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TRAFFIC TIPS

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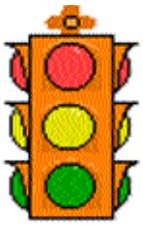

COMPREHENSIVE SERVICES

***Hubbell, Roth & Clark, Inc.**, is a professional organization providing comprehensive engineering services. Our Transportation and Traffic Engineering expertise allow us to address problems of urban traffic congestion, traffic safety, and highway design. We provide assistance in transportation planning, design and operations. Other services of the firm include:*

- *Municipal Engineering*
- *Civil and Site Engineering*
- *Wastewater Treatment*
- *Underground Storage Tank Replacement Engineering*
- *Water Treatment and Distribution*
- *Industrial Waste Treatment*
- *Industrial Engineering*
- *Storm Water Control*
- *Surveying and Mapping*
- *Electrical Engineering*
- *Street and Parking Lot Lighting*

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Hubbell, Roth & Clark, Inc.
P.O. Box 824
Bloomfield Hills, MI 48303-0824
(248) 338-9241
Fax (248) 338-2592

TRAVEL CHARACTERISTICS

Travel surveys provide important information for transportation planners. This information is used to forecast future travel demand and travel patterns. The forecasts provide the basis for transportation facility design.

The U.S. Department of Transportation recently released the findings of the latest Nationwide Personal Transportation Survey (NPTS). The 1995 Survey is the fifth in a series that began in 1969 and continued in 1983, 1990, and 1997. The NPTS serves as the nation's inventory of daily personal travel. It is the only authoritative source of national data on daily trips.

The data were collected for all trips, modes, purposes, and trip lengths for all areas of the country, both urban and rural. The 1995 NPTS dataset contains data from 42,033 households. The main results are as follows:

- Household Vehicles increased 143% since 1969.
- In a typical day, the nearly 100 million households in the U.S. generate more than a billion person trips and over nine billion person miles of travel.

Means of Travel	
Private Vehicle	86.2%
Transit	1.8%
Walk	5.4%
School Bus	1.7%
Other	4.9%

- Travel to and from work is only the third most frequent trip purpose, despite the common perception that most trips are made during the traditional morning and evening drive times.
- The major reason for travel is family and personal business. The next most common reason is social and recreational activities. These trip purposes represent about two-thirds of all travel.
- Private vehicles predominate in personal travel, accounting for 91% of all person commute trips and 93% of all person miles to work. Transit supports 3.13% of work trips and 3.47% of the person miles.
- About 60% of trips by low-income households are three miles or less, compared with 50% for other households. People in low-income households take 20% fewer trips and travel 40% fewer miles.
- The average time driving per day for all drivers is 1 hour and 13 minutes with men drivers averaging 81 minutes a day behind the wheel and women averaging 64 minutes.
- Between the ages of 20 through 54, men drive 17,000 to 18,000 miles annually, while women average 11,000 miles per year.

Factor	*Value*
Persons per household	2.44
Workers per household	1.33
Drivers per household	1.79
Vehicles per household	1.78
Vehicles per Driver	1.00
Vehicles per Worker	1.34

Commute Profile	
Average Work Trip Length (miles)	11.6
Average Work Travel Time (minutes)	20.7

FIGHTING CONGESTION - IMPROVING MOBILITY

Trip Speed (mph) 33.6

Improving mobility will increase a nation's economic productivity and enhance its competitiveness in the international community. Understanding what causes congestion - and how we can fight it - is the first step that we need to take. Traffic congestion is one of the major issues facing our nation. There are, however, proven measures to fight congestion and improve our mobility.

Freeway Incident Management Systems can reduce congestion by about 30% on an urban freeway system and can cut incident duration by an average of ten minutes. Estimated cost: $1 million per mile to design and construct, $100,000 annual maintenance. Estimated benefit/cost of 4:1.

Ramp metering can increase highway speeds by 24%; the number of accidents can be reduced by 20 to 58%. Depending on the type of system, cost to implement can be low to moderate.

Traffic signal improvements can reduce travel time by 8% to 25% and costs approximately $3,000 per signal update. Estimated benefit/cost of 10:1.

Geometric Design can increase mobility, reduce congestion and right of way costs, increase traffic flow, improve safety and provide better aesthetics. Costs vary by type of design.

Grade Separation - vertically separating pedestrian travel (through the use of "flyovers," for example) from congested vehicular intersections can substantially increase the capacity of the intersections. Vertically separating railroad operations from highways through the use of bridges, and thereby eliminating railroad crossings, can reduce highway congestion, as well as increase safety.

Goods movement management can reduce congestion on specific roads by management of time and location of truck deliveries and pickups.

Alternative work hours can reduce peak congestion at local sites.

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555 Hulet Drive
Bloomfield Hills, MI 48303-0824