Request for Information
Computerized Maintenance Management System
Work Order Management and Asset Tracking System
(CMMS)
State of Connecticut
Department of Transportation
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Abbreviation and Terminology:

CTDOT – Connecticut Department of Transportation  
DAS – Connecticut Department of Administrative Services  
Department - Connecticut Department of Transportation  
EXOR - Oracle Spatial Linear Reference System, provided by Bentley, to the Connecticut Department of Transportation for geographically displaying asset and project information.  
InspecTech - Bentley product for mobile inspection and asset management solutions which enable clients to more effectively collect, analyze and manage inspection data.  
ProjectWise: Bentley product that provides document management, online collaboration and distributed engineering solutions.  
Respondent: Individual or entity responding to this RFI  
RFI – Request for Information  
State – State of Connecticut

Confidentiality

All information included in this RFI is confidential and only for the recipient knowledge. No information included in this document or in discussions connected to it may be disclosed to any other party.

Disclaimer:

The Department will review information submitted due to this RFI with the intention of generating a refined scope of services/legal agreement for potential future action.

However, this RFI is issued solely for information gathering and planning purposes; it does not constitute a Request for Proposal (RFP) or a promise to issue an RFP or to imply any future direction.

This request for information does not commit the Department to contract for any supply or service whatsoever. No telephone inquiries will be accepted. Further, the Department is not at this time seeking proposals and will not accept unsolicited proposals. Responders are advised that the Department will not pay for any information or administrative costs incurred in response to this RFI; all costs associated with responding to this RFI will be solely at the interested party’s expense. Not responding to this RFI does not preclude participation in any future RFP, if any is issued. It is the responsibility of the potential entities to monitor appropriate sources for additional information pertaining to future actions.
About the Department:

The Connecticut Department of Transportation (Department) is responsible for the administration of transportation projects to provide a safe and efficient intermodal transportation network that improves the quality of life and promotes economic vitality for the State and the region. The Department envisions leading, inspiring and motivating a progressive, responsive team, striving to exceed customer expectations. Measurable results, customer service, quality of life, excellence, accountability and integrity are the core values of the Department.

The Bureau of Highway Operations is responsible for the administration and management of the maintenance of the highway and bridge infrastructure program.

It consists of the following:

Office of Maintenance Operations - Supervises, directs, and coordinates all activities performed by the following Divisions: Maintenance Planning; Special Services; Bridge Maintenance; Highway Operations; and, Equipment and Repair.

Highway Operations - Responsible for the existing computerized traffic signal system and its expansion. Also responsible for and has jurisdiction over the development, operation, and maintenance of the Department's traffic management system, including incident management plans, congestion management measures, electronic and traffic management, and advances in smart-highway technology.

Four District Offices - Each Maintenance district is responsible for all aspects of maintenance in its assigned geographical area, including electrical, signs and markings, bridges, special services, and maintenance planning.

- **District Sections** - Districts are subdivided into highway maintenance sections, each managed by a Maintenance Manager. Each highway maintenance section generally consists of approximately one-half of the total lane miles of State-maintained highway within each of the four districts; six garages, which are strategically located within each of the sections; General Supervisors; Crew Leaders; approximately 140 Maintainers; and the equipment to perform all highway maintenance activities in each section.

- **Signs and Markings** - Responsible for the painting of pavement lines and pavement markings, and the maintenance and installation of regulatory, warning, and guide signs throughout the district.

- **Electrical** - Responsible for the installation and maintenance of traffic signals, highway lighting, overhead sign illumination, bridge navigation lights, and electrical systems on drawbridges, rest areas, and commuter parking lots throughout the four districts.

- **Bridge** - Each district has a bridge office, which consists of the appropriate personnel and equipment to perform the specialties of bridge maintenance throughout the district. Bridge maintenance performs the inspection of all bridge work and the maintenance of these structures, including painting, preventative and emergency maintenance of the structure and deck, and other miscellaneous concrete, steel, and carpentry repairs.
• **Special Services & Planning** – Each district has a special services and planning section to perform administrative functions. Planning functions include the maintenance management system, vendor projects, contracts, and budgetary oversight. Special Services include encroachment permit authorizations and inspections, agreements, major traffic generators, traffic and drainage investigations, environmental issues, landscape design and roadside maintenance, claims, safety, and training.

**Request for Information:**
The Connecticut Department of Transportation is seeking information on an “off the shelf” software solution that will enable staff to track and manage work orders, service requests, assets, and costs. The solution enables both mobile and office staff to update and add information and status to a database at the CTDOT, and therefore must be accessible from both desktop, and mobile devices including tablet and smartphone devices.

The solution must:

- Provide a scalable solution that enables complete work order and asset tracking management
- Define work flow and service request capabilities to automate the work order process
- Track resources and costs associated with staff, vehicles, tools, materials, etc.
- Support open industry standards in hardware and software that allows information to be distributed between proposed system and existing systems (data integration)
- Integrate with the CTDOT Geospatial Information System (GIS) infrastructure, and use the State’s GIS data in the field with or without internet connection
- Run on mobile devices, including but not limited to tablets (Windows, Android, iOS) and smartphones (Windows, Android, iPhone)

**Maintenance Management System Capabilities:**

**General Needs**

1. Intuitive system, icon navigation – must be easy to use at all levels of operation (e.g. configurable menus, screens drop down lists etc.)
2. Data input supported by drop down menus or lists with selection options, easy data entry
3. Ability to run system checks to identify /flag erroneous input/data
4. System must significantly reduce the amount of manual paperwork and duplicate data entry currently needed for the creation and completion of work orders.
5. System will be FEMA friendly – needs to be compatible with the categories and formatting necessary for FEMA submittals
6. Mobile device friendly (Smartphone, Tablet)
7. Cloud based solution is desired – Software as a Service installation (SaaS)
8. System should provide a public-facing Web form where citizens can report a problem, initiate a request for work and submit video or pictures
9. Full audit trail history tracking, which captures who made what changes, by user, date, time and location, where applicable

**Work Order Needs**

10. System will support the ability to generate work orders made up of multiple job assignments / daily duties
11. System will support assigning priorities to work orders
12. System will allow the assignment of a work order to an external vendor-based support team and back to CTDOT maintenance staff or management
13. System will allow team in the field to generate a new work order for future scheduling (ability to alert General Supervisor of new work generated while in the field)
14. System will be able to drill down to the details of a work order (costs, materials, equipment assigned, etc.)
15. System will be able to handle the creation of a work order for reactive work (priority work that pops up during the day i.e. traffic accident) situations as they occur throughout the day
16. System will be able to route work orders by time and location to offer the most productive work day for the assigned work crew including accounting for breaks, lunch, and travel time
17. System will provide turn-by-turn directions to each work order location
18. System will be able to schedule and track the creation of work orders supporting a preventive maintenance schedule
19. System will support a flexible and configurable work flow in support of a work order i.e. Sign work order triggers fabrication of signs prior to installation task being assigned
20. System will allow reprioritization of work orders with the ability to escalate, pause and divert work orders, as the repair system requires. An area for clarifying status such as notes or comments will be required
21. Ability to provide notifications using multiple media (e.g. text alerts, phone call, email and designated account user)
22. Generation of a work order with default information from predefined / configurable templates (Bridge, Electric, Signs & Markings and Roadway Maintenance, Maintenance Highway Operations and customizable profiles to support future growth)
23. Integration of agency defined inspection templates (checklists, photos, etc.)
24. No limit to the number of work orders that can be open at any time. Stored data shall be stored indefinitely and accommodate customizable search criteria
25. Have the ability to reassign a work order or work request to another crew leader or field crew
26. System will need to disseminate daily duties by defined staff roles
27. Ability to administer inspection programs through work orders
28. System will provide electronic access to manuals, procedures and other support materials
29. System will provide work order support for the management and tracking of encroachment permits with access provided to the public via a public interface
30. Ability to associate work orders with asset identification numbers
31. Ability to provide geospatial capabilities to view asset ids in vicinity of a location

Staff Management Needs

32. Need to support assignment of work orders to an individual or a group of team members
33. System will have the ability to generate a daily work order summary for staff based on defined work orders, assigned tasks, estimated time to complete, and ability to sort by priority
34. System will have options to track staff hours, staff / project costs time of work order issued, time of starting work followed by completion. Ability to show total hours of completion for issued work order
35. Ability to view staff organization by office, districts, sections and garages
36. Ability to create and track performance measures (office, district, section, garage and individual employees or contractors)

Asset Tracking Needs

37. Ability to view the current information of an asset in the field via a mobile device or tablet (via an internet connection or detached)
38. System will need to gather appropriate attributes of each asset being touched (Inventoried, Installed, Moved or removed) and update back into authoritative database. Provide ability to differ the attributes depending on the assets requirements
39. Ability to add, update and delete attribution data on assets
40. Ability to provide geospatial capabilities to view asset ids in vicinity of location (display on a map)
41. Ability to assimilate both linear and fixed asset references
42. Ability to group assets within a category and area, within GIS format, to help schedule and coordinate maintenance activities
43. Ability to set repair priority (e.g. based on asset condition, repair history, repair versus replacement with new system and useful life)
44. Have the ability to access asset planned replacement schedules, while planning repair or maintenance of the asset (e.g. Guiderail end treatments)
45. Ability to add to an existing Work Order providing a temporary hold on the original Work Order created, while another party has been issued a request for support on the existing Work Order. When the work is completed by the second or 3rd party, the original would be called back in to complete

Equipment and Materials Management
46. Ability to provide a parts/equipment list for a given work request
47. Support material utilization (inventory) within a work order
48. System will support utilization of miles and hours on trucks and equipment
49. System will present a schedule of availability of a piece of equipment or truck
50. System will reserve and assign equipment to a work order, when requested
51. When a work order closes, any remaining assigned resources should be released
52. Ability to use a work order for ordering inventory (signs stock orders); the current Work Order may need to be placed in a temporary hold while awaiting parts to arrive and should have ability to comment and clarify the status update
53. Ability to use a work order to order inventory and trigger installation of the inventory once it has arrived or has been fabricated

Financial:

54. Ability to track budget and actual project costs per work order / work request
55. System should track labor costs and equipment costs

System Integration and Technology Needs

56. Support multiple system integrations and communications with:
   b. Microsoft SharePoint
   c. PeopleSoft (CORE) – Employee Timesheets
   d. CTDOT (TED) - Transportation Enterprise Database
   e. Asset Works – Fleet Management
   f. UCONN - Crash Data Reporting
   g. ESRI – ArcMap, ArcGIS pro, ArcGIS Online
   h. STARS (Mileage)
   i. CT DOT Web Master Interface (Public reporting an issue)
   j. Others
57. Work seamless with personal computers, tablets and other mobile equipment, without client software
58. Flexible and configurable user permissions and securities that can be self-managed by the CTDOT IT admin staff
59. System will support mobile technologies and synchronization when no internet connection is available. No data is lost (Tablets, Smartphones)
60. System will be able to trigger emails, where appropriate, in the workflows – integration with Outlook
61. System shall have the ability to create and consume an optimized route for a list of work orders assigned to a staff member or crew
62. Integration with open source GIS and GIS viewing capabilities
63. System should support single sign on (SSO) capabilities integrated with MS active directory
64. What are the documented backup and recovery strategies for your solution?
65. Store data on the cloud/outside the CTDOT firewall, in compliance with the State’s retention policies
66. Scalable in terms of user system capacity and functionality
67. Overall licensing and maintenance costs must be cost effective for the CTDOT

**Reporting Needs**

68. System will support various levels of reporting (e.g. Summary, detailed)
69. System will support an executive dashboard and reporting
70. Search, sort and report on all fields in database and sub-total in a variety of ways (e.g. custom reporting)
71. Ability to schedule reports to be run automatically and distribute as required
72. Monitor and report on key user defined performance indicators
73. Drill down from report line to detailed level

**Training Needs and non-functional requirements**

74. How will training be provided for the overall solution?
75. How quickly do you respond to system outages?
76. What support options are available for addressing bugs or problems discovered?
77. What type of documentation exists for support staff and end users?
78. How would we report issues with the system?
79. How large (number of users and supported assets) are your current installations?
80. What is your solution’s published uptime percentages?

**Scenarios:**

We have included three Maintenance Management scenarios which outline some of the capabilities we are looking for in an integrated CMMS solution. Please outline whether your solution can support the capabilities outlined in these scenarios.

**Scenario #1 – Leaning Tree**

A report of a leaning tree by the public via an outward facing web site comes in.

1. Using a publicly accessible website, mobile application or call center, a citizen enters a report of a tree leaning over the roadway.
   - The report should include the location of the incident and allow for the inclusion of photos and comments.
2. The system creates a work order and sends a notification to the appropriate district garage supervisor.
3. Using a desktop system, the supervisor assigns the work order to a staff person to inspect the site.

4. Using a mobile device at the location of the incident, the inspector reports that a crew should be dispatched to address the problem.
   - The inspector has the ability to update the geospatial location of the incident, if the initial report is inaccurate.
   - The system notifies the garage supervisor of the inspector’s recommendation.
   - The inspector shall have ability to send photos and provide comments as needed for further clarification.

5. The supervisor assigns a high priority to the work order and schedules a crew to do the work.
   - The high priority overrides any scheduled routine tasks that had been assigned to the crew members.
   - The system recommends the skills, number of staff, equipment, and materials that are required to address the issue.
   - The system also provides additional support contact for those that may have equipment in the area of work.
   - The system will alert the supervisor to any conflicts or shortcomings in staff, equipment, or materials.
   - The system shall provide alerts to the supervisor of any unrelated potential conflicts of scheduled work in the area.
   - The system shall be configured to alert multiple users of the work order, such as the main office managers, Highway Operations and so on.

6. The crew uses a mobile device to indicate when the crew leaves the garage to go to the job.

7. The mobile device routes the crew to the job site with turn-by-turn directions.

8. The crew reports completion of the task via the mobile device.
   - The system automatically tracks the assigned equipment, materials, vehicles, mileage, staff, and time that were used to complete the task.
   - Details and total costs for the job are available through website dashboards and reports that are accessible to the supervisor, district manager, and other executive personnel.

**Scenario #2 - Guiderail**

General Supervisor sees a section of guiderail and an end cap that was damaged by a drive away accident which is in need of repair.
1. Using a mobile device at the site of the incident, but without a cellular signal, the supervisor creates a new work order for a staff person to do a detailed inspection of the site.
   - The supervisor is able to specify that this task should be given a high priority.
2. When the device gets an internet connection, device pushes the new work order to the system.
3. The system notifies the staff person that they have a high priority request to inspect the site of the incident.
   - The system queries the asset repository to determine the type of guardrail currently installed at that location and informs the inspector.
   - The system queries the document repository and notifies the inspector of any engineering directives relevant to replacement of this type of guardrail.
4. Using a mobile device, the inspector is given turn-by-turn directions to the location of the site.
   - The system tracks the inspector’s time and mileage of the vehicle.
   - At the location of the incident, the inspector uses the mobile device to report the status of the guardrail on the work order.
   - The inspector is able to attach a picture of the damaged asset to the work order and provide additional comments if needed.
5. The system checks the guardrail inventory to determine if the required materials are in stock.
   - For this scenario, we assume a required guardrail terminal is out of stock.
   - The system triggers an order for a new terminal.
   - The work order remains in a pending status until the new terminal is received.
6. The system returns the work order to an active status once all of the required materials are in stock.
7. The general supervisor assigns a crew to perform the repairs specified in the work order.
   - The system recommends the number of crew members for this type of work, and notifies the supervisor if any specialized skills are required.
   - The system notifies the crew of the materials and equipment required to perform the repairs.
8. Using a mobile device, the crew lead is given turn-by-turn directions to the job site.
   - The mobile device allows the crew to collect the starting and ending coordinates of the new section of guardrail.
   - The crew reports when the job is completed, and also records actual materials used.
   - The system removes the materials used from the inventory database.
   - The system tracks the vehicle use and mileage, and time worked for the crew members.
The system tracks the total cost of the work order, with costs broken down by vehicles, equipment, materials, and staff.

9. The system updates the asset inventory with the installed materials and location of the new section of guiderail.
10. All tracked information about the work order is available to the general supervisor, maintenance manager, and other executive personnel through reports and/or dashboards.

Scenario #3

MS4 Scenario

MS4 team assigns a prioritized drainage area for inspection and cleaning of catchbasins based upon drainage system mapped in a GIS layer.

1. General Supervisor assigns a work order to a crew to inspect drainage system.

2. Work crew inspects drainage system from most downstream structure to upstream structure. Using a mobile device, but without cellular signal, work crew records depth of sediment with respect to lowest invert elevation to determine if the catchbasin is more than ½ full.

3. When the device gets an internet connection, device pushes a new work order to a vacuum truck crew to proceed to remove sediment from catchbasin and to perform a follow-up inspection in 1 year.

4. If during the second follow-up inspection the same catchbasin is more than ½ full, push a new work order to the District Drainage Engineer to investigate and develop work order for follow-up activities (i.e. Grading, notice to abutting property owner, etc.).

5. Provide reporting of all catchbasins cleaned and those that were more than ½ full during two consecutive annual inspections.
Response Guidelines:

Interested organizations are encouraged to respond to this RFI. In the response, companies shall include the following:

- A completed company profile form (attached).
- A report providing pertinent information regarding this RFI (including assumptions).

Responses shall be formatted as follows;

- Be in native Portable Document Format (PDF) – not scanned
- Include a table of contents.
- Use single space, Times New Roman font, size 12.
- Contain a page number and the number of total pages per page
- Have a footer that includes the name of the respondent’s organization.
- Be no more than 15 pages in length.
- Be signed by a duly authorized representative of the organization – electronic signature is acceptable.

Response to this notice is not a request to be added to a bidders list or to receive a copy of a solicitation.
Submission Procedure:

Responses shall be digitally uploaded into ProjectWise as described below:

1. Put the **Responses file** and the **Company Profile form** in a zipped folder
2. Name the zip folder so that it contains the organizations name
3. Go to [CTDOT-ProjectWise](#), select the CTDOT Location, do not select CTDOT CONNECT, and login using the following login information
   
   **User name:** PWONLINE\RFI.Answer  
   **Password:** Mb86Lnj4
4. Next select Document>Upload as shown below:

   ![ProjectWise Web Server](image)

   *Browse out to the file to upload and click Open*
**Timeframe:**

This is the timeframe for the RFI

6/6/2018 – The RFI Issue Date
7/9/2018 – Last date for questions
8/17/2018 – Last date for submission

**Contacts:**

For questions regarding this RFI please contact:

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