A Report From Joe Molinaro

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The 2005 ITE Technical Conference and Exhibit was held in Las Vegas, NV from February 28 – March 2. I attended that meeting as a representative of IMSA to the National Transportation Operations Coalition (NTOC). The NTOC held several sessions during the conference including a discussion of the results of the National Traffic Signal Self Assessment. My report below is an attempt to provide an understanding of the NTOC and summarize the mission and goals of the organization. My report also summarizes one of the key efforts underway as part NTOC, namely the National Traffic Signal Self Assessment or Report Card.

Summary of the NTOC

The National Transportation Operations Coalition is an important community that serves as the foundation for institutionalizing management and operations into the transportation industry. This alliance of national associations, practitioners and private-sector groups represent the collective interests of stakeholders at state, local, and regional levels.

Mission and Goals of NTOC

To improve management and operation of the nation’s existing transportation system so that is performance will exceed customer expectations. Some of the NTOC goals to achieve this mission include:

- Minimizing congestion and improving safety
- Implementing and sustaining effective transportation operation centers
- Reducing delays and disruptions caused by incidents
- Reducing congestion and delays by regular retiming of traffic signals
- Providing timely and accurate information to travelers

In order to accomplish this mission and goals, the NTOC identified some immediate actions that would offer tangible results. These actions are separated into three categories. I have listed the categories below as well as some of the action items for each of the categories.

Managing for Performance

- Encourage consideration of maintenance and operations into the planning process
- Develop easy to use performance measure materials

Advancing the State of the Practice

- Develop a toolbox of best practices
- Develop performance benchmarks for traffic signal systems

Communicating the Message

- Develop a comprehensive/coordinated outreach program
- Summarize operations benefits data
- Develop products aimed at decision makers
- Create a shared management and operations website

NTOC currently consists of a number of different subcommittees and action teams that work actively to promote management and operations strategies to stakeholders. Some of the NTOC members include:

- AASHTO
- APWA
- FHWA
- FTA
- I-95 Corridor Coalition
- ITE
- IMSA
- ITS America
- ITS Joint Program Office
- National Governors Association
- TRB, and others.

How Can IMSA get Involved?

Existing members can follow actions and programs of the NTOC through the NTOC website at www.ntoctalks.com. The NTOC website highlights activities and products of the NTOC. Also, the website contains a calendar of upcoming events including “Talking Operations” web casts. As part of my report, I would suggest IMSA do the following to get more involved with NTOC:

- Obtain a member username/password to the NTOC website
- Participate in “Talking Operations” web casts (monthly)
- Provide a link between the IMSA website and the NTOC website
- Help get the “maintenance and operations” word out through publishing white papers and journal articles
- Provide links to the ITS Cooperative Deployment Network (ICDN) newsletter – a subcommittee of the NTOC
- Participate in the “Rollout” of the National Traffic Signal Operations Report Card through partnering with the NTOC and ITE
- Continue to track funding for traffic signal maintenance and operations as NTOC moves forward

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As part of my attendance at this conference, I was able to meet each of these individuals and introduce myself as the IMSA representative to the NTOC. I believe it is important for IMSA to stay active with the NTOC to continue to track maintenance and operations funding for traffic signal systems.

**National Traffic Signal Report Card**

As part of my report, I have summarized the activities of the NTOC relating to the development and release of the National Traffic Signal Report Card. Most of this information was taken from the NTOC website with specific reference to documents prepared by Shelley Row.

**What is the National Traffic Signal Self Assessment?**

Traffic signal operations and maintenance are historically under funded and their benefits are poorly understood by decision makers. Investment in traffic signal operations is one of the most cost effective means to improve transportation system operation.

To increase national awareness of the value of improved traffic signal operation, ITE and the NTOC sponsored a Traffic Signal Self Assessment. The objective of the Traffic Signal Self Assessment is to help assist agencies to highlight the need for funding support for traffic signal operations, the performance challenges due to limited resources, and the cost effectiveness of increased investment for traffic signal operations. The release of the national report card results will be the topic of a national press event.

**What are results of the National Traffic Signal Self Assessment?**

Some of the results of the Traffic Signal National Report Card that were summarized by the NTOC include:
- More than 378 agencies responded representing 49 states
- The number of signals represented by the responding agencies represents about one third of all signals in the US
- There was good distribution among cities, counties and state and among signal system sizes
- On a 100-point scale, the overall national score is not surprisingly “low”
- The results seem to indicate that typical mode of operation is reactive or described as “fighting fires”
- Few agencies, due to resource constraints, are able to manage their signal systems in a systematic, thoughtful, strategic way
- More than 50% of the agencies that reported do not retime their traffic signals in a 3-5 year period

**What are the next steps?**

Now that the unofficial results of the National Report Card have been released to the ITE technical community, the NTOC and ITE are planning a national press event April 20th. The press event is intended to create national press exposure on the results of the National Report Card and to increase awareness of the need for more support for traffic signal operations and maintenance. Specifically, this press event is intended to help give agencies ammunition to make the case before their own decision makers to set priorities for needed funding for maintenance and operations of traffic signal systems.

This national press event is likely to generate a “buzz” in local areas. The NTOC and ITE are recommending that agencies plan ahead and be prepared. The NTOC and ITE will be sending agencies “press kits” to help them prepare for their own local media event.


**Traffic Signals–1, 2, 3s of Communicating Signal Retiming Benefits to Managers**

1. **What is signal retiming?**

   Signal timing is a process to optimize the operation of signalized intersections. The objective of signal retiming is to respond to the demands of all types of motor vehicles, bicycles and pedestrians in an optimum manner. Signal retiming strategies maximize progression along an arterial and minimize stops and delays, fuel consumption and air pollution emissions.

   Unfortunately, in many jurisdictions, there is no strategic retiming effort. Spot adjustments to signal retiming are preformed only upon request from the motoring public.

2. **Why is signal retiming done?**

   Traffic signal retiming is one of the most cost-effective ways to improve traffic movement and make our streets safer. Signal retiming is done for the following reasons:
   - To reduce motorist frustration by reducing stops and delay and unsafe driving behavior;
   - To improve traffic flow through a group of signals and reduce delay at individual intersections;
   - To improve air quality and reduce fuel consumption by coordinating traffic flow;
   - To adjust signal retiming to account for changes in traffic pattern due to new developments and traffic growth;
   - To reduce response time for emergency vehicles and...
To postpone the need for costly long-term road constructions by improving traffic flow with existing resources today.

Signal retiming can produce benefit-to-cost ratios by 40 to 1.

3. What are the costs and benefits of retiming traffic signals?
Estimates for the time and cost required to time signals vary according to available expertise and equipment. The cost of signal retiming is roughly $2000 to $2,500 per intersection for the typical four retiming plans (AM peak, noon peak, PM peak, and off peak).

Examples of Successful Retiming Projects
According to the Institute of Transportation Engineers, traffic signal improvements reduce travel time from 8 percent to 25 percent. The reduction in travel time also reduces fuel consumption and emissions.

Retiming and 11-intersection arterial in St. Augustine, FL, USA, (2001) reduced average arterial delay by 36 percent, arterial stops by 49 percent, and arterial travel time to 10 percent. These resulted in an estimated annual fuel savings of 26,000 gallons, and an overall cost saving of $1.1 million.

In a project in Portland, OR, USA (1996), 35 traffic signals were retimed on two major city arterials. The resulting timing reduced fuel consumption on the streets by more than 175,000 gallons of fuel per year, while the total project cost was only $75,000.

The Traffic Light Synchronization Program (1992) in Texas shows a benefit to cost ratio of 62:1. The program resulted in a 24.6 percent reduction in delay, 9.1 percent reduction in fuel consumption, and a 14.2 percent reduction in stops.

The Fuel Efficient Table Signal Management Program (1988) in California demonstrated a benefit to cost ratio of 58:1. The program resulted in savings of 15 percent in delays, 8.6 percent in fuel consumption, 16 percent in stops and 7.2 percent in travel time.

4. Who times traffic signals?
The ultimate responsibility for signal retiming typically falls to the agency responsible for the operation of roadways where signals are located.

Local counties, municipalities and state highway departments retime signals within their jurisdictions. Usually this performed within the agency’s public works or traffic engineering departments. Many agencies also utilize the services of consulting engineers on signal-retiming projects.

5. How is signal retiming done?
The following is a summary of the steps to conduct signal retiming:

- **Inventory your signal system.** This includes confirming the operation of each signal, signal spacing and the limits of your timing strategy.

- **Collect traffic and pedestrian counts.** This includes turning movement and corridor traffic counts at key locations and may incorporate spot speed studies.

- **Review collision history to determine if safety enhancements can be made with the signal retiming efforts.**

- **Develop timing plans using traffic signal optimization software.** These programs provide initial time settings.

- **Implement, fine-tune and evaluate new signal timings.** The best timing plans include in-the-field fine-tuning.

- **Evaluate the new signal timing.** Use before and after studies to review travel time and delay savings.