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Think Jersey DOT

Tech Brief

Implementation of Manual Guidelines for the Inspection of ITS Equipment and Facilities

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BACKGROUND

- Proper installation, care, and upkeep of Intelligent Transportation Systems (ITS) equipment increase the efficiency and connectivity of New Jersey's surface transportation system, conserve the public's investment in the highway system, and ensure that the system will continue to provide maximum benefits to the traveling public. ITS equipment failures and malfunctions caused by lack of technical knowledge, inadequate inspection during installation, and improper maintenance practices potentially lead to increased motorist and maintenance costs (unnecessary failures or malfunctions, increasing personnel and repair time, replacement part costs, and spare part inventory requirements), increased delays and accidents, and increased fuel consumption with degraded air quality.

- In a recent study funded by NJDOT, Rutgers Intelligent Transportation Systems (RITS) researchers successfully developed a state-of-the-art Intelligent Transportation Systems inspection and maintenance manual (ITSIMM) and the Rutgers ITS Inspection and Maintenance Software (RITSIMS) based on ITSIMM (Ozbay et al., 2008). The results of this unique research project were also presented at the 2009 Transportation Research conference in Washington D.C. in the form of a research paper that is also published in the journal, Transportation Research Record (Ozbay et al., 2009).

NJDOT maintenance crew deploying a traffic sensor in South Jersey

WHAT'S THE PROBLEM?

- Prior to the research project performed by Ozbay et al., 2008, NJDOT did not have an acceptance ITS and maintenance inspection manual (NJDOT RFP - Project 2005-13). This manual (ITSIMM) is a comprehensive reference document that has separate inspection (acceptance) and maintenance sections to assist Department's inspectors, ITS design and traffic operations, and ITS maintenance personnel to ensure effective inspection and maintenance of ITS facilities.. The software version of the manual, RITSIMS, provides NJDOT with complete, practical, and efficient inspection procedures for the proper installation and preventive or routine maintenance of ITS equipment.

- The Rutgers research team conducted a number of training workshops to introduce RITSIMS to its potential users. The initial feedback from the first group of expert users of the manual and its software was very positive both in terms of its operational approach and user-friendly interface. RITSIMS was also installed in several NJDOT operations staff's computers to allow them to test the software.

- Comments and suggestions of the training session attendees and NJDOT users were solicited to identify possible future improvements. Regarding these recommendations and suggestions, a need for the enhancements in ITSIMM and RITSIMS emerged. The most important enhancements needed were:
    - an additional module for changes and additions to be able to add new equipment and questions without using the access database tables,
    - an extended database to include the new equipment installed,
    - the incorporation of the new ITS testing forms in the software.

HERE'S THE SOLUTION

- To ensure RITSIMS' long-term usage as NJDOT's ITS maintenance and inspection tool, it is important to conduct an implementation study of RITSIMS to obtain the enhanced version, E-RITSIMS.

THESE ARE THE OBJECTIVES…

- This implementation study will address two major goals:

  - ✓ To enhance the contents of ITSIMM and the RITSIMS software based on the recommendations of the expert users of the manual and software.
  - ✓ To deploy E-RITSIMS for its prospective users from NJDOT operations, inspection, and maintenance departments to ensure its use as an efficient tool by NJDOT.

HERE IS WHAT WE DID…

- The Rutgers team conducted a series of meetings where E-RITSIMS was introduced to prospective users. The feedback obtained during these training sessions was also used to improve its functionalities as well as to identify future improvements.

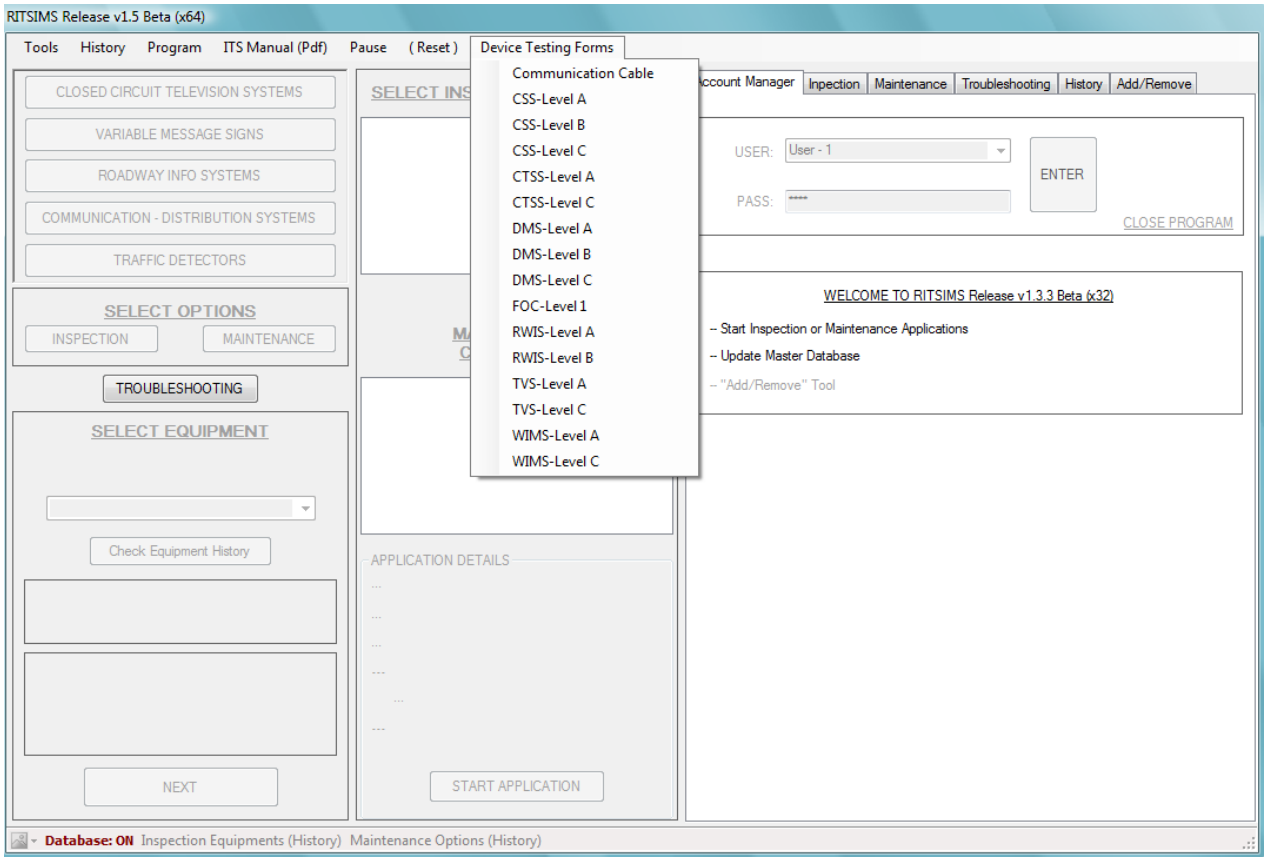
- The research team updated the ITS equipment database of RITSIMS based on the new data obtained from Tim Herlihy of NJDOT. Now, we have approximately 700 types of equipment in the database, including CCTV, VMS, HAR, RTMS, WIM equipment.

- RITSIMS was improved with the functionality of an additional module for changes and additions, to be able to add new questions without using the access database tables. Several user interface changes were added to RITSIMS to make the software more user-friendly, based on the comments and suggestions made at the training sessions.

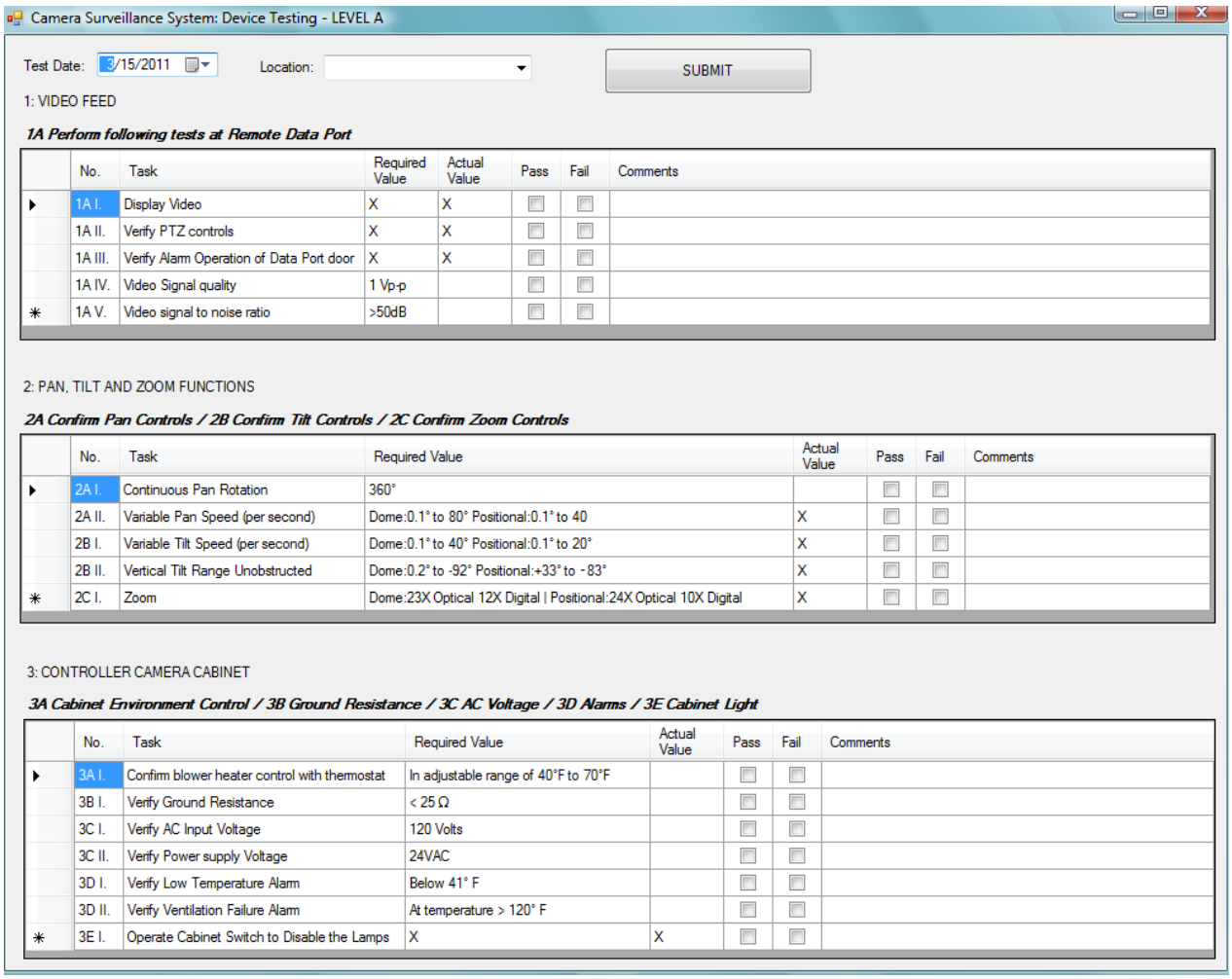
- Based on the meeting with Tim Bourne of NJDOT, the software was updated using the new ITS testing forms of NJDOT. There are 22 ITS testing forms implemented into the software, of which 17 are distinct:

  - ✓ Communication Cable (General)
  - ✓ Camera Surveillance Systems (Level A, B and C)
  - ✓ Fiber Optics (Level 1 and 2)
  - ✓ Controlled Traffic Signal System (Level A and C)
  - ✓ Travel Time Systems (Level A, B and C)
  - ✓ Road Weather Information Systems (Level A, B and C)
  - ✓ Dynamic Message Systems (Level A, B and C)
  - ✓ Weight in Motion Systems (Level A and C)
  - ✓ Traffic Volume Systems (Level A and C)

HERE IS WHAT E-RITSIMS LOOKS LIKE…



HERE IS WHAT NEW ITS DEVICE TESTING FORMS LOOK LIKE…



FOR MORE INFORMATION CONTACT:

NJDOT PROJECT MANAGER:	Dr. Nazhat Aboobaker
PHONE NO.	**(609) 530-5637**
e-mail	**Nazhat.Aboobaker@dot.state.nj.us**
UNIVERSITY PRINCIPAL INVESTIGATOR:	Dr. Kaan Ozbay
UNIVERSITY:	***Rutgers University -CAIT***
PHONE NO.	**(732) 445-2792**
e-mail	**kaan@rci.rutgers.edu**

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