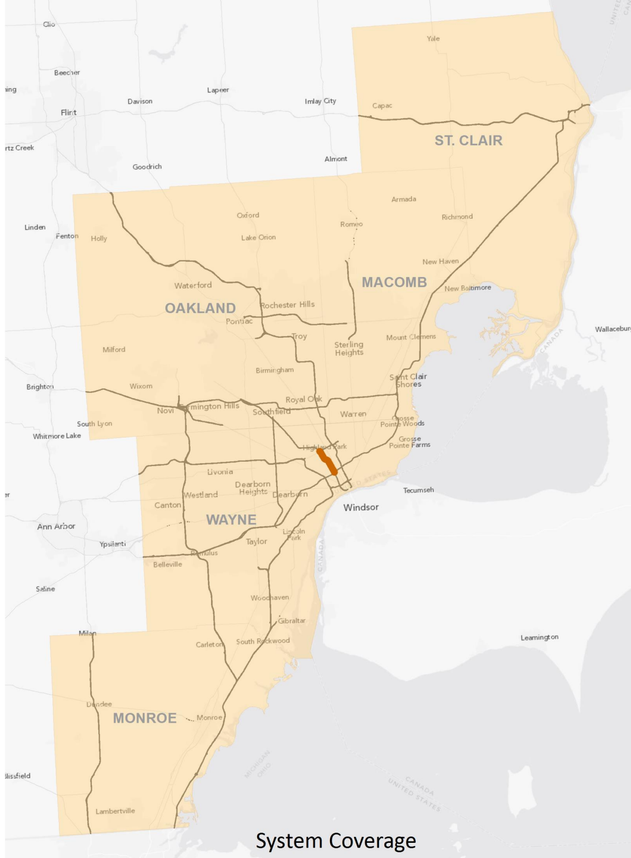
50+ YEARS OF INNOVATION

1957-1971
JOHN C. LODGE PROVING GROUND PROJECT

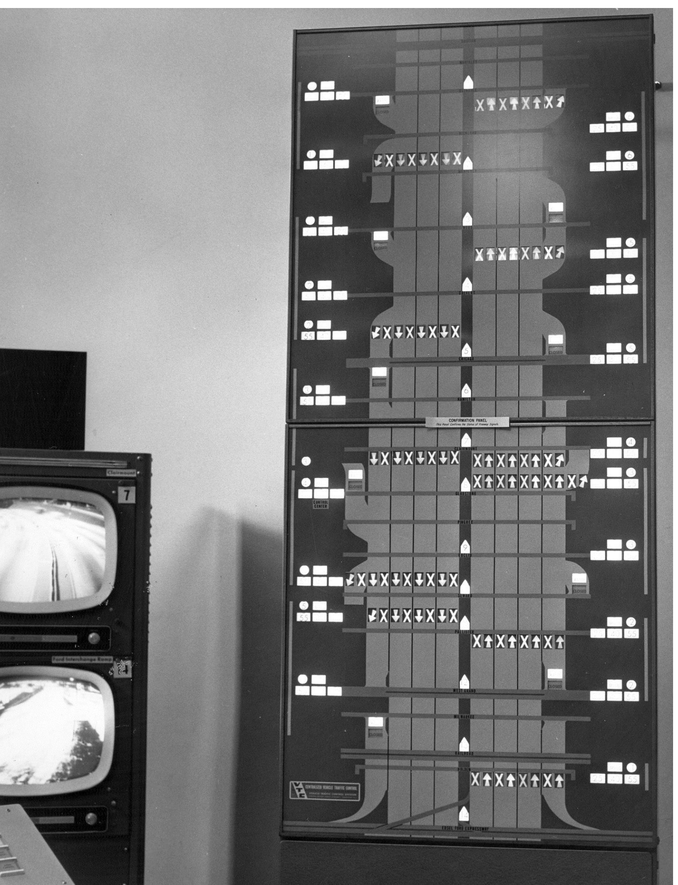
The first experiments in the nation to use closed-circuit television (CCTV) to study freeway traffic were started in Detroit in 1957 and the John C. Lodge Proving Grounds project opened in 1961. The project installed 14 CCTV cameras along M-10 from Glendale Street to Holden Street just north of I-94 and allowed roadway conditions to be monitored remotely. To supplement the CCTV cameras, classification and speed sensors and analog computers with display panels were added.

In 1962, “use of lane” signals, on-ramp signs and variable speed signs were installed, thus enabling staff to have traffic control capabilities in conjunction with traffic surveillance capabilities. Monitoring and control of the new freeway system took place at Detroit’s first TMC housed in a small room at the Herman Keifer Hospital.

The John C. Lodge Proving Grounds project ended in 1971.



System Coverage



1961

DETROIT'S FIRST TRAFFIC MANAGEMENT CENTER OPENS

From Detroit's first traffic management center (TMC), situated in a small room at the Herman Keifer Hospital, operators monitor and control the freeway system.

1962

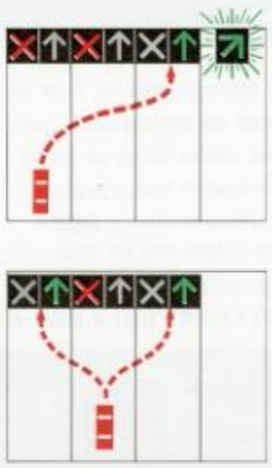
STAKEHOLDERS ADVERTISE TRAFFIC CONTROL SYSTEMS TO THE PUBLIC

Publications were released to educate and provide guidance to motorists on interacting with the new on-street system components.

VARIABLE SPEED LIMITS

VARIABLE SPEED: The speed limit is 55 when traffic conditions are normal. When it is required, the speed limit is reduced to either 40 or 25. These speeds *must* be obeyed. They take precedence over *any* posted limits.

RAMP SIGNALS: A ***Flashing Slanted Green Arrow*** at an exit ramp indicates it is advisable to leave the freeway to avoid excessive delay. Signs at entrance ramps to prevent motorists from entering the freeway will be installed in the future.



LANES: When your lane and the adjacent lane have the ***Red X*** illuminated, you must move safely across these lanes to a ***Green Arrow*** lane. To avoid delay, you may wish to leave on the exit ramp.

LANES: In this situation, you have a choice of transferring either to the left or the right open lane.

FIRST IN THE NATION: This pioneering traffic control and research system is the first of its type in the nation. It is a joint project of the Michigan State Highway Department, the City of Detroit, Wayne County Road Commission and the U. S. Bureau of Public Roads. The experience gained in Detroit will be applied to freeways throughout the nation.

EMERGENCY SERVICE: Direct telephone contact between the control room and the Detroit Police Department permits immediate dispatch of emergency vehicles to the scene of an accident or vehicle breakdown.

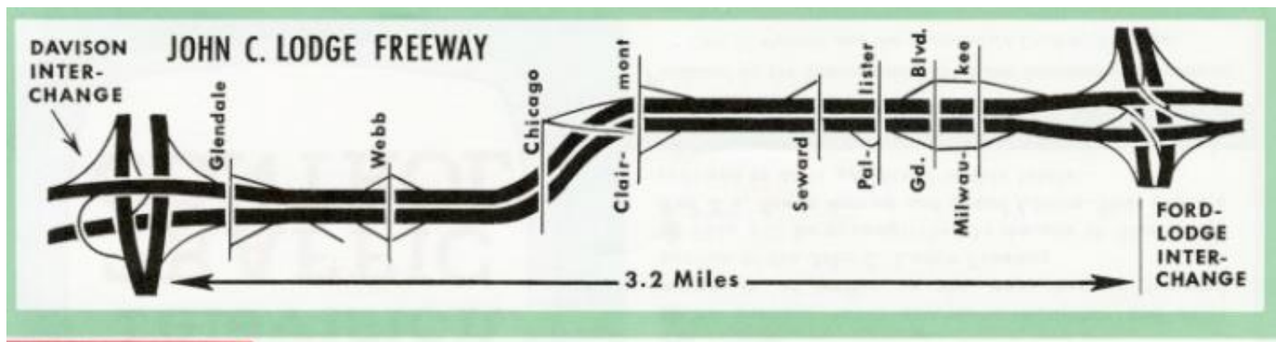
RESEARCH: Electronic computers and data-processing equipment are fed information from automatic sensing devices over the freeway, providing data on traffic volumes, density, speeds and other facts required for analysis by traffic engineers.

Detroit's Television TRAFFIC CONTROL

FOR YOUR INFORMATION • • • •

- The nation's first experimental traffic control system of closed-circuit television coordinated with illuminated signs will begin operation on Monday, May 7, 1962.
- Its purpose is to provide a smoother and safer movement of traffic on the most heavily traveled section of the John C. Lodge Freeway.
- This will be accomplished by the use of illuminated ***Red X's, Green Arrows*** and ***Speed Limits.*** What you are required to do is explained in this leaflet.

Produced by the Department Report and Information Committee, City of Detroit and the Automobile Club of Michigan.



WHERE?

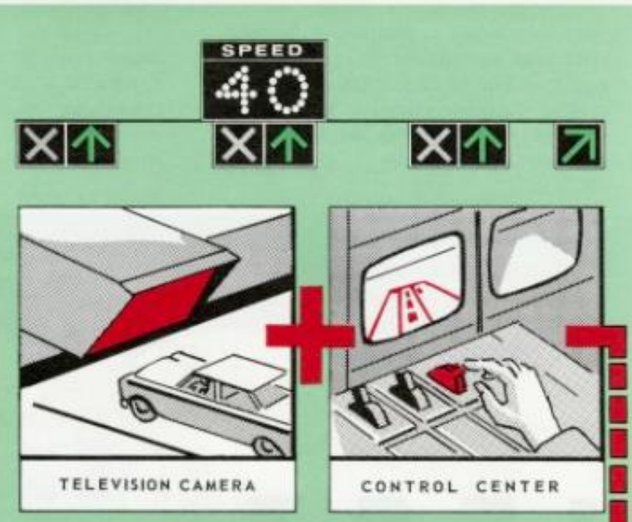
This unique closed-circuit television system with overhead illuminated signs and signals covers a 3.2 mile section of the Lodge Freeway between the Davison and Ford interchanges.

Fourteen cameras are mounted on bridges and monitor traffic in both directions. There are 21 sets of overhead illuminated lane signals and speed signs.

WHAT?

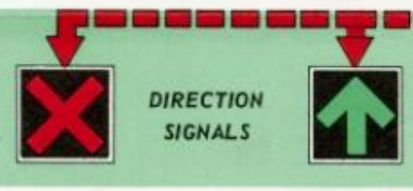
The project is designed as a pioneering attempt to control traffic so as to provide maximum efficiency and safety. It also gathers and analyzes information regarding driver behavior under all types of freeway driving conditions to enable highway engineers to improve future design.

The pictures from the fourteen cameras are observed and the lane signals and speed signs controlled from a central control room. Traffic observers are able to "pan" and "tilt" the camera, switch from standard to telephoto lens, adjust for night or daylight conditions and activate the lane signals and speed signs from the control room by pushing buttons.



HOW?

The illuminated signs and signals operate only during peak travel periods and when unusual conditions arise. They inform motorists what to do. An illuminated RED X is a warning that a lane is blocked ahead. A GREEN ARROW indicates the lane is clear ahead but does not necessarily mean conditions are right to travel at top speed.



IF RED X IS ILLUMINATED OVER YOUR LANE:

- ***DO*** *move to a* ***GREEN ARROW*** *lane as soon as you safely can.*
- ***DON'T*** *veer suddenly to the adjacent lane.*
- ***DON'T*** *stop unless necessary.*

In all of these cases your own good judgement is vital. Concentrate on your lane and speed control. Be alert for cars entering your lane.

1962

EARLY TRAFFIC CONTROL DEVICES ARE DEPLOYED

CCTV cameras, dynamic “use of lane” signs and variable speed limit signs allowed staff at the TMC to manage roadway operations more efficiently.

1976-1991
SCANDI

The Surveillance, Control and Driver Information (SCANDI) program began in 1976. The program built a control room in the Sentinel Building in Detroit and installed equipment along segments of I-94, M-10, I-75 and I-375 for a total coverage area of 32.5 miles. Project implementations included the following components.

- 1,300 traffic detectors, spaced at increments of every third of a mile.
- Four traffic cameras, expanding to 12 cameras by 1991.
- Nine advisory signs, growing to 14 dynamic message signs (DMS) by 1991.
- 28 ramp meters along I-94 and 23 ramp meters along M-10 by 1987.
- 69 motorist-aid telephones along I-94 connected directly to the Michigan Sate Police (MSP).
- Two central Perkin-Elmer mainframe computer processors.

The SCANDI system allowed personnel to collect real-time roadway information from cameras and detectors, coordinate incident observances with MSP, and disseminate critical information to the advisory signs to notify motorists of roadway conditions.

System Coverage

1980

SCANDI CONTROL ROOM OPENS FOR OPERATIONS

A control room operator monitors real-time traffic operations using data feeds from 1,300 on-street detectors and four traffic cameras. The traffic management center was located in the Sentinel Building in downtown Detroit and housed two Perkin-Elmer mainframe computers to support operations.

1980

MOTORISTS BEGIN RECEIVING INFORMATION VIA TRAFFIC ADVISORY SIGNS

Nine advisory signs were installed in the initial phase of SCANDI. By 1991, there were 14 signs installed throughout the project area.

1980

MOTORIST-AID SYSTEM CONNECTS STRANDED MOTORISTS WITH POLICE

The motorist-aid system installed 69 telephone call boxes along 13.5 miles of I-94. Motorists' calls from these telephones connected directly with the Michigan State Police Post 29.

MOTORIST-AID CALL BOXES

An important supplement to the SCANDI system is a network of motorist-aid call boxes. They are placed every one-third mile along the shoulders of both eastbound and westbound I-94 (Edsel Ford) Freeway in Detroit. All are well marked and resemble the familiar outdoor telephones widely available in public places. The motorist-aid phones, seldom more than one-sixth mile from a disabled vehicle, are for emergency use only.

If a driver runs out of gas, has a blow-out or some other emergency, he or she has only to lift the telephone off the hook to be in a two-way voice communication with the dispatcher for the State Police freeway patrol.

This is SCANDI

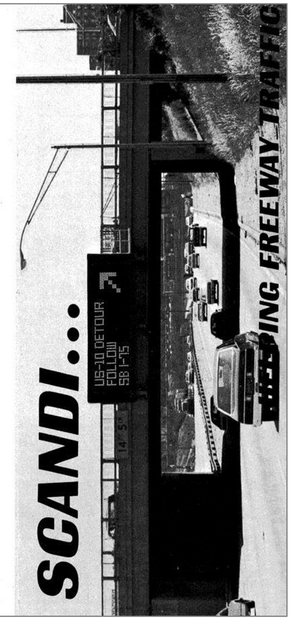
SCANDI is designed to reduce congestion on Detroit freeways by helping to maintain a steady flow of traffic.

Reduced Congestion Means:

- Safer freeways
- Reduced gas consumption
- Less air pollution
- Fewer delays
- Less stress and frustration for the motorist
- Less need for more or wider freeways or widening of existing streets to accommodate increased traffic volumes

SCANDI
Freeway Operations Unit
2211 E. Jefferson
Detroit, MI 48202

313-256-2704



SCANDI what is it?

SCANDI stands for "Surveillance, Control and Driver Information" system.

This is a program to reduce congestion on Detroit freeways and help keep traffic flowing as smoothly as possible.

Reduced congestion means safer freeways, reduced gas consumption, less air pollution, fewer delays and less stress and frustration for the motorist.

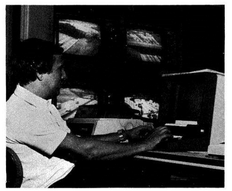
Congestion can develop very quickly and unexpectedly when an accident occurs or a vehicle stalls on the freeway. It can also develop at predictable times during morning and evening rush hours or when large numbers of cars are headed to and from a single destination such as a hockey or baseball game.

Some congestions is unavoidable. But it can be reduced without resorting to the extremely costly, and disruptive, alternative of building more freeways or widening existing streets. That's what SCANDI is all about.

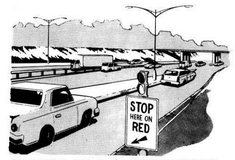
Using modern technology, it continuously SURVEYS traffic along 32.5 miles of Detroit freeways and instantly transmits data to a team of traffic specialists stationed at SCANDI headquarters near downtown Detroit. Using that data, the traffic specialists can issue electronic "commands" to help CONTROL the volumes of traffic entering the freeway and to provide INFORMATION TO DRIVERS that will help them cope with traffic problems ahead of them on the freeway. SCANDI also detects accidents or other traffic-slowing incidents faster than other methods do, allowing for a quicker response.

THE SURVEILANCE SYSTEM... how it works

SCANDI's surveillance system is virtually invisible to motorists. A major component consists of some 1,300 sensor loops, or detectors, embedded in the pavement every one-third mile in each of the freeway lanes. These devices constantly "detect" the number of cars passing over them, as well as the speed they are traveling. The data is transmitted instantly to computers at SCANDI headquarters and then to a huge color-coded "live" map which shows constantly changing conditions on every mile of freeway served by SCANDI. Any accident or other incident that interferes with traffic flow can thus be quickly detected.



SCANDI crews also survey the freeways by watching a bank of television screens mounted on a wall at the control center. Ten cameras mounted on high poles at various locations along the freeway focus on moving traffic and relay the picture to SCANDI headquarters via closed circuit TV. The cameras are controlled by technicians monitoring the screens. If an accident occurs, a vehicle stalls, or some other traffic-related incident occurs within range of a camera, the operator can "zoom in" with the camera to get a close-up view of the scene. SCANDI staffers then notify police or other agencies about any incident requiring their attention. Every minute counts in action that can be taken to get traffic moving again at normal speeds.



RAMP FLOW CONTROL

Congestion occurs when more vehicles are trying to use the freeways than they can handle. One way of maintaining a good flow of traffic is to regulate the number of vehicles entering a freeway when it is overcrowded.

SCANDI does it with two-color traffic signals placed at a limited number of entrance ramps. When the signal is red, drivers must wait until it switches to green before moving onto the freeway, one car at a time. The signal regularly changes from red to green so that waiting traffic is allowed to enter the freeway even when congestion occurs.

Although the signals look like ordinary traffic lights, they actually are controlled by the finely-tuned SCANDI computer system. Each signal can be individually adjusted by the computer to instantly respond to traffic conditions, but all work together as a system.

It may take drivers a little longer to get on the freeway with ramp flow controls, but once they are in the traffic stream they can expect to drive at a faster, steadier rate, thus reducing their overall driving time.

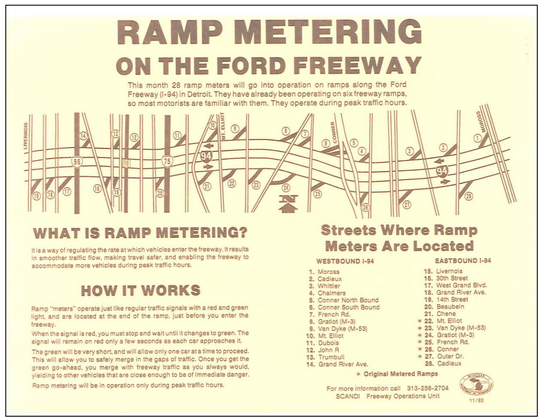
ADVISORY SIGNS

Highly visible components of the SCANDI system are 9 large advisory signs erected on freeway overpasses throughout Detroit. These electronic signs display changeable messages that inform drivers of conditions ahead if traffic is snarled or slowed by highway work, for example, and advise them of the best alternate routes to take. The signs also give parking advice, such as which exits to use for parking during special events. They are controlled by the crew at SCANDI headquarters and remain blank unless traffic conditions warrant their use.

1982

RAMP METERS BEGIN REGULATING TRAFFIC FLOW

The ramp metering operation of SCANDI began at six ramps on I-94. By 1985, 22 more ramp meters had been installed and a few years later, 23 ramp meters were installed on M-10, for a total of 51 ramp meters.



RAMP METERING
ON THE FORD FREEWAY

This month 28 ramp meters will go into operation on ramps along the Ford Freeway (I-94) in Detroit. They have already been operating on six freeway ramps, so most motorists are familiar with them. They operate during peak traffic hours.

WHAT IS RAMP METERING?

It is a way of regulating the rate at which vehicles enter the freeway. It results in smoother traffic flow, making travel safer, and enabling the freeway to accommodate more vehicles during peak traffic hours.

HOW IT WORKS

Ramp "meters" operate just like regular traffic signals with a red and green light, and are located at the end of the ramp, just before you enter the freeway.

When the signal is red, you must stop and wait until it changes to green. The signal will remain on red only a few seconds as each car approaches it.

The green will be very short, and will allow only one car at a time to proceed. This will allow you to safely merge in the gaps of traffic. Once you get the green go-ahead, you merge with freeway traffic as you always would, yielding to other vehicles that are close enough to be of immediate danger.

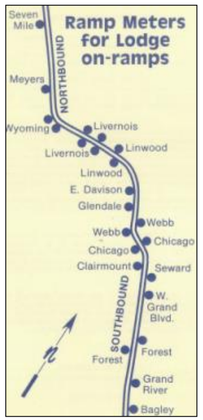
Ramp metering will be in operation only during peak traffic hours.

Streets Where Ramp Meters Are Located

WESTBOUND I-94	EASTBOUND I-94
1. Moross	15. Livernois
2. Cadieux	16. 30th Street
3. Whittier	17. West Grand Blvd.
4. Chalmers	18. Grand River Ave.
5. Conner North Bound	19. 14th Street
6. Conner South Bound	20. Beaubien
7. French Rd.	21. Cherry
8. Gratiot (M-3)	* 22. Mt. Elliot
9. Van Dyke (M-53)	* 23. Van Dyke (M-53)
10. Mt. Elliot	* 24. Gratiot (M-3)
11. Dubois	* 25. French Rd.
12. John R.	* 26. Conner
13. Trumbull	* 27. Outer Dr.
14. Grand River Ave.	28. Cadieux

* Original Metered Ramps

For more information call 313-256-2704
SCANDI Freeway Operations Unit
11/83



1985

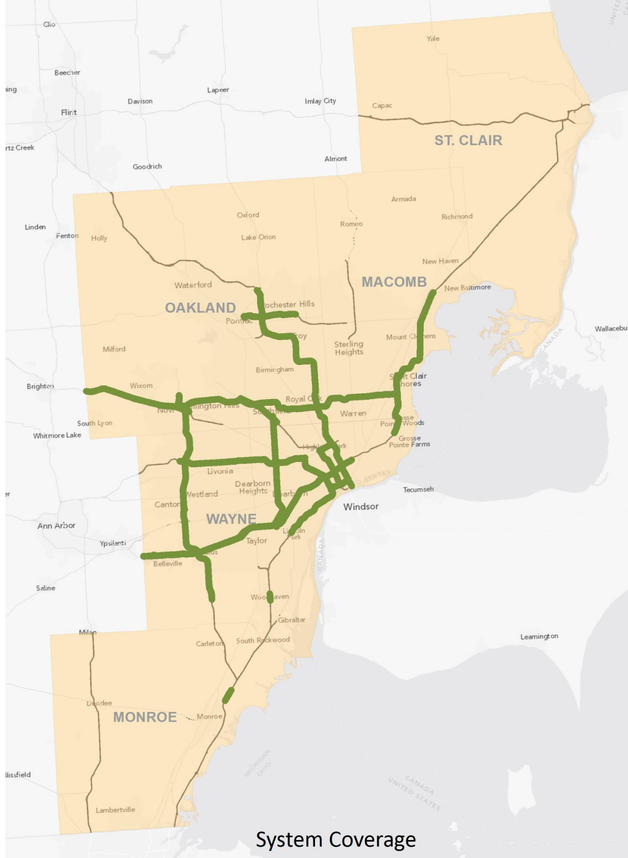
SCANDI INFORMATIONAL BROCHURE

Because the SCANDI system introduced new traffic management technologies and required motorists' participation in order for the benefits to be noticed, extensive efforts were spent to advertise the functionality of the system.

1991-2012 MITSC

In 1991, freeway operations staff and device communications were relocated to MITSC in Detroit. Operations would expand considerably over the next two decades, as follows:

- The Freeway Courtesy Patrol (FCP) began as a pilot program in Detroit in 1994 with MDOT assuming responsibility in 1999.
- In 1995, the MSP dispatch relocated to MITSC and established the first combined freeway operations and State Police dispatch center in Michigan.
- By 1998, system coverage had expanded to 180 miles of freeway to become the largest intelligent transportation system (ITS) deployment in the world at the time.
- To provide a common space for stakeholders to operate during emergencies or special events, MDOT built an auxiliary transportation operations center (TOC) in 2006.
- To better manage traffic approaching and crossing the Blue Water Bridge in Port Huron, MDOT opened the Blue Water Bridge TOC in 2009.
- In 2009, the MITSC video wall was upgraded and MDOT began converting its communications system to digital format.



System Coverage

AROUND M·DOT

photos by Jim LeMay

Metropolitan Transportation Center staff greet Director Nowak (from left) Leo Defrain, Pat Nowak, Ray Kluczny, Monroe Pendelton, Mark Michaels, Wendell Bilkken, Dave DeVaughn, Tom Mullin, Claressa Wagner, Mike Rogers (directly behind Wagner), Ross Bremer, Mohammed Bahalwan, Bodie Reed, Mark Bush (behind Reed), Bob Maki and Andy Hodges.

New Detroit Transportation Center does double duty

Intercity bus passengers enjoy the new Detroit Transportation Center.

The Freeway Operations Division, Intelligent Vehicle Highway Research section and thousands of intercity bus passengers are enjoying the new Detroit Transportation Center. It was officially opened with a ribbon-cutting ceremony on Valentine's Day.

The downstairs area serves as the operating base for private intercity bus services for the city of Detroit, including Greyhound, American Bus Lines and Greyhound Lines of Canada.

The second floor houses M-DOT's Detroit Freeway Operations unit and new Intelligent Vehicle/Highway System (IVHS) laboratory, collectively known as the Metropolitan Transportation Center (MTC). The freeway operations center oversees operations on 65 miles of freeways throughout the Greater Detroit.

IVHS technology, still in its early stages, will be conducted by M-DOT and researchers from the University of Michigan. The $6.2 million center was paid for with a grant from M-DOT.

14

1991

FREEWAY OPERATIONS MOVE TO MITSC

The Metropolitan Transportation Center (MTC), later adopting the name Michigan Intelligent Transportation Systems Center (MITSC), was situated on the second floor above the Greyhound station and provided access to more roadway data and a larger space for freeway operations.

1994

FREEWAY COURTESY PATROL PROGRAM BEGINS

The Freeway Courtesy Patrol (FCP) program began under private ownership with two vans patrolling a portion of I-75 in Detroit. The Michigan Department of Transportation (MDOT) assumed responsibility of the program in 1999 and has continued to expand the fleet, services provided and coverage area since.

1995

FREEWAY OPERATIONS AND MSP POST 29 DISPATCH CO-LOCATE

The Michigan State Police (MSP) dispatch relocated to MITSC. The move encouraged direct communication and resource sharing between MITSC operators and MSP dispatchers, resulting in more effective traffic incident management.

2006

AUXILIARY TOC IS BUILT TO SUPPORT SPECIAL EVENT OPERATIONS

An auxiliary transportation operations center (TOC) was built at MITSC to provide a space where stakeholders could gather and operate during special events and emergency situations. The space marked the beginning of truly coordinated event traffic management in Detroit.

2009

BLUE WATER BRIDGE TRANSPORTATION OPERATIONS CENTER OPENS

MDOT sought to improve traffic operations near the Blue Water Bridge in Port Huron, especially after the intelligent transportation system (ITS) expansion project in the area. Thus, the Blue Water Bridge Transportation Operations Center (BWBTOC) began operations.

2009

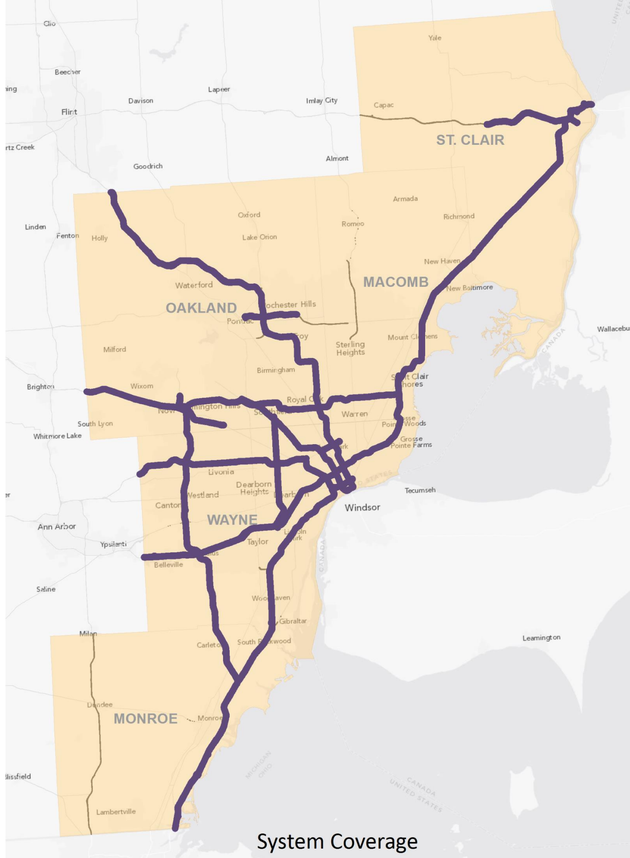
TECHNOLOGY ADVANCEMENTS INCLUDE NEW VIDEO WALL AND DIGITAL COMMUNICATIONS

The video wall in the MITSC control room was upgraded to allow more flexibility in viewing traffic cameras and television feeds. MDOT also began conversion of its communications system from analog to digital format to provide more reliable, quicker data transfers between field devices and MITSC.

2012-PRESENT
SEMTOC

In 2012, the Michigan Intelligent Transportation Systems Center (MITSC) relocated across the street to its new home and assumed the new name of Southeast Michigan Transportation Operations Center (SEMTOC). The Michigan Department of Transportation (MDOT) continues to integrate new ITS technologies into its system while simultaneously enhancing existing operations and capabilities. SEMTOC was built with the necessary space to accommodate the future growth of ITS throughout the region as the system and roles expand.

MDOT is investing in the research, development and deployment of infrastructure to support connected vehicles that will lead to significant improvements in safety and mobility. MDOT developed a connected vehicle simulator to allow users to experience the benefits of this technology and has led the nation in deploying test bed facilities on public and private roadways.



System Coverage

2012

FREEWAY OPERATIONS AND MSP DISPATCH RELOCATE TO SEMTOC

Operations of the Metro Region intelligent transportation system (ITS) and Michigan State Police (MSP) dispatch relocated to the Southeast Michigan Transportation Operations Center (SEMTOC). The new facility provides state-of-the-art tools and spaces to accommodate traffic operations of today and room to expand for the operations of the future.

2014

INTEGRATED CORRIDOR MANAGEMENT SYSTEMS ARE DEPLOYED

MDOT deployed its first integrated corridor management (ICM) pilot projects in the Metro Region. ICM integrates arterial roadways and the freeway system, improving traffic flow and efficiency during major freeway incidents. The projects installed trailblazing guide signs and arterial traffic cameras, and programmed special signal timing to improve arterial flow during incidents. All components are integrated into SEMTOC as well as local agency operation centers.

2014

DETROIT HOSTS 21ST WORLD CONGRESS FOR INTELLIGENT TRANSPORTATION SYSTEMS

The largest gathering of ITS professionals was held in Detroit in September 2014. MDOT worked closely with local, national and international stakeholders to create an event that demonstrated the latest in ITS technology. SEMTOC was on display during the event to showcase its ITS operations.

LOOKING TOWARD THE FUTURE OF ITS IN MICHIGAN

MDOT has been a leader in ITS technologies in the past and MDOT continues to pave the road into the future. Studies to integrate vehicle and roadway infrastructure into a common communications platform that provides safer, more efficient traffic operations are under way and test beds have been deployed. MDOT has and will continue to be a key partner in future ITS endeavors throughout the state, nation and world.