A Guide for Monitoring Mobility

In Small to Medium-Sized Communities
As communities expand, their needs change. This is especially true of the transportation infrastructure. A city’s growing population can quickly lead to more traffic, creating congested roadways unfamiliar to smaller communities.

This is a problem long recognized in big cities like Houston, Denver, and Atlanta. Yet even smaller communities can experience the negatives of congestion: frustrated drivers, costly delays to businesses, higher rate of crashes, and more pollution. The transportation systems of many small and medium-sized cities* are being challenged—and sometimes overwhelmed—by their own growth.

How can you monitor the traffic in your community to optimize your local transportation network? This guide will describe the steps for taking the pulse of your citizens, measuring and monitoring your city’s mobility, and adjusting your transportation network to meet the growth needs of your community.

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* Small communities are defined as having a population less than 100,000. Medium-sized communities are defined as having a population between 100,000 and 200,000.
The methods presented in this guide can help transportation professionals in your community measure mobility, reduce congestion, and increase reliability. But what do those terms really mean?

**Mobility** is a flexible term that means the ability to reach a destination in a satisfactory time and at a reasonable cost. Local transportation professionals, with citizen input, can estimate performance measure targets of time and cost based on that community’s needs. For example, your city might decide that it should take no longer than five minutes to reach the town square from the city limits. If it takes more time, your community’s mobility has been compromised.

**Congestion** is the result of compromised mobility. Traffic backs up. Drivers get frustrated. Tempers flare. Businesses might even lose money because of congestion—all because your community’s reasonable expectations for mobility are not being met.

**Reliability** is the level of consistency in transportation service (e.g., hour to hour and day to day). For example, can you count on getting to work on time every day if you leave at the same time and take the same route?
Step 1: Identify the Community’s Needs and Opportunities

PERCEPTION IS REALITY

How do you know if a community has a mobility problem? Listening to citizens is the first step to answering that question. Local media, citizen groups, and the city’s own comprehensive plan are good sources of information. Knowing the goals and expectations of the community is key to setting mobility standards. In short, if there’s a public perception of a problem, there’s a problem.

It’s also important to have a clear sense of where transportation ranks as a priority in the community. What are the transportation needs of a local neighborhood, for example? Who are the stakeholders who can help answer that question? Knowing how transportation impacts a city is vital to understanding its mobility needs.

Realize too that multiple agencies often have jurisdiction over the roadways in your community. Cities share responsibility with state and federal agencies for maintaining and operating some roadways, while being completely responsible for other roadways. Getting all parties around the table to plan improvements can make the process work for everyone.
“HOUSTON, WE HAVE A PROBLEM” . . . NOW WHAT?

What causes mobility problems? A few typical culprits include the following:

- Rapid development;
- Inadequate roadway capacity;
- Increased traffic control (signals);
- Increased truck traffic in the community;
- Inadequate transit or bicycle and pedestrian facilities;
- Special events and work zones; and
- Lack of development regulatory controls or municipal ordinances.

Elected officials may champion local projects. Understanding how transportation networks are funded and built helps decision makers prioritize and execute improvement projects.

Steps to effectively identify the need for monitoring include the following:

- Determine who will benefit and how;
- Clearly define community expectations for “improved mobility” and “reduced congestion” as measurable, attainable goals;
- Select good performance measures to use in determining mobility levels;
- Ensure improvement efforts support mobility goals of all transportation agencies in the community;
- Keep the public informed by choosing effective communication methods; and
- Identify funding sources for ongoing monitoring.
After establishing the need to decrease congestion, a mobility monitoring plan directs how to obtain the necessary data. Accurate and complete traffic data are absolutely necessary to identify how exactly to improve mobility. The plan should address how to gather various data elements, such as hourly traffic volumes (both peak and off-peak), stopped delay, speed, and travel time between destinations. Because other traffic monitoring agencies—including metropolitan planning organizations (MPOs) and state departments of transportation (DOTs)—likely gather some of these data already, transportation professionals should leverage it whenever possible.

Different monitoring methods exist, each with its own best application. Transportation engineers and planners should identify the most effective method for the community’s needs. Transportation experts should also make sure that locations and timeframes identified as problematic are covered by the monitoring plan. The plan itself should clearly outline how monitoring will be performed.
Once the plan is in place, look back at the performance measures identified in Step 1. They provide a context in which to evaluate the results of monitoring. Comparing the measured data and calculated measures with the community’s mobility goals will point out areas for improvement.

Transportation professionals first have to collect or estimate data elements (e.g., hourly volume, speed, and travel time data). A videolog of the physical environment under study can help tell the story of congestion in the community. Videologs include a visual record of the environment along with a narration describing all aspects impacting mobility in that location.

Transportation experts should set a monitoring schedule (e.g., annually) to follow up the present study with future efforts. Repeated monitoring allows trends to be developed and tracked, and can demonstrate the effectiveness of mobility improvements.
So now it’s time to begin analyzing the collected data. Transportation professionals should also note the gaps—the data that are not there. Knowing that identifies what needs to be captured during future monitoring cycles.

Using the results, transportation engineers and planners can estimate specific performance measures, such as travel time in the monitored corridor. By comparing specific locations and their performance measures with community targets, a particular corridor’s mobility can be graded or classified. With that information, the need for decreasing congestion in that particular corridor can be prioritized.

By analyzing data over time, transportation professionals can identify increasing or decreasing mobility trends, which is the first step in identifying ways to improve mobility. Analysis over time can identify what transportation improvements have worked, which have not worked, and what areas are candidates for improvements. It’s vital that data are analyzed consistently. Consistency promotes reliability and is especially important for properly documenting traffic trends over time.
Using the latest data and the original performance measures, transportation professionals should develop mobility improvement strategies and an action plan. The community should publicize the plan by telling a compelling, visually appealing story. Press releases are ideal for this purpose.

Graphics are often the most effective means for getting the word out to the public. Choosing the right graphics (e.g., maps, tables, photographs) is vital to the public’s understanding (and acceptance) of the results of the monitoring project. Commercially available software is so easy to use these days that our society has developed sophisticated visual tastes. Even basic things—like the use of color and scale—can make all the difference.

And with the ready access to information through the Internet, the public is demanding increased “transparency” of corporate and governmental agencies. Even if the monitoring project reveals problems, addressing those problems in a public forum can help build credibility with citizens.
Remember, communities grow. Priorities change. And the need for traffic monitoring, as well as the methods and locations chosen, will likely change as the needs of the community change.

Transportation professionals must ensure that long-range plans are flexible enough to account for these changing needs. Doing something a certain way simply because “that’s the way we’ve always done it” isn’t a sufficient reason.

To effectively note trends over time, monitoring must occur on a regular basis. The annual work plan created by your community’s transportation professionals should account for this process. And remember, the longer the time between efforts, the more likely data consistency could be a problem. Time between efforts also makes it harder to identify trends, gauge their momentum, and develop proactive measures to protect or preserve mobility.
Here are some tips for effectively monitoring mobility over time:

- Collect data annually or more frequently to best capture the community’s changing needs. Do not exceed five years between data collection efforts;
- Be aware of the effect weather has on how and when monitoring should occur;
- Note opportunities for improving monitoring procedures for future efforts; and
- Improve future efforts with lessons learned.

Ultimately it’s citizens that will evaluate their own set of data: how well their elected representatives have served their interests by improving mobility, minimizing congestion, and enhancing their current standard of driving.

For More Information

For more information about issues regarding mobility, please visit http://mobility.tamu.edu/resources under the heading of “Mobility Monitoring in Small to Medium-Sized Communities.”

The content of this brochure represents the findings of
Research Product: 0-5571-P1
Project Number: 0-5571
Research Project Title: Congestion Monitoring Measures and Procedures for Small to Medium-Sized Communities
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Research Project Title: Congestion Monitoring Measures and Procedures for Small to Medium-Sized Communities
February 2008

Sponsored by the Texas Department of Transportation