



Federal Highway Administration

# Every Day Counts

Innovation Initiative



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## Message from the Administrator

Every Day Counts (EDC) is designed to identify and deploy innovation aimed at shortening project delivery, enhancing the safety of our roadways, and improving environmental sustainability.

These goals are worth pursuing for their own sake. But I also think it's imperative we pursue better, faster and smarter ways of doing business because of the many challenges we face – as an industry and a society.

The list of challenges is really unprecedented. Because of our economy, we need to work more efficiently. The public wants greater accountability in how we spend their money. We need to find ways to make our roads safer. And we have an obligation to help preserve our planet for future generations.

But it's not enough to simply address those demands. We need to do it with a new sense of urgency. It's that quality – urgency – that I've tried to capture in the name Every Day Counts. This initiative is designed to focus on the deployment of a finite set of initiatives. Performance measures will be developed, and EDC Implementation Teams will work with our State, local, and industry partners to deploy.

The EDC round one initiatives described in the following pages represent what I hope will lead to a sea change about how we are deploying innovation. Invention, ingenuity and imagination round out the framing of the EDC logo above – but they along with innovation are not new words in the transportation community's lexicon. The Nation's transportation agencies and industry have long been associated with innovation. The difference I want us to make together is the commitment to focus on rapid deployment of proven solutions that can make a difference. Our customers, the taxpayers, deserve no less.

Secretary LaHood has set a high bar for USDOT. He not only expects all of us to think innovatively, he understands the times demand it. This is FHWA's effort to provide national leadership in the quest to meet the demands of the 21<sup>st</sup> Century.

Victor Mendez  
Administrator

## EDC Initiatives

We received many thoughtful, creative and interesting ideas from people inside and outside FHWA. Narrowing the list was a difficult process. Ultimately, we've decided to focus on this initial series of technologies and innovations as we look to meet the transportation needs of the American people.

### Accelerating Technology and Innovation Deployment

21<sup>st</sup> century solutions must be leveraged to improve safety, reduce congestion, and keep America moving and competitive in the world market.

### Shortening Project Delivery Toolkit

This toolkit is being developed to guide and support State and local agencies in the use of underutilized flexibilities in the law and in the development of processes and agreements that minimize duplication of effort and reduces delays in project implementation.

### Accelerated Project Delivery Methods

Building projects more quickly depends on the highway community advancing innovative practices to a level of routine use by highway agencies and contractors. EDC focuses FHWA's efforts to make innovative contracting everyday standard business practice.

## Accelerating Technology and Innovation Deployment

### Warm Mix Asphalt

Warm-Mix Asphalt (WMA) is the generic term for a variety of technologies that allow the producers of hot-mix asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road.



Temperature reductions of 30 to 75 degrees Fahrenheit have been documented. In most cases, the lower temperatures result in significant cost savings and reduced greenhouse gas emissions because 30 to 35 percent less fuel is required.

By 2009, WMA projects had been constructed in more than 40 States, and at least 14 State highway agencies had adopted specifications to accommodate WMA.

### Prefabricated Bridge Elements and Systems

With Prefabricated Bridge Elements and Systems (PBES), many time-consuming construction tasks no longer need to be accomplished sequentially in the work zone. Instead, PBES are constructed concurrently, off-site, and brought to the project location ready to erect. Because PBES are usually fabricated under controlled climate conditions, weather has a smaller impact on the quality, safety, and duration of the project. Through the use of standardized bridge elements, PBES offers cost savings in both small and large projects. The use of rapid onsite installation for PBES can reduce the environmental impact of projects in environmentally sensitive areas.



### Adaptive Signal Control Technology

Adaptive signal control systems coordinate control of traffic signals across a signal network by adjusting the lengths of signal phases based on prevailing traffic conditions to improve travel time reliability, reduce congestion, and provide smoother flow. Adaptive Control Software Lite (ACS-Lite) is an example of specific technology that provides adaptive control for small groups of traffic signals. Conventional signal systems use pre-programmed, daily signal timing schedules. ACS-Lite measures traffic flow and adjusts the signal timing, within intersection control equipment, based on those measurements. The main benefits of using adaptive control over conventional signal systems are to:

- Continuously distribute green time equitably for all traffic movements.

- Improve travel time reliability by progressively moving vehicles through green lights.
- Reduce congestion by creating smoother flow.
- Prolong the effectiveness of traffic signal timing.

ACS-Lite was specifically designed to be deployed using conventional control equipment, communications, and traffic sensors on arterial streets, making it a cost-effective alternative to existing adaptive technologies.

### Safety Edge

The Safety Edge is an uncomplicated but extremely effective solution to reduce pavement edge-related crashes and to help save lives. By simply shaping the edge of the pavement to 30-35 degrees, the Safety Edge helps eliminate the problem of vertical drop-off. Research has shown this is the optimal angle to allow drivers to re-enter the roadway safely.



The asphalt Safety Edge provides a strong, durable transition even for vehicles that are particularly vulnerable, such as smaller, lighter cars. Even at higher speeds, vehicles can return to the paved road smoothly and easily. In the next 19 months, FHWA's goal is to accelerate the implementation of the Safety Edge technology, working with States to develop specifications and adopt this pavement edge treatment as a standard practice on all new and resurfacing pavement projects.

### Geosynthetic Reinforced Soil

Instead of a conventional bridge supported on a pile cap abutment, Geosynthetic Reinforced Soil (GRS) integrated bridge system technology uses alternating layers of compacted fill and sheets of geotextile reinforcement to provide support for the bridge. GRS is also used to construct approach ways and transitions onto the roadway. This bridge system alleviates the "bump at the bridge" problem caused by differential settlement between the bridge abutment and approaching roadway. The technology offers unique advantages in the construction of small bridges, including:

- Reduced construction time.
- 25 percent to 30 percent less cost than standard pile capped abutments with 2:1 slopes.
- Less dependence on weather conditions during construction.
- Flexible design—easily field modified for unforeseen site conditions.
- Easy to maintain because of fewer parts.
- Can be built with common equipment and materials.

## Shortening Project Delivery Toolkit

It is a commonly held perception that it takes an average of 13 years to deliver a major highway project from planning through completion. This perception is based partly on the experiences of State DOTs and FHWA, and partly on data collected on projects that require the preparation of an Environmental Impact Statement. FHWA believes that several opportunities exist in the current project delivery process where innovative approaches will improve project delivery times.

### Planning and Environmental Linkages

Planning and Environment Linkages represent an approach to transportation decision-making that considers environmental, community, and economic goals early in the planning stage and carries them through project development, design, and construction. This can lead to a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays in project implementation. This initiative will increase incorporation of planning documents and decisions into the environmental review process.

### Legal Sufficiency Enhancements

Decisions made early in planning and project development are often the root causes of problems identified when NEPA and Section 4(f) documents are reviewed for legal sufficiency later in the environmental review process. Consultation with FHWA environmental attorneys at early decision points can help decision-makers avoid problems later, saving time and costs. This initiative will also identify the most common problems in document development, their root causes, and measures preparers can take to avoid the problems.

### Expanding Use of Programmatic Agreements

The continued and expanded use of programmatic agreements (PAs) has been very effective in producing time savings as coordination and procedures have been standardized and agreed upon. When prior agreements exist for avoiding, minimizing, and mitigating impacts, projects are reviewed quicker and trust is developed resulting in improved relationships between DOTs and regulatory agencies. The goal of this initiative will be to identify and assist in the expansion of new and existing programmatic agreements to a regional or national level.

### Use of In-Lieu Fee and Mitigation Banking

The 404 permitting process currently constitutes a major component of the project development / project delivery process. Significant time savings can be achieved by expanding the use of "in-lieu" fees and mitigation banking currently allowed under existing statute, FHWA regulations, State law and court decisions. This initiative will expand the use of in-lieu fees and mitigation banking to create a more streamlined process to expedited project delivery.

### Clarifying the Scope of Preliminary Design

This initiative will identify the amount of design work allowable under current law prior to NEPA completion regardless of contracting mechanism and develop guidance to provide consistency in applying this definition.

### Flexibilities in Right of Way

The Right of Way (ROW) process currently constitutes a major component in the project development process. Significant time savings can be achieved by employing flexibilities already provided for in statute and FHWA regulations. The initiative will underline opportunities for improved coordination of ROW activities with other key project development actions in preliminary design; land acquisition for utilities accommodation and relocation project activities; NEPA mitigation land needs; and a number of other areas where streamlined approaches may prove beneficial. The proposed initiative deals only with flexibilities allowed under existing regulations and statutes. Legislative changes required for additional flexibilities will need to be addressed separately.

### Flexibilities in Utility Accommodation and Relocation

The often-conflicting priorities of State transportation agencies and utility companies can adversely affect the timely completion of transportation projects. Potential utility conflicts exist on most transportation projects. It is estimated that half of all highway and bridge projects eligible for Federal funding involve the relocation of utility facilities; and construction generally takes longer and costs more when utilities need to be relocated. The initiative will spotlight existing flexibilities currently in place under Federal law and regulations, and describe techniques that foster effective utility coordination during project development which warrant more widespread use.

### Enhanced Technical Assistance on Delayed EISs

This initiative will provide additional FHWA technical assistance to identify major challenges on ongoing Environmental Impact Statement projects and implement solutions to resolve project delays where feasible. Candidate projects would ideally be those where 60 months have elapsed since issuance of the Notice of Intent (NOI) without issuance of a Record of Decision (ROD). FHWA teams will focus on facilitating interagency coordination and collaboration to resolve outstanding issues and provide peer-to-peer activities, workshops, training, or specialized on-site assistance.



## Accelerated Project Delivery Methods

### Construction Manager/General Contractor

Construction Manager/General Contractor (CM/GC) is an alternative project delivery method in which the owner places the responsibility for design review, design modifications, system integration, and construction with a single contractor. Typically, a CM/GC contract stipulates that the construction manager (CM) is responsible for costs over the guaranteed maximum price. It may consist of two separate contracts: pre-construction services and construction. In a typical CM/GC scenario, the owners of a project hire either a general contractor or design firm to serve as the CM. CM/GC allows State DOTs to remain active in the design process while assigning risks to the parties most able to mitigate them. CM/GC occupies the middle ground between design-bid-build and design-build.

Additional benefits include:

- Potential for lower project costs, primarily due to risk identification and allocation during early project development.
- Enhanced cost certainty at an earlier point in design than either design-build or design-bid-build, because of real time costing information inherent to method.

- Value engineering savings accrue to owner in CM/GC arrangement. Change orders, indicator of design quality, are also low.
- Enhanced ability to accelerate the project's delivery schedule due to activities that can occur concurrently.
- Increased partnership and team building fosters an environment where innovation can be nurtured, rewarded, and flourish.
- Owner has control over design details as a member of the design team.

### Design Build

Design-build (DB) is an alternate method of project delivery in which the design and construction phases of a project are combined into one contract, allowing for certain aspects of design and construction to run concurrently. This can provide significant time savings compared with the more traditional design-bid-build approach where the design and construction services must be undertaken in sequence. With DB project delivery, the design-builder assumes responsibility for the majority of the design work and all construction activities, together with the risks associated with providing these services. This provides the DB with an increased flexibility to be innovative. Along with the increased flexibility, the design-builder also assumes greater responsibility and risk. The owners of the project usually retain responsibility for financing, operating and maintaining the project. Because both design and construction are performed under the same contract, claims for design errors or delays are significantly decreased and the potential for other types of claims are greatly reduced. From a State highway agency perspective, the potential time savings is a significant benefit.

The successful execution of a DB contract provides several benefits, including:

- Time savings through:
  - Early contractor involvement.
  - Elimination of a separate construction contractor bid phase.
- Cost savings from:
  - Reduced construction engineering and inspection costs to the contracting agency when these quality control activities and risks are transferred to the design-builder.
  - Fewer change and extra work orders.
- Improved quality through:
  - Greater focus on quality control and quality assurance through continuous involvement by design team throughout project development.
  - Project innovations uniquely fashioned by project needs and contractor capabilities.

