

Highway System Performance Trends

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Introduction

The northeastern Illinois' roadway system represents a massive ongoing investment. As of January 2017, the system consisted of more than 30,000 miles of mainline roadway.¹ In the last decade, approximately \$14.6 billion in public funding has been devoted to maintaining and expanding this system.² Tracking the performance of the highway system is a key part of refining investment priorities for the region. This memo reviews the system condition and capital investment issues that the region faces and its analysis will guide recommendations as the Chicago Metropolitan Agency for Planning (CMAP) develops ON TO 2050, the region's next comprehensive plan. Note also that, in a separate process, CMAP is developing a Vision for the Northeastern Illinois Expressway System in partnership with the Illinois Department of Transportation (IDOT) and the Illinois Tollway to prepare more focused recommendations for the expressway system.

After conducting a review of pavement and bridge condition, congestion, accessibility, and safety performance, CMAP's analysis finds that progress has been mixed. The sheer volume of needs on the system emphasizes GO TO 2040's recommendation to pursue prioritized investments in the region's transportation network. While performance of the highway system has improved in many ways, challenges remain. For example, over the past ten years, ride quality as measured by pavement smoothness on major roadways has improved somewhat, yet several expressways have major reconstruction needs for which funding has not yet been identified. Structural deficiency on bridges has improved steadily, although in the Chicago region it is still worse than the rest of the state. Over the past decade, congestion on the expressways has decreased, partly because of new capacity additions, yet it remains costly in terms of stress, lost productivity, and crashes associated with heavy traffic. The ease with which travelers can access jobs and services -- that is, accessibility -- has improved in some parts of the region, but the average household has actually experienced a slight decline in accessibility over the past 15 years. Turning to safety, serious and fatal injuries from vehicle crashes have dropped by about one-quarter over ten years, but regional trends suggest that progress is reversing.

¹ That is, excluding ramps and special purpose lanes.

² CMAP analysis of northeastern Illinois obligation and award data, 2005-14, including Illinois Tollway projects. Figure is not adjusted for inflation.



The region's highway network

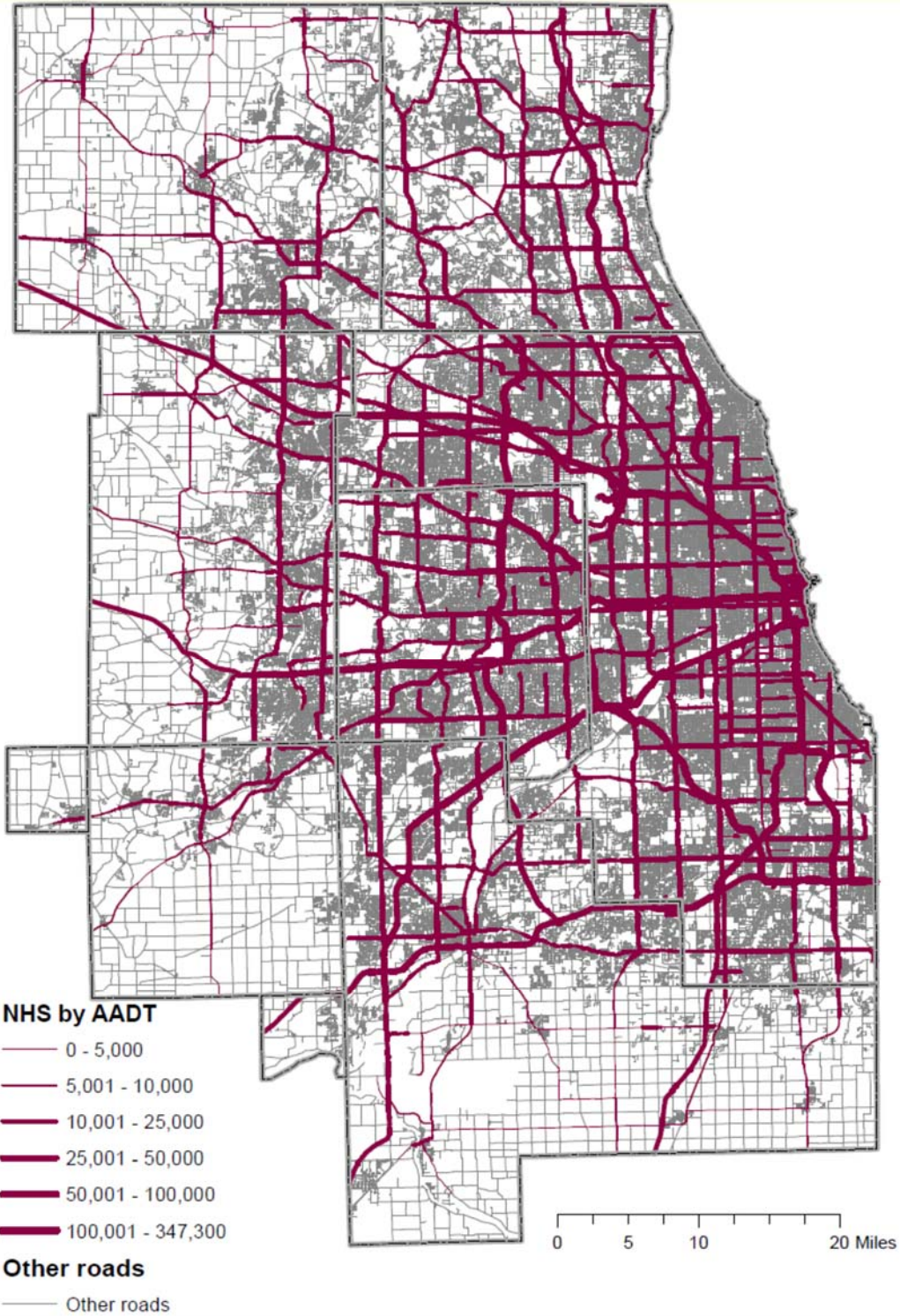
All roadways play a role in getting people around, but at the regional level the key elements of the highway system are the expressways and other principal arterials that make up the National Highway System (NHS) (Figure 1).³ The NHS is a federal designation for roadways considered important to the nation's economy. The NHS is also the focus of the performance measurement requirements mandated in the 2012 federal transportation authorization bill Moving Ahead for Progress in the 21st Century (MAP-21) and refined in the Fixing America's Surface Transportation Act (FAST Act).⁴

³ Along with a limited mileage of intermodal connectors that provide accessibility from major public transit stations, airports, rail and truck terminals, ports, etc. to the expressways and other principal arterials.

⁴ See <https://www.fhwa.dot.gov/tpm/rule.cfm> for a full synopsis of the performance measures.



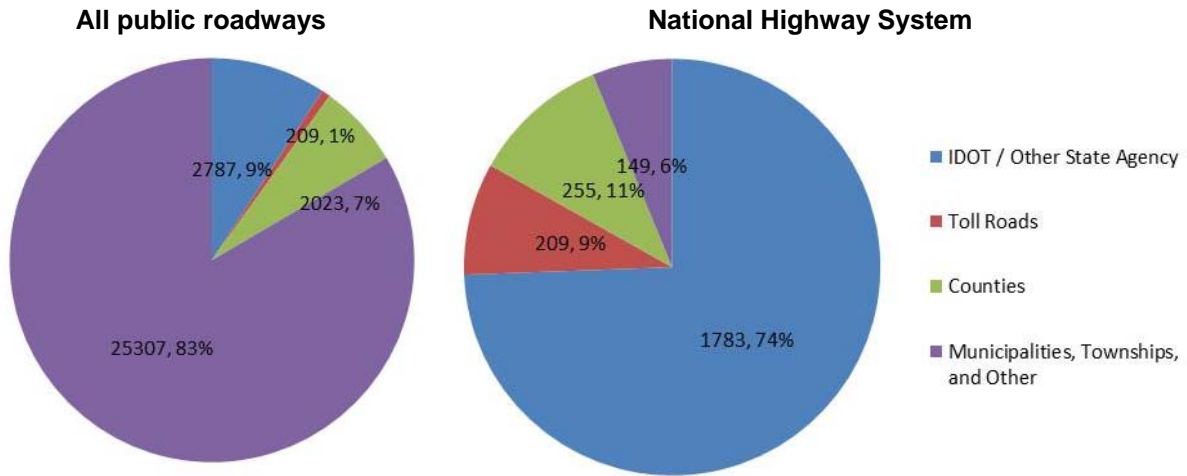
Figure 1. National Highway System in northeast Illinois



AADT = average annual daily traffic
Source: Illinois Roadway Information System

While the NHS is only about 2,400 miles long in the CMAP area, or 8 percent of total mileage, it carries 57 percent of the vehicle-miles traveled in the region. By contrast, the majority of the rest of the road system in the CMAP region is lightly traveled, particularly the municipal and township roads. Much of the NHS is under the jurisdiction of the Illinois Department of Transportation (IDOT), and all of the highways under the Tollway’s jurisdiction are included in the NHS (Figure 2).

Figure 2. Mainline roadway mileage by jurisdiction type and highway system



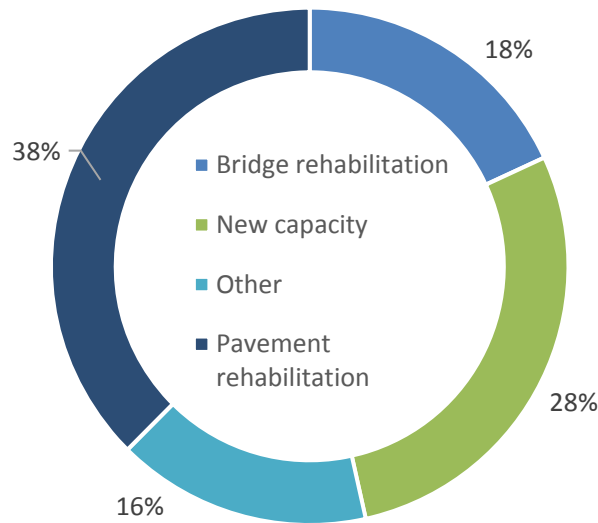
Source: CMAP analysis of Illinois Roadway Information System.



System condition

A well-maintained system is a primary concern of every transportation agency. Given the maturity of the system in the Chicago area, the majority of highway agency investment has been devoted to maintaining roads and bridges (Figure 3). As a result, over the past decade and a half, road and bridge condition has improved on the NHS, but that improvement has stalled in the past few years as agency budgets have diminished. Furthermore, many major reconstruction projects needed on the expressway system remain unfunded.

Figure 3. Estimated obligations or awards on highway system in Chicago area, 2005-14



Source: CMAP obligation data.

Note: "Obligation" occurs when a commitment is received from the federal government to financially participate in a project. "Award" occurs when a contract has been executed for carrying out the project.

Pavement condition

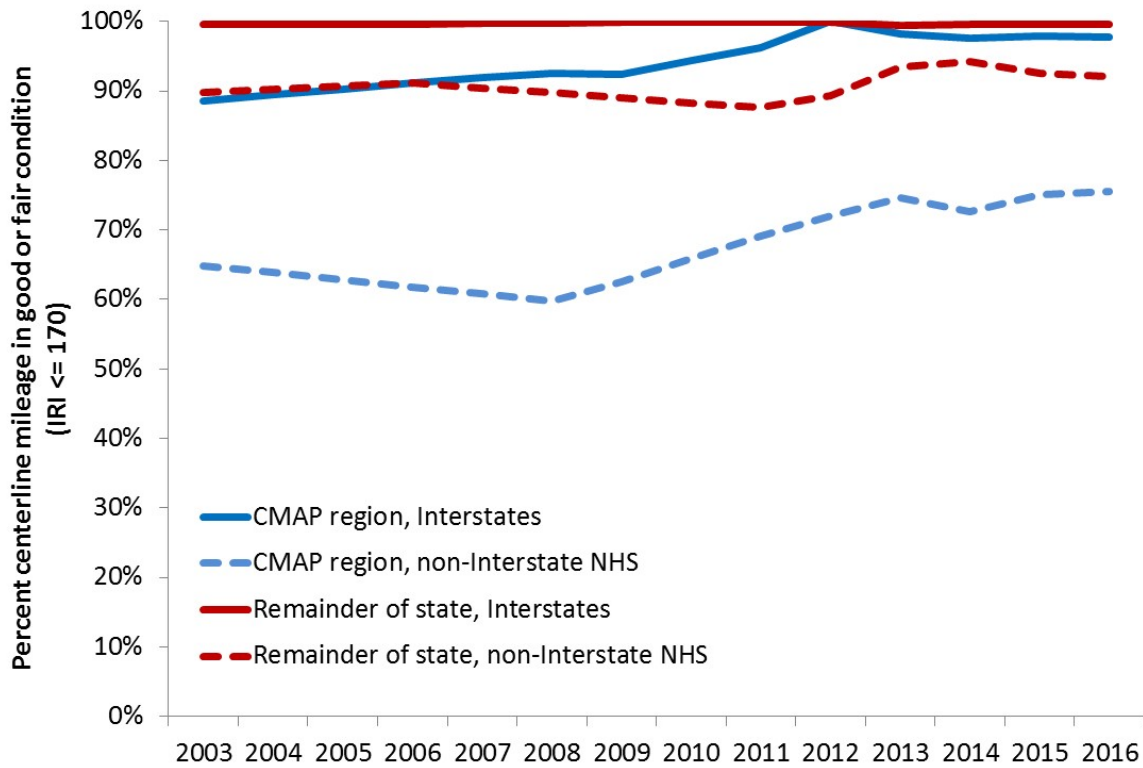
GO TO 2040 recommends a target that 90 percent of centerline mileage be in acceptable condition for the entire NHS by 2040. Acceptable condition is defined as having an International Roughness Index (IRI) of less than 170. IRI measures the road user's experience in the form of ride quality and represents the number of inches of deviation from a completely smooth surface over a mile of roadway.

The region does not appear to be on track to meeting its long-term condition target. In the early 2000s, condition dipped on the non-Interstate portion of the NHS in the CMAP area and then returned to around 75 percent acceptable (good or fair condition) by 2012, likely because of resurfacings made possible with funds from the American Recovery and Reinvestment Act in 2009 and two state capital bills in 2009 and 2014 (Figure 4). Since then improvement in condition has stalled. The interstate portion of the NHS has had consistently better condition



than the non-interstate portion as the state targets additional maintenance to the interstate system. Ride quality is also typically better on the NHS outside of the CMAP area.

Figure 4. Ride quality on the National Highway System, 2003-16



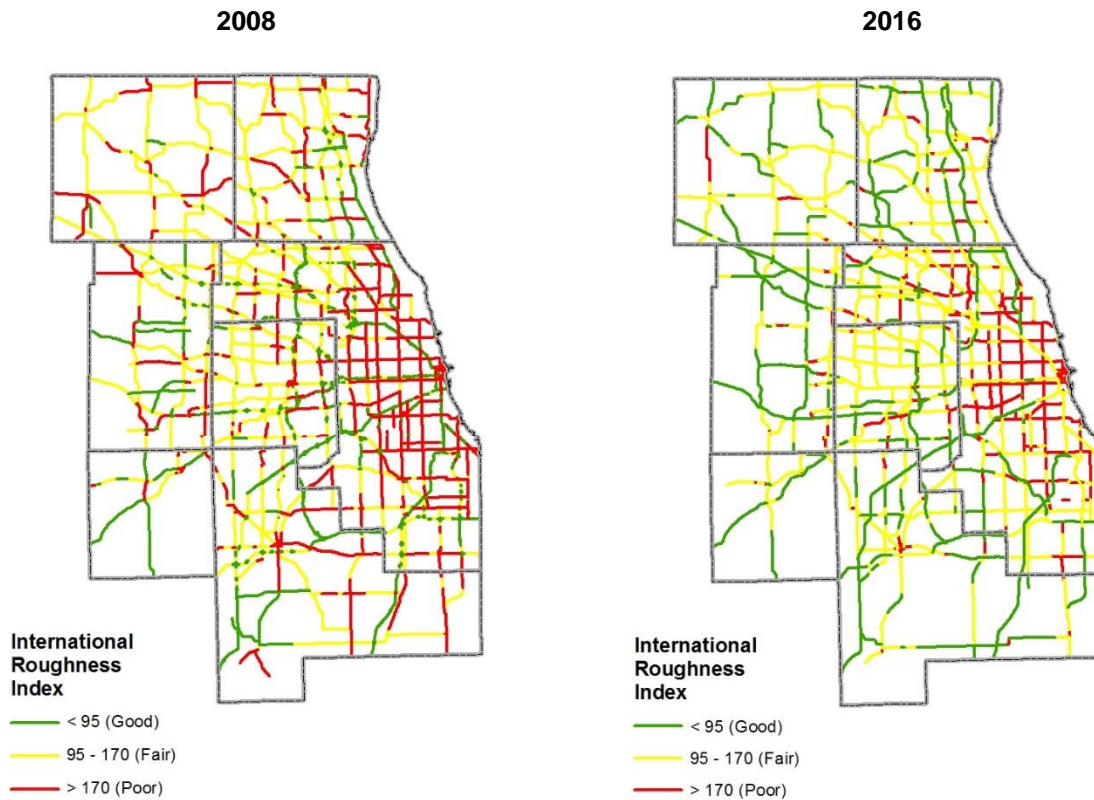
Source: Illinois Roadway Information System, FHWA Highway Performance Monitoring System

Gains in ride quality on the arterial NHS have been spread throughout the region (Figure 5), yet the portions of the roadway network that remain in poor condition are still concentrated in Chicago and suburban Cook County. Poor ride quality in these places is partly attributable to the numerous pavement cuts in urban areas for underground utilities, bus pads, and other features of the streetscape. Such cuts hasten the deterioration of pavement.

The City of Chicago has developed best practices to reduce deterioration from pavement cuts, which should be adopted by other local jurisdictions. The City has attempted to reduce utility cuts in pavement by increasing permit fees for roadway excavation when a road has recently been repaved or reconstructed. Through its Project Coordination Office, it has also improved scheduling of utility and other work to avoid making pavement cuts. The City has documented significant benefits from this approach.



Figure 5. Pavement condition on the enhanced National Highway System from 2008-16⁵



Source: Year-end Illinois Roadway Information System files.

Note: Excludes ramps and functional classes other than principal arterials.

As a matter of policy, GO TO 2040 focuses on improving ride quality on the NHS because it carries so much volume and has higher speeds where rougher roads cause more wear and tear on cars and likely contribute to collisions.⁶ But significant expenditures are devoted to improving pavement condition off the NHS as well. Yet pavement condition cannot currently be documented for this much larger system, even for roads where federal funds or state motor fuel tax funds are used. The state tracks condition mostly on state routes, with limited data on other jurisdictions' routes (Figure 6). While municipalities, counties, and townships may track pavement condition on their own roads, these data have not been collected in a centralized

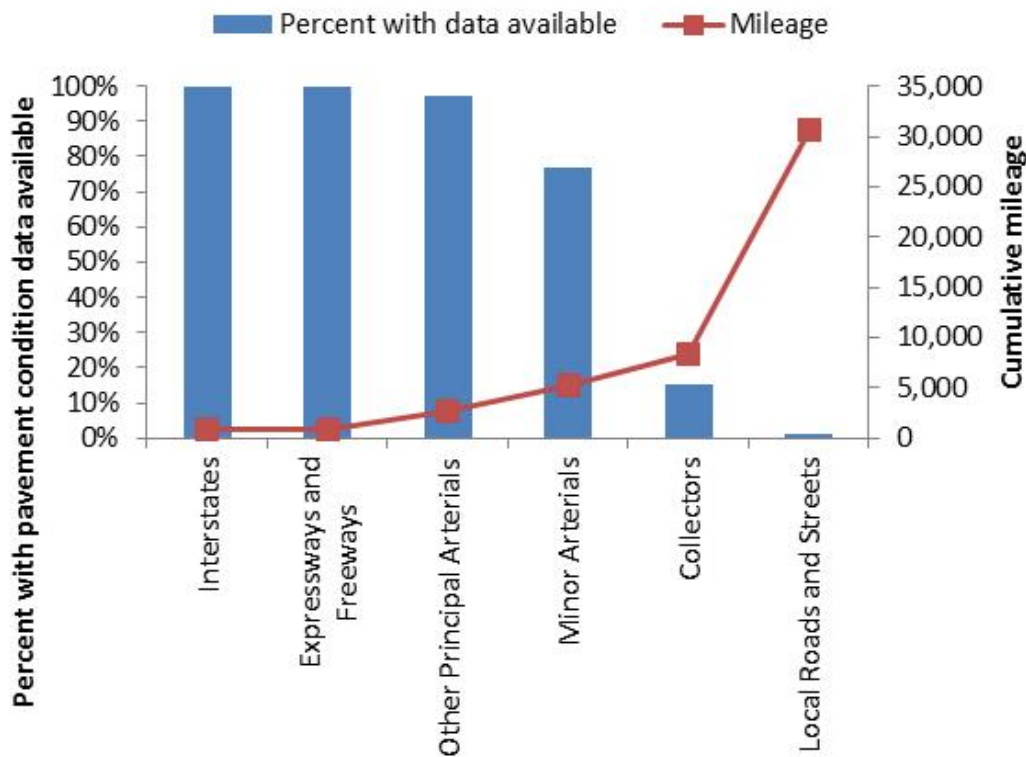
⁵ With the passage of MAP-21, all principal arterials were added to the NHS. The 2008 map shows this "enhanced" NHS. Some of these additions were later deleted, a decision made by FHWA in coordination with IDOT and CMAP. The 2016 map reflects these deletions.

⁶ Research by CMAP suggests that crash frequency on the NHS is unaffected by ride quality when IRI < 170, but that when IRI > 170 (the federal threshold for poor pavement condition), crashes increase steadily as ride quality deteriorates.

location, so it is not possible to conduct a complete needs analysis and demonstrate whether travelers in the region are facing better or worse pavement conditions over time.

In the coming years, CMAP should work with the state and local agencies to collect additional pavement data, or catalog any local data that already exist, to build a complete picture of condition -- at least on the Federal aid system.

Figure 6. Pavement condition data availability for roads other than local streets, 2015



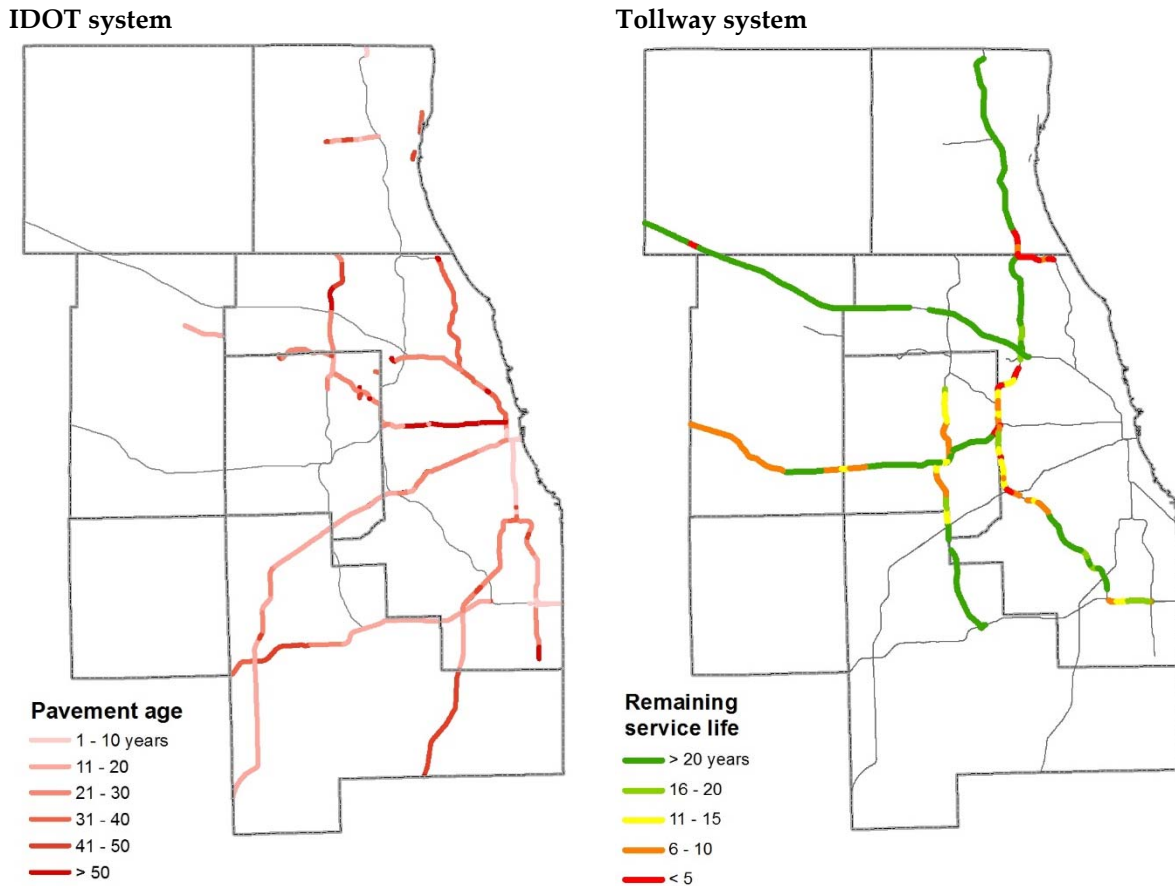
Source: Illinois Roadway Information System

MAP-21 implemented new requirements for state DOTs and Metropolitan Planning Organizations (MPOs) to measure and set targets for the level of performance they seek to achieve. While the metrics ultimately used will be more complex, condition reporting before the end of 2018 is based just on IRI, albeit with some technical differences from the presentation above.⁷

⁷ The condition measures after 2018 will be based on rutting, faulting, and cracking in addition to IRI, and will depend on the type of pavement. See <https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00550.pdf>. These additional measures will provide a fuller picture of condition, but the state's Illinois Roadway Information System file does not currently have complete coverage for them or express the measures in the way required under federal rules (cracking is indicated using a code letter representing ranges rather than being reported as a continuous variable). IRI will be based on lane-mileage, and will not include bridges or ramps.



Figure 7. Remaining service life on Tollway system and age of IDOT system, in years



Source: Illinois Tollway, IRIS, CMAP analysis

IRI only measures the roughness of the pavement surface.⁸ Even when the user experience is satisfactory, the underlying pavement structure may still have deteriorated, requiring excessive maintenance. For example, portions of the central Tri-State Tollway and Eisenhower Expressway are currently rated as having good or excellent ride quality, yet both have underlying pavement beyond its useful service life and require full reconstruction. Instead, a measure such as remaining service life or years since construction or reconstruction could document these needs. Figure 7 shows remaining service life for the Illinois Tollway system, clearly showing the need to reconstruct the Edens Expressway spur and the central Tri-State Tollway, which the Tollway has included in the Move Illinois capital program. The eastern portion of the Jane Addams had not been reconstructed as of the time the data were collected.

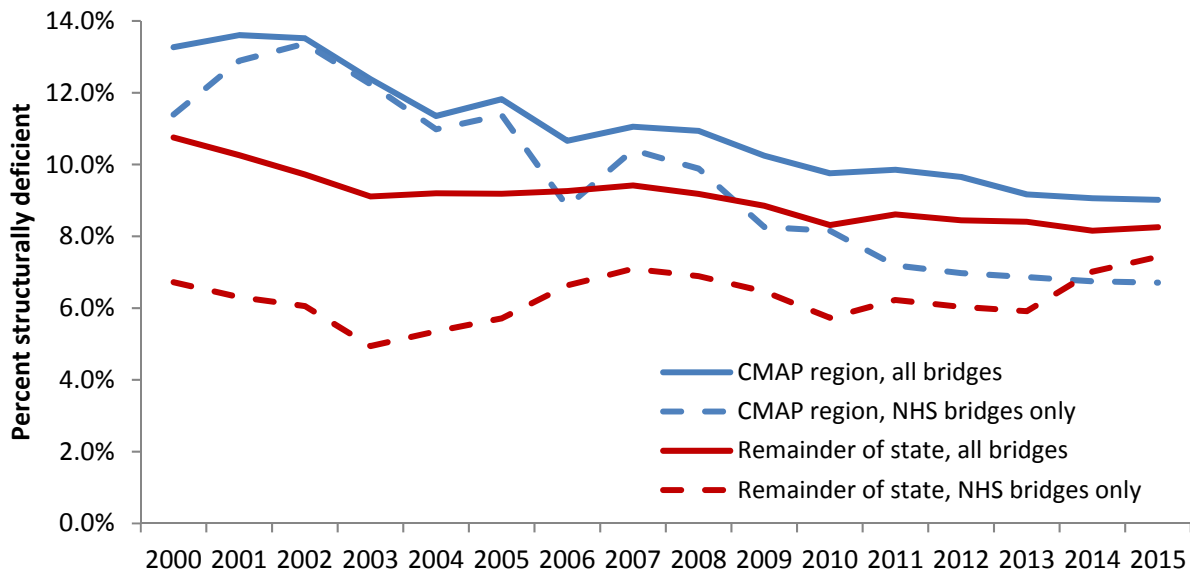
⁸A number of different systems exist for grading pavement condition a more holistic way than IRI, with the most widely used system in the Chicago region being the Condition Rating Survey (CRS) developed by IDOT. Unfortunately, while it is a broader measure than IRI, the CRS method is still not able to fully capture the structural health of pavement, particularly on the expressway system. The CRS is followed in popularity by the Pavement Condition Index developed by the U.S. Army Corps of Engineers. Neither of these are directly related to the federal performance measures required under MAP-21.

Unfortunately, on the non-Interstate portion of the NHS, data have not been collected to comprehensively document reconstruction needs, which is a major data gap that CMAP and partners should fill in the upcoming years.

Bridge condition

The region has made significant progress in improving the condition of its bridges, cutting the percentage rated structurally deficient by almost one-third over the past 15 years (Figure 8). Structural deficiency means that some bridge elements have deteriorated, requiring significant ongoing maintenance to remain in service as well as eventually a major rehabilitation or replacement to address the deterioration. Bridge condition has steadily improved by about 0.3 percentage points per year, which reflects the emphasis IDOT and the Tollway have placed on addressing bridge condition, particularly on the NHS.

Figure 8. Percent of bridges structurally deficient



Source: National Bridge Inventory

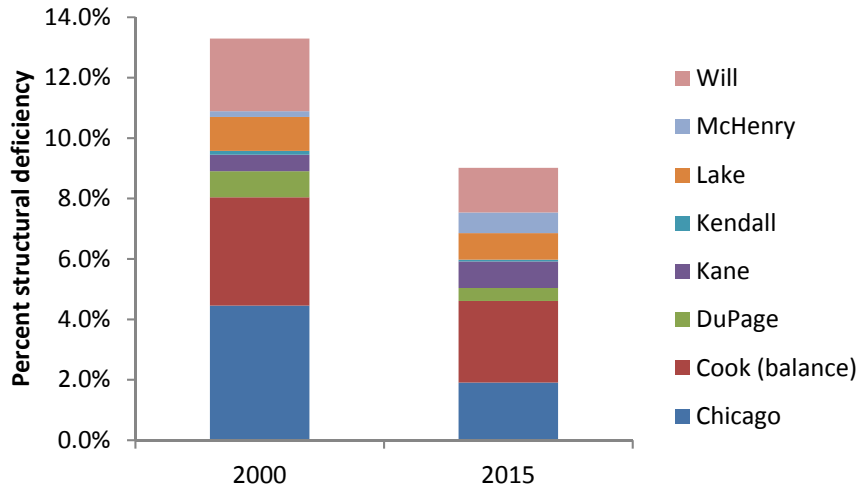
GO TO 2040 set a target of 4 percent deficiency by 2040 as well as an interim target of 7.3 percent by 2020. Simple trend extrapolation would suggest that the region is on track to meeting this target. However, continued progress on bridge condition depends on having the resources available to meet the bridge needs that are coming due. Forecasts developed by CMAP for the ON TO 2050 Financial Plan suggest that the region will not be able to make the needed investments given available resources.

While the gap has been narrowing over time, bridges in the Chicago region generally remain in slightly worse condition than those in the rest of the state. Declines in NHS bridge condition outside of the CMAP region occurred because MAP-21 added significant mileage to the NHS,



including many rural roads downstate where bridges are in poor condition. Within the CMAP area, bridge condition has improved in most counties, but the biggest improvements have occurred on bridges located within Chicago followed by Will and Cook Counties (Figure 9).

Figure 9. Percent of total structural deficiency for all bridges in any jurisdiction in each county



Source: National Bridge Inventory

MAP-21 also added an additional set of measures for bridge condition, requiring states and MPOs to report on the percentage of NHS bridges in good, fair, and poor condition. These measures are based on data already included in the National Bridge Inventory, and the “poor” rating tracks very similarly to the structurally deficient category.



Mobility

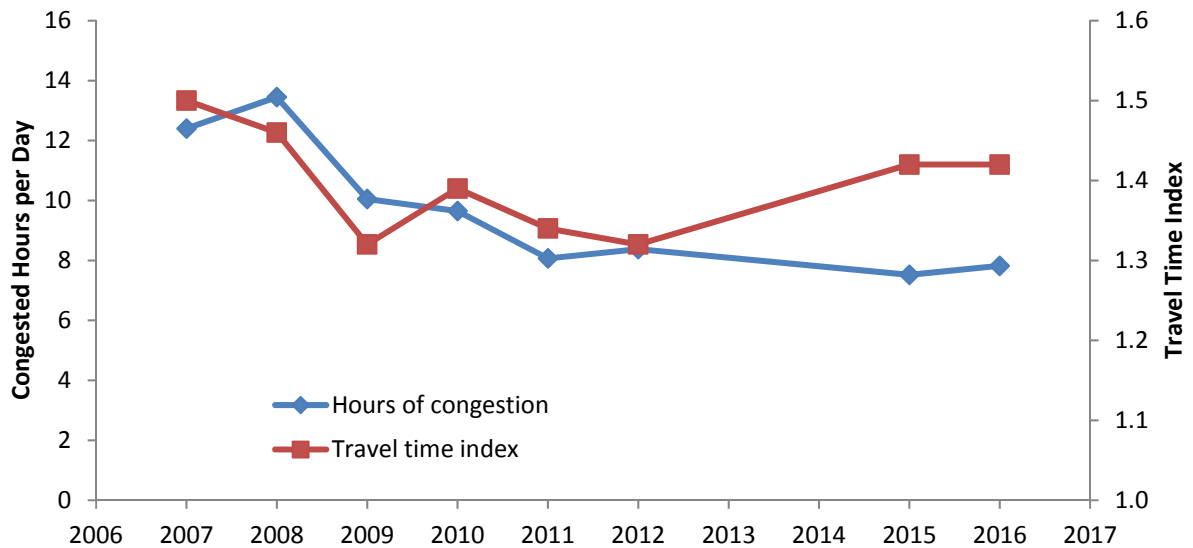
Congestion on the expressway system

While it may not be apparent to a driver stuck in traffic, congestion on the expressway system has moderated over the past decade. Several factors influence this outcome, including the last recession, in which unemployment and lower incomes reduced many kinds of trips. Another contributing factor was high gas prices in the latter part of the previous decade. Lower Vehicle Miles Traveled (VMT) in the state and the CMAP region since 2004 probably contributes as well. This lower VMT may be due to societal shifts in driving, employment levels, the aging of the region's population, location of employment, and other trends. Workers are increasingly taking advantage of flexible commuting options, which may also affect congestion. Finally, alleviating congestion has been the objective of numerous highway capacity improvements and the region is now reaping the benefits of these projects. However, congestion has rebounded somewhat in the past two years. It remains to be seen whether this represents the beginning of a new trend of intensifying traffic.

Measured in terms of duration, congestion has decreased dramatically. On a typical day on the expressway and tollway system, congestion now lasts about two-thirds as long as it did a decade ago (Figure 10). In contrast, the travel time index (TTI) tracks how much longer a trip is during peak periods than under light traffic conditions. For example, if a trip takes twice as long in the peak period as it does off-peak, then $TTI = 2$. The TTI measure also decreased significantly over the last decade.



Figure 10. Change in hours of congestion and travel time index on expressway and tollway system, 2007-16



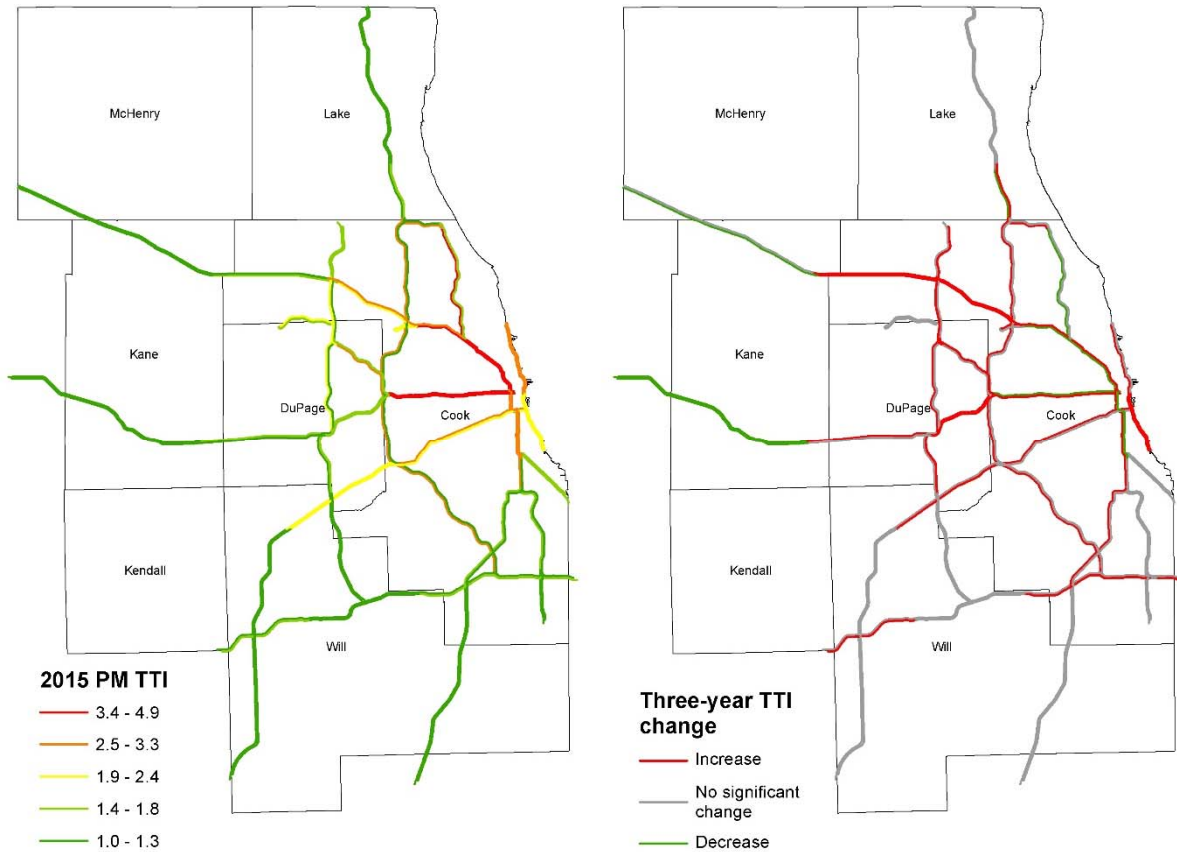
Source: FHWA; all data are for the April - June period. In 2013, the source of the data changed from loop detectors embedded in the roadway to a dataset that determines speed from GPS location data via vehicle navigation systems and occupants' smartphones.

Peak period congestion rebounded in 2015. Lower gas prices and economic recovery may have contributed to this return to rising congestion. However, construction on the Jane Addams Tollway, the Elgin-O'Hare area, and the Circle Interchange probably accounts for a significant portion of the increased TTI. If so, the rise in the severity of congestion may be temporary and would decline further after these capacity-adding projects are complete. Also, the spread between congested hours and TTI in the past two years indicates that congestion has grown more "peaked," that is, lessening in mid-day and evening relative to the morning and afternoon rush periods. At least on the expressway system, this suggests a reversal of a decades-long trend of rising congestion in the off-peak hours. However, more time and data collection is needed to verify this shift in congestion patterns.

In general, as peak period congestion has rebounded, expressways that were already congested have become more so (Figure 11). Most of the increase is in the core of the region. On many outlying expressways, peak period congestion has stayed the same or even decreased.



Figure 11. Morning and afternoon peak TTI for 2015; TTI change for 2012-15



Source: CMAP analysis of Here speed probe data obtained from RITIS website.

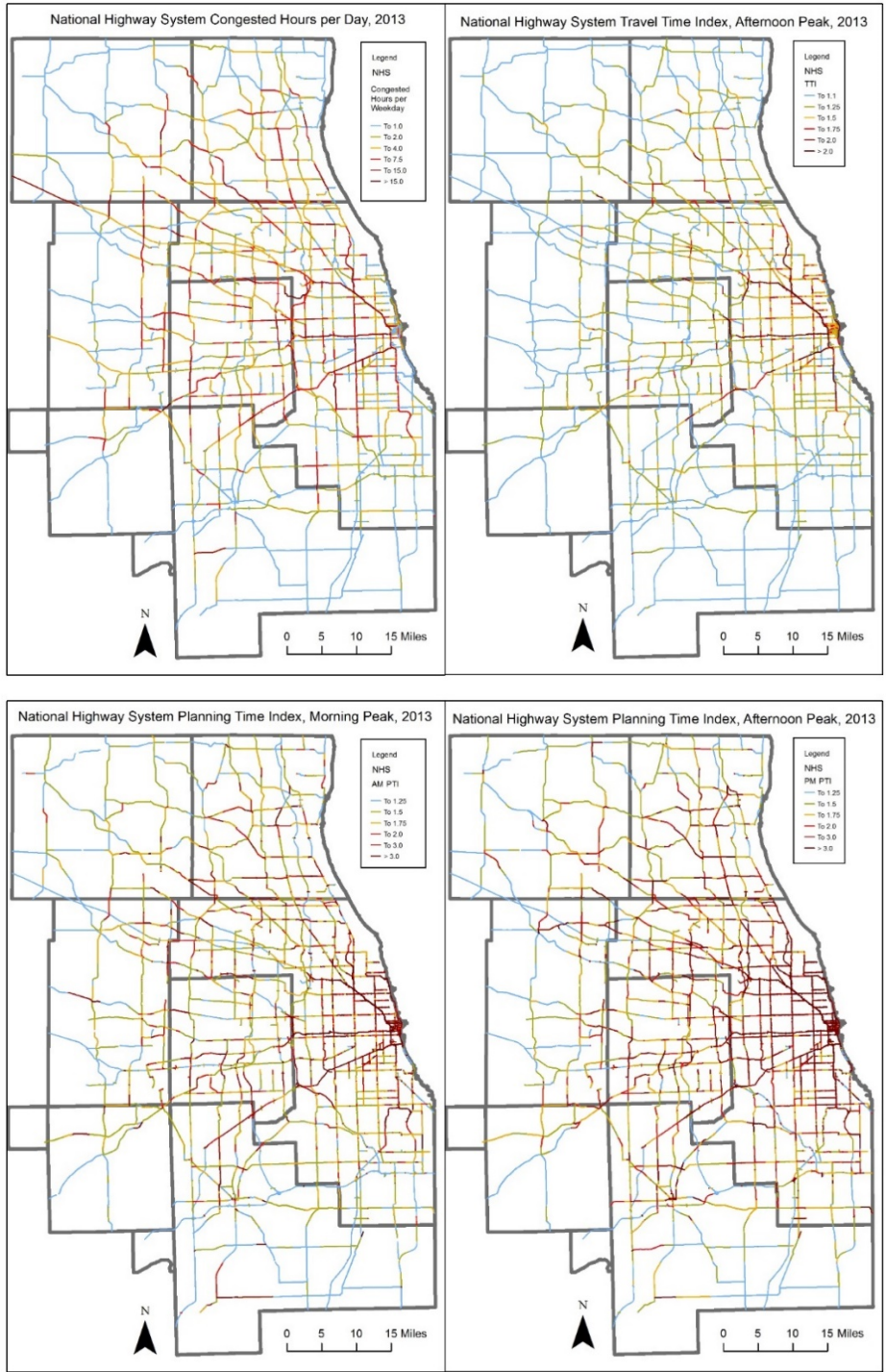
Mobility and reliability on the entire NHS

Congestion on the entire NHS system is widespread and persistent throughout the day, leading to increased travel and planning time to move people and goods. As shown in Figure 12, the most severe congestion is concentrated in the central part of the region, particularly on the expressways leading downtown, on the northwest side of Chicago, and in the northern suburbs, although specific bottlenecks are apparent in many other places. The hours of congestion measure suggests that a chronic low level of congestion is widespread and often lasts through much of the day. Unreliability, as measured by the planning time index (PTI), is more widespread. The PTI measures unreliability by indicating the extra time one must include when planning a trip to ensure arriving on time 95 percent of the time.⁹

⁹ For example, if a traveler needs to set aside an hour to account for variation in a trip that should take 20 minutes in light traffic, then the PTI is 60 minutes ÷ 20 minutes = 3.0.



Figure 12. Hours of congestion, travel time index, and planning time index on the National Highway System, 2013



Source: CMAP analysis of Here data.

Note: The TTI and PTI shown is the morning peak measured in the worst direction. The hours of congestion are for the worst direction. While it would be valuable to show trends in congestion on the arterial portion of the NHS, time series data are not available for the past decade.



The measures reported here for congestion and travel time reliability are different than those required under the MAP-21 performance measurement program.¹⁰ The MAP-21 system performance measures just went into effect in May 2017; they require a more intense level of data analysis which CMAP will begin in summer 2017 for later reporting as required under FHWA rules.

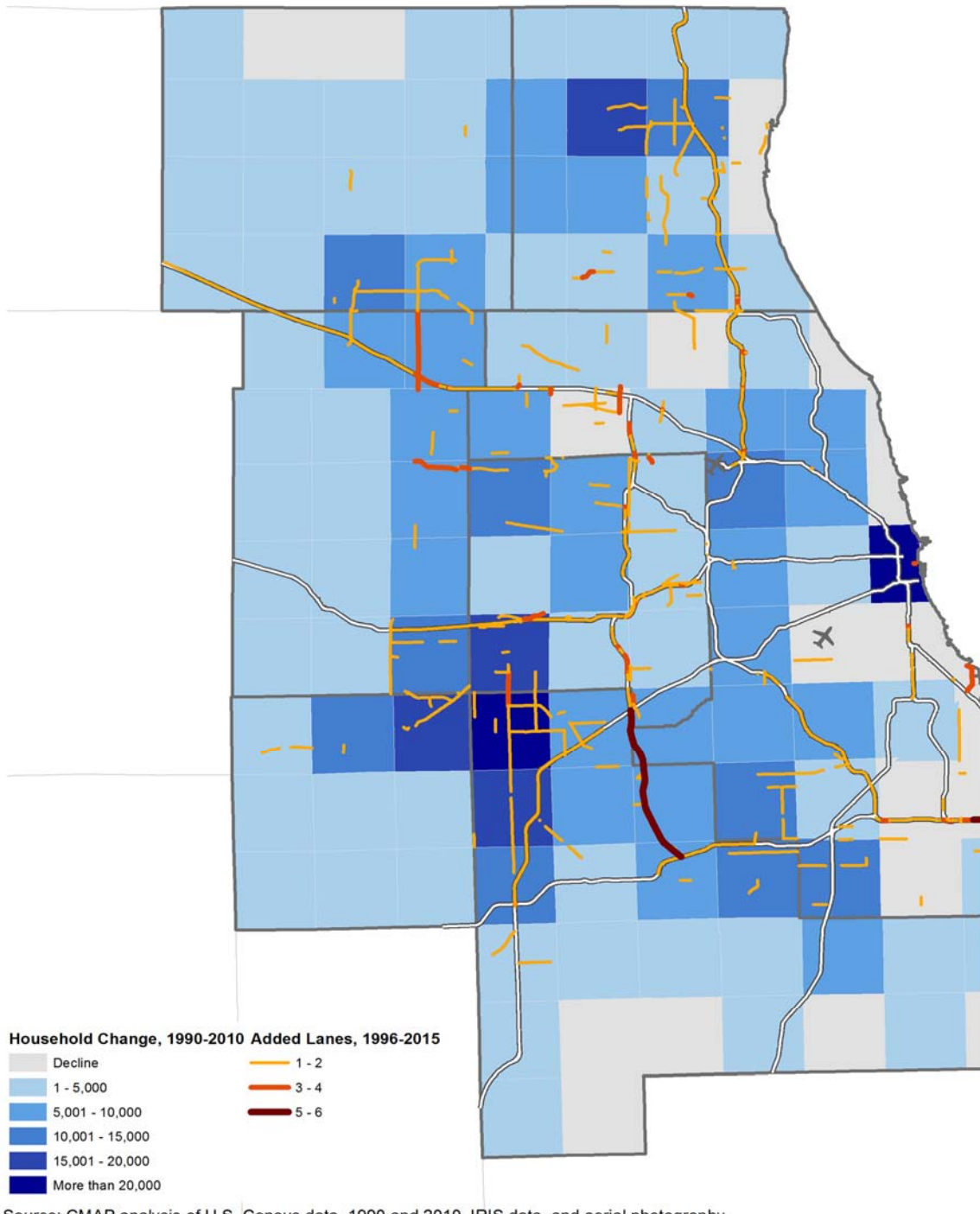
Effects of capacity additions

The highway system in the Chicago region is mature, but significant capacity has been added in recent years, particularly to serve areas of high population growth. In the past two decades, about 1,000 expressway and arterial lane-miles were added to the system (Figure 13), representing a 2 percent increase in arterial lane-mileage and a 15 percent increase in expressway lane-mileage over that time period. Much of the Tollway system had a new lane added during this time. The map shows segments where new through-lane capacity has been built and does not count other traffic flow improvements such as additions of turn lanes at intersections, new ramp capacity, or widening without new lanes.

¹⁰ National Performance Management Measures; Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program, 82 Fed. Reg. 5970 {Jan. 18, 2017}.



Figure 13. New through-lane capacity on arterials and expressways, 1996-2015



Source: CMAP analysis of U.S. Census data, 1990 and 2010, IRIS data, and aerial photography.
 Note: includes only new lanes on roads with functional classifications of minor arterial or above

Source: CMAP analysis of U.S. Census data, 1990 and 2010, IRIS data, and aerial photography.
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Analysis using the CMAP travel demand model¹¹ suggests that, had this capacity not been added, congested hours per day would be about 18 percent higher on the expressway system than it is, or approximately 8.9 hours per day in 2015. The new lane-mileage did induce additional auto travel, as the model suggests VMT is about 1 percent higher than it otherwise would be. While this analysis indicates that new highway capacity has reduced congestion, it does not address any negative impacts to the environment or nearby communities. Nor does it speak to whether less costly approaches to congestion reduction, such as improved operations, might have been effective. Nor, finally, does it address how the underlying demand for auto travel might have been reduced by land use policy or by making investments that support biking, walking, and transit.

Accessibility

Mobility refers to the speed of travel, while accessibility instead refers to the ease with which travelers can obtain goods and reach jobs or otherwise achieve the goals of their travel. Accessibility has grown in importance as a measure of travel. Increasing accessibility involves increasing travel speeds, creating shorter trips (for instance, through more compact development), or reducing the need for motorized travel (for instance, by making neighborhoods more walkable).

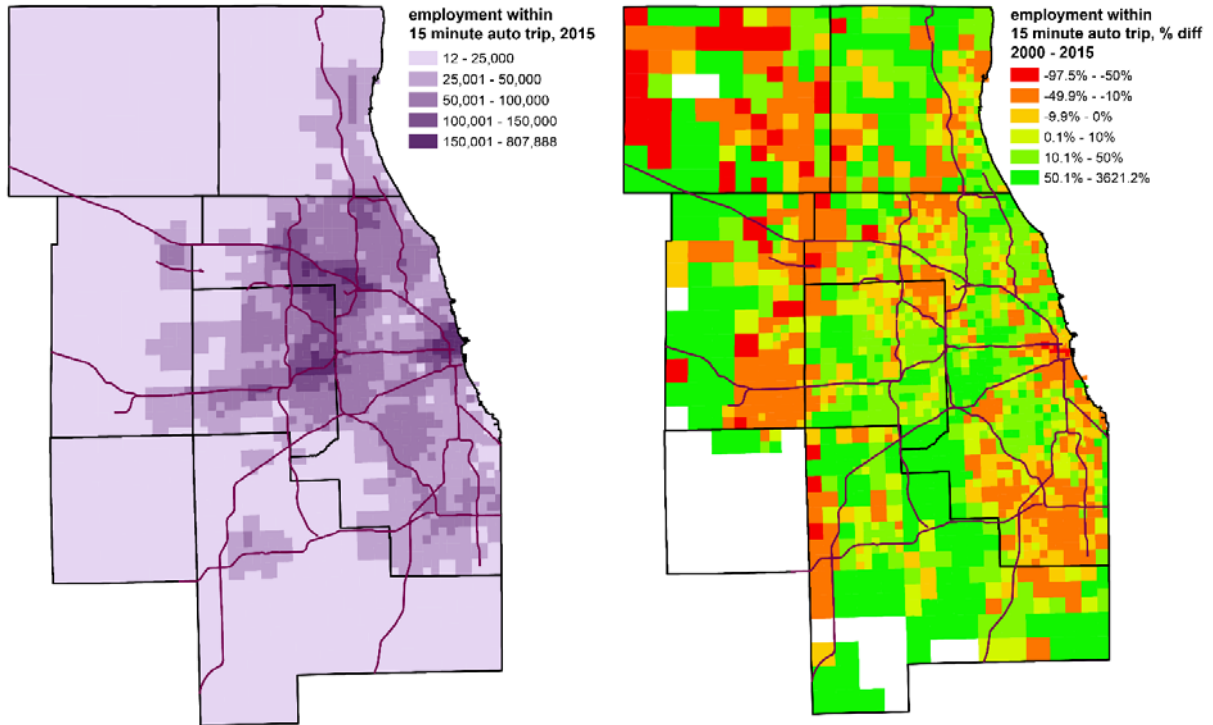
A widely used measure of accessibility is the number of destinations, including stores, hospitals, schools, and jobs that can be reached within a certain amount of time. Accessibility matters most for local travel -- most people would not consider a destination 60 miles away accessible. The number of jobs within 15 minutes by auto is a useful proxy for the number of locally-accessible destinations. Figure 15 shows that accessibility is highest in the areas in and immediately around downtown Chicago, around O'Hare, and in the I-88 corridor.

Accessibility is deeply affected by land use, particularly development density, with the transportation system playing a supporting role. However, in auto-dependent areas, congestion reduces travel speeds and, therefore, accessibility. The low accessibility of some areas in the region is caused partly by congestion. While they are often contrasted, mobility and accessibility are closely related in reality.

¹¹ A report on the most recent (2017) validation of the travel model, along with documentation for the model itself, is available at <http://www.cmap.illinois.gov/data/transportation/modeling>.



Figure 15. Destinations within 15 minutes by auto or transit in 2015 during AM peak (left) and percent difference between 2000 and 2015 (right)



Source: CMAP analysis. Note: areas on right-hand map that are not colored did not have valid employment data for 2000.

Tracking accessibility from 2000 -15 also suggests that there have been large changes in the ease of reaching employment from different locations in the region (Figure 15). While job growth in the downtown area has been strongly increasing in the past few years, it has not yet exceeded 2000 levels, which accounts for the accessibility loss in the neighborhoods around downtown. A similar explanation applies to the O’Hare area and in the south suburbs, although the latter have not recovered from the Great Recession and earlier employment declines. In contrast, eastern Kane County and southeastern McHenry have generated employment growth since 2000, but accessibility has declined. In these areas, lower density development is adding travel opportunities at a slower rate than travel times are increasing. Overall, from 2000 to 2015 the average household in the region saw a slight decline of 2 percent in the number of jobs reachable by auto within 15 minutes. Jobs are a strong proxy for access to services, retail, entertainment, and similar resources, meaning that congestion and lower density development are causing residents to take longer to reach many of their day-to-day destinations.

Safety

Safety is the paramount issue for highway agencies. It has been a focus of federal and state policy for decades, encompassing everything from roadway design to vehicle technology requirements to law enforcement priorities. Considerable progress has been made in the past decade, yet signs show that improvement has begun to reverse. Improvement notwithstanding, car crashes remain a very serious issue: for instance, they are the leading cause of death for 15- to-19 year olds nationwide.¹² At the planning level, MAP-21 for the first time instituted requirements for states and MPOs to establish quantitative targets for safety measures,¹³ going into effect in mid-2017 for states and early 2018 for MPOs. CMAP is developing a strategy paper on highway safety¹⁴ that will examine options for how to set and meet these targets.

Fatal and serious injury trends

The Chicago region has seen significant decreases in both traffic fatalities and serious injuries over the past decade (Figure 16, Figure 17). One likely reason for this is the implementation of the Illinois Graduated Driver Licensing Program, which, over a period from 2004-08, raised training requirements for teen drivers, restricted late-night driving, and restricted the number of teen passengers allowed in a vehicle with a teen driver. However, many factors are at work, including the recession, which may have limited certain kinds of travel during the time period with the greatest crash reductions. The steepest decrease occurred early in the period, and serious injuries and fatalities have now begun trending upward, with a significant jump in fatalities from 2015 to 2016.

In comparison to the rest of the state, the fatal crash rate is significantly lower in northeastern Illinois. There are many reasons for this, but the most salient factors likely are a higher share of two-lane roads, increasing the risk of head-on collisions, and faster speeds in rural areas. Crashes in urban areas may also benefit from quicker response from emergency medical providers, improving survival rates in crashes.

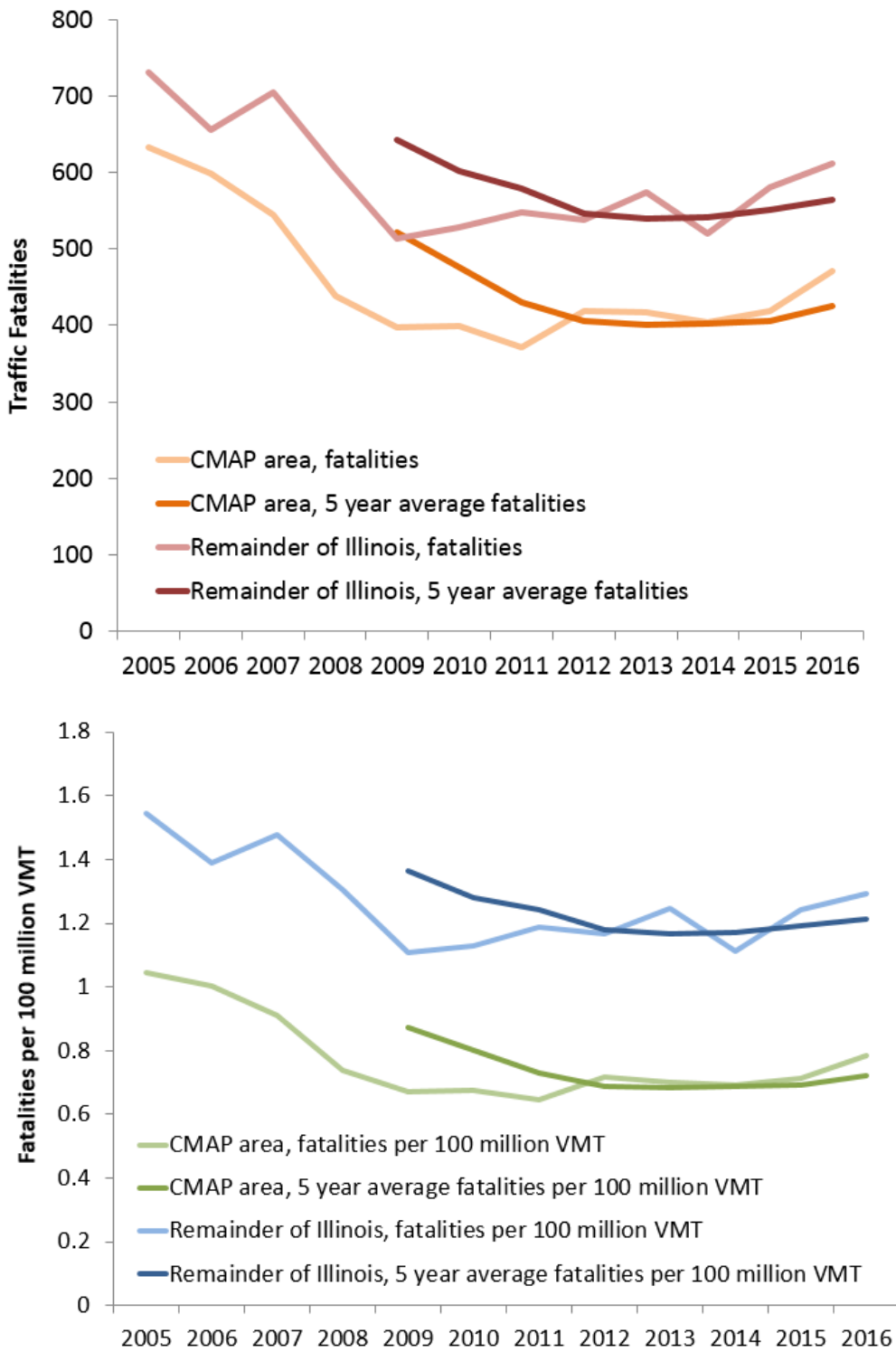
¹² "Global Burden of Disease," Institute for Health Metrics and Evaluation, University of Washington, accessed August 15, 2017, <http://vizhub.healthdata.org/gbd-compare/patterns>.

¹³ The safety measures are the number of fatalities, number of serious injuries, rate of fatalities per 100 million VMT, rate of serious injuries per 100 million VMT, and the number of non-motorized serious injuries and fatalities, each expressed as a five-year average. MPOs can elect to adopt the state targets if appropriate.

¹⁴ "Traffic Safety," Chicago Metropolitan Agency for Planning, accessed August 15, 2017, <https://www.cmap.illinois.gov/onto2050/strategy-papers/traffic-safety>.

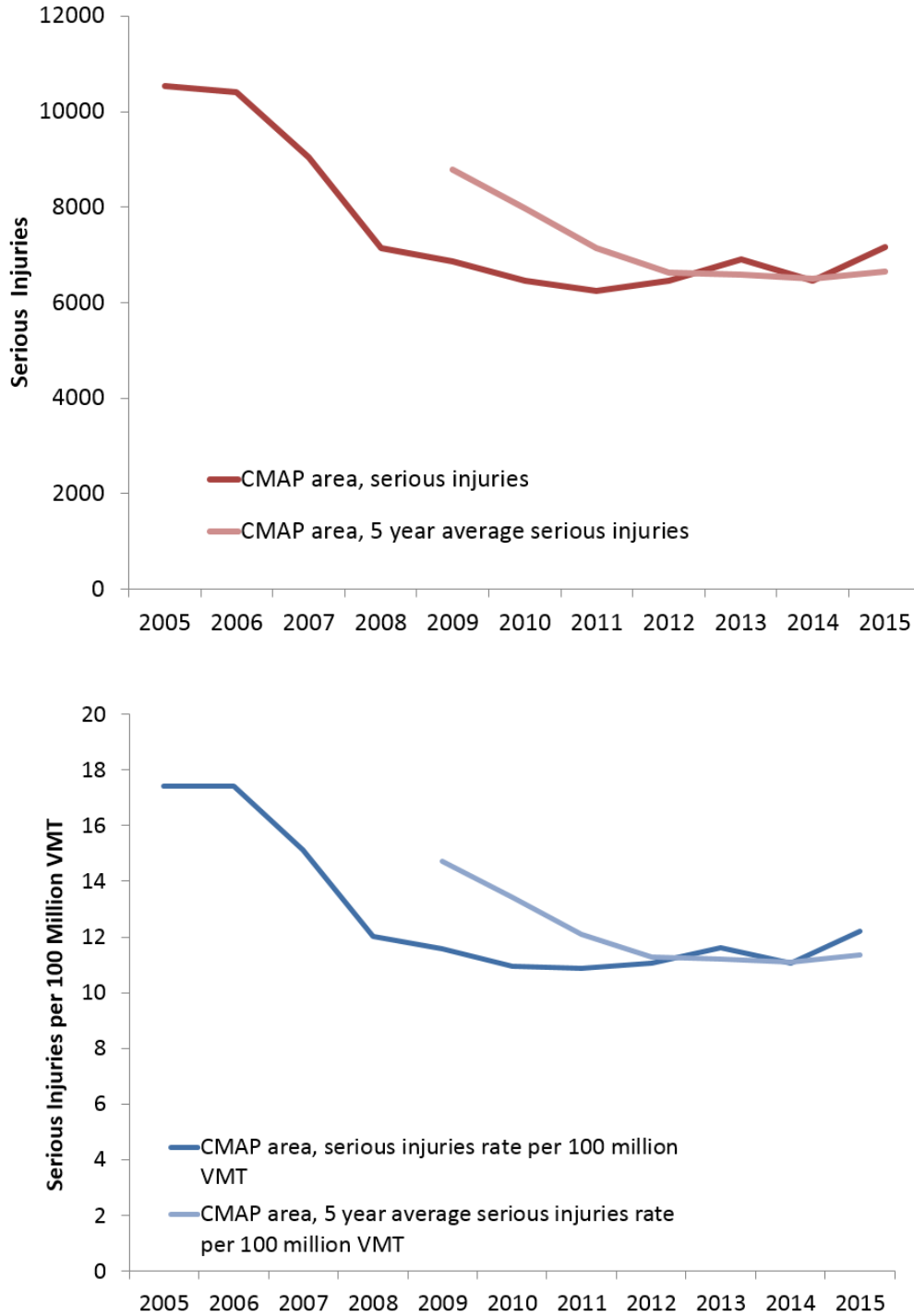


Figure 16. Traffic fatalities and fatality rate in the CMAP area relative to the remainder of the state, 2005-16



Source: IDOT Safety Portal and NHTSA Fatality Analysis Reporting System

Figure 17. Serious injuries and serious injury rate in the CMAP area, 2005-15

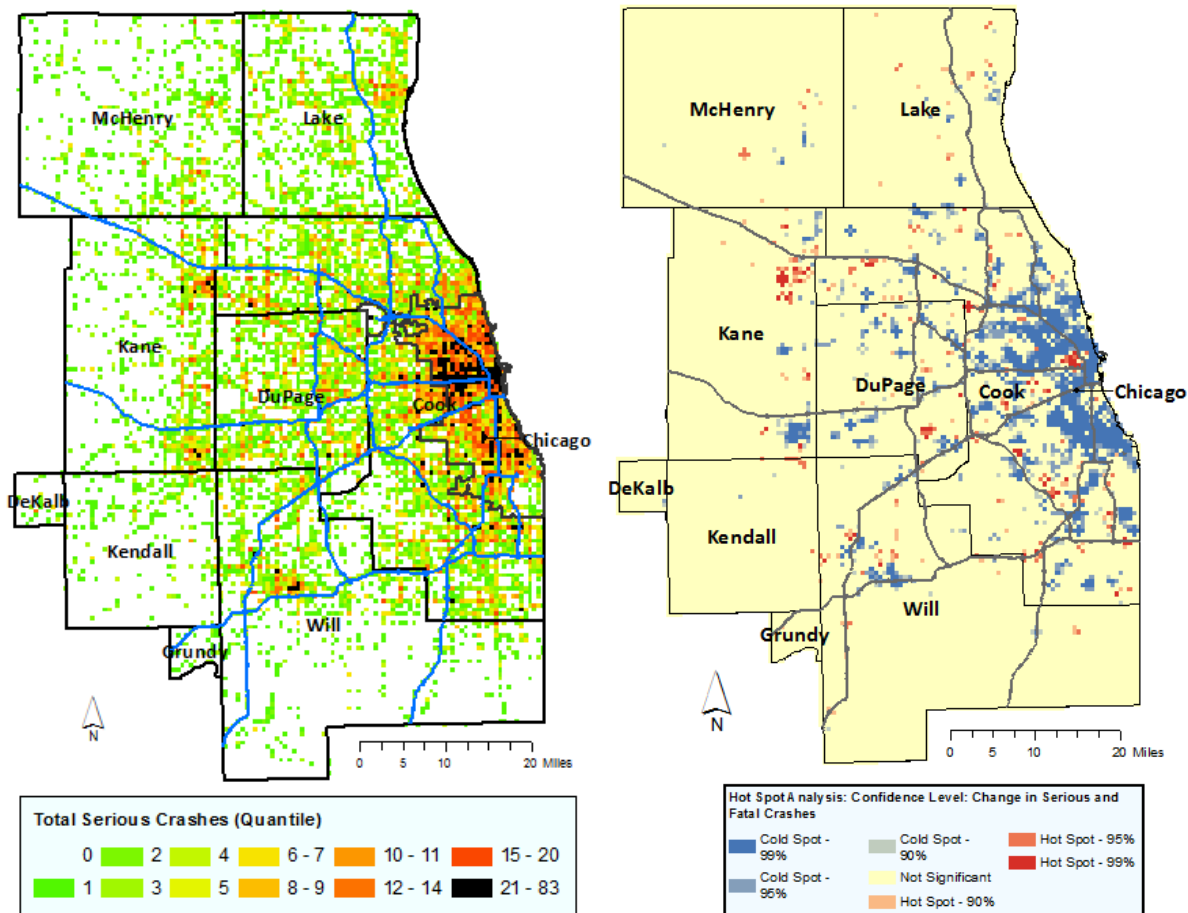


Source: IDOT Safety Portal



Much of the previous decade's reduction in traffic fatalities and serious injuries occurred in the City of Chicago, as well as in smaller population centers around the region (Figure 18). While almost all types of crashes fell in number, pedestrian crashes, angle, and rear-end crashes in particular declined. A few areas are hotspots for crash increases. Local study is needed to understand the causes.

Figure 18. Five-year average serious injury and fatal crashes by subzone 15 for 2014 (left) and hotspot analysis of change in five-year average for 2009-14 (right)



Source: CMAP analysis of IDOT Safety Portal data

Serious crash rate by facility type

The declining trend in the rate of traffic fatalities and serious injuries over the ten years of this analysis is generally similar for all facility types, as shown below. Essentially identical trends in

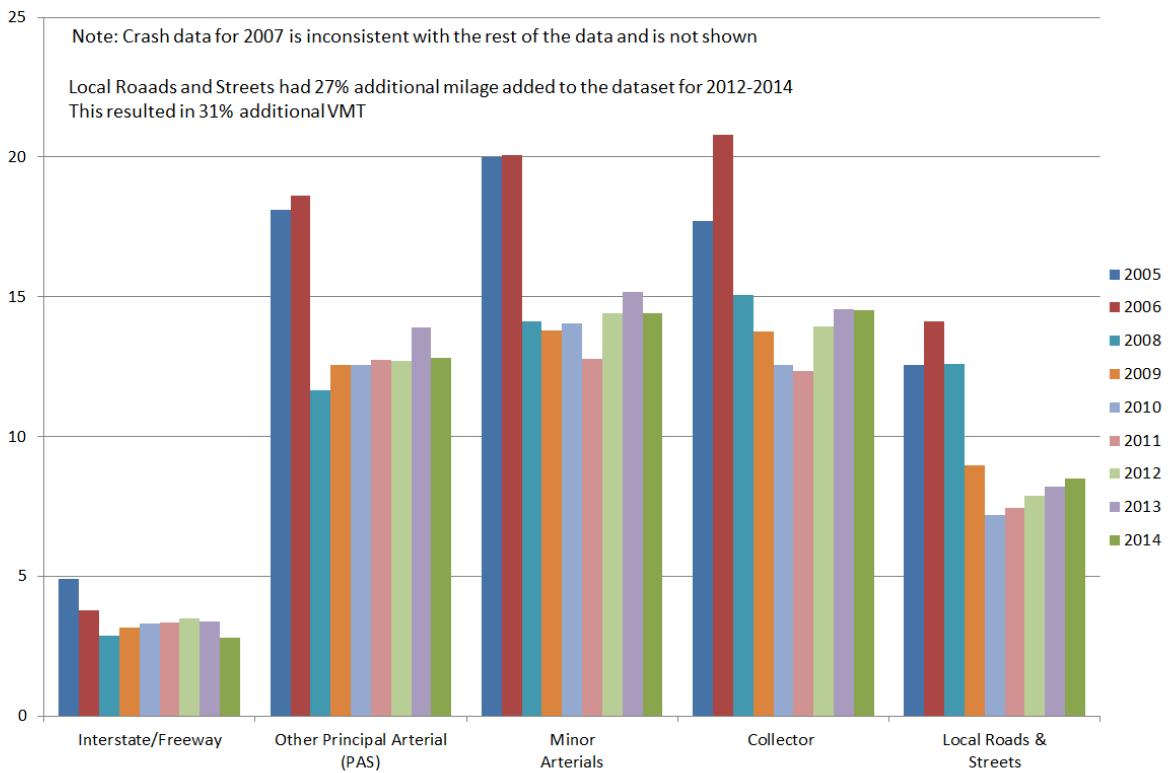
¹⁵ Subzones are small geographies used in CMAP transportation analyses that are generally squares 0.5 miles on a side.



fatal and serious injury crash rate reduction can also be seen in aggregate on the state- and local-jurisdiction arterial systems. This may suggest that crash rates are more responsive to region- or state-wide changes in policy (e.g., restricting younger drivers, ticketing for seat belt use or penalties for driving under the influence), vehicle technology, economic shifts, and broader trends such as distracted driving than to particular roadway improvements.

The expressway system is far safer than the rest of the road network, with a rate of serious or fatal crashes per VMT that is 75 percent lower than other roadway types (Figure 19). The difference is mostly due to the presence of at-grade intersections on arterials, which lead to more stopping and starting and cause potential conflicts between turning vehicles. Thus, projects that encourage more traffic to use the expressway system rather than arterials generally reduce crash rates, although initiatives to shift auto trips to transit, biking, or walking would have the largest safety benefit by reducing driving altogether. Due to higher speeds, however, the ratio of fatal crashes to serious crashes is the highest on the expressways.

Figure 19. Fatal and serious injury crash rates per 100 million VMT by functional class



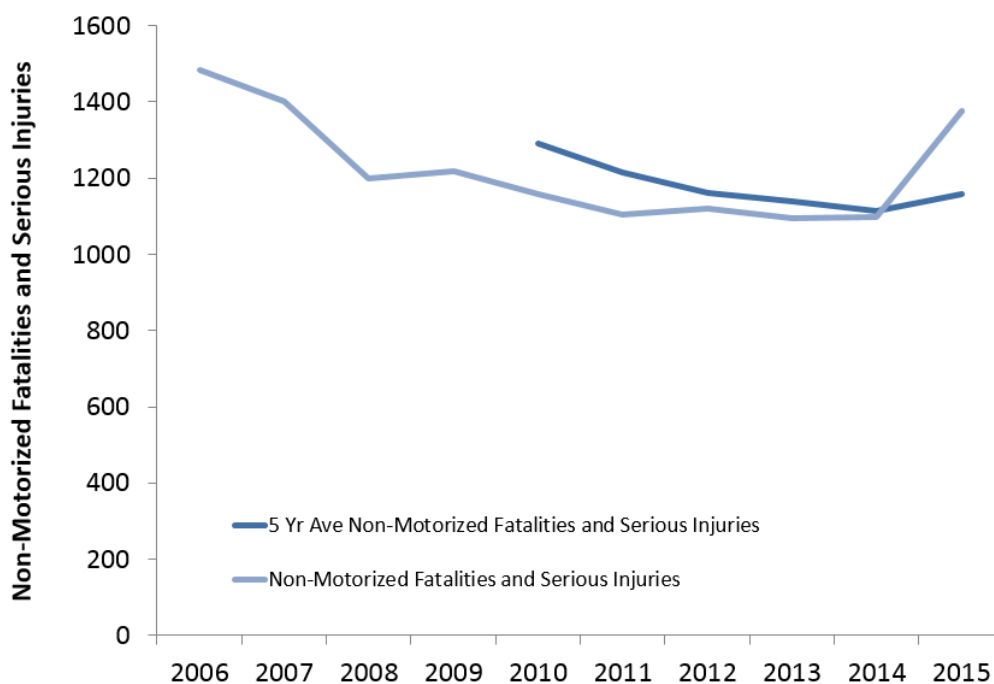
Source: CMAP analysis of IDOT Safety Portal data. Note: Values for 2007 are not shown because of data quality issues.



Non-motorized serious injuries and fatalities

Overall, non-motorized serious injuries and fatalities have been declining (Figure 20), but just in the past year the region has seen a marked increase in serious injuries and fatalities involving pedestrians and bicyclists. In general, serious injuries and fatalities suffered by bicyclists have been increasing. One factor behind the latter trend is that the number of people traveling by bicycle has been increasing. The share of workers in the region who bike to work increased from 0.3 percent in the 2000 decennial census to 0.7 percent in the one-year 2014 American Community Survey estimates. Bicycling for non-work trips has probably risen as well, but the census data only cover commute trips. Serious crashes involving bicyclists have increased in recent years, but the rate per mile of travel may not have changed. However, this cannot be determined due to a lack of reliable data on bicycle miles traveled.

Figure 20. Non-motorized fatalities and serious injuries in the CMAP area, 2005-15



Source: IDOT Safety Portal

Pedestrians and bicyclists have also begun to make up a larger fraction of all fatalities and serious injuries. For pedestrians, this trend has been mixed over time, but the bicyclist share of serious injuries in the region has exhibited a gradual rise that is probably associated with increased use of bicycles. The region has been more effective in the past decade at improving



safety for vehicle occupants than for bicyclists and pedestrians, pointing to the need for policies to accommodate bicyclists and pedestrians as well as measures aimed at improving their safety.



Next steps

The region must prioritize limited resources. While pavement and bridge conditions have been improving in recent years, meeting the GO TO 2040 targets and sustaining them over time will be difficult given funding availability. The region may need to accept more pessimistic or more measured maintenance standards, or implement new state, regional, and local transportation funding sources. To improve conditions on the NHS system, which is the most critical part of the roadway network, funding may need to be redirected away from lower volume Federal-aid roads that serve more local traffic.

The region's transportation implementers should also work with CMAP to develop data on the age and condition of the full NHS and local systems. Despite significant state and federal expenditure on the road network, implementers rarely have a complete understanding of the condition and needs of the full road network. In an era of constrained resources, it is even more important to know whether funding is being directed to the most significant needs. CMAP, state, and local partners should prioritize additional pavement data collection and analysis at least on the Federal-aid system. Furthermore, conditions are generally worse on the NHS in northeast Illinois relative to the remainder of the state, while roads in the CMAP area carry 55 percent of statewide VMT. Because of that, GO TO 2040's recommendation to reform state highway funding distribution remains crucial.

More than a quarter of highway spending in the past decade has been devoted to new capacity. Analysis shows that recently added capacity has reduced congestion. But, going forward, the region must consider the role of new highway capacity. Much of the expressway system will need reconstruction by 2050, presenting opportunities to add lanes at the same time in some locations rather than rebuild in kind, although with added expense. The evaluation process for regionally significant projects in ON TO 2050 will consider the tradeoffs involved, including potential additional community and environmental impacts, and the probable gains in traffic safety from shifting more drivers to the expressway system from arterials, as well as the potential for new transit service on those corridors. Similar considerations will be part of developing the Vision for the Northeastern Illinois Expressway System, a new initiative carried out by CMAP in partnership with IDOT and the Tollway.

Much of this memo analyzes performance based on measures that CMAP has tracked for several years. However, MPOs and states are now required to report on condition, safety, congestion, reliability, etc. using measures only recently defined by FHWA. MPOs in particular have to report baseline conditions and targets for the federal measures in their long-range plans. To the extent possible, this memo reports performance based on federal measures, but in some cases data are not yet available or additional coordination needs to take place with IDOT before the metrics can be computed. ON TO 2050 will include a report on baseline conditions for the federal measures.



233 South Wacker Drive, Suite 800
Chicago, Illinois 60606
312-454-0400
ONTO2050@cmap.illinois.gov

www.cmap.illinois.gov

The Chicago Metropolitan Agency for Planning (CMAP) is our region's comprehensive planning organization. The agency and its partners are developing ON TO 2050, a new comprehensive regional plan to help the seven counties and 284 communities of northeastern Illinois implement strategies that address transportation, housing, economic development, open space, the environment, and other quality-of-life issues. See www.cmap.illinois.gov for more information.

ON TO 2050 reports will define further research needs as the plan is being developed prior to adoption in October 2018.