



Transportation Technology Innovations

Presented to the Missouri Transportation Institute
April 17, 2007

Agnes Otto
HNTB Associate Vice President
Director of Technology Solutions

Transportation Technology Innovations



- **Program Management**
- **Public and Stakeholder Communications**
- **Design Analysis and Constructability**
- **Asset Planning and Management**
- **Monitoring Systems**

Program Management

Project portals and document management systems improve communication and drive efficiencies for truly collaborative teaming.

Program Management

Project Control Tools

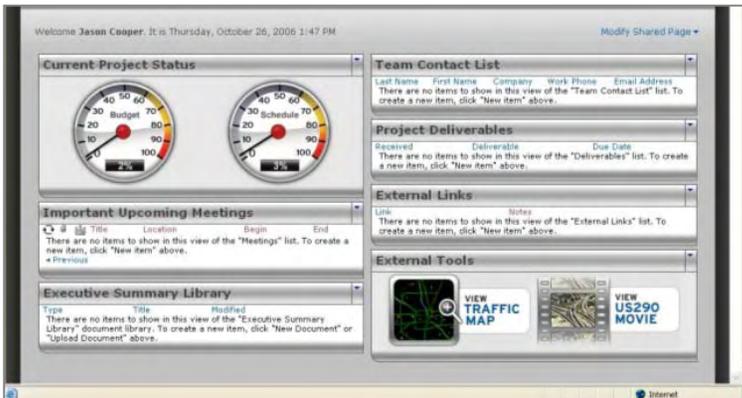
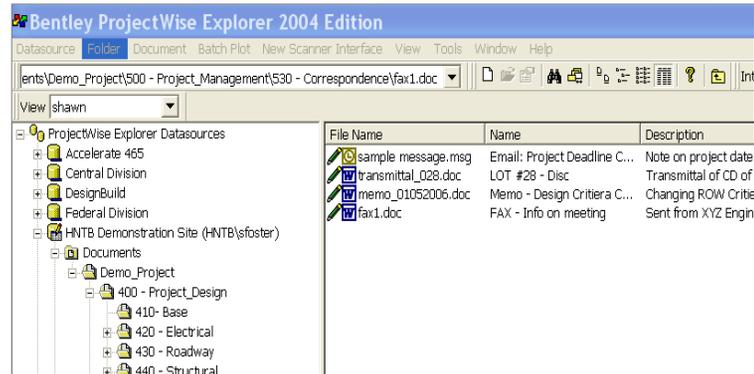
Dashboard Solutions



HNTB ProCIMS™



Bentley ProjectWise® - Design Documents



Scheduling



Program Management

Quality Management

Verification Form - Design, Administration, Management Plans

Report No.: ALB-014
Review Date: 10/12/04 mm/dd/yy
Deliverable: Vegetation
Subdeliverable: Turf Establishment
Component: Construction
Contractor/Subcontractor: GM

Submittal / Description: 147
Reviewer: Amber Blanchard
Approver: Kevin Anderson
Contractor Respondent: Cameron Kruse

Save / Close
 Requirement
 Fitness
 Linked Files

Create/Load Template OMN to Excel View Verification Report View FFU Report
 Add New Requirement Excel to OMN View OMN Report

Requirement Selector ?

- 1200 - 1200 Bidding Requirements and Conditions
- 1201 - 1201 Prequalification of Bidders
 - 1201.0-1 - No prequalification requirements are imposed prior to submitting a bid; however, each bidder is advised that a written statement may be required prior to consid
- 1202 - 1202 Contents of Proposal Form
 - 1202.0-1 - The Proposal form will state the location and description of the contemplated construction, and will include a schedule of items showing the estimated quantitie
 - 1202.0-2 - Bound within the proposal forms will be any Special Provisions and other supplementary requirements. All papers bound with or attached to the Proposal form a
- + 1203 - 1203 Issuance of Proposal Forms
- + 1204 - 1204 Interpretation of Quantities in Bid Schedule
- + 1205 - 1205 Examination of Plans, Specifications, Special Provisions, and Site of Work

Mn DOT	ReNo:	Contractor	Mn DOT						
No.	Reference	Requirement	Results/Level	Objective Evidence	Response	Details	Implem. Date	Comments	Closed
34	1.1.2.0-1	The term "Contract Documents" shall mean the documents listed in Section 1.1.2.0-1		BIC		BIC		BIC	Date Closed:
35	StandDiv3.310 3.0-1	Portland-Pozzolan cement furnished under this Specification shall conform to ASTM C 150		BIC		BIC		BIC	Date Closed:

Record: 1 of 150

Public and Stakeholder Communications

To better understand and
communicate with stakeholders, make
their participation **easy and valuable.**

Public and Stakeholder Communications

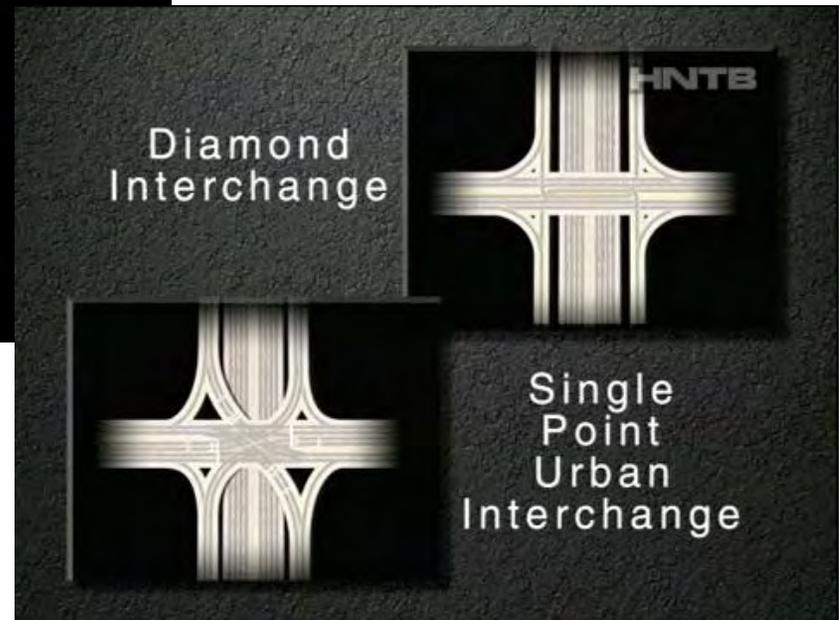
3D Visualization



San Francisco Bay Bridge

Public and Stakeholder Communications

Educational Videos



Single Point Interchanges

Public and Stakeholder Communications

Presentation Tools

The screenshot displays the LiveWorks Presenter software interface. The top window shows the 'PROJECT PROPERTIES' panel with fields for 'PROJECT TITLE' (corpwide_template.swf), 'COVER PAGE' (cover.swf), 'LIVE TOOL TYPE' (checked), 'CHESOPUS SLIDE' (checked), 'SLIDESHOW SLIDE DELAY IN SEC.' (5), and 'IS SOUND LOOP' (media\kT43-6.mp3). Below this is a 'DEFAULT OPTIONS' section with 'DRIPPLE LINK', 'TOOL UP MESSAGE', and 'SERPINE LINK' options. The main content area shows a presentation slide titled 'Pearl Harbor Memorial (O Bridge) - Contract B | Main Index'. The slide features a table of contents with sections: ORGANIZATION AND MANAGEMENT, BUILDING THE BRIDGE, TECHNOLOGY, BUILDING THE O, CLOSING, and QUESTIONS AND ANSWERS. A large image on the slide shows a '2040 Regional Framework Plan' document and a map of the Chicago area. A caption below the image reads: 'IMAGE 1 : The NIPC Realizing the Vision Media Kit, designed by HNTB, provided project stakeholders with a comprehensive print/multimedia program that helped to translate the complex long-range growth plans for Chicago's Metro area.'

HNTB PROJECTS

NIPC

- HNTB developed multimedia marketing materials for the Northeastern Illinois Planning Commission to support the release of its 2040 Regional Framework Plan, which provides a 35-year vision for growth and sustainable development in the six-county Chicago region.
- HNTB planned, wrote, designed and produced an integrated package in a three-month timeframe.
- Print materials included a folder package, 20-page brochure, poster map, envelope, business card, bookmark, and presentation posters.
- The multimedia CD-ROM included more than 50 screens and 40 minutes of played media, including audio narration and 30 video interviews.
- Sections of the CD-ROM included an interactive interface for regional census and forecast maps, a virtual tour through cities of the future based upon the plan's framework, and access to full plan documents.
- HNTB's services included project management, communications planning, writing and editing, graphic and identity design, illustration development, audio/video production, photography, highly sophisticated Flash development, and print management.

HNTB

LiveWorks™ Presenter

Public and Stakeholder Communications Web Sites

NTTA
NORTH TEXAS TOLLWAY AUTHORITY

SEARCH

ABOUT NTTA

CUSTOMER SERVICE CENTER

WORKING WITH US

214-461-2000 (Admits Offices)
5800 West Plano Parkway
Suite 100,
Plano Texas 75093
web@ntta.org

www.ntta.org

Welcome to the new NTTA Website!
You told us what you wanted, and we listened.
After reading your emails about our web site all year, and conducting our first-ever customer satisfaction survey, we learned that you wanted several improvements made to our web site. We took your suggestions and implemented them and invite you now to take your time and navigate your way through our new site. Please make sure to visit the new Online Customer Service Center also. Once you have reviewed the site, please let us know what you think by emailing web@ntta.org

DNT at Frankford
PG&T at Angier
PG&T at Sandy Lake
Updated 06/2008 3:04:02 PM
[Go to driving conditions map](#)

Project Overview
Study Maps
Community Center
Design-Build
InfoZone
Site Map

Submit A Comment

THE NEW I-64

Project Overview
Study Maps
Community Center
Design-Build
InfoZone
Site Map

Submit A Comment

INTERACTIVE STUDY MAP
View Plans for The New I-64 in Detail. Click to learn more.

SITE MAP CONTACT US

US 82 Greenville Bridge
LONGEST CABLE-STAYED BRIDGE SPAN ON THE MISSISSIPPI RIVER

MISSISSIPPI RIVER 2006
— Washington County, Mississippi —
— Chicot County, Arkansas —

Greenville Bridge Television Documentary
Read more about it (click to view)

WHAT'S HAPPENING?
 > Main Span Closure
 > Construction Photo Album
 > Construction Timetable
 > Television Documentary (new)

MAIN SPAN CLOSURE FRIDAY-SATURDAY, APRIL 21-22
Details and large-format photos on the [Main Span Closure](#) page. Other photos in the [Photo Album](#).

PROJECT SUMMARY MULTIMEDIA COMMUNITY CENTER WEB CAM

For more than half a century, we've known this road as US-40, but...
Get Ready St. Louis, there's a new highway in your future, and construction work starts in 2007! Once construction begins, this web site will be your source for daily project updates. Until then, we are here to provide news and information to help you prepare for what's ahead.
 Next step is ... The New I-64

[Flash plug-in](#). Please select YES if you are prompted to download Flash.
 Department of Transportation. All rights reserved.
 Technology.

Public and Stakeholder Communications

Content Management Systems

Add Event - Microsoft Internet Explorer provided by HNTB Corporation

Address: http://admin.alachuainterchange.com/modules/event/EventOccurrenceGet.do?eventOccurrenceId=6

Event Occurrence Title: PD&E Kickoff Meeting

Descriptions:

Event Location: Santa Fe High School

Event Location Link: http://www.mapquest.com/maps/map.adp?address=1

Address: 16213 NW U.S. Highway 441

Address 2:

Event City: Alachua

Event State: Florida

Zip: 32615

Country:

Event Country: United States

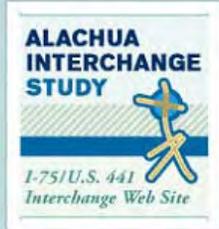
Occurred: September 27, 2005 5:00 PM to 9:00 PM

Status: Active

Document Sets:

Image Sets:

Save Cancel



ALACHUA INTERCHANGE STUDY
1-75/U.S. 441
Interchange Web Site

Meetings and Events

As meetings and events are scheduled, the details will be posted here.

PD&E Kickoff Meeting
September 27, 2005
5:00 PM
Santa Fe High School
16213 NW U.S. Highway 441
Alachua, FL 32615

[Directions](#)

- Home
- Project Overview
 - Study Area
 - FAQ
 - Glossary
- Accomplishments
 - Project Progress
- Community Information
 - Meetings and Events**
 - News
 - Comments
- Project Documents
- Design Alternatives
- Contact Us
- Site Map

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Related links: [City of Alachua](#), [Alachua County](#)
Web site developed by [HNTB Corporation](#)



Public and Stakeholder Communications

Surveys: Engaging and Fun

MISSOURI'S FUNDING ALLOCATION CHALLENGE

SKIP VIDEO

A double challenge designed for you

HOW TO PLAY

Drag and drop coins in the desired area. The amount used of your \$100 will be displayed in real time.

Click on each area for more information.

Aviation Freight Maintain Current Build/Expand

\$2

[LINK](#)

[DEMO](#)

Public and Stakeholder Communications

Surveys: Administration Made Easy

The screenshot shows the 'Survey - Survey Add Form' interface in the RealTime WORKS application. The top navigation bar includes 'PROJECT', 'MODULES', and 'SECURITY'. Below this, a secondary navigation bar contains 'Events', 'Comments', 'Subscribers', and 'Surveys'. The main form area is titled 'Survey - Survey Add Form' and contains several sections:

- Survey Title:** A text input field.
- Survey Code (admin use only):** A text input field.
- Description:** A rich text editor with a toolbar containing icons for bold (B), italic (I), bulleted list, link, unlink, and other text formatting options.
- Redirect URL:*** A text input field.
- Completion Text:*** A rich text editor with a toolbar similar to the Description field.

A note below the Completion Text field states: '*One or the other of Redirect URL or Completion Text is required. If you enter a redirect URL, users will be taken to that page after completing the survey. If you enter completion text, a page will display containing the text.'

The **Survey Options:** section is titled 'User Restriction Options' and contains four radio button options:

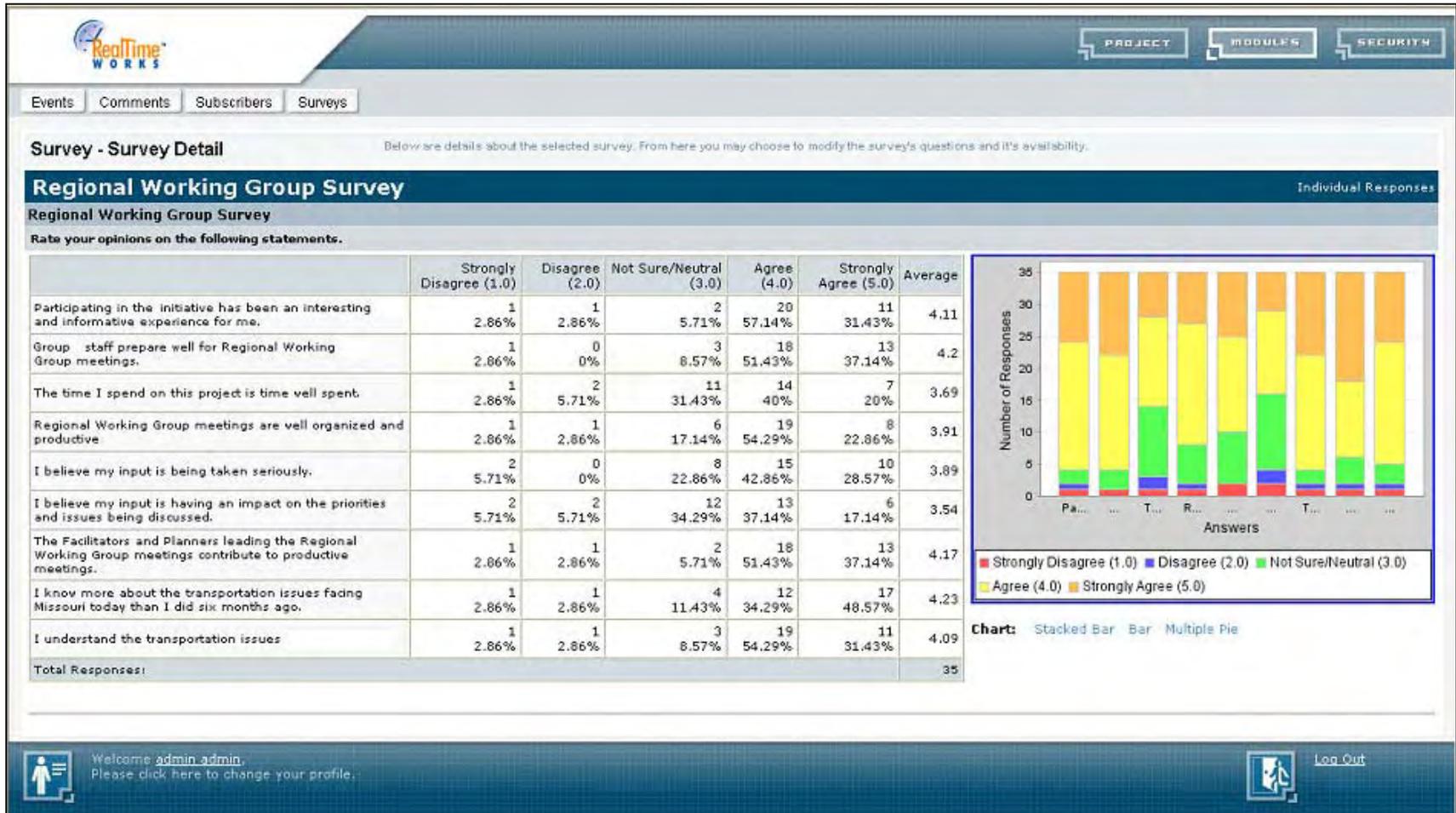
- By Invitation Only - Track Responses** - Survey link must be sent to a user. The user must click the link in the email to be identified as a valid user. The user may only take the survey one time.
- By Invitation Only - Anonymous Responses** - Survey link must be sent to a user, as it will not be available on the web site; however, because no id will be attached to the email, the recipient could forward the email to others or take the survey more than once.
- Public - unlimited response** - Users can access the survey through a web site. Users are not tracked and may take the survey as many times as they would like.
- Public - one time response** - Users can access the survey through a web site. After a user takes the survey, a cookie is placed on his machine to prevent the user from taking the survey again. If the user deletes the cookie, he can take the survey again; however, this is the best way to prevent users from taking a survey more than once without identifying them.

At the bottom of the form are 'Save' and 'Cancel' buttons.

The footer of the application shows a user profile icon with the text 'Welcome admin_admin. Please click here to change your profile.' and a 'Log Out' button. The system tray at the very bottom shows 'Done' and 'Internet' status icons.

Public and Stakeholder Communications

Surveys: Detailed Results



Welcome admin_admin.
Please click here to change your profile.



Log Out

Public and Stakeholder Communications

Surveys: Face-to-Face Effectiveness



Public and Stakeholder Communications

Data Integration: ITS

MARQUETTE INTERCHANGE PROJECT

[Getting Around](#) | [Project Guide](#) | [News and Talk](#) | [Traffic Information](#) | [Submit Comments](#) | [Site Map](#)

[En Español](#) | [Hmong](#)

TRAFFIC information

- [Current Traffic Conditions](#)
- [Sign up for Alerts](#)

Milwaukee's Marquette Interchange, a cornerstone of southeastern Wisconsin's highway system since the 1960s, is being replaced with new structures and roadway.

Use the information utilities on our web site to keep up with current traffic conditions and ramp closures, and to plan your trip to or through downtown.

Make [mchange.org](#) part of your daily routine as construction continues through 2008.

GETTING around

- [Map Your Route](#)
- [Ramp Closure Schedule](#)

INFO zone headlines other INFO zone news inside

There are no current InfoZone headlines

PROJECT guide | [Get the big picture of the old and new Marquette Interchange](#)

| [Governor's Welcome](#) | [DBE Outreach](#) |

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Read our [Legal Notice](#), [Privacy Notice](#) and [Acceptable Use Policy](#).
Web Site developed by HNTB Corporation in association with Milwaukee Transportation Partners.
Map-It Routing tool developed by CH2M Hill and ESRI in association with Milwaukee Transportation Partners.

[LINK](#)

Public and Stakeholder Communications

Data Integration: ITS

 Powered by RouteWorks™, desktop delivery of traffic alerts and information. An icon in the system tray flashes when new information is received.

TrafficBug™

File Options Help

Settings

Select Routes:

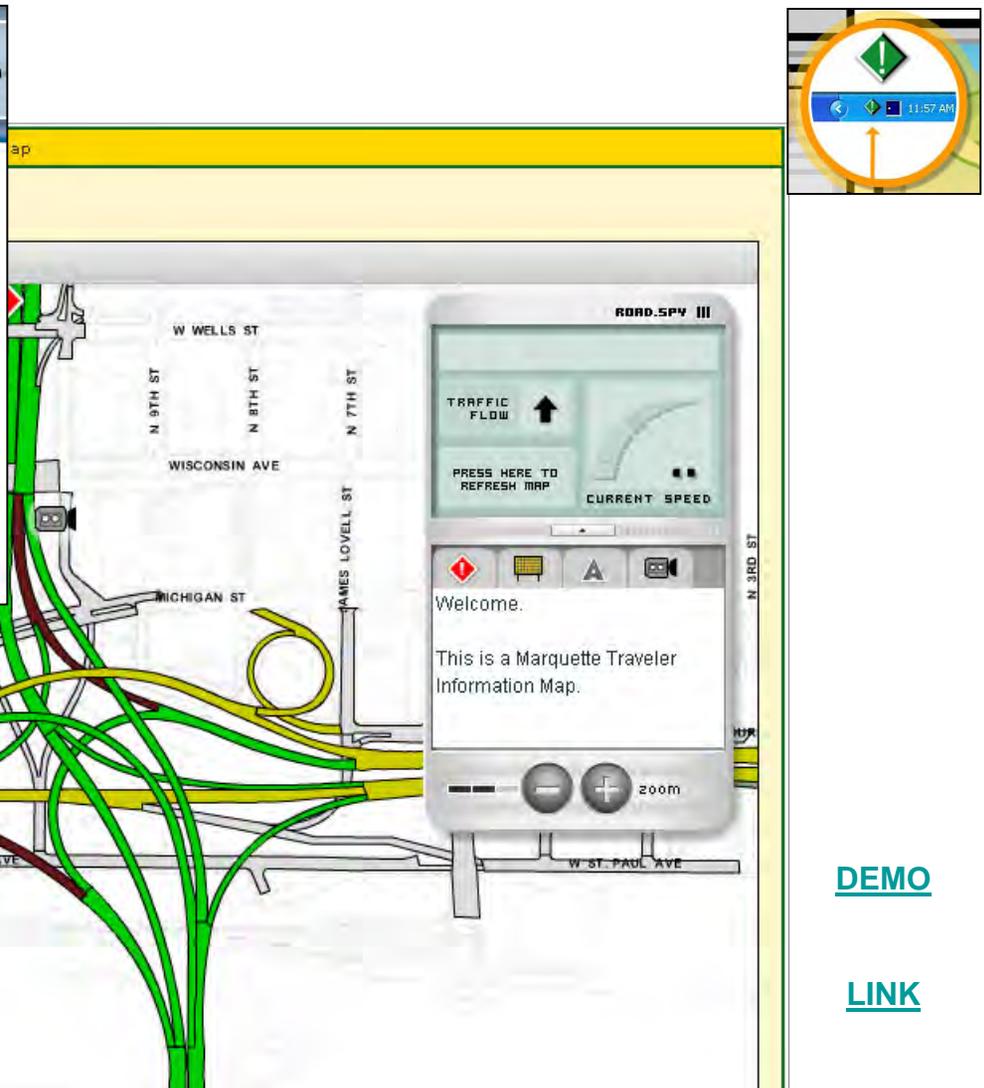
<input type="checkbox"/> SB I-43 to WB I-94	<input type="checkbox"/> NB I-94/43 to NB I-43
<input checked="" type="checkbox"/> SB I-43 to SB I-94/43	<input type="checkbox"/> NB I-94/43 to WB I-94
<input type="checkbox"/> SB I-43 to EB I-794	<input type="checkbox"/> NB I-94/43 to EB I-794
<input type="checkbox"/> I-43 to Marquette Interchange	<input type="checkbox"/> NB I-94/43 to Marquette Interchange
<input type="checkbox"/> EB I-94 to NB I-43	<input type="checkbox"/> WB I-794 to NB I-43
<input checked="" type="checkbox"/> EB I-94 to SB I-94/43	<input type="checkbox"/> WB I-794 to WB I-94
<input type="checkbox"/> EB I-94 to EB I-794	<input type="checkbox"/> WB I-794 to SB I-94/43
<input type="checkbox"/> EB I-94 to Marquette Interchange	<input type="checkbox"/> WB I-794 to Downtown

Select Advisories:

Traveler Alerts Closures Performance

Ok Cancel

SKIP



ROAD.SP.V III

TRAFFIC FLOW ↑

PRESS HERE TO REFRESH MAP

CURRENT SPEED

Welcome.

This is a Marquette Traveler Information Map.

zoom

MAP LEGEND

0-19	20-39	40-55
MPH	MPH	MPH

- LOCAL STREET
- NO DATA
- DATA FAILURE
- CLOSED



[DEMO](#)

[LINK](#)

Public and Stakeholder Communications

Data Integration: Messaging Systems

NTTA
NORTH TEXAS TOLLWAY AUTHORITY

HOME SITE MAP

Traffic Conditions

NEW! Driving Conditions

Need to find out about traffic on the toll roads?
Use this interactive map to help you more effectively use the toll roads and get where you're going fast!
To see more detailed information, simply hover the mouse over the section of interest!

Incident Travel Time Lane Closures

Eastbound MLP 9 to MLP 8 - Normal Flow
Current Travel Time: 5 min 57 sec
Typical Travel Time: 5 min 57 sec

Westbound MLP 8 to MLP 9 - Normal Flow
Current Travel Time: 5 min 57 sec
Typical Travel Time: 5 min 57 sec

Normal Flow
Slight Delays
Expect Delays
No Data Collected

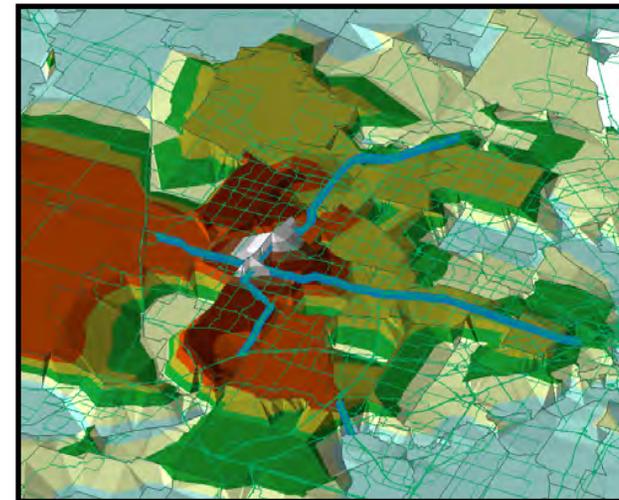
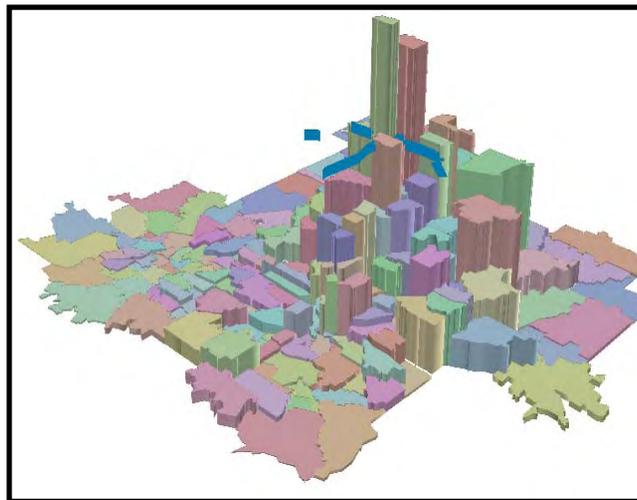
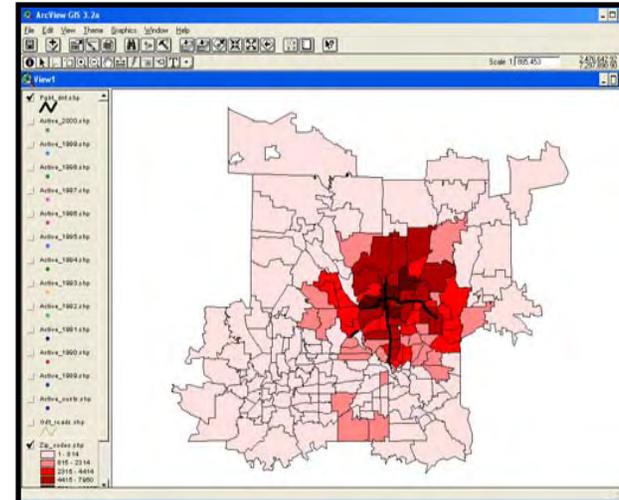
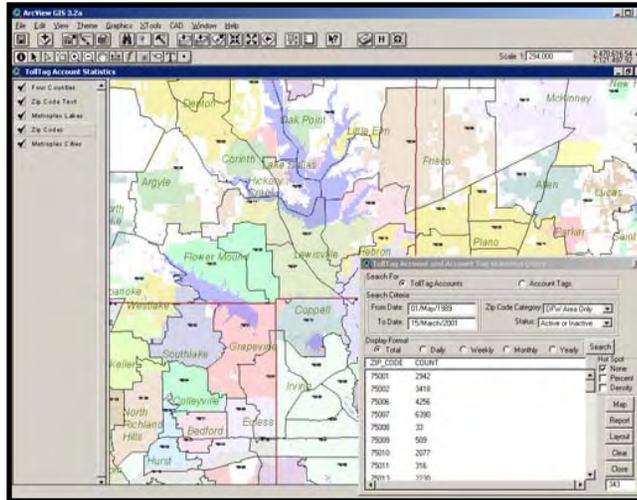
Updates occur approx. every two minutes

- NTTA Board
- Toll Tags
- Violation Processing
- Traffic Conditions
- Driving Conditions
- Cameras
- News Releases
- Roadways
- Projects
- About NTTA
- Business
- Employment
- Contact Us



Public and Stakeholder Communications

GIS-Based Business Systems



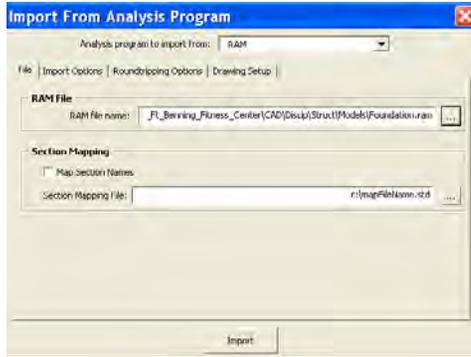
TollTag Market Analysis

Design Analysis and Constructability

New technologies bring projects to life early in the design process and provide value from planning through construction and beyond.

Design Analysis and Constructability

Building Information Modeling (BIM)



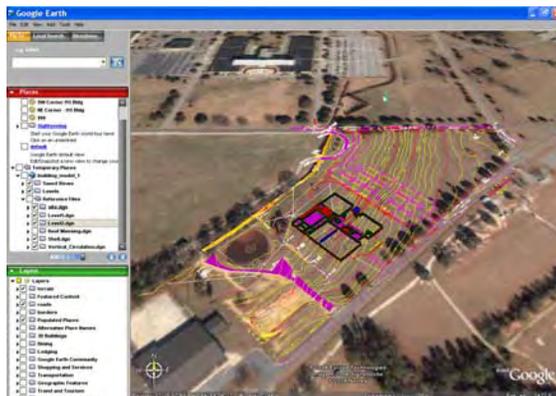
Structural Analysis Integration

Member Count	Length of STR member	261.33	261.33
	STR Weight (Len * unit wt)	12491.73	12491.73
HSS16X8X5/16	Member Count	25	25
	Length of STR member	296.67	296.67
	STR Weight (Len * unit wt)	14477.55	14477.55
HSS8X6X1/4	Member Count	37	37
	Length of STR member	437.31	437.31
	STR Weight (Len * unit wt)	11262.66	11262.66
W16X26	Member Count	3	3
	Length of STR member	33.17	33.17
	STR Weight (Len * unit wt)	862.33	862.33
Total Member Count		67	132
Total Length of STR member		1833.65	2600.80
Total STR Weight (Len * unit wt)		64421.81	91044.35

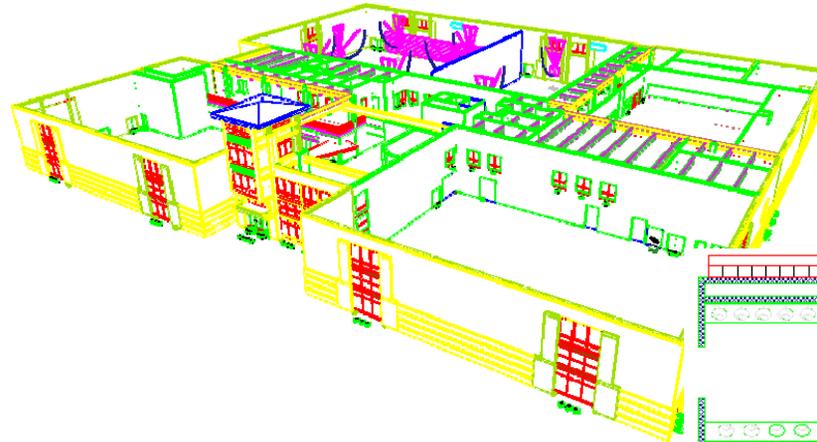
Quantification



Visualization

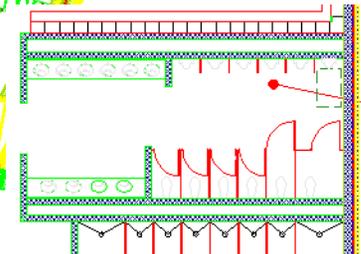


Google Earth™ Export



Instance N	Instance C	Type	filename	Dimension	Dimension	Fram e/dep	Fram e/dep	Fram e/thic	Leatthic
DR-SD-HM	APP	BXF	DR-SD-HM'3' 4"	6' 10"	0' 6 5/8"	false	0' 2"	0' 1 1/2"	
DR-SD-HM	APP	BXF	DR-SD-HM'3' 4"	7' 2"	0' 4"	false	0' 2"	0' 1 1/2"	
DR-SD-HM	APP	BXF	DR-SD-HM'3' 4"	7' 2"	0' 4"	false	0' 2"	0' 1 1/2"	
DR-DD-HM	APP	BXF	DR-DD-HM'6' 4"	7' 2"	0' 4"	false	0' 2"	0' 1 1/2"	
DR-SD-HM	APP	BXF	DR-SD-HM'3' 4"	7' 2"	0' 4"	false	0' 2"	0' 1 1/2"	
DR-SD-HM	APP	BXF	DR-SD-HM'3' 4"	7' 2"	0' 4"	false	0' 2"	0' 1 1/2"	

Intelligent Scheduling

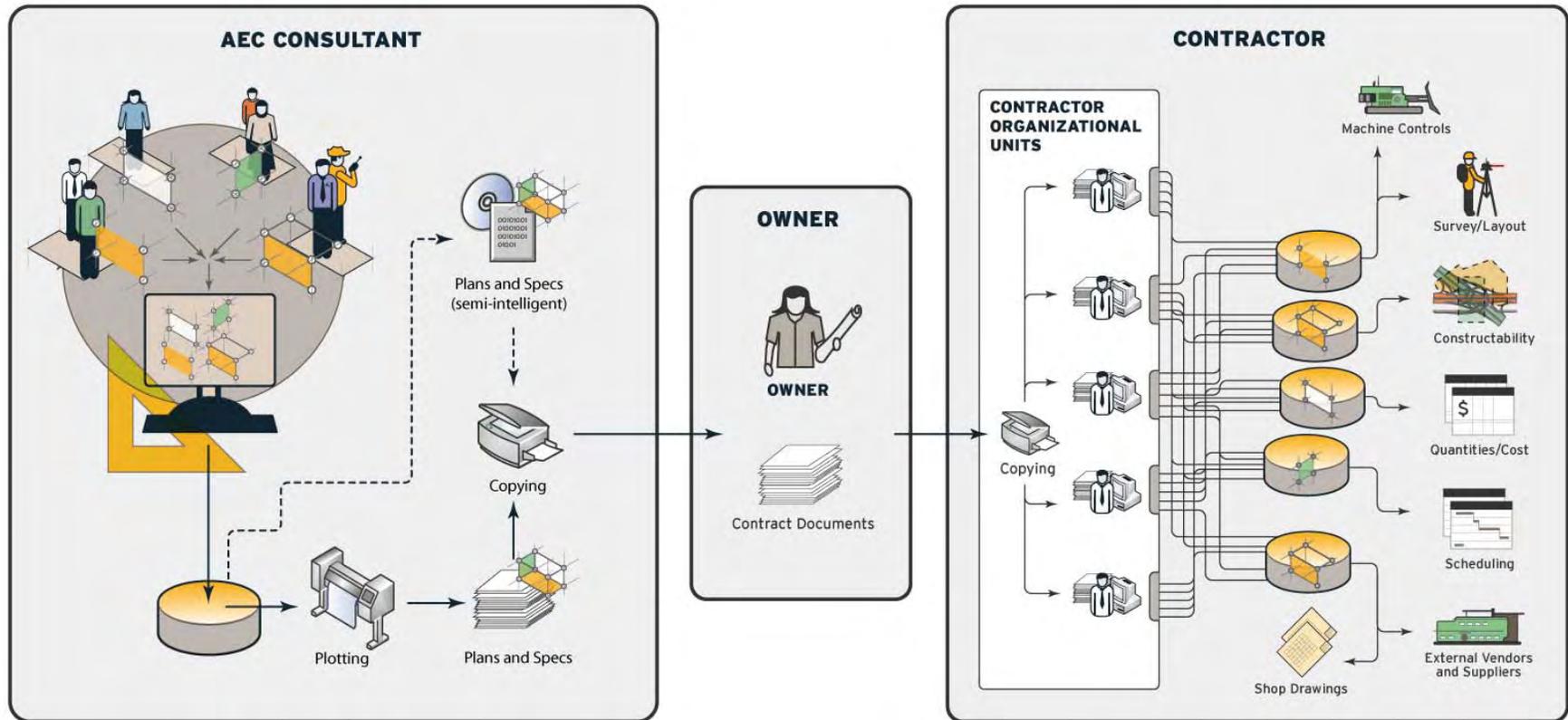


Plan/Detail Extraction

Design Analysis and Constructability

Design/Bid/Build

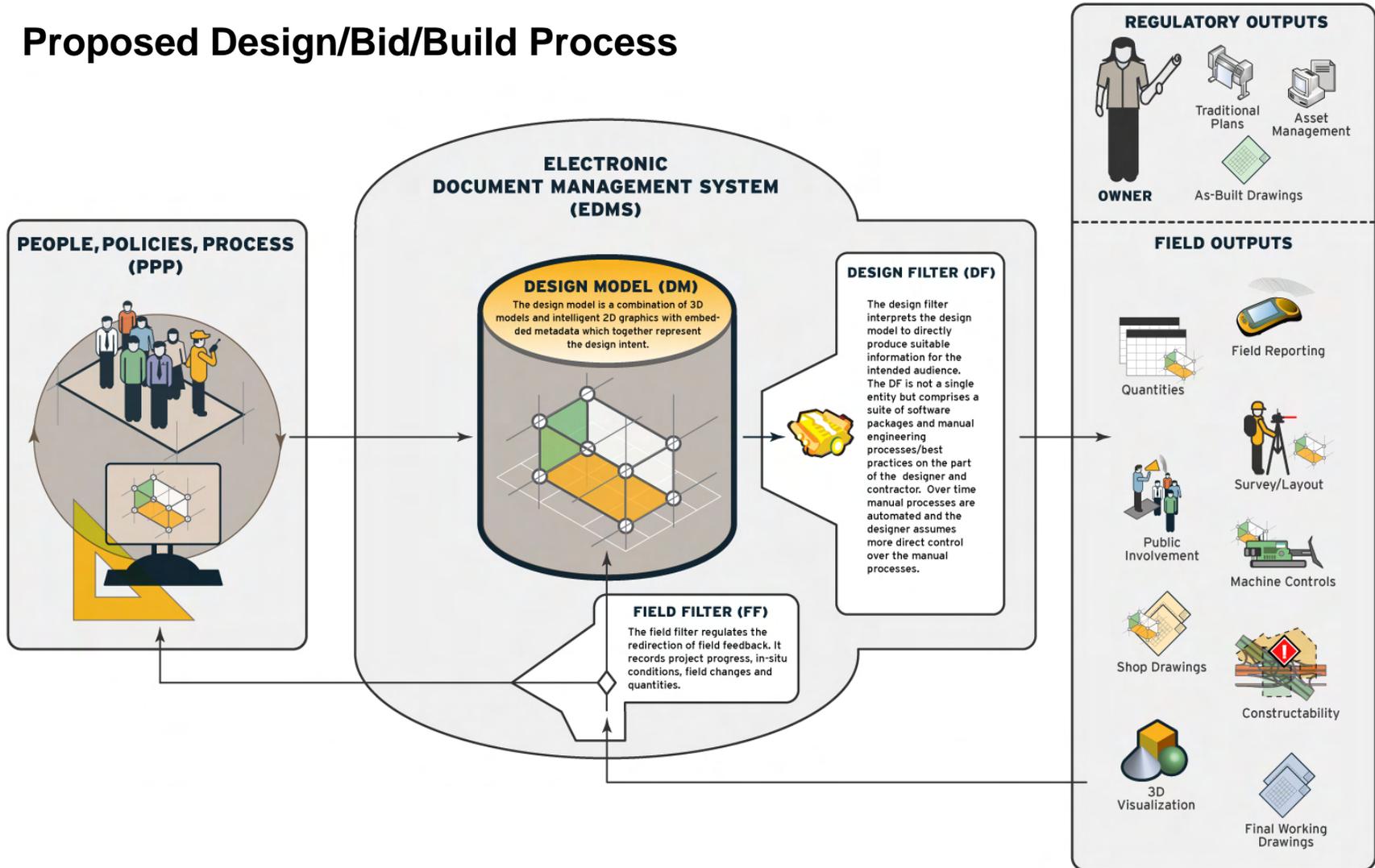
Existing Design/Bid/Build Process



Design Analysis and Constructability

Design/Bid/Build

Proposed Design/Bid/Build Process



Design Analysis and Constructability

TrueViz® Family of Products



Transport®, Simulation™, Interactive Simulation Environment™, OnTarget®

Design Analysis and Constructability

TrueViz[®] Transport

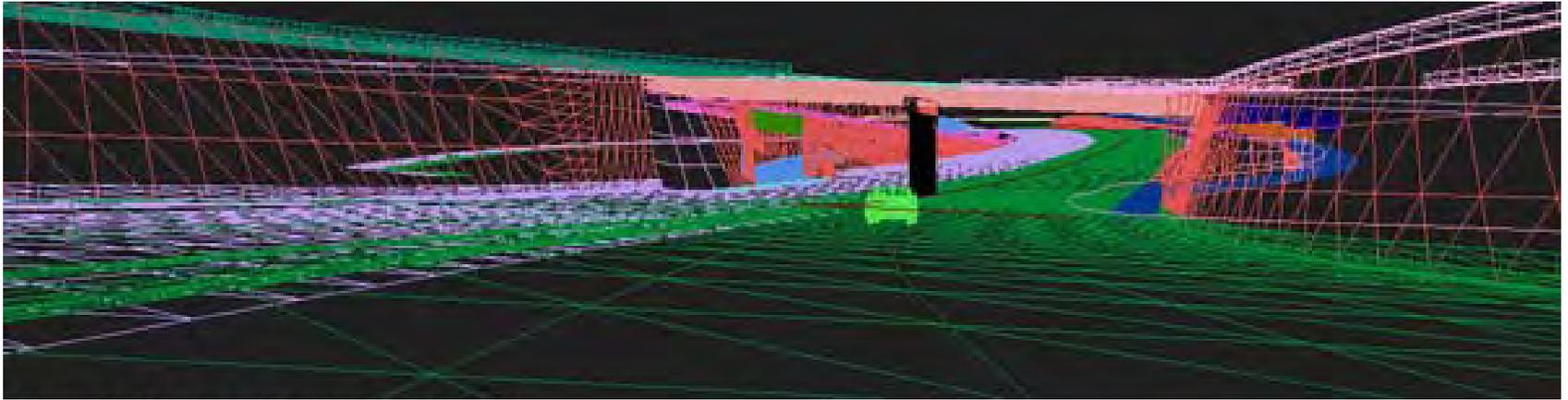


Figure 1: Triangulated Irregular Networks (TIN)

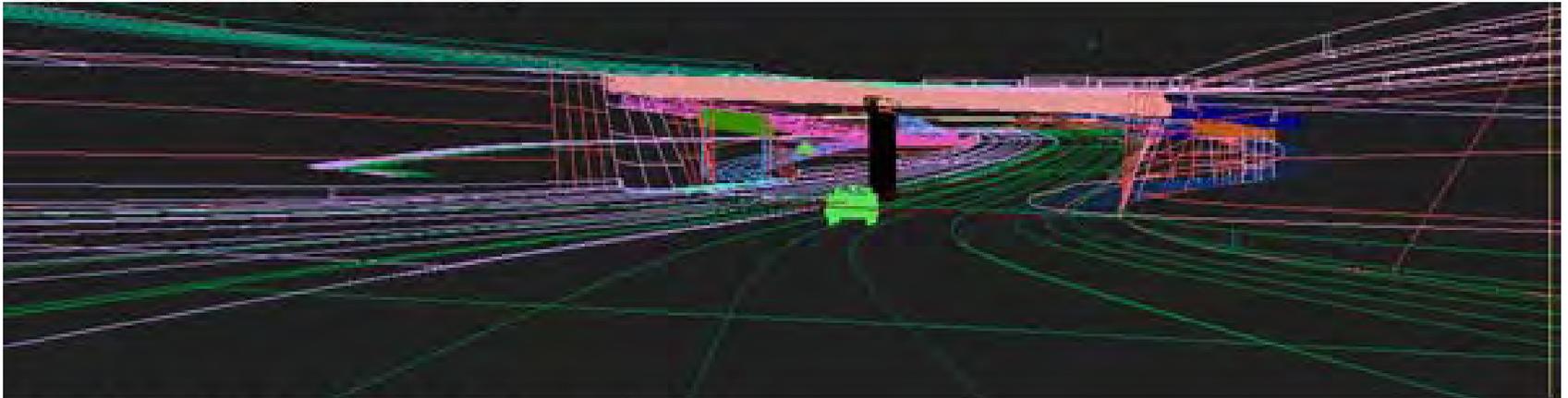


Figure 2: Translation to mathematically defined curves and surfaces

Design Analysis and Constructability

TrueViz® Transport



Design Analysis and Constructability

TrueViz® Interactive Simulation Environment



Design Analysis and Constructability

VISSIM



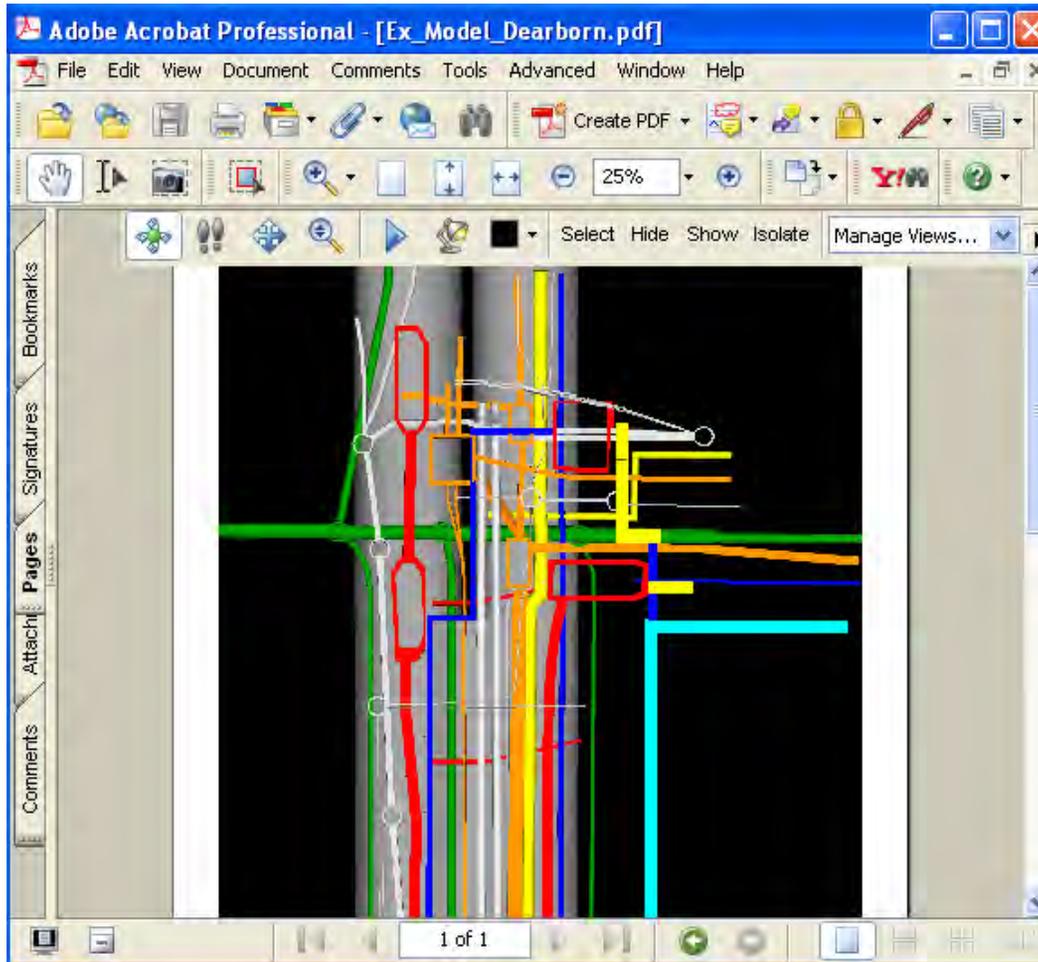
Design Analysis and Constructability

TrueViz® Simulation



Design Analysis and Constructability

Adobe® 3D

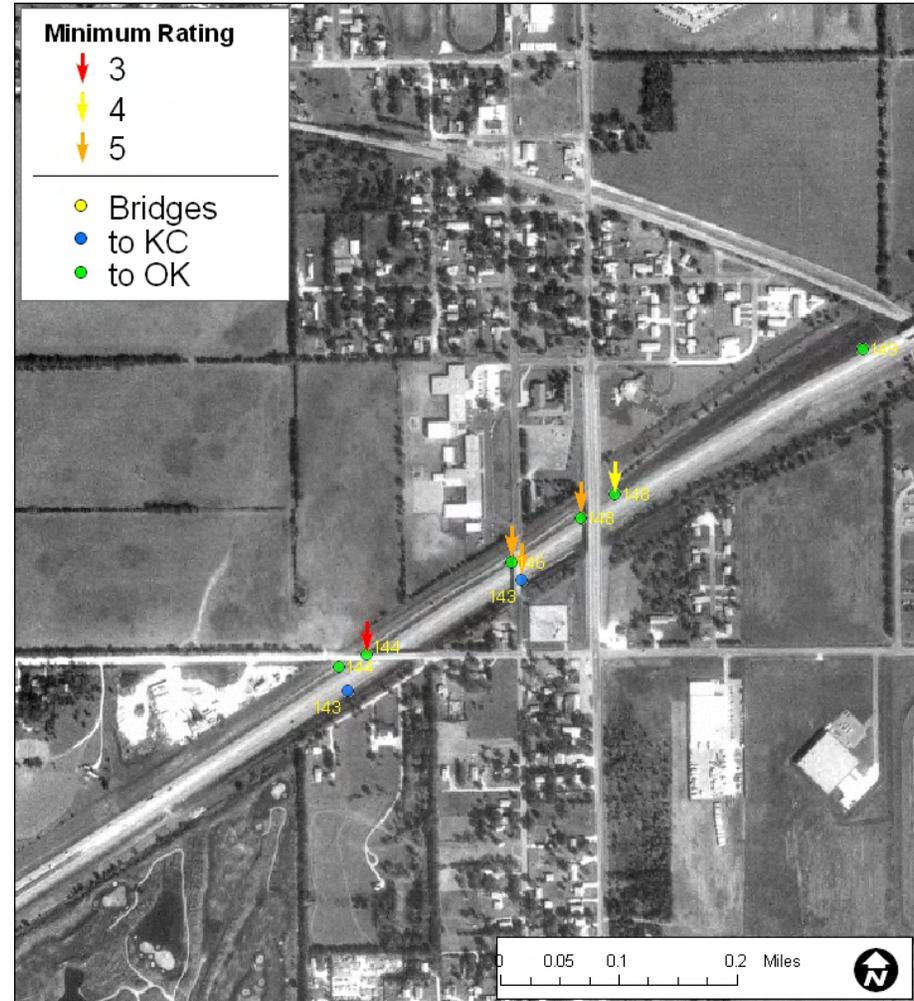


Asset Planning and Management

When clients understand the **critical assets** in their enterprise, they can make **informed decisions** regarding maintenance or replacement.

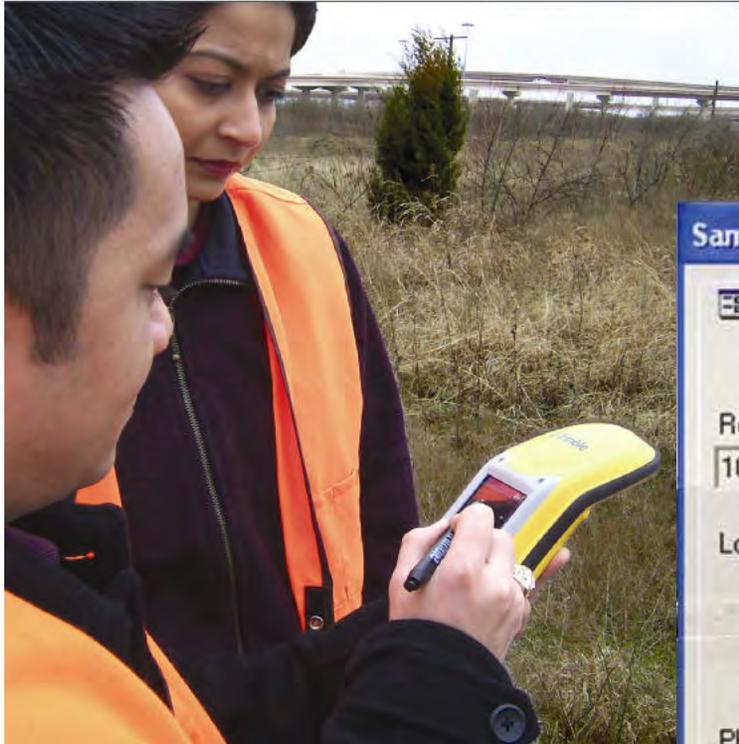
Asset Planning and Management

KTA Culvert Inspection



Asset Planning and Management

Bureau of Land Management



The image shows two overlapping software windows. The 'Sample' window on the left contains the following fields:

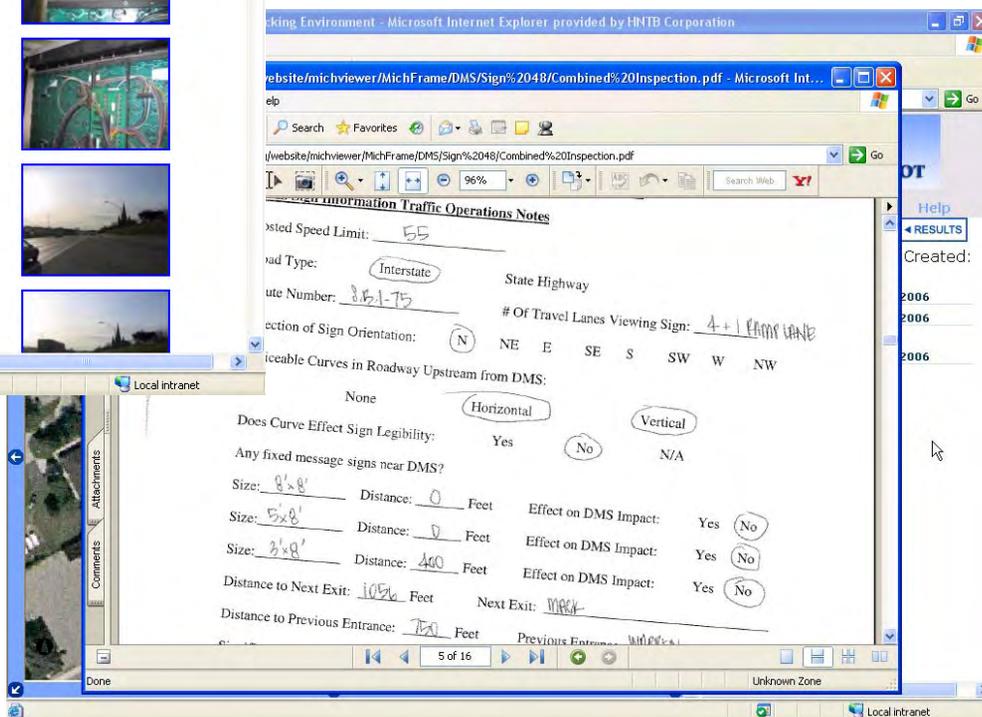
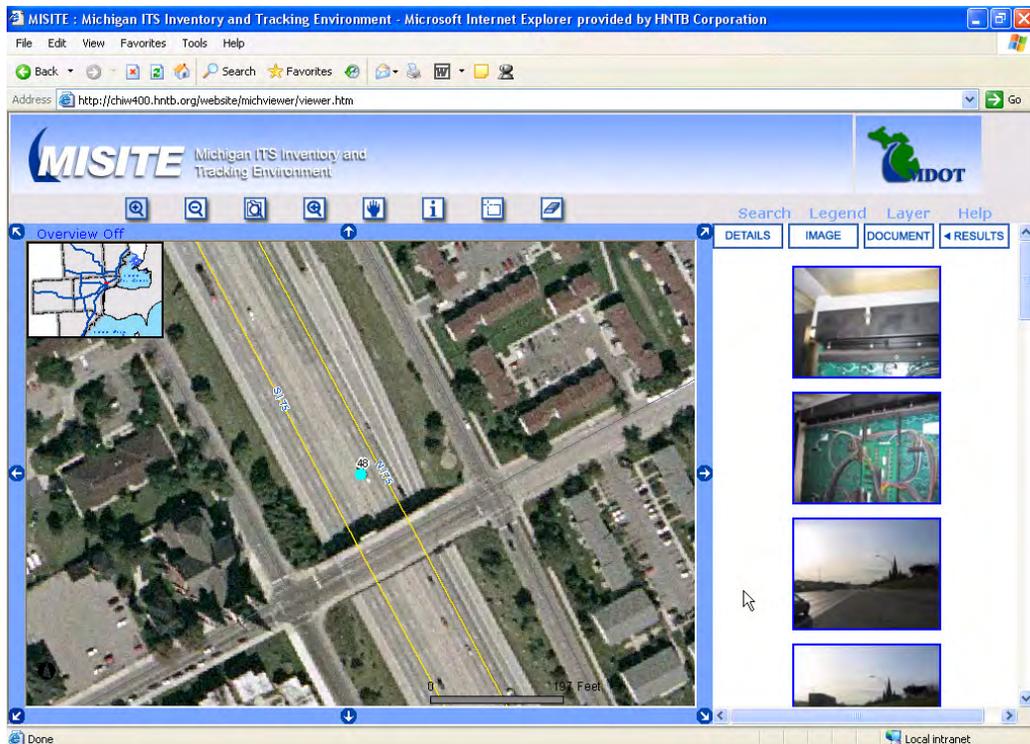
- Site Attributes: | Attribul | |
- Sample ID:
- Route Name:
- Location Type: (dropdown menu)
- Latitude:
- Longitude:
- Photograph Name:
- Buttons: |

The 'Critical Health and Safety' window on the right contains the following fields:

- Site Attributes: | Attribul | |
- Route Name:
- Deficiency: (dropdown menu)
- Dropdown list items:
 - Ditch Condition
 - Culvert Condition
 - Corrugations/Wash Boarding
 - Potholes
 - Ruts
 - Loose Aggregate(gravel roadways)
 - Missing Aggregate(gravel roadways)
 - Cracking(paved roadways)
 - Vegetation Removal
 - Other Appurtenances(cattle guards, lot

Asset Planning and Management

Michigan DOT ITS Asset Inventory



Monitoring Systems

**Monitoring improves traffic management
and threat assessment, leading to
informed risk management.**

Monitoring Systems

BorderCast™

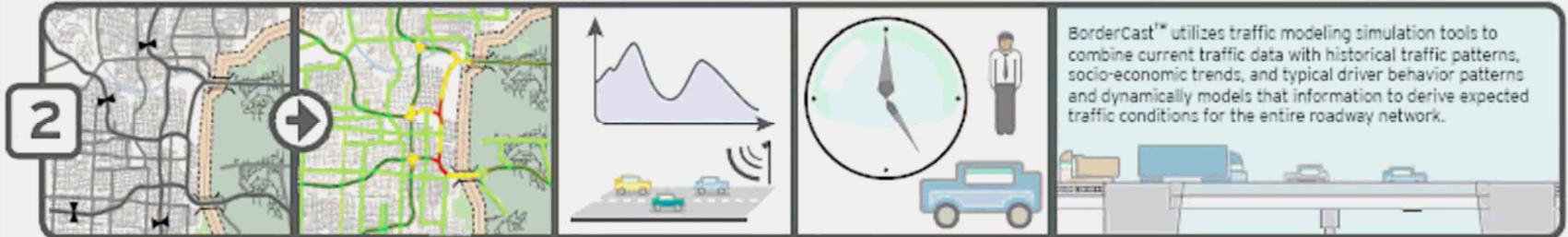
How BorderCast™ Completes the Picture

BORDERCAST™

INPUT



BorderCast™ INTELLIGENT TRAFFIC MODELING



OUTPUT



Monitoring Systems

Video Incident Detection

- Improved response management
- Improved traffic management
- Improved threat assessment
- Reduced road hazard crashes
- Higher conviction rate
- Improved resource recovery

