November 25, 2014

To: Pedestrian/Bicycle/Motor Vehicle Commission

Subject: **City of Madison Traffic Count Program Summary**

Data collection and analysis is a primary program of the Madison Traffic Engineering (TE) and Parking Divisions.

Background

The City of Madison collects routine traffic counts throughout the City. The definition of traffic count data includes both motorized (automobile) and bicycle traffic. These two modes of transportation lend themselves to automated data collection using inductive loop technology. Inductive loop systems detect traffic and provide an output to a controller which records and "bins" the data.

Technology

An inductive loop detection system is comprised of two elements, the electronic detector module and the inductive loop coil. The loop coil is buried or "cut into" the multiuse path or street pavement, which in turn, protects the detector from snowplow damage. The detector circuit drives energy through loop wire creating a magnetic field. The loop detector forms a tuned electrical circuit, of which the loop wire is the inductive element. If a metallic mass passes through the field, eddy currents are induced in the conducting object. The detector senses a change in inductance and actuates an electrical output, which the logic or controller then converts to vehicles—either motorized or bicycle. Because pedestrians are not "metallic masses" there is no current, cost effective way to maintain a standing pedestrian counting system.

The traffic data that is collected by the City is used by:

- Madison Area Transportation Planning Board (MPO) planners for modeling data and reporting to the Federal Highway Administration (FHWA)
- Wisconsin Department of Transportation (WisDOT)
- FHWA
- City Engineering for pavement design, life cycle analyses, maintenance operations
- City Streets Division for maintenance operations
- City TE for street design, data reporting, operations, traffic calming, and daily work needs including bicycle facility design and reporting
- Development community
- Real estate community
- Planning Department

The data that the City TE Division collects is compiled and published annually in its Traffic Volume Report. The 2013 version of the report is provided for your review, and is also available on the City's website. The Division also prepares the attached Flow Map—a graphical depiction of traffic data on the City's surface streets; these maps are also available on the City's website. The City collects motorized vehicle traffic data at 1,100 count stations. In addition, 100 special counts are conducted at locations citywide as staff needs require. This is done using portable traffic counters equipped with pneumatic hoses—i.e. non-inductive counters. A portable counter will be available at Tuesday's 11/25 PBMVC meeting. Portable pneumatic systems are acceptable for motorized traffic data collection, but not for bicycle data collection. Bicycle count stations have been in place in Madison for the past several decades. Currently, there are eighteen (18) bicycle count stations across the City. These stations are located primarily on separated multi-use paths and on-street locations where we can secure separation from motorized traffic. This way, the bicycle count is not affected by the detection of a stray motor-vehicle.

Detection technology is improving as more military applications are transferred to the public sector, for instance, forward looking infrared systems or (FLIR) are coming to the transportation industry and one is in fact in use at the intersection of John Nolen Drive and Williamson Street. Video camera detection systems are becoming more refined and will be more useful for data collection, and potentially, for remotely detecting pedestrians and cyclists. Cost is a factor in any system. There are currently many data collection systems that could be implemented, however they are not cost effective for TE at this time. For example, the cost of a 4-lane video camera detection system for traffic signal detection is in the $25,000 range. Consider that we operate over 300 traffic signals in the region, and the costs can quickly become prohibitive.

The City and WISDOT have recently partnered to purchase a new signalized intersection control system, aka CENTRACs, (Econolite product). CENTRACs is a state-of-the-art system for operating and managing a City's surface street system. As more intersections are added to the system, and the backbone communications system is slowly completed throughout the City, we will be able to provide more real-time data and make available for planning and private sector uses.

Real-Time Traffic Data
The current traffic data collection system requires staff intervention and manipulation. It is not a system where data is collected and electronically processed and inventoried real-time. There has been much recent interest in real-time data with the installation of the Division's first bicycle barometer, however at this point the Ecovisio Company does not "port out" real time data from its bike barometer products.

Bicycle Barometer
In early October, 2014, the City TE Division installed the state's first bicycle barometer or "totem" just northeast of the intersection of Regent Street and Monroe Street on the Southwest Path. Totem literature is provided. This system is proprietary, manufactured by one company, a French company by the name of Ecovisio. The totem is configured with inductive loop technology and displays the data real-time to the passing path users (see photo on page 3). The data is uploaded via cellular connection once per day to the Traffic Technology Company website; the data is currently not real-time. The cost of a Totem with installation is approximately $30,000 per station. Two future stations are planned, one in Law Park, and a second along the Capital City Path.

Madison Eco-Totem, SW Path, NE corner Regent and Monroe St. Nov. 21, 2014
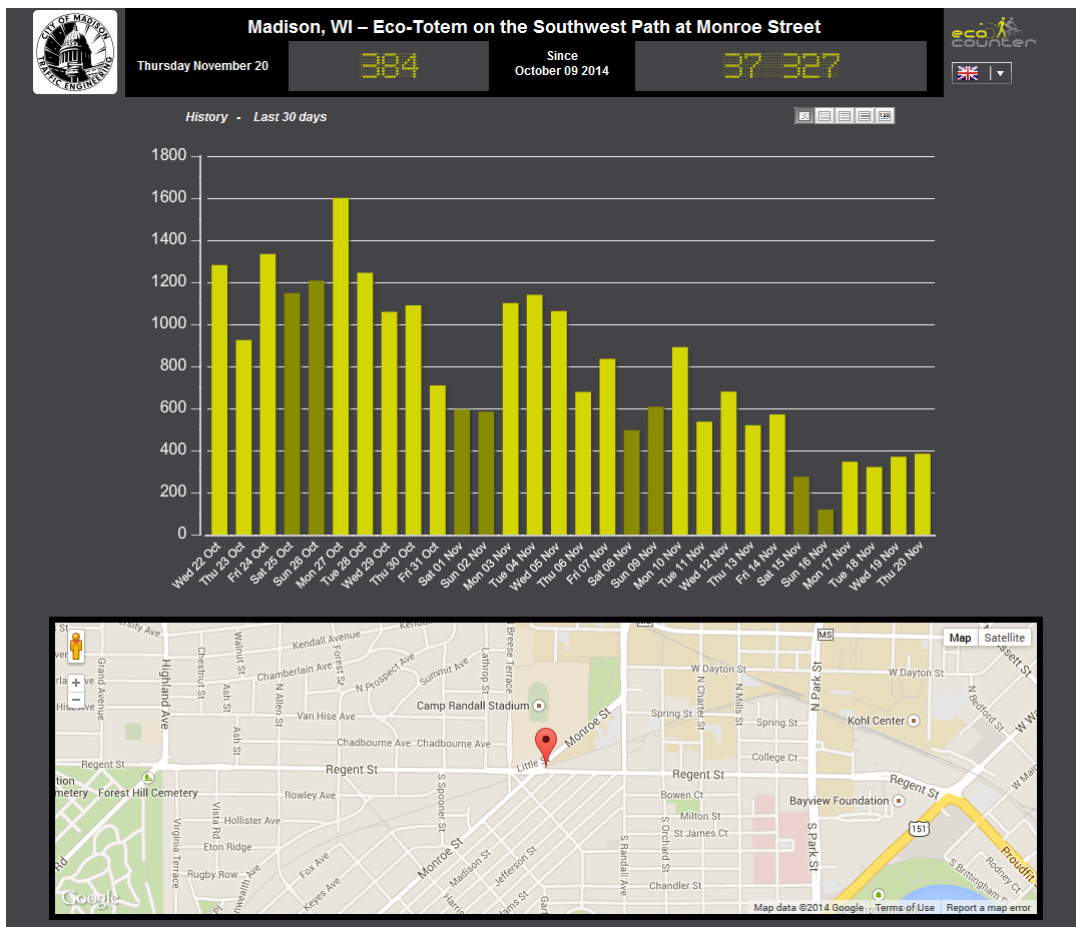
Screen Shot from ECO-TOTEM Website, November 21, 2014. http://madison-monroe.visio-tools.com/

Bicycle Screen Line Counts

The City TE Division also conducts annual screen line counts of bicycle and pedestrian users. This is a study where staff count pedestrians and bikes cutting across an "imaginary" line drawn across the city. This data collection practice is a standard transportation planning exercise, and is used to determine transportation mode split information for annual reports and modeling verifications. In some circumstances, the City has used volunteers to assist in collecting the data, however, there have been issues with the consistency of collection. Manual screen line counts are taken in the fall when the UW is in session and on fair-weather days. The City does not tie its data collection efforts to annual count days recommended by select advocacy groups because weather impacts can affect data. While City staff appreciate volunteer data collection efforts, we do not have the authority to dictate data collection efforts including, count location, count duration, and count accuracy.

TE is currently planning a special screen line count in Spring, 2015. Previous locations, while very useful in obtaining the number of vehicles entering the highly congested Isthmus area, may naturally exclude some of our highest bicycle and pedestrian uses. This will require a large number of manual counts, and Traffic Engineering is working with volunteer effort organizers to modify counting practices to allow their counts to be utilized for this purpose.

Regards,

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