With more than 125,000 miles of roads, Ohio has one of the largest and most utilized roadway networks in the United States. Unfortunately, congestion and the deterioration rate of road conditions and safety are accelerating. Proper maintenance and available capacity of the roadway network is crucial to Ohio’s economy. Billions of dollars are being lost annually due to lost time, wasted fuel consumption, traffic accidents, and inefficient manufacturing caused by inconsistent delivery schedules. As roads continue to require more attention, the shortfall of funds needed to maintain this critical infrastructure continues to increase. It is estimated that by the year 2014, Ohio will have a highway budget shortfall of more than $10 billion at the state government level alone.\(^1\,^2\) Ohio’s state and local agencies face a difficult challenge to address this budget deficit in the midst of a downturn in the economy, a task that is required if they wish to not just maintain, but correct the poor roadway conditions and over-congestion problem facing the state’s roadway infrastructure.

Background

Ohio’s location within the United States has contributed to the state’s extensive roadway network, which includes numerous miles of public roads within the state’s boundaries. Bordering the state to the north are the Great Lakes, while the Ohio River borders the state to the south. These two bodies of water have enabled transportation of goods and materials over water to and from Ohio’s borders and resulted in a need for an efficient and well-maintained internal network of roads to support the industrial and economic development of the state. As a midwestern state, Ohio also boasts a large amount of agricultural interests distributed across the state. The combination of widespread agricultural development and a well-developed industrial base contributed to a need for miles of public roads to move goods and people throughout the state and beyond.

The network of public roads connects the three principal cities in Ohio (Columbus, Cleveland, and Cincinnati) as well as 930 additional cities, towns and villages. These public roads span the 88 counties and 1,362 current and historic townships that divide the state into smaller governmental jurisdictions. The Ohio Department of Transportation (ODOT) owns 19,266 miles of roadway, 29,009 miles are owned by counties, 73,006 miles are owned by townships, and 3,826 miles are owned by others, including State Parks and other state and local agencies.

The length of the public roads in Ohio amounts to 3.1% of the total length of public roads in the United States. Included in Ohio’s public roads are 1,574 miles of Interstate highways, which
represents 3.4% of the total length of the Interstate system in the United States. This ranks Ohio 5th nationally in Interstate road length, behind Texas, California, Illinois and Pennsylvania.\(^3\) Ohio is also ranked 7th nationally in total public road length.

The 21 Interstate routes in the state have supported the migration of a significant portion of the population outside of the principal cities. This migration has led to an increase in vehicle miles traveled (VMT). VMT is the measure that is commonly used to describe automobile use on a daily or annual basis by incorporating the number of vehicle trips and the length of those trips. Since 2000, Ohio’s VMT has increased 5%, and the total VMT measured in 2006 ranked Ohio 6th nationally.\(^3,4\)

**Ohio Roads Facts and Issues**

Deterioration of the road infrastructure in Ohio is accelerating. The lack of financial programming and the number and length of roadways in Ohio are contributing to an increased number of roads being evaluated as having a fair, poor, or critical condition. The following is a breakdown of the physical condition of Ohio’s roadway infrastructure: \(^5,6\)

- Excellent – 22.5%
- Good – 34.5%
- Fair – 29.0%
- Poor – 11.3%
- Critical – 2.7%

Ohio ranks “critical” roads as those that are dangerous, unsafe, or unusable and that are in need of immediate improvement. “Poor” roads are deemed inadequate or substandard and will need improvement soon to preserve usability. “Fair” roads will likely need improvement in the near future. “Good” roads are in good condition and will not require improvement in the near future. “Excellent” roads have new or almost-new pavement and require no improvement. 43% of Ohio’s roads are in critical, poor, or fair condition. This is an increase from 2000, when 38% of Ohio’s roads were in these substandard categories. One leading contributor to this is the increase in truck traffic on the roads. Truck registration in Ohio increased 9.3% from 2000 to 2006, and truck VMT increased just over 10% in the same period.\(^3\) This increased truck traffic is accelerating the deterioration of the state’s highway pavement.

Substandard road conditions are dangerous. Poor and obsolete road design, deteriorating pavement conditions, and lack of safety features are major contributors to many fatal highway accidents. While the total number of fatalities in Ohio has dropped from 2000 to 2006, the number of traffic fatalities equates to 16 fatalities per year for every 100,000 licensed drivers. This ranks Ohio 40th nationally in total traffic fatalities per 100,000 licensed drivers.\(^3\) Pedestrian fatalities as a result of traffic accidents accounted for 7.8% of total traffic fatalities in 2006, up 0.7% from 2000.\(^3,4\) Crash data in 2005 for the six largest urbanized areas in Ohio (Columbus, Cleveland, Cincinnati, Toledo, Akron, and Dayton) indicates there were 811 fatalities and 91,144 injuries as a result of traffic accidents, costing the economy $8.85 billion in 2005, or $4,055 for each resident living in just these six cities.\(^7\)

Congestion in the large urbanized areas in Ohio is getting worse. Each year, the Texas Transportation Institute publishes a ranking of highway congestion in the 50 largest urban areas, as ranked by hours of delay per person.\(^8\) In 2002, Columbus was ranked 41st nationally and was the only Ohio city included.\(^4\) By 2005, Columbus’ ranking rose to 34th, and Cincinnati
and Cleveland joined Columbus as Ohio cities included on the list (ranked 40th and 49th, respectively). Congestion caused the annual average delay (defined as extra travel time during peak period travel) per traveler in the city of Columbus to rise from 27 hours in 1995 to 33 hours in 2005 – an increase of over 22%.

There is general consensus that maintaining the integrity of the state’s roadway infrastructure system requires continual updates and a steady and predictable flow of capital. According to the U.S. Department of Commerce, in 2005, Ohio state and local governments collected $2.5 billion in revenue for use on transportation projects. Sources of this revenue included motor fuel taxes, truck registration, interest income, and miscellaneous income including vanity license fees. However, in the same year, Ohio spent $4.4 billion on highway projects. This shortfall is compounded each year due to consistent lack of ability to receive enough revenue to cover project expenses. According to the Ohio Department of Transportation’s 2008-2009 Business Plan, the state agency will see a shortfall of nearly $3.3 billion by 2014. When the deficit from the Transportation Review Advisory Council (TRAC) list of Tier 2 projects (projects that have been identified as a need, but do not currently have funding in place to complete) is added in, the shortfall increases to $10.05 billion by 2014 at the state level alone.

TRAC is a committee that chooses the major transportation projects in the state of Ohio to be funded and constructed based on several criteria, such as congestion, ability to provide mobility and connectivity, and economic development. The budget deficit makes it difficult for TRAC to successfully create a legitimate, fundable list of projects that are necessary to maintain the existing conditions of the roads, let alone improve the facilities that are substandard.

Policy Options

As transportation infrastructure continues to deteriorate and the demand continues to increase, Ohio must look to solutions that can improve the roadway conditions, decrease congestion, and improve safety. These solutions should be wide-ranging and include decreasing dependency on traditional vehicular travel, utilization of modern transportation technologies, and increasing investments in transportation projects across the state.

To decelerate the increasing demand on Ohio’s roadway network, it is critical to provide options that promote the use of alternative means of transportation. Incorporation of complete streets designs to increase pedestrian and bicycle travel, encouragement of ride-sharing, and willingness for companies to incorporate telecommuting and flexible scheduling are a few examples of ways to accomplish this goal.

Solutions that could materialize through the use of modern technologies would be the incorporation of innovative designs in roadway projects that improve capacity, reduce delay, and increase safety for Ohio’s transportation network. Such designs may include the use of roundabouts in lieu of traditional intersection designs and diverging diamond interchange configurations instead of a standard diamond interchange. Ohio will need to remain on the cutting edge of design and construction to determine feasible solutions in locations of constrained right-of-way or environmentally sensitive areas.

Proper funding is an integral part of making all of the necessary solutions viable, however, Ohio is experiencing a major budget deficit that is impeding its ability to maintain and improve its current roadway network. Some potential sources of revenue that would help overcome the deficit include the American Recovery and Reinvestment Act of 2009, a potential increase in the
state gas tax, or other options including tolling or mileage-based licensing fees. Should Ohio receive financial support from any or all of these sources, it would still likely leave the state short of the necessary funding required to keep the infrastructure at a desirable level. Therefore, the continual pursuit of additional sources of revenue is crucial.

Specific ASCE Ohio Council Recommendations

- Remove the Highway Trust Fund from the unified federal budget
- Increase funding for long-term fundamental highway research efforts at the national level
- Encourage the use of life-cycle cost analysis principles to evaluate the total costs of projects
- Support the environmental streamlining of highway projects
- Address the long-term viability of fuel taxes for transportation funding, and explore the viability of the most-promising options to strengthen this funding. In particular, the effects of fuel cell technology should be studied to lessen the nation’s dependence on gasoline as a fuel source for automobiles, as should investigating the creation of a mileage-based system for funding our nation’s surface transportation systems.

Sources

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4 Bureau of Transportation Statistics, State Transportation Statistics 2004, March 2005

5 Ohio Public Works Commission, Summary of Public Works Capital Improvements Report, March 2009

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The following sources provided additional information considered in the preparation of this section of the report:


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17 Texas Transportation Institute, The 2003 Urban Mobility Report, November 2003