IDAHO ACTT WORKSHOP

# EMBRACING INNOVATION:

## *THE I-84 CORRIDOR IMPROVEMENTS PROJECT*



U.S. Department of Transportation
**Federal Highway Administration**

ACTT
ACCELERATED CONSTRUCTION TECHNOLOGY TRANSFER
www.fhwa.dot.gov/construction/accelerated

- ACTT provides a fresh outlook by bringing national experts to your planning table.
- ACTT introduces innovations that have been tested elsewhere.
- ACTT saves time: according to FHWA's *ACTT II* report, published in March 2005, "most agencies have found ways to slice construction time by 30 percent or more."
- ACTT saves money: ACTT suggestions enabled New Jersey to reduce its budget for the Route 46 bridge project from $10 million to $7.2 million.
- ACTT works for you and your customer!

## How do I ACTT?

- Select a corridor: ACTT is most helpful when applied during the project development phase.
- Make a workshop proposal to ACTT team members, and submit a copy of your proposal to the FHWA Division Office. Include details on the project corridor, timeline and goals.
- Hold a pre-workshop meeting with the ACTT management team.
- Select a meeting site, and coordinate workshop details with the FHWA Division Office.
- Host the workshop.
- Draft a report for submittal to FHWA.
- Incorporate ACTT into project operations.

## WHY ACTT?

IDAHO ACTT WORKSHOP

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**COVER PHOTO:**
I-84 Vista Interchange, Boise, Idaho.

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# EXECUTIVE SUMMARY

> A mantra frequently used by the highway community — "**Get In, Stay In, Get Out, Stay Out**" — has become popular because of the need to reduce traffic congestion caused by work zones. The slogan also is relevant to the reconstruction of bridges because of the pivotal roles that they serve in most transportation systems and the resulting need to avoid long construction times.
>
> Source: Vasant Mistry and Al Mangus, "Get In, Stay In, Get Out, Stay Out," Public Roads, November/December 2006, Federal Highway Administration, U.S. Department of Transportation, *http://www.tfhrc.gov/pubrds/06nov/01.htm*

As this quote shows, issues such as accelerating construction and reducing work zone congestion are taking center stage for departments of transportation (DOTs) across the Nation. These concerns are even more evident when a project involves replacing one or more major bridge structures.

Getting in, staying in, getting out and staying out is especially relevant for the Idaho Transportation Department (ITD) as it prepares to reconstruct 22 miles of Interstate 84 (I-84) in Ada and Canyon Counties.

The focus of the I-84 Corridor Improvements Project is to minimize construction time and costs for the reconstruction of I-84 from the junction with State Highway (SH)-44 in Caldwell to Five Mile Road in Boise and from the Orchard Street Interchange to the Isaac's Canyon Interchange, one of the most congested and heavily traveled corridors in the State. The DOT plans to reconstruct numerous interchanges along the corridor, all of which are substandard and severely lacking capacity.

Knowing this, ITD approached the Federal Highway Administration (FHWA) about hosting an Accelerated Construction Technology Transfer (ACTT) workshop for the I-84 Corridor Improvements Project.

A planning meeting that included representatives from FHWA, ITD and Connecting Idaho Partners (CIP) was held on November 7, 2006 in Boise, Idaho. Together, the planning team identified the following skill sets for the I-84 Corridor Improvements Project workshop:

- Construction.
- Pavements/Geotechnical & Materials.
- Innovative Contracting.
- Maintenance & Operations.
- Public Relations.
- Roadway Design/Utilities.
- Structures/Railroad Coordination.
- Traffic Operations/ITS.

Each team focused on how the ACTT process applied to their area of expertise. The group as a whole searched for methods and measures to help the ITD achieve its goal of reducing the construction timeframe from 12 to 6 years.

As the workshop progressed, each team summarized their thoughts and narrowed them down to a list of priority recommendations. On the final day, each skill set presented their suggestions to the conference attendees. Now that the workshop is complete, ITD will evaluate the various recommendations and decide which ideas should be implemented as part of the project.

## 1.1. Opening Session

The I-84 Corridor Improvements Project ACTT workshop took place February 13-15, 2007, at the Washington Group International Offices in Boise, Idaho.

FHWA Construction & System Preservation Engineer Chris Schneider moderated the opening session. ITD Director Pam Lowe, FHWA Oregon Division Administrator David Cox and FHWA Idaho Field Operations Engineer Edwin Johnson welcomed participants, after which workshop attendees introduced themselves. Dave Butzier from CIP provided a project overview, and the group toured the project corridor.

## 1.2. Workshop Process

The ITD workshop followed the traditional ACTT process. On Wednesday morning, the ACTT management team discussed the brainstorming process with workshop attendees. The skill sets then broke apart to discuss the project and brainstorm preliminary ideas, reconvening before lunch to share initial thoughts. After lunch, the skill sets continued their work, intermingling with other teams to ask questions and share ideas. The teams spent the remainder of the afternoon preparing final recommendations for presentation to the group on Thursday morning.

## 1.3. Skill Set Goals

Participants in each skill set had an established group of goals that was unique to their subject area:

**Construction**

- Minimize road user delay and inconvenience.
- Limit the duration of lane closures.
- Explore innovative construction methods and sequencing to minimize cost and construction timeframe.
- Explore partnering as a means of reducing time and cost.
- Ensure safety.

**Pavements/Geotechnical & Materials**

- Explore innovative materials and methods that allow for faster construction.
- Explore new material testing methods to expedite turnaround times for material acceptance.
- Design to minimize maintenance.
- Incorporate design and materials resistant to rutting and studded tire wear.

- Design for a 50-year service life.
- Consider recycling existing materials.
- Consider performance specifications that will give contractor the flexibility to use innovation.

**Innovative Contracting**

- Explore options to advance projects to construction prior to 100 percent plan specification & estimate (PS&E).
- Consider multiple contract packages versus larger contracts to expedite construction.
- Evaluate use of incentives such as A-plus-B and A-plus-B-plus-C bidding as well as no-excuse bonuses.
- Consider incentives for time savings.

**Maintenance & Operations**

- Seek out high performance transportation improvements that have a minimum 40-year design life.
- Identify winter service, traffic operations and preventative maintenance strategies for the I-84 corridor.
- Minimize long-term operations and maintenance costs.

**Public Relations**

- Identify project stakeholders.
- Recommend ways to partner with local entities.
- Define key marketing tactics for the I-84 campaign.
- Determine the most effective means for informing both local communities and the traveling public about the project before, during and after construction.
- Promote both internal and external communication.

**Roadway Design/Utilities**

- Meet design standards.
- Provide flexibility for the future.
- Promote early utility clearance.
- Minimize traffic disruptions.
- Begin construction in 2007.
- Reduce the duration of construction.
- Minimize cost.
- Maintain quality.

### Structures/Railroad Coordination

- Evaluate bridge types and options to expedite construction.
- Use prefabricated components where practical.
- Use high performance materials where practical.
- Utilize advance construction techniques to accelerate the project.
- Consider options to expedite railroad agreements for crossings and encroachments.
- Consider aesthetic themes that reflect the character of the corridor.

### Traffic Operations/ITS

- Consider maintenance of traffic (MOT) options to minimize disruptions to traffic.
- Consider parallel/alternative detour routes to facilitate traffic movement.
- Maintain clear, well-signed traffic patterns.
- Ensure safety for contractors and travelers, including bike and pedestrian traffic.
- Maintain access for businesses and residents throughout construction.
- Anticipate and develop traffic plans for major traffic-generating events.
- Utilize smart work zones/ITS.

## 2.1. Project Overview

The I-84 Corridor Improvements Project consists of the sections of I-84 from the junction with SH-44 in Caldwell to Five Mile Road in Boise and from the Orchard Street Interchange to the Isaac's Canyon Interchange. The goal is to reconstruct these 22 miles, including the interchanges, as they are substandard and severely lacking capacity. Construction is slated to begin in the summer of 2007. ITD's goal is to reduce the construction timeframe from 12 to 6 years. Maintaining the existing number of lanes throughout construction will be the principal challenge.

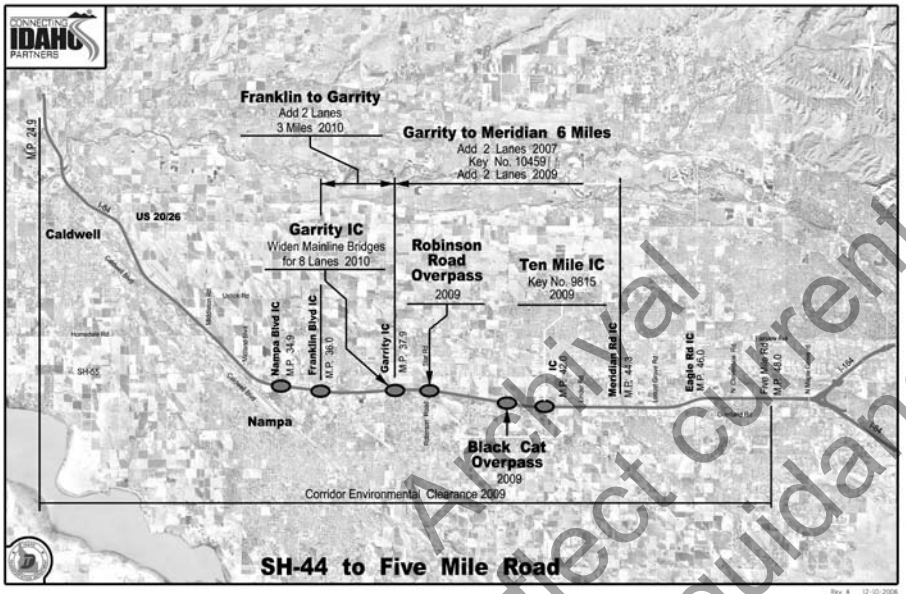


Figure 1. *Proposed improvements on I-84 from the junction with SH-44 to Five Mile Road.*

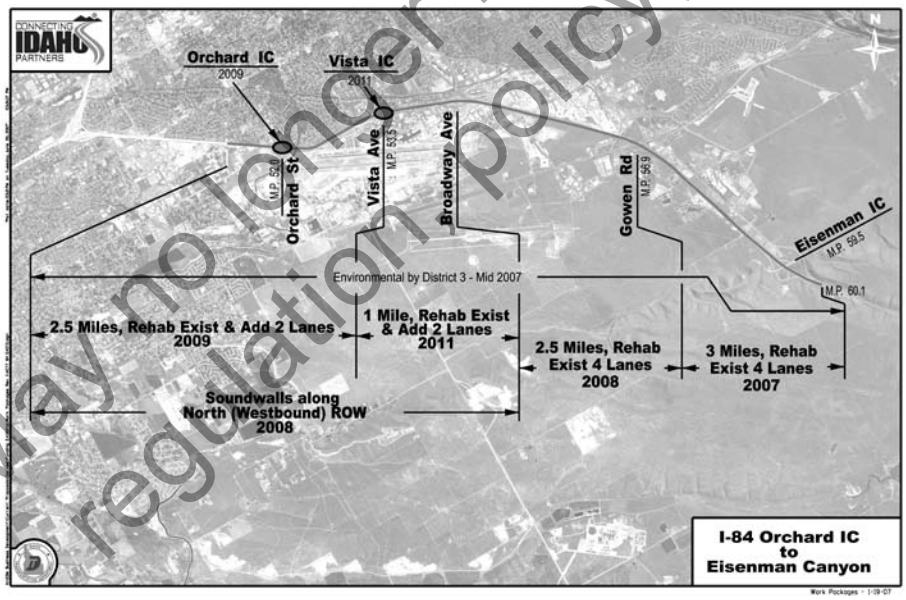


Figure 2. *Proposed improvements on I-84 from the Orchard Street Interchange to Eisenman (Isaac's Canyon).*

## 2.2. Project History and Development

I-84 is the only major east-west link through southern Idaho. It connects Boise to Portland and Seattle to the west and to Salt Lake City and Denver to the east. In addition, I-84 serves as a major commuter route for residents of Treasure Valley.

I-84 from Orchard Interchange to Isaac's Canyon is situated in Ada County and runs through the Boise metropolitan area. Built in the 1960s, this once-rural corridor is now one of the fastest-growing urban centers in the Nation.

Traffic counts along this section of I-84 vary greatly, ranging from 21,000 vehicles per day (VPD) near the Gowen Interchange to 76,000 VPD near the Orchard Interchange. The threshold for I-84 between Orchard Street and Broadway Avenue is a level of service (LOS) D with an average daily traffic (ADT) of 70,000, which means that existing traffic volumes exceed the operational capacity of the roadway. And things will only get worse – 2035 traffic volumes are forecast at 156,000 VPD near the Orchard Interchange. The mainline and four of the interchanges (Orchard, Vista, Broadway and Gowen) will need to be rehabilitated in order to meet these travel demands.

The situation is similar on I-84 from SH-44 to Five Mile Road, where a corridor study completed in 2001 showed that residents could expect significant travel delays and LOS between E and F if major roadway improvements did not take place within a few years.

The ramp taper lengths at most of the entrance and exit ramps along this section of I-84 do not meet current AASHTO standards, and the I-84 vertical alignment needs to be adjusted to meet clearance requirements and improve the drainage of the pavement surface.

Furthermore, 2035 travel projections show 52,000 VPD near the junction with SH-44 and 180,000 VPD near Eagle Road. These traffic volumes far exceed the operational capacity of the existing roadway.

## 2.3. Project Challenges

The segment under study as part of the I-84 Corridor Improvements Project consists of a four-lane divided freeway. The concrete pavement is failing and is in urgent need of replacement. The ramp taper lengths at all of the entrance and exit ramps do not meet current design standards. Vertical clearance is an issue in several areas, as is pavement drainage.

Both segments of the I-84 corridor are part of the CIP Grant Anticipation Revenue Vehicle (GARVEE) Bond Program. Because the estimated cost is greater than the projected bond funding, construction will be staged based on corridor priorities. The Idaho Transportation Board has approved a five-year plan to design and construct approximately $250 million of improvements within the segment from SH-44 to Five Mile Road and approximately $187 million within the I-84 corridor from the Orchard Street Interchange to the Isaac's Canyon Interchange. The actual bond funding available will be subject to annual authorization by the Idaho legislature.

## 2.4. Project Status

Several projects are scheduled to be let in 2007 for I-84 from SH-44 to Five Mile Road.

An Environmental Assessment (EA) is underway for I-84 from Orchard Interchange to Isaac's Canyon. ITD anticipates that the NEPA process for this segment will be complete in mid-2007. Construction on portions of the project corridor is slated to begin in the fall of 2007.

## 3.1. Construction

The construction skill set offered the following recommendations:

### Preconstruction

- Let separate contracts for road work and structure work.
- Obtain environmental permits early, especially for the Orchard to Gowen portion.
- Provide access breaks for the contractor to utilize staging areas.
- Use State-owned constructability reviews; this may allow more out-of-area contractors to bid on the projects.
- Meet individually with contractors at 60 percent design.
- Conduct web-based constructability reviews.

### Contracting

- Use a lump sum contract versus unit pricing.
  - ➢ Requires less labor to administer.
  - ➢ May cost less over the life of the project; some States report a four to five percent price savings.
- Pre-negotiate a contract for hazardous waste removal.
- Utilize incentives to accelerate construction, i.e., A-plus-B bidding, short-time schedules, lane rentals, etc.
- Incorporate milestones into the contract language.

### Utilities

- Relocate all utilities prior to construction utilizing advance relocation contracts.
- Relocate utilities as part of the construction project.
  - ➢ Use joint participation agreements.
  - ➢ Compile a list of pre-approved utility subcontractors.
- Restrict new utilities to locating their lines in pre-designated locations.
- Work with the Joint Trench Commission – Idaho Power Coordinator.

### Drainage

- Pre-cast structures.
- Consider time restrictions for construction due to the irrigation season.

### Structures

- Utilize self-propelled modular transporters (SPMTs).
  - ➢ Allows for quick removal of existing bridges with limited work over the roadway.

- ➢ Provides quicker construction/demolition.
- ➢ Enables construction of replacement bridges in a remote location (not over the roadway).
- ➢ Increases public and worker safety.
- ➢ Provides a high degree of quality control.
- ➢ Also has disadvantages:
  - ■ Is new technology so ITD has limited experience with it.
  - ■ Need temporary bent construction.
  - ■ Requires correct survey with close attention to tolerances.
  - ■ Increases cost.

- ♦ Pre-cast bridge elements, including deck panels.
- ♦ Consider alternate materials for sound walls; post and panel can be built faster than concrete block.
- ♦ Standardize bridge construction. Utilize the existing foundations, abutments and piers, if possible.
- ♦ Package multiple bridges under one contract.
- ♦ Start the bridge projects first.
- ♦ Allow a complete bridge closure for up to one month, and offer an incentive for using less closure time.

**I-84 Overpasses**

- ♦ Depress local streets to at-grade and make all I-84 structures overpasses.
  - ➢ Eliminates clearance issues for Interstate traffic.
  - ➢ Allows for future widening without significant ROW concerns.
  - ➢ Requires a major change in philosophy. Cost is a concern as well.
- ♦ Maintain two lanes at all times.
- ♦ Improve existing shoulders and shift lanes onto the outside shoulders.
- ♦ Utilize median as work zone for new work.
- ♦ Construct the new bridge on-site in the median.
- ♦ Construct everything but the center span that will cross the local roads. Then close the local roads for a limited time (provide an incentive) and construct the center span. Complete the overpass project:
  - ➢ Shift traffic to the new I-84 bridge.
  - ➢ Remove, fill and restore local roads to their at-grade configurations.
  - ➢ Relocate the on-ramps closer to I-84/within the State ROW.
- ♦ Utilize mechanically stabilized earth (MSE) walls.

**Pavements**

- Consider an un-bonded concrete overlay with an asphalt leveling course.
- Mill out four to five inches of the existing asphalt pavement and replace it with six to eight inches of Superpave.
- Consider raising the bridges to obtain clearance rather than excavating and removing the pavement under the structures.
- Upgrade roadway shoulders before putting traffic on them.
- Note that concrete can be placed later in the season than asphalt.

## 3.2. Pavement/Geotechnical & Materials

The pavement/geotechnical & materials crew offered the following recommendations:

**Pavements: Challenges or Issues Common to All Pavement Types**

- Vertical clearance issues under structures.
- Lane delineation/horizontal clearance.
- Need to construct structures first!

**Composite Pavement**

- Consider a concrete slab with a three-inch asphalt overlay.
  - ➢ Has initial higher cost but is readily renewable.
  - ➢ Eliminates final "concrete" texture.
  - ➢ Offers good performance in high-traffic areas.
- Note issues related to working with two material types, i.e., contractor familiarity.

**Concrete/Paving Options**

- Consider jointed plain concrete pavement (JPCP).
  - ➢ Is ITD's traditional concrete pavement. Contractors are familiar with this method.
- Utilize continuously reinforced concrete (CRC), where there are no joints to construct or maintain.
  - ➢ Has proven performance. It is used in other parts of the country, but there is a lack of experience with CRC locally.
  - ➢ Costs more and takes longer. Utilizing CRC is labor-intensive.
  - ➢ Makes phasing of work more difficult.
- Consider asphalt concrete pavement (asphalt over a granular or cement recycled asphalt base stabilization – CRABS – base).
  - ➢ Lessens construction time under traffic.
  - ➢ It's a familiar construction technique, so there's a large contractor pool.

- ➢ Ruts more easily.
- ➢ Requires more maintenance.

♦ Utilize crack and seat. This will minimize traffic impacts.
- ➢ Break the concrete into three- to four-foot sections and overlay.
- ➢ Can recycle existing material.
- ➢ Face risk of reflective cracking.
- ➢ Does not offer a viable long-term solution.
- ➢ Need to consider vibration concerns for adjacent owners.

**Rubblization of Existing Pavement**

♦ Break up existing concrete to three-inch minus material and overlay with asphalt.
- ➢ Recycles existing concrete.
- ➢ Eliminates reflective cracking.
- ➢ Reduces required sub-base.
- ➢ Is more expensive than crack and seat.
- ➢ Can't run traffic during construction.
- ➢ Limits profile and grade adjustments.

**Rigid Pavement over CRABS**

♦ Lay concrete over an existing pulverized asphalt base; this is a proven process in Idaho.
- ➢ Provides material for a third lane. Some material might need to be removed.

**Fast Track Concrete**

♦ Utilize fast-set concrete for early opening of traffic.
- ➢ Can get in and out quickly.
- ➢ Is more expensive.
- ➢ Has durability concerns, i.e., shrinkage and cracking.

**Base Material**

♦ Utilize an asphalt-treated base or a cement-treated base.
- ➢ Performs well under concrete.
- ➢ Is a familiar product for contractors.
- ➢ Is non-erodible.
- ➢ Is more expensive than an aggregate base.
- ➢ Requires mix design.
- ➢ Note: cement-treated base has a questionable performance history in Idaho.

♦ Consider an untreated aggregate base.
- ➢ Performs well under concrete.
- ➢ Is a familiar product for contractors.
- ➢ Has a lower cost than a treated base.

- ➢ Provides for ease of placement.
- ➢ Requires more pavement and is erodible.

♦ Evaluate a permeable versus a dense-graded base, noting that a permeable base drains more rapidly.
- ➢ Need edge drains and a drainage system with a permeable base.
- ➢ Incur more expense with a permeable base.

### Sub-base Material

♦ Utilize a granular sub-base and rock cap.
- ➢ Costs less than an aggregate base.
- ➢ Allows for larger number of sources (because of lower quality requirements).
- ➢ Need to investigate availability of rock cap.

### Geotechnical

♦ Eliminate soil nail wall by removing the loop ramp at Meridian Road. This change may necessitate the addition of lanes to Meridian Road.
- ➢ Eliminates the need to construct another wall.
- ➢ Minimizes construction costs.
- ➢ Will increase left-turn traffic volume at the intersection.

## 3.3. Innovative Contracting

The innovative contracting team centered their recommendations on four key areas:

♦ Contract scope.
♦ Contract terms.
♦ Contracting methods.
♦ Optimal use of available funds.

### Contract Scope

♦ Phase early work opportunities.
♦ Identify critical path items.
♦ Issue separate contracts for tasks such as utility relocation, grading and drainage, sound walls and paving. Smaller contracts match cash flow.
♦ Start construction before design is complete.

### Contract Terms

♦ Provide a “no-excuse” bonus that awards early completion.
- ➢ Include a clause allowing no claims.

♦ Consider other incentives as well.

- Expand procurement options to include design-build (D-B).
  - Is a proven delivery method that was used as early as 1436 for the dome of the Florence Cathedral.
  - Saves time.
    - Obligate money earlier.
    - Start/finish construction sooner.
    - Allows for concurrent design and construction.
    - Applies to large or small projects.
- Consider best value procurement as well.

**Optimal Use of Available Funds**

- Align legislative appropriations with the GARVEE program.
- Right-size each contract.
  - Consider that large-dollar contracts might be more efficient.
  - Note that "smart" work packages are limited by the amount of available funding.
  - Remember that cash flow may impact program delivery.

## 3.4. Maintenance & Operations

The maintenance & operations skill set offered a number of recommendations for pre-construction, construction and post-construction:

**Corridor Manager**

- Hire a corridor manager, and maintain his/her presence throughout the project continuum.
- Make the corridor manager responsible for coordinating the development of the design, construction, maintenance and public relation activities for all projects. The coordinator would be responsible for coordinating these functions with the following entities:
  - Utilities.
  - Contractors.
  - Canal companies.
  - Police.
  - ITD maintenance.
  - ITD district 3.
  - Public transportation.
  - Other public agencies.

**Alternate Route Data Base**

- Assemble an alternate route data base.
  - Inventory information on alternate routes.
  - Update data on geometric and structural limitations.

### Construction Phasing

- Consider preliminary contracts to complete work that does not affect mainline traffic, i.e., work on the interchanges, over-crossing structures, medians and noise walls.
- Expedite mainline construction to minimize traffic impacts.

### Alternate Pavement Treatments

- Investigate alternate pavement preservation and rehabilitation strategies.
- Consider extending the pavement service life by utilizing construction staging options.
- Educate the public; this will require an extensive public relations effort.

### Public Transportation

- Enhance public transportation by providing more services for the following:
  - Buses – additional express bus service.
  - Vanpools – additional vehicles.
  - Carpool – a carpool matching system.
  - Park & Ride – additional parking facilities for bus, vanpool and carpool users.

### Incident Management/Response

- Prepare maintenance crews for what they will encounter within the work zone.
- Expand the existing incident response program throughout the corridor.
- Consider outsourcing incident response.
- Rebuild the incident management team.

### Smart Work Zones

- Utilize real-time message boards.
- Prioritize signals on the mainline.
- Consider ramp meters on alternate routes.
- Utilize 511.
- Utilize the Advanced Traffic Management System (ATMS).
- Continue with these measures post-construction.

### Drainage

- Look at pavement drainage issues, and coordinate with construction.
- Analyze how grade changes and median construction will affect drainage.

### Traffic Safety and Delineation

- Look at the visibility of pavement markings.
- Utilize rumble strips.
- Consider raised pavement markers.

### Miscellaneous

- Ensure that the maintenance contract defines adverse winter weather maintenance requirements and responsibilities.
- Develop a comprehensive vegetation management plan.
- Promote an asset management philosophy that includes:
  - Network and corridor approach.
  - Short- and long-term costs.
  - Bridge management.
  - Pavement management.
  - Maintenance management.
  - Safety.
  - Operations.
- Optimize median barrier treatments based on maintenance and operations costs and performance.
- Develop an all-inclusive, activity-based, long-term maintenance contract for fence-to-fence maintenance.

## 3.5. Public Relations

The public relations team offered the following recommendations:

### Market Research

- Use university students and programs.
- Explore existing research/publications.
- Hire a market research company, if necessary.

### Stakeholder Identification/Communication

- Develop stakeholder mailing lists.
- Utilize signage on roadways.
- Promote the project at the State fair and other major events.

### Key Messages

- Develop key messages that:
  - Articulate the benefits of the project.
  - Discuss traffic impacts.
  - Develop support for the project.
  - Promote safety.

### Corridor Brand

- Brand the corridor.
- Institute a public education campaign.
- Develop a media campaign.

### Corridor Spokesperson

- Designate an ITD representative to speak to the media.
- Consider the community liaison as an alternate spokesperson.

### Community Liaison

- Hire a community liaison to answer high-level questions and represent the project at community events.
  - ➢ Explore funding partnerships.
  - ➢ Make this a full-time position.

### Community Information Center

- Establish a community information center to be staffed by the community liaison.
  - ➢ Partner with local agencies for funding.
  - ➢ Note the importance of location, location, location!

### Additional Recommendations

- Promote corridor and project events. Utilize an outside firm, if necessary, since some projects are ready for construction.
- Mitigate traffic impacts.
- Collaborate with emergency medical service (EMS) providers.
- Ensure the communication of project information internally.
- Establish rapport with communication partners.
- Dedicate a minimum of one percent of the project budget to public relations.
- Seek additional funding sources, i.e., FHWA, local employers and other partners.
- Consider cost sharing.

## 3.6. Roadway Design/Utilities

The roadway design/utilities crew offered the following recommendations:

### Get In, Stay In, Get Out, Stay Out (GISIGOSO)

- Conduct a reverse engineering process to establish the project timeline.
- Perform an overall cash flow analysis.
- Consider GARVEE funding; it supports GISIGOSO.

- Utilize this philosophy to lessen traveler impacts, beat inflation and enhance safety.
- Avoid any adverse perception of the duration of the project.

### Garrity to Meridian Projects

- Build the corridor so it is open to three lanes in each direction.
  - ➢ Provides optimal traffic maintenance opportunities. There aren't any air quality conformity issues.
- Design the overpasses for two lanes now but expandable for the future.

### Gowen Road to Isaac's Canyon Crack and Seat

- Prepare a comprehensive life-cycle cost analysis comparing a crack and seat with a complete rebuild.
- Will require additional funding during the current funding cycle.
- Will provide long-term savings.

### Utilities

- Involve the utilities early, including coordination and surveying.
- Implement subsurface utility engineering (SUE) to relocate utilities quickly.
- Create a full-time utility coordinator.

### Irrigation

- Involve the irrigation districts early.
  - ➢ Address water quality issues.
  - ➢ Note that the irrigation districts trump ITD.
- Begin immediately.
  - ➢ Solicit input on drainage design for both water quality and water quantity.

### Materials Standardization

- Develop process for early approval and acquisition of standardized materials and supplies that can be made available to the contractor. They should be:
  - ➢ Owner provided.
  - ➢ On hand.
  - ➢ Materials for landscaping, color pallets, traffic control items, etc.

### Sound Walls and Fiber-optics

- Address fiber-optic and ROW issues early on; sound walls are a priority.
  - ➢ Purchase ROW now to minimize rebuilding the final wall later.

- Consider conduit sections to minimize fiber-optic relocations and/or ease construction.

### Work Zone Access

- Clearly define work zone access in the D-B documents.
  - Have contractors bid on the exact same project variables.
  - Allow creativity and value engineering (VE).
- Consider prescribed access breaks, i.e., every three miles.

### Interchange Footprint

- Review interchange concept layouts to reduce ROW and utility impacts and create a buffer zone.
  - Review traffic operations analysis as well as lane numbers and arrangements.
  - Consider optimized bridge width based on traffic operations.
  - Incorporate this into the CIP work flow and corridor design process.

## 3.7. Structures/Railroad Coordination

The structures/railroad coordination team offered a number of recommendations:

### Design/Construction Collaboration

- Create a win/win/win environment.
- Initiate partner agreements among the contractor, designer and owner.
- Provide continuous communication, both periodic and ad hoc.
- Develop goal-oriented processes.
  - Conduct onboard reviews.
  - Address railroad issues early.
  - Define environmental constraints early.
- Provide project coordination.
  - Requires early and continuous involvement of all disciplines.

### Acceleration of Project Development (Design and Construction)

- Set a benchmark of 30 percent preliminary design for bidding, similar to CALTRANS' design sequencing.
- Establish parallel tracks for design and construction.
- Incorporate the contractor's means and methods into the design.
- Maintain owner control.
- Ensure that the designer is independently contracted with the owner.
- Provide contract incentives for the designer.
- Promote a high level of partnering.

### Accelerated Design Development

- Pre-contract on a task order basis for design consultations.
- Conduct pre-design bridge workshops for type, size & location (TS&L) development.
- Utilize an accelerated design review process with collaborative meetings.
- Minimize design details.

### Prefabrication

- Consider prefabricating the following:
  - Foundations.
  - Piers.
  - Abutments.
  - Girders.
  - Deck slabs.
  - Barriers.
  - Spans.
  - Retaining walls (MSE).
  - Sound walls.

### Innovative Construction Methods

- Consider innovative construction methods, such as:
  - Roll in.
  - The use of SPMTs at near-by staging areas.
  - Longitudinal launching.
  - The use of cranes for component erection.

### Materials

- Pre-procure the following materials:
  - Steel H piles.
  - Beams.
  - Cement.
  - Pre-cast components.
  - Drain pipes.
  - Manholes.

### High-performance Materials

- Use high-performance concrete (HPC) in all areas possible:
  - Decks.
  - Overlays.
  - Girders.
  - Piers.
- Consider carbon fiber wrap.
- Use high-performance steel (HPS).

### Economy of Scale

- Package multiple structures into a single contract.
- Utilize a phased approach to control sequencing and packaging.
- Consider standardized designs.

### Temporary Structures

- Utilize temporary structures to maintain traffic flow.
- Consider a temporary superstructure. Value will be added by reuse.
- Consider temporary substructure bents.

## 3.8. Traffic Operations/ITS

The traffic operations/ITS crew offered the following recommendations:

### Maintaining Corridor Capacity

- Designate alternate routes and make improvements as needed.
- Utilize ITS.
- Establish construction performance measures.
- Use the median for temporary lanes.
  - Utilize temporary pavement and structures.
- Utilize reversible lanes.
- Establish incident management vehicles.
- Designate a corridor traffic manager with responsibility for the following:
  - Coordinating individual contracts/traffic control plans/ construction access.
  - Establishing construction performance measures, i.e., delay times, crashes, queue lengths, speeds, congestion, travel times through corridor, etc.
  - Coordinating with key stakeholders.

### Travel Demand Management (TDM)

- Work with employers, i.e., Micron, to modify shift times.
- Consider reversible lanes.
- Promote the use of vanpools, public transit and Park & Ride.
- Designate alternate routes for large vehicles.
- Incorporate TDM incentives into the construction contract:
  - Guaranteed Ride Home. (Expand the program.)
  - Fleet vehicle (or others available) for personal trips.
  - Wireless fidelity (WiFi) on buses/vans.
  - Expansion of carpool match program.
  - Education of employers regarding travel demand programs.
  - Carpools/vanpools.

- ➢ Downtown parking for carpool/vanpool vehicles.
- ➢ Flextime.
- ➢ Expansion of public bus system and incentives.
- ➢ Express bus services.
- ➢ Special event transit options.

♦ Utilize ITS to disseminate real-time traffic information.

**Safety of Travelers and Workers**

♦ Incorporate safety performance measures and incentives into the construction contract.
♦ Develop a worksite traffic control plan for getting trucks in and out of the construction site.
♦ Protect workers from traffic.
♦ Develop an incident management/emergency response plan that includes the following:
  - ➢ The establishment of prestaged wreckers and additional incident response vehicles.
  - ➢ Construction phasing for incident plan.
  - ➢ Protocol regarding coordination: whom to contact and who is responsible in the event of an emergency.
  - ➢ Plan for access to the Interstate.
  - ➢ Agreements with law enforcement.
  - ➢ Emergency response times for those crossing/using the corridor.
  - ➢ A contingency plan in the event of a snow storm or pavement failure.
  - ➢ Designation of pull-outs and enforcement areas.
♦ Utilize additional law enforcement in the work zone.
♦ Increase safety training.
♦ Promote safety for pedestrians and bicyclists.

**Minimizing Impacts of Construction**

♦ Coordinate multiple projects simultaneously.
♦ Provide financial incentives for minimizing construction time/ impacts.
♦ Utilize alternate routes. Will require agency and project coordination.
  - ➢ Make necessary intersection and lane improvements.
  - ➢ Accelerate current projects.
  - ➢ Provide public with advance warning.
  - ➢ Establish and publicize weight limits.
  - ➢ Designate truck and wide load routes.
  - ➢ Interconnect all signals on all routes in Canyon and Ada Counties.
  - ➢ Use cameras to capture real-time traffic information.

- ➢ Notify employers about alternate routes, especially in the case of delays.
- ➢ Establish temporary routes for temporary closures.

- ♦ Communicate with the public.
- ♦ Use variable message signs (VMS) to provide real-time travel times/construction information.

**Long-term Regional Traffic Management**

- ♦ Improve local roads.
- ♦ Establish more Park & Ride lots.
- ♦ Promote vanpool and transit options.
- ♦ Utilize ramp metering/peak high occupancy vehicle (HOV) lanes.
- ♦ Utilize available ITS technology to:
  - ➢ Communicate with travelers during and after construction.
    - ■ Highway Advisory Radio (HAR).
    - ■ 511 input for Internet.
  - ➢ Collect and respond to data.
    - ■ Variable speed limits.
    - ■ VMS.
    - ■ Real-time travel times.
- ♦ Adjust signal timing on alternate routes.
- ♦ Promote incident detection and emergency responses.
- ♦ Utilize ramp metering.
- ♦ Operate the traffic management center (TMC) 24/7.
- ♦ Identify and address problems, i.e., the cumulative effects of multiple projects.

## 4.1. Next Steps

Now that the workshop is complete, ITD is evaluating the recommendations to determine which items will be implemented in developing the project.

As this report shows, local and national transportation experts came together to brainstorm innovative techniques that will accelerate delivery of a much-needed project on a major corridor. Once again, ACTT has proven to be a valuable tool in project planning and success.

## GLOSSARY OF FREQUENTLY USED TRANSPORTATION ACRONYMS

| ACRONYM | FULL NAME |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| AB | Aggregate Base |
| ACC | Acid Copper Chromate |
| ACHD | Ada County Highway District |
| ACTT | Accelerated Construction Technology Transfer |
| ADT | Average Daily Traffic |
| AEP | American Electric Power |
| AGC | Associated General Contractors of America |
| ASCE | American Society of Civil Engineers |
| ASR | Alkali-Silica Reaction |
| ATB | Asphalt-Treated Base |
| ATCs | Alternative Technical Concepts |
| ATMS | Advanced Traffic Management System |
| BANs | Bond Anticipation Notes |
| BIMRS | Bridge Incident Management and Response System |
| BMPs | Best Management Practices |
| CAD | Computer-Aided Design |
| CB | Citizen Band |
| CCTV | Closed Circuit Television |
| C-D | Collector-Distributor |
| CDC | Community Development Center |
| CE | Categorical Exclusion |
| CIP | Cast-in-Place |
| CIP | Connecting Idaho Partners |
| CM at Risk | Construction Manager at Risk |
| CMAQ | Congestion Mitigation and Air Quality |
| CMP | Congestion Mitigation Plan |
| CPI | Consumer Price Index |
| CPM | Critical Path Method |
| CRC/CRCP | Continuously Reinforced Concrete Pavement |
| CSO | Combined Sewer Overflow |
| CSS | Context Sensitive Solutions |
| CTB | Cement-Treated Base |
| D-B | Design-Build |
| D-B-B | Design-Bid-Build |
| DBE | Disadvantaged Business Enterprise |
| DEIS | Draft Environmental Impact Statement |
| DMS | Dynamic Message Sign |
| DOT | Department of Transportation |
| DRB | Dispute Review Board |
| EA | Environmental Assessment |
| EJ | Environmental Justice |

| | |
|---|---|
| EMS | Emergency Management System |
| EPS | Expanded Polystyrene |
| ESA | Endangered Species Act |
| FAA | Federal Aviation Administration |
| FCC | Federal Communications Commission |
| FEIS | Final Environmental Impact Statement |
| FFY | Federal Fiscal Year |
| FHWA | Federal Highway Administration |
| FMS | Freeway Management System |
| FONSI | Finding of No Significant Impacts |
| FRP | Fiber Reinforced Polymers |
| GARVEE | Grant Anticipation Revenue Vehicle |
| GIS | Geographic Information System |
| GISIGOSO | Get In, Stay In, Get Out, Stay Out |
| GPS | Global Positioning System |
| GRS | Geosynthetic Reinforced Soil |
| HAR | Highway Advisory Radio |
| HfL | Highways for LIFE |
| HMA | Hot Mix Asphalt |
| HOT | High Occupancy Toll |
| HOV | High Occupancy Vehicle |
| HPC | High-Performance Concrete |
| HPS | High-Performance Steel |
| IM | Incident Management |
| IT/ITS | Intelligent Transportation/Intelligent Transportation Systems |
| ITD | Idaho Transportation Department |
| JPCP | Jointed Plain Concrete Pavement |
| LOS | Level of Service |
| MIS | Major Investment Study |
| MOA | Memorandum of Agreement |
| MOT | Maintenance of Traffic |
| MOU | Memorandum of Understanding |
| MPH | Miles per Hour |
| MPO | Metropolitan Planning Organization |
| MSE | Mechanically Stabilized Earth |
| NCHRP | National Cooperative Highway Research Program |
| NEPA | National Environmental Policy Act |
| NHI | National Highway Institute |
| NPDES | National Pollutant Discharge Elimination System |
| NS | Norfolk Southern |
| PAB | Private Activity Bond |
| PCC | Portland Cement Concrete |
| PCMS | Portable Changeable Message Signs |
| PIO | Public Information Officer |

| | |
|---|---|
| PMT | Project Management Team |
| PR | Public Relations |
| PS&E | Plan Specification & Estimate |
| PSI | Pounds per Square Inch |
| QA/QC | Quality Assurance/Quality Control |
| RAP | Reclaimed Asphalt Pavements |
| RFP | Request for Proposal |
| RFQ | Request for Qualifications |
| ROD | Record of Decision |
| ROW | Right-of-Way |
| RPMs | Raised Pavement Markers/Markings |
| RSCH | Repeated Shear at Constant Height |
| RSS | Reinforced Soil Slopes |
| RTA | Regional Transit Authority |
| RWIS | Roadway Weather Information System |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users |
| SCC | Self-Consolidated Concrete |
| SEP | Special Experimental Project |
| SH | State Highway |
| SIB | State Infrastructure Bank |
| SIP | State Implementation Plan |
| SIP Forms | Stay-in-place Forms |
| SMA | Stone Matrix Asphalt |
| SPMTs | Self-Propelled Modular Transporters |
| SUE | Subsurface Utility Engineering |
| TDM | Traffic Demand Management |
| TIF | Tax Incremental Financing |
| TIFIA | Transportation Infrastructure Finance and Innovation Act |
| TIG | Technology Implementation Group |
| TMC | Traffic Management Center |
| TMP | Traffic Management Plan |
| TRAC | Transportation Review Advisory Committee |
| TRB | Transportation Research Board |
| TS&L | Type, Size & Location |
| TSA | Transportation Security Administration |
| TSM | Transportation System Management |
| TSP | Thrift Savings Plan |
| VE | Value Engineering |
| VMS | Variable Message Sign |
| VPD | Vehicles per Day |
| VPPP | Value Pricing Pilot Program |
| WiFi | Wireless Fidelity |

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## SKILLS SET RECORDING FORMS

- **Construction**
- **Pavements/Geotechnical & Materials**
- **Innovative Contracting**
- **Maintenance & Operations**
- **Public Relations**
- **Roadway Design/Utilities**
- **Structures/Railroad Coordination**
- **Traffic Operations/ITS**

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# Construction Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Acceleration of bridge construction | Accelerate bridge construction to alleviate bottlenecks during construction. Standardize bridge construction; retain existing foundations, abutments and piers, if possible; allow complete bridge closure for up to one month and implement incentive for using less closure time; remove entire span (deck, girders, diaphragms) using SPMTs and demolish bridge on ground; build new structure in median or nearby staging area; slide new structure into place with SPMTs. | Traffic may slow or be distracted by construction in median. SPMT availability may be limited. |
| Separate contracts for roadwork and structure work | Package four or more structures into one contract to accelerate construction; require staged construction of structures. | |
| I-84 structures | Make all I-84 structures overpasses and depress local streets to at-grade. To construct the overpasses, utilize the outside shoulders to shift I-84 traffic away from the median, and use the median area to construct the overpass. Build the overpass up to the adjacent transverse local street underpass; shut down the transverse street on a weekend; demolish the existing underpass; and build the last span of the I-84 overpass. | Overpasses could be expanded in the future much more easily than underpasses. This would alleviate clearance issues for over-height vehicles. This could create drainage issues on certain areas of the Interstate. |
| Pre-cast deck panels on cast-in-place bridges | Consider using pre-cast deck panels for cast-in-place bridges. Place a four-inch overlay on pre-cast deck panels. Use fiber board in between pre-cast panel and girder to accommodate the grade/slope of the bridge. | |

## Construction Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Southern Interstate loop | Build southern Interstate loop to handle local traffic volumes. | Local road network has very little capacity; area around the Interstate loop could eventually develop and create more traffic on the loop. |
| Different paving methods | Try an un-bonded concrete overlay with an asphalt leveling course to improve the existing concrete pavement in lieu of crack and seat. Mill out four to five inches of existing asphalt pavement and replace with six to eight inches of Superpave. | Texas and Oklahoma have had good luck with un-bonded concrete overlay. |
| Clearance changes | Raise (or jack) the existing underpasses to increase bridge clearance. May be easier to raise the smaller bridges than excavate the area below the bridges to get clearance. | This would not improve Interstate lane capacity. |
| New drainage configurations | Try to send water to outside the shoulder; consider using a mainline storm water system in the median. | High ground water in the area; time restrictions on construction due to the irrigation season. Local farmers use flood irrigation, and local irrigation districts do not want water run-off from the highway. |
| Staging areas | Allow staging area adjacent to Interstate. Allow contractor to "break the fence" (put a break in the access control) so that the contractor could have direct access to the Interstate. The staging area could be fenced to keep wildlife off the Interstate. | Break-in access requires prior approval from the ITD Board and FHWA. |
| Incentives/disincentives | Use incentives/disincentives, A-plus-B bidding, lane rentals, etc. Include language in the contract to alleviate issues regarding lane impacts during construction. | |

# Construction Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Milestones | Create aggressive milestones that the contractor would be required to follow. Incorporate the milestones into the contract language. | May scare off contractors. |
| Contract package | Try to get out-of-State and local contractors to bid on the project as one large package. | Nearby States also have large projects underway – large contractors could be tied up with these projects. |
| Utility issues | Address utility issues early in the process. Relocate utilities prior to construction. Include utility relocation as part of the contract work, to be cost shared between ITD and the utility company. | Using utility relocates as part of the contract will increase the number of owners the contractor will be involved with. |
| Alternative construction materials for concrete block sound walls | Consider post- and pre-cast panel sound walls, which are quicker to construct than block walls. | |
| Constructability reviews | Conduct constructability reviews prior to bidding a project. At 60 percent design, meet with contractors to review the plans; use open invitation to State-approved contractors. | Meet with contractors individually rather than with multiple contractors at once; contractors tend to open up more when approached one-on-one. |
| Environmental process | Complete environmental mitigation and acquire permits for the west end of project (Orchard to Gowen) as soon as possible. | |
| State-owned material sources | Use State-owned material sources. This may open the door for out-of-State contractors. | Lack of State-owned sources in the area; sources could be depleted. |
| ROW acquisition | Acquire ROW as early as possible. Buy out the railroad ROW. | |

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# Pavements/Geotechnical & Materials Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Common pavement issues | Note barriers or issues common to all pavement types:<br>■ Clearance issues under structures – vertical.<br>■ Lane delineation – horizontal clearance.<br>■ Need to construct structures first! | |
| Composite pavement | Utilize a concrete base with two- to three-inch asphalt top. The asphalt creates a wearing course. | Higher initial cost; many inexperienced contractors (new to area). Eliminates concrete final texture. |
| JPCP | | Conventional method; contractor familiarity. |
| CRC | | Long process; labor intensive for reinforcement installation. Higher cost; lack of experience by owner and contractors. Phasing of work is an issue. |
| Asphalt concrete pavement | Utilize asphalt over a granular or CRABS base. | Increases maintenance over the long-term; rutting may be an issue. Has shorter construction time under traffic. Familiar construction technique; provides larger contractor pool. |
| Crack and seat | Break up into three- to four-foot sections and overlay. For existing concrete pavement only. | Faces vibration concerns for adjacent landowners during construction; is a public relations concern. Performance risk due to reflective cracking. May not be a long-term solution. |

# Pavements/Geotechnical & Materials Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Rubblization of existing pavement | Break up existing concrete to three-inch minus and overlay with asphalt. For existing concrete pavement only. | Can't run traffic during construction. More expensive than crack and seat option due to increased effort to break up concrete in place. A thicker overlay is required. |
| Rigid pavement over CRABS | Develop process for recycling existing asphalt pavement (west of Meridian). | Produces excess material – use for third lane. Is a proven process in Idaho. |
| Fast track concrete | Use high-early-strength concrete for early opening of the roadway to traffic. | Look at special situations (critical path). Is more expensive. There are durability concerns (shrinkage, cracking). Testing is intensive. |
| Base material: permeable versus dense-graded | Compare asphalt-treated base (ATB), cement-treated base (CTB) and aggregate base (AB). | ATB performs well under concrete. CTB hasn't performed well. AB is a conventional material. If ITD uses a permeable material, it will require a drainage system. |
| Sub-base material | Consider a granular sub-base and rock cap. | Granular sub-base is readily available; rock cap is questionable. Contractor is familiar with placement. |
| Edge drains | Install positive pavement drainage. | Limit to low spots on this project. Maintenance is required for long-term performance. Requires discharge point. |
| Material sources | Have sources be State- or contractor-owned. Look at quality and quantity of available materials. | Determine availability of acceptable material within a reasonable haul distance. May face competition with local and private projects. |

# Pavements/Geotechnical & Materials Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Soil nail wall (Meridian structure) | Accommodate loop ramp. Underpin existing abutment. | Determine if loop is required. Consider a left-turn signal for eastbound traffic to I-84. Would be a short-term solution until the Meridian structure is replaced. Determine if this is cost effective. Explore alternative structure solutions. |
| Larger projects put out to bid | Draw in contractors with greater capacity to speed up construction – they have more equipment and personnel. | There are a limited number of contractors for large projects. Need to evaluate Associated General Contractors of America (AGC)/political considerations. |
| Retaining wall alternatives | Consider utilizing precast wall system to accelerate construction. | Requires ITD approval if not included on standard list. Ease of construction is a plus. Is readily available. |

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# Innovative Contracting Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Financing: bonds | In order to reduce interest expense, consider:<br>1. Using bond anticipation notes (BANs).<br>2. Combining variable rate with fixed rate debt. | Long-term interest rate risk. Generally will result in lower interest costs. |
| Generating additional revenue | Establish a State Infrastructure Bank (SIB) to operate as a revolving fund for the State to make loans to Cities/Counties. Consider high occupancy toll (HOT) lanes. Require developers to pay for some of these improvements through development impact fees and/or special assessments. | Provides flexibility with loans. Local option taxes could be imposed to repay SIB loans. Technology of enforcement is a challenge. Determine whether use of toll revenue would be restricted to I-84 corridor. |
| Multi year financing plan<br>**(priority 4)** | Note that other State legislatures have approved multi year GARVEE bonds to finance corridor programs. | Requires legislative approval. Multi year financing increases flexibility and expedites construction delivery. |
| Stewardship agreement | Develop a separate agreement to allow concurrent PS&E and ROW obligational authority (advance construct). | Determine if stewardship agreement with division can be revised or if Special Experimental Project (SEP) 15 is necessary. |
| Contract sizing | Consider size of contract to facilitate speed of delivery. | Larger contracts may facilitate earlier delivery. Local contractors' capabilities need to be considered. |
| Phased early work opportunities<br>**(priority 3)** | Look at phasing sound walls, utilities, grading and drainage. Consider job order contracting (pre-procurement of materials and equipment). | Address the early critical path items in accordance with cash flow. Provides opportunity for smaller contracts. Enables award before design is 100 percent complete. Provides disadvantaged business enterprise (DBE) opportunities and small business opportunities. |

# Innovative Contracting Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Incentive contracting | Consider A-plus-B bidding, multiple milestone incentives (i.e., travel time, worker and vehicular safety, incident response, etc.) and a "no excuse" bonus **(priority 2).** | Do a cost-benefit analysis. Note incentives may be difficult to administer because of acceleration of the job. Promote public relations and highway user benefits. Research other States' experiences, i.e., Florida, Texas, Indiana, etc. |
| Contractor involvement in preconstruction activities | Do constructability reviews. Hold mandatory pre-bid meetings to explain the project and speed up the production process. Conduct a VE workshop prior to advertisement. | Determine if contractor participation in constructability reviews will preclude participation in the bidding process. Obtain contractor input on production sequencing, phasing and opportunities for accelerating construction. |
| Special prequalification | Check contractor capabilities to deliver the project in an accelerated construction environment in advance of bid. Review equipment, materials, safety record, financial strength, etc. | Ensures appropriate bidders for this type of project. Need to coordinate with the AGC. |
| Going to bid prior to final design (non D-B) | Advertise initial bid package before final design and select contractor based on low bid. Contractor then provides input on completion of design. | May be prohibited by permitting restrictions. List 100 percent packages on major bid items, and put estimates for design details that are not complete. (Use contingency amounts.) Get to finalize the design with the contractor building the project. Need to include a quantity variation clause in the contract. Can handle bid adjustments using bid escrow. |
| Design standardization and compatibility | Utilize standard designs for all bridges. Would cut down the proposal, design, fabrication and erection time. | Depict snappy logos on the bridges. |

# Innovative Contracting Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Performance-based contracting | Consider performance-based contracts for construction of the sound walls, MSE walls and canal structures as well as for MOT. | Implement with measurable criteria. Give the contractor flexibility to meet given performance standards for MOT. |
| D-B and best value **(priority 1)** | Use this: it's a proven strategy for project acceleration. | Requires legislative approval. Could set up trial project before seeking blanket legislation. CIP could initiate discussions with legislature for trial project. |
| Contract administration | Have program manager handle construction oversight and coordinate corridor-wide contracts. Implement change management structure to fit the project. | Need ITD personnel to be engaged in project decision-making. Need specific timelines for decisions, design reviews, etc. |
| QC/QA, material testing requirements | Streamline testing requirements. | Requires further study by technical teams. |

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# Maintenance & Operations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| **PRECONSTRUCTION** | | |
| Corridor manager | Responsible for coordinating development of design, construction and public relation activities for the project. The coordinator's role includes involving the following entities in these activities:<br>■ Maintenance.<br>■ Utilities.<br>■ Contractors.<br>■ Canal companies.<br>■ Police.<br>■ ITD district 3.<br>■ Public transportation.<br>■ Other public agencies.<br>■ Public relations. | Ensure manager is appointed early and has a strong role in all aspects of the projects within the corridor. Maintain through project continuum. Define rules of engagement. |
| Alternate route data base | Inventory alternate route information. Update geometric and structural limitations. | Negotiate with local permitting agencies. Provide information to project development and public relations teams. Provide information to ITD permitting agency. Consider trailblazing alternate routes. |
| Construction phasing | Consider preliminary contracts to complete work at interchanges, over-crossing structures, medians and noise walls that do not affect mainline traffic. Expedite mainline construction to minimize impacts to traffic. | Requires detailed critical path method (CPM) and cost analysis. |

# Maintenance & Operations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Alternate pavement treatments | Consider alternate pavement preservation and rehabilitation strategies. | Consider short-term extension of existing roadway pavement life for flexibility in staging the entire corridor (i.e., a three-year extended life might provide time to reconstruct the interchanges and bridges to allow more rapid and higher-quality mainline construction). Requires public education. |
| **DURING CONSTRUCTION** | | |
| Enhancement of public transportation | Provide more services for the following:<br>■ Buses: additional express bus service.<br>■ Vanpools: additional vehicles.<br>■ Carpools: carpool matching system.<br>■ Park & Ride: additional parking facilities for bus, vanpool and carpool users. | Current bus, vanpool and Park & Ride systems are at capacity. No funding is available to expand these systems. Need to explore potential funding sources, including project funds (as used on the WYE project) or grant funds. Use the WYE mitigation project as a funding and implementation model. Build on existing draft traffic mitigation plan. Identify potential Park & Ride locations. |
| Incident management/response | Prepare maintenance crews for what they will encounter within the work zone. Expand current "incident response" program throughout the corridor. Consider outsourcing incident response. Rebuild the incident management team. | Provide training for maintenance staff on:<br>■ The prevention of incidents through their activities.<br>■ Their roles and responsibilities in active construction areas.<br>Define priority for response by type. Coordinate with law enforcement and emergency response personnel. Provide funding. Consider a Quick Tow towing provision. |

# Maintenance & Operations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Smart work zone | Use real-time message boards, signal prioritization on the mainline, ramp metering on alternate routes, the State's 511 system and ITD's ATMS. | Install VMS prior to roadway construction. Enhance 511 system to address freight management and subscription services (cell phone/pager/e-mail notification) prior to construction. Consider long-term maintenance and operation of devices. Extend TMC operation to 24/7 365 days a year. Provide training to Valley Ride. |
| Drainage | Coordinate drainage of pavement with construction. Look at grade changes and median construction. | Ensure designers and contractors provide pavement surface drainage during plan preparation and construction. (Focus on MOT plans.) Prevent ponding that results from grade changes, crossovers and median construction. Consider the long-term maintenance needs of selected drainage systems. |
| Traffic safety and delineation | Look at visibility of pavement markings. Utilize rumble strips and raised pavement markers. | Note that multiple phasing will cause more problems. Streamlining construction will reduce the number of lane shifts. |
| Winter maintenance | Define adverse winter weather maintenance requirements and responsibilities in the contract. | Consider traffic phasing in winter maintenance activities and in the design of MOT plans. |

# Maintenance & Operations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| **POST CONSTRUCTION** | | |
| Vegetation management | Develop a comprehensive vegetation management plan (i.e., the right grasses, "Bronco Blue Turf," etc.). | Review with roadside manager. Review current studies by other States. Examine the pending National Cooperative Highway Research Program (NCHRP) Synthesis Report. Train maintenance personnel in the proper care and management of vegetation. Conduct a detailed review of applicability of the existing roadside vegetation program to minimize mowing and long-term maintenance. |
| Asset management philosophy | Integrated system should include:<br>■ Network and corridor approach.<br>■ Short- and long-term costs.<br>■ Bridge management.<br>■ Pavement management.<br>■ Maintenance management.<br>■ Safety.<br>■ Operations. | Consider all ideas to extend the effective life of the system. Develop a preventative maintenance program. Look at a geographic information system (GIS)-based system. Conduct an asset inventory. |
| Smart Zone concepts | See Smart Zone section in "During Construction" phase. | |
| Median barrier treatments | Optimize treatment based on maintenance and operations cost and performance. | Keep all options open. Consider future maintenance needs. |
| Long-term maintenance contracts | Develop an all-inclusive contract that provides fence-to-fence maintenance. Make it activity-based. | Need to establish performance measures (timeliness and quality levels). May face inability to define quantities. |

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# Public Relations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Market research | Use market research to determine what the public needs, needs to know, and how to get the information to them. | Use university students and programs. Use surveys to determine which communication tools are most effective for staying in touch with stakeholders. Explore existing research/ publications/literature. Hire a market research company, if necessary. **Obstacles:** Public overload and competing messages. |
| Stakeholder identification | Refer to the comprehensive list of stakeholders on pages three and four of the workshop manual. Consider separating the stakeholders into specific groups: private sector, public sector, metropolitan planning organizations (MPOs), local highway districts, legislature and other elected officials, media, airport and transit groups, businesses, neighborhood organizations, contractors and ITD. | Develop mailing lists through website signup, signup-cards at public meetings and assessor's lists of property owners. Send information to Cities, other jurisdictions and legislators. (The intent is that they use ITD information to reach their constituent contacts.) Implement a State fair presence with signup for project information available. Take advantage of sporting/entertainment events to hand out information and signup cards. Use shopping mall campaigns to hand out information and signup cards. Karcher Mall is recommended. Place information displays and signup cards at rest areas. **Obstacles:** Time and cost. |
| Message development | Determine what, when, where, how and why. | Articulate the benefits of the projects, and show that the community is getting what they asked for. Inform the public of traffic impacts. Give support for transportation projects. Promote safety. Make strategic marketing a part of every message. |

# Public Relations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Branding the corridor | Define the relationships among programs, corridors and projects. Emphasize the corridor. | Possible ways to develop a brand:<br>• A naming contest through schools.<br>• A TV/radio/newspaper-hosted naming contest.<br>• Market research.<br>• Public input cards – "name the corridor."<br>• Public response to media stories.<br>Recommend Treasure Valley Corridor as the corridor name.<br>**Obstacle:** Branding thought of as a "frill." |
| Corridor spokesperson | | Designate one ITD representative to speak with the media. The community liaison might be an alternate. |
| Community liaison | Use this person as the liaison between all the project stakeholders. He or she would answer high-level questions and represent the project at community events. | Explore partnerships for funding. Make this a full-time position. Have his or her office at the community information center. |
| Community information center | | Partner with local agencies for funding. Determine a location that meets the corridor needs. Have the office staffed by the community liaison and an administrative assistant. |

# Public Relations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Corridor awareness events | Use these events as a groundbreaking/ribbon-cutting event or a rollout event. Include an educational piece about funding.<br><br>Event ideas include:<br>• A transportation fair with bus rides along the corridor. Invite speakers, have a formal presentation and produce a video.<br>• Tie a celebrity to the corridor.<br>• Announce the "face" of the project.<br>• Announce the community liaison.<br>• Promote traffic reports and new ITS cameras.<br>• Designate a TV personality host.<br>• Do a radio remote from the project site. | **Obstacles:** Some projects are ready for construction. Have CIP handle the corridor rollout, or hire a PR firm. |
| Communication | Promote internal and external communication. | Communicate internally with employees. Collaborate with the media on traffic mitigation. Publicize specific projects well in advance to allow the public to adapt their travel patterns. Collaborate with emergency service providers on incident management and response plans. Work with communication partners such as EMS, the airport, transit providers, MPOs, etc. |

# Public Relations Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Funding | Seek FHWA funding for public relations (with safety funds). Prepare a hierarchy chart as follows:<br>■ CIP marketing plan.<br>❖ I-84 corridor.<br>➢ Individual construction projects. | Set public relations budget at one percent (minimum!) of the project budget. Explore funding sources: FHWA, American Market Organization, Ada County Highway District (ACHD) Commuterride, AGC, chambers, schools and universities, MPOs, major employers, third party endorsers and the airport. Look at cost sharing through employer pay stubs, the Idahy newsletter, St. Lukes/St. Als. newsletters and utility billings. |

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# Roadway Design/Utilities Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Get In Stay In Get Out Stay Out (GISIGOSO) | Note that the philosophical approach of doing a complete build-out initially rather than revisiting project areas is more in tune with ACTT goals. From a cash flow analysis stand point, the project can be shown to be less expensive for a 3-year construction cycle than a 10- to 12-year period. Note: The NEPA process and ROW schedule need to be in sync with construction phasing. | • Determine the ultimate build-out and the optimum construction phasing for the ultimate build-out.<br>• Perform a construction-schedule-based cash flow analysis. Implementing this may require reprioritizing the allocation of funding.<br>• Consider GARVEE funding: it's consistent with GISIGOSO.<br>• Shorten the duration of traveler impacts.<br>• Avoid adverse public perception of continual construction within a given segment.<br>• May need to address political requirements to spread funds throughout the State.<br>• Note: There is the potential for the ACTT workshop and findings to be used as a demonstration that funding allocation changes on this corridor could result in quicker and more complete construction at a better value overall. |
| Garrity to Meridian project overpasses | Construct the Black Cat and Robinson Road overpasses before or during the construction of the third lane project. | • Design overpasses for two lanes now but expandable up to four lanes in the future.<br>• Obtain NEPA clearance.<br>• Need to re-allocate funding.<br>• May eliminate the need for a design exception at these two locations.<br>• Enhances traveler safety.<br>• Will provide for more efficient/earlier construction and reduce costs. |

# Roadway Design/Utilities Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Crack and seat pavement project: Gowen Road to Isaac's Canyon | Prepare a life-cycle cost comparison of the full build-out pavement section versus the currently planned "crack and seat with overlay" project; this may show that it would be more cost effective to construct the full build-out pavement initially. | • May need to re-allocate funding to construct the full pavement section initially. |
| Utilities | Implement SUE now, and avoid or remove utility conflicts before construction begins where physically possible. Include fiber-optic cable relocation at the sound wall and other conflict sites. | • Provide utility surveys early.<br>• Get utility companies on board early.<br>• Use SUE information for possible roadway design changes, and identify other ways to avoid utility conflicts.<br>• Hire a full-time utility coordinator to deal with utilities issues in the corridor.<br>• Purchase materials early that have long lead times for delivery. |
| Irrigation district facilities | Seek early involvement with the irrigation districts to concur on necessary facility modifications and assure adequate construction work windows. | • Address water quality, cost, schedule, easement, permit and other issues as early as possible since district canal rights can take precedence over ITD highway needs. |
| Standardization and pre-purchasing of materials | Seek early approval and acquisition of standardized materials and supplies that can be made available to the contractor. Examples include pre-cast bridge and wall units, work zone traffic barriers, lighting poles and fixtures, traffic control devices, bridge rails, drainage facilities, etc. | • Need justification and prior FHWA approval.<br>• Reduces schedule impacts for long lead-time materials.<br>• Is potentially more cost effective.<br>• Provides maintenance efficiencies. |

# Roadway Design/Utilities Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Advance construction of sound walls – Cole to Broadway | Advance construction of the Cole to Broadway sound walls to the fall of 2007 so they are in place prior to construction on the mainline (scheduled for the summer of 2008). Note: Funding is scheduled to be available in July 2007. | • Resolve wall location and limits.<br>• Resolve conflict with fiber-optics; accommodate the cable in a conduit compatible with the permanent sound wall location and construction.<br>• Obtain early NEPA clearance.<br>• Resolve and complete any ROW or easement needs.<br>• Use 1) innovative contracting to involve the contractor early in the design completion, and 2) incentives for early completion and a reduction in impacts to the traveling public and adjacent property owners.<br>• Use a standardized design concept.<br>• Consider pre-purchasing certain materials, i.e., piling, wall panels. |

# Roadway Design/Utilities Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Work zone access | Clearly define the approved access in the PS&E documents. Allow for VE options. Consider A-plus-B-plus-C bidding, where C might be the value of the access. | • Clearly define the access agreement in the bidding process so that all of the contractors bid on the exact same project requirements. A level bidding field needs to be maintained, but flexibility needs to be allowed. Perhaps the contractor could be allowed access at certain defined points plus a potential "break" in the fence providing access every three (+/-) miles.<br>• Identify possible State-owned parcels adjacent to the freeway for contractor staging and access.<br>• Identify possible "acquisition" parcels adjacent to the freeway. |
| Interchange footprint reviews | Note the interchange footprints and layouts, as currently being used for the NEPA studies, are very preliminary.<br>Coordinate with study teams to assure that concept designs are accounting for, and consistent with, ROW, utility, traffic operations, design standards and construction phasing issues.<br>Plan for an efficient transition to preliminary and final designs. | • Review conceptual interchange layouts.<br>• Review traffic operations analysis and lane numbers/arrangements.<br>• Review interchange geometry for optimal footprint and ROW requirements.<br>• Consider optimized bridge width based on traffic operations. |

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# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Enhanced design/construction collaboration | Create a win/win/win situation so that all parties (owner, designer and contractor) are motivated to cooperate and put forth extra effort when needed. Develop a partnering agreement between the parties to define the rules and responsibilities for cooperation. Foster continuous communication through regular and frequent (periodic) meetings among the participants. Enable the participants to easily meet on an unscheduled basis to ensure that issues can be discussed and decisions rendered as they arise without delaying the work (ad hoc process). Utilize and maximize goal-oriented processes. This involves the use of "onboard reviews," meaning that the review process will be performed as a group effort as much as possible, enabling all parties to work collaboratively on the review. The objective is to more quickly develop an understanding of the issues as they impact the various participants and thus be able to quickly come to acceptable decisions. Railroad issues must be discussed and addressed very early in the developmental process to avoid potential delays or rework in the design. Environmental constraints must be defined early to allow the design to properly address environmental issues. Effective project coordination requires the early and continuous involvement of all relevant disciplines. The project manager must ensure that issues and decisions are documented in a timely fashion. All parties must have commitments for the maximum time allowed to deliver their portion of the work, and the project manager must ensure that these commitments are met. | **Benefits:** Provides participant flexibility. Improves quality of relationships between partners. Limits claims and reduces risk.<br><br>**Barriers:** Potential of higher cost. Requires changing of mind set. While railroad approvals are critical for portions of the work, the railroad does not necessarily feel the same level of urgency since their functioning is not going to be improved by this project.<br><br>**Challenges:** Requires a well developed chain of documentation. Need to develop means of owner protection and risk allocation among partners.<br><br>**Coordination:** Must include railroads early in the design process. Design and environmental sections must work together and develop a strong understanding of how they impact one another. Need decision makers involved early in the process. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Acceleration of project development (design and construction) | Advertise project for bidding at a preliminary stage (approximately 30 percent) of design development – Caltrans' design sequencing is an example of this approach. Have final design and construction proceed concurrently. Complete final design for a portion of the work, i.e., the foundations, as soon as possible to enable construction to begin. Remaining design activities must proceed at a fast pace to avoid being overtaken by the construction work. Designer must be very responsive in evaluating the contractor's proposals or addressing the contractor's concerns. The contractor's means and methods must be incorporated into the design through close coordination among the owner, designer and contractor. Have the designer contracted independently with the owner so that the owner maintains control of the design process. (This is different from D-B, where the contractor controls the design process.) Because the method of contracting places high demand on the designer, the contract may need to incorporate monetary incentives for the designer to insure the desired responsiveness. This method of contracting requires a high level of partnering among the owner, designer and contractor. | **Benefits:** Accelerates both design and construction. Elicits construction feedback earlier in the design process. Encourages innovation in design and construction.<br><br>**Barriers:** Need to allocate risk among all parties. There is limited adaptation of this approach in the U.S. Need to determine owner's capability to respond to the contractor's proposals or requests as quickly as needed. (This is a manpower issue.) Project must be bid with a PS&E package that is not fully developed. Risk exists for all parties, but it is the owner who assumes the most risk – the designer has no incentive to assume any risk. Inter-related design or construction problems may be overlooked at a partial stage of design; the owner may have to redo or modify construction work after construction has begun because unforeseen problems require that design changes be made. Structures that are less complex, (i.e., routine) greatly reduce the potential for problems.<br><br>**Challenges:** Need to develop pay item quantities as much as possible at the preliminary design (bidding) stage. Establish provisions for quantity and bid price adjustments in case quantity revisions occur as plans become finalized. Must develop proper incentive programs for both the designer and the contractor. Must have a designer who is very responsive to the contractor's requests for change as the design is developed; needs to be adaptable to the fast pace of evaluation and decision making. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Accelerated design development | Consider pre-contracting on a task order basis for design consultation. Since the design work is a controlling activity on the project critical path, the process for procuring design services must be very efficient so that valuable time is not lost in obtaining these services. Schedule pre-design bridge workshops for TS&L development. The conceptual design is illustrative of Pareto's Law, which states that 20 percent of the effort will yield 80 percent of the benefits. It is important to have a strong effort with multiple sources of input at the concept stage to guarantee that the concept employed will be an effective and appropriate choice. Utilize an accelerated design review process with collaborative meetings. Minimize the design detail required of the designer, i.e., do not require the designer to produce reinforcing bar list sheets since the contractor must do this as part of the normal contract requirements. | **Benefits:** Accelerates design process. Ensures that the conceptual design is the most appropriate choice through collaborative effort. Reduces the design effort required by eliminating redundant activities.<br>**Challenges:** Requires buy-in by all parties. FHWA must see the driving benefit (cost versus convenience). Requires adapting to changes in normal practice, i.e., minimizing or eliminating elements of the contract plan detailing. Must adapt to a faster design pace. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Prefabrication of structural components | Recommend prefabrication of virtually all bridge components, including the following:<br>■ Foundations.<br>■ Piers.<br>■ Abutments.<br>■ Girders.<br>■ Deck slabs.<br>■ Barriers.<br>■ Complete superstructure spans.<br>Components for other structures such as retaining walls and sound barriers can also be prefabricated. | **Benefits:** Allows for faster construction. Provides potential to improve worker safety. Minimizes impact on road users, reducing road user costs. Reduces owner's time for contract administration, which reduces owner's personnel costs. Provides higher quality of components due to fabrication in a controlled environment.<br>**Barriers:** Must overcome perception of higher cost of prefabrication. Need to weigh user benefits against higher construction costs. Must address concern over durability of connections between prefabricated components and related concern over long-term maintenance costs. Note lack of contractor familiarity with prefabricated construction – must address contractor preference for conventional construction methods due to equipment investment and desire to maintain personnel staffing commitments, skill sets and familiar procedures. May also encounter designer's lack of familiarity with some types of prefabricated component detailing. Requires greater degree of preliminary planning, engineering and coordination. Market availability for components may not be sufficient. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Innovative construction methods | **Roll in:** Construct new bridge adjacent to its final position while maintaining traffic on the existing structure. Slide new structure laterally into position after the existing bridge is removed. Requires construction of temporary substructures.<br><br>**SPMTs:** Use SPMTs to quickly remove or install entire bridge spans – they have virtually no limit to the load they can carry because their modular design allows flexibility in configuring them for a particular load. (Even multiple span continuous bridge superstructures have been moved into position by SPMTs.) Requires an area of adequate size near the travel way to allow the contractor to construct the new bridge span on temporary supports and then transport it with the SPMTs to the bridge site.<br><br>**Longitudinal launching:** Prefabricate the new structure at one end of the bridge site and push into position longitudinally. Eliminates the need for falsework.<br><br>**Cranes:** Use cranes in combination with other equipment such as beam launching trusses to minimize disruption to traffic. Note: cranes are the most commonly used equipment for prefabricated component erection. | **Benefits:** Requires minimal road closure. Improves worker safety; using SPMTs allows the span demolition and construction crews to perform their work in the relative safety of the staging area away from traffic. This allows the work to be done much closer to the ground, minimizing the consequences if a worker should lose balance and fall. Improves quality of construction when work is performed away from traffic. Improves speed of construction.<br><br>**Barriers:** Increases cost due to procurement of specialized subcontractor services. State lacks experience in developing the appropriate contractual provisions and procedural requirements. There are a limited number of specialized subcontractors with the requisite equipment and experience, which could mean a limited availability to perform the work or a lack of competition to restrain price for the work.<br><br>**Challenges:** Need good geometric control to insure that the new superstructure fits properly with the substructure when it is moved into position. Must coordinate traffic control. Need to assess applicability of site and bridge type to determine which options are viable. Locate a feasible staging area during the planning stage to ensure that the area will be available to the contractor. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Procurement of materials | Pre-procure beams, steel H-piles, cement, pre-cast components, drain pipes and manholes. | **Benefits:** Guarantees availability of necessary materials so that work can proceed as planned. Guards against material price increases during construction. Guarantees that the item or material procured is exactly what the designer anticipated using.<br><br>**Barriers:** May necessitate owners assuming ownership of material if is procured before the contract is awarded. There is little or no space to store material. Owner does not have staff to accept, inspect and maintain material in good condition and therefore is unable to bear the cost of storing inventory. Material damaged during storage becomes a loss for the owner. Price of materials could drop after procurement of contract. Material incompatibility with contractor's means, methods or experience may create a situation where the contractor resists using it or says that it created problems, leading to a contract claim.<br><br>Contractor may be able to buy material at a better price than the owner can. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Performance of materials | Use HPC for decks, overlays, girders and piers. Consider fiber reinforced polymers, i.e., carbon fiber wrap. Utilize HPS. Consider pile type. | **Benefits:** Provides greater durability and thus promote greater longevity of service. An example is the use of low permeability concrete in bridge decks. It resists penetration by road salts to a much greater degree than traditional concrete and thereby prevents corrosion of reinforcing steel and the subsequent deterioration of the deck concrete. Higher strength materials enable longer spans, leading to fewer substructures. Higher strength materials also enable shallower spans to meet roadway vertical clearance requirements. Lightweight concrete facilitates construction methods by reducing the weight of prefabricated components that must be moved into position. Lightweight material reduces the structure weight, reducing the size of foundations and substructures needed.<br><br>**Barriers:** Need to familiarize parties with materials: the owner, designer and contractor do not properly understand the material characteristics. Owner lacks material specifications and experience with the material (or had a bad experience in previous applications). State has a lack of suppliers with experience in producing these materials. Contractors lack experience in the proper handling and installation of these materials. The State faces the possibility of very high material costs due to the unfamiliarity of the supplier and/or contractor with these materials. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Economy of scale | Package multiple structures into a single contract. Utilize a phased approach to control the project sequencing and packaging. Use standardized components and repetitive designs; this offers benefits to both the designer and the contractor. | **Benefits:** Tends to lead to a lower per-unit bid price for the work. Plus, the cost of any specialized equipment can be distributed over a larger number of structures. Larger contracts attract contractors with greater equipment and manpower capacity. These contractors may have greater experience in employing innovative/time-saving construction methods. Smaller contractors may still be able to perform a portion of the work by functioning as a subcontractor to the larger prime. Standardized components and repetitive structure design reduce design and construction costs; have a shorter learning curve; and can lead to faster, better-quality construction. The contractor's familiarity with standardized components and repetitive structures may reduce the level of design detail required of the designer and also reduce the amount of construction oversight and engineering required. This leads to fewer contract modifications and a greater ability to stay on schedule and avoid claims. This simplifies the coordination needed between contracts.<br><br>**Barriers:** May encounter resistance from the contracting community, i.e., the AGC; they may not be supportive of contracts that are too large for local association members to handle. Must have consistent phasing throughout the corridor. Need to check availability of funding to support a large contract, particularly when it is performed at a fast pace.<br><br>**Challenges:** Need to ensure proper phasing of the work so that multiple structures can be package under one contract. Need to assure that the funding is in place to support a large contract. Must complete all the necessary environmental studies and obtain approvals to allow the work to proceed. |

# Structures/Railroad Coordination Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Temporary structures | Use temporary structures to maintain traffic flow with as little interference as possible. Demolition of existing structures and construction of new ones can be accomplished in a way that minimizes the need for multiple phases of work. The temporary structure would consist of a reusable superstructure (examples of commercially available structures are the Acrow or Mabey bridges) that is placed on temporary substructures. The substructures may or may not be reusable. Temporary foundations must be constructed. Need to consider contractor access and temporary substructure bents. | **Benefits:** Can be used in multiple locations. Can become the property of the State for use in a future emergency, i.e., a bridge washout, where quick response by the ITD is needed. This offers a value-added component to the use of a temporary structure. Minimizes or eliminates the need to perform staging of bridge work. May simplify traffic control. Offers a safer environment for workers than multiple phasing of construction across the width of the bridge. Improves contractor access to the work site.<br><br>**Barriers:** May necessitate more modification of the bridge approach. Costs more. Need to allow additional time for the construction of the temporary substructures. Need to look at available ROW for temporary bridge and approaches.<br><br>**Coordination:** Must coordinate traffic control to enable the installation and removal of the temporary structures. |

## SKILL SET ROSTER:

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# Traffic Operations/ITS Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Intersections and choke points | Consider two lanes of traffic in each direction and LOS at E or F. Investigate necessary vertical profile changes; current clearances do not meet today's standards. (Note that roadways will have to be dipped for vertical clearance.) Determine whether the current shoulders are full depth or whether they will need to be improved to put traffic on. Consider temporary pavement. Widen alternate routes, and improve intersections with the cooperation of local entities. Note: The ACHD operates signals on the State system and manages all ROW not controlled by ITD. Need two lanes open to through traffic during peak hours. | Add a third and later a fourth lane. Set up temporary lanes with design exceptions such as four foot shoulders in the median. Determine how long ITD can wait with the current bridges. Consider a reversible lane to address eastbound morning traffic and westbound afternoon traffic. Improve local roads such as Gowen and Franklin to help with traffic during construction. Develop staging plans and consider having only one lane open to traffic from Gowen to Isaac's Canyon. Consider directing larger vehicles onto alternate routes. |
| Managing traffic | Determine major destinations and evaluate alternate commuter options. Promote public transportation. Install traffic cameras or micro traffic loops for instant management of traffic, VMS and 511. Utilize ITS systems. Look at crossovers and how they can be used. Analyze potential bridge and interchange closures and how long it will take to open new bridges. Plan ahead for other projects along the route. Designate an incident management vehicle. Consider reversible lanes for rush-hour traffic. | Look at detour options. Note that Park & Rides are currently maxed out. Work to mitigate congestion. Work out flex hours with private businesses, i.e., Micron, to lighten traffic by busing or varying shifts to off peak hours. Research existing traffic models to review possible traffic and emergency plans. Look at potential problems with radar detection or usage of VMS. Build structures next to existing before removing existing. Need to coordinate construction with County and/or City entities. Need to identify areas impacted the most by Interstate construction. |

# Traffic Operations/ITS Skill Set

| Idea Name | Detailed Description | Implementation Details (barriers, skills set coordination, etc.) |
|---|---|---|
| Corridor management teams | Determine which contracts within the overall project will affect each other. Combine traffic control contracts. Consider performance based contracts. Research what other States have used. Determine priorities. | Designate one team to coordinate a group of contracts instead of administering each contract separately. Provide performance based bonuses for accident counts or flow rates. Utilize lane rentals with prices to determine the cost effectiveness of lane restrictions. Maintain flexibility with regards to traffic control plans. (Who will monitor this?) Try to keep the route open at all times or during peak traffic hours. Address problems with the contractor and traffic control corridor team and determine who takes responsibility for claims. |
| Traffic safety for bicycle and pedestrian traffic | Consider bike lanes on the Interstate. Ensure ADA compliance. | May need to truck bikes and/or pedestrians across the work zone. |
| Traffic control for major events | Plan work zone closures in advance. Check on events for the duration of the project. | |
| Smart work zones | Design ITS around the desired objectives. Utilize variable speed limits depending on the time of day. Utilize FHWA's Quick Zone program. | Link travel times to incentives/disincentives. Use a money pool. Identify objectives and set priorities for the setup of the work zone. Use digital speed limit signs to vary speeds as needed. |

**Innovative Financing.** The team's primary goals are to align potential financing options with project goals; match anticipated cash flow with project management; and provide options for managing competing priorities for existing resources.

**ROW/Utilities/Railroad Coordination.** The ROW group's primary role is to ensure that ROW, utilities and railroad work comply with state laws and procedures. They must also consider the numbers and types of businesses and residences impacted by a project and evaluate the ready availability of additional right-of-way.

**Geotechnical/Materials/Accelerated Testing.** The geotechnical team explores subsurface conditions to determine their impact on the project; pursues options for expediting materials acceptance and contractor payment; and evaluates the use of innovative materials in accordance with project performance goals and objectives.

**Traffic Engineering/Safety/ITS.** The traffic engineering team strives to enhance safety; improve traffic management; and explore technologies, including ITS systems, that will communicate real-time construction information to the public.

**Structures (Bridges, Retaining Walls, Culverts, Miscellaneous).** The structures skill set focuses on accelerating the construction of structures. Their task is to identify the most accommodating types of structures and materials that will meet design requirements and minimize adverse project impacts.

**Innovative Contracting.** The innovative contracting group explores state-of-the-art contracting practices and strives to match them with the specific needs of the project.

**Roadway/Geometric Design.** The roadway team evaluates proposed geometrics and identifies the most accommodating product with the minimum number of adverse impacts.

**Long Life Pavements/Maintenance.** The maintenance skill set identifies pavement performance goals and objectives and explores future maintenance issues for the project corridor, including winter service, traffic operations and preventative maintenance.

**Construction (Techniques, Automation and Constructability).** The construction crew explores techniques that will encourage the contractor to deliver a quality product within a specific timeframe while maintaining traffic.

**Environment.** The environment team ensures that the scope of work and construction activities reflect local environmental concerns. Their goal is to provide the most accommodating and cost effective product while minimizing natural and socio-economic impacts.

**Public Relations.** The public relations skill set discusses ways to partner with local entities and effectively inform both local communities and the traveling public about the project before, during and after construction. Their role is to put a positive spin on the project.

# Background of ACTT

ACTT is a process that brings together public- and private-sector experts from across the country in a setting that encourages flexibility and innovation. The goal is to recommend technologies that will accelerate construction time while reducing user delay and community disruption. This necessitates a thorough examination of all facets of a highway corridor with the objective of improving safety and cost effectiveness while minimizing adverse impacts to the traveling public.

The ACTT concept was originated by the Transportation Research Board (TRB) in conjunction with FHWA and the Technology Implementation Group (TIG) of the American Association of State Highway and Transportation Officials (AASHTO). Following the completion of two pilot workshops, one in Indiana and one in Pennsylvania, the originating task force, A5T60, passed the concept off to FHWA and TIG to continue the effort. They have done so by coordinating a series of ACTT workshops around the country, with several more pending in 2007.

More information on the ACTT program is available online at http://www.fhwa.dot.gov/construction/accelerated/index.htm.



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