

FAST-TRAC and Other Innovations at the Road Commission for Oakland County

Presented by:
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www.rcocweb.org



AGENDA



ABOUT
RCOC

FAST-
TRAC

Comms/
Detection

Other
Initiatives

Connected
Vehicles

ABOUT RCOC

The Road Commission for Oakland County (RCOC) is largest county road agency in the State of Michigan



1800

Traffic
Signals

90,000

Signs

1,000,000+

Residents in Oakland
County

2700

Miles of County
Road

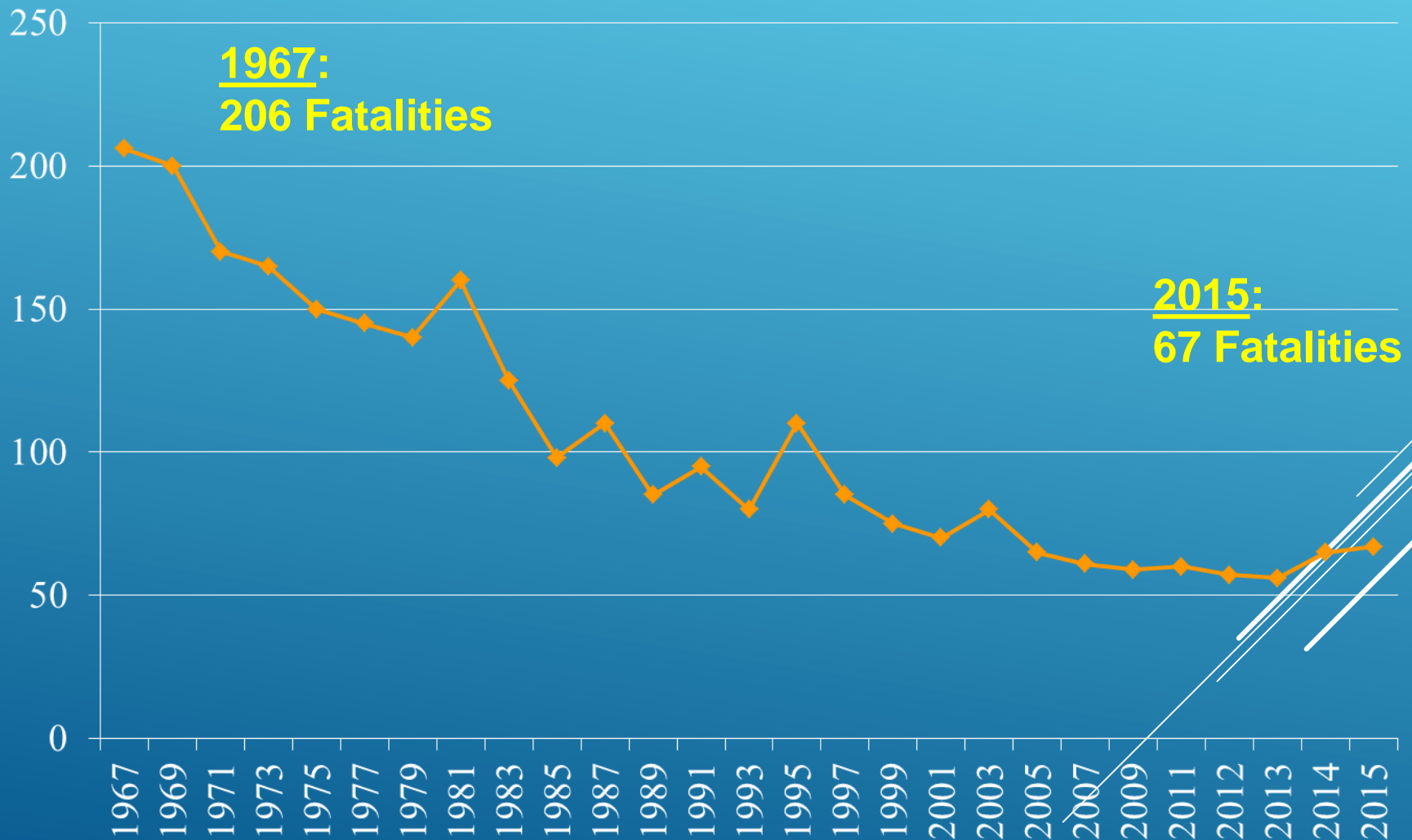
SAFETY STORY

- Oakland County's roads are among the safest in the world for an area our size and population
- In 1978, "Safety" became our top priority

Fatality Rates (per 100 million vehicle miles of travel)

	<u>1967</u>	<u>2015</u>
➤ Oakland County	6.8	0.53
➤ Michigan	6.5	0.98
➤ USA	5.7	1.11

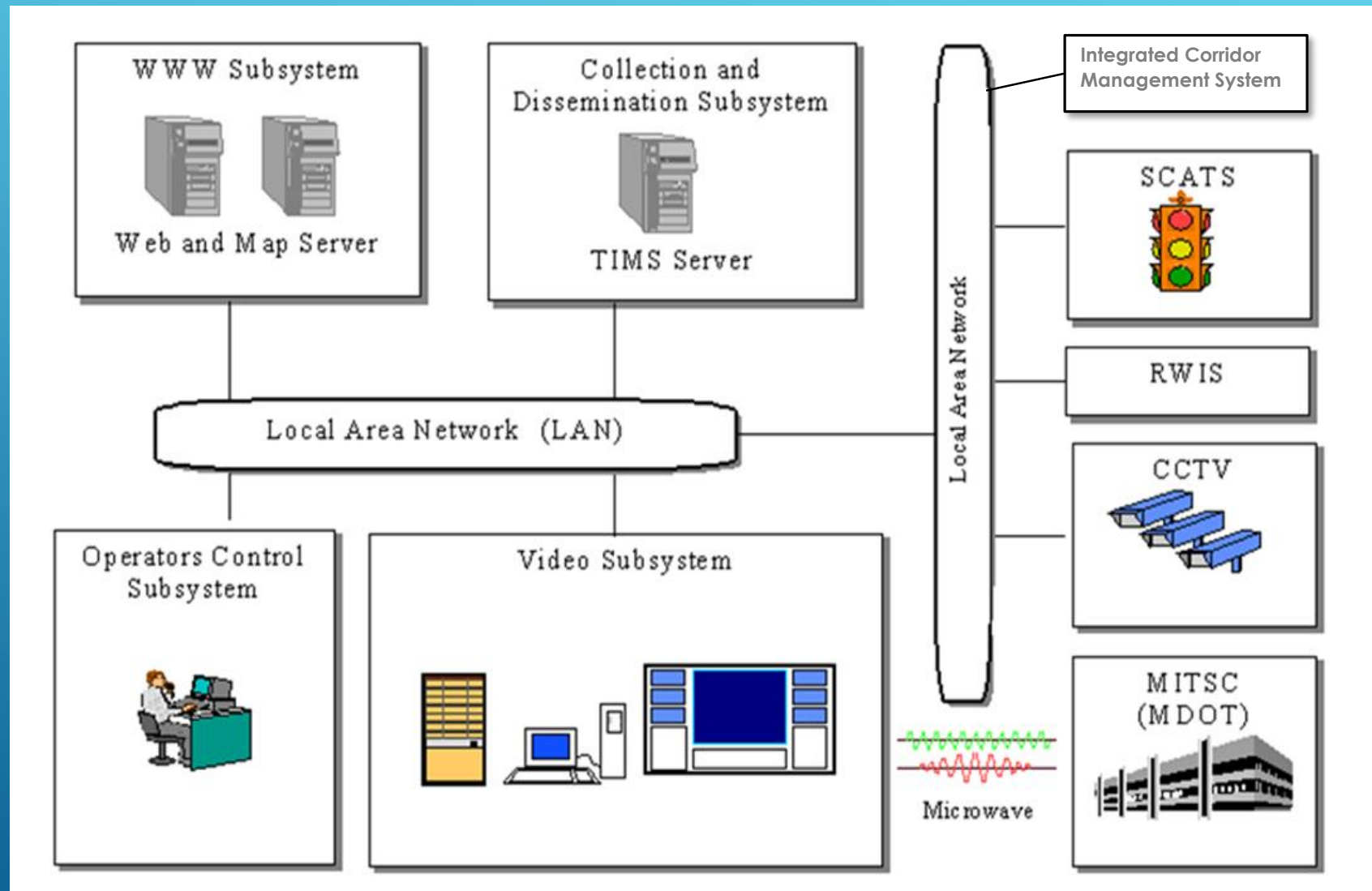
OAKLAND COUNTY TOTAL TRAFFIC FATALITIES





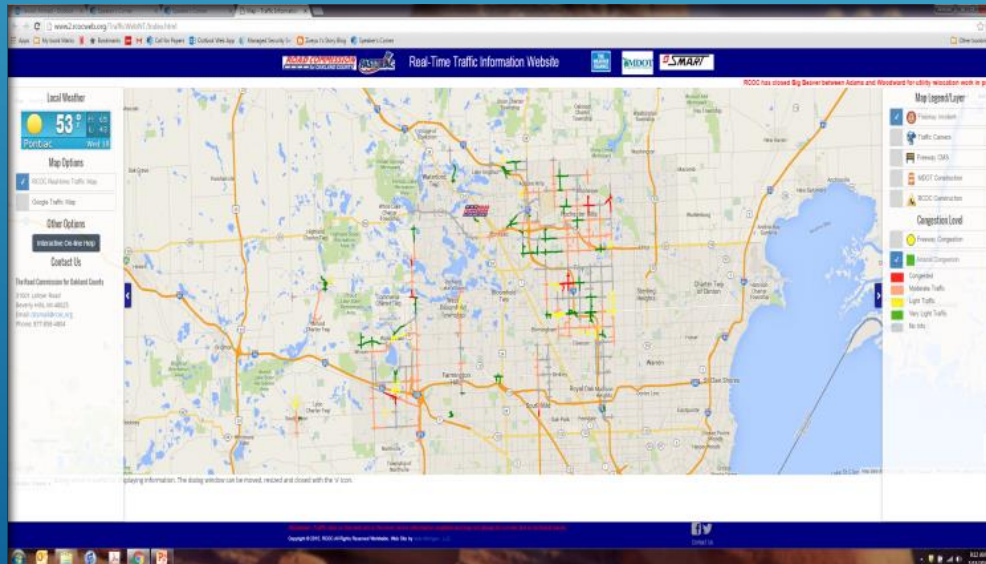
**Faster And Safer Travel - Through
Traffic Routing & Advanced Controls**

RCOC FAST-TRAC



GROWTH OF *FAST-TRAC*

- Started in June 1992 with 28 intersections under *SCATS* and *Autoscope* control
- Currently over 750 Intersections are using *SCATS* technology
- *SCATS* is in 40 communities....and growing





WINTER STORM PLUTO
MOVING OFF COAST
RECORD RAIN IN CA
THROUGH THE WEEKEND
SPRING-LIKE HEAT
ACROSS MUCH OF U.S.

WINTER STORM PLUTO
the Northeast after Winter Storm Pluto pulls out
Additional snow amounts will be less than 5"

WINTER STORM PLUTO
SAN ANTONIO
TONIGHT 49° Partly Cloudy
Chance of Rain 10%

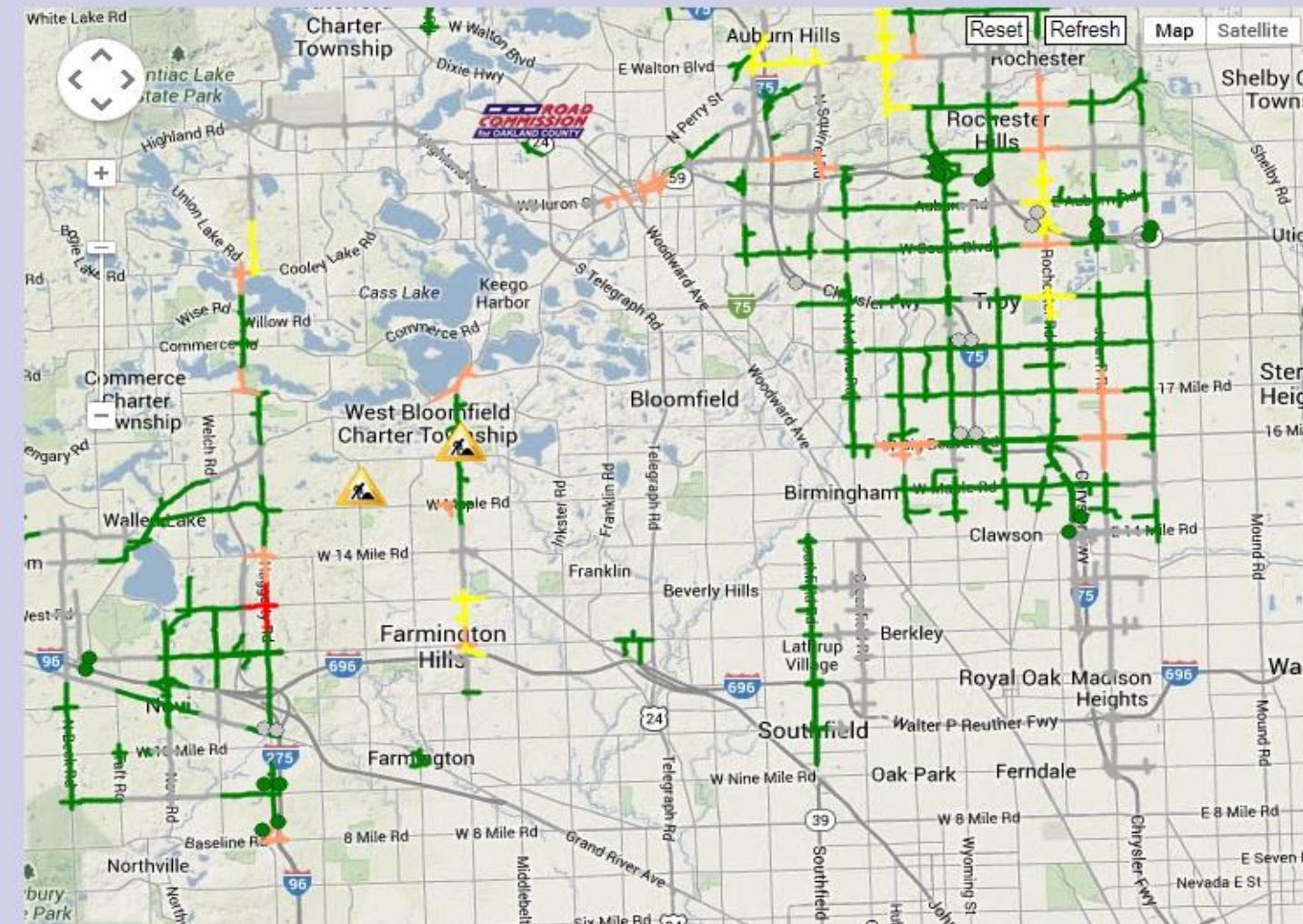
GLC S DR & BALDWIN

2017/02/16 09:57:37
SB COUNTY CENTER

WIXOM & OLD WIXOM

For the next several weeks NB or SB Orchard Lake Rd from Maple to Long Lake will have intermittent lane closures between the hours of 6am and 3pm

Local Traffic Measurement Google Traffic & Weather MDOT Lanes Closure Info.



Local Weather

20° F H: 30 L: 19
Pontiac Mon 24
[See 10-Day Forecast](#)

Map Legend/Layers

- ☐ Freeway Incident
- ☐ Traffic Camera
- ☐ Freeway CMS
- ☒ Road Construction

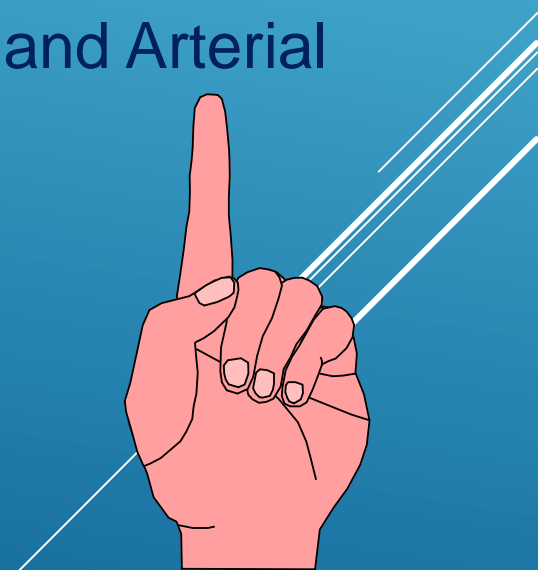
Congestion Level

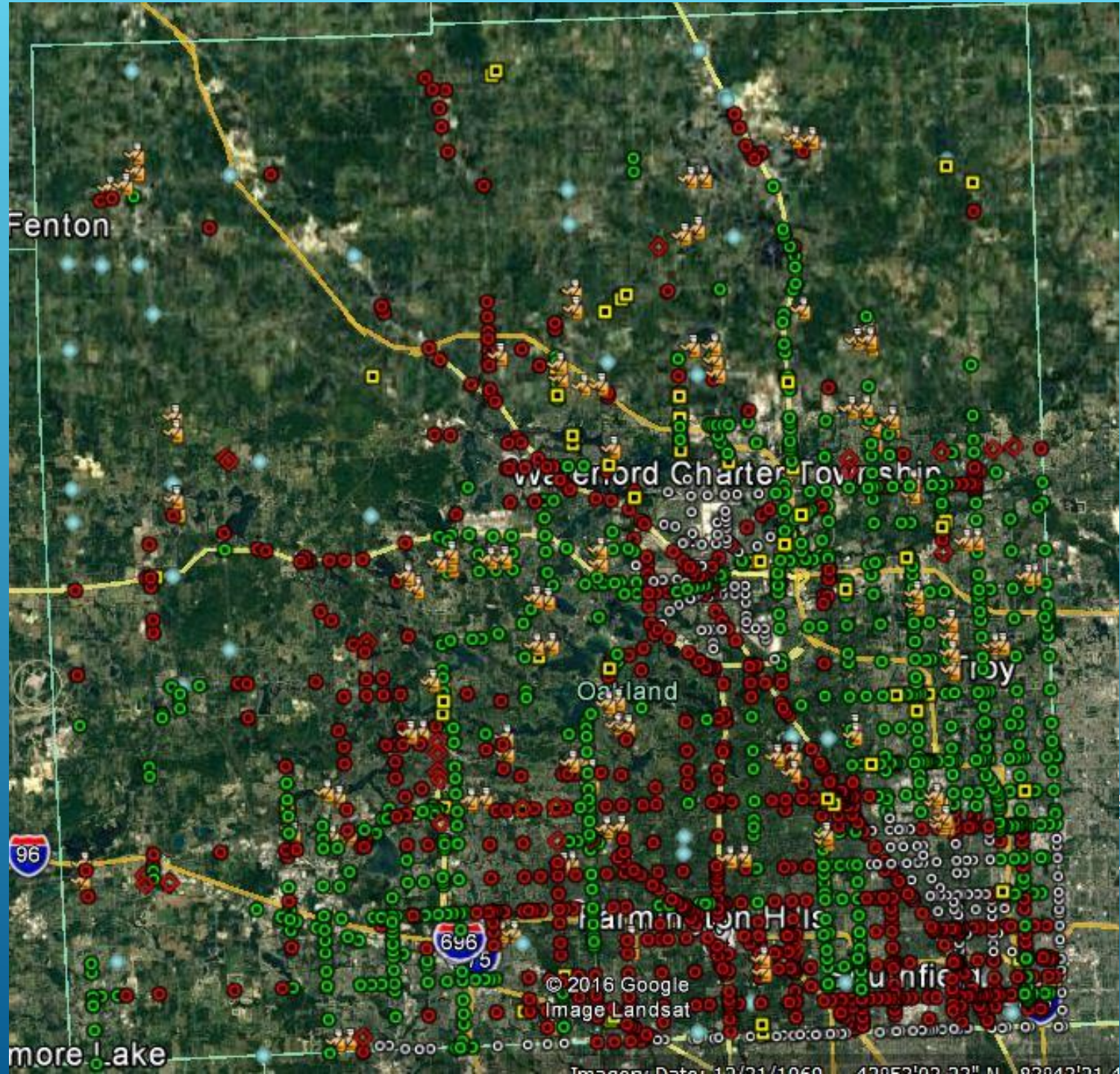
- ☒ Freeway Congestion
- ☒ Arterial Congestion
- Congested
- Moderate Traffic
- Light Traffic
- Very Light Traffic
- No Info.

FAST-TRAC'S FIRSTS

- First Suburban Adaptive Traffic Control System in the USA
- First Test of Video Processing for Adaptive Traffic Control in the World
- First Local Unit of Government to Initiate an *ITS* Project of this Scope
- First Traffic Web Site to Include Freeway and Arterial Information

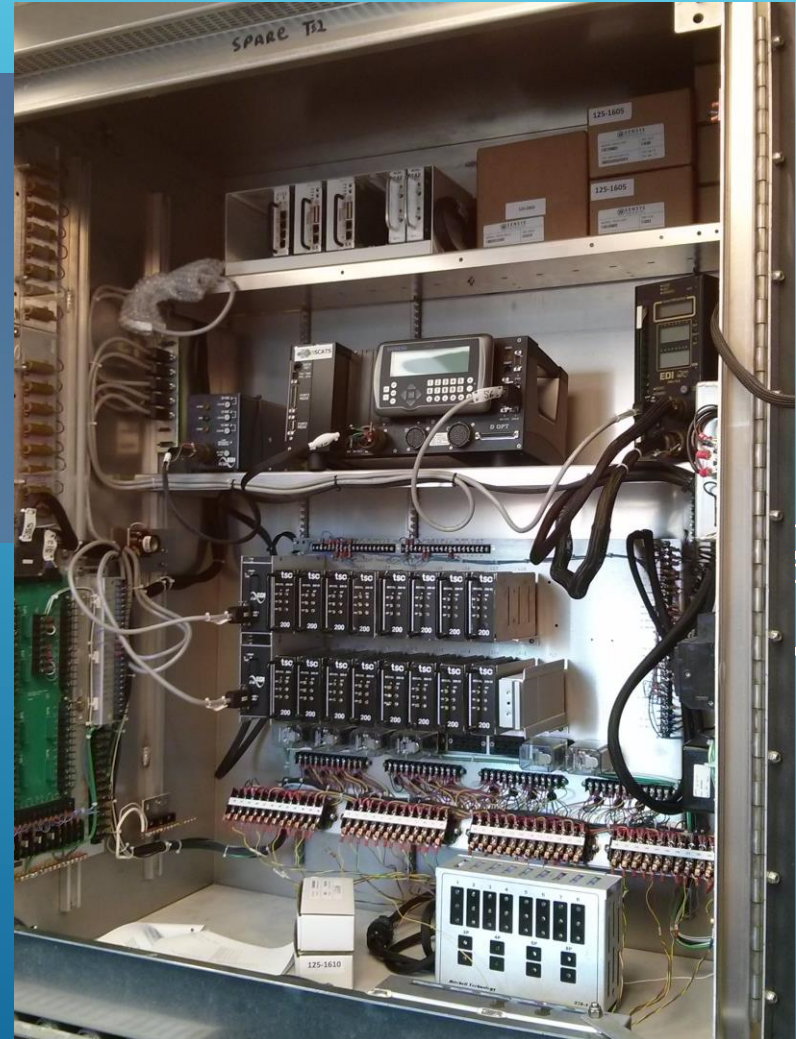
(<http://www2.rcocweb.org/TrafficWeb>)





SCATS SIGNAL SYSTEM

SYDNEY COORDINATED ADAPTIVE TRAFFIC SYSTEM



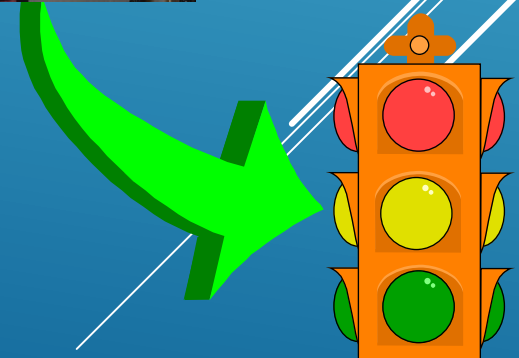
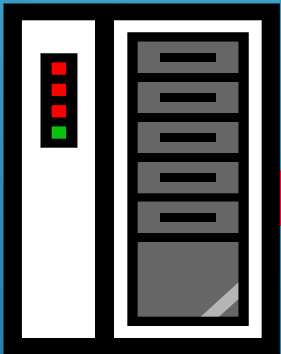
SCATS HARDWARE STRUCTURE

Management
Computer

Autoscope

FAST-TRAC
Controller

Regional
Computer



SCATS INTERFACE

SCATS Access

File View Edit Tools Window Help

Cycle lock	Trim	Detector alarm	RAM update	Short clearance	Fallback	Manager
Dwell	Notices	Lamp fault		Long clearance	High density	Region
Plan lock	Incidents	Major alarm	System alarm	Messages	Increment failure	File update

Central Manager - RCDC SCATS User 0 - Level 0

(1) 69 - Big Beaver, Adams : Troy (TROY) - AUBURN

Show Configure Options

Find Monitor Subsystem Strategic Monitor TS2; Mod 52 Scats; Terra Rackvision FLIR Cam

Alarms NF	AUBURN Subsystem 51	Degree of saturation 40	SCATS 6
Split plan 2	System plan 2	Master subsystem	Cycle generator 61
Offset plan 3	Link plan 3	Link none	Active link none
Special facilities Z3,6	Cycle plan none	Cycle time 80	Required cycle time 80
XSF 2,4,6,8			

Active plan

<A>	40%	32
B	18%	14
C	25%	20
D	17%	14

Site operation

<A>	7	34
B	13	0
C	26	10
D	15	-1

8 STAGES

MIN A TG9 <I>

Adams & Big Beaver - UCPA.30699.001

Region - AUBURN User 0 - Level 0 3/24/2014 10:26:56 AM

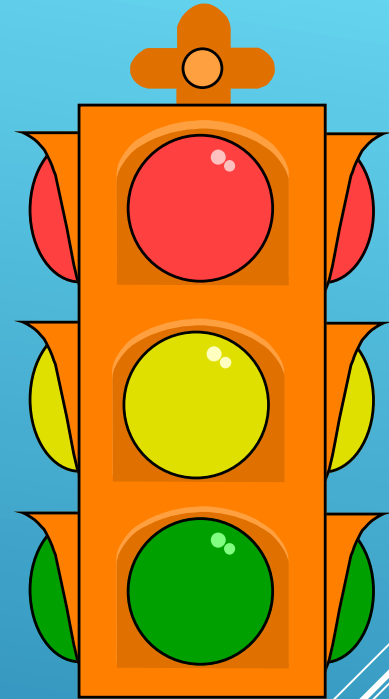
SELECTION OF SCATS

- Wanted a system that was cutting edge with real-time signal plan generation
- In 1989 only 2 systems existed
- SCATS fit better with the local conditions
 - 8 Phase signals
 - Poor Spacing
 - Corridors/Grids/Lakes
 - Changing Traffic Patterns



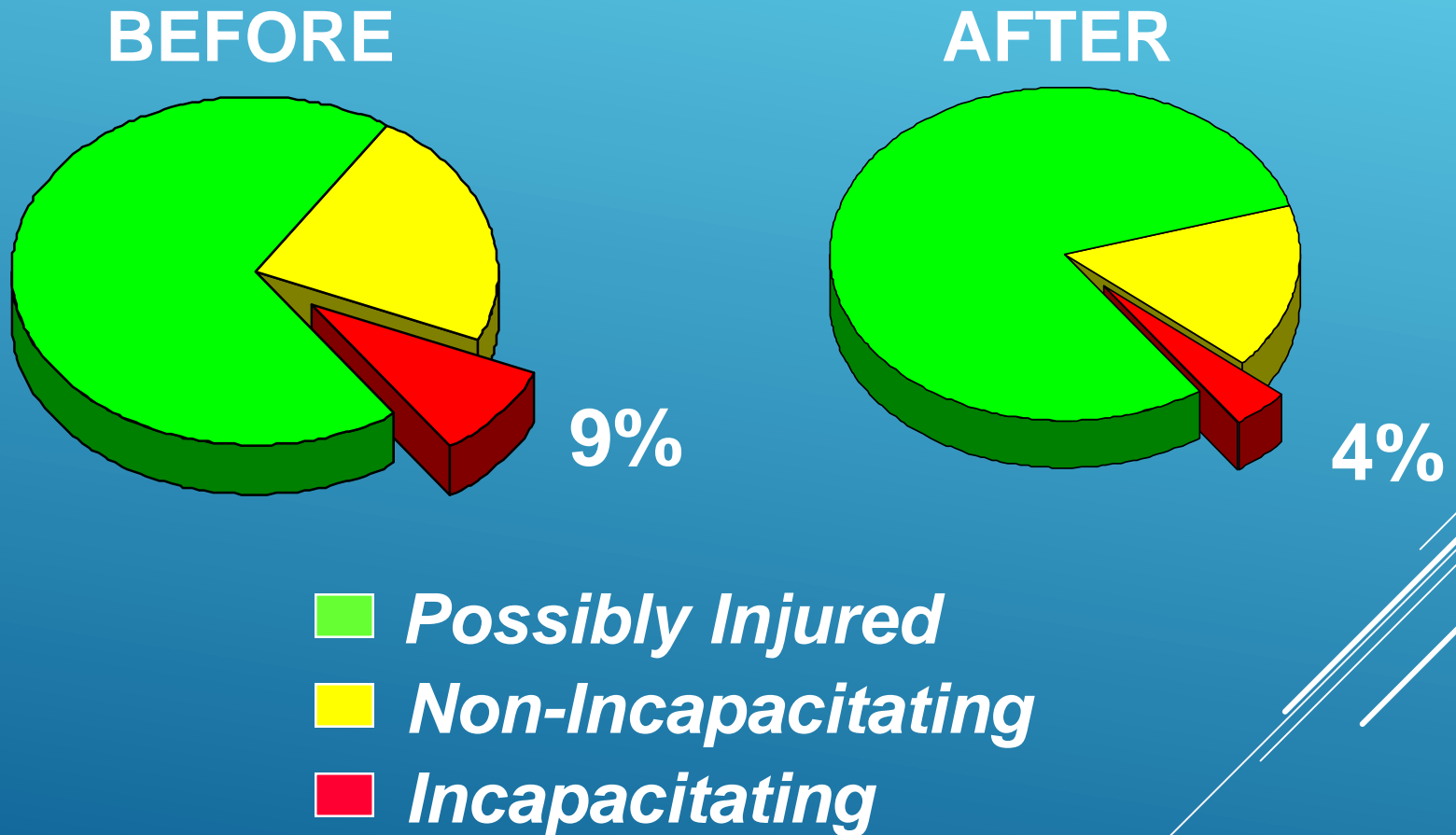
ADVANTAGES OF SCATS TRAFFIC SIGNALS

- Adaptive
 - Adjust signal timings in real-time based on actual volumes
 - Skips phases with no demand
 - End phases early
- Continuous Signal Timing Updates
- Central Monitoring of System from TOC



BENEFITS

ACCIDENT SEVERITY ANALYSIS



BENEFITS

TRAVEL TIME IMPROVEMENTS

(NB ORCHARD LAKE RD)

AM Peak

-20%

Off-Peak

-32%

PM Peak

-7%



COMMUNICATIONS

“Any Adaptive System is useless without reliable Communications “

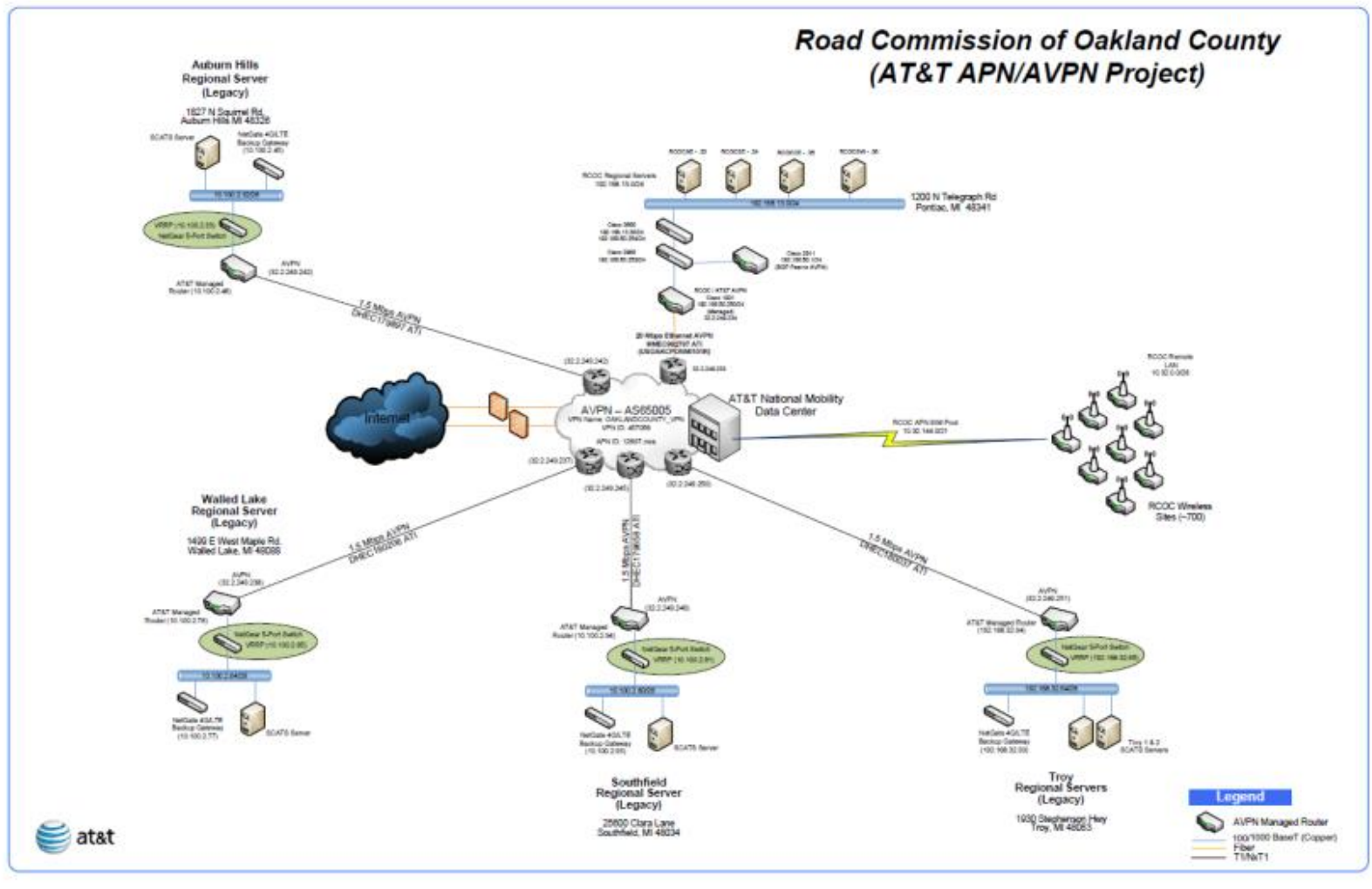
Recently updated from old copper (analog) phone lines to wireless communications

- Updated over 750 SCATS Signals
- Second phase - communications to fixed time signals

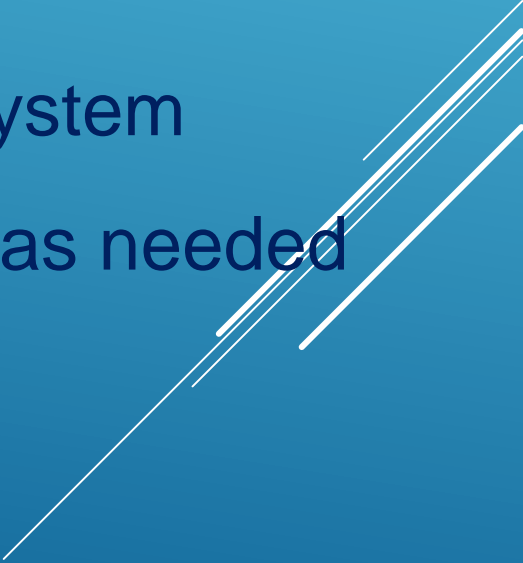
Additional benefit is of Upgrade is CCTV Installations

- Over 100 CCTV cameras by the end of FY 2018

COMMUNICATIONS



COMMUNICATION BENEFITS

- Significant cost savings (operations, staff time)
 - Upgrade supports future growth
 - A public-private-partnership with AT&T
 - Improved SCATS efficiencies
 - Improve the visibility of the arterial system
 - Flexibility to install/add new devices as needed
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DETECTION

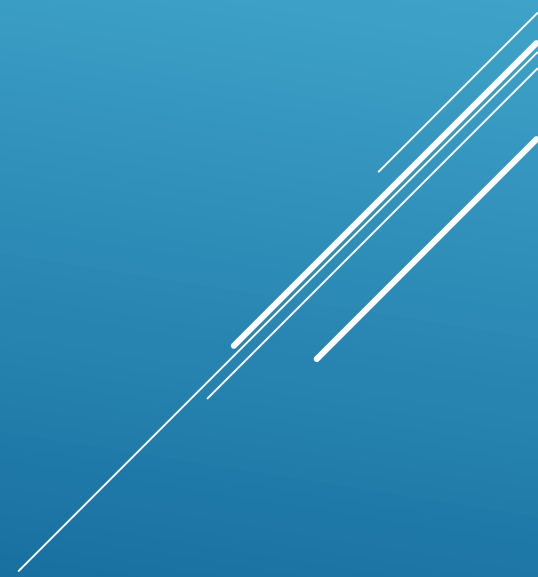
“Any Adaptive System is useless without effective detection”

Overhead Cameras – over 2000 deployed

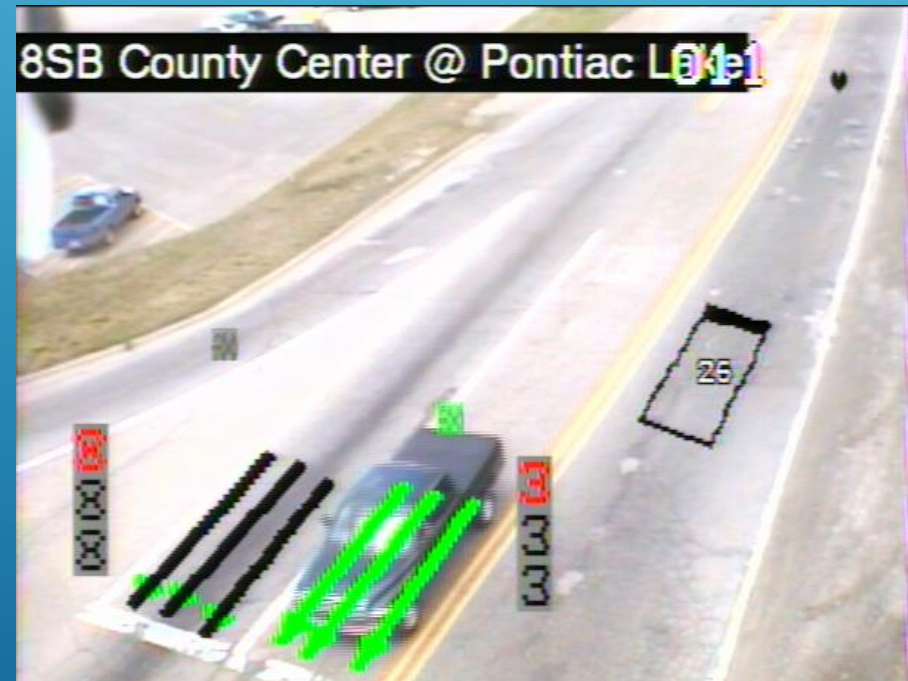
- Autoscope
- FLIR (thermal)

Surface Detection

- Sensys detection system (pucks)
- Traditional (traffic loops)



OVERHEAD VEHICLE DETECTION

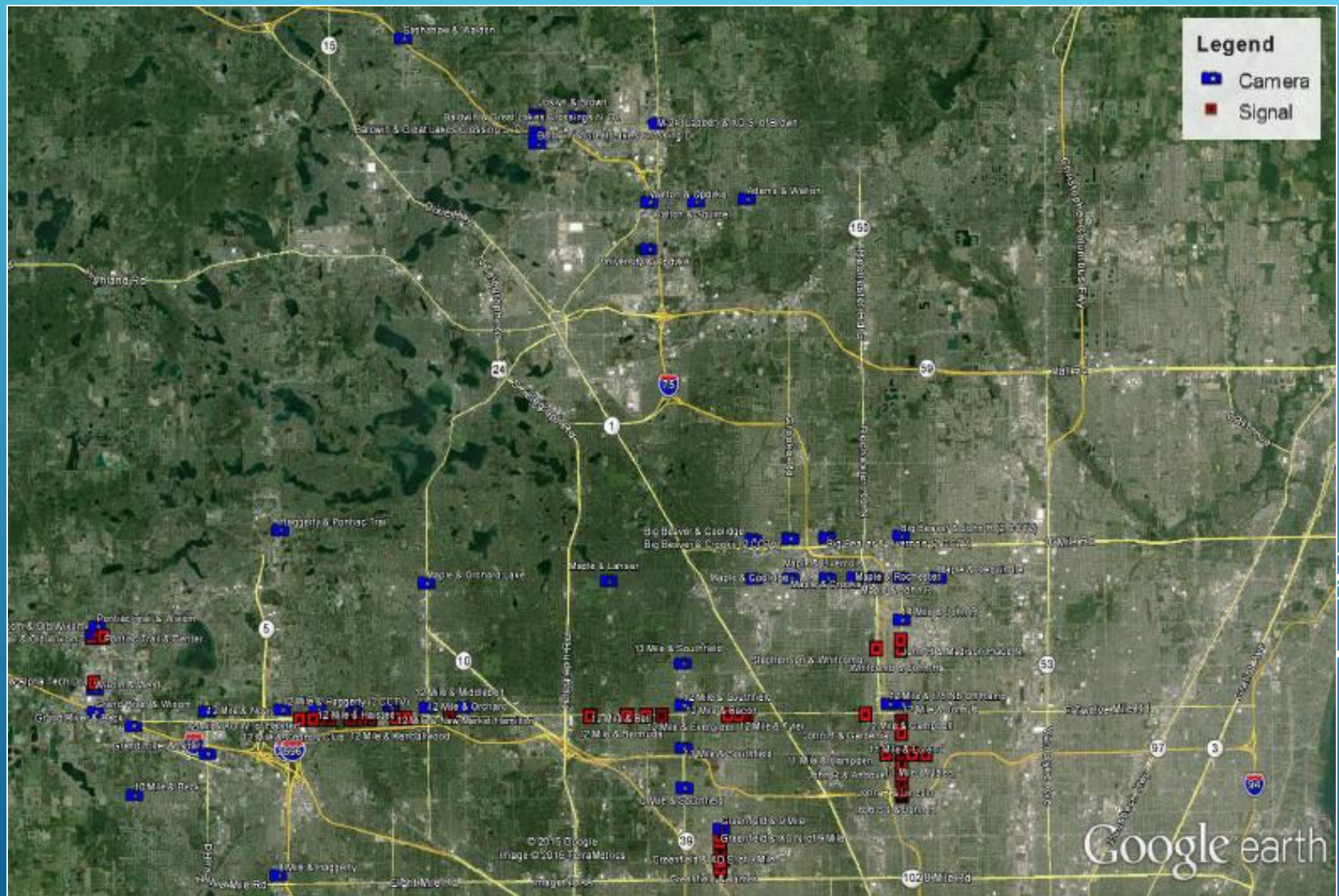


ADVANTAGES OF OVERHEAD DETECTION

- Able to Maintain 365 Days Per Year
- Usually No Lane Closures Needed for Maintenance
- Difficult to Maintain Loops
- Safer for Motorists and our Crews

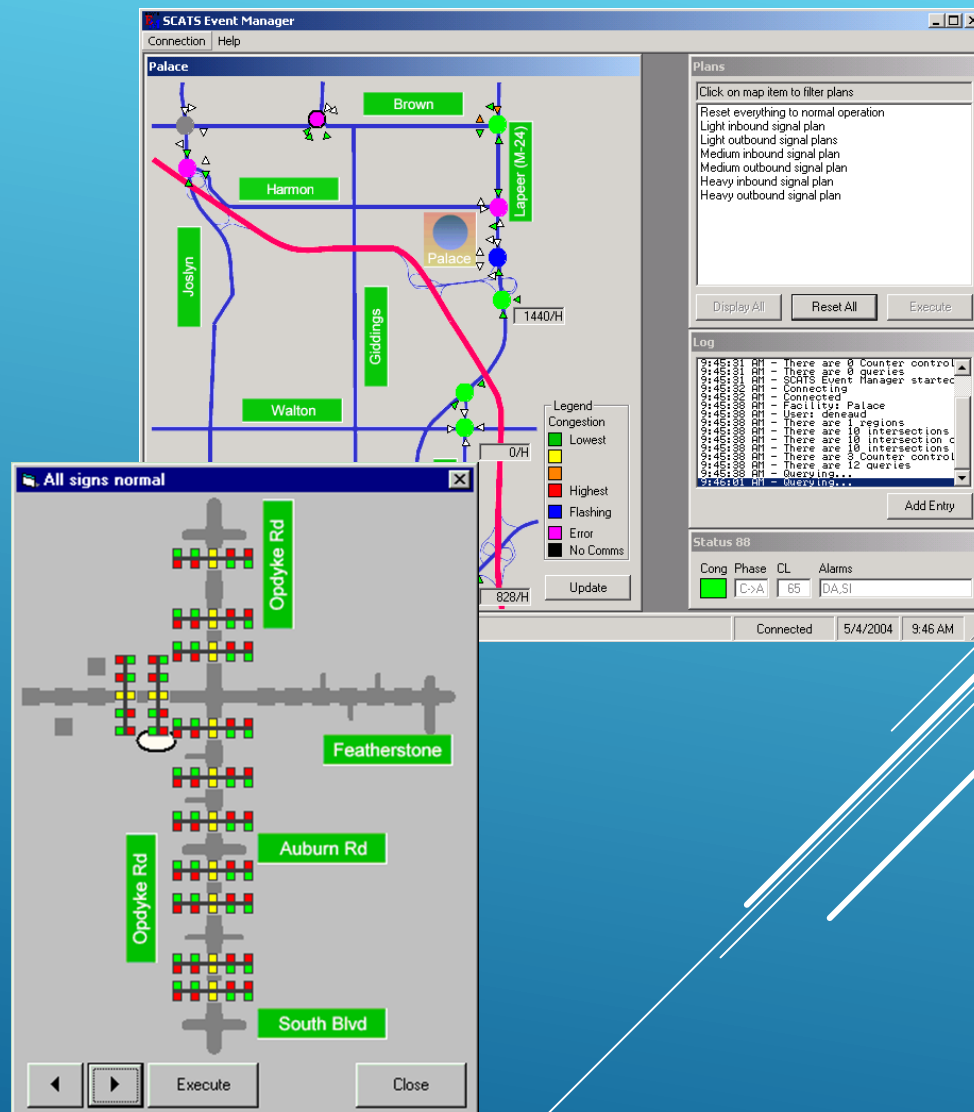


CCTV CAMERAS



SCATS EVENT MANAGER

- Palace of Auburn Hills had 8 plans controlled 12 intersections and over 200 events each year
- Suburban Collection in Novi has one intersection
- Pontiac Silverdome had over 200 plans that controlled 23 Intersections and 12 lane-use signs
- MDOT/RCOC ICM Project to control 46 intersections (I-75 in Troy)



TOC INTEGRATION WITH MDOT

- Inter-tie to MDOT's SEMTOC (SE Michigan Transportation Operations Center)
- Data sharing from MDOT
 - Speed and volume
 - Incidents
 - Construction
 - Freeway video
- Transportation Information Management System (TIMS)
- Metro Traffic reported from TOC



OTHER INITIATIVES

HAWK



RRFB



ROUNDABOUTS


AVL Tracking System



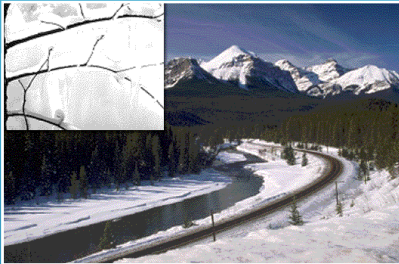
THE FUTURE OF THE TRANSPORTATION INDUSTRY

CONNECTED VEHICLE INSTALLATIONS IN OAKLAND COUNTY

PARADIGM SHIFT FOR ROADWAY SAFETY

- Moving from passive safety to active safety
 - Connected Vehicle Technology allows us to move from minimizing the extent of the injury after the crash to preventing the crash in the first place
 - Ability of cars talking to other cars and the infrastructure
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CONNECTED VEHICLE TECHNOLOGY POTENTIAL APPLICATIONS



Weather Sensing



Intersection Collision Avoidance



**Traveler
Information**



Work Zone Management

-also
- In-Vehicle Signing
- Emergency Vehicle Alerts
- Curve Warnings
- Slippery Pavement Alerts
- Over 100 other applications

WHAT IF WE HAD CONNECTED VEHICLE TECHNOLOGY.....

I-75 in Grayling.....

100-car I-75 pileup Kills 1, injures 40



Squall blinds drivers
at exit near Frederic

By Jeremy Pearce, Rusty
Hoover and Santiago Espinoza
LATIMAR NEWS

FREDERIC, Mich. — A blizzard squall blinds drivers on Thursday and set off a 100-car pileup on I-75 near the town of Frederic, killing one person, injuring 40 and blocking traffic for hours.

The 100-car pileup occurred on a section of I-75 just north of the town of Frederic, where a blizzard squall hit the area. The accident occurred on a section of I-75 just north of the town of Frederic, where a blizzard squall hit the area. The accident occurred on a section of I-75 just north of the town of Frederic, where a blizzard squall hit the area.



Be careful
Times Drivers need snow tires, in course, Page 4A

.....I-96 in Muskegon....




.....I-96 in Williamston



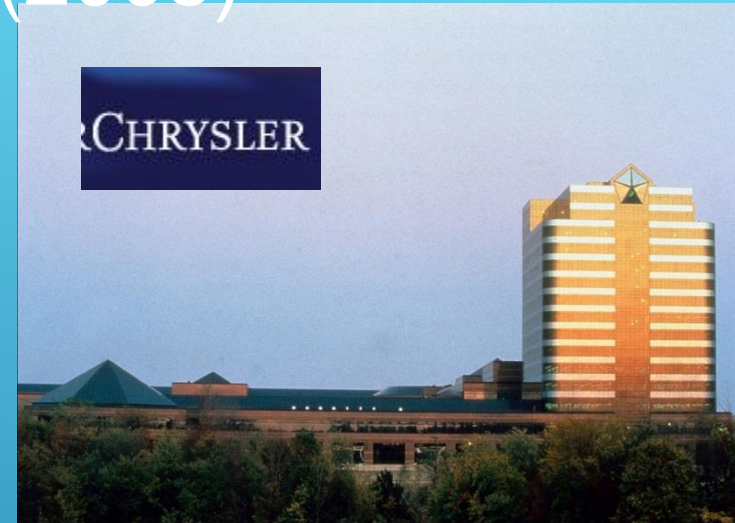
MICHIGAN AND CONNECTED VEHICLE TECHNOLOGY

Michigan's Advantages as CV Center

- Home to Big Three and Auto Suppliers (OEMs)
 - History of ITS leadership (FAST-TRAC)
 - RCOC is a partner with MDOT and FHWA
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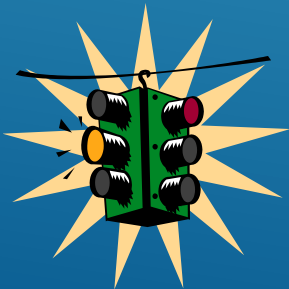
DAIMLER CHRYSLER (DCX) HQ INSTALLATION (2005)

- Installation of wireless network on six traffic signals around HQ, Telegraph at Maple & Telegraph at 12 Mile
- Joint project between RCOC, MDOT, DCX and Ottawa Wireless
- Chrysler instrumented “fast-feedback” cars to communicate data across the wireless network
- Intent: Retrieve real-time probe and diagnostic data from vehicles
- RCOC/MDOT received “probe vehicle” information




COOPERATIVE INTERSECTION COLLISION AVOIDANCE SYSTEM (CICAS) (2006)

- Implemented field trials that demonstrated improved intersection safety by alerting vehicles that were about to run a stop sign or traffic signal
- Oakland County test intersections
12 Mile & Farmington Rd and 10 Mile & Orchard Lake
- Other field trials were in Virginia and California



DATA USE ANALYSIS AND PROCESSING (DUAP) (2006)

- Ongoing effort led by MDOT
 - Evaluate the use of Connected Vehicle data for public-sector purposes
 - Responding to safety concerns
 - Managing traffic
 - Managing transportation assets
 - Answer the questions “How can public agencies use Connected Vehicle?” and “What data is useful?”
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NATIONAL CONNECTED VEHICLE PROOF OF CONCEPT (POC) (2007)

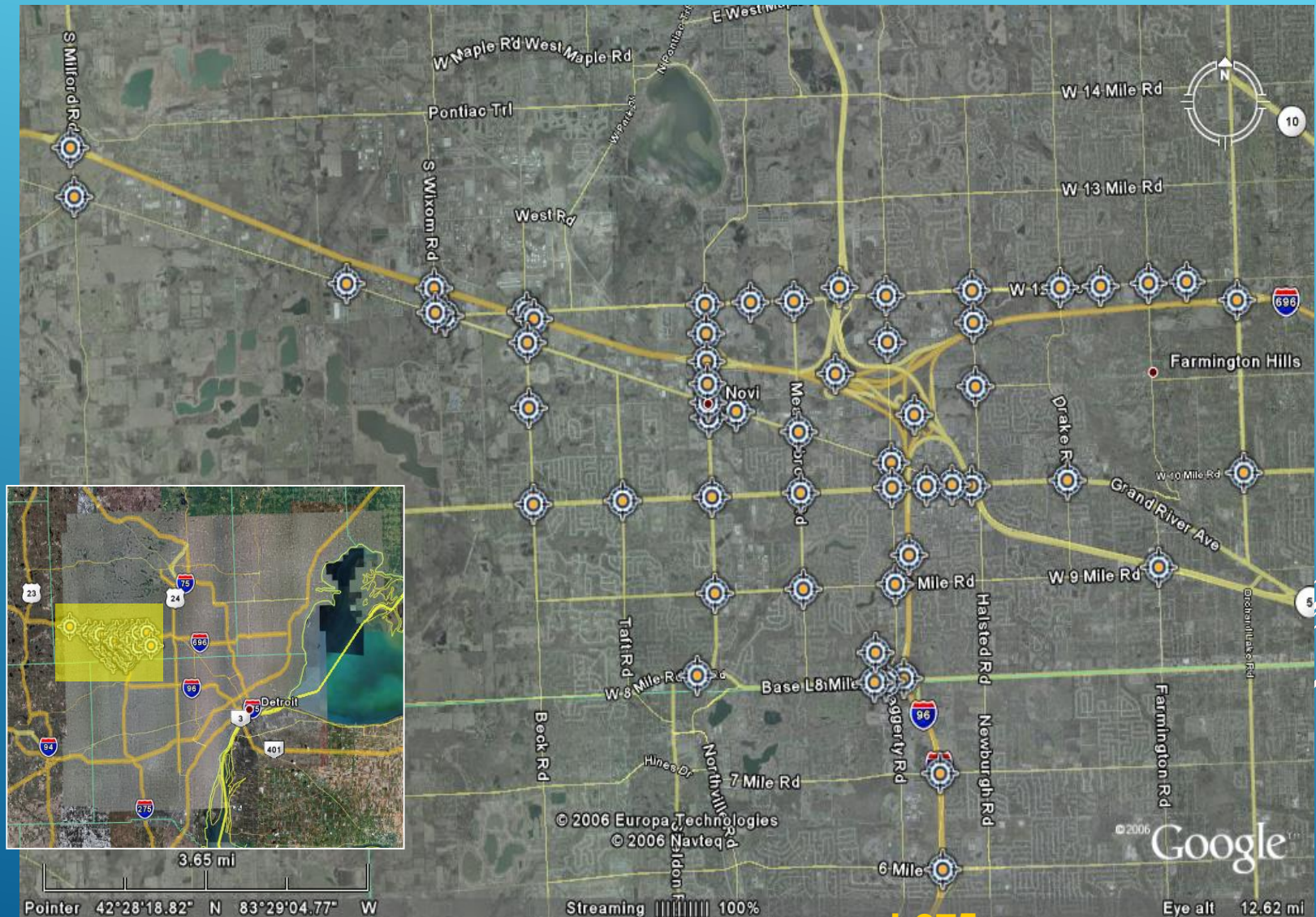
- Joint project with MDOT and FHWA
- First large-scale demonstration in the entire U.S.
- Located in the southwest portion of Oakland County (Novi/Farmington Hills)
- 55 RoadSide Equipment (RSE) units installed at 43 traffic signals
- Covered about 45 square miles
- Successfully proved that data could be shared between infrastructure and vehicles in a timely, accurate and useful manner
- Project is ongoing with RCOC helping to maintain

POC RSE LOCATIONS

M-5

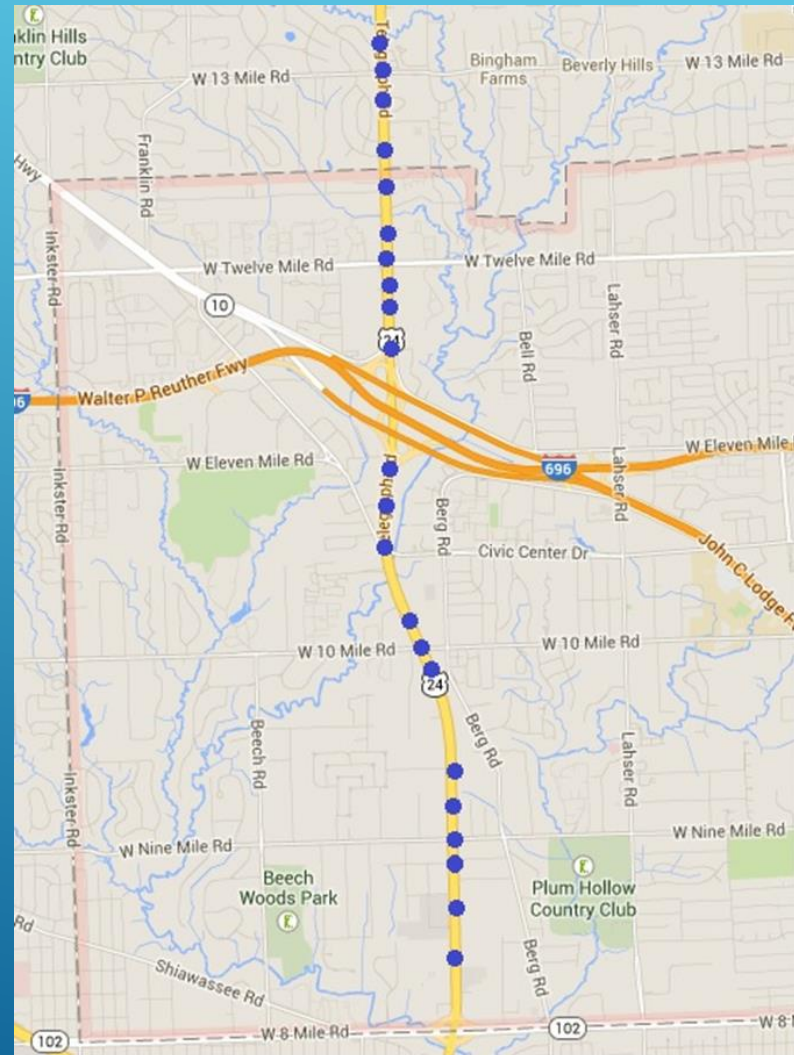
I-96

I-696




MDOT TELEGRAPH EXPANSION PROJECT (2010)

- 22 RSEs in Southfield
- Send SPaT information
- Open test bed
- Ongoing project



CONNECTED VEHICLE DEPLOYMENT EFFORTS

- Ford Lincoln (2005) Wi-Fi
 - Motorola DSRC (2006) VtoV and Vtol
 - Taiwan SPaT Demo (2011) Cellular and DSRC
Adjust car speed to get a green signal
 - USDOT Safety Pilot (2011) Ann Arbor
 - ITS World Congress (2014)
 - RCOC CV Committee Involvement
 - Pooled Fund
 - AASHTO CV Working Group
 - ITE CV and Autonomous Task Force
 - CV Coalition
- 

CONNECTED VEHICLE DEPLOYMENT EFFORTS CONT'D

Current CV Collaborations with MDOT

- Auburn Hills SPaT Project
- 3M Sign Applications
- Potential to equip RCOC fleet for CV applications

OCCV Task Force

- Testing various technologies with OCCV taskforce, MDOT and multiple private entities

ITS AMERICA 2018 IN DETROIT

Annual ITS event June 4 to 7, 2018





QUESTIONS???



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