AASHTO Technology Implementation Group
Nomination of Technology Ready for Implementation

Sponsoring DOT	1. Sponsoring DOT (State): New Hampshire		
Primary Technical Contact	2. Name: Amy Weinberger		
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Technology Description	3. Name of Technology: Risk Assessment Survey for Contamination and Appraisal of Land (RASCAL) and Inventory of Managed Properties (IMP)		
	4. Briefly describe the technology. The New Hampshire Department of Transportation (NHDOT) has implemented a system of integrated handheld computers and web-based data management to support a contaminated property valuation policy for prospective and currently owned properties. NHDOT project development policy necessitates that 1) all properties potentially affected by construction projects be screened for hazardous materials (hazmat) issues, and 2) this screening be performed as early as possible in project planning/design to maximize the time available for assessment of contamination and to allow for the incorporation of this data into purchasing decisions, route selection, construction planning, and health & safety plan preparation. NHDOT operations policy requires that all NH DOT maintenance facility properties be screened and all environmental concerns recorded. The technology developed by the Department to implement these policies is identical and consists of personal digital assistants (PDAs) running custom site-screening checklist software. The web-based program also stores digital photographs and GPS coordinates collected from hardware that integrates directly with the PDA. Prior to mobilizing to the field, site screeners download pertinent information to the PDA about the properties to be evaluated, from a web-based database. This information is linked with the NHDOT right-of-way database. Upon completing the screening, data is uploaded from the PDA to the web database and is managed and analyzed through user-friendly graphic interfaces and reporting functions.		
	5. Briefly describe the history of its development. The development began with a comprehensive User Needs Assessment, with extensive discussions and process mapping performed with the Bureau of Environment and NHDOT's IT Services. A consultant to the NHDOT that performs environmental assessments and also maintains a software development group spearheaded the development. The Bureau of Environment and IT Services each designated project managers to work with the design team to ensure that quality and user needs were addressed throughout the development. The development of the RASCAL application software took approximately one year. The development of IMP was done in several weeks, as the database was an exact duplicate of the technology used for RASCAL. The aggressive timeline was largely due to the number of personnel involved, and the continuous testing throughout development. Since their debut, both databases have been met with enthusiasm, understanding and affirmation of the need for the tool. The implementation of both databases has helped identify some important issues related to required training and user operations revisions.		

State of Development

6. For how long and in approximately how many applications has your organization used this technology?

The RASCAL program has been in use for roughly 2 years on about thirty different projects throughout the state. IMP has been in use for just over a year and is beginning to incorporate a UST management program in addition to being used in the documentation of hazardous waste inventories, remediation and in addressing issues for each of the DOT maintenance facilities throughout the state.

7. What additional development is necessary to enable routine deployment of the technology?

RASCAL does not currently require any additional development aside from routine maintenance and the addition and removal of projects as they cycle through various stages of development. Two parallel databases are being developed to house historical information and archive surplus property information once a project has been completed. While these databases are under development, documents relating to these and other non-hazardous materials issues are being stored in the RASCAL database. Documents uploaded to the system may include aerial photographs, Sanborn and topographic maps, site maps, wetlands permits, and other written documents. A Global Positioning System (GPS) that is built into the PDA locates each parcel and may easily be linked to the NHDOT Global Information System (GIS). In addition, RASCAL provides a direct link to the New Hampshire Department of Environmental Services (NHDES) website. Upon completion, authorized users will be able to access multiple aspects of a specific project on a single database quickly, easily, and efficiently.

Similarly, IMP is fully functional, but an Underground Storage Tank (UST) module is under development to manage USTs owned by the Department. In the future, site inventory information for the Department's maintenance facilities will also be included in the IMP database, as it relates to the National Pollutant Discharge Elimination System (NPDES) requirements.

8. Have other organizations used this technology? If so, please list organization names and contacts.

Organization	Name	Phone	E-mail
Jacques Whitford	Brian DesMarais	(603)431-4899	bdesmara@jacqueswhitford.com
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Potential for Payoff	9. What benefits has your organization realized from using this technology? Include cost savings, safety improvements, transportation efficiency or effectiveness, environmental benefits, or other advantages over other existing technologies. The policy to screen all properties potentially impacted by a project or currently owned by the state has increased the volume of hazmat data being collected and managed. It has also placed more emphasis on early detection than previous approaches to identification and assessment. A robust site screening protocol was developed to collect preliminary field observations of hazmat sources and receptors. This has reduced the time spent on site and has standardized data collection and reporting performed by consultants. Another benefit of collecting this volume of hazmat data has been a reduced cost on construction projects related to hazmat issues. The early detection of hazmat issues allows the NHDOT to appraise properties at a value reduced proportionally to the issues noted on site. This up-front cost savings is then applied against the costs associated with remediation of these properties. Early detection also ensures that all hazmat issues are addressed prior to actual construction of a project, reducing costly time delays. To support the protocol, the field data collection application was developed for use on PDAs. The PDA software standardizes site-screening data, improves data completeness and quality, and reduces time delays from fieldwork to data reporting. Since digital photographs and GPS data are captured using integrated hardware, and are stored directly to the database upon collection, there is no sorting, labeling, and management of this information following field work. Both web-based databases are protected by password security, allowing consultants and NHDOT employees to access the database from outside the NHDOT firewall. The database is dynamically linked to the Bureau of Right-of-Way, ensuring that property information is kept accurate and redundancy of data is eliminated. NHDOT also has the ability to control dataflow between its servers and the external web-site to maintain security of the systems. Functionality built into the graphic user interface on the web calculates “risk scores” for each property and prioritizes all of the sites within a corridor, flagging key hazmat issues. The developed technology provides the NHDOT with better and faster data from the initial phases of a project; the ability to “triage” sites based on their calculated risk rankings and flags; and the capability to manage contaminated sites from identification through remediation within the web application. IMP also has the added advantage of allowing DOT to easily communicate with the state’s Department of Environmental Services (DES). By allowing DES to view this data at their leisure, minor incidents do not need to be reported directly to DES, as long as the occurrence is posted on the database. This helps eliminate several sets of paperwork, which would normally need to be prepared for both NHDOT and NHDES.

Implementation Potential	10. Please describe what actions another transportation agency would need to take to adopt this technology. Both applications should be implemented simultaneously with a User Needs Assessment for the user groups. It is relatively easy to customize the applications and both will be most successful if they satisfy the needs of the user, which may vary from state to state. The ease of the technology implementation depends on the scale of the application, the number of users and the user-specific features developed. The availability of developers with enough knowledge of site assessment and programming to translate between users and programmers may be limited. The application is designed to be user friendly, and as a result, there is relatively little training required. The web applications are intuitive, and the PDAs require a minor amount of practice to operate with speed. PDAs are available for about half the cost of a laptop computer. As an aside, representatives from the Bureau of Environment and it's consultant firm, Jacques Whitford, which assisted in the development of the technology, made a presentation about this technology at the annual meeting of the Waste Management in Transportation Committee of the Transportation Research Board this past July. Participants were enthusiastic about the potential application of this technology for their agencies.
	11. What is the estimated cost, effort, and length of time required for procurement or adoption by another transportation agency? The costs associated with the implementation of the technology are borne by the implementing agency, which is also the primary user. The initial development costs for these programs were $85,000 for RASCAL and $30,000 for IMP. However, since these programs have been previously developed for NHDOT, the cost of implementation to another state agency would likely be about $30,000-40,000, depending upon the number and complexity of necessary changes requested by the new agency. Maintenance costs include the periodic replacement of PDAs ($400-$600) that are lost or damaged (this may be passed on to outside consultants if they are directly responsible). Some DOTs may have an available external web server, in which case they will not need to pay to maintain the web-based service. However, this can be an additional cost should the state need to purchase or rent this technology. The annual maintenance and rental of an external server cost NHDOT $10,000 for RASCAL and $5,000 for IMP, depending mainly on each program's size. The timeframe for implementation would also depend somewhat on the customization required by the end user. A system could be implemented in as little as 2-3 months if substantial changes from the version developed for NHDOT were not required. Integration with different existing systems (e.g. the NHDOT Right-of-Way database in this instance) can require some substantive discussion and testing.
	12. What organization(s) currently supply and provide technical support for this technology? Jacques Whitford developed the software and has indicated a willingness to promote and support implementation. Possibilities include developing similar solutions or customizing the NHDOT version for other states.

	13. Please describe any legal, regulatory, social, intellectual property, or other issues that could affect ease of implementation. We are not aware of any implications.
Willingness to Champion	14. Is the sponsoring DOT willing to promote this technology to other states, if partially supported by the AASHTO Task Force on Technology Implementation? _X_ Yes __ No
Date Submitted	15. Date: September 6, 2005

16. Please include image(s) of sketches or photographs, if available ☐Image(s) are attached

Hand-held computers called Personal Data Assistants (PDA's) are changing the way the NHDOT collects data about land parcels, saving the agency both time and money.

This form is available electronically at **http://www.aashtotig.org/solicitation/**
