



# Organization and Structure of Traffic Management Centers: Two Case Studies in Michigan

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## 1 Project Overview: The Design of Traffic Management Centers

- **Report 1:** Reviews the current literature and research on human factors considerations in traffic management centers (TMCs) and identifies future research needs (Nowakowski, Green, and Kojima, 1999).
- **Report 2:** Examines two local TMCs in order to obtain a better understanding of the practical problems of TMC design (this report).
- **Report 3:** Develops human factors guidelines for TMC website design.

## 2 Topics

Topics examined in this report for TMCs in Detroit, Michigan, and Oakland County:

- *Each center's layout, structure, and operation*
- *Practical and human factors issues in the two centers*
- *Differences between actual system problems experienced by the TMCs and problems described in the literature*

## 3 Detroit TMC Findings

Interviews with operators revealed that their goals were consistent with goals of an ideal TMC identified in the Georgia Tech TMC Design Guidelines (1993).

- 5 objectives of an ideal TMC are:
  - *Maximize the available capacity of the area-wide roadway system.*
  - *Minimize the impact of roadway incidents (crashes, stalls, and debris).*
  - *Contribute to the regulation of demand.*
  - *Assist in the provision of emergency services.*
  - *Create and maintain public confidence in the TMC.*
- MDOT's primary goal: Assist in incident response and communicating traffic information to the public

Detroit TMC Summary		
Characteristic	Preexpansion	Postexpansion
Miles of Freeway	32.5	170.5
TV Monitors	24	24
CCTVs	11	149
CMS	14	57
Ramp Meters	49	59
Loop Detectors	1,240	2,400
HAR Transmitters	0	12
Staffing	12 hr weekdays	24 hrs all days

Features of the Detroit TMC		
Data Collection	Data Processing	Information Dissemination
<ul style="list-style-type: none"> <li>Cameras and loop detectors are used to monitor traffic.</li> <li>CCTVs are used to visually confirm traffic.</li> <li>Motorist Aid Telephones were removed in 1991.</li> </ul>	<ul style="list-style-type: none"> <li>A 3-panel video wall with 24 monitors and nine 41-inch projectors is in the control room.</li> <li>A U-shaped desk faces the wall and houses workstations.</li> </ul>	<ul style="list-style-type: none"> <li>CMSs, HAR, and the internet are used to relay traffic information.</li> <li>Major incident reports provided to TV/Radio at no cost.</li> </ul>

#### 4 Oakland County TMC Findings

- Primarily concentrated on traffic management and traffic planning
- Manages the FAST-TRAC operational field test

Features of the Oakland County TMC		
Data Collection	Data Processing	Information Dissemination
<ul style="list-style-type: none"> <li>288 Autoscope cameras and 3 CCTVs are used to monitor traffic on 2,700 miles of road.</li> <li>Automatic operation (not staffed)</li> </ul>	<ul style="list-style-type: none"> <li>A 3-panel video wall with 12 monitors and nine 31-inch projectors is in the control room.</li> <li>A desk faces the wall and houses 4 Windows PC workstations.</li> </ul>	<ul style="list-style-type: none"> <li>Traffic information is relayed to the public through faxes sent to MetroNetwork stations.</li> <li>A fully functional website is currently being developed.</li> </ul>

#### 5 Recommendations and Observations

Recommendation	Benefit
<ul style="list-style-type: none"> <li>Collocate police and traffic management personnel</li> <li>Take advantage of central control of signal timing</li> <li>Distribute the Georgia Tech Guidelines for TMC design</li> </ul>	<ul style="list-style-type: none"> <li>Dramatically increase incident response</li> <li>Increase traffic flow and decrease labor costs</li> <li>Compensate for low human factors awareness in TMC design</li> </ul>
Observations	
<ul style="list-style-type: none"> <li>Expansion upon older systems can create compatibility issues between software.</li> <li>Interest in the commercial potential of TMCs is growing.</li> <li>The internet can be a valuable resource for traffic information.</li> </ul>	

#### 6 References

Georgia Tech Research Institute (1998). *Human Factors Handbook for Advanced Traffic Management Center Design* (2nd ed.). Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration.

Nowakowski, C., Green, P., and Kojima, M. (1999). *Human Factors in Traffic Management Centers: A Literature Review* (Technical Report 99-5). Ann Arbor, MI, The University of Michigan Transportation Research Institute.