

Highway Work Zone Safety Audit Guidelines Development and Training

- Updating, January 2009

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Progress, to December 2008

- 1. Submitted three reports: Literature Review Report, Dan Ryan Reconstruction Case Study Report, and Work Zone Safety Audit Questionnaire Survey Report.
- 2. Sponsored and observed two WZSA case studies in Illinois
- 3. Guidelines development
- 4. GOOGLE-Earth based tool for assisting work zone safety audit
- 5 - Preparation of training materials at Utah-LTAP

1. Three submitted reports

- Literature Review (100 pages)
- Dan Ryan Reconstruction Case Study (30 pages)
- Work Zone Safety Audit Questionnaire Survey Report (40 pages)



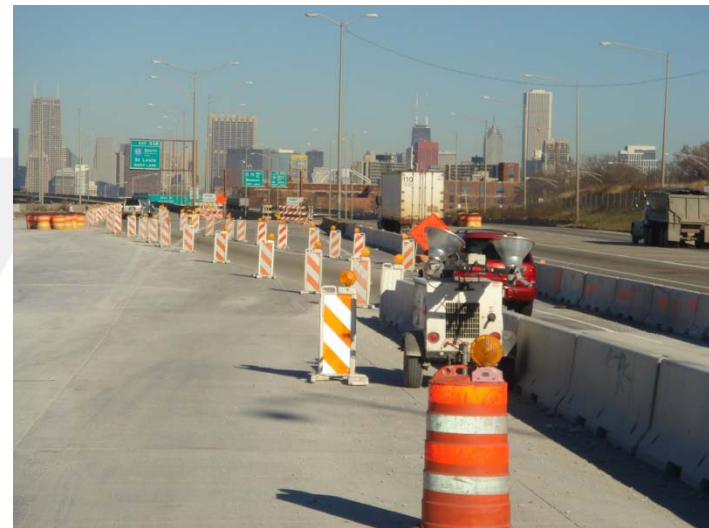
1a. Literature Review

- Chapter 1 - Introduction to the scope and objectives of the literature review, and review methodology.
- Chapter 2 - Review on the Rule on work zone safety and mobility, guideline for the rule implementation, and states' compliance.
- Chapter 3 - Review on work zone guidelines, manuals, and best practices in use by state transportation agencies.
- Chapter 4 - Summary of RSA methodologies and practices with an emphasis on construction stage application.
- Chapter 5 - Focus on relevant documents on construction worker safety.
- Chapter 6 - Review on existing training programs including work zone and construction worker safety.
- Chapter 7 – Summary of the report.



1b–Dan Ryan Case Study Report

- Chapter 1 - Introduction
- Chapter 2 - Background of The Dan Ryan Expressway
- Chapter 3 - Work Zone Safety manuals, Guidelines, and programs
- Chapter 4 - Major Parties and their Responsibilities
- Chapter 5 - Worker Safety
- Chapter 6 - Dan Ryan Mobility Impact analysis
- Chapter 7 - Conclusions and Recommendations





1c. Key Survey Findings

- Leading causes of work zone safety problems:
 - inadequate work zone setup (40%), inadequate pre-construction planning (36%),
 - deficient work zone speed enforcement (35%), and inadequate or inefficient temporary traffic controls (34%).
- Effective measures for improving work zone safety:
 - periodic work zone safety review or inspection (74%),
 - public outreach and education (64%), and
 - innovative contracting methods (56%).
- Audit team members:
 - State transportation agencies (89%), FHWA (76%), highway contractors (75%),
 - Law enforcement personnel (62%), Local government agencies (55%).
- Funding sources for work zone safety audits:
 - FHWA (44%), State transportation agencies (26%), and Project budget (14%).
- Suitable projects for safety audits:
 - Major (95%) , Minor (82%), Minimal (71%)
- 80% respondents recommended to consider worker safety inside the construction area.
 - review of construction workers' safety training records and safety inspection records.
 - 60% respondents favor the contractor to submit worker injury data to the project owner.
- Adequate safety training for all project personnel.
- Computer-based tools can assist the audit team.



2a. WZSA Case Study – I55

- A joint effort btw IDOT & FHWA
- WZ selected in April 2007
- Audit team formed in May with 4 RSA auditors: 2 from IDOT, 1 from FHWA, and 1 from IST.
- 5 observers, 2 from FHWA (Dr. Oliver & Umbs), 3 from IIT.
- Project plans were mailed to the auditors and observers 2 weeks prior to the audit.
- The audit took place during July 30 and 31, 2007.

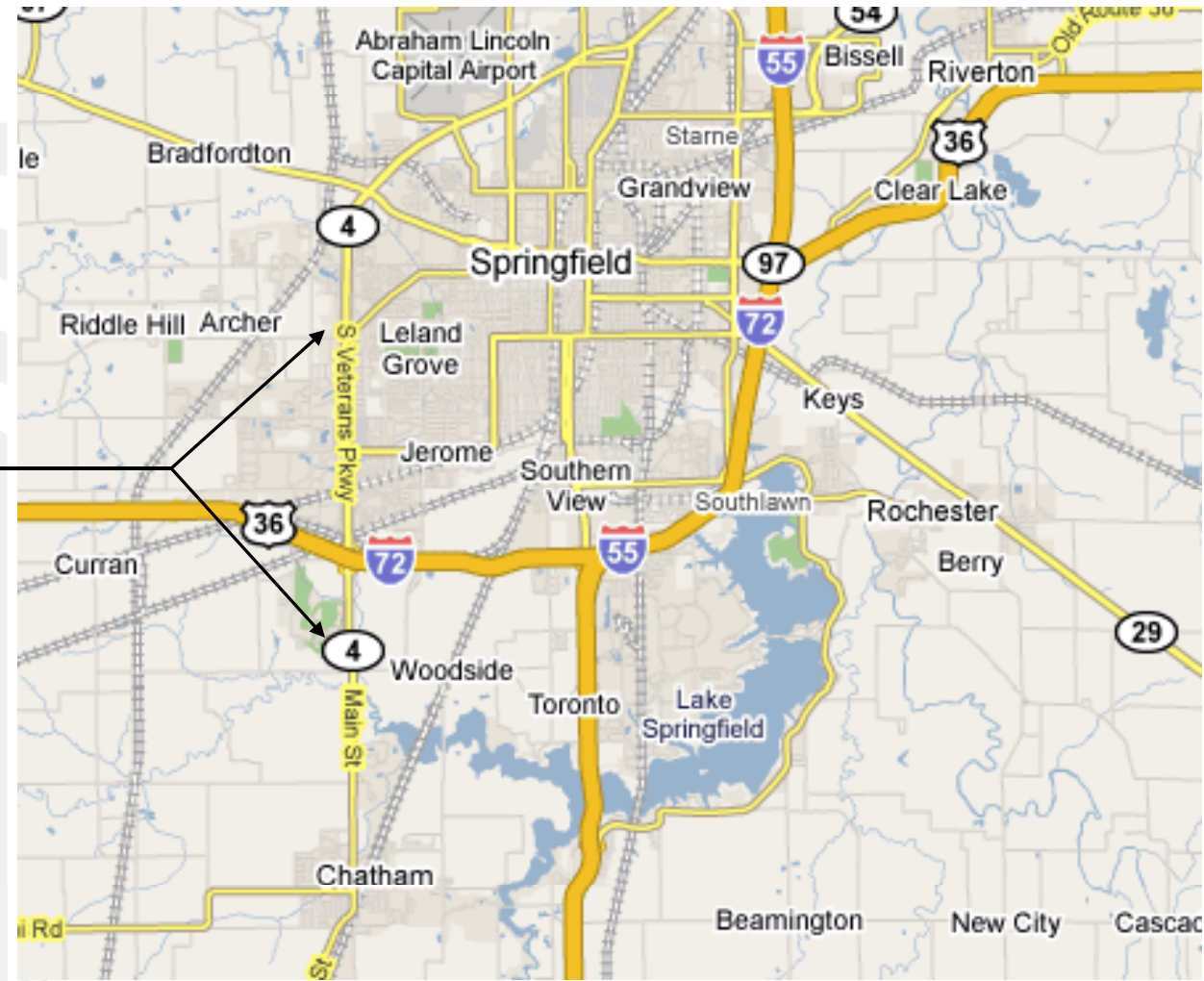




2b. Case Study – Veterans

Conducted:
Sept. 2008

Limits





3. Guidelines Development

- A draft of the entire guideline is completed.
- The guideline and the field manual at the construction stage have been reviewed.
- The entire document will be ready for external review and comments in March 2009.
- More case studies will follow.
- Volunteers are solicited for review and case studies.

Structure of the Guidelines

- PART I: FUNDAMENTAL PRINCIPLES OF WORK ZONE SAFETY AUDITS
 - Chapter 1: Introduction
 - Chapter 2: Overview of Work Zone Safety Audits
 - Chapter 3: Implementation of Work Zone Safety Audits
 - Chapter 4: Conducting work zone safety Audits in the Pre-Construction phase
 - Chapter 5: Conducting Work Zone Safety Audits in the Construction Phase
 - Chapter 6: Conducting Work Zone Assessment in the Post-Construction phase
 - Chapter 7: References
- PART II. FIELD MANUALS FOR CONDUCTING WORK ZONE SAFETY AUDITS
 - Field Manual for Conducting work zone safety Audits in the Pre-Construction Phase
 - Field Manual for Conducting work zone safety Audits in the Construction Phase
 - III. Field Manual for Conducting Work Zone Assessment in the Post-Construction Phase

What is WZSA?

- Work zone safety audits (WZSAs) adapt the RSA concept and emphasize work zone planning and management in order to mitigate work zone safety and mobility impacts on road users, affected communities and businesses, and construction workers.
- WZSA is different from RSA
- WZSA is different from work zone safety inspection/reviews

Audit Process



Step 1: Identify candidate project and contact person



Step 2: Select an audit team and team leader



Step 3: Conduct pre-audit review



Step 4: Hold formal audit meetings with the key parties



Step 5: Conduct audit inspections



Step 6: Perform audit analyses



Step 7: Present audit findings and recommendations

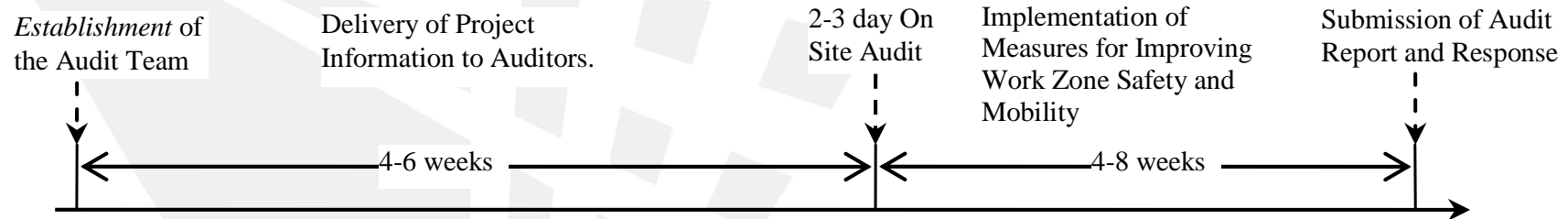


Step 8: Report on findings and Implementation

Essential Materials for Auditing

- Project plan/design/specifications
- Work zone impacts assessment
- Transportation management plan (TMP)
- Site inspections
- Inputs of the project key parties

Typical Audit Timeline



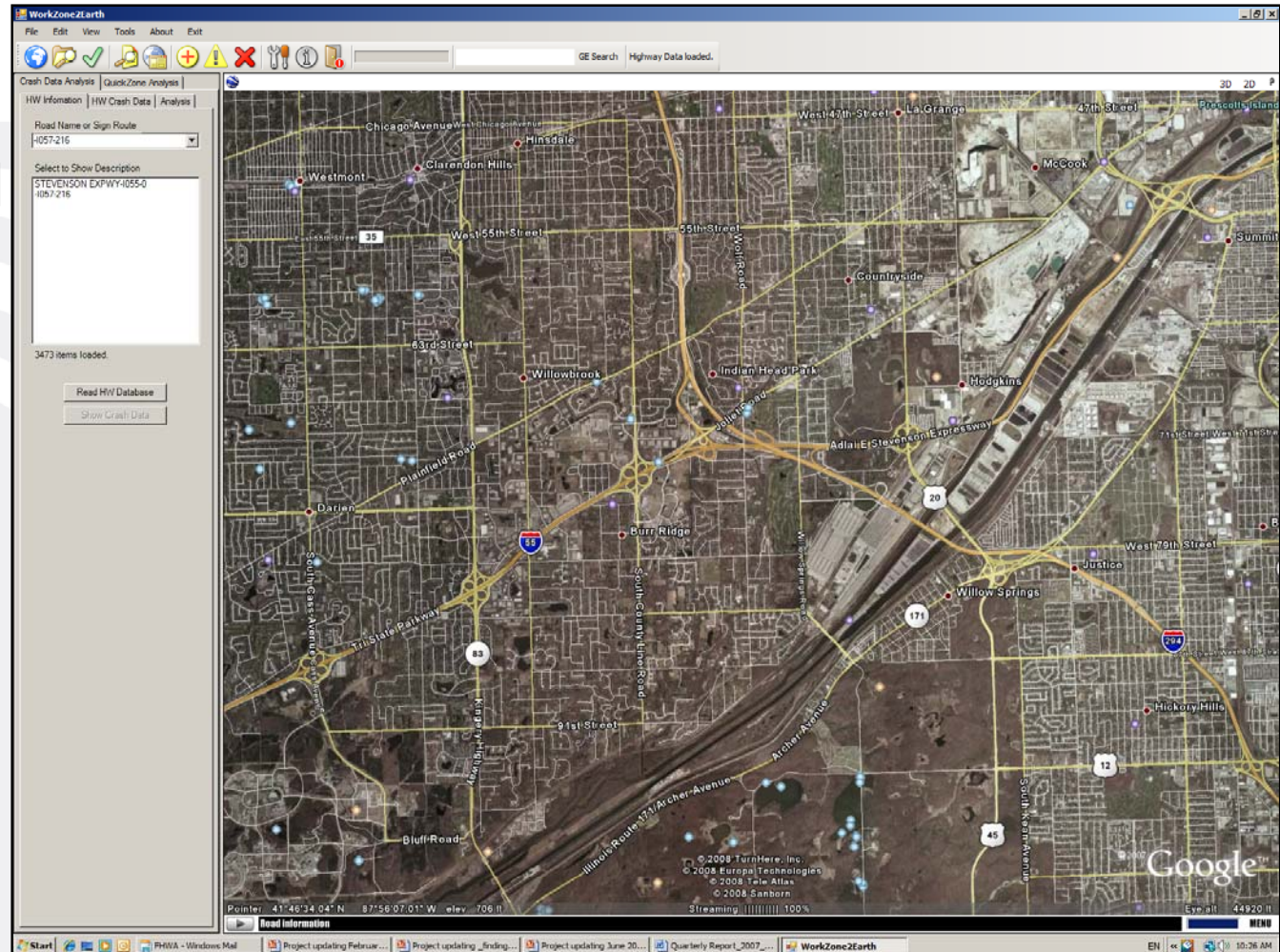
Field Manual

- 1. Project Background
- 2. Transportation Operations (TO)
- 3. Public Information (PI)
- 4. Traffic Control Strategies
- 5. Sample Questions for the Project Owner
- 6. Sample Questions for the Design Team
- 7. Sample Questions for the Contractor
- 8. Questions for the Traffic Control Team
- 9. Inspecting Work Zone Conditions
- 10. Traffic Control Devices
- 11. Inspecting the Activity Area and Worker Safety
- 12. Work Zone Safety and Mobility Performance



4. Google-Earth WZ Tool

- Three major components are integrated into Google Earth:
 - Road Information Database
 - Detailed Crash Database
 - QuickZone





4a. Study Trans Network

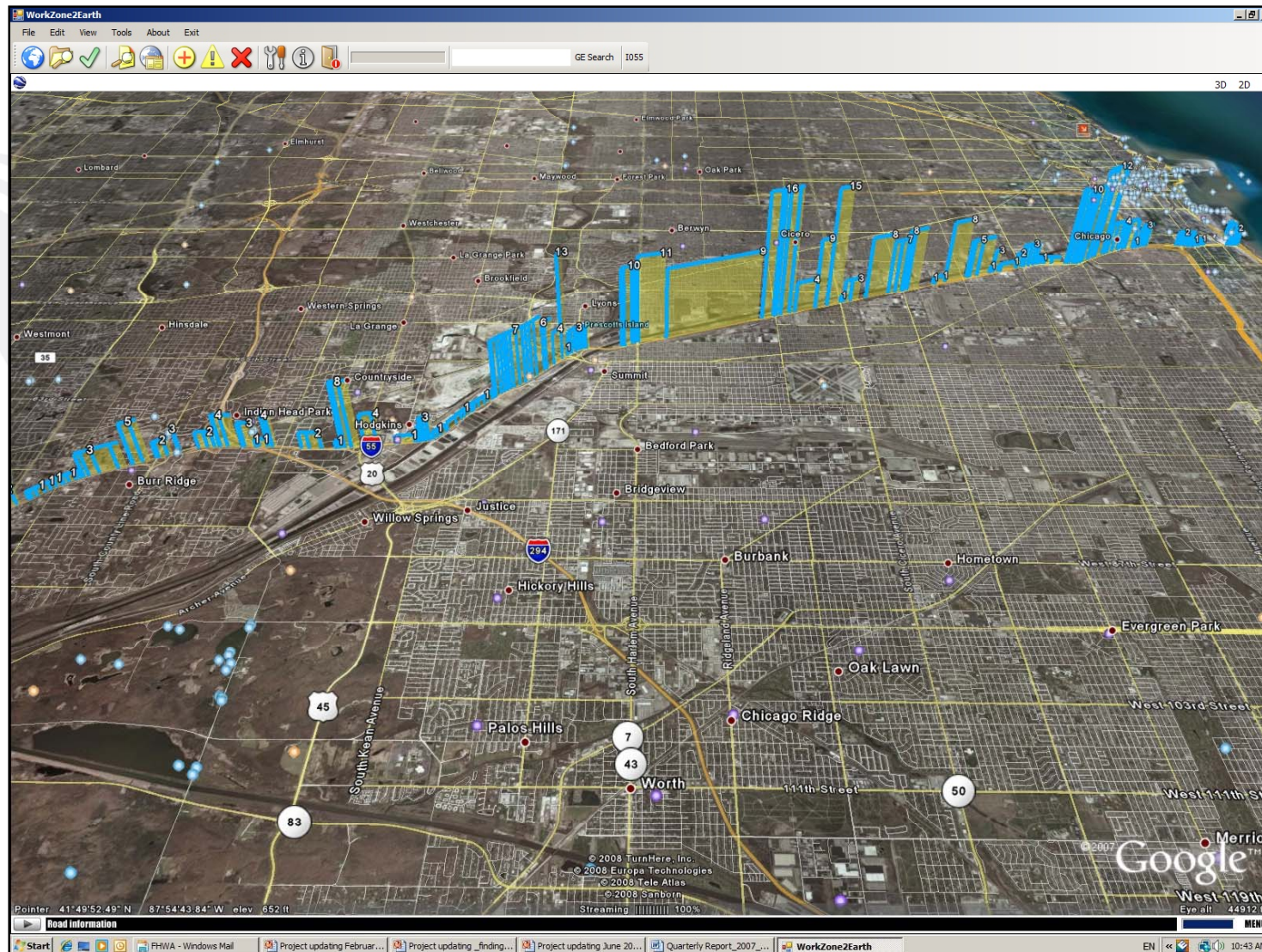
The screenshot displays the WorkZone2Earth software interface. The main window shows a 3D aerial view of a highway interchange. A road segment, labeled 'Adlai E. Stevenson Expressway', is highlighted in pink. The interface includes a menu bar (File, Edit, View, Tools, About, Exit), a toolbar with various icons, and a left-hand panel with the following sections:

- Crash Data Analysis | QuickZone Analysis
- HW Information | HW Crash Data | Analysis
- Road Name or Sign Route: -I057-216
- Select to Show Description: STEVENSON EXPWY-I055-0 -I057-216
- 3473 items loaded.
- Buttons: Read HW Database, Show Crash Data

The map shows several roads: North Frontage Road, Joliet Road, Tri-State Parkway, and Adlai E. Stevenson Expressway. A pink line highlights a segment of the Stevenson Expressway. The bottom of the window shows a status bar with coordinates (Pointer: 41°45'30.02" N 87°54'54.95" W elev: 700 ft), a 'Road Information' button, and a 'MENU' button. The Windows taskbar at the bottom shows several open applications, including 'FHWA - Windows Mail', 'Project updating Februar...', 'Project updating _finding...', 'Project updating June 20...', 'Quarterly Report_2007...', and 'WorkZone2Earth'. The system clock shows 10:33 AM on 10/31/07.

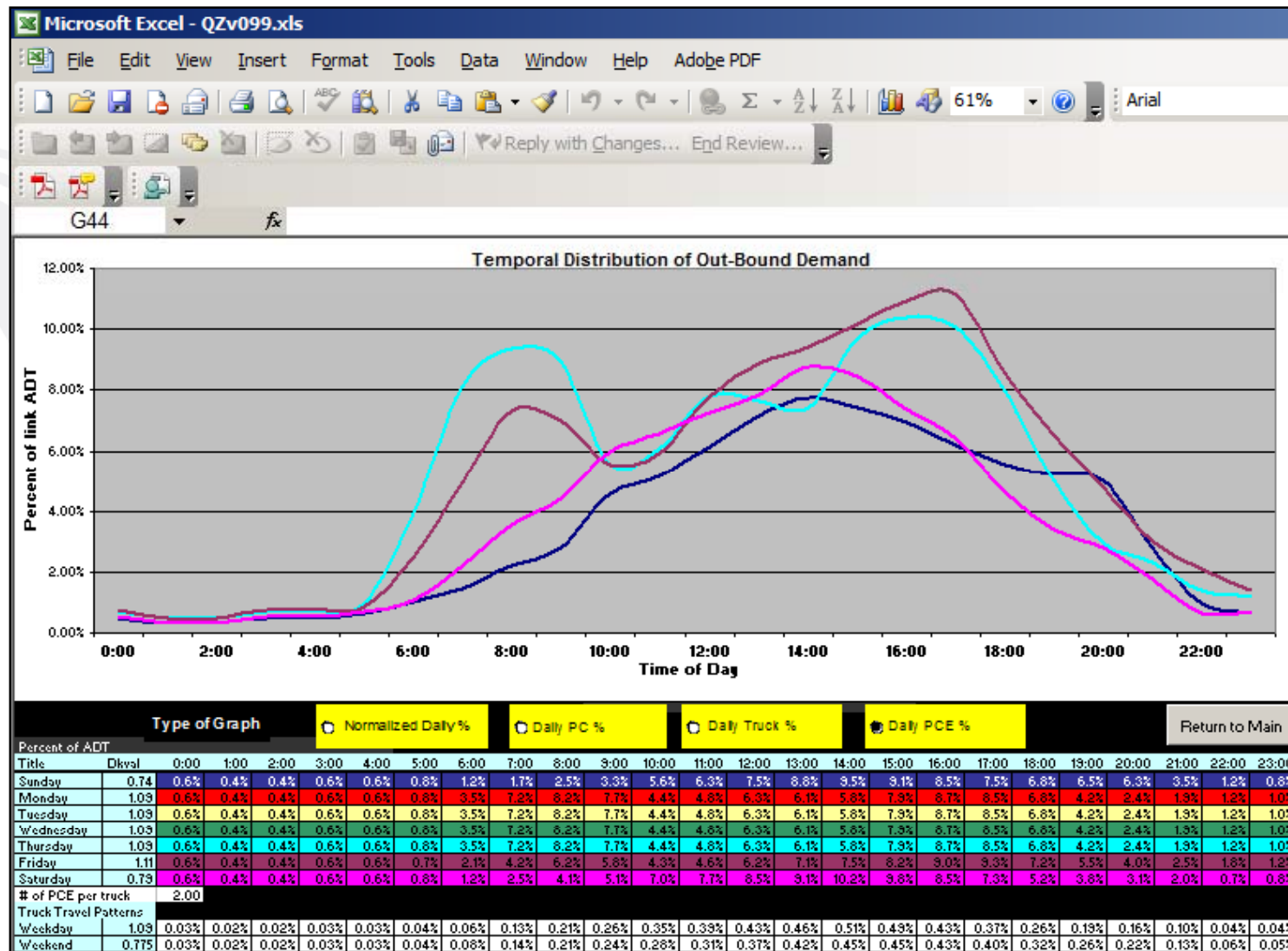


4b. Analyze Crash History





4c. Assess WZ Impacts



5. Activity at Utah-LTAP

- The Utah LTAP has developed a computer software tool for conducting RSAs outside of the grant.
- The team is now investigating the possibility of expanding the features of the tool for assisting WZSAs.
- The project team is planning to use the tool for a WZSA case study in Utah during May and June 2009.