

# AASHTO Innovation Initiative

[Proposed] Nomination of Innovation Ready for Implementation

## Sponsor

Nominations must be submitted by an AASHTO member DOT willing to help promote the innovation. If selected, the sponsoring DOT will be asked to promote the innovation to other states by participating on a Lead States Team supported by the AASHTO Innovation Initiative.

1. Sponsoring DOT (State): Florida DOT
2. Name and Title: Edith Wong, P.E., District Safety Study Engineer

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## Innovation Description (10 points)

The term “innovation” may include processes, products, techniques, procedures, and practices.

### 3. Name of the innovation:

Design Build Push Button Contract

### 4. Please describe the innovation.

The Design-Build Push Button (DBPB) contract, developed by a team of Florida Department of Transportation (FDOT) employees in the District office in the Tampa Bay Region, is an

innovative program designed to accelerate the process of constructing traffic safety improvements. The DBPB contractual approach addresses the inherent inefficiencies of the typical contractual process for traffic safety improvement projects by combining the efficiencies of design-build contracts (in which designer is working in close coordination with the construction team) with the time savings of push-button contracts (in which pre-selected push-button contractor is able to quickly get to work since all of the contractual paperwork is already in place). In the design-build scenario, the designer and the construction contractor are working together on the same team, so there are no misunderstandings about the what and the how of the project. The project also gets built faster, as construction activities can begin while some parts of the plan are still being finalized. In the push-button scenario, significant time savings are realized from having pre-approved contractors on stand-by who can quickly be mobilized to do certain types of work.

In the DBPB approach, the design-build contract team has already been selected. Once a needed safety improvement concept has been identified (typically using our Crash Data Management System – a 2007 National Roadway Safety Award winner), a task work order is issued and the design team can quickly begin design in close coordination with the DOT and the contractor. The designs are accelerated through the phase review process, and once approved, immediately released to the contractor. The time frame associated with this can be just a few weeks or a few months. This results in very quick implementation, and helps us move toward zero deaths. The DBPB program is a partnership of the Florida DOT and the Federal Highway Administration – Florida Division. The program utilizes a combination of state and federal funding in order to implement safety improvements quickly to help reduce crashes, injuries, and fatalities.

To further expedite project delivery, a number of other innovative technologies were used: The DBPB contractor developed a SharePoint website for the project to facilitate quick transfer of files for the design plan phase reviews. When coupled with the Florida DOT's Electronic Review Comment system (where plan reviewers enter their comments on submitted design plans and each comment is tracked from start to finish), the DBPB project was able to expedite submittals, reviews, comments, and responses in a way that is easy to track and focused on improving productivity and accountability.

##### **5. What is the existing baseline practice that the innovation intends to replace/improve?**

Small traffic safety improvement projects that are too large to be handled by in-house DOT maintenance forces must be handled by the five year work program. The traditional design/bid/build process that is typical of transportation projects often takes several years to go from “concept to concrete.” Typically, the DOT goes through a selection process to select a design consultant. After going through the selection process and getting the contract negotiated

and signed, the consultant can then begin design. The consultant then designs the project, with periodic phase reviews by the DOT. After design is completed, the DOT then goes through a bidding process to solicit bids for the construction of the project. After selecting the successful bidder and negotiating and signing a contract, construction can finally begin. The length of time to go through this process can be several years.

**6. What problems associated with the baseline practice does the innovation propose to solve?**

The major challenge of the traditional contract approach is the length of time required from the initial developmental stages of the project to the final implementation of the project, along with the associated paperwork. The Design-Build Push Button (DBPB) contract combines the inherent efficiencies of the Design Build process with the time savings of the Push Button contracting process, the DBPB streamlines delivery of safety projects from beginning to end within 12 months. In the past 10 years of the DBPB program, the time required to go from concept to concrete has often been less than 25% of the time it would have taken to implement the same improvement through standard contractual methods. The use of the DBPB approach helps to reduce crashes and save lives, and thus helps bring us closer to zero deaths.

**7. Briefly describe the history of its development.**















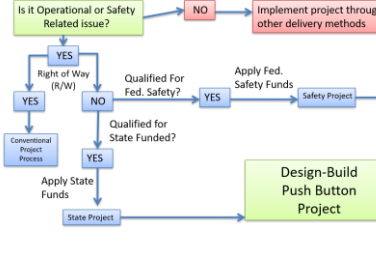

Reducing traffic crashes (Vision Zero) is becoming a major focus in the US Congress issued Transportation Bill from the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) to the latest 2015 Fixing America's Surface Transportation Act (FAST). State DOTs have challenges to use engineering treatments and allocated federal safety funds to address severe crash location promptly due to the traditional project delivery rules. Starting from year 2007, a small team of FDOT employees worked with FHWA FL Division & FHWA Headquarters in Washington D.C. to find ways to address this safety challenge. A ten-member team of participants from FDOT and FHWA worked together for almost 20 months to develop the Design Build Push Button contract such that it met FHWA & FDOT requirements (rules and laws). The first version of the DBPB contract was prepared in 2009. By coordinating in advance with the FHWA throughout the development of the DBPB contract, a true multi-agency partnership exists to provide the necessary funding for safety improvement projects. In the first year of the 4<sup>th</sup> DBPB contract (2017-2018), it is estimated that over 55 crashes were avoided by reducing safety improvement implementation time from three years to 310 days. Using FDOT's estimate of the societal costs of crashes involving injury to be an average of \$152,866 per crash, the total estimated societal benefit realized in the first year of the DBPB contract is \$8,407,630.

**8. What resources—such as technical specifications, training materials, and user guides—have you developed to assist with the deployment effort?** If appropriate, please attach or provide weblinks to reports, videos, photographs, diagrams, or other images illustrating the appearance or functionality of the innovation (if electronic, please provide a separate file). Please list your attachments or weblinks here.

Below is a link to the Design Build Push Button contract with pictures, videos, presentations, contract projects, information on the contract advertisement process, sample contract documentations (with financial data), and contract evaluation with crash reduction benefit.

<http://www.tampabaytrafficsafety.com/DBPB/layouts/15/start.aspx#/SitePages/Home.aspx>

Attach photographs, diagrams, or other images here. If images are of larger resolution size, please provide as separate files.

<p><b>Task #32 – US 41 at Leonard Road</b> Median Modification</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 	<p><b>Task #26 – SR 685</b> Installation of Midblock Pedestrian Crossings</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 	<p><b>Task #12 – SR 50/SR 41/SR 674/SR 583/SR 566/SR 553</b> Installation/Removal/Relocation of Sign Assemblies/Structures</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 
<p><b>Task #4 – Intersection of SR 597/North Dale Mabry Highway at Mapledale Drive</b> Signal Rebuild</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 	<p><b>Task #2 – I-275 NB Off-Ramp and SR On-Ramp at 31<sup>st</sup> St South, Pinellas County</b> Sid Resistance Improvements</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 	<p><b>Task #17/ 18 – SR 45/US 41 from Symmes Road to North of Lala St</b> Replace Existing Street Lighting</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 
<p><b>Task #5 – US 19/SR 55 at SR 586/Curlew Road</b> Extension of Northbound Dual Left Turn Lanes</p> <p><b>BEFORE</b></p>  <p><b>AFTER</b></p> 	 <pre> graph TD     Q1[Is it Operational or Safety Related issue?] -- NO --&gt; A1[Implement project through other delivery methods]     Q1 -- YES --&gt; Q2[Right of Way R/W]     Q2 -- YES --&gt; A2[Conventional Project Process]     Q2 -- NO --&gt; Q3[Qualified for Fed. Safety?]     Q3 -- YES --&gt; A3[Apply Fed. Safety Funds]     Q3 -- NO --&gt; Q4[Qualified for State Funded?]     Q4 -- YES --&gt; A4[Apply State Funds]     Q4 -- NO --&gt; A5[Design-Build Push Button Project]     A2 --&gt; A5     A3 --&gt; A5     A4 --&gt; A5     </pre>	

## State of Development (40 points)

Innovations must be successfully deployed in at least one State DOT. The All selection process will favor innovations that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.

**9. How ready is this innovation for implementation in an operational environment? Please select from the following options. Please describe.**

- Prototype is fully functional and yet to be piloted
- Prototype has been piloted successfully in an operational environment
- Technology has been deployed multiple times in an operational environment

Technology is ready for full-scale implementation

The Florida DOT has been expanding the use of DBPB throughout the state as a routine contract delivery method, and Florida’s FHWA Division Office has promoted it to other Divisions as well.

10. What additional development is necessary to enable implementation of the innovation for routine use?

There is no additional development necessary in State of Florida. For other State DOTs, they would just need to work with their respective FHWA Division offices and review their state law requirements to adopt this FDOT Design Build Push Button (DBPB) contract approach to make their roads safer.

11. Are other organizations using, currently developing, or have they shown interest in this innovation or of similar technology??  Yes  No

If so, please list organization names and contacts. Please identify the source of this information.

Organization	Name	Phone	Email
Virginia Department of Transportation	Don Robbins	(804) 371 2536	<a href="mailto:Don.robbsins@dot.state.fl.us">Don.robbsins@dot.state.fl.us</a>
Federal Highway Administration Office of Safety	Melonie Barrington	(202) 366-8029	<a href="mailto:Melonie.Barrington@dot.gov">Melonie.Barrington@dot.gov</a>
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## Potential Payoff (30 points)

Payoff is defined as the combination of broad applicability and significant benefit or advantage over baseline practice .

12. How does the innovation meet customer or stakeholder needs in your State DOT or other organizations that have used it?

The DBPB is a first-of-its-kind contractual arrangement designed specifically to accelerate construction of safety improvements in order to save lives and move toward zero deaths. It allows for the DOT to improve responsiveness to safety issues brought up by citizens, elected

officials, and partnering agencies. The DBPB contract type has currently in its fourth iteration, and the program has been highly successful in delivering projects quickly and efficiently. The following table displays the safety performance of a few sample DBPB projects, along with the contract time saved, crashes reduced, and the corresponding crash costs. These projects yielded up to 500% return on investment.

**TABLE 8-1: PROJECTED CRASH REDUCTION BENEFIT FOR DBPB CONTRACT, CASE STUDIES**  
*\* Tasks listed are the only tasks with crash data available after construction from January 2017-November 2018*

Project Types	Locations	Final Acceptance Date	Projected Crash Reduction per Year	Traditional Const. Time (Days)	DB PB Const. Time (Days)	Time Savings (Days)	Potential Crash Reduction DBPB	Cost Per Crash	Potential Crash Reduction	Correctable Crashes Before Construction (Per Year)	Actual Correctable Crashes After Construction (Per Year)	Reduction Factor	Percent of Initial Projected Crash Reduction Achieved
<b>Skid Resistance Improvements (Task #2)</b>													
Skid Resistance Improvements	I-275 Northbound Off-Ramp at 31st St South; I-275 Southbound On-Ramp	4/7/2016	2.7675	1095	240	855	6.48	\$124,618	\$807,870.33	6.75	0.50	92.59%	225.84%
<b>Signal Rebuild (Task #4)</b>													
Signal Rebuild	I-75 /SR 93A at Exit 260 & 261; I-4/SR 400 at Exit 3, 7, 10, & 19	7/8/2016	3.87	1095	310	785	8.32	\$225,315	\$1,873,715.42	13.33	0.50	96.25%	331.90%
<b>Extension of Northbound Dual Left Turn Lanes (Task #5)</b>													
Extension of Northbound Dual Left Turn Lanes	US 19/SR 55 at SR 586/Curlew Road	4/5/2016	2.4	1095	240	855	5.62	\$123,598	\$694,857.80	12	0.00	100.00%	500.00%
<b>Offset Left Turn Lane (Task #6)</b>													
Offset Left Turn Lane	SR 600/Hillsborough Avenue at Lincoln Avenue	6/13/2016	2.4	1095	240	855	5.62	\$123,598	\$694,857.80	3.5	2.50	28.57%	41.67%
<b>Signal Rebuild (Task #7)</b>													
Signal Rebuild	SR 574/East Martin Luther King Jr Blvd at US 301	7/25/2016	4.50	1095	310	785	9.67	\$225,315	\$2,178,194.18	15.5	0.50	96.77%	333.70%
<b>Signal Rebuild (Task #8)</b>													
Signal Rebuild	US 41/SR 45/ South Tamiami Trail at CR 672/Big Bend Road	9/24/2016	3.84	1095	310	785	8.26	\$225,315	\$1,862,004.70	13.25	8.00	39.62%	136.63%
<b>Signal Installation (Task #16)</b>													
Signal Installation	SR 688/Ulmerton Road at Wilcox Road/130th Avenue North	11/18/2016	1.41	1095	310	785	3.03	\$225,315	\$683,260.02	4.5	1.50	66.67%	212.77%

13. Identify the top three benefit types your DOT has realized from using this innovation. Describe the type and scale of benefits of using this innovation over baseline practice. Provide additional information, if available, using quantitative metrics, to describe the benefits.

Benefit Types	Please describe:
Improved Safety	The FDOT DBPB contract can implement safety engineering actions faster within 12 months instead of the traditional process that requires 4+ years. The sooner the safety improvements are implemented, the sooner traffic crashes can be reduced annually.
Shorter Schedule	The FDOT DBPB contract can reduce the implementation time of the safety project by up to 75% (4 years to 1 year). In addition, multiple projects can be developed and delivered simultaneously and

	with overlapping schedules. Associated paperwork and procedures are also reduced compared to the traditional delivery method.
Improved Customer Service	The FDOT DBPB contract process allows the state agency to respond more quickly to the safety needs of citizens and requests from elected officials, providing safety projects that reduce traffic crashes.

Provide any additional description, if necessary:

The Design-Build Push-Button contract has been used to extend turn lanes, install or improve traffic signals, implement median revisions, install signing improvements, install or improve pedestrian accommodations (including rapid rectangular flashing beacons and pedestrian hybrid beacons), install barrier wall extensions, retrofit street lighting fixtures, and many other type of safety improvement projects. The total project cost of each task is limited to \$1 million, however, multiple tasks can be utilized to implement a higher cost project.

**14 How broadly might this innovation be deployed for other applications. in the transportation industry (including other disciplines of a DOT, other transportation modes, and private industry)?**

This FDOT DBPB contract has already being discussed with FHWA Division offices and FHWA Headquarters. Several state DOTs have also expressed interest in implementing a similar contract approach in order to be able to use Federal safety funds promptly for safety project implementation. This concept can also be used for other types of federal funding to reduce the long project delivery time.



## Market Readiness (20 points)

The All selection process will favor innovations that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.

**15. What specific actions would another organization need to take along each of the following dimensions to adopt this innovation?**

Check boxes that apply	Dimensions	Please describe:
<input checked="" type="checkbox"/>	Gaining executive leadership support	Leadership in State DOTs & FHWA Division office will need to endorse this innovation concept.
<input checked="" type="checkbox"/>	Communicating benefits	FDOT has excellent presentation material for the benefits of FDOT DBPB contract to facilitate communication
<input type="checkbox"/>	Overcoming funding constraints	<a href="#">Click or tap here to enter text.</a>
<input checked="" type="checkbox"/>	Acquiring in-house capabilities	FDOT DBPB contract links all FDOT offices together to address traffic safety quickly
<input type="checkbox"/>	Addressing legal issues (if applicable) (e.g., liability and intellectual property)	<a href="#">Click or tap here to enter text.</a>
<input checked="" type="checkbox"/>	Resolving conflicts with existing national/state regulations and standards	FHWA safety funds cannot be issued in the “push button” (issue multiple tasks to the same contract team). However, the DBPB contract addressed the FHWA safety fund usage legally to deliver safety projects promptly.
<input checked="" type="checkbox"/>	Other challenges	State law & FHWA rule requirements will need to be studied carefully.

**16. Please provide details of cost, effort, and length of time expended to deploy the innovation in your organization.**

**Cost:** The overall DBPB contract has a length of 3 years, with a total amount up to \$24M, which FDOT can issue safety project tasks from a minimum amount of \$100K to a maximum of \$1M.

**Level of Effort:** FDOT has developed 'Design Build Push Button' contract guideline and website to aid with deployment.

**Time:** Contract preparation time is up to 8 months for creating initial projects, funding allocation, proposal development, advertisement and contract selection and execution.

**17. To what extent might implementation of this innovation require the involvement of third parties, including vendors, contractors, and consultants? If so, please describe. List the type of expertise required for implementation.**

For contract documentation preparation, coordination is needed among in-house staff & consultants in the Operation, Safety, Design, Construction & Contract Support offices. The level of expertise would be standard for those specific offices. Weekly coordination meetings are recommended to provide updates on development of engineering or other contract documentation. The construction contractor community is highly involved in the contract pursuit process. Once the contract is procured, weekly coordination is recommended between the department staff (project manager for the design portion and the construction project administrator) and the design-build firm to keep track of active tasks. The level of expertise is also standard for those positions. [Click or tap here to enter text.](#)