AASHTO Technology Implementation Group Nomination of Technology Ready for Implementation 2013 NOMINATIONS DUE BY FRIDAY, SEPTEMBER 14, 2013

	Nominations <u>must</u> be submitted by an AASHTO member DOT willing to help promote the technology.	1. Sponsoring State DOT: Maryland State Highway Administration				
Sponsor		2. Name: Sandy Hertz				
		Title: Deputy Director, Office of Environmental Design				
		Mailing Address: 707 North Calvert Street, MS C-303				
		City: Baltimore	State: MD	Zip Code: 21209		
		E-mail:	Phone: 410-545-8609	Fax: 410-209-5004		
		shertz@sha.state.md.us				
		3. Date Submitted: 09/14/2012				
		4. Is the Sponsoring State DOT willing to promote this technology to other states by participating				
		on a Lead States Team supported by the AASHTO Technology Implementation Group?				
		Please check one: X Yes No				
nology Description (10 points)	The term "technology" may include processes, products, techniques, procedures, and practices.	5. Name the technology: watershed Resources Registry (WRR)				
		6. Please describe the technology: The WRR is a national pilot to integrate land-use planning, regulatory, and non-regulatory decision making using the watershed approach. A GIS-based pilot registry was developed out of the Green Highways Partnership through a project proposed by the Maryland State Highway Administration (MDSHA) for Route 301 in Prince George's and Charles Counties, Maryland. WRR Technical Advisory Team members sought to develop a framework for integrated watershed management that could be transferred nationally. The project team initially targeted southwest Maryland as a pilot region. Today, GIS-based WRR opportunity outputs have been compiled for the entire State of Maryland and are available through a web-based user interface. Using available data from various organizations the WRR reveals a comprehensive picture of watershed health and identifies opportunities for aquatic and terrestrial creation, restoration, enhancement and preservation.				
Tecł		appearance or functionality of the tec Please check one: Yes,	hnology. (If electronic, ple images are attached.	ar images inustrating the ase provide a separate file.)] No images are attached.		

		8. Please describe the l	nistory of the technology'	s development.			
	Technologies must be successfully	Spring 2007 - Through Green Highway Partnership initiatives, EPA Region 3, U.S. Army Corps of Engineers and the Maryland State Highway Administration formulated the first Watershed Resources Registry for a pilot study.					
		Summer-Fall 2007 – Research performed on EPA Region III data					
		Winter-Spring 2007-2008 – Initial executive summary and proposal developed					
		Summer 2008 – Watershed Resources Registry proposal agreed upon					
		Spring 2009 – Work plans developed, Technical Advisory Committee (TAC) formed					
		Summer 2009 – Initial data layers determined for each suitability analysis					
		Fall 2009 – GIS models developed using model builder for each suitability analysis					
		Winter 2009 – GIS models reviewed					
		Spring 2010 – GIS models outputs finished for the pilot area					
		Summer 2010 – Preliminary field testing of the outputs completed by an interagency group					
ints)	deployed in at least one State	Fall 2010 – Statewide data layers collected					
0 poi	DOT. The TIG selection	Winter 2010 – GIS models reworked to run statewide					
ent (3	process will favor technologies that have advanced beyond the research stage, at least to the pilot deployment	Spring 2011 – Web application developed statewide					
opme		Summer 2011 – Desktop testing performed for the statewide model outputs					
Jevel		Fall 2011 – GIS models reviewed (QA/QC)					
of		Winter 2011 – GIS models corrected based on QA/QC report and desktop testing					
State		Spring 2012 - MDSHA began using the WRR for project development					
	stage, and	Summer 2012 - Beta version of Outreach Website developed in support of WRR					
	preferably into	9. For how long and in a	pproximately how many	applications has	your State DOT used this		
	routine use.	technology? The Maryla	nd State Highway Admin	istration (MDSH	A) has used the WRR since		
		Spring 2012. The WRR application has been valuable for gathering environmental inventory					
	information, assessing watershed needs, and identifying potential mitigation sites. It can also						
		regulatory permitting pro	cesses. The web applic	ation also compl	iments initial field reconnasiance		
		by providing the ability to	export data about a loca	ation onto a print	map including latitude / longitude		
		coordinates which can be keyed into a GPS for navigation purposes.					
		10. What additional development is necessary to enable routine deployment of the technology?					
		Maryland to gather feedback on the application. During this time coordination between the WRR					
		Technical Advisory Committee (TAC) members will occur to review and address agency feedback.					
		Web hosting and technical support geared to the web application and separate outreach website					
		will be ongoing. Cyclical	updates to WRR models	in order to mair	ntain an accurate depiction of		
		potential restoration and	preservation areas within	n the State will a	also be ongoing.		
		II. Have other organiza	nions used this technolog	ly ? Please check			
		Organization	Name	Phone	E-mail		
		Maryland Department	Kelly Neff	410-537-	kneff@mde.state.md.us		
		of the Environment	Christing Cours	4018			
		of Natural Resources	Constine Conn	410-260- 8785	CConn@anr.state.md.us		

	Environmental Protection Agency	Ralph Spagnolo	215-814- 2718	Spagnolo.Ralph@epa.gov	
	Army Corps of Engineers	Ellen Bryson	410-962- 6084	Ellen.A.Bryson@usace.army.mil	
Payoff is defined as the combination of broad applicability and significant benefit or advantage over other currently available technologies.	Engineers 6084 12. How does the technology meet customer or stakeholder needs in your State DOT or other organizations that have used it? The WRR helps to: • Streamline information collection and preparation for permit processes • Prioritize watershed needs • Utilize limited resources to achieve multiple goals In addition the WRR aids in: • NEPA and State environmental review, Integrated transportation, energy and land use planning • Agency collaboration and program integration between: CWA 319, 401,402,404, 303(d) • Watershed planning, permit review, mitgation assessments • Total Maximum Daily Loads and Watershed Implementation Plan applications • Stormwater management • Resource conservation/ environmental resource planning including: - GreenPrint and Rural Legacy priorities - ESA Section 7 (Threatened and Endangered Species) - Transportation and land use planning - NEPA review 13. What type and scale of benefits has your DOT realized from using this technology? Include cost savings, safety improvements, transportation of regulatory and non-regulatory programs and less review/site assessment/coordination time - Improves environmental outcomes - Supports integrated decision making among multiple users - Uses a common watershed-based platform - Provides access to updated, consistent, and defensible				
selection process will favor technologies that can be adopted with a reasonable amount of effort and cost, commensurate	organization would need to establish a Technical Advisory Committee (TAC), determine suitability analyses relevent to their jurisdiction, collect needed data (non-Federal), and develop the models specific to their state with the final model outputs represented on a ranked scale of 1-5 and -1 (not suitable). Upon it's completion, model outputs would then be uploaded to the WRR web application. Authorization from key agencies would be necessary to use, redistribute, and publish model outputs along with supplemental base mapping (for the web application) to fully implement the technology.				
	Payoff is defined as the combination of broad applicability and significant benefit or advantage over other currently available technologies. The TIG selection process will favor technologies that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff	Environmental Protection Agency Army Corps of Engineers12. How does the technol organizations that have • Streamline informati • Prioritize watershed • Utilize limited resour In addition the WRR ai • NEPA and State en planning • Agency collaboratic • Watershed planning • Agency collaboratic • Watershed planning • Total Maximum Dai • Stormwater manag • Resource conserva • GreenPrint and Rur • Stormwater manag • Resource conserva • GreenPrint and Rur • NEPA reviewPayoff is defined as the combination of broad applicability and significant benefit or advantage over other currently available technologies.13. What type and scale cost savings, safety imp benefits, or any other ac • Reduces costs througt and less review/site ass • Improves environment • Supports integrated de • Uses a common water • Provides access to upor • Results in enhanced p • Achieves multiple envi • Is a model approach for credits, offsets) on a wa • Is transparent, predicta • Provides transferability 14. Please describe the type (including other bra factors. How broadly mig The intent is to roll the V entities. As a result, the manner that allows for the a variety of watershed-IThe TIG favor technologies that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff	Protection Agency Army Corps of Engineers Ellen Bryson 12. How does the technology meet customer or sorganizations that have used it? The WRR helps • • Streamline information collection and prepare • • Prioritize watershed needs • • Utilize limited resources to achieve multiple ginning • • NEPA and State environmental review, Integritic • • NEPA and State environmental review, mitigatic • • Watershed planning, permit review, mitigatic • • Total Maximum Daily Loads and Watershed • • Stormwater management • • Resource conservation / environmental reso • • GreenPrint and Rural Legacy priorities • • ESA Section 7 (Threatened and Endangere • • Transportation and lause planning • • NEPA review 13. What type and scale of benefits has your DO cost savings, safety improvements, transportation improves environmental outcomes • advantage • Supports integrated decision making among mitoredits, on any other advantages over other exits • Currently available • Provides access to updated, consistent, and de • Results in enhanced protection and targeted re • Achieves multiple environmental ob	Protection Agency 2113-614- 2718 Army Corps of Engineers Ellen Bryson 410-962- 6084 12. How does the technology meet customer or stakeholder need organizations that have used it? The WRR helps to: • • Streamline information collection and preparation for permit p • Priortize watershed needs • Utilize limited resources to achieve multiple goals In addition the WRR aids in: • NEPA and State environmental review, Integrated transporta planning • Agency collaboration and program integration between: CW/ • Watershed planning, permit review, mitigation assessments • Total Maximum Daily Loads and Watershed Implementation • Stormwater management • Resource conservation/ environmental resource planning incostavings, safety improvements, transportation efficiency or efficient administration of regulato applicability and significs, or any other advantages over other existing technologie • Pavereiw • Supports integrated decision making among multiple users • Supports integrated decision making among multiple users • Supports integrated decision making anong multiple users • Supports integrated decision making anong multiple users • Suports integr	

potential.	16. What is the estimated cost, effort, and length of time required to deploy the technology in another organization? The estimated cost would depend on the number of suitability analyses desired, in addition to the types of GIS datasets that would be available for a given geography. Given the technology has already been implemented successfully, there would be a cost savings realized when following the Maryland example. Assumed costs for up to 6 models and a framework would be between \$250,000 and \$500,000. This would not account for any hardware
	(e.g. personal computers) or software (ESRI - ArcGIS software) procurement that may be necessary to implement within another organization/State. Factoring development and testing of the models along with updating the WRR web application to account for other States, the time required to deploy the technology would be 1-2 years. Timeframe would be dependent upon the number of stakeholders involved in the development process and availability of needed data. MDSHA anticipates that the WRR will likely save us over \$100,000 and up to a year in agency coordination time per each large project mitigation site search effort.
	 17. What resources—such as technical specifications, training materials, and user guides—are already available to assist deployment? Technical Documentation pertaining to technology stack used to run the Web Application. WRR User Guide WRR outreach website - Currently beta (http://watershedresourcesregistry.com/outreach/home.html) WRR Web Application (http://watershedresourcesregistry.com/Default.aspx) WRR Training Materials - How to use the WRR web application, How to conduct analysis using WRR data in ArcGIS.
	18. What organizations currently supply and provide technical support for the technology? Environmental Protection Agency (EPA) Region 3; US Army Corps of Engineers (ACE); MD State Highway Administration (MDSHA); US Fish and Wildlife Service (FWS); Federal Highway Administration (FHWA); Maryland Department of the Environment (MDE); Maryland Department of Natural Resources (MDNR); Maryland Environmental Service (MES); and Interstate Commission on the Potomac River Basin (ICPRB)
	19. Please describe any legal, environmental, social, intellectual property, or other barriers that might affect ease of implementation. There are no legal restrictions on using the source code associated with the web application, the intellectual property of the code belongs to the State. Models were developed by ACE based on criteria devloped by the TAC. Ease of full implementation will require a commitment from TAC stakeholders to continue supporting the initiative over time. A key concept to the WRR is assuring the models themselves are updated on a cyclical basis which is a primary responsibility of the TAC. This assures stakeholders always have an accurate representation of potential restoration and preservation areas based on the best available data. This coupled with ongoing web hosting and regular maintenance needs to be acknowledged and embraced.
Submit Completed form to	http://transportation1.org/tig_solicitation/Submit.aspx

Opening page of the WRR application





Using the Find Opportunities tool to locate potential projects for upland preservation



Adding resource data layers to customize your view

Revealing opportunity details



Opening page of WRR outreach website

