations	No. Expected	34	@	$4,000	(average)	=	$136,000
Demolitions	No. Expected	0	@	$0	(average)	=	$0
					Sub-Total		$756,806

INCIDENTALS:

Estimated as a percentage of overall costs. 0.00 % $0

(Includes Title Costs, Admin. Settle., Legal Settle., Attorney & Court Costs, Property Mngmnt. & Misc.)

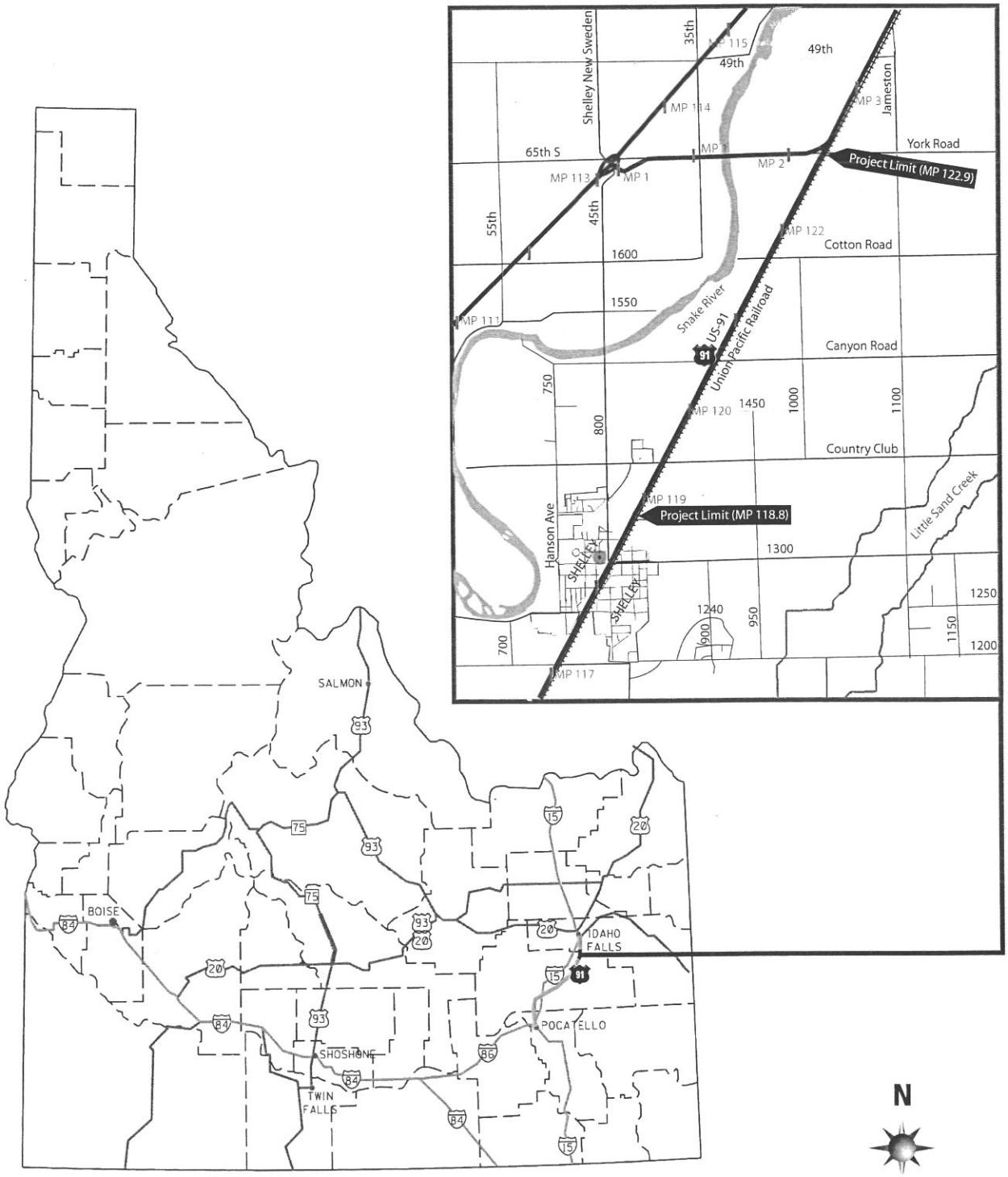
Total Estimated Project R/W Costs: $756,806

Proposed R/W Plans Approval Date

Projected R/W Expenditure Years

Contruction Year(s)

Estimtd. By: Jason Bleyl, P.E. Title: Project Engineer Date: 12/1/2005



91 Shelley To York Road	Project No. STP-1767(101) Key No. 8116	
	Title: Project Location	Figure No. 1
		Date: December 2005
		IDAHO TRANSPORTATION DEPARTMENT

ITD 00606 (Rev. 8/01)

ACCESS CONTROL DETERMINATION

Project Number	STP-1767(101)	Key Number	8116	District	5
Location	Shelley to York Road				
Route Number	US-91	Functional Classification	Minor Arterial		
Design Year	2032	ADT	10,710	DHV	1190	Design Speed	60

ACCESS CONTROL

Limits	Type
MP 118.8 (Shelley) to 122.9 (York Road)	Type III

REMARKS

In accordance with Rural Highways Access Control Guide, Administrative Policy A-12-01, any changes to existing Access Control must be documented. The existing classification of the roadway is a Major Collector (Type I). The proposed improvements to US-91, including two lanes, a median, and increased shoulder width warrants a change in access control. Given the substantive investment in the improvements to US-91, Type III Access Control is the most appropriate for the function of this highway.

RECOMMENDED BY

District Engineer	Date
District Traffic Engineer	Date
District R/W Supervisor	Date
HQ Traffic Engineer	Date
Roadway Design Engineer	Date

APPROVED BY

ACE (D)	Date

Distribution: Original - Transportation Planning Administrator
Copies - HQ Traffic Roadway Design PDE District Right of Way District Traffic District

INSTRUCTIONS

1. Complete all blanks as indicated.
2. Refer to "Access Management: Standards and Procedures for Highway Right-of-Way Encroachments" for further information.
3. Indicate the units under "Limits" as either Milepost (MP) or Station (Sta.)
4. Use "Remarks" to explain or justify all revisions to an existing access control.
5. Add more lines if more than one type of Access Control is recommended.
6. Attach an 8 1/2" x 11" Vicinity Map showing the limits of Access Control if the limits are not readily understood (e.g., an interchange or major intersection).
7. Complete the ITD 00606 and send it to Headquarters Traffic Section for approval.

TYPE OF ACCESS CONTROL

<table>
<tr><th rowspan="2">Method of Access</th><th>Full Control</th><th colspan="4">Partial Control</th><th rowspan="2">ITD Spacing Standards</th></tr>
<tr><th>V</th><th>IV</th><th>III</th><th>II</th><th>I</th></tr>
<tr><td>Public Road Connections</td><td>Via interchange ramps only.</td><td colspan="4">Per ITD spacing standards or as shown on project plans.</td><td rowspan="2">As established in:
IDAPA 39.03.42
"Rules Governing Highway Right-of-Way Encroachments on State Rights-of-Way"</td></tr>
<tr><td>Existing Approaches</td><td>Interchange only.</td><td>Frontage road and joint use is encouraged.
Public roads and private approaches must meet ITD spacing standards.</td><td><u>Urban</u>
Maximum is 4/mile per side.
<u>Rural</u>
Maximum is 3/mile per side.</td><td colspan="2">As shown on the project plans or right-of-way documents.</td></tr>
<tr><td>New Approaches</td><td>Prohibited except for interchanges.</td><td>Frontage road access ONLY.
Must meet ITD spacing standards.</td><td>Frontage road and joint use is encouraged.
<u>Urban</u>
Maximum is 4/mile per side.
<u>Rural</u>
Maximum is 3/mile per side.</td><td colspan="2">Must meet ITD spacing standards.</td><td>Intersections, approaches, and signals must meet ITD spacing standards.</td></tr>
</table>

ACCESS CONTROL ON ALL SEGMENTS OF THE STATE HIGHWAY SYSTEM SHALL BE UPGRADED TO MATCH THE MOST CURRENT FUNCTIONAL CLASSIFICATION.

Full Control Access (Type V) prohibits all at-grade intersections, including those with railroads, except as approved by the Federal Highway Administration.

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 on the ITD 00606, Access Control Determination, right-of-way documents, and 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 under Type III and Type IV partial access control.

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 ITD standards. Variances to the spacing standards shall not be permitted unless a need can be demonstrated for the variance. Any variance must be fully documented on the ITD 00606 form.

See page 3 for spacing standards and functional classification.

MINIMUM APPROACH AND SIGNAL SPACING

Access Type	Urban/ Rural	Type	Approaches		Signals	Frontage Roads
			Intersection Spacing	Approach Spacing	Signal Spacing	
I	U	Sections shall be upgraded to Type II or greater				
	R	At-Grade	0.25 mile	300 feet	0.5 mile	0.25 mile
II	U	At-Grade	660 feet	150 feet	0.25 mile	0.25 mile
	R	At-Grade	0.25 mile	500 feet	0.5 mile	0.25 mile
III	U	At-Grade/ Interchange	0.25 mile	300 feet	0.5 mile	0.25 mile
	R	At-Grade/ Interchange	0.5 mile	1,000 feet	0.5 mile	0.25 mile
IV	U	At-Grade/ Interchange	0.5 mile	N/A	0.5 mile	0.25 mile
	R	At-Grade/ Interchange	1 mile	N/A	1 mile	0.25 mile
V	U	Interchange	1 mile	N/A	None	N/A
	R	Interchange	3 miles	N/A	None	N/A

The distance between approaches is measured along the curb line or outside edge of the shoulder between the nearest edges of adjacent approaches, excluding the flares, transitions, or radii. The distance between approaches shall be such that the curb approach transition or radii of an approach does not encroach upon the transition or radii of the adjacent approach. Frontage road distance is measured from the intersecting point of a primary highway and secondary roadway to a point on the secondary roadway at which a new frontage road intersects.

ACCESS TYPES AND THEIR RELATIONSHIP TO FUNCTIONAL CLASSIFICATION

Greater Control ↓

Access Type	Rural Functional Class	Urban Functional Class
I →	Minor Collector, Major Collector	
II →	Minor Arterial	Collector, Minor Arterial
III →	Principal Arterial	Principal Arterial
IV →	Principal Arterial (Multiple-Lane)*	Principal Arterial (Multiple-Lane)*
V →	Interstate	Interstate

↓ *Function Higher*

*Multiple-lane implies two or more thru lanes in each direction. The highway may or may not be divided.

NOTE: Functional classification reports are available from the Headquarters Traffic Section or the Division of Transportation Planning.

ITD 0651 (Rev. 11-02)

Conceptual Environmental Evaluation

Date	District	Route #	City/County
March 10, 2006	5	US-91	Bingham/Bonneville Counties

Project Name	Project #	Key #
US-91 Shelley to York Road	STP-1767(101)	8116

Work Authority	Program Year	Termini (Mp To Mp)
	Prel	118.8 to 122.9

Acres of New Public R/W	Acres of New Private R/W	Located on Indian Reservation, Tribal Lands, Etc.?
0	21.0	☐ Yes ☒ No

Air Quality
☒ Attainment Area ☐ Non-Attainment Area ☐ CO ☐ PM 10 ☐ PM 2.5 ☐ Exempt Project

Type One Project (I.E., New Location, Substantial Alignment Change, Addition of a Through-Traffic Lane):
☒ Yes ☐ No

Construction Impacts Requiring Special Provisions (Enter Details on Separate Sheet)
☐ Yes ☒ No

Project Purpose and Benefits

Double mark (xx) only the item that best describes the Primary Reason for Proposing this Project
Single mark (x) all Other Relevant Items

x	Maintain/Improve User Operating Conditions	___	Enhance Accessibility for the Disabled/Safety
x	Maintain/Improve Traffic Flow	___	Enhance Pedestrian Safety and/or Capacity
x	Time Savings	___	Enhance Bicycle Safety and/or Capacity
xx	Increase Capacity	___	Traffic Composition Enhancement (e.g., Truck Route, HOV Lane, Climbing Lane)
x	Reduce Congestion	___	Visual/Cultural Enhancement (e.g., Landscaping, Historic Preservation)
x	Hazard Reduction	___	Environmental Enhancement (e.g., Air Quality, Noise Attenuation, Water Quality)
___	Reduce Highway User Operating Costs	___	Economic Prudence (e.g., Repair Less Expensive than Replacement, B/C Ratio)
___	Other, List (e.g., Driver Convenience and Comfort regarding Rest Area Projects)		

Check Any of the Following That Are Adversely Impacted by the Project

		Yes	Unknown
1.	Noise Criteria Impacts	X	☐
2.	Change in Access or Access Control	X	☐
3.	Change in Travel Patterns	☐	☐
4.	Neighborhood or Service Impacts	☐	☐
5.	Economic Disruption	☐	☐
6.	Inconsistent W/Local or State Planning	☐	☐
7.	Environmental Justice	☐	☐
8.	Displacements	X	☐
9.	Section 4(f) Lands-DOT Act 1966	X	☐
10.	LWCF Recreation Areas/6(f) Lands	☐	☐
11.	Section 106-Nat. Hist. Preserv. Act	X	☐
12.	FAA Airspace Intrusion	☐	☐
13.	Visual Impacts	☐	☐
14.	Prime Farmland, Parcel Splits	X	☐
15.	Known/Suspected "Hazmat" Risks	☐	☐
16.	Wildlife/Fish Resources/Habitat	☐	☐
17.	Threatened/Endangered Species	☐	☐
	☐ Listed ☐ Proposed	☐	☐

		Yes	Unknown
18.	Air Quality Impacts	☐	☐
19.	Inconsistent With Air Quality Plan ☐ SIP ☐ TIP	☐	☐
20.	Stream Alteration/Encroachment ☐ IWDR ☐ F&G ☐ COE (404)	☐	☐
21.	Flood Plain Encroachment ☐ Longitudinal ☐ Traverse	☐	☐
22.	Regulatory Floodway ☐ PE Cert. & FEMA Approval ☐ Revision	☐	☐
23.	Navigable Waters ☐ CG (Sec 9) ☐ COE (Sec 10) ☐ Dept. Lands	☐	☐
24.	Wetlands ☒ Jurisdictional (404) ☐ Non-Jurisdictional	X	☐
25.	Sole Source Aquifer ☐ Exempt Project ☐ Non-Exempt	☐	☐
26.	Water Quality, Runoff Impacts	☐	☐
27.	NPDES-General Permit (If no, complete sediment-erosion control plan)	☒	☐

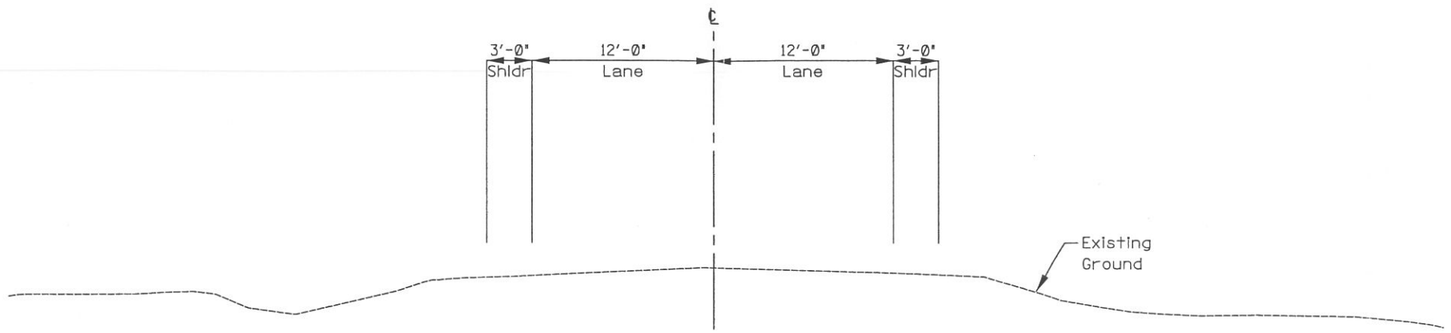
Prepared By	Date
Diana L. Atkins	03/10/2006

Comments

TYPICAL SECTION

Scale N.T.S.

Existing Conditions



REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED J. Christensen	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
DESIGN CHECKED J. Bleyl	
DETAILED J. McGee	CADD FILE NAME 8116tyex.dgn
DRAWING CHECKED J. Bleyl	DRAWING DATE: December, 2005

IDAHO TRANSPORTATION DEPARTMENT

PB PARSONS BRINCKERHOFF

PROJECT NO.	TYPICAL SECTION
STP-1767(101)	SHELLEY TO YORK ROAD

English

COUNTY BINGHAM/BONNEVILLE

KEY NUMBER 8116

SHEET 1 OF 2

NOT APPROVED FOR CONSTRUCTION

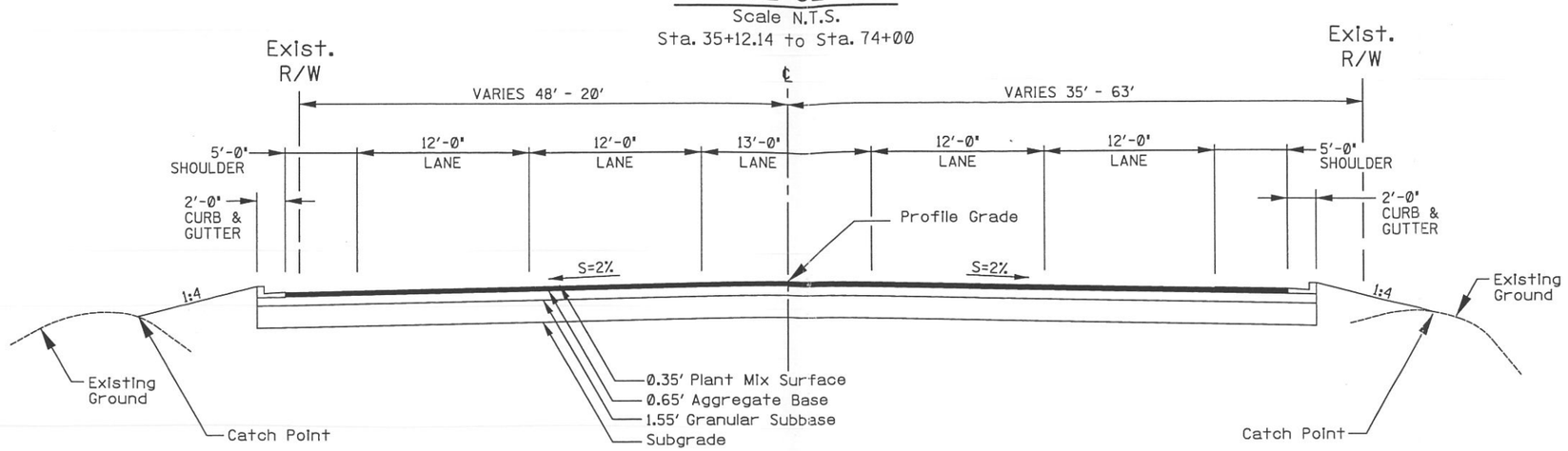
PRELIMINARY

12/1/2005 P:\project\22706A.US91\Prelim. Design\Sht-Files\Concept Reports\8116tyex.dgn

TYPICAL SECTION

Scale N.T.S.

Sta. 35+12.14 to Sta. 74+00

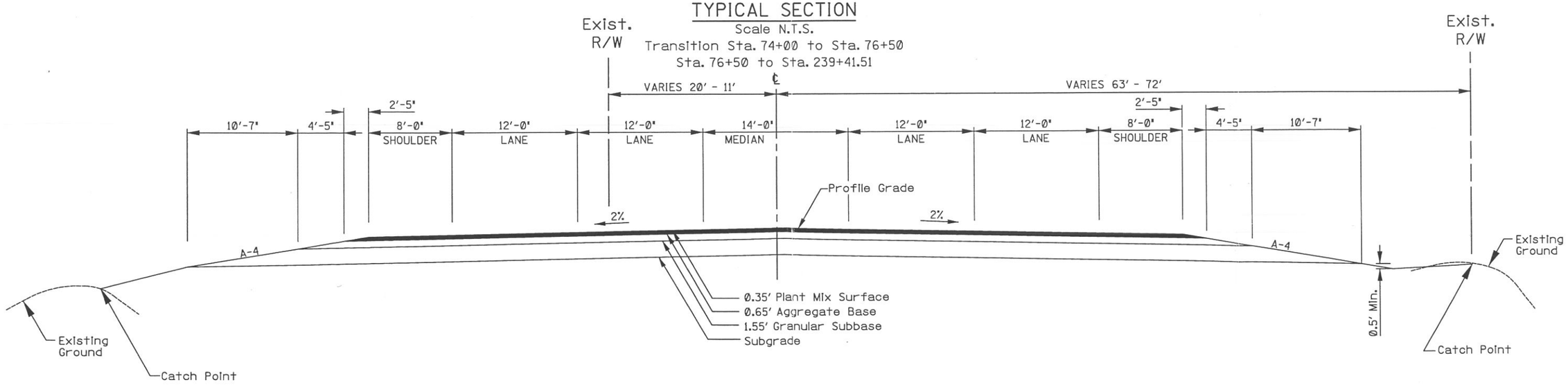


TYPICAL SECTION

Scale N.T.S.

Transition Sta. 74+00 to Sta. 76+50

Sta. 76+50 to Sta. 239+41.51



REVISIONS				DESIGNED	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT	PROJECT NO.	TYPICAL SECTION	English
NO.	DATE	BY	DESCRIPTION	J. Christensen					COUNTY BINGHAM/BONNEVILLE
				DESIGN CHECKED J. Bleyl			STP-1767(101)	SHELLEY TO YORK ROAD	KEY NUMBER 8116
				DETAILED J. McGee	CADD FILE NAME 8116ty01.dgn				SHEET 2 OF 2
				DRAWING CHECKED J. Bleyl	DRAWING DATE: December, 2005	PB PARSONS BRINCKERHOFF			

NOT APPROVED PRELIMINARY FOR CONSTRUCTION

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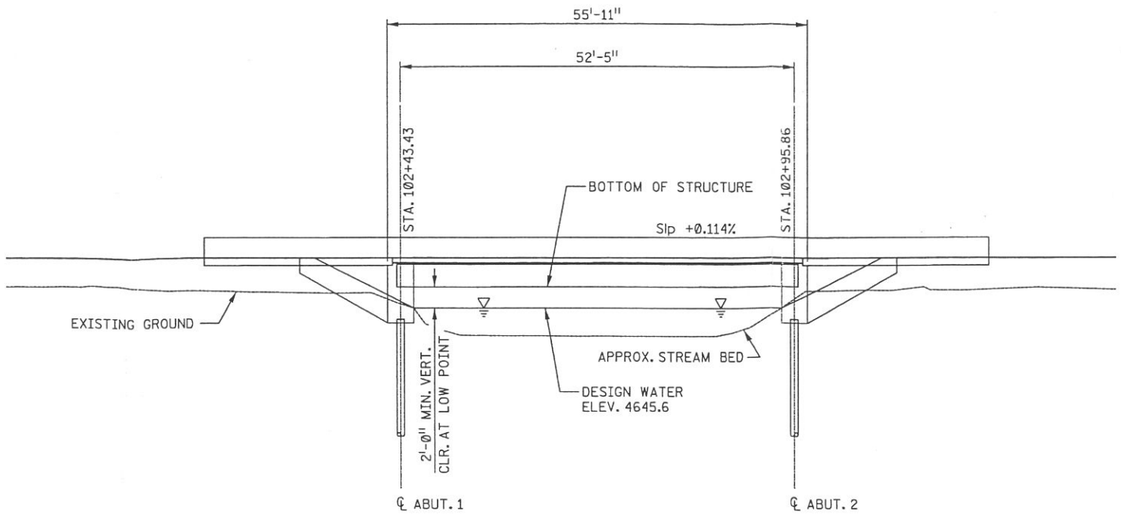
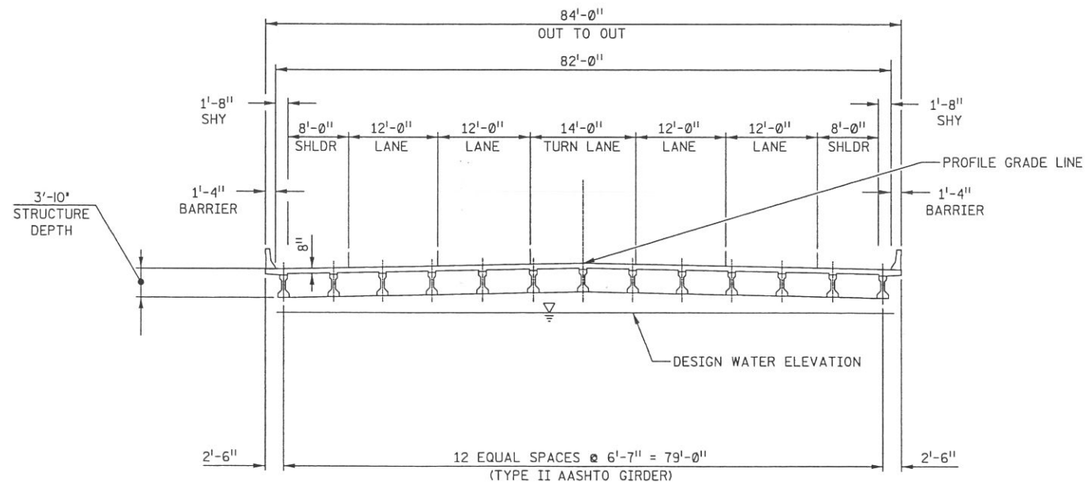
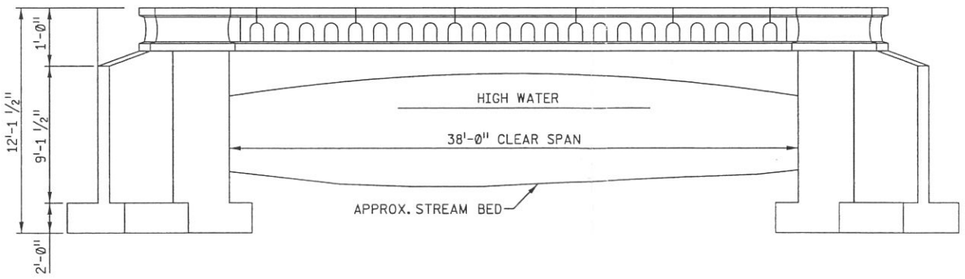


PROPOSED BRIDGE ELEVATION



SECTION THRU PROPOSED STRUCTURE



EXISTING BRIDGE ELEVATION

NOTES

1. NO UTILITIES (IF ANY) SHOWN.

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED Gloria T-K	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT
DESIGN CHECKED D. Church		
DETAILED Gloria T-K	CADD FILE NAME 8116pl_Snake River Bridge.dgn	
DRAWING CHECKED D. Church	DRAWING DATE: March, 2006	PB PARSONS BRINCKERHOFF

PROJECT NO.	CONCEPT REPORT	
STP-1767(101)	SHELLEY TO YORK ROAD	English
		COUNTY BINGHAM/BONNEVILLE
		KEY NUMBER 8116
		SHEET 1 OF 1

NOT APPROVED PRELIMINARY FOR CONSTRUCTION

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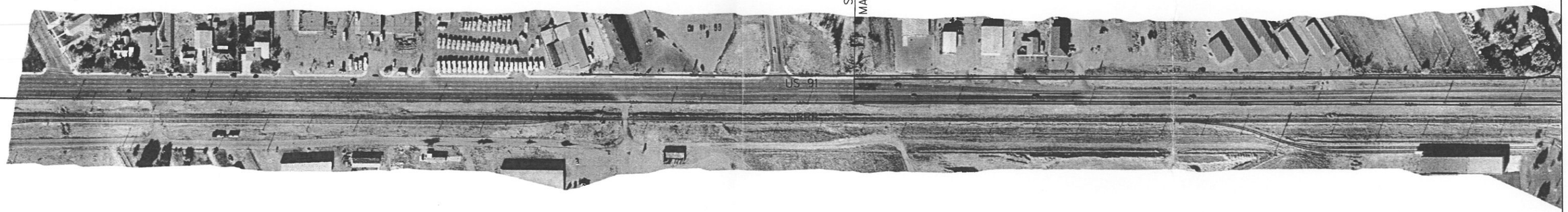
3/8/2006



LEGEND

- PROPOSED ALIGNMENT CENTERLINE
- EDGE OF PAVEMENT (5-LANE)
- RIGHT-OF-WAY

150 0 300
SCALE IN FEET

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED J. Christensen
DESIGN CHECKED J. Bleyl
DETAILED J. McGee
DRAWING CHECKED J. Bleyl

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME Align_1of5.dgn
DRAWING DATE: December, 2005

IDAHO TRANSPORTATION DEPARTMENT

PB PARSONS BRINCKERHOFF

PROJECT NO.: STP-1767(101)

CONCEPT REPORT: SHELLEY TO YORK ROAD

English
COUNTY BINGHAM/BONNEVILLE
KEY NUMBER 8116
SHEET 1 OF 5

NOT APPROVED
PRELIMINARY
FOR CONSTRUCTION

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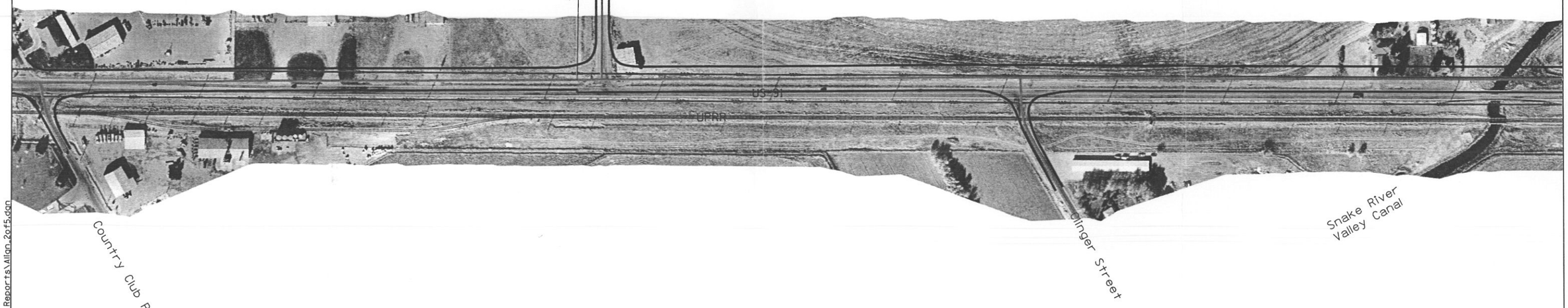
12/6/2005



LEGEND

- PROPOSED ALIGNMENT CENTERLINE
- EDGE OF PAVEMENT (5-LANE)
- RIGHT-OF-WAY

150 0 300
SCALE IN FEET

NOT APPROVED
PRELIMINARY
FOR CONSTRUCTION

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12/6/2005

REVISIONS			
NO.	DATE	BY	DESCRIPTION

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DESIGN CHECKED J. Bleyl	
DETAILED J. McGee	CADD FILE NAME Align_2of5.dgn
DRAWING CHECKED J. Bleyl	DRAWING DATE: December, 2005

IDAHO TRANSPORTATION DEPARTMENT

PB PARSONS BRINCKERHOFF

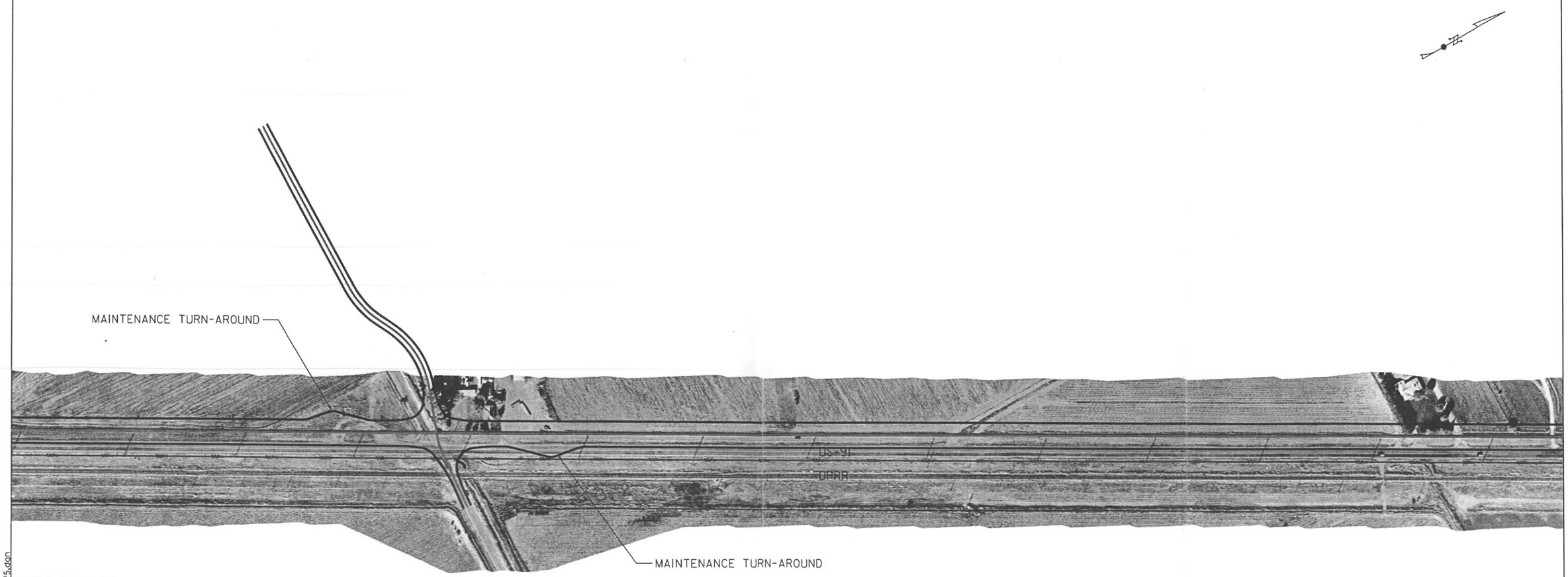
PROJECT NO.	CONCEPT REPORT
STP-1767(101)	SHELLEY TO YORK ROAD

English

COUNTY BINGHAM/BONNEVILLE

KEY NUMBER 8116

SHEET 2 OF 5



LEGEND
- PROPOSED ALIGNMENT CENTERLINE
- EDGE OF PAVEMENT (5-LANE)
- RIGHT-OF-WAY

150 0 300
SCALE IN FEET

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED J. Christensen
DESIGN CHECKED J. Bleyl
DETAILED J. McGee
DRAWING CHECKED J. Bleyl

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME Align_3of5.dgn
DRAWING DATE: December, 2005

IDAHO TRANSPORTATION DEPARTMENT

PB PARSONS BRINCKERHOFF

PROJECT NO.
STP-1767(101)

CONCEPT REPORT
SHELLEY TO YORK ROAD

English
COUNTY BINGHAM/BONNEVILLE
KEY NUMBER 8116
SHEET 3 OF 5

NOT APPROVED
PRELIMINARY
FOR CONSTRUCTION

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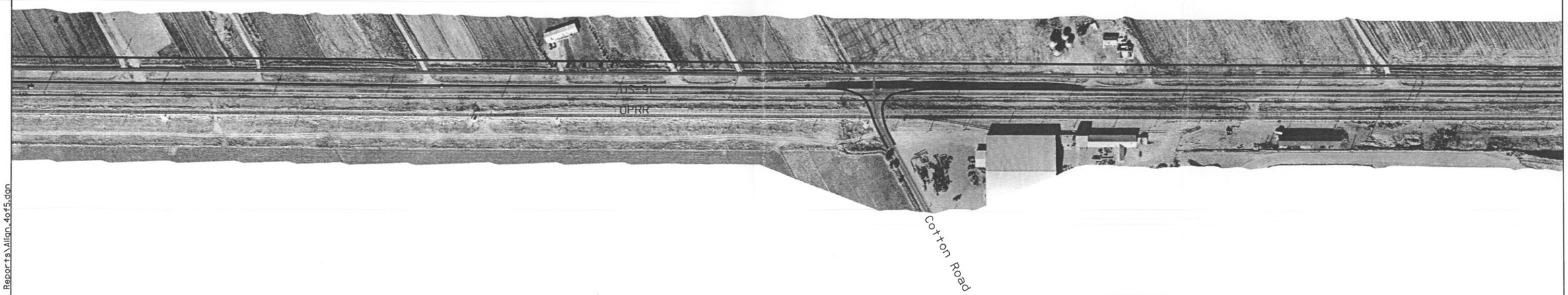

LEGEND

- PROPOSED ALIGNMENT CENTERLINE
- EDGE OF PAVEMENT (5-LANE)
- RIGHT-OF-WAY

150 0 300
SCALE IN FEET

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED J. Christensen
DESIGN CHECKED J. Bleyl
DETAILED J. McGee
DRAWING CHECKED J. Bleyl

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME Align_4of5.dgn
DRAWING DATE: December, 2005

IDAHO TRANSPORTATION DEPARTMENT

PB PARSONS BRINCKERHOFF

PROJECT NO.
STP-1767(101)

CONCEPT REPORT
SHELLEY TO YORK ROAD

English
COUNTY BINGHAM/BONNEVILLE
KEY NUMBER 8116
SHEET 4 OF 5

NOT APPROVED
PRELIMINARY
FOR CONSTRUCTION

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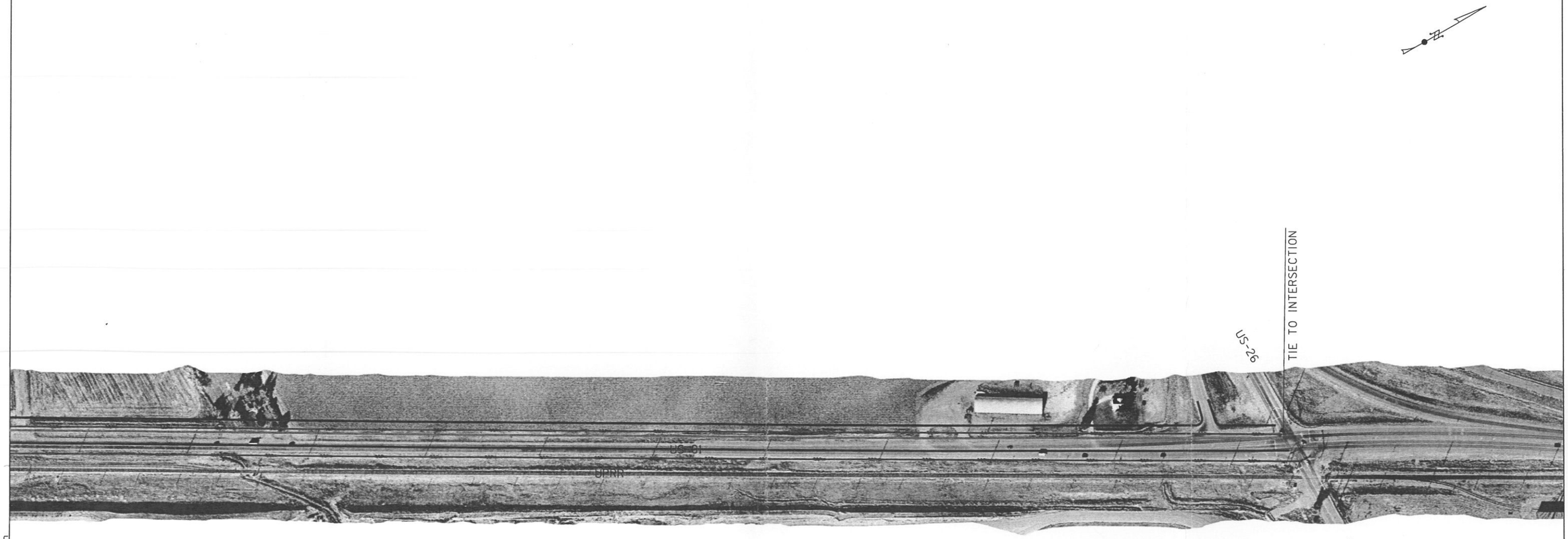
12/6/2005



LEGEND

- PROPOSED ALIGNMENT CENTERLINE
- EDGE OF PAVEMENT (5-LANE)
- RIGHT-OF-WAY

150 0 300
SCALE IN FEET

NOT APPROVED
PRELIMINARY
FOR CONSTRUCTION

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED J. Christensen
DESIGN CHECKED J. Bleyl
DETAILED J. McGee
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IDAHO TRANSPORTATION DEPARTMENT

PB PARSONS BRINCKERHOFF

PROJECT NO.
STP-1767(101)

CONCEPT REPORT
SHELLEY TO YORK ROAD

English
COUNTY BINGHAM/BONNEVILLE
KEY NUMBER 8116
SHEET 5 OF 5

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12/6/2005

SUMMARY OF TRAFFIC DATA

This report summarizes the existing and future traffic operations for US-91 from New Sweden Road in north Shelley to York Road.

1.0 METHODOLOGY

PM peak hour traffic counts and turning movement counts were taken during October, 2004 at the key intersections within the project limits. Percent heavy vehicles were also obtained in this count program.

To estimate future-year traffic volumes, existing counts were used and increased by a growth rate of 1.47% per year. This growth rate was calculated based on historic average daily traffic volumes obtained by ITD for the years of 1990 to 2003 and verified using growth rates calculated from the Bonneville Metropolitan Planning Organizations travel demand forecasting model output.

Highway Capacity Manual analysis methodologies and SYNCHRO analysis were used to determine current and future year 2032 traffic operations.

2.0 EXISTING CONDITIONS

The existing (2004) peak hour, Average Annual Daily Traffic (AADT), and percent heavy trucks for the segment of US-91 from New Sweden Road to York Road are provided in the following table.

Average Weekday PM Peak Hour	2004 ADT	Percent Heavy Trucks
700-780	7000	2-3%

2.1 CAPACITY ANALYSIS

Capacity analyses were performed for the US-91 mainline and for 4 intersections using the PM peak hour turning movement counts at New Sweden Road, Country Club Road, Canyon Road and York Road. Capacity analysis is the procedure used to compare the carrying capacity of a roadway with existing or forecasted traffic volumes. The volume to capacity ratio is a measure of roadway congestion, calculated by dividing the number of vehicles passing through a section of highway during the peak hour by the capacity of the section.

The ability of a roadway system to accommodate traffic demand is governed in part by the capacity of individual intersections. The key congestion points are generally located at the intersections. Thus, both roadway segment and intersection capacity analysis are principal tools used in traffic engineering to determine the adequacy of a system to meet traffic demands. Level of service (LOS) is a term used to describe the degree of traffic congestion.

Existing volumes were input into the Highway Capacity Software (HCS: McTrans, 2003) to estimate existing levels-of-service. For the US-91 mainline, traffic flows are relatively unconstricted except for locations where vehicles turning off of US-91 do not have a turning lane, and where overtaking of slower-moving vehicles is impeded due to a no-passing zone or by oncoming traffic. The two-lane highway HCM method is to base level-of-service on the amount of time a vehicle is constrained to be following another, slower-moving vehicle due to the presence of no-passing zones or oncoming traffic: the higher the percentage of time spent following another vehicle, the lower the average speed and also the lower the level-of-service.

The existing US-91 mainline LOS is shown below:

Roadway		2004 Existing Conditions					
From	To	LOS	% Time Following	Average Speed	v/c Ratio	ITD LOS Standard	Deficient?
New Sweden Road	York Road	C	36.0%	51	0.25	C	No

The results of the traffic operations analysis of the four intersections is shown below:

	2004 Existing Conditions		ITD LOS Standard	Deficient?
Intersection	LOS	Delay+		
New Sweden	B	10.9	C	N/A
Country Club	C	18.1	C	No
Canyon	C	15.6	C	No
York (signalized)	A	8.6	C	No

+Delay at unsignalized intersection is for the approach with the higher delay.

ITD's turning lane "warrants" were used to identify locations where existing volumes warrant a right-turn or left-turn lane at the four intersections.

Left turn lane warrants are based on Section 452.01 of the ITD Traffic Manual. Warrants are based on hourly turning and through traffic movements (in the highest volume direction) on US-91, as well as the posted speed. The ITD Traffic Manual states "in most cases, left-turn lanes should be provided where there are more than 12 left turns per peak hour".

Right-turn lane warrants are found in Section 452.02 of the Traffic Manual. They are based on peak hour right-turning volumes, hourly volume of the highway, and posted speed. Tables 7 and 8 provide a summary of left and right turn lane warrants for existing traffic conditions at New Sweden, Country Club, Canyon, and York Roads.

Table 7. Existing Intersection Left-Turn Lane Summary

	Northbound US-91			Southbound US-91		
US-91 Intersection	Existing LT Vol.	Volume Threshold	Turn Lane Warranted?	Existing LT Vol.	Volume Threshold	Turn Lane Warranted?
New Sweden	69	12	Yes	n/a	12	No
Country Club	19	12	Yes	9	12	No
Canyon	3	12	No	2	12	No
York (signalized)	15	12	Yes	15	12	Yes

Table 8. Existing Intersection Right-Turn Lane Summary

	Northbound US-91			Southbound US-91		
US-91 Intersection	Existing RT Vol.	Volume Threshold	Turn Lane Warranted?	Existing RT Vol.	Volume Threshold	Turn Lane Warranted?
New Sweden	n/a	5	No	25	5	Yes
Country Club	26	5	Yes	13	5	Yes
Canyon	8	5	Yes	10	5	Yes
York*	28	5	Yes	0	5	N/A

* Signalized intersection.

3.0 FUTURE TRAFFIC CONDITIONS

By the year 2032, traffic volumes in the project area are expected to increase by 53%. This increase is based on a growth rate of 1.47% per year and verified using growth rates calculated by the Bonneville Metropolitan Planning Organization's model. A comparison of 2004 and predicted 2032 traffic volumes is shown below.

Existing (2004)		2032 No-Build		Percent Heavy Trucks
Average Weekday PM Peak Hour	AADT	Average Weekday PM Peak Hour	AADT	
700-780	7,000	1,070-1,190	10,710	2-3%

Future traffic operations on the US-91 mainline were analyzed and compared to ITD's LOS Standard of LOS C, and are summarized below.

2032 No-Action Conditions						
LOS	% Time Following	Avg. Speed	v/c Ratio	2004 Existing LOS	ITD LOS Standard	Substandard?
D	71.0%	47.7	0.40	C	C	Yes

Future traffic operations at 4 intersections within the project area were analyzed and compared to the ITD LOS C standard.

	2004 Existing Conditions		2032 No-Action Conditions		ITD LOS Standard	Substandard In 2032?
US-91 Intersection	LOS	Delay+	LOS	Delay+		
New Sweden	B	10.9	B	13.3	C	No
Country Club	C	18.1	E	46.7	C	**Yes**
Canyon	C	15.6	D	26.3	C	**Yes**
York (signalized)	A	8.6	B	11.4	C	No

+Delay at unsignalized intersection is for the approach with the higher delay.

Traffic operations of four US-91 intersections were analyzed in five-year increments, and are summarized as follows:

US-91 Intersection	2004	2010	2015	2020	2025	2032
New Sweden	B	B	B	B	B	B
Country Club	C	C	C	D	D	E
Canyon	C	C	C	C	C	D
York (signalized)	A	A	A	B	B	B

Year 2032 left and right turn warrants were also conducted and are presented below.

	Northbound US-91			Southbound US-91		
US-91 Intersection	Future Left Turn Volume	Volume Threshold	Left Turn Lane Warranted?	Future Left Turn Volume	Volume Threshold	Turn Lane Warranted?
New Sweden	105	12	Yes	n/a	12	N/A
Country Club	29	12	Yes	14	12	Yes
Canyon	5	12	No	3	12	No
York (signalized)	23	12	Yes	23	12	Yes

	Northbound US-91			Southbound US-91		
US-91 Intersection	Future Right Turn Volume	Volume Threshold	Right Turn Lane Warranted?	Future Right Turn Volume	Volume Threshold	Right Turn Lane Warranted?
New Sweden	n/a	5	No	38	5	Yes
Country Club	40	5	Yes	20	5	Yes
Canyon	12	5	Yes	15	5	Yes
York (signalized)	43	5	Yes	n/a	5	N/A

HCS2000: Two-Lane Highways Release 4.1d

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Two-Way Two-Lane Highway Segment Analysis

Analyst	Jesse Barton
Agency/Co.	Parsons Brinckerhoff
Date Performed	12/1/2005
Analysis Time Period	PM Peak Hour
Highway	US-91
From/To	New Sweden to York Rd.
Jurisdiction	
Analysis Year	2004
Description	Existing Conditions

Input Data

Highway class	Class 1				
Shoulder width	6.0	ft	Peak-hour factor, PHF	0.92	
Lane width	12.0	ft	% Trucks and buses	5	%
Segment length	4.7	mi	% Recreational vehicles	0	%
Terrain type	Level		% No-passing zones	15	%
Grade: Length		mi	Access points/mi	7	/mi
Up/down		%			

Two-way hourly volume, V 723 veh/h
Directional split 59 / 41 %

Average Travel Speed

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.2	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.990	
Two-way flow rate,(note-1) vp	794	pc/h
Highest directional split proportion (note-2)	468	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	mi/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	60.0	mi/h
Adj. for lane and shoulder width, fLS	0.0	mi/h
Adj. for access points, fA	1.8	mi/h
Free-flow speed, FFS	58.3	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATS	51.0	mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	0.995	
Two-way flow rate,(note-1) vp	790	pc/h
Highest directional split proportion (note-2)	466	
Base percent time-spent-following, BPTSF	50.1	%
Adj.for directional distribution and no-passing zones, fd/np	5.9	
Percent time-spent-following, PTSF	56.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	916	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3369	veh-mi
Peak 15-min total travel time, TT15	17.9	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Two-Way Two-Lane Highway Segment Analysis

Analyst	Jesse Barton
Agency/Co.	Parsons Brinckerhoff
Date Performed	12/1/2005
Analysis Time Period	PM Peak Hour
Highway	US-91
From/To	New Sweden to York Rd.
Jurisdiction	
Analysis Year	2032
Description	2032 No-Build Conditions

Input Data

Highway class	Class 1				
Shoulder width	6.0	ft	Peak-hour factor, PHF	0.92	
Lane width	12.0	ft	% Trucks and buses	5	%
Segment length	4.7	mi	% Recreational vehicles	0	%
Terrain type	Level		% No-passing zones	15	%
Grade: Length		mi	Access points/mi	7	/mi
Up/down		%			

Two-way hourly volume, V	1180	veh/h	
Directional split	59 / 41	%	

Average Travel Speed

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.995	
Two-way flow rate,(note-1) vp	1289	pc/h
Highest directional split proportion (note-2)	761	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	mi/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	60.0	mi/h
Adj. for lane and shoulder width, fLS	0.0	mi/h
Adj. for access points, fA	1.8	mi/h
Free-flow speed, FFS	58.3	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATS	47.7	mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.0	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	
Two-way flow rate,(note-1) vp	1283	pc/h
Highest directional split proportion (note-2)	757	
Base percent time-spent-following, BPTSF	67.6	%
Adj.for directional distribution and no-passing zones, fd/np	3.4	
Percent time-spent-following, PTSF	71.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	1507	veh-mi
Peak-hour vehicle-miles of travel, VMT60	5546	veh-mi
Peak 15-min total travel time, TT15	31.6	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Multilane Highways Release 4.1d

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OPERATIONAL ANALYSIS

Analyst:	Ivan Hooper
Agency/Co:	Parsons Brinckerhoff
Date:	8/24/2005
Analysis Period:	PM Peak Hour
Highway:	US-91
From/To:	New Sweden to York Rd.
Jurisdiction:	
Analysis Year:	2032
Project ID:	2032 Build Conditions

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type				
Free-flow speed:	Measured		Measured	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	668	vph	437	vph
Peak-hour factor, PHF	0.92		0.92	
Peak 15-minute volume, v15	182		119	
Trucks and buses	5	%	5	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.976		0.976	
Flow rate, vp	372	pcphpl	243	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	372	pcphpl	243	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	6.8	pc/mi/ln	4.4	pc/mi/ln

Overall results are not computed when free-flow speed is less than 45 mph.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	90	69	249	454	25
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	6	96	73	265	483	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	1					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	776	255	510			
vC1, stage 1 conf vol	496					
vC2, stage 2 conf vol	279					
vCu, unblocked vol	776	255	510			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4	2.2			
p0 queue free %	99	87	93			
cM capacity (veh/h)	431	730	1059			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	6	96	73	132	132	322	188
Volume Left	6	0	73	0	0	0	0
Volume Right	0	96	0	0	0	0	27
cSH	431	730	1059	1700	1700	1700	1700
Volume to Capacity	0.01	0.13	0.07	0.08	0.08	0.19	0.11
Queue Length 95th (ft)	1	11	6	0	0	0	0
Control Delay (s)	13.5	10.7	8.7	0.0	0.0	0.0	0.0
Lane LOS	B	B	A				
Approach Delay (s)	10.9		1.9			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	13	10	37	12	9	19	284	26	9	365	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	14	11	39	13	9	20	299	27	9	384	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	755	749	391	763	756	313	384			299		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755	749	391	763	756	313	384			299		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	96	98	87	96	99	98			99		
cM capacity (veh/h)	304	331	655	299	328	725	1169			1257		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	61	20	326	9	398
Volume Left	8	39	20	0	9	0
Volume Right	11	9	0	27	0	14
cSH	384	336	1169	1700	1257	1700
Volume to Capacity	0.09	0.18	0.02	0.19	0.01	0.23
Queue Length 95th (ft)	7	16	1	0	1	0
Control Delay (s)	15.3	18.1	8.1	0.0	7.9	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	15.3	18.1	0.5		0.2	
Approach LOS	C	C				

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	3	5	5	3	3	3	265	8	2	435	10
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	3	6	6	3	3	3	305	9	2	500	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	828	822	506	828	821	309	500			305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	828	822	506	828	821	309	500			305		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	99	98	99	100	100			100		
cM capacity (veh/h)	288	310	532	286	310	736	1075			1268		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	13	317	514
Volume Left	6	6	3	2
Volume Right	6	3	9	11
cSH	356	352	1075	1268
Volume to Capacity	0.04	0.04	0.00	0.00
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	15.5	15.6	0.1	0.1
Lane LOS	C	C	A	A
Approach Delay (s)	15.5	15.6	0.1	0.1
Approach LOS	C	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1840		1752	1807		1752	3505	1568	1752	3505	
Flt Permitted	0.69	1.00		0.68	1.00		0.52	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	1267	1840		1262	1807		957	3505	1568	1128	3505	
Volume (vph)	225	103	2	28	87	14	15	209	28	15	367	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	242	111	2	30	94	15	16	225	30	16	395	0
RTOR Reduction (vph)	0	1	0	0	11	0	0	0	14	0	0	0
Lane Group Flow (vph)	242	112	0	30	98	0	16	225	16	16	395	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	11.5	11.5		11.5	11.5		22.3	22.3	22.3	22.3	22.3	
Effective Green, g (s)	11.5	11.5		11.5	11.5		22.3	22.3	22.3	22.3	22.3	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.53	0.53	0.53	0.53	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	349	506		347	497		511	1870	837	602	1870	
v/s Ratio Prot		0.06			0.05			0.06			c0.11	
v/s Ratio Perm	c0.19			0.02			0.02		0.01	0.01		
v/c Ratio	0.69	0.22		0.09	0.20		0.03	0.12	0.02	0.03	0.21	
Uniform Delay, d1	13.6	11.7		11.2	11.6		4.6	4.9	4.6	4.6	5.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.2		0.1	0.2		0.1	0.1	0.0	0.1	0.3	
Delay (s)	19.4	11.9		11.4	11.8		4.7	5.0	4.6	4.7	5.4	
Level of Service	B	B		B	B		A	A	A	A	A	
Approach Delay (s)		17.0			11.7			4.9			5.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	41.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	137	105	380	693	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	146	112	404	737	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	1					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1183	389	778			
vC1, stage 1 conf vol	757					
vC2, stage 2 conf vol	426					
vCu, unblocked vol	1183	389	778			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4	2.2			
p0 queue free %	97	76	87			
cM capacity (veh/h)	291	596	841			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	10	146	112	202	202	491	286
Volume Left	10	0	112	0	0	0	0
Volume Right	0	146	0	0	0	0	40
cSH	291	596	841	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.13	0.12	0.12	0.29	0.17
Queue Length 95th (ft)	3	24	11	0	0	0	0
Control Delay (s)	17.8	13.0	9.9	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	13.3		2.2			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	20	15	56	18	14	29	434	40	14	557	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	21	16	59	19	15	31	457	42	15	586	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1154	1144	597	1165	1155	478	586			457		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1154	1144	597	1165	1155	478	586			457		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	89	97	60	90	97	97			99		
cM capacity (veh/h)	151	190	501	146	187	585	984			1099		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	49	93	31	499	15	607
Volume Left	13	59	31	0	15	0
Volume Right	16	15	0	42	0	21
cSH	219	175	984	1700	1099	1700
Volume to Capacity	0.23	0.53	0.03	0.29	0.01	0.36
Queue Length 95th (ft)	21	67	2	0	1	0
Control Delay (s)	26.2	46.7	8.8	0.0	8.3	0.0
Lane LOS	D	E	A		A	
Approach Delay (s)	26.2	46.7	0.5		0.2	
Approach LOS	D	E				

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	5	8	8	5	5	5	405	12	3	664	15
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	9	6	9	9	6	6	6	466	14	3	763	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1266	1256	772	1266	1254	472	763			466		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1266	1256	772	1266	1254	472	763			466		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	97	98	93	97	99	99			100		
cM capacity (veh/h)	141	171	372	139	172	596	858			1106		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	21	485	784
Volume Left	9	9	6	3
Volume Right	9	6	14	17
cSH	196	189	858	1106
Volume to Capacity	0.12	0.11	0.01	0.00
Queue Length 95th (ft)	10	9	1	0
Control Delay (s)	26.0	26.3	0.2	0.1
Lane LOS	D	D	A	A
Approach Delay (s)	26.0	26.3	0.2	0.1
Approach LOS	D	D		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1840		1752	1806		1752	3505	1568	1752	3505	
Flt Permitted	0.65	1.00		0.65	1.00		0.39	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	1203	1840		1196	1806		716	3505	1568	1007	3505	
Volume (vph)	344	157	3	43	133	21	23	319	43	23	560	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	370	169	3	46	143	23	25	343	46	25	602	0
RTOR Reduction (vph)	0	1	0	0	13	0	0	0	26	0	0	0
Lane Group Flow (vph)	370	171	0	46	153	0	25	343	20	25	602	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	19.3	19.3		19.3	19.3		21.6	21.6	21.6	21.6	21.6	
Effective Green, g (s)	19.3	19.3		19.3	19.3		21.6	21.6	21.6	21.6	21.6	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.44	0.44	0.44	0.44	0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	475	726		472	713		316	1548	693	445	1548	
v/s Ratio Prot		0.09			0.08			0.10			c0.17	
v/s Ratio Perm	c0.31			0.04			0.03		0.01	0.02		
v/c Ratio	0.78	0.24		0.10	0.21		0.08	0.22	0.03	0.06	0.39	
Uniform Delay, d1	12.9	9.9		9.3	9.8		7.9	8.4	7.7	7.8	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.9	0.2		0.1	0.2		0.5	0.3	0.1	0.2	0.7	
Delay (s)	20.8	10.0		9.4	9.9		8.4	8.8	7.8	8.1	9.9	
Level of Service	C	B		A	A		A	A	A	A	A	
Approach Delay (s)		17.4			9.8			8.6			9.9	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	137	105	380	693	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	146	112	404	737	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	1					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1183	389	778			
vC1, stage 1 conf vol	757					
vC2, stage 2 conf vol	426					
vCu, unblocked vol	1183	389	778			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4	2.2			
p0 queue free %	97	76	87			
cM capacity (veh/h)	291	596	841			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	10	146	112	202	202	491	286
Volume Left	10	0	112	0	0	0	0
Volume Right	0	146	0	0	0	0	40
cSH	291	596	841	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.13	0.12	0.12	0.29	0.17
Queue Length 95th (ft)	3	24	11	0	0	0	0
Control Delay (s)	17.8	13.0	9.9	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	13.3		2.2			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	20	15	56	18	14	29	434	40	14	557	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	21	16	59	19	15	31	457	42	15	586	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1143	1134	586	1144	1134	457	586			457		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1143	1134	586	1144	1134	457	586			457		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	89	97	61	90	98	97			99		
cM capacity (veh/h)	154	193	508	151	193	602	984			1099		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	49	93	31	457	42	15	586	21
Volume Left	13	59	31	0	0	15	0	0
Volume Right	16	15	0	0	42	0	0	21
cSH	223	181	984	1700	1700	1099	1700	1700
Volume to Capacity	0.22	0.51	0.03	0.27	0.02	0.01	0.34	0.01
Queue Length 95th (ft)	21	64	2	0	0	1	0	0
Control Delay (s)	25.7	44.2	8.8	0.0	0.0	8.3	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	25.7	44.2	0.5			0.2		
Approach LOS	D	E						

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	5	8	8	5	5	5	405	12	3	664	15
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	9	6	9	9	6	6	6	466	14	3	763	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1250	1247	763	1250	1247	466	763			466		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1250	1247	763	1250	1247	466	763			466		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	97	98	94	97	99	99			100		
cM capacity (veh/h)	145	173	377	143	173	601	858			1106		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	24	21	6	466	14	3	763	17
Volume Left	9	9	6	0	0	3	0	0
Volume Right	9	6	0	0	14	0	0	17
cSH	199	193	858	1700	1700	1106	1700	1700
Volume to Capacity	0.12	0.11	0.01	0.27	0.01	0.00	0.45	0.01
Queue Length 95th (ft)	10	9	1	0	0	0	0	0
Control Delay (s)	25.5	25.9	9.2	0.0	0.0	8.3	0.0	0.0
Lane LOS	D	D	A			A		
Approach Delay (s)	25.5	25.9	0.1			0.0		
Approach LOS	D	D						

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	44.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1840		1752	1806		1752	3505	1568	1752	3505	
Flt Permitted	0.65	1.00		0.65	1.00		0.39	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	1203	1840		1196	1806		714	3505	1568	1007	3505	
Volume (vph)	344	157	3	43	133	21	23	319	43	23	560	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	370	169	3	46	143	23	25	343	46	25	602	0
RTOR Reduction (vph)	0	1	0	0	13	0	0	0	27	0	0	0
Lane Group Flow (vph)	370	171	0	46	153	0	25	343	19	25	602	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	18.8	18.8		18.8	18.8		19.7	19.7	19.7	19.7	19.7	
Effective Green, g (s)	18.8	18.8		18.8	18.8		19.7	19.7	19.7	19.7	19.7	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	486	744		484	730		302	1485	664	427	1485	
v/s Ratio Prot		0.09			0.08			0.10			c0.17	
v/s Ratio Perm	c0.31			0.04			0.04		0.01	0.02		
v/c Ratio	0.76	0.23		0.10	0.21		0.08	0.23	0.03	0.06	0.41	
Uniform Delay, d1	11.9	9.1		8.6	9.0		8.0	8.6	7.8	7.9	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	0.2		0.1	0.1		0.5	0.4	0.1	0.3	0.8	
Delay (s)	18.8	9.3		8.7	9.2		8.5	8.9	7.9	8.2	10.1	
Level of Service	B	A		A	A		A	A	A	A	B	
Approach Delay (s)		15.8			9.1			8.8			10.1	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	137	105	380	693	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	146	112	404	737	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	1					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1163	369	778			
vC1, stage 1 conf vol	737					
vC2, stage 2 conf vol	426					
vCu, unblocked vol	1163	369	778			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4	2.2			
p0 queue free %	97	76	87			
cM capacity (veh/h)	297	614	841			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	10	146	112	202	202	369	369	40
Volume Left	10	0	112	0	0	0	0	0
Volume Right	0	146	0	0	0	0	0	40
cSH	297	614	841	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.13	0.12	0.12	0.22	0.22	0.02
Queue Length 95th (ft)	2	23	11	0	0	0	0	0
Control Delay (s)	17.5	12.7	9.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	A					
Approach Delay (s)	13.0		2.2			0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	20	15	56	18	14	29	434	40	14	557	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	21	16	59	19	15	31	457	42	15	586	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2			2						
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	915	1134	293	851	1134	228	586			457		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	915	1134	293	851	1134	228	586			457		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	89	98	73	90	98	97			99		
cM capacity (veh/h)	198	191	700	218	191	771	978			1093		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	13	37	59	34	31	228	228	42	15	293	293	21
Volume Left	13	0	59	0	31	0	0	0	15	0	0	0
Volume Right	0	16	0	15	0	0	0	42	0	0	0	21
cSH	198	334	218	340	978	1700	1700	1700	1093	1700	1700	1700
Volume to Capacity	0.06	0.11	0.27	0.10	0.03	0.13	0.13	0.02	0.01	0.17	0.17	0.01
Queue Length 95th (ft)	5	9	26	8	2	0	0	0	1	0	0	0
Control Delay (s)	24.4	19.4	27.5	18.8	8.8	0.0	0.0	0.0	8.3	0.0	0.0	0.0
Lane LOS	C	C	D	C	A				A			
Approach Delay (s)	20.6		24.4		0.5				0.2			
Approach LOS	C		C									

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	5	8	8	5	5	5	405	12	3	664	15
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	9	6	9	9	6	6	6	466	14	3	763	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2			2						
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1017	1247	382	868	1247	233	763			466		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1017	1247	382	868	1247	233	763			466		
tC, single (s)	7.5	6.5	7.3	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	97	98	96	97	99	99			100		
cM capacity (veh/h)	187	173	568	237	173	775	858			1106		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	9	15	9	11	6	233	233	14	3	382	382	17
Volume Left	9	0	9	0	6	0	0	0	3	0	0	0
Volume Right	0	9	0	6	0	0	0	14	0	0	0	17
cSH	187	451	237	347	858	1700	1700	1700	1106	1700	1700	1700
Volume to Capacity	0.05	0.03	0.04	0.03	0.01	0.14	0.14	0.01	0.00	0.22	0.22	0.01
Queue Length 95th (ft)	4	3	3	3	1	0	0	0	0	0	0	0
Control Delay (s)	25.3	17.2	20.8	18.1	9.2	0.0	0.0	0.0	8.3	0.0	0.0	0.0
Lane LOS	D	C	C	C	A				A			
Approach Delay (s)	20.3		19.3		0.1				0.0			
Approach LOS	C		C									

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1752	3505	1568	1752	3505	
Flt Permitted	0.67	1.00	1.00	0.65	1.00	1.00	0.39	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	1228	1845	1568	1200	1845	1568	717	3505	1568	1007	3505	
Volume (vph)	344	157	3	43	133	21	23	319	43	23	560	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	370	169	3	46	143	23	25	343	46	25	602	0
RTOR Reduction (vph)	0	0	2	0	0	14	0	0	26	0	0	0
Lane Group Flow (vph)	370	169	1	46	143	9	25	343	20	25	602	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	18.5	18.5	18.5	18.5	18.5	18.5	19.8	19.8	19.8	19.8	19.8	
Effective Green, g (s)	18.5	18.5	18.5	18.5	18.5	18.5	19.8	19.8	19.8	19.8	19.8	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.43	0.43	0.43	0.43	0.43	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	491	737	627	479	737	627	307	1499	671	431	1499	
v/s Ratio Prot		0.09			0.08			0.10			c0.17	
v/s Ratio Perm	c0.30		0.00	0.04		0.01	0.03		0.01	0.02		
v/c Ratio	0.75	0.23	0.00	0.10	0.19	0.01	0.08	0.23	0.03	0.06	0.40	
Uniform Delay, d1	11.9	9.2	8.4	8.7	9.0	8.4	7.9	8.4	7.7	7.8	9.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.5	0.2	0.0	0.1	0.1	0.0	0.5	0.4	0.1	0.3	0.8	
Delay (s)	18.4	9.3	8.4	8.8	9.2	8.4	8.4	8.8	7.8	8.0	10.0	
Level of Service	B	A	A	A	A	A	A	A	A	A	A	
Approach Delay (s)		15.5			9.0			8.6			9.9	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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SAFETY EVALUATION

I. PROJECT DATA

	DISTRICT	ROUTE	SEG CODE	B.M.P.	E.M.P.	LENGTH	AADT	TYPE RDWY
EXIST. RDWY	5	US-91	2350	118.8	122.9	4.1	6.7	48

LOCATION		PROPOSED IMPROVEMENT			
			COST(1000)		
		LIFE	CONST	R/W	TOTAL
IMPROVEMENT	Change Horizontal & Vertical Alignment, Replace Bridge, Reconstruct Intersection, Left-Turn Lane, Shoulder Widening	20	14000	750	14750

Shelley to York Road, Bingham County

II. ACCIDENT SUMMARY - SIGNIFICANCE

MO.	YR.	TOTAL	FATAL	INJURY	I + F	PDO	SV	MV	WET	DRY	Inter.	
	1999	7	-	5	5	2	5	2			3	
	2000	16	-	8	8	8	4	12			10	
	2001	8	1	3	4	4	3	5			3	
	2002	17	-	7	7	10	7	10			11	
	2003	13	-	5	5	8	7	6			8	
TOTAL--------		61	1	28	29	32	26	35			35	
AVE. SEVERITY % FOR THIS ROAD TYPE----------					46.5	53.5						
EXPECTED I+F AND PDO ACCIDENTS----------					28.4	32.6						
DIFFERENCE (DEVIATION FROM EXPECTED) ---------					+0.6							
STATISTICALLY SIGNIFICANT ?----------					NO							
CONFIDENCE LEVEL----------					-							

☐ SPOT INTERSECTION (INCLUDE X STREET)
☐ SPOT NON-INTERSECTION
X SEGMENT (ALL ACCIDENTS)

III. TRAFFIC DATA

1	2	3	4	5	6	7	8	9	10	11	12
AADT (1000)					TOTAL NO. OF			TOTAL TRAVEL			
			CROSS	VCF			ACC/YR	MV/YR	MVM/YR	ACC/MV	ACC/MVM
PRES.	FUT.	AVE.	STREET	(3÷1)	YEARS	ACC.	(7 ÷ 6)	.365(1+4)	(9XMI.)	(8 ÷ 9)	(8 ÷ 10)
6.7	10.2	8.45	-	1.26	5	61	12.2	2.446	10.03	-	1.22

IV. REDUCTION FACTOR

1	2	3	4	5	6
ACC/MV(M)	R.F.	BASE RATE ACC/MV(M)	EXPECTED ACC/MV(M)	D.R. MV(M)	CALC. R.F.
				1-(>3 OR 4)	(5 ÷ 1)
1.22	0.36	1.22			

V. SAFETY INDEX CALCULATION (METHOD I)

1	2		3	4	5	6	7	8	9	10	11
	ACC.		BEFORE ACC. COST ($1000)								
	TYPE	NO.	COST	TOTAL							
	I+F				5	6	7	8	9	10	11
	PDO				$/ACC.	ACC./YR	VCF	LIFE	1.00-CRF	$ BEFORE	$ AFTER
YES(+)											
YES(-)											
NO											

SAFETY INDEX = (BOX 10 - BOX 11) ÷ TOTAL COST = ÷ =

ANNUAL SAFETY BENEFIT = (BOX 10 - BOX 11) ÷ (BOX 8) = ÷ =$

COMPUTED BY: Jason Bleyl DATE: 8/25/2005 PROJECT NO.: STP-1767(101)

CHECKED BY: John Thomas DATE: 8/26/2005 KEY NUMBER: 8116

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(REVERSE SIDE)

SAFETY EVALUATION
-SUPPLEMENTAL-

VI. ACCIDENT COSTS (METHOD II)

1	2	3	4		5	6	7
BEFORE ACCIDENTS					EXPECTED ACCIDENTS		
TYPE	NO.	COST	TOTAL		NO.	COST	TOTAL
I + F							
PDO							
TOTAL							

VII. SAFETY INDEX CALCULATION (METHOD II)

1	2	3	4	5	6	7
BEFORE	EXPECTED				BEFORE	EXPECTED
$/ACC	$/ACC	ACC/YR	VCF	LIFE	COST	COST
SAFETY INDEX = (BOX 6 - BOX 7) ÷ TOTAL COST =				÷	=	
ANNUAL SAFETY BENEFIT = (BOX 6 - BOX 7) ÷ (BOX 5) =				÷	=$	

COMMENTS:

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SAFETY EVALUATION

I. PROJECT DATA

	DISTRICT	ROUTE	SEG CODE	B.M.P.	E.M.P.	LENGTH	AADT	TYPE RDWY
EXIST. RDWY	5	US-91	2350	118.8	122.9	4.1	6.7	48

		PROPOSED IMPROVEMENT			
			COST(1000)		
		LIFE	CONST	R/W	TOTAL
LOCATION	Shelley to York Road, M.P. 119.4 (Country Club Road)				
IMPROVEMENT	Change Horizontal & Vertical Alignment, Replace Bridge, **Reconstruct Intersection**, Left-Turn Lane, Shoulder Widening	20	14000	750	14750

II. ACCIDENT SUMMARY - SIGNIFICANCE

MO.	YR.	TOTAL	FATAL	INJURY	I + F	PDO	SV	MV	WET	DRY		
	1999	1	-	1	1	-	-	1				
	2000	3	-	1	1	2	-	3				
	2001	2	-	1	1	1	1	1				
	2002	3	-	3	3	-	-	3				
	2003	-	-	-	-	-	-	-				
TOTAL--------		9	-	6	6	3	1	8				
AVE. SEVERITY % FOR THIS ROAD TYPE----------					46.8	53.2						
EXPECTED I+F AND PDO ACCIDENTS----------					4.2	4.8						
DIFFERENCE (DEVIATION FROM EXPECTED) ---------					+1.8							
STATISTICALLY SIGNIFICANT ?----------					NO							
CONFIDENCE LEVEL----------					-							

X SPOT INTERSECTION (INCLUDE X STREET)
☐ SPOT NON-INTERSECTION
☐ SEGMENT (ALL ACCIDENTS)

III. TRAFFIC DATA

1	2	3	4	5	6	7	8	9	10	11	12
AADT (1000)					TOTAL NO. OF			TOTAL TRAVEL			
PRES.	FUT.	AVE.	CROSS STREET	VCF (3+1)	YEARS	ACC.	ACC/YR (7 ÷ 6)	MV/YR .365(1+4)	MVM/YR (9XMI.)	ACC/MV (8 ÷ 9)	ACC/MVM (8 ÷ 10)
6.7	10.2	8.45	-	1.26	5	9	1.8	2.446	10.03	0.74	-

IV. REDUCTION FACTOR

1	2	3	4	5	6
ACC/MV(M)	R.F.	BASE RATE ACC/MV(M)	EXPECTED ACC/MV(M)	D.R. MV(M)	CALC. R.F.
				1-(>3 OR 4)	(5 ÷ 1)
0.74	0.52	0.67	0.36	0.07	0.09

V. SAFETY INDEX CALCULATION (METHOD I)

1	2		3	4	5	6	7	8	9	10	11
	ACC.		BEFORE ACC. COST ($1000)								
	TYPE	NO.	COST	TOTAL	$/ACC.	ACC./YR	VCF	LIFE	1.00-CRF	$ BEFORE	$ AFTER
	I+F										
	PDO										
YES(+)											
YES(-)											
NO			30.729			1.8	1.26	20	0.91	1393.9	1268.4
SAFETY INDEX = (BOX 10 - BOX 11) ÷ TOTAL COST =125.5								÷14750		=0.009	
ANNUAL SAFETY BENEFIT = (BOX 10 - BOX 11) ÷ (BOX 8) = 125.5								÷20		=$6275.00	

COMPUTED BY: Jason Bleyl DATE: 8/25/2005 PROJECT NO.: STP-1767(101)

CHECKED BY: John Thomas DATE: 8/26/2005 KEY NUMBER: 8116

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(REVERSE SIDE)

SAFETY EVALUATION
-SUPPLEMENTAL-

VI. ACCIDENT COSTS (METHOD II)

1	2	3	4		5	6	7
	BEFORE ACCIDENTS				EXPECTED ACCIDENTS		
TYPE	NO.	COST	TOTAL		NO.	COST	TOTAL
I + F							
PDO							
TOTAL							

VII. SAFETY INDEX CALCULATION (METHOD II)

1	2	3	4	5	6	7
BEFORE	EXPECTED				BEFORE	EXPECTED
$/ACC	$/ACC	ACC/YR	VCF	LIFE	COST	COST
SAFETY INDEX = (BOX 6 - BOX 7) ÷ TOTAL COST =				÷	=	
ANNUAL SAFETY BENEFIT = (BOX 6 - BOX 7) ÷ (BOX 5) =				÷	=$	

COMMENTS:

Accident Date	Mile Post	Severity	Contributing Circumstance	Most Harmful Event	Event Rel. to Junction	Vehicle
19990125	121.898	A-Inj-Acc	Over-Corr	Loss Ctrl	Nonjunction	01
19991217	122.86	B-Inj-Acc	Vision-Obs	Loss Ctrl	At Intrsct	01
19990416	119.303	C-Inj-Acc	Inatten	Rear-end	Nonjunction	02
19990416	119.303	C-Inj-Acc	None	SS Opposite	Nonjunction	03
19990401	122.93	B-Inj-Acc	2-Fas-4-Cond	Delin. Post	Intrsct Rel	01
19990719	119.413	C-Inj-Acc	None	Angle	At Intrsct	02
19990416	119.303	C-Inj-Acc	None	Rear-end	Nonjunction	01
19990719	119.413	C-Inj-Acc	Fail-2-Yld	Angle	At Intrsct	01
19990622	119.1	PD/Rpt	Distraction	Ran off Rd	Nonjunction	01
19991217	120.7	PD/Rpt	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20001222	118.99	B-Inj-Acc	Improp-Turn	RearEndTrng	Nonjunction	01
20001222	118.99	B-Inj-Acc	Inatten	RearEndTrng	Nonjunction	02
20000927	122.8	B-Inj-Acc	Fail-2-Yld	Head-on Trng	At dr/alley	01
20000203	119.413	C-Inj-Acc	None	Angle	At Intrsct	02
20000223	122.881	B-Inj-Acc	Fail-2-Yld	Angle	At Intrsct	01
20000316	119.413	PD/Rpt	None	Angle	At Intrsct	02
20000716	122.93	B-Inj-Acc	Pass-Stp-Sgn	Angle	At Intrsct	01
20000916	119.413	PD/Rpt	Pass-Stp-Sgn	Angle	At Intrsct	02
20001218	122.93	B-Inj-Acc	Alc/Drg Imp	Angle	At Intrsct	01
20000721	119.7	PD/Rpt	Fail-2-Yld	SameDirTrng	At Intrsct	02
20000203	119.413	C-Inj-Acc	Fail-2-Yld	Angle	At Intrsct	01
20001022	119.988	C-Inj-Acc	Improp-Ovrtak	SameDirTrng	At Intrsct	02
20001022	119.988	C-Inj-Acc	None	SameDirTrng	At Intrsct	01
20000630	122.881	C-Inj-Acc	Inatten	Angle	At Intrsct	01
20000316	119.413	PD/Rpt	Fail-2-Yld	Angle	At Intrsct	01
20000916	119.413	PD/Rpt	None	Angle	At Intrsct	01
20000721	119.7	PD/Rpt	Fail-2-Sig	SameDirTrng	At Intrsct	01
20000927	122.8	B-Inj-Acc	None	Head-on Trng	At dr/alley	02
20000701	120.052	PD/Rpt	None	Domstc Animl	Nonjunction	01
20000223	122.881	B-Inj-Acc	None	Angle	Nonjunction	02
20000507	120.3	PD/Rpt	Inatten	Ran off Rd	Nonjunction	01
20000630	122.881	C-Inj-Acc	None	Angle	At Intrsct	02
20001114	121.189	PD/Rpt	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20000716	122.93	B-Inj-Acc	None	Angle	At Intrsct	02
20000902	121.589	PD/Rpt	None	Domstc Animl	Nonjunction	01
20001218	122.93	B-Inj-Acc	None	Angle	At Intrsct	02
20000915	122.93	PD/Rpt	None	Rear-end	Intrsct Rel	01
20000915	122.93	PD/Rpt	None	Rear-end	Intrsct Rel	02
20000915	122.93	PD/Rpt	Follow-2-Clos	Rear-end	Intrsct Rel	03
20011201	119.428	C-Inj-Acc	2-Fas-4-Cond	Loss Ctrl	Intrsct Rel	01
20010425	118.999	PD/Rpt	Follow-2-Clos	RearEndTrng	Nonjunction	02
20010206	120.26	C-Inj-Acc	None	Rear-end	At dr/alley	01
20010105	119.393	PD/Rpt	None	Immersion	Nonjunction	02
20010613	121.704	C-Inj-Acc	Fail-2-Yld	Angl Trning	At Intrsct	01
20010331	120.3	Fatal-Acc	None	Head-On	Nonjunction	01
20010425	118.999	PD/Rpt	None	RearEndTrng	At dr/alley	01
20010206	120.26	C-Inj-Acc	Follow-2-Clos	Rear-end	At dr/alley	02
20010105	119.393	PD/Rpt	Improp-Ovrtak	Rear-end	Nonjunction	01
20010331	120.3	Fatal-Acc	Veh-Defects	Loss Ctrl	Nonjunction	02
20010305	119.713	PD/Rpt	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20010125	120.543	PD/Rpt	Follow-2-Clos	Rear-end	Intrsct Rel	02
20010125	120.543	PD/Rpt	None	Rear-end	Intrsct Rel	01

Accident Date	Mile Post	Severity	Contributing Circumstance	Most Harmful Event	Event Rel. to Junction	Vehicle
20010613	121.704	C-Inj-Acc	None	Angl Trning	At Intrsct	02
20020430	119.25	A-Inj-Acc	Left-Of-Cntr	Head-On	Nonjunction	01
20020608	119.413	A-Inj-Acc	None	Angle	At Intrsct	01
20020430	119.25	A-Inj-Acc	None	Head-On	Nonjunction	02
20020325	122.5	A-Inj-Acc	Fail-2-Yld	Angle	At Intrsct	01
20020401	119.413	C-Inj-Acc	Inatten	Angle	At Intrsct	02
20020120	122.872	B-Inj-Acc	None	Pedestrian	Intrsct Rel	01
20020608	119.413	A-Inj-Acc	None	Angle	At Intrsct	02
20020120	122.927	B-Inj-Acc	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20021003	119.413	C-Inj-Acc	Fail-2-Yld	Angle	At Intrsct	02
20020401	119.413	C-Inj-Acc	None	Angle	At Intrsct	01
20021003	119.413	C-Inj-Acc	None	Angle	At Intrsct	01
20020722	119.038	PD/Rpt	None	Oth-Non-Col	Nonjunction	01
20020503	120.552	PD/Rpt	Fail-2-Yld	Angle	At Intrsct	02
20021030	120.302	PD/Rpt	None	Loss Ctrl	Nonjunction	01
20020213	120.9	PD/Rpt	None	SS Opposite	Nonjunction	02
20020524	120.5	PD/Rpt	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20020503	120.552	PD/Rpt	None	Angle	At Intrsct	01
20021108	121.7	PD/Rpt	Pass-Stp-Sgn	Angle	At Intrsct	02
20020213	120.9	PD/Rpt	Left-Of-Cntr	Dr L/R ofCtr	Nonjunction	01
20020325	122.5	A-Inj-Acc	None	Angle	At Intrsct	02
20021029	121.381	PD/Rpt	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20020907	122.866	PD/Rpt	None	SS Opposite	Nonjunction	02
20020907	122.866	PD/Rpt	None	Angle	At Intrsct	03
20021108	121.7	PD/Rpt	None	Angle	At Intrsct	01
20020120	122.872	B-Inj-Acc	Inatten	Pedestrian	Intrsct Rel	02
20020907	122.866	PD/Rpt	Fail-2-Yld	Angle	At Intrsct	01
20020430	122.93	PD/Rpt	Fail-2-Yld	Angl Trning	At Intrsct	01
20020430	122.93	PD/Rpt	None	Angl Trning	At Intrsct	02
20030114	121.038	A-Inj-Acc	None	Ran off Rd	Nonjunction	01
20030913	122.817	A-Inj-Acc	Fail-2-Yld	Head-on Trng	At Intrsct	01
20031030	119.663	C-Inj-Acc	2-Fas-4-Cond	Loss Ctrl	Nonjunction	01
20030830	121.881	C-Inj-Acc	Lght-Defect	Rear-end	At Intrsct	01
20030617	122.866	C-Inj-Acc	Fail-2-Yld	Head-on Trng	At Intrsct	01
20030503	120.552	PD/Rpt	None	Loss Ctrl	At Intrsct	01
20030830	121.881	C-Inj-Acc	Alc/Drg Imp	Rear-end	At Intrsct	02
20031224	121.604	PD/Rpt	None	Loss Ctrl	Nonjunction	01
20030627	121.704	PD/Rpt	Inatten	Ran off Rd	Intrsct Rel	01
20030913	122.817	A-Inj-Acc	None	Head-on Trng	At Intrsct	02
20031013	122.5	PD/Rpt	None	Oth-Not-Fix	Nonjunction	01
20031004	122.817	PD/Rpt	Disregd-Sgnl	Angl Trning	At Intrsct	02
20031004	122.817	PD/Rpt	None	Angl Trning	At Intrsct	01
20030311	122.866	PD/Rpt	None	Angle	At Intrsct	02
20030311	122.866	PD/Rpt	Disregd-Sgnl	Angle	At Intrsct	01
20030604	122.866	PD/Rpt	None	Rear-end	Other	02
20030604	122.866	PD/Rpt	None	Rear-end	Other	01
20030617	122.866	C-Inj-Acc	None	Head-on Trng	At Intrsct	02
20030903	122.866	PD/Rpt	Fail-2-Yld	Head-on Trng	At Intrsct	01

ITD 02[illegible] (Rev. 4-06)
itd.idaho.gov

Feasibility Study

Key Number	Location	General Description	Route
9225	SHELLEY NCL TO YORK RD	MAJOR WIDENING	US-91

Beginning Milepost	Ending Milepost	Length in Miles	County	City	District
118.700	122.880	4.180	BINGHAM/BONNEVILLE	N/A	5

The project is located on a Connecting Idaho Corridor
☐ Yes ☒ No

The Purpose and Needs was originally identified in the Corridor Plan
☒ Yes ☐ No

Purpose and Needs Report

Project Purpose/Benefits

Mark (xx) the one item that best describes the Primary Reason for Proposing this Project
Mark (+) all Other Relevant Items

+	Maintain/Improve User Operating Conditions	____	Enhance Accessibility for the Disabled/Safety
+	Maintain/Improve Traffic Flow	+	Enhance Pedestrian Safety and/or Capacity
+	Time Savings	+	Enhance Bicycle Safety and/or Capacity
xx	Increase Capacity	____	Traffic Composition Enhancement (e.g., Truck Route, HOV Lane, Climbing Lane)
+	Reduce Congestion	____	Visual/Cultural Enhancement (e.g., Landscaping, Historic Preservation)
+	Hazard Reduction/Safety	____	Environmental Enhancement (e.g., Air Quality, Noise Attenuation, Water Quality)
____	Reduce Highway User Operating Costs	____	Economic Prudence (e.g., Repair Less Expensive than Replacement, B/C Ratio)
____	Other, List (e.g., Driver Convenience and Comfort Regarding Rest Area Projects)		

Describe design elements needed to accomplish the purpose of this proposal as they relate to the current deficiencies.

The 5-lane design consists of two travel lanes in each direction with a center left turn lane and standard width shoulders. The horizontal alignment is shifted to the west to avoid impacts to the railroad right-of-way and ballast section and improve intersection operations. The vertical alignment is approximately 3 to 5 feet above the existing profile to facilitate roadway drainage and minimize the overall footprint. The design requires 21 acres of right-of-way from the parcels in the west side of US-91 abutting the existing highway right-of way. The five lane cross-section will have the following characteristics:

- Five lanes provide sufficient capacity for the design year traffic volumes. It operates at a LOS A in the design year.
- Traffic operations will be improved as a result of continuous opportunities for passing slower moving vehicles.
- All intersections along this segment of US-91 will operate at an acceptable level of service.
- 8-foot shoulders will help accommodate oversize vehicles, snow storage, bicycle traffic, and refuge for incident management, exceeding state standard, and consistent with other US-91 projects.
- The center left turn lane will provide refuge for left turning vehicles eliminating queuing behind turning traffic and decreasin the potential for rear-end accidents.
- Skewed intersections will be improved to the extent possible with minor adjustments to skew angle and vertical curvature.
- Storage length at intersections between the railroad tracks and US-91 will be increased to accommodate more and longer vehicles.
- The Snake River Valley Canal Bridge at milepost 120.277 will be replaced (widened, and brought up to current standards).
- Roadside obstacles will be relocated or removed from the clear zone after the centerline of roadway is shifted.
- Widened shoulders will accommodate bicycle travel and pedestrians along this section of US-91.

Proposed Improvements (See ITD 2708 and ITD 1150)

Roadway: Widen roadway to accommodate 5 lanes (including a center turn lane) with 5' to 8' shoulders. M.P. 118.8 to 119.7 - Widen from 30' to 68'. M.P. 119.7 to 122.9 - Widen from 30' to 78'. Move centerline of roadway away from railroad and utilities.

Intersections: Reconstruct to improve site distance at M.P. 119.4, which will give a 52% estimated accident reduction. Various other intersection improvents including reduced skew angle and vertical curvature. Storage length at intersections between the railroad tracks and US-91 will be increased to accommodate longer vehicles.

Drainage: Curb and gutter.

Structures: Snake River Valley Canal (120.266)

Railroad Crossings: Country Club Rd. (119.4) - RR crossing gates and lights, Clinger St. (119.98) - RR signage, Canyon Rd. (120.55) - RR signage, Cotton Rd. (121.7) - RR crossing gates and lights.

Traffic Items: Improve current LOS capacity rating from C to A. Modify access control from a TYPE I COLLECTOR to a TYPE IV ARTERIAL. Roadside obstacles will be relocated or removed from the clear zone. Widened shoulders will accommodate bicycle travel. Shift centerline of roadway away from railroad and utilities.

Traffic Control: Add additional lanes and a median for left-turning vehicles.

Other Items: Update substandard roadway features

Utilities: Relocate various utilities.

Environmental (Check any of the following that are likely impacted by the proposal.)

1. Noise Criteria Impacts ☒
2. Change in Access or Access Control ☒
3. Change in Travel Patterns ☐
4. Neighborhood or Service Impacts ☐
5. Economic Disruption ☐
6. Inconsistent W/Local or State Planning ☐
7. Environmental Justice ☐
8. Displacements ☒
9. Section 4(f) Lands-DOT Act 1966 ☒
10. LWCF Recreation Areas/6(f) Lands ☐
11. Section 106-Nat. Historical Preservation Act ☒
12. FAA Airspace Intrusion ☐
13. Visual Impacts ☐
14. Prime Farmland, Parcel Splits ☒
15. Known/Suspected "Hazmat" Risks ☐
16. Wildlife/Fish Resources/Habitat ☐
17. Threatened/Endangered Species ☐
    ☐ Listed ☐ Proposed
18. Air Quality Impacts ☐
19. Inconsistent With Air Quality Plan ☐
    ☐ SIP ☐ TIP
20. Stream Alteration/Encroachment ☐
    ☐ IWDR ☐ F&G ☐ COE (404)
21. Flood Plain Encroachment ☐
    ☐ Longitudinal ☐ Traverse
22. Regulatory Floodway ☐
    ☐ PE Cert. & FEMA Approval ☐ Revision
23. Navigable Waters ☐
    ☐ CG (Sec 9) ☐ COE (Sec 10) ☐ Dept. Lands
24. Wetlands ☒
    ☒ Jurisdictional (404) ☐ Non-Jurisdictional
25. Sole Source Aquifer ☐
    ☐ Exempt Project ☐ Non-Exempt
26. Water Quality, Runoff Impacts ☐
27. NPDES – General Permit ☐
28. Sediment – Erosion Control Plan ☐

Anticipated Environmental Document/Decision ☒ EE/Cat Ex ☐ EA/FONSI ☐ EIS/ROD

Right of Way (See ITD 2839)

Direct Acquisition Costs	$ 620,806
Indirect Acquisition Costs	$ 136,000
Incidentals	$ 0
Total	**$ 756,806 ***

Number of Parcels Requiring Acquisition 34

Number of Parcels Requiring Relocation 7

Preliminary Project Costs (See ITD 1150)

Development (Planning/Engineering/Environmental)	$ 1,500,000
Construction (CN/CE)	$ 12,483,000
Utilities	$ 1,978,000
Right of Way	$ 757,000
Total	**$ 16,718,000 **

Financial Plan

List possible funding sources/programs (Preservation, Bridge, Safety, Mobility, Enhancement, CMAQ, etc.): Mobility, Bridge, CMAQ, Safety (Railway-Highway crossings), Transportation and Community and System Preservation Program

Will total funding be within available District source/program levels? ☐ Yes ☒ No

If no, what additional funding sources are identified? Wait for conventional funding or cost sharing

Is any planning funding needed to prepare the project for a five year program? ☒ Yes ☐ No

When could full funding be available? 2012 to 2017

Recommended By:	Environmental Planner	Project Development Engineer	District Engineer
Approved By	Date	Approved By	Date

Key No.: 9225
Location: SHELLEY NCL TO YORK RD

Notes:

* As of 1-Dec-2005.

** As of 10-Mar-2005. A similar project on US-30 (Topaz to Lava, about 4 miles long) inflated from approximately $11 million in 2004 to around $19 million in 2006. It would be anticipated that the construction cost for this project would actually be around $20 million, bringing the total cost of the project up to about $24.2 million.