Simply Produce Your PCI Values Using MicroPAVER

Craig Schorling, GISP
Vice President
Transmap Corporation

Andrew Aidt
City Planner/GIS
City of Kettering, OH

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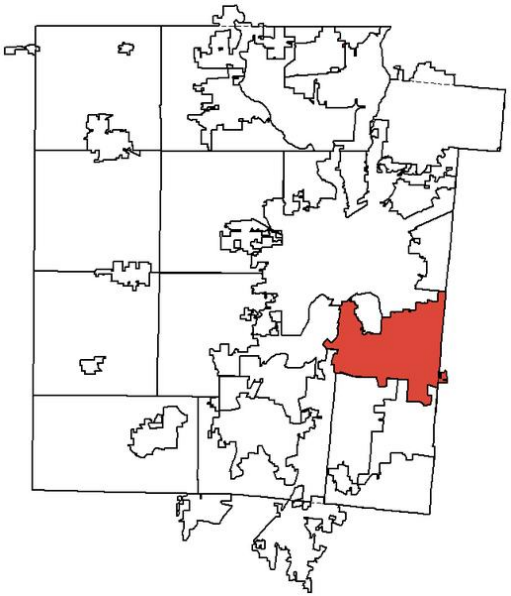
City of Kettering Facts

- A city in Greene and Montgomery Counties in Ohio
- It is a suburb of nearby Dayton
- Population: 56,427 (As of 2011)
- Largest suburb in the Dayton Metropolitan Statistical Area
- Area: 18.72 sq miles

Location of Kettering, Ohio



Location of Kettering within Montgomery County

In 2013, the City of Kettering implemented a comprehensive pavement management system to better maintain its street infrastructure.

The City of Kettering was set up with **MicroPAVER** to analyze pavement distress data that Transmap collected to make objective decisions on pavement rehabilitation projects.

CITY OF KETTERING

Project Statistics

- Total Miles Driven: **272.94**
- Total Pavement Miles: **258**
- Sample Points: **2,770**

CITY OF KETTERING

Hybrid Approach

Hybrid Approach

boots on the ground + automated technology

Data Collection
ON-SIGHT Vehicle

Transmap successfully collected 274 miles of pavement data in the City of Kettering.

2011 Freightliner Sprinter Crew Van

Number of Devices:
- 6 possible
- 3 cameras/1 LiDAR

Resolution
- HD Image Resolution
- Best Color Profile to Extract Assets

360 Degree View

Sick LiDAR Scanner

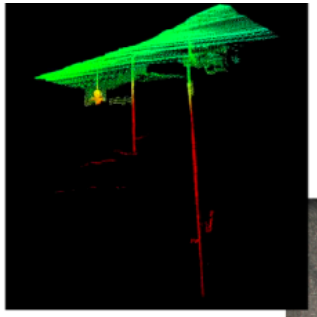
Laser Profilometer (rut - ride)

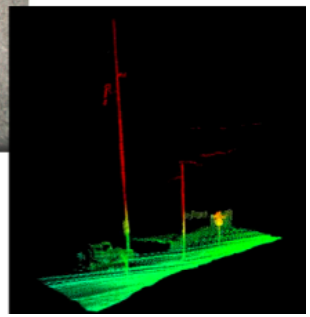
Falling Weight Deflectometer

Approach - Full 360 Degree View

Accurate Condition Assessment Required

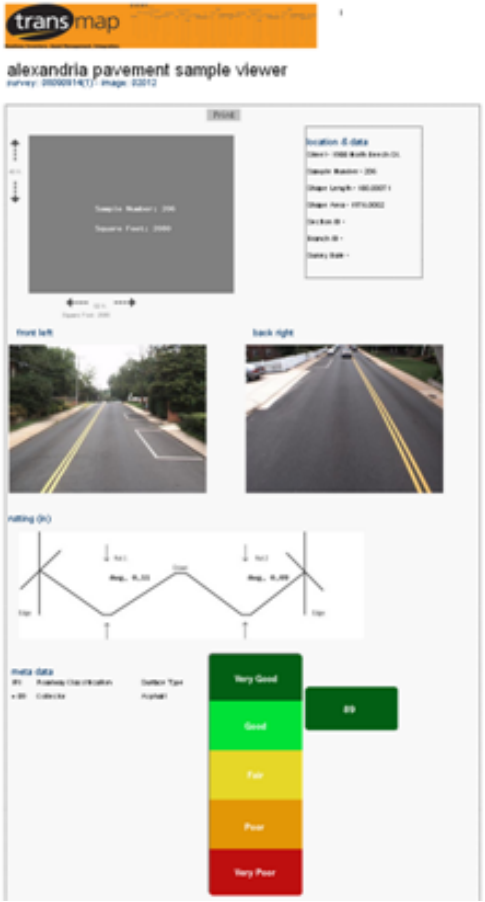
(13 ft spacing)





Advanced Inspection Technologies

Profilometer - Rut/Ride Subsystem
MicroPAVER Import Toolbox

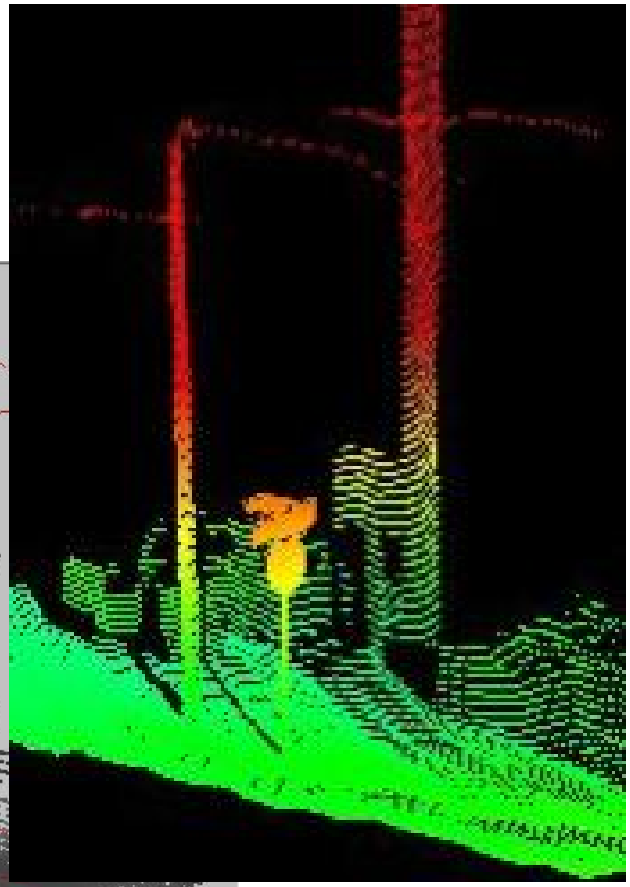


- ASTM E950
- IRI/RUT Reporting

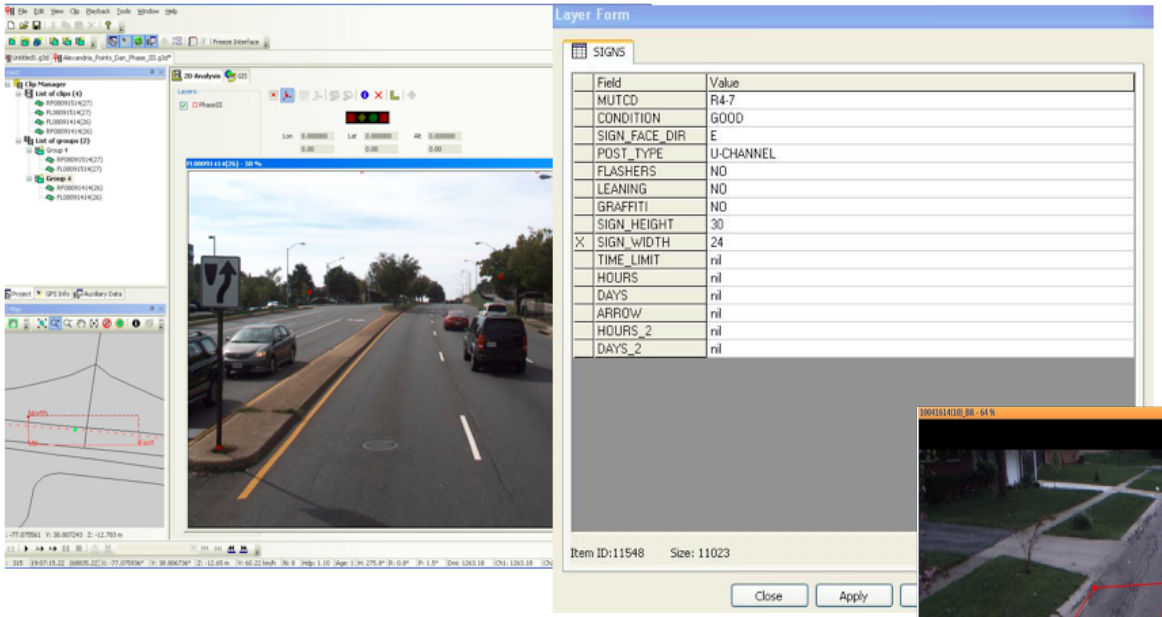
Advanced Inspection Technologies

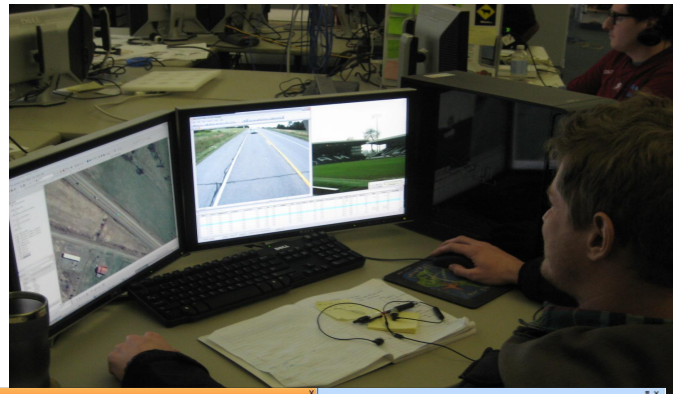
LiDAR/Image Database

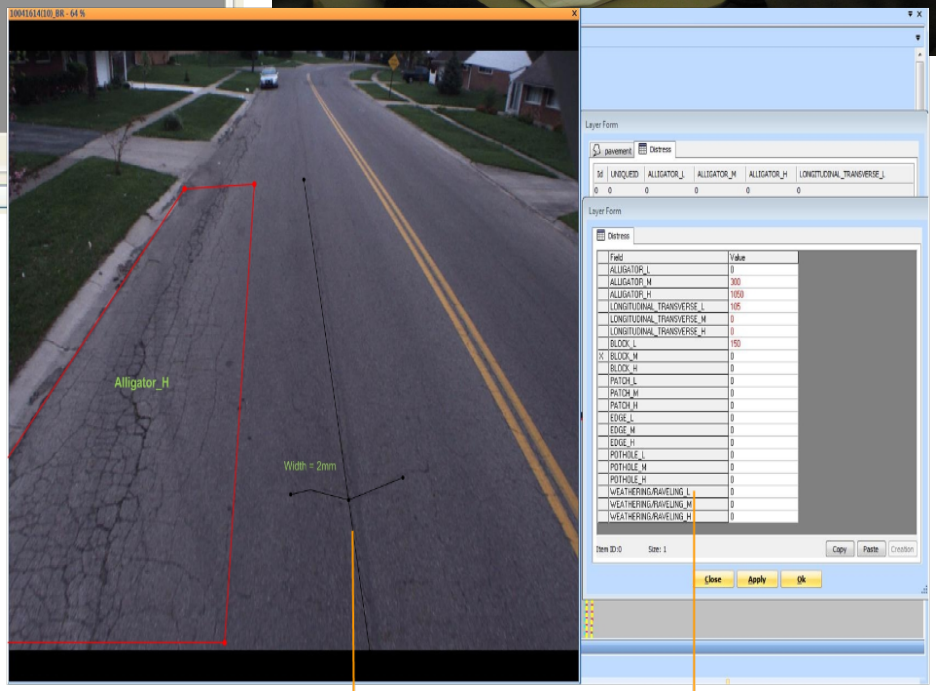
- Raw Laser Point Cloud Data



Data Extraction Tools

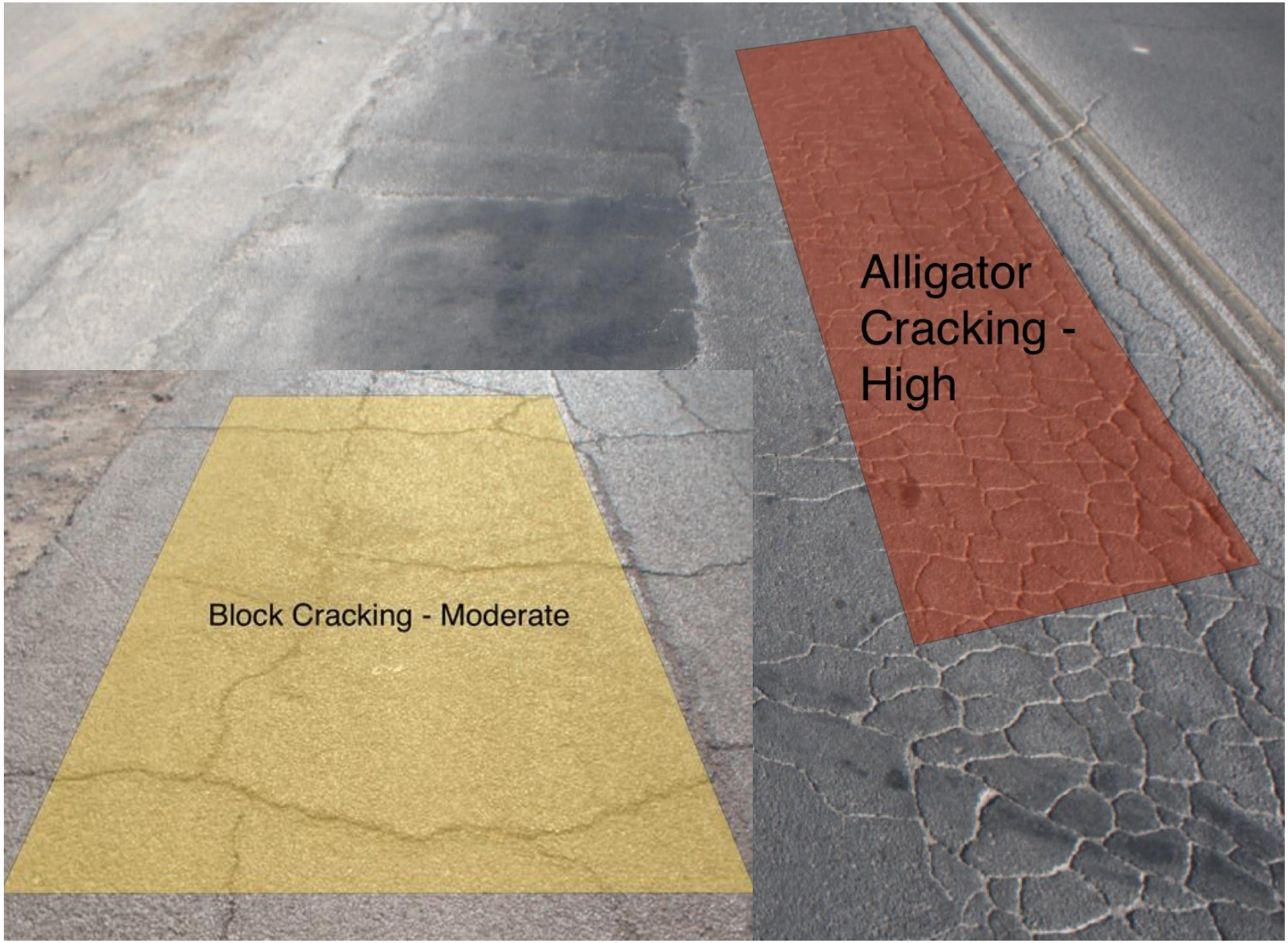






- Repeatability
- Real photogrammetric measurements
- Database designed for analysis (no fat fingers)
- Analysis that stands up to field walk outs
- NOT a windshield survey

Detailed Surface Distress Analysis

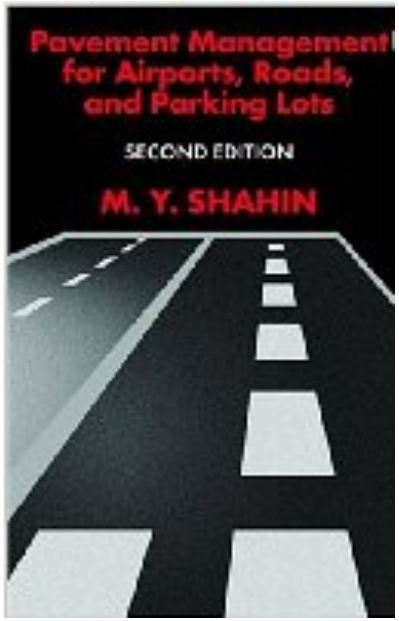


ASTM/MicroPAVER Standards

ASTM D6433

Samples

- Samples must belong to a network, branch and section
- Transmap looks at the total width
- The goal is to have sample areas between 1,500 sq. ft and 3,500 sq. ft.



Pavement Management for Airports, Roads, and Parking Lots -M.Y. Shahin

MicroPAVER

- Used by over 600 cities, counties and airports
- Site license only $600 per year in maintenance
- American Society for Testing and Materials **(ASTM)** standard **D6433**
- Standard **D6433** is the only pavement rating methodology recognized for rating road and parking lot pavements
- Full compliance with the modified approach to accounting for infrastructure in the Government Accounting Standards Board **(GASB) Standard 34**

PAVER™ 6.5 TRAINER DEVELOPERS

MicroPAVER Distresses

AC Surfaced Distress Codes			
1. Alligator Cracking Sq Ft	6. Depression Sq Ft	11. Patching & Util Cut Patching Sq Ft	16. Shoving Sq Ft
2. Bleeding Sq Ft	7. Edge Cracking Ft	12. Polished Aggregate Sq Ft	17. Slippage Cracking Sq Ft
3. Block Cracking Sq Ft	8. Jt. Reflection Cracking Ft	13. Potholes Count	18. Swell Sq Ft
4. Bumps and Sags Ft	9. Lane/Shoulder Drop Off Ft	14. Railroad Crossing Sq Ft	19. Weathering/Ravelling Sq Ft
5. Corrugation Sq Ft	10. Long & Trans Cracking Ft	15. Rutting Sq Ft	

- The latest version of MicroPAVER (6.5.2) splits Weathering and Raveling. *Weathering* is now distress code 20.

PAVER™ 6.5 TRAINER DEVELOPERS

Turn Key Solution Delivery

GIS-Centric Approach

- Esri ArcGIS pavement centerline
- PCI results on centerline
- Sample areas defined as polygons
- Linear Reference System
- Work orders linked to ArcGIS
- ArcGIS server applications

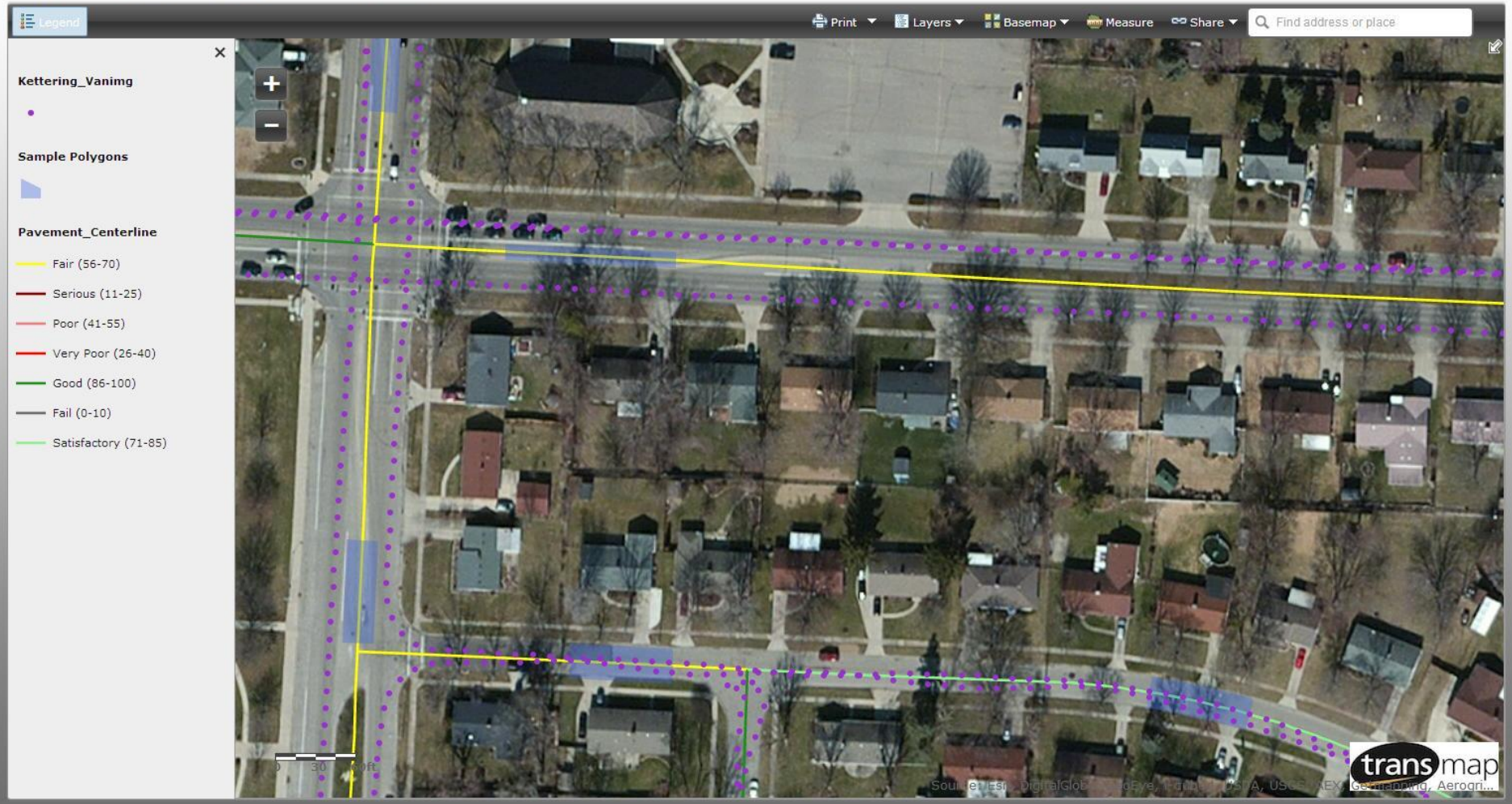
esri
Public Works
PARTNER

ArcGIS Online

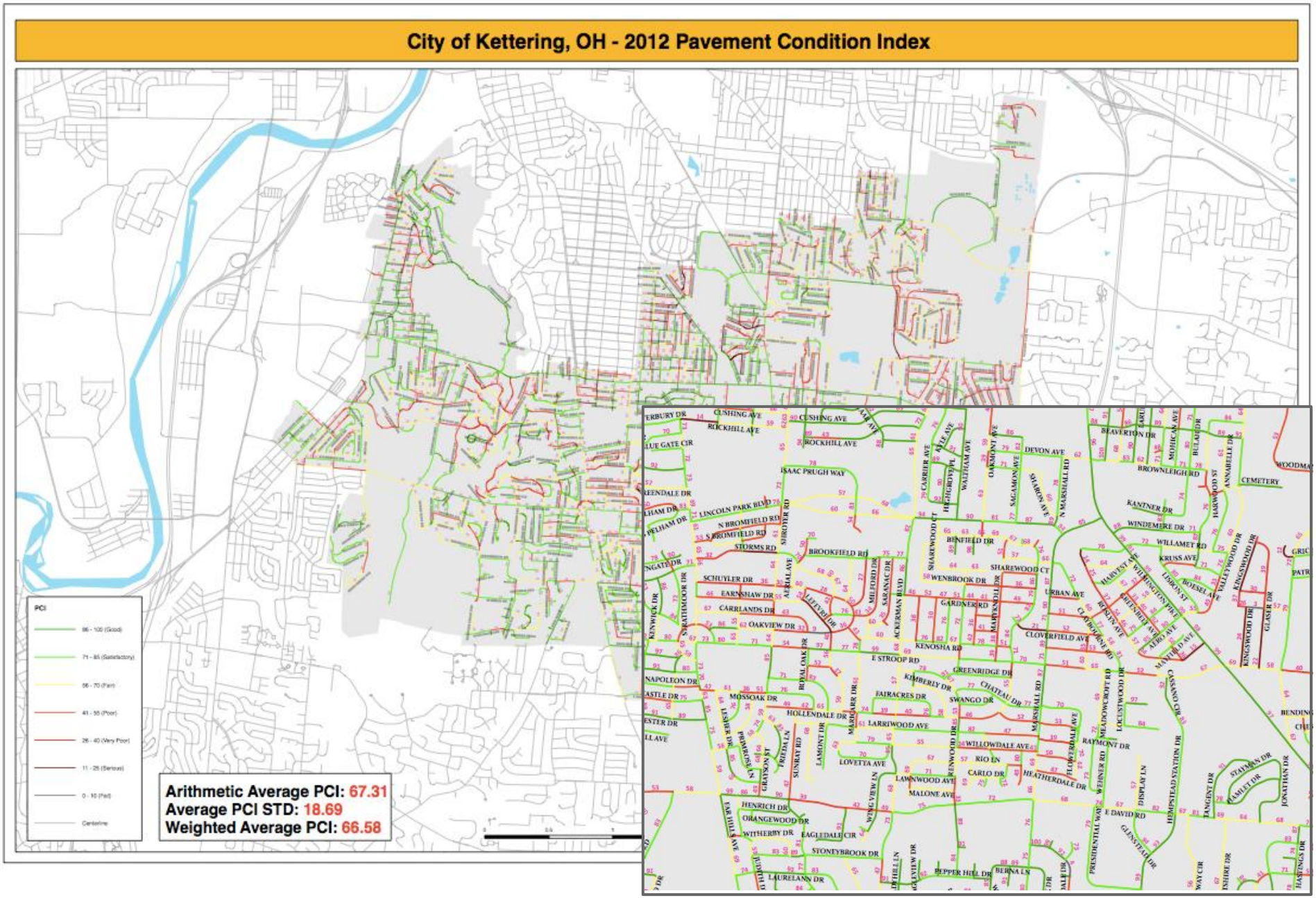
ArcGIS Online

ArcGIS.com

City of Kettering, OH Pavement

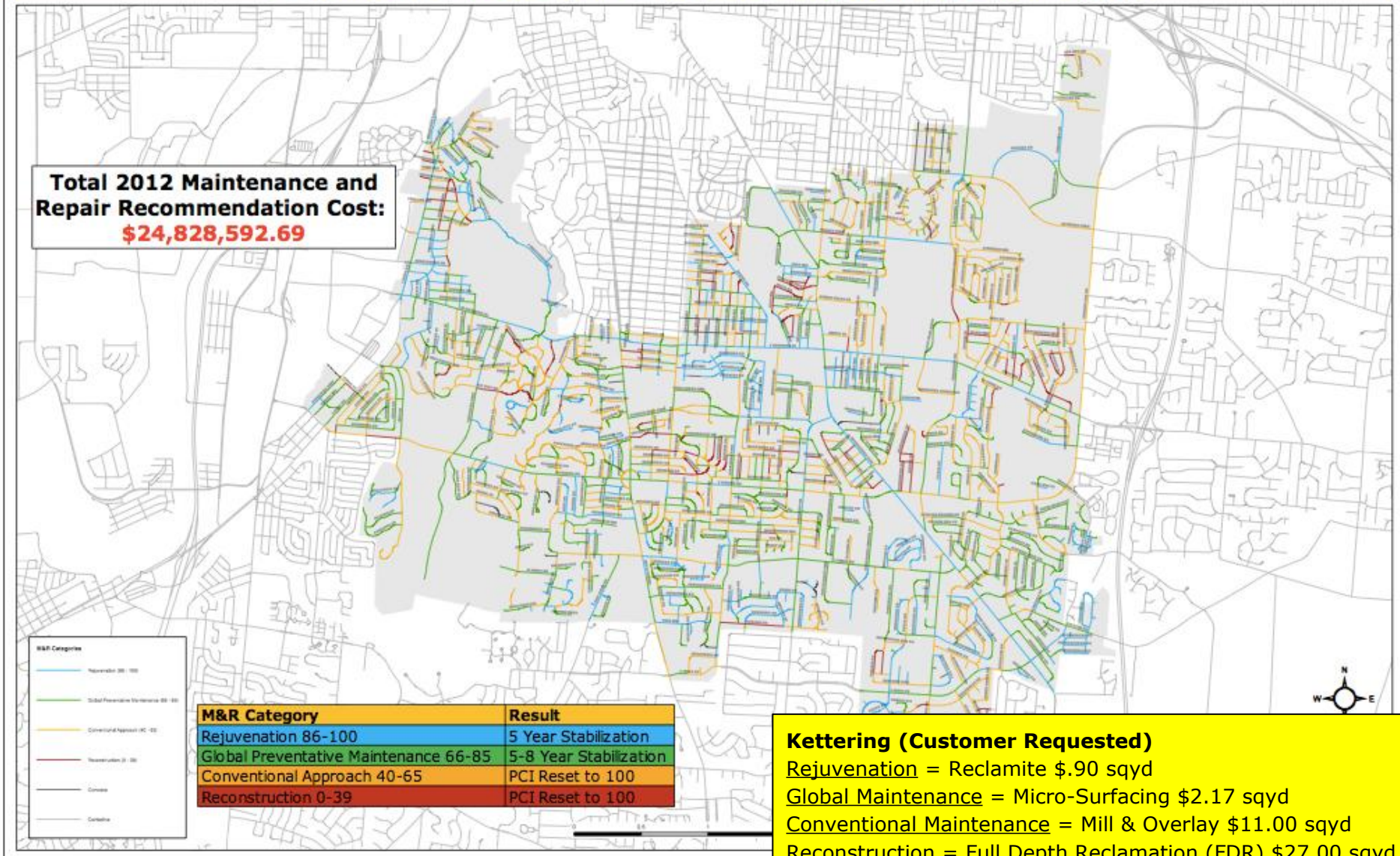


PCI


City of Kettering, OH - 2012 Pavement Condition Index
PCI
86 - 100 (Good)
71 - 85 (Satisfactory)
56 - 70 (Fair)
41 - 55 (Poor)
26 - 40 (Very Poor)
11 - 25 (Serious)
0 - 10 (Fail)
Centerline
Arithmetic Average PCI: 67.31
Average PCI STD: 18.69
Weighted Average PCI: 66.58

M&R

City of Kettering, OH - 2012 Maintenance and Repair Recommendations



M&R Category	Result
Rejuvenation 86-100	5 Year Stabilization
Global Preventative Maintenance 66-85	5-8 Year Stabilization
Conventional Approach 40-65	PCI Reset to 100
Reconstruction 0-39	PCI Reset to 100

Kettering (Customer Requested)

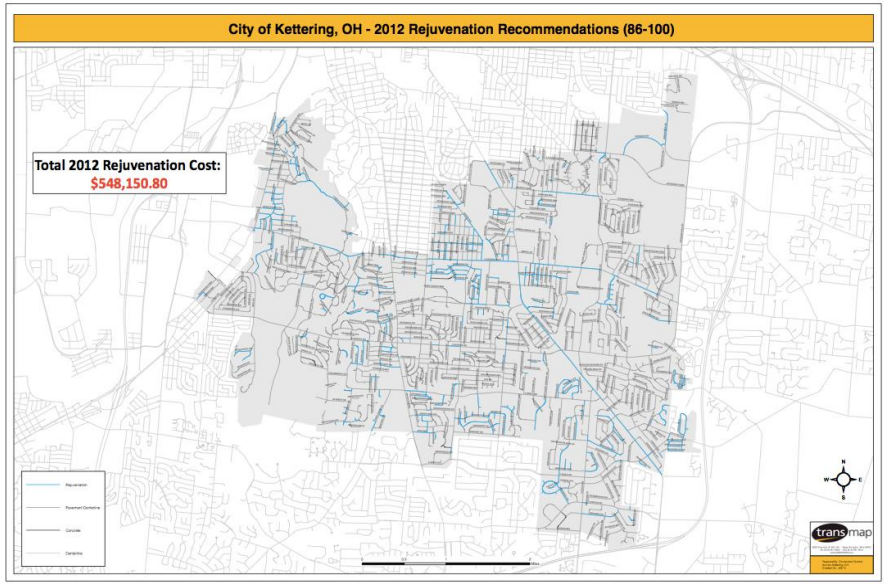
Rejuvenation = Reclamite $.90 sqyd

Global Maintenance = Micro-Surfacing $2.17 sqyd

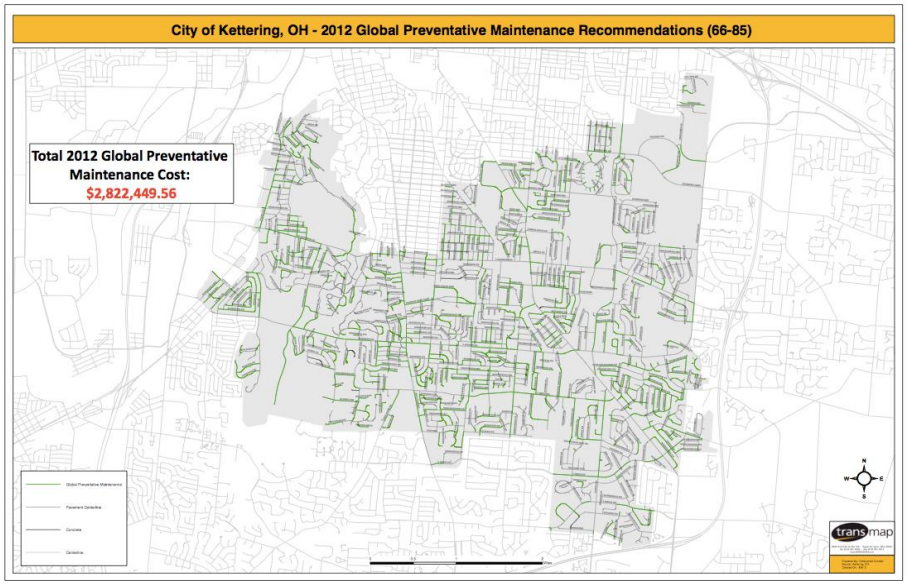
Conventional Maintenance = Mill & Overlay $11.00 sqyd

Reconstruction = Full Depth Reclamation (FDR) $27.00 sqyd

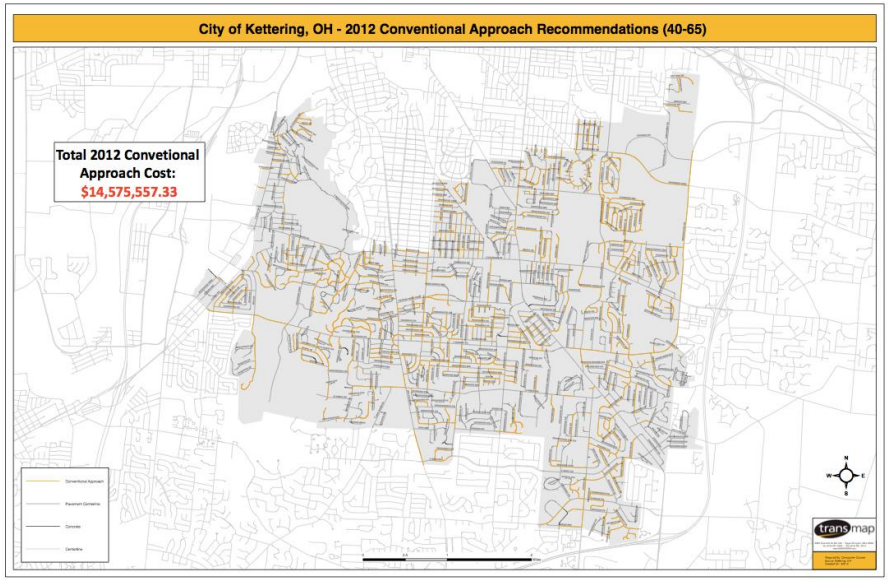
1. Rejuvenation



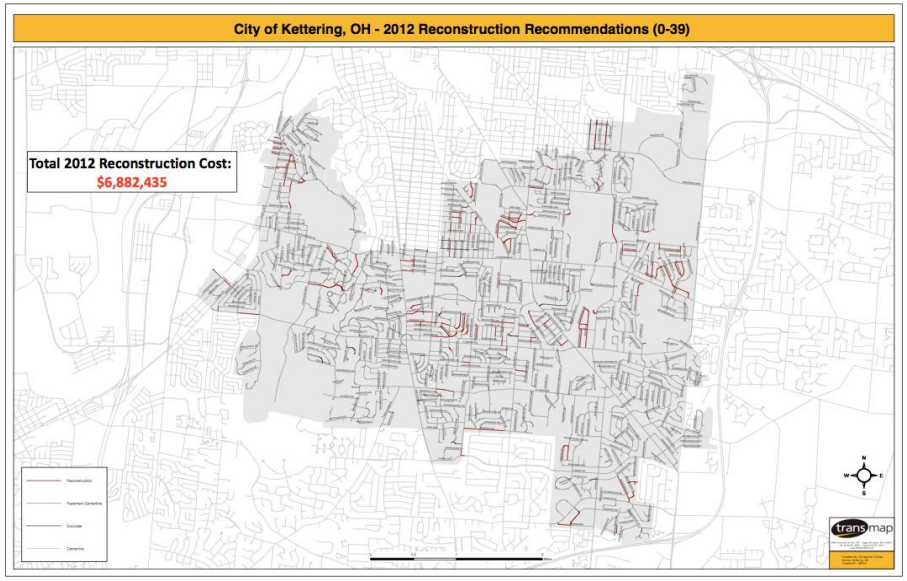
2. Global



3. Conventional



4. Reconstruction



GIS System

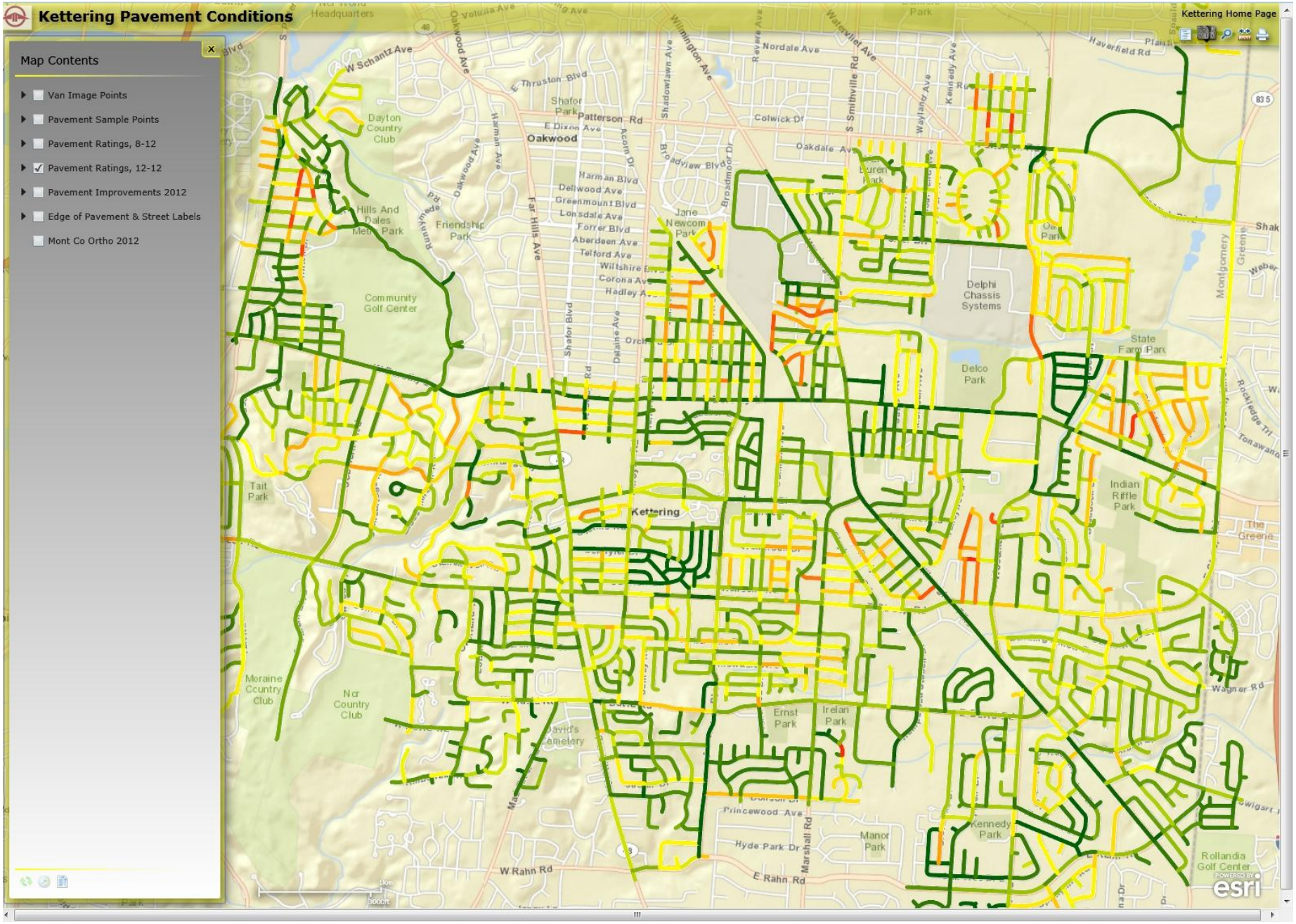
CITY OF KETTERING

GIS System

- **ESRI Shop**
  - 10.2
  - Desktop & Enterprise Server
  - ArcGIS Viewer for Silverlight
  - Only internal data, nothing online, yet

- **Many GIS layers - few maintained by City**
  - Two Counties, two very different sets of data
  - City does not have any utilities
    - Signs
    - Street lights
    - Pavement

CITY OF KETTERING


Kettering Pavement Conditions
Kettering Home Page
Map Contents
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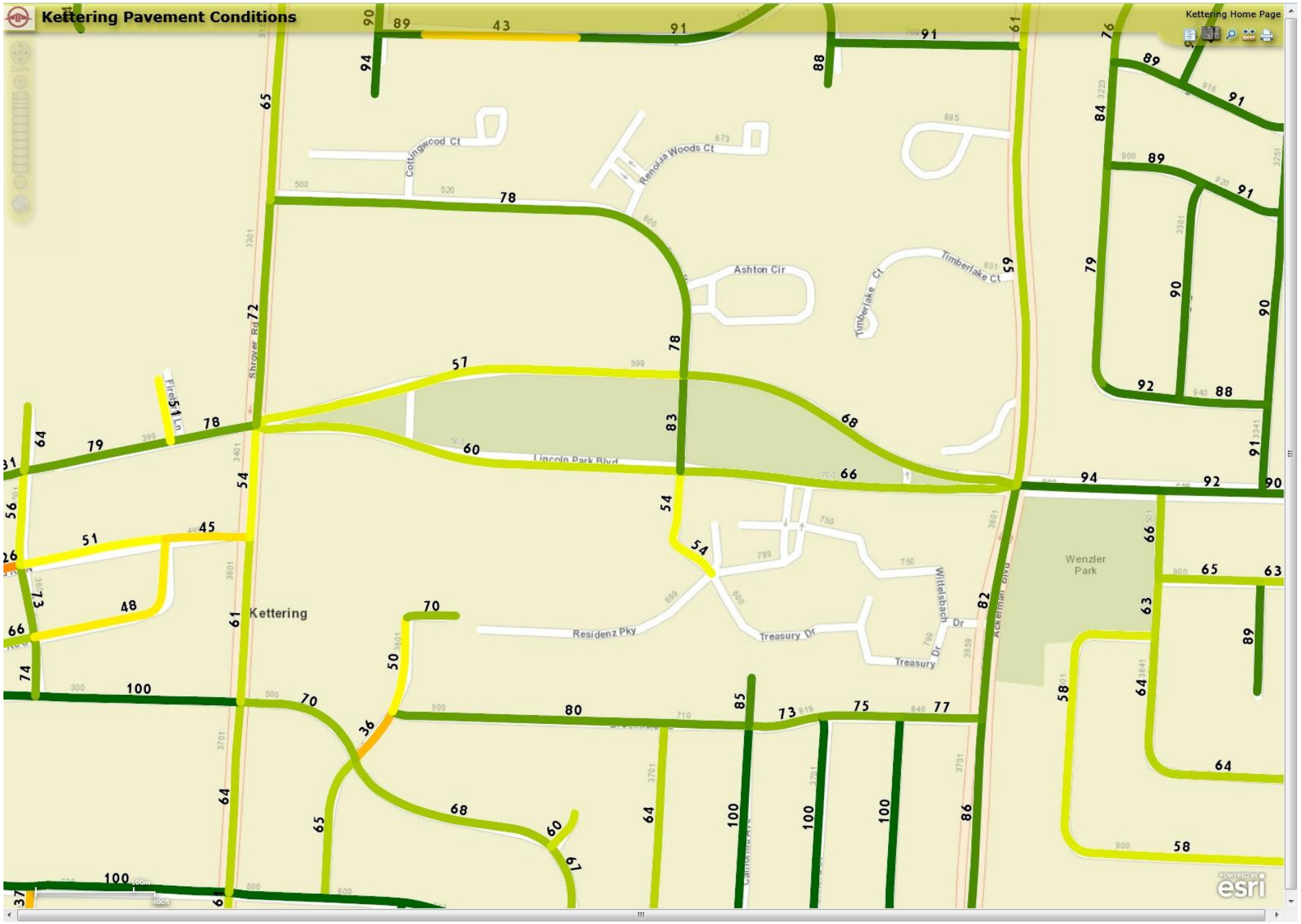
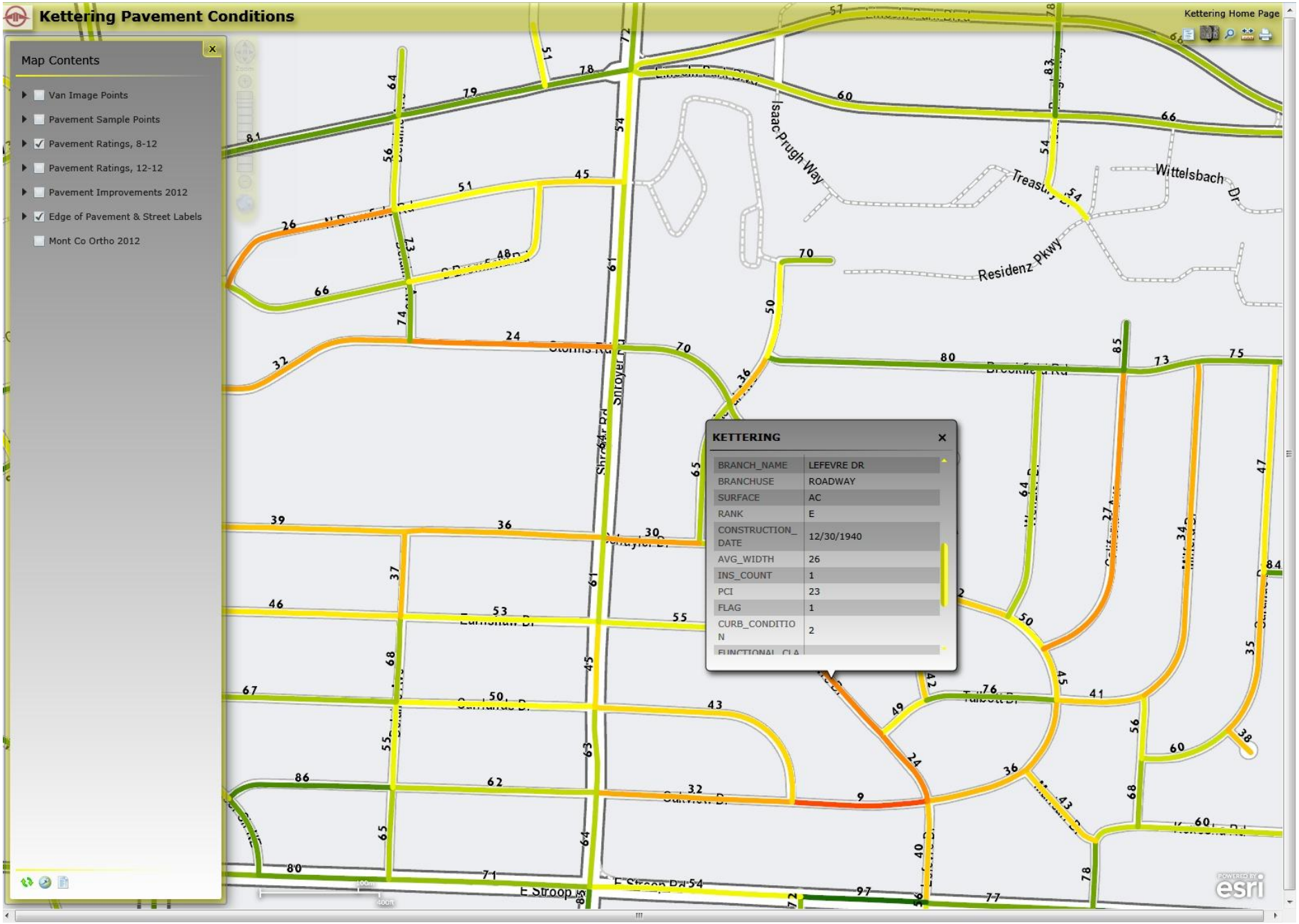
Pavement Sample Points
Pavement Ratings, 8-12
Pavement Ratings, 12-12
Pavement Improvements 2012
Edge of Pavement & Street Labels
Mont Co Ortho 2012
Oakwood
Kettering
Dayton Country Club
Hills And Dales Metro Park
Friendship Park
Community Golf Center
Jane Newcom Park
Delphi Chassis Systems
Delco Park
State Farm Park
Indian Riffle Park
Tait Park
Moraine Country Club
Ncr Country Club
David's Cemetery
Ernst Park
Irelan Park
Manor Park
Kennedy Park
Rollandia Golf Center
W Schantz Ave
E Thruston Blvd
Patterson Rd
E Dixon Ave
Harman Blvd
Dellwood Ave
Greenmount Blvd
Lonsdale Ave
Forrer Blvd
Aberdeen Ave
Telford Ave
Wiltshire Blvd
Corona Ave
Hadley Ave
Shafor Blvd
Far Hills Ave
Oakwood Ave
Harman Ave
Shadowlawn Ave
Wilmington Ave
Broadview Blvd
Broadmoor Dr
Nordale Ave
Colwick Dr
Oakdale Ave
S Smithville Rd
Wayland Ave
Kennedy Ave
Haverfield Rd
Montgomery
Greene
Rockledge Trl
Tonawanda
The Greene
Wagner Rd
Princewood Ave
Hyde Park Dr
Marshall Rd
W Rahn Rd
E Rahn Rd
esri


Kettering Pavement Conditions
Kettering Home Page
Cottingwood Ct
Renolia Woods Ct
Ashton Cir
Timberlake Ct
Timberlake Ct
Shroyer Rd
Firel Ln
Lincoln Park Blvd
Kettering
Residenz Pky
Treasury Dr
Treasury
Wittelsbach Dr
Ackerman Blvd
Wenzler Park
esri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Isaac Prugh Way
Wittelsbach Dr
Residenz Pkwy
Shroyer Rd
E Stroop Rd
KETTERING
BRANCH_NAME LEFEVRE DR
BRANCHUSE ROADWAY
SURFACE AC
RANK E
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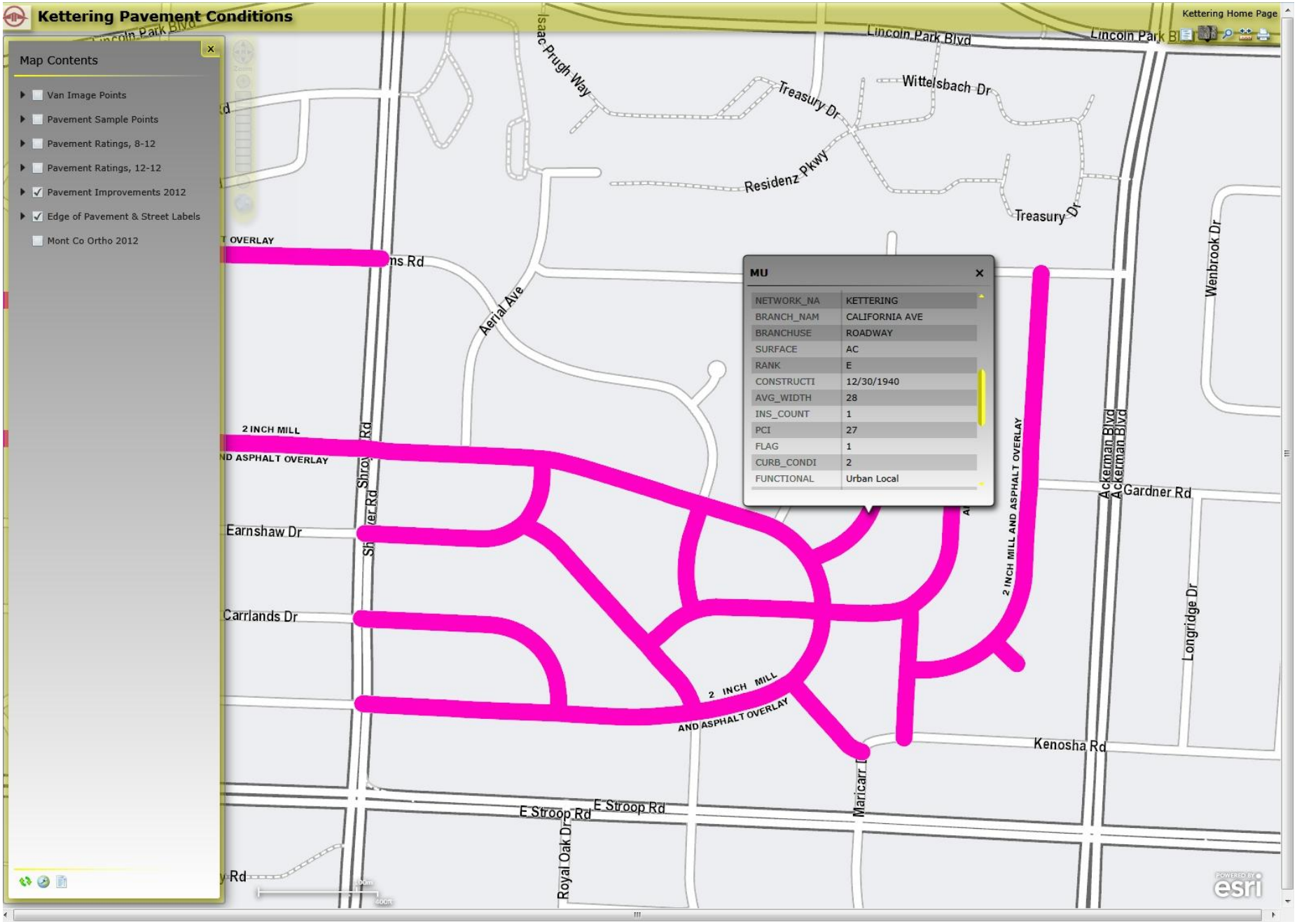
PCI 23
FLAG 1
CURB_CONDITION 2
esri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Gardner Rd
Earnshaw Dr
Carrlands Dr
Longridge Dr
Kenosha Rd
E Stroop Rd
Royal Oak Dr
Maricarr
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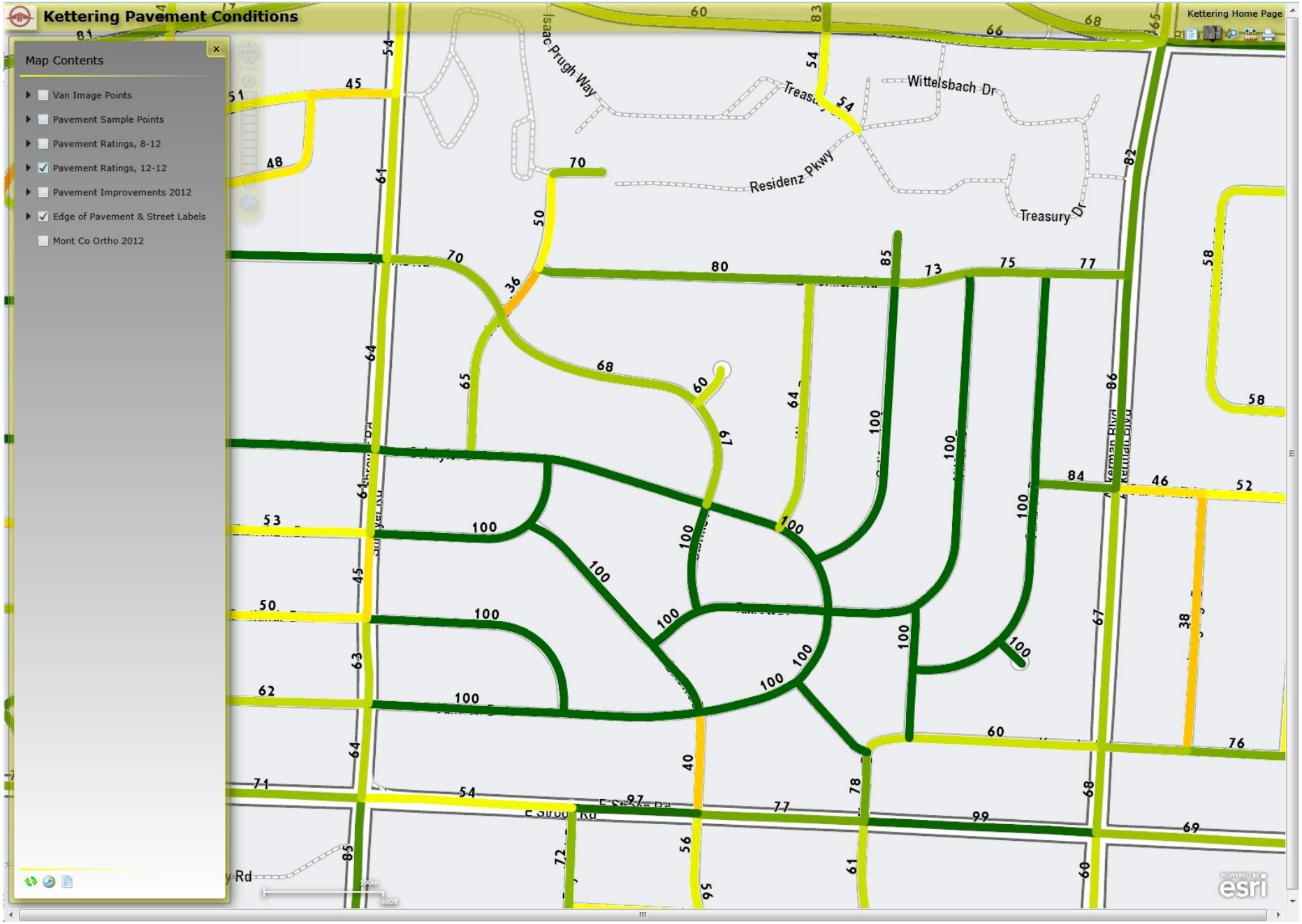
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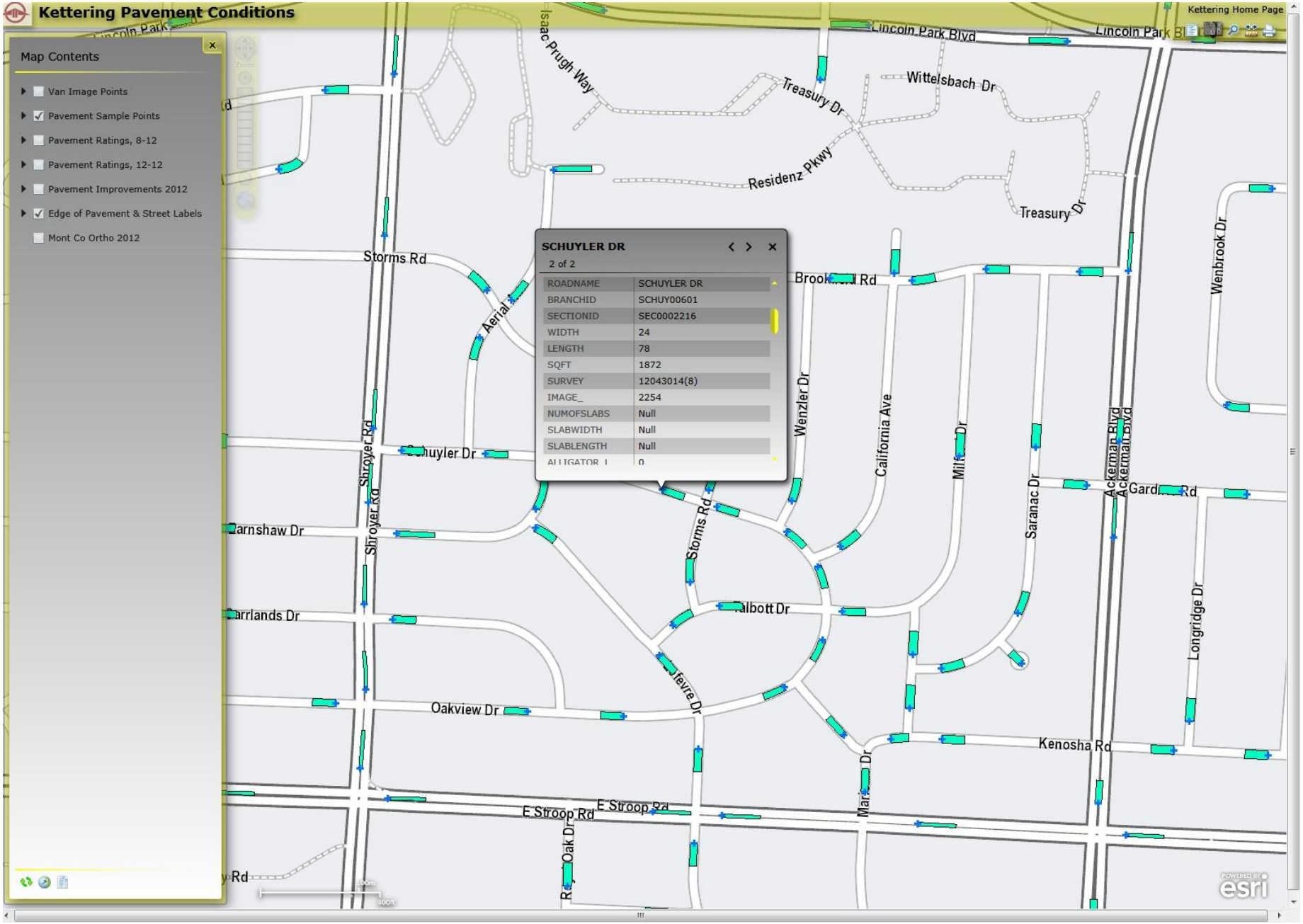
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Mont Co Ortho 2012
SCHUYLER DR
2 of 2
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BRANCHID SCHUY00601
SECTIONID SEC0002216
WIDTH 24
LENGTH 78
SQFT 1872
SURVEY 12043014(8)
IMAGE_ 2254
NUMOFSLABS Null
SLABWIDTH Null
SLABLENGTH Null
ALLIGATOR_L 0
Lincoln Park Blvd
Isaac Prugh Way
Treasury Dr
Wittelsbach Dr
Residenz Pkwy
Storms Rd
Aerial
Wenzler Dr
California Ave
Saranac Dr
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Wenbrook Dr
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Kenosha Rd
E Stroop Rd
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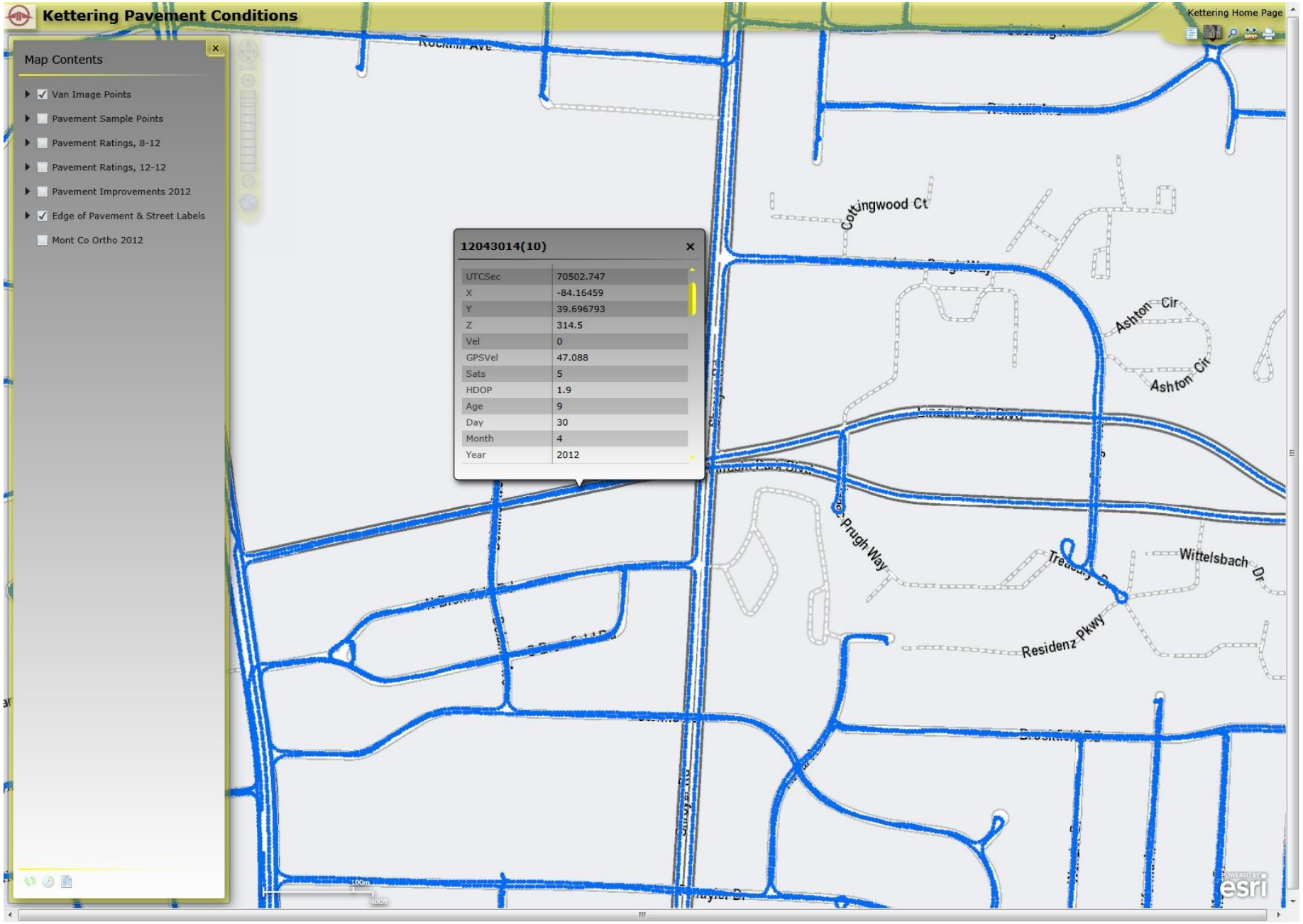
esri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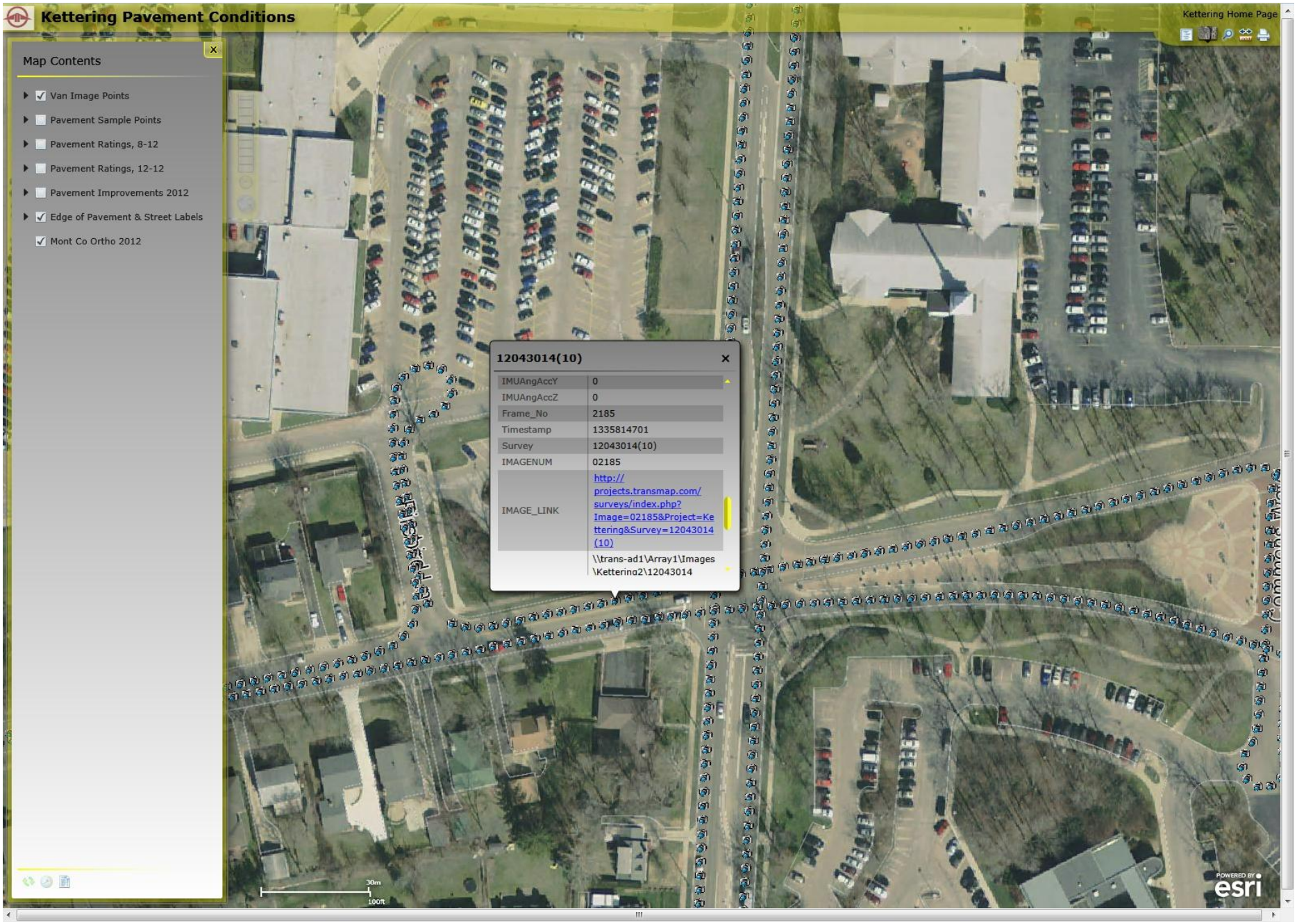
12043014(10)
UTCSec 70502.747
X -84.16459
Y 39.696793
Z 314.5
Vel 0
GPSVel 47.088
Sats 5
HDOP 1.9
Age 9
Day 30
Month 4
Year 2012
Cottingwood Ct
Ashton Cir
Ashton Cir
Prugh Way
Wittelsbach Dr
Residenz Pkwy
Taylor Dr
100m
400ft
esri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30m
100ft
POWERED BY esri

kettering road image viewer

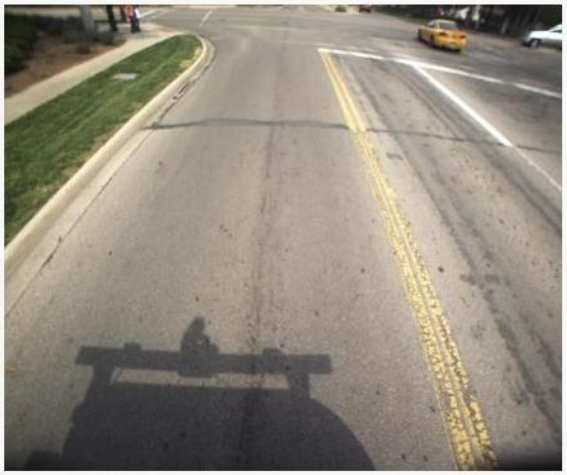
survey: 12043014(10) - image: 02185

Lighten images

front left

right front

back right



images x 1

Forward

Backward

images x 5

Forward

Backward

- **Future**
  - Signs
  - Traffic Signals
  - Pavement Analysis Updates

CITY OF KETTERING

Thank you for your time!

Craig Schorling, GISP
Vice President
Transmap Corporation
614.537.6297

Andrew Aidt
City Planner/GIS
City of Kettering, OH
937.296.2420