



**IHEEP
2009**



Bing Maps for Enterprise

Best of Both Worlds: Microsoft Mapping Tools for Transportation Agencies

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Microsoft

Your potential. Our passion.™



Maps
For Enterprise

Best of Both Worlds: Microsoft Mapping Tools for Transportation Agencies

- ✓ What is Microsoft Bing Maps for Enterprise (BME)
- ✓ Transportation applications with BME
- ✓ Idea Integration, Microsoft Gold Partner BME solution for
City of Houston Public Works
- ✓ Microsoft UltraCam & Imagery

The Power of Bing Maps

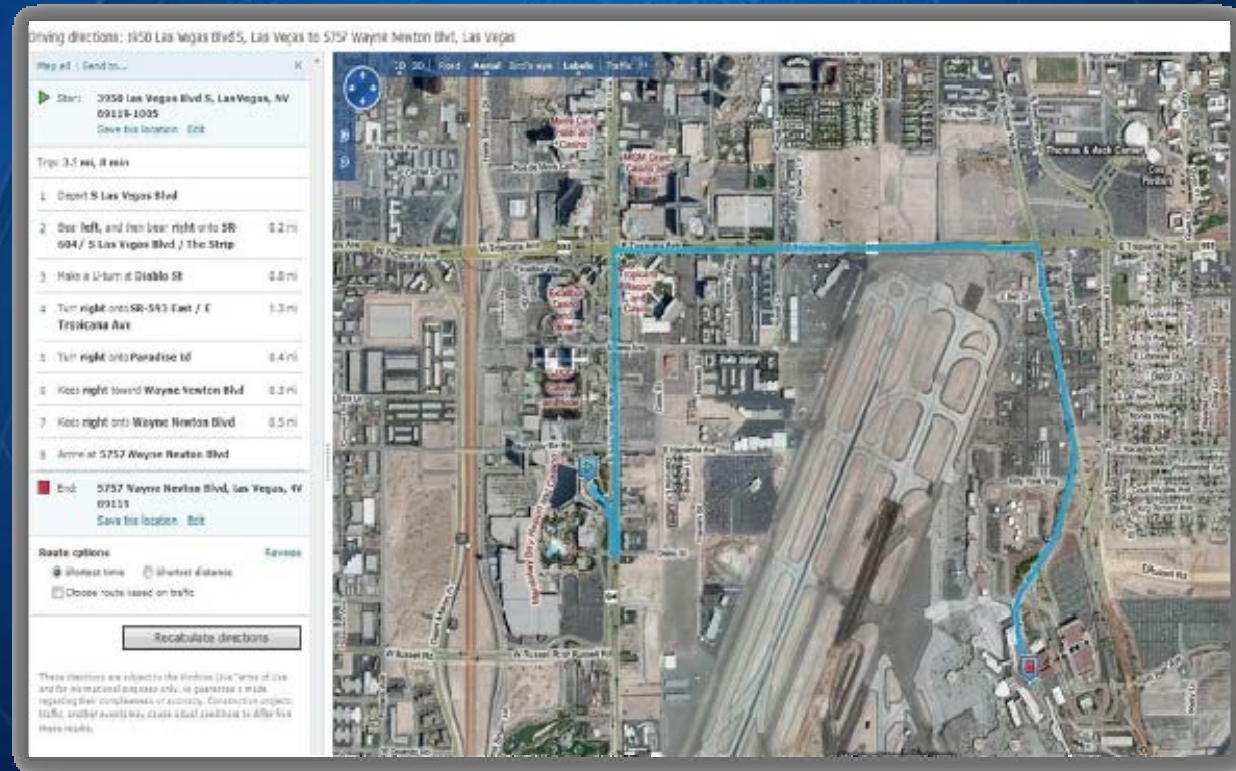
The Microsoft Bing Maps platform is an integrated set of services that helps organizations visualize data and provide immersive user experiences in context of location.

- High resolution aerial views
- Driving, walking directions
- Directions in 13 languages
- Detailed geo-coding
- Customizable tool set
- Other rich features



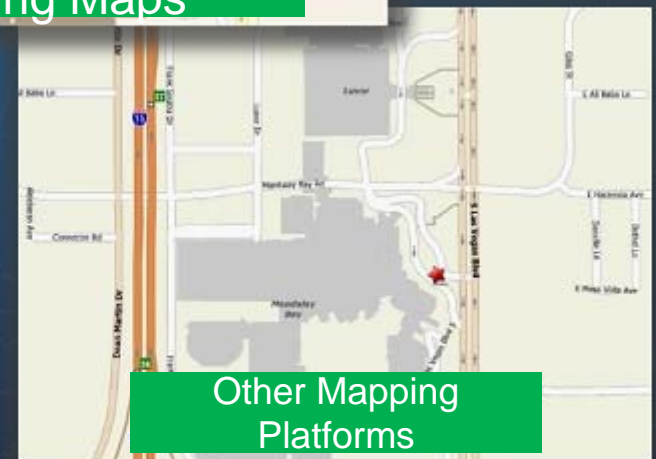
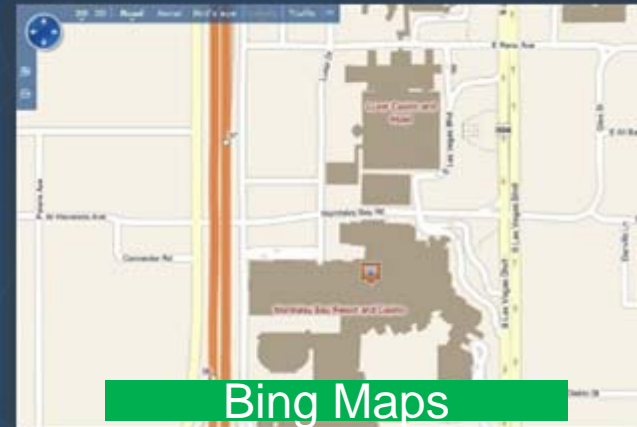
The Power of Bing Maps

- High resolution aerial imagery
- Driving, walking directions
- Directions in 13 languages
- Detailed geo-coding
- Customizable tool set
- Other rich features



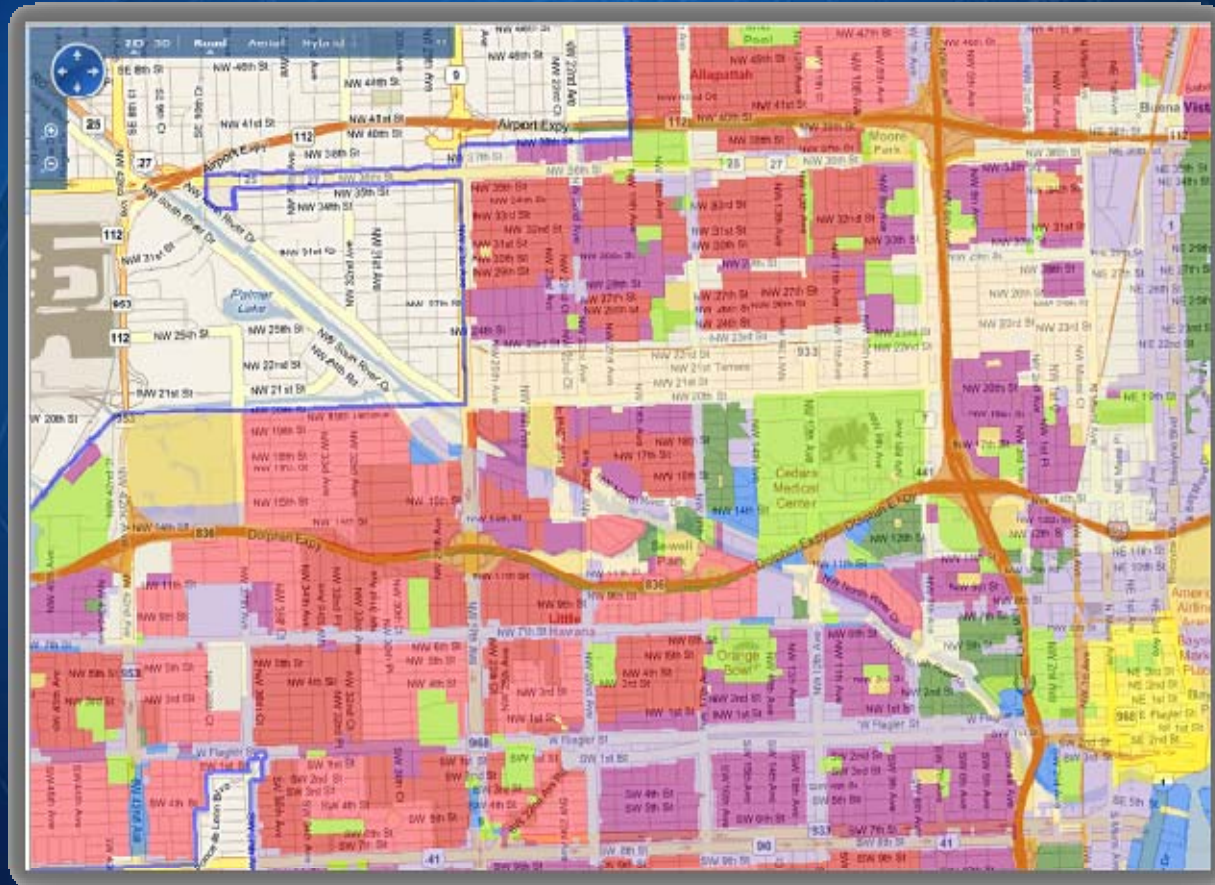
The Power of Bing Maps

- High resolution aerial imagery
- Driving, walking directions
- Directions in 13 languages
- Detailed geo - coding
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- Other rich features



The Power of Bing Maps

- High resolution aerial imagery
- Driving, walking directions
- Directions in 13 languages
- Accurate geo-coding
- Customizable tool set
- Other rich features



Bing Maps Platform

Microsoft's Apps

Bing Maps

<http://bing.com/maps>

Your Applications

Bing Maps JS APIs
and SOAP APIs

[http://www.microsoft.com/maps/
developers/](http://www.microsoft.com/maps/developers/)

Map Data/
Tiles

Imagery/
Tiles

DEMs/
Buildings

Geo-
coding/
Rooftop

Yellow
Pages/
POIs

Traffic

Search/
Proximity

Routing/
Directions

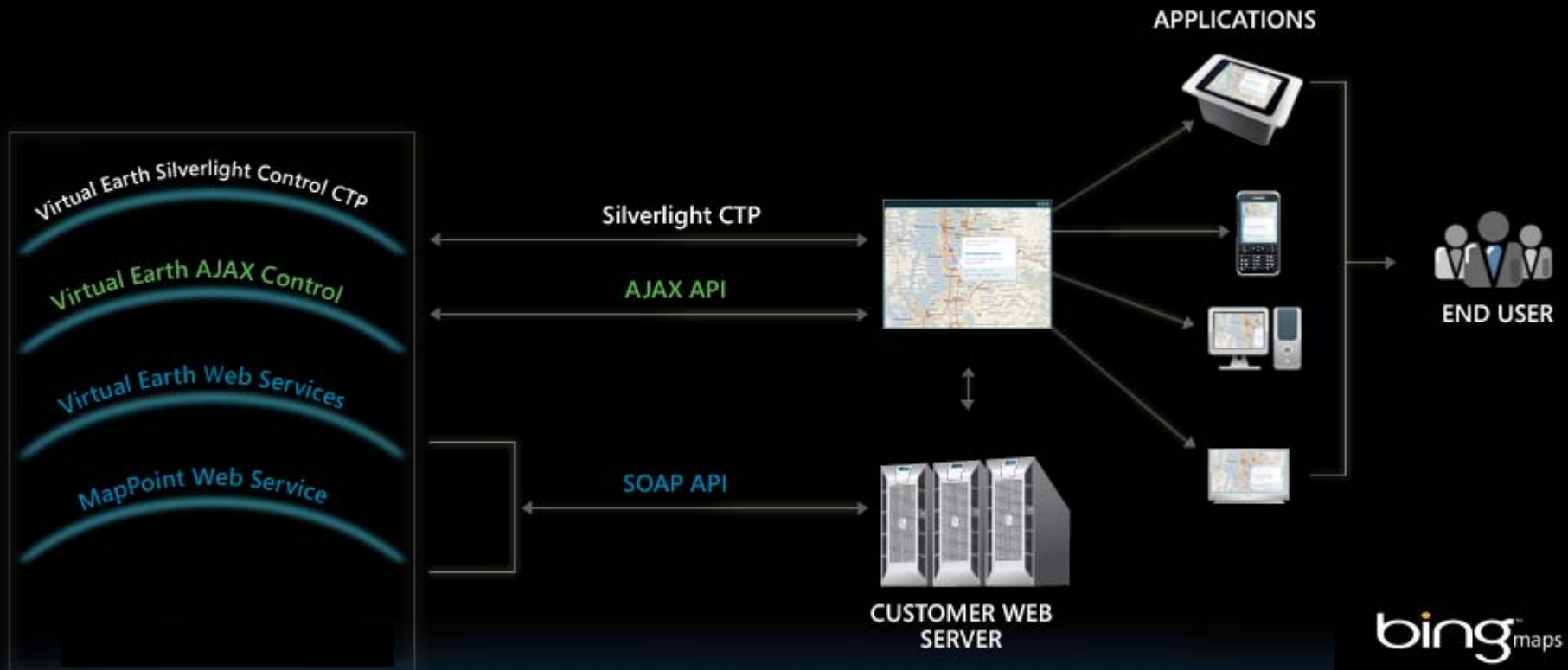
Data
Services/
Reporting

Data Sets & Capabilities



Your Secure Data

More tools for rich end user experiences



Integration Advantage

Web



Desktop



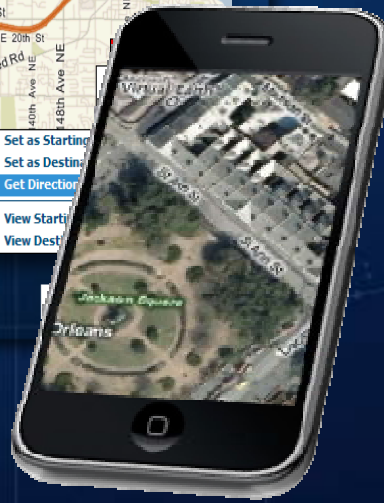
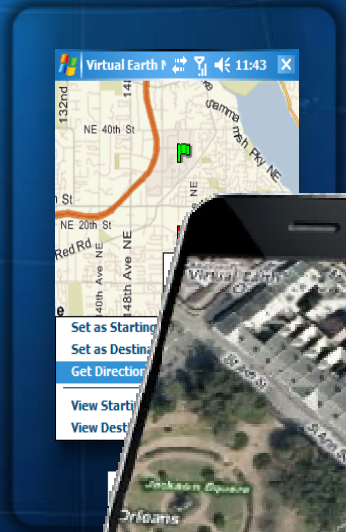
PC

Web

Mobile

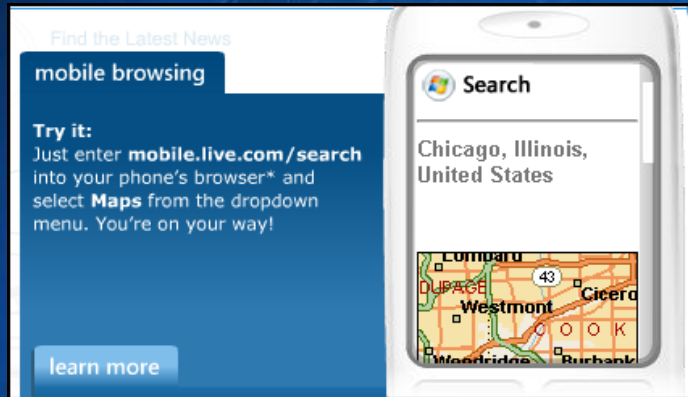


SQL Server
MOSS 2007

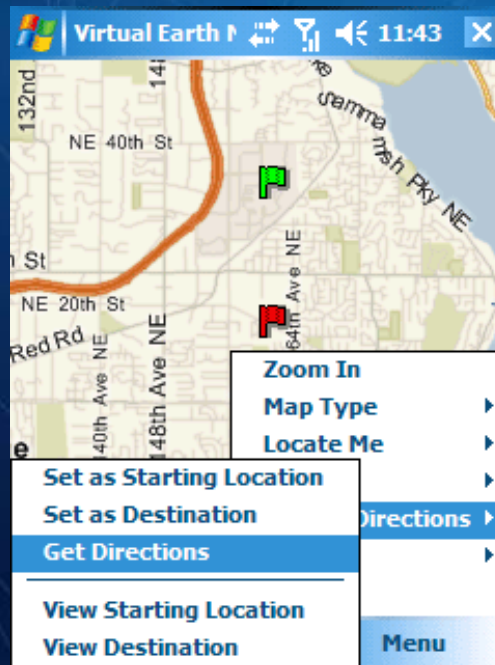


Mobile bing™

Available today @ <http://livesearchmobile.com>



Location & Search
running on Mobile
Devices!



Developing couldn't be easier!

bing
Maps Interactive SDK

I want to:

- Show a map
- Control the map
- Show/hide controls
- Use default shapes
 - Add default shapes
 - Show/Hide a shape
 - See how zindex works
 - Delete shape
 - Delete all shapes
- Customize shapes
- Use shape layers
- Import data into shape layers
- Use custom tile layers
- Find information (basic)
- Find information (advanced)
- Get a multi-point route and directions
- Use birdseye images
- Work with 3D maps
- Use events and callbacks
- Get map info

NEW
What's new in the latest release?

Show file Source Code Reference Learn More

2D 3D Road Aerial Bird's eye Labels cc

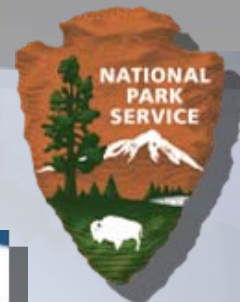
Default shapes Click on the links below to add a default shape to the map.
[Add Pushpin](#) [Add Polyline](#) [Add Polygon](#)
 Set best zoom level when shape is added.



bing

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Trusted by Leading Agencies





Transportation & Transit Customers

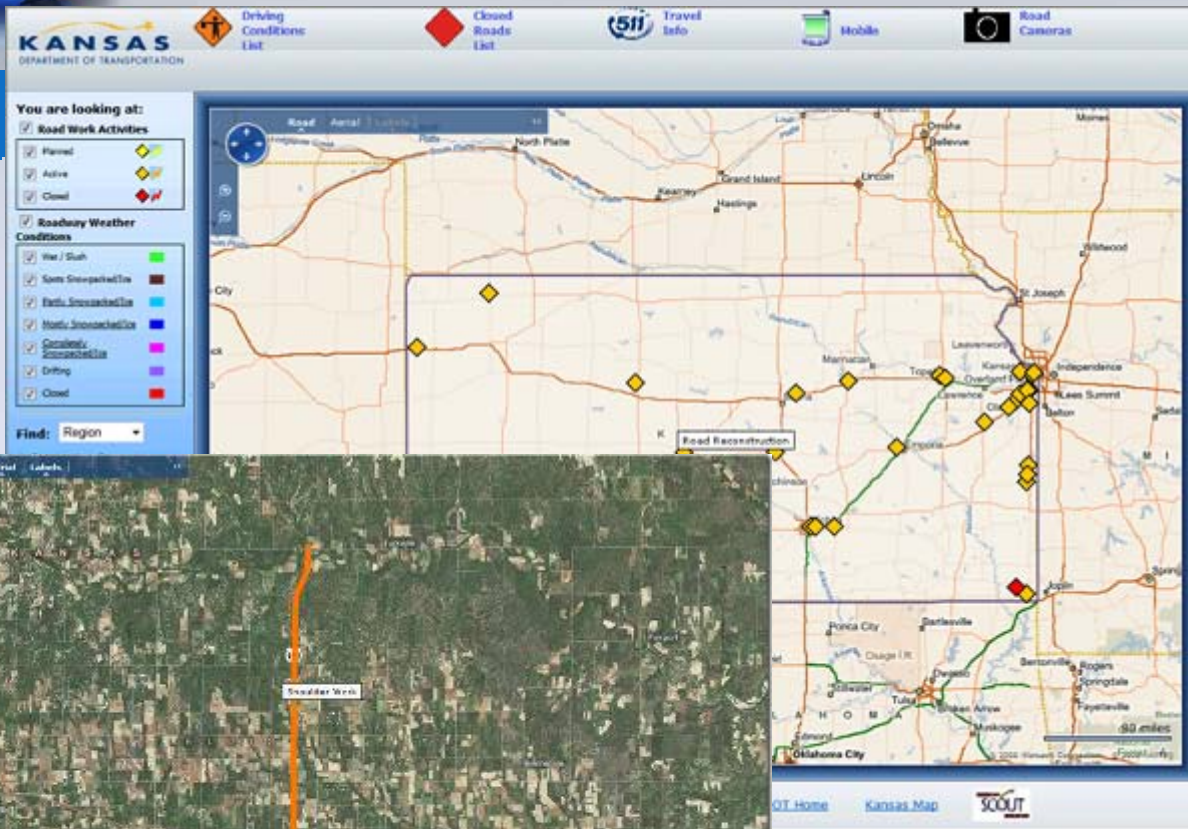
- [TXDOT](#) various DOT Districts, [Project Tracker including Stimulus Projects, Rider 55 & Rider 56](#)
- [Seattle DOT](#)
- [KSDOT](#)
- [OHDOT](#)
- [IL DOT](#)
- [LADOT, LA Ferry & Moveable Bridge](#)
- [VA511](#) & [VA Truck Restrictions](#)
- [Leon County, FL/ISC Traffic Crash Density Map](#)
- [Port Metro Vancouver](#)
- [NYCT Trip Planner](#)

Kansas Dept of Transportation

KSDOT

“Virtual Earth gives us a friendly interface, ease of use, and a platform we can build on in the future”

“...gives us a measure of peace and reliability that we didn't necessarily have before” - Ron Kaufman, Bureau Chief of Public Involvement



Virginia Dept of Transportation 511 & Truck Restrictions

VA511



Road Conditions

Use the drop-down menus and map controls below to zoom in and out and move around the map. Click an icon for information.

Richmond OR -- Select a Road --

Location: Albemarle (County)
Description: On Rt. 616 (Union Mills Rd) in the County of Albemarle, in the vicinity of Fox Hunt Dr; Rt. 1056W/E (Albemarle County), motorists can expect potential delays due to a vehicle accident. The north through lanes are closed. The south through lanes are closed.
Last Updated: 09/08/2008 16:36:54

Hover over icons for map key

Microsoft Virtual Earth

“Our job at VDOT is to keep traffic moving, Virtual Earth helps us do that by providing an easy-to-use Web application to show the information people need to know to make good travel decisions”- Bill Cannell, IT Project Manager

“Virtual Earth allows us to provide an excellent base map to our customers and a consistent user experience across applications” – Robert Borter, GIS section technical lead

Ohio Dept of Transportation Buckeye Traffic & Crash Data Analysis



Ohio.gov Department of Transportation

Welcome!

20 30 Road Accident Labels

Help / FAQ
Travel Status
Region: Statewide
Closures & Restrictions
Road & Weather Sensors
Road Activity
Web Cameras
Winter Conditions
Apply Filters

Text-Only Version
Travel Advisories
Options

Ted Strickland, Governor
Juliana H. Holtkamp, ODOT Director

Crash Data Analysis Tool - Microsoft Internet

http://cdast.dot.state.oh.us/Cr

Crash Data Analysis Tool

Crash Data Analysis Tool

Crash Query

MONDAY
 TUESDAY
 WEDNESDAY
 THURSDAY
 FRIDAY
 SATURDAY

Hour of Day
 Year
 2004
 2005
 2006
 2007
 2008

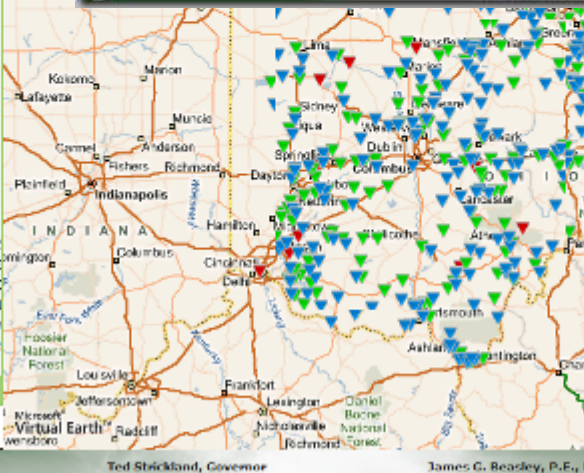
Crash Type
 Crash Severity
 Driver/Vehicle (first 3)
 Alcohol Type
 DATA NOT AVAILABLE
 NO ALCOHOL DETECTED
 ALCOHOL NOT STATED
 HBD - ABILITY IMPAIRED
 HBD - ABILITY UNKNOWN
 HBD - ABILITY NOT MP

Animal Type

Crash Selection Tools

Get Data Update Map

Done



Closures & Restrictions
Road & Weather Sensors
Road Activity
Accident
Disabled Vehicle
Flooding
Roadwork
Name of Incident
Other
Web Cameras
Winter Conditions
Apply Filters

Text-Daily Version
Travel Advisories
Options

ROAD ACTIVITY ROADWORK PLANNED

Route Name: 95-104
Road Status = reduced
Device type = (downstream, RR 1 - 4) (downstream) - all lanes closed
Estimated Start: 3/22/2008 5:30:00 AM
Estimated End: 3/23/2008 5:30:00 AM

Latitude: 39.9207958500295 Longitude: 82.9010520117107

Ted Strickland, Governor
James G. Beasley, P.E., P.S., ODOT Director

Texas Dept of Transportation ITS & Project Tracker



✓ TXDOT - Intelligent Transportation

Amarillo

El Paso

Dallas/Fort Worth

Houston

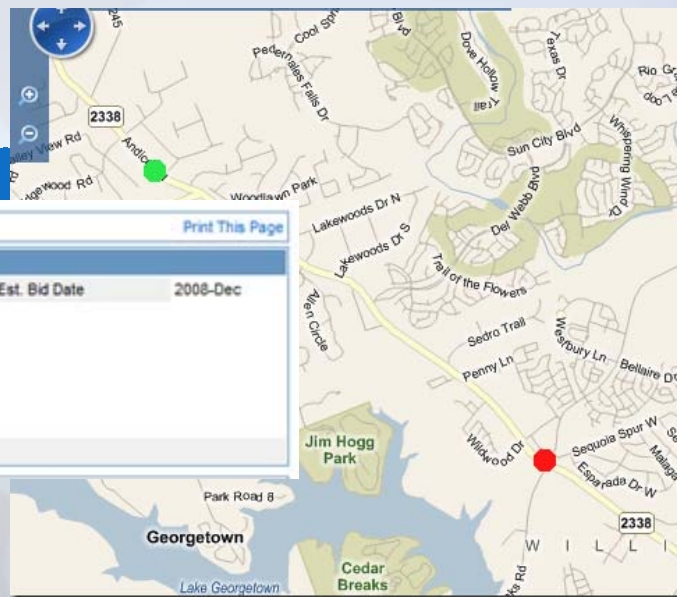
Laredo

Lubbock

Wichita Falls



✓ Project Tracker - public informed of the progress of funded transportation projects statewide



Data updated on: 1/08/2009 2:25 PM

[Print This Page](#)

Project Summary							
Project ID	221101016	TxDOT District	Austin	County Name	Williamson	District Est. Bid Date	2008-Dec
Highway	RM 2338	Project Length	4.500 Miles	Proposition 14 Project	No		
Work From	0.3 MI W OF FM_3405						
Work To	3.3 MI W OF IH 35 (D.B. WOOD RD)						
Description	Widen Roadway						
Project Note	This project is being developed by non-TxDOT resources. Estimates have been provided to TxDOT by these resources.						
	Show Project Location						

Seattle Dept of Transportation Traveler's Web Portal



SEATTLE.GOV City Services Departments Staff Directory

SEATTLE.GOV
Greg Nickels, Mayor

Seattle Department of Transportation
A vibrant Seattle through transportation excellence

Travelers Information Map

Viaduct @ Blanchard St

 Mouse over icons for more details.

 SDOT and WSDOT Traffic Cameras

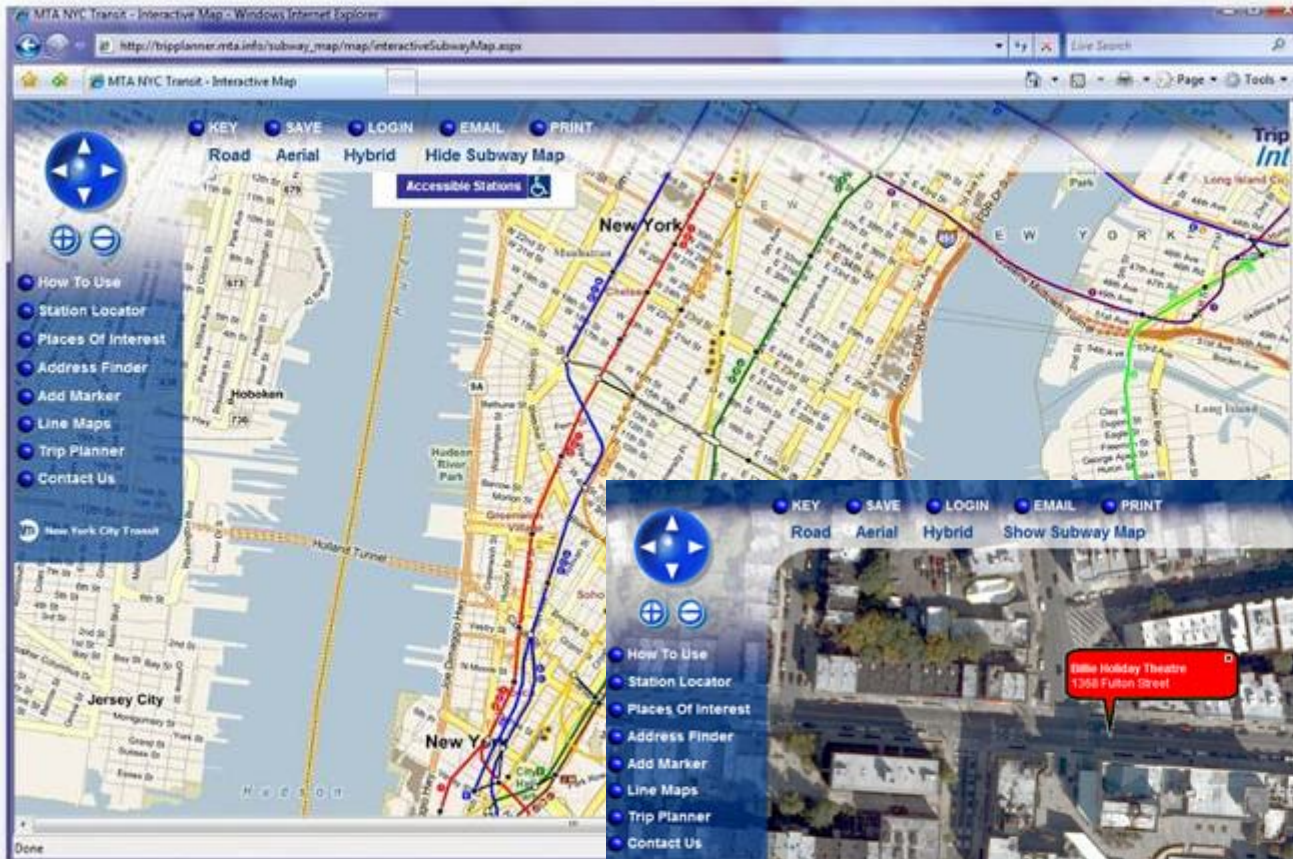

heavy light

Construction

4TH AVE

From: VIRGINIA ST
To: BLANCHARD ST
Lanes Affected: NB
Description: 4th Ave paving, Blanchard to Olive streets. At least 2 lanes open south of Lenora, on lane open north of Lenora.
Start Time: 3/23/2009 8:00 AM
Est. End Time: 7/31/2009 5:00 PM
[More Details](#)

New York City Transit Trip Planner



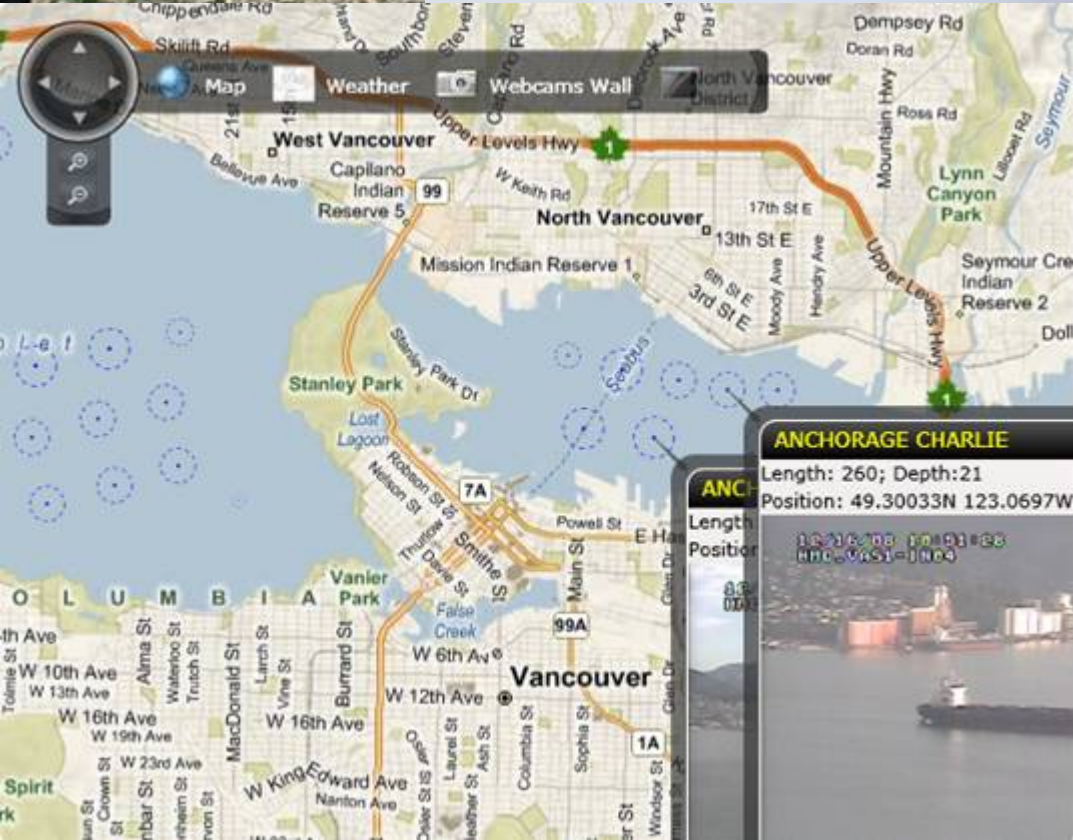
NYCT Trip Planner
Trip Planner is now used by more than 3.7 million customers, a **187% increase over 2007**





Port of Vancouver

Locate/track – vessels & cargo



Microsoft and ESRI Integrated Technology



Where We Align: Technology

ArcGIS Desktop



Client



Desktop



.NET Framework

Microsoft Direct



ArcGIS Online & ArcGIS Server



ASP.NET AJAX



Microsoft Virtual Earth

Microsoft IIS Internet Information Services



Online

ArcGIS Server



Server



.NET Compact Framework



Mobile

bing™ maps

Tools



Microsoft Expression

Microsoft Popfly



How it Works

ESRI ArcGIS Server 9.3 with Bing Maps for Enterprise

Microsoft Virtual Earth and ESRI:
Great location-based solutions. Even better together.



Use Virtual Earth base maps with ArcGIS Desktop.

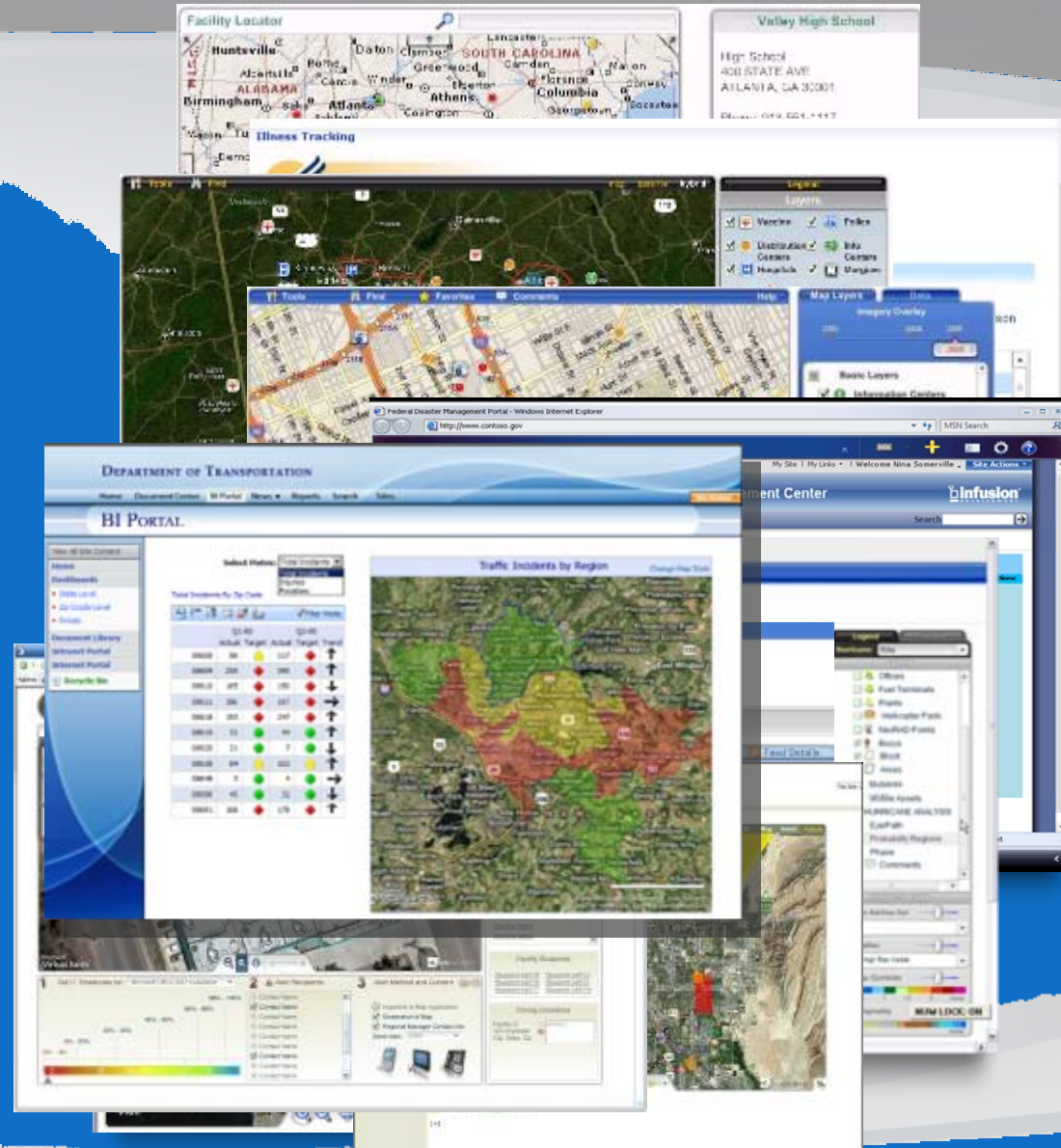
Deploy maps more easily with one-click authoring to the ArcGIS Server 9.3.

Add your own data to rich imagery from Virtual Earth to bring your Web applications to life.

Bing Maps for Enterprise Solutions

Powered by our Partner Ecosystem

- Disaster & Response Management
- Health Crisis Portals
- Focused Logistics & Loss Prevention
- Supply Chain Management
- Business Location Intelligence
- Inspection Management
- Asset Management
- Security Command & Control
- Scenario Modeling
- IT Health & Management





Todd Buehlman, Idea Integration



Data Collection Mobile Unit Pavement





Todd Buehlman, Idea Integration

Agenda

Introductions

Update on Project Status

Overview of Solution

Tour of Vehicle

Demonstration Drive

Overview of Data Processing

Review of Data Visualization Tool

Questions



idea integration

MPS
LISTED
NYSE



Todd Buehlman, Idea Integration

Rutting, IRI, and Cracking Collection Devices on Vehicle



CrackScope

Road Profiler



Todd Buehlman, Idea Integration

Location and Distance Devices





Todd Buehlman, Idea Integration

Immersive Media 360° Video Camera





Todd Buehlman, Idea Integration

Data Processing

CrackScope - 772680809A71G200091054801_CO1G20001.jpg

Operation: Full size Seal White box Flip over Perspective Max

100 zoom Check Unmark Transfer Invert Median

High pass Mid pass Allpass 0.1 Image Size 2x

Overlay Path Grid Load Unload From Stop Exit

CrackScope - 772680809A71G200091054801_CO1G20001.jpg

CrackScope - 772680809A71G200091054801_CO1G20001.jpg

Time	Severity	Message
**		

Step 1 – Process Images with CrackScope

City of Houston Payment Application

COH Custom Desktop Application

Report on Pavement Data | Process Data | Import Video MetaData

Select Runs to Process:

F:\20080918\0000918\0000918\4581201 | Browse

Data Processing not started.

Data Processing Log

Time	Severity	Message
**		

Step 2 – Generate Scores

Invasive Media Visual Editor

File Edit Options Help

EDL File Name: E:\20080918\0000918.edl

Mark IN Mark OUT Clear List Play EDL Play DVE Entry Launch EDL in Web

Name	Duration	Frame #	Start Time	End Time	First Frame	Last Frame	PDF File Name
20080918_01	00:01:15:10	2280	08:08:00.00	08:09:15.17	1	2287	R13\loc... Sep

PDF View: R13\loc... Sep 11:08:14:55:32\EDV:0001.PDF

Made: Current PDF | Frame: 25 | Time: 00:00:00.00 | Speed: 1 | View: A

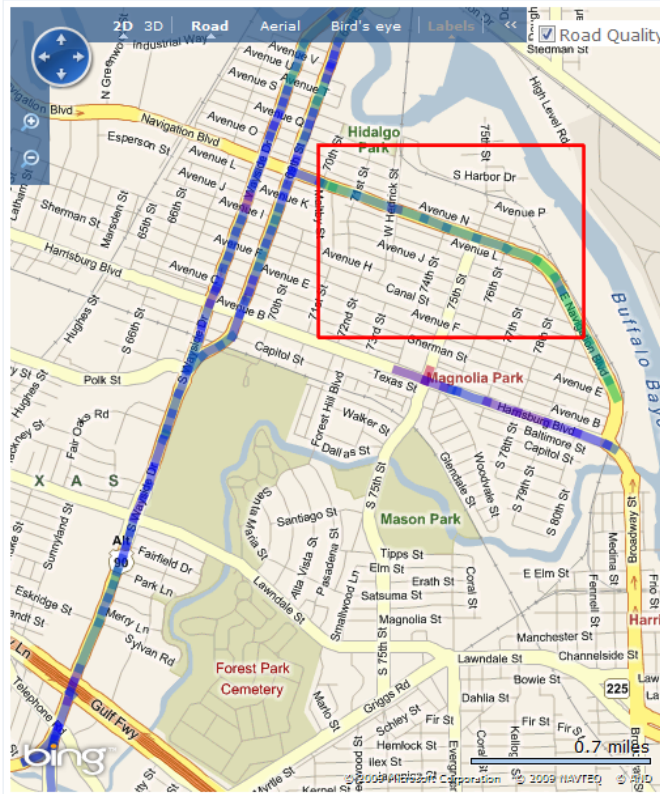
Position: Elevation: 6.6 m | Longitude: 108°14.293' W | Latitude: 29°42.122' N | Heading: 029.00° | Speed: 0.04 m/s

Total Duration: 00:01:15:11

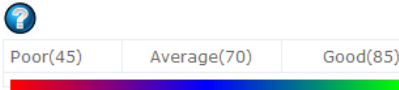
Step 3 – Create Video

Todd Buehlman, Idea Integration

Data Visualization Tool – Map Interface



StarMap	KeyMap	Street Name	From Block	Lane Miles	Pavement Type	Pcr Score
1127627	495T	E NAVIGATION BLVD	1100	0.06	Rigid	77.31
1127587	495T	E NAVIGATION BLVD	1200	0.10	Rigid	90.95
1130053	495X	E NAVIGATION BLVD	700	0.07	Rigid	87.08
1120822	495X	E NAVIGATION BLVD	800	0.16	Rigid	90.65
1091636	495S	NAVIGATION BLVD	0	0.03	Rigid	60.99
1091524	494V	NAVIGATION BLVD	6900	0.10	Rigid	71.46
1078357	494V	NAVIGATION BLVD	6950	0.01	Rigid	67.97
1100246	494V	NAVIGATION BLVD	7000	0.04	Rigid	88.94
1078036	494V	NAVIGATION BLVD	7024	0.10	Rigid	83.40
1091626	495S	NAVIGATION BLVD	7100	0.15	Rigid	80.28
1091726	495S	NAVIGATION BLVD	7200	0.11	Rigid	82.90
1091801	495S	NAVIGATION BLVD	7300	0.09	Rigid	80.63
1091883	495S	NAVIGATION BLVD	7400	0.13	Rigid	83.23
1130381	495S	NAVIGATION BLVD	7500	0.13	Rigid	80.84
1120815	495S	NAVIGATION BLVD	7600	0.13	Rigid	84.03



- To select roads with scores, hold down the CTRL key and use the mouse to draw a box on the map
- To select all roads, hold down CTRL+SHIFT and use the mouse to draw a box on the map
- To zoom in, hold down alt and use the mouse to draw a box on the map



Todd Buehlman, Idea Integration

Data Visualization Tool – 360° Video

City of Houston Pavement Application

Section Video



Run Videos : [1](#) [2](#) [3](#) [4](#) [5](#) [6](#)

StarMap ID: 1141230	Overall PCR: 52.30	Potholes: 0
Key Map: 618G	Street Name: MEADOW GARDENS DR	Lane Miles: 0.11
Council District: E	From Block: 2214	To Block: 2299

Right click [here](#) to download current high resolution video (200+ mb).



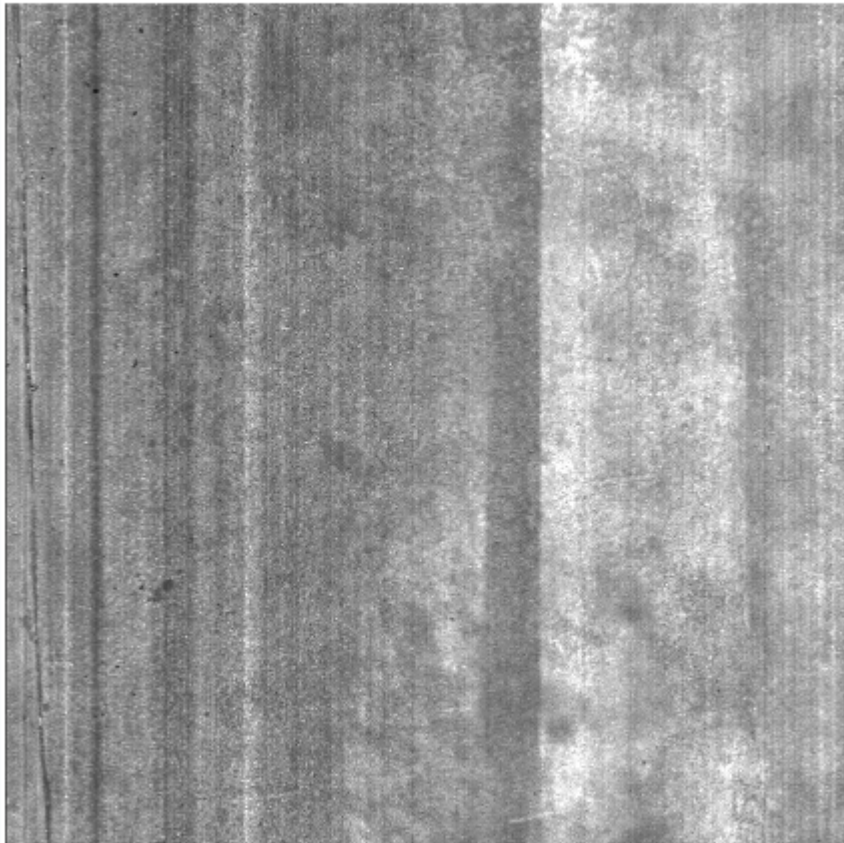
Todd Buehlman, Idea Integration

Data Visualization Tool – Pavement Images

City of Houston Pavement Application

Section Images

Pavement Images : 1 of 20 for Section 1141347



Previous 1G001957.jpeg Next



Todd Buehlman, Idea Integration

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City of Houston

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713.837.7508

713.569.2116



idea[™] integration

MPS
LISTED
NYSE



Pat McConnell, Microsoft UltraCam

From Web Mapping to Map Acquisitions UltraCamLp

Corridor Mapping the UltraCam Way

Microsoft

Your potential. Our passion.™



Why Segmentation?



**Efficiency:
The Right Tool For The Right Job**

To Big For The
Job



To Small For The
Job

Microsoft

Your potential. Our passion.™





Two Worlds – Two Cameras




The Right Tool For The Right Job



Why Segmentation?

- 15,000 Images per year
- Local Business
- 150,000 Images per year
- Global Business





Can a medium format camera make the cut?

SENSOR

- DMC
- UltraCam Lp
- UltraCam Xp

PIXEL ARRAY

- 13810*7600
- 11704*7920
- 17310*11310

Cost (cam, mount, FMS, maint.)

- ~1.2M USD
- ~480K USD
- ~1.1M USD



Cont'd

SENSOR

At GSD=2" 100knts 60% FL cycle rate=

- DMC 3 sec
- UCLp 3.13 sec
- UCXp 4.47 sec



Cont'd

SENSOR	Footprint (ft)	#lines/# images (10mi*.25mi)
• DMC	2303*1267	1/105
• UCLp	1952*1321	1/100
• UCXp	2886*1886	1/70



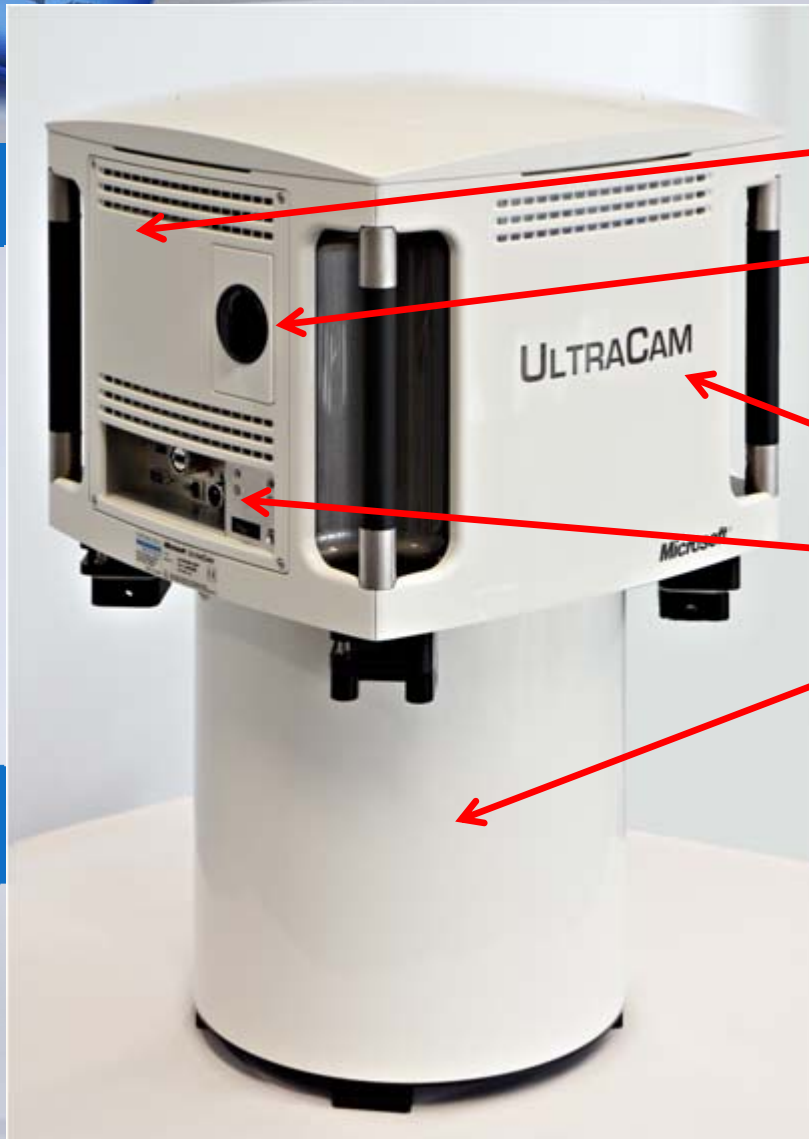
UltraCamLp Camera System



- Large format camera image quality
- Mapping grade camera
- Medium format package and price



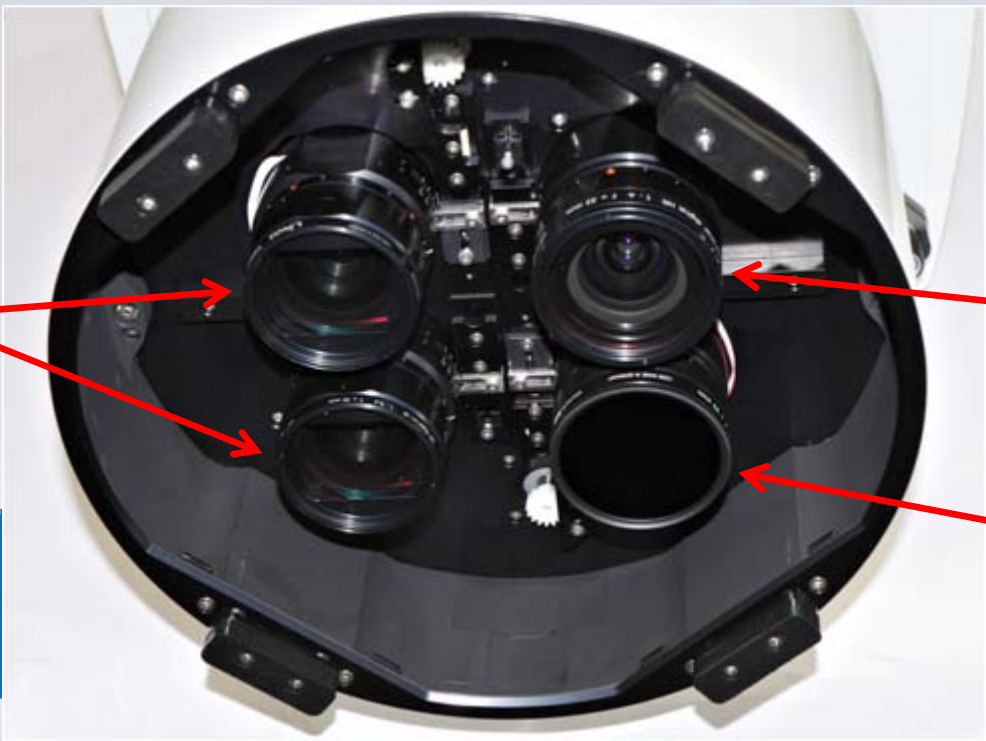
UltraCamLp Camera System



- Computer sub-system
- Solid state storage sub-system
- IMU bay
- Connectors
- Sensor sub-system (lenses, shutters, CCDs, electronics)



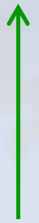
UltraCamL



PAN



**Flight
Direction**



RGB Cone



NIR Cone





UCL Service Concept



- **Pull-Out computer and storage subsystem**
- **Easy accessible**
- **Easy serviceable**



UCL Storage Sub-System



- **Solid State Device**
- **1 Terra Byte, 3600 images**
- **In-flight exchangeable**
- **Data upload to the processing system by a downloadstation**





Large Scale

Capability

Graz, Highway A2





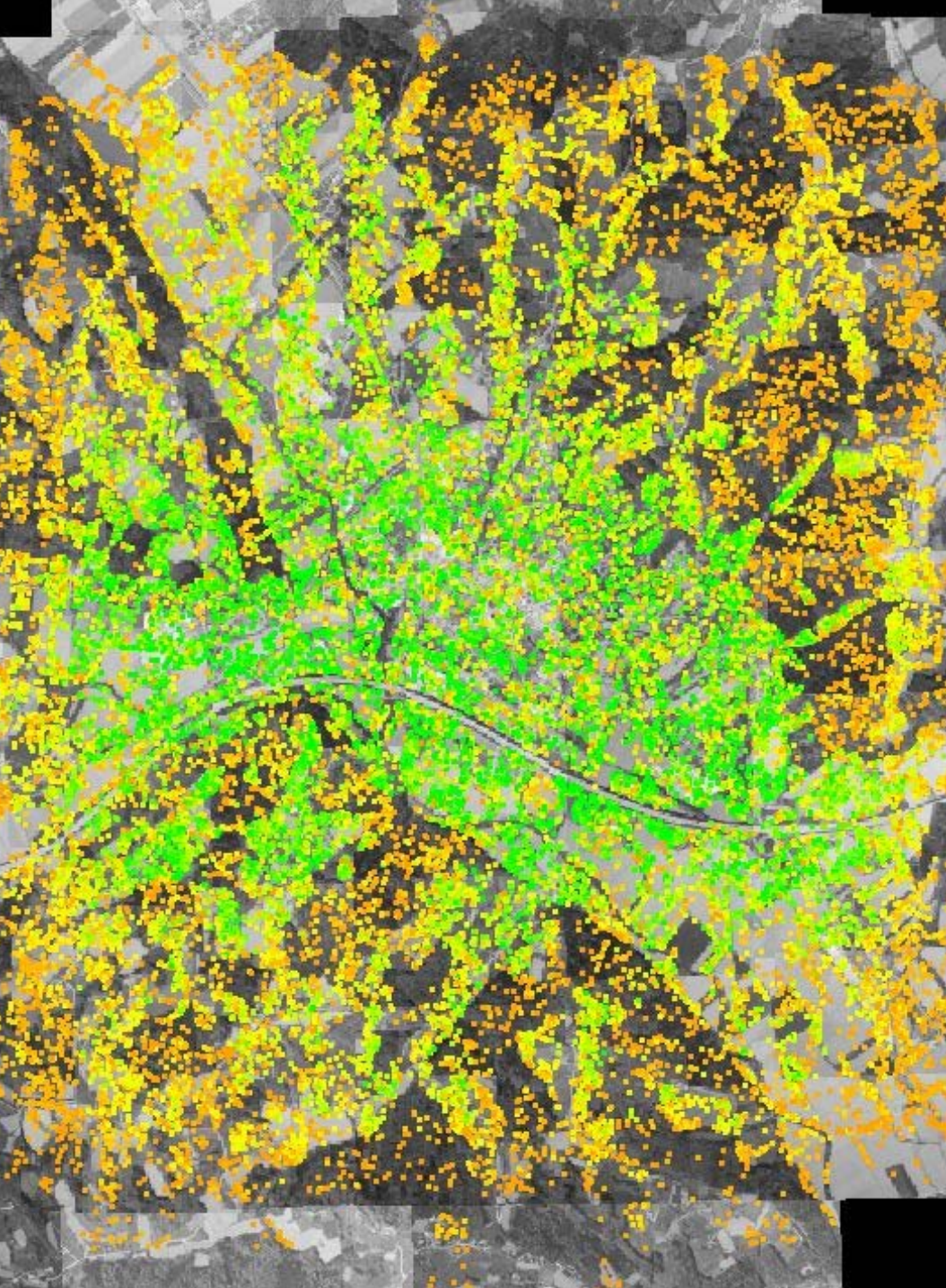
**Near Graz
Austria
GSD = 2.5 cm**



UCL, 10cm GSD, Graz







Virgin Flights
21. and 22. April
09:

- **Aerotriangulation**
by Ultra Map AT

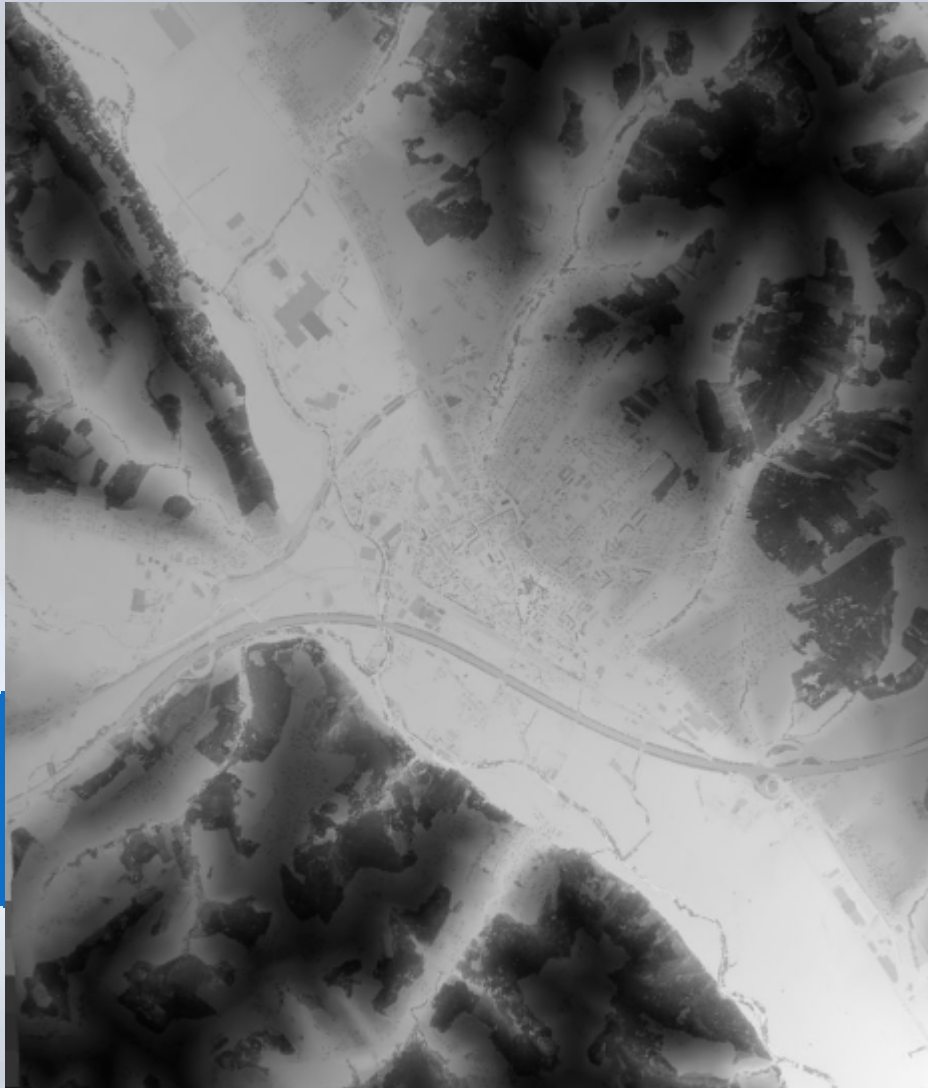


Geometric Accuracy

- **Bundle Adjustment**
- **GSD = 10 cm**
- **$\Sigma_o = 0.77$**
- **RMS GCP residuals: 50. 48. 17. (mm)**
- **RMS GPS residuals: 60. 73. 40. (mm)**
- **RMS CHECK residuals: 58. 51. 28. (mm)**



UCL, Automated DSM



Additional Resources



Bing Maps & Developer Resources

<http://www.microsoft.com/maps/developers/>

Try Bing Maps for yourself!

www.bing.com/maps

Have Additional Questions?

bmps4ps@microsoft.com



UltraCam Web Site

<http://www.microsoft.com/maps/ultracam>

Have Additional Questions?

mpsiinfo@microsoft.com

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Your potential. Our passion.™



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