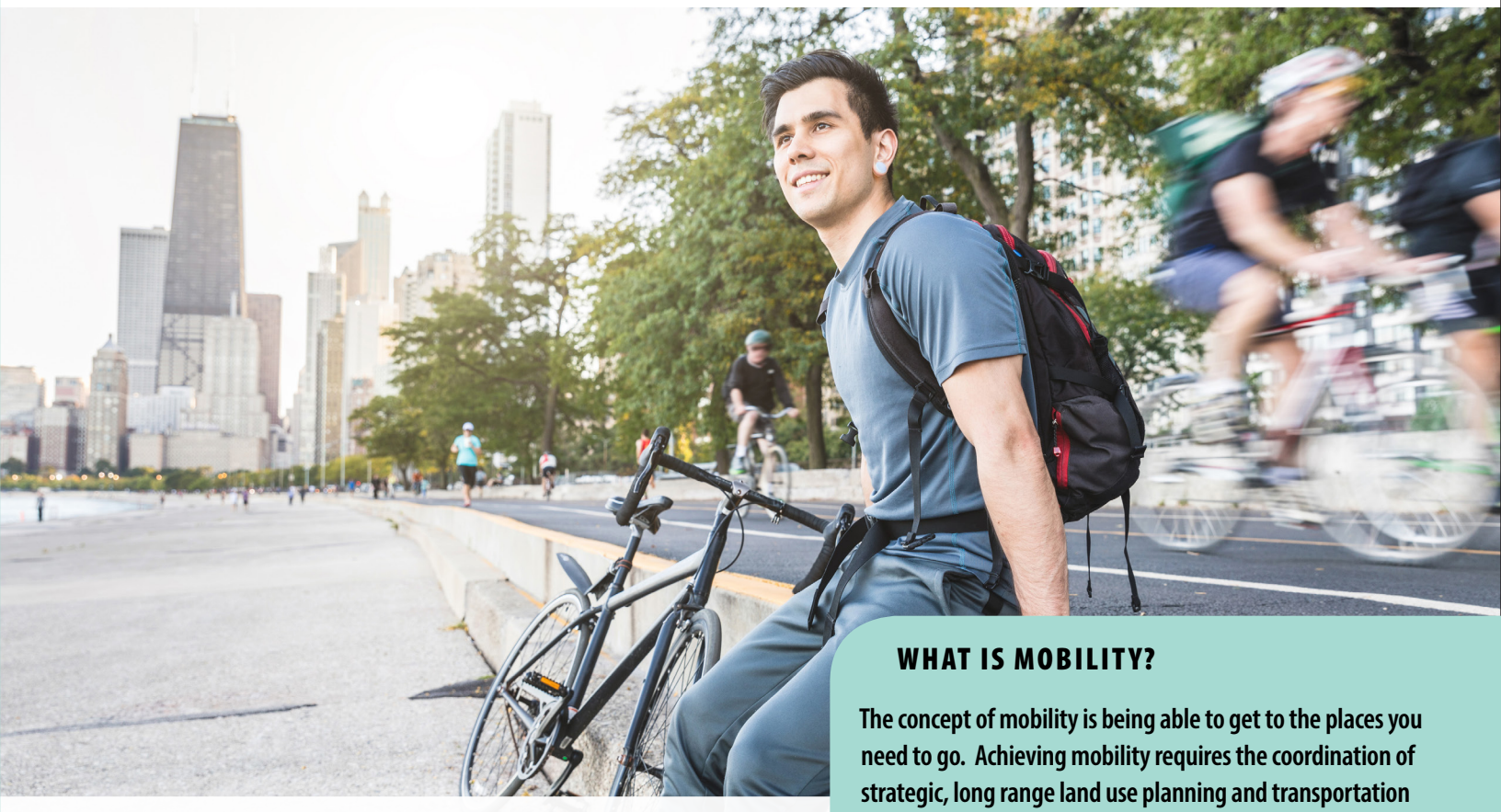
Mobility



4. Mobility

A robust transportation system that offers multiple modal options, whether by car, train, bus, bicycle, or foot and high-quality infrastructure is crucial to achieving mobility of people and goods. Planning for a large state with a diverse mix of urban and rural areas is challenging. Meeting the transportation and mobility needs of such a diverse population is practicable; but, requires a comprehensive approach to transportation planning.

Mobility is a core component of the vision of the Illinois' LRTP. Furthermore, IDOT's vision for mobility is to develop a multimodal network, moving people from place to place to support economic development. The strategies and implementation programs outlined in this chapter look at all modes of transportation in Illinois in an effort to link transportation and planning intended to improve mobility, while also managing existing issues.

GOAL

Support all modes of transportation to improve accessibility and safety by improving connections between all modes of transportation

WHAT IS MOBILITY?

The concept of mobility is being able to get to the places you need to go. Achieving mobility requires the coordination of strategic, long range land use planning and transportation planning. The level of performance of a transportation system/network can be evaluated by means which relate to users (e.g. Was the route congested?), modes (e.g. What mode did you use?), land use, cost (How much did it cost?), environmental impacts, and more. Modes of transport are largely considered mobility as it is the main component in the movement of people and freight. A decrease in mobility performance, or transit modes that support mobility, can result in increased user costs. These include fuel consumption increases, travel time increases, traffic congestion, and an overall negative quality of life.

Mobility encompasses the interactions between all modes of transportation and are increasingly important for the movement of people and goods. A well-designed transportation network provides mobility choices for users, to move both goods and people, alike.

From the user perspective, mobility is the ability to utilize the transportation network effectively to reach destinations via effective multimodal transitions. From a goods perspective, mobility is the ability to utilize the transportation network to effectively provide the delivery of products often using multiple modes to their end users. This, in turn, will continue to drive economic activity in Illinois.

4.1 MOBILITY OF PASSENGERS AND GOODS IN ILLINOIS

Illinois boasts an extensive transportation network, comprised of numerous transportation modes and publicly- and privately-owned facilities. This includes the state's substantial roadway network, multiple aviation facilities, pedestrian and bicycle infrastructure, public transit entities, the second-largest rail and freight system in the nation, and a number of waterways, canals, and ports. The interconnected nature of this network is defined as multimodal connectivity.

The overall system continues to grow and improve due in part to Illinois' central location within the United States and its distinction as a top agricultural and industrial producer. The progress is most notable near the larger population regions surrounding Chicago to the north and St. Louis to the south. This system of interconnected transportation methods is crucial to providing and maintaining accessible and reliable transportation for both people and goods.

Optimized mobility is of particular interest to commercial and private passengers, especially those traveling on urban corridors or heavily traveled rural corridors that experience heavy congestion. Mobility options such as passenger rail, commuter rail, bicycle and pedestrian facilities are increasingly important in efforts to manage congestion, reduce energy consumption and improve system operations. Each of these options are essential to the success of mobility within the state.

Mobility is both the willingness and capability for movement, and the location decisions related to mobility create relationships which require continuous changes to the infrastructure: by physical change (e.g. construction), space (e.g. living or working), or local connection (e.g. identity, habit, integration).

The availability of transportation options contributes to improved quality of life in communities across the state. In general, a lack of choice in a transportation network and subsequent reduction in mobility forces users to choose driving as their only mode of transportation. Those who are unable to drive (due to age, disability, vehicle access, etc.) are left with an absence of mobility. As a result, the lack of mobility for users impedes economic activity by reducing the transportation options for people to get to work, appointments and run daily errands.

The structure of the rural economy is different from urban areas, requiring different transportation infrastructure. Hence, mobility is fundamental to one's locational behaviors. For example, a rural resident will have a different set of challenges than an urban resident when accessing health care providers and services. Furthermore, an urban resident on the edges of a city will experience challenges different than the resident living in the city's central business district (e.g. downtown). These challenges can range from limited choice, options to access, and even quality of health care providers and services. Within Illinois, these challenges are most apparent in downstate Illinois, particularly in the more rural portions of the state. Reviewing mobility within the various areas of the state in terms of the context of urban and rural, results in several overall challenges (**see Table 4.1**).

TABLE 4.1: Mobility and Context of the State

AREA	CHALLENGES RELATED TO REDUCED MOBILITY OPTIONS
RURAL	
	✓ Reliable and cost-effective transit service is a challenge.
	✓ Wide range of stakeholders.
	✓ Programs that connect larger geographies are typically unsupported.
SMALL URBAN	
	✓ Political boundaries limit mobility, due to counties and municipalities operating specific services.
	✓ Dispersed land-use patterns create challenges to providing service in growing communities.
	✓ Regional connectivity.
LARGE URBAN	
	✓ Specialized and human services transportation services are limited.
	✓ Services lack coordination.
	✓ Ease of connections between modes or service providers.

In terms of the future, mobility of the Illinois transportation network is anticipated to be greatly impacted by the development and deployment of autonomous vehicles. Currently, many automobiles have features such as automatic braking, collision warning and lane departure warning, which all aid in safe driving on the roads. Future technological advances will extend these capabilities and foster an environment for others to create autonomous vehicles in which the vehicle can take over the task of a human driver. Autonomous vehicles will fundamentally impact passenger travel and improve safety, productivity and mobility of people. In general, time used driving could be utilized in a more constructive way, and travel times could decrease. Those who cannot drive, including our aging populations, may gain increased access and mobility, and autonomous taxi services may increase mobility for those who do not own a vehicle. Several of the contextual identifiers outlined in Table 4.1 for why mobility is problematic could potentially be addressed with the development of autonomous vehicles. The creation of multimodal mobility platforms offering mobility as a service is an essential way to connect urban mobility services now and in the future. While a fully automated vehicle is still under development, it will eventually be integrated onto roadways as technology advances. For example, **the National Highway Traffic Safety Administration (NHTSA) has already developed several guidance documents in an effort to help states with legislation, procedures and conditions for automated driving systems[1].** These policies will play a large role in determining the impact autonomous vehicles will have in increases to VMT or reducing congestion so they must be considered wisely.

4.2 MOBILITY AND IDOT

An overarching role for IDOT is to provide and maintain a transportation network that offers options and alternatives for its users. IDOT is committed to maintaining a safe environment and improving the quality of life for transportation users and the surrounding communities. IDOT enables this process through its integrated and engaging multi-modal planning and programming approach. Example projects that support this approach include CREATE[2], the 606[3], and Bikeshare. Through this approach, it is the Department's goal to provide needed and dynamic logistical links among highway, rail, public transportation, air, water, bicycle and pedestrian options. Each of these multimodal options are described further in the TSU, which is an appendix of this plan.

IDOT fundamentally supports mobility, and in turn, all other goals of this plan, by exploring opportunities to combine resources with other units of government, take advantage of technological enhancements and continue to research best practices. That said, IDOT recognizes the importance of the state-local partnership when considering mobility of the transportation network and strives to promote a dynamic planning relationship with all local agencies. Therefore, the IDOT District-level planning process is essential to improved mobility at the local level. To effectively plan for improved mobility across the state and beyond, IDOT District planning efforts are a coordinated effort with local Metropolitan Planning Organizations (MPOs) and local officials. IDOT consults with local officials on the allocation of funding, transportation planning, highway and transit program development, project development and other transportation issues[4].

IDOT recognizes the importance of the state-local partnership in delivering a safe and efficient transportation system. The department strives to promote a dynamic and effective working relationship with all local agencies. In Illinois, the coordination of transportation activities between the state and local officials include the entire transportation planning, programming, and implementation process. While the consultation process in urbanized areas is very structured, state coordination with local agencies in rural and small urban areas follows a process that is more flexible in order to meet the needs of local officials.

1 NHTSA website, https://www.nhtsa.gov/technology-innovation/automated-vehicles, accessed on September 21, 2017.

2 The CREATE program identifies approximately 70 improvement projects to provide over $31 billion in benefits in the Chicago metropolitan region.

3 The 606! is 2.7 miles of multi-use recreational trail and park alternative transportation corridor in the City of Chicago. https://www.the606.org/, accessed January 9, 2018.

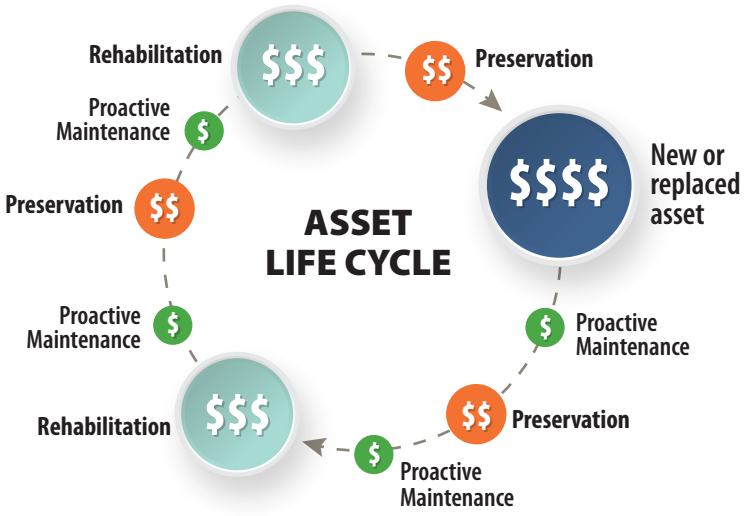
4 IDOT, Local Planning website, http://www.idot.illinois.gov/transportation-system/local-transportation-partners/local-planning/index, accessed September 21, 2017.

While the following sections detail what IDOT's role is related to mobility in terms of highways and bridges, transit, aviation, and railways; if we are to achieve the vision set out for mobility at the outset of this chapter, more must be done to integrate all modes of transportation. The future must include local priorities, comprehensive planning, sharing of information, and funding in order to be successful.

4.2.1 HIGHWAYS AND BRIDGES

IDOT continuously assesses and identifies the highway system's needs for improvement, repair and strategic expansion. This involves road and bridge performance-based assessments, identification of high crash locations, identification of segments with regular congestion issues, and pavement/structural condition reports. It is through this data gathering and analysis that IDOT is able to take a comprehensive approach to planning for state-maintained highways and bridges.

The majority of the planning for highways and bridges can be found in the annual multi-year program, called the Proposed Highway Improvement Program for fiscal years 2018 – 2023 (MYP). This program details how it will invest transportation dollars in the state and local highway system[5]. IDOT anticipates spending a total of $11.65 billion over the six-year 2018-2023 program horizon. However, the majority of the funds will go to improve the existing system. Due to limited dollars for expansion of the system, IDOT utilized a performance-based project selection process to evaluate and prioritize major expansion projects within the MYP in 2017. The process aligns with the goals in this LRTP.



Asset management planning is important, as it keeps infrastructure in better overall condition, prevents projects from being delayed until action is absolutely needed, and consistent asset investments overtime helps grow the economy and ensures the system remains competitive.

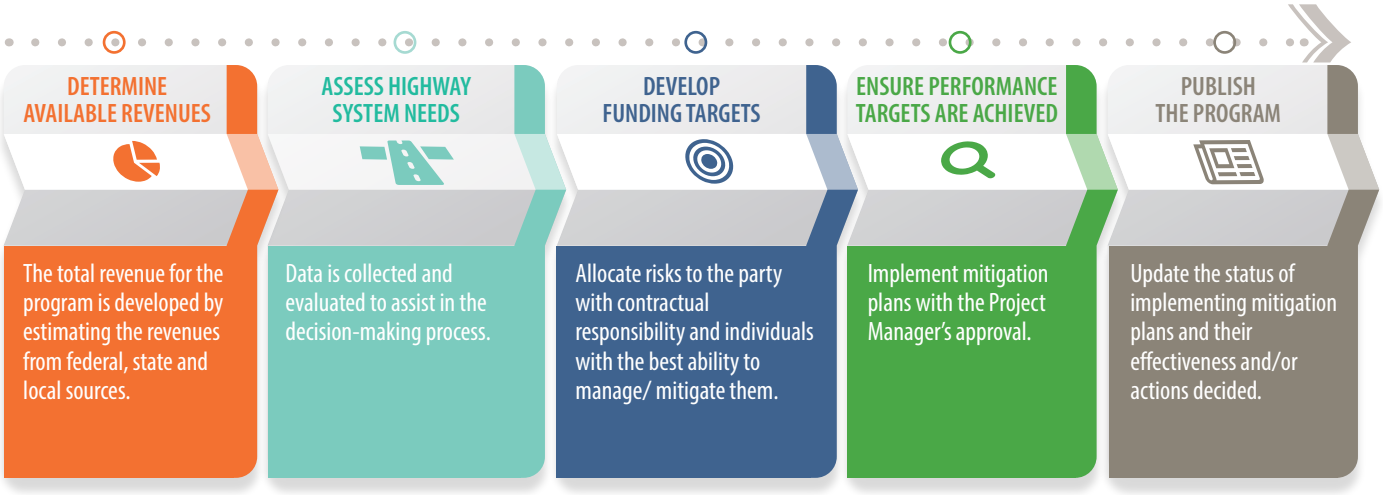
IDOT recently developed the Transportation Asset Management Plan (TAMP), another planning tool for highways and bridges. The TAMP is a data-driven and performance-based document, required by FHWA, outlining investment strategies for preserving existing assets over the duration of 10 years. The intent of the plan is to achieve a desired state of acceptable condition over the life cycle of the assets. A draft of the IDOT TAMP was released in April 2018, with implementation of the TAMP no later than June 30, 2019.

4.2.2 TRANSIT

IDOT's role in Illinois' transit system includes the oversight of state and federal funding for transit projects across the state. IDOT reviews proposed capital projects submitted by transit operators in downstate and northeastern Illinois[6]. It is anticipated that IDOT will spend $1.85 billion in funding for transit-centric projects and improvements between FY 2018-2023 as indicated in the multi-modal multi-year improvement program. The recently completed, Illinois Statewide Public Transportation Plan, which includes a discussion on correlating transit with other modes, and depict improvements for mobility in Illinois.

IDOT's role in the transit system is not always tangibly defined as with highways. For example, IDOT invests in the planning of transit by identifying overall transit strategies for issues seen across the systems and reviewing the public's relationship with transit. Specifically, IDOT looks at transit as a way to create productivity by enhancing workforce accessibility, or reviews how transit can reduce the amount of money spent to move people. Ultimately, IDOT's role with transit is more planning driven and economically-focused. Transit helps drive the economy, as it provides access to jobs, schools, appointments, and various other activities. Transit is also considered as an opportunity to mitigate congestion during major corridor planning initiatives.

5 FY 2018 – 2023 Proposed Highway Improvement Program, IDOT, May 2017.
6 Transforming Transportation for Tomorrow FY 2015-2020 Proposed Multimodal Transportation Plan, page 16-17, IDOT, April 11, 2014.



The CTA 2016 Annual Ridership Report stated that it experienced its highest one-day rail ridership total ever when it provided 1.15 million rail rides for the World Series Championship parade.[7]

In terms of transit and IDOT, of note, is a result from the recent (2016) annual Illinois Traveler Opinion Survey conducted by IDOT. The purpose of the survey is to provide a snapshot of public opinion in a given year on multiple issues related to transportation in Illinois. The survey aims to provide IDOT with actionable insights which aid in future planning. Most notable from the 2016 survey is how strongly those surveyed support public transit.[8] Further public support is depicted in actual ridership numbers across the state. In northeastern Illinois (e.g. Chicago region) in 2015, the Regional Transportation Authority (RTA) recorded 634.9 million trips, with the Chicago Transit Authority (CTA) having a ridership of 516.0 million trips, Metra had 81.6 million trips, and Pace made 33.1 million trips.[9] Downstate, urban bus systems provided nearly 40 million rides in 2013, while six million demand response rides were provided in the same year.[10]

4.2.3 AVIATION

Airports may not be the first thing most people associate with IDOT; however, IDOT plays an important role in the development of airports across the state. Airports are one of the most vital economic assets and transportation links in a state. Illinois has ten primary airports (i.e. airports that have schedule enplanements of at least 10,000 passengers within a single calendar year); Chicago O'Hare International is consistently rated as one of the busiest airports in the nation. In 2014, O'Hare was ranked third in passenger boardings and fourth in freight movement, moving more than 3.7 million tons[11], and Chicago Rockford International Airport is a key freight hub for the United Parcel Service (UPS).

Likewise, airports are critical freight connectors, and are a fundamental conduit to bringing freight shipments to the state. Goods are commonly shipped by truck to and from airports to sorting centers throughout the state. Therefore, as road and rail networks improve, airports are able to capitalize and develop as national freight nodes.

7 2016 Calendar Year, Annual Ridership Report, CTA, February 1, 2017.
8 2016 Illinois Traveler Opinion Survey, IDOT, December 2017, page 3.
9 2015 Regional Ridership Report, RTA.
10 http://www.idot.illinois.gov/transportation-system/Network-Overview/transit-system/index, IDOT, January 4, 2018.
11 Aviation in Illinois Fact Sheet, IDOT, April, 2016.

Since Illinois participates in the State Block Grant Program (SBGP), IDOT regulates and monitors all airport activity in the state of Illinois for airports classified as "other than primary." Activity includes the coordination and implementation of programs focused on improving the state's airport and aviation facilities and the prioritization of safety, system preservation, capacity and operational abilities, airport upgrades, and capacities. The data for the airport system is collected from IDOT's annual airport pavement condition survey, the Airport Inventory Report, and airport inspections results.

4.2.4 RAILWAYS

IDOT partners with the Federal Railroad Administration (FRA), privately owned railroads, Amtrak and local governments to provide rail passenger service, operate stations and improve freight mobility by investing in rail infrastructure. The FY 2015-2020 Proposed Multimodal Transportation Program (a component of the FY 2015-2020 MYP) includes a $3.090 billion component reserved for railroad improvements. IDOT is responsible for assisting in project development, overseeing the funding and planning of new or enhanced higher-speed and conventional-speed passenger rail routes, mitigating the negative impacts of rail abandonment and attracting new rail passengers.

The management of the movement of goods is an essential aspect of mobility and livability needs. Illinois has 46 freight railroad companies operating within the state and is the only state in which all seven Class 1 railroads operate. The Chicago region is the world's third busiest intermodal hub, covering 16,000 acres where six of the seven Class I railroads converge, and where nearly a quarter of the nation's rail shipments arrive or pass through.[12]

Further freight details are outlined in the TSU (Appendix B). To that end, IDOT is a key partner of the Chicago Region Environmental and Transportation Efficiency Program (CREATE) program, a public-private partnership between the U.S. Department of Transportation, IDOT, the City of Chicago Department of Transportation, Cook County, the Association of American Railroads, Amtrak, Metra, and the six Class I freight railroads in the Chicago area (BNSF Railway, Canadian Pacific Railway, Canadian National Railway, CSX Transportation, Norfolk Southern Corporation, and Union Pacific Railroad), the Belt Railway Company of Chicago, and the Indiana Harbor Belt Railroad. New overpasses and underpasses will reduce the time Chicago-area motorists spend waiting at railroad crossings, reduce accidents at existing grade crossings and improve emergency vehicle routes. Rail commuter travel times, schedule reliability and capacity will improve as well. Emissions from cars, trucks and locomotives will be greatly reduced, as will noise from idling or slow-moving trains. Green space will also be restored along Lake Michigan.[13]

The CREATE partners will invest billions to increase rail infrastructure efficiency and residents' quality of life by improving transportation flow through the Chicago region. It will reduce rail and motorist congestion, improve passenger rail service, enhance public safety, promote economic development, create jobs, improve air quality, and reduce noise from idling or slow-moving trains.

The CREATE program identifies approximately 70 improvement projects to provide over $31 billion in benefits. A majority of the projects are grouped along or near four rail corridors running through the Chicago region. Currently, 28 of the 70 overall projects are considered complete. Example completed projects at the core of keeping freight moving in the Chicago area include: adding a new track on a new bridge in Melrose Park, Illinois, affecting 27 freight trains; construction of a rail flyover in Chicago, Illinois, affecting 46 freight trains, 78 Metra trains, and 14 Amtrak trains; and, grade separation of tracks in Bridgeview, Illinois, affecting 80 freight trains. Furthermore, the CREATE program will help address the increase of freight rail trade in Chicago, which is anticipated to double from the year 2012 to 2045.[14]

12 https://www.fhwa.dot.gov/ipd/project_profiles/il_create.aspx, January 5, 2018.
13 http://www.createprogram.org/index.htm, accessed August 16, 2017.
14 U.S. DOT Freight Analysis Framework 4.0, https://ops.fhwa.dot.gov/freight/freight_analysis/faf/, January 5, 2018.

4.3 IMPORTANCE OF MOBILITY

Just as previous transportation decision makers invested in the interstate highway system to provide for the mobility needs of future generations, IDOT is investing in the State's transportation system to provide a legacy for future users. This LRTP is intended to guide the future legacy by assessing the effectiveness of the current system in providing needed mobility, identifying infrastructure investments, and realizing various new innovative initiatives. Together, with the other LRTP goals, mobility within the state will improve and the users experiences will be enhanced. The following details the importance of mobility as it relates to the other LRTP goals:

The ultimate goal of transportation is 'access'; one's ability to reach desired goods, services, and activities. Transportation decisions often involve tradeoffs between different forms of access, which assumes mobility is an end in itself, rather than a means to an end. Therefore, the context of mobility may be perceived differently when reviewed in parallel with the four other goals of the LRTP.

- **Livability** – Mobility is crucial to the livability of a state. Positive influences in mobility in the state will lead towards greater livability.
- **Economic Growth** – Building new transportation infrastructure generates construction and engineering jobs in the short-term; however, the long-term benefit of the infrastructure investment can be attributed to the greater mobility the investment provides.
- **Stewardship** – Mobility of goods and people is fundamental to a functional society. IDOT, in an effort to be a good steward for society, is anticipated to start trending transportation investments from moving vehicles to moving people and goods.
- **Resilience** – IDOT strives to develop and maintain a transportation system that responds to and recovers from adverse conditions with resilience. Improvements in mobility will, in turn, increase resilience in the transportation system.

4.4 OBJECTIVES AND STRATEGIES

IDOT has developed three objectives to guide its investment decisions to improve statewide mobility. Each objective contains recommended actions, performance measures, data sources and implementation strategies which IDOT will pursue. The LRTP content as a whole will be considered guidance for programming decisions; however, each objective below also denotes some of the more specific recommended actions/strategies that will be used to guide programming decisions. These have been denoted with P.

The three objectives are:

Enhance intermodal freight connectivity and mobility to improve continuity and accommodate the efficient movement of goods and services.

Invest in and support multimodal transportation infrastructure improvements and strategic performance-based expansion of services that support the effective movement of passengers.

Increase route efficiency and safety for all users by improving infrastructure condition and addressing capacity issues.

4.4.1 OBJECTIVES, STRATEGIES, PERFORMANCE MEASURES, AND IMPLEMENTATION

OBJECTIVE 1.

Enhance intermodal freight connectivity and mobility to improve continuity and accommodate the efficient movement of goods and services.

RECOMMENDED ACTIONS/STRATEGIES:

- **Explore scenarios where modal connections can be improved to facilitate shipments by rail, water and air.**

  IDOT will develop scenarios that offer the opportunity for state and regional agencies, municipalities, and communities to collectively plot a future strategy, allowing a system-wide approach that considers multimodal and intermodal connections. An example would be the corridor management approach, which focuses on specific corridors within the state.

- **Work collaboratively with freight stakeholders to identify and address issues related to transporting freight within Illinois.**

  Typically, freight stakeholders often have interests that cover a much broader area (i.e. their interests and travel patterns might involve several MPOs or states, and beyond). Furthermore, given the diversity of freight stakeholders, there is no single approach to their stakeholder engagement. IDOT will exhibit the following characteristics to increase the effectiveness of freight stakeholder outreach in determining issues related to transporting freight in Illinois: develop custom outreach approaches; recognize the importance of timing; engage the freight community early; include freight in non-freight projects and plans; and, use freight stakeholders to inform highway design.

- **Enhance intermodal connectivity by identifying and implementing improvements needed to truck routes, ports, airports and rail lines that provide access to Illinois intermodal facilities.**

  Intermodal shipping provides many benefits to both businesses and the public. It is the fastest growing sector of the freight industry and is projected to continue growing in the future. IDOT will work with the freight industry to determine the combination of modes and routes that make the most cost effective and efficient transportation path for their goods, and then identify projects to implement along those routes.

- **Establish procedures to use the National Performance Management Research Data Set (NPMRDS) to calculate performance.**

  FHWA's NPMRDS is used by states to monitor system performance. NPMRDS provides comprehensive and consistent data for passenger and commercial freight roadway performance across the NHS. Furthermore, NPMRDS is defined as the baseline dataset to meet the newly established federal congestion and freight performance reporting regulation. IDOT will provide resources to MPOs to use the NPMRDS.

- **Evaluate existing and proposed innovative intelligent transportation systems (ITS) technology to improve safety.**

  Intelligent Transportation Systems (ITS) technologies advance transportation safety and mobility, and enhance productivity by integrating advanced communications technologies into transportation infrastructure and into vehicles. ITS encompasses a broad range of wireless and traditional communications-based information and electronic technologies. IDOT will evaluate familiar ITS technologies which include electronic toll collection, in-vehicle navigation systems, rear-end collision avoidance systems, and dynamic message signs. The evaluation will determine which ITS technologies are further promoted and implemented by IDOT in other areas of infrastructure development (i.e. work zones).

- **Explore ITS technologies to foster the most efficient movement of freight.**

  Successful implementation of ITS technologies for the benefit of the freight industry depends on interagency cooperation and strong partnerships with industry stakeholders. IDOT will analyze the intermodal freight transportation system in Illinois and identify physical and information exchange bottlenecks.

- **Investigate potential use of commercial connected/autonomous vehicles (CAV) for the movement of freight.**

  In 2016, more than 70 percent of freight tonnage moved in America was via truck. The figure is expected to grow steadily in the coming years, per the latest American Truck Association estimates. Connected/Autonomous vehicles (CAVs) have great potential for improving existing, high-demand transportation services. Increasing automation in the movement of freight is anticipated to address driver shortage and improve safety. IDOT will accelerate the investment, development, and testing of CAV capabilities to further the efficient movement of freight within Illinois and beyond.

PERFORMANCE MEASURES:

- ✓ **Modal breakdown of annual shipping volumes**

  IDOT will utilize the Freight Analysis Framework (FAF) to determine the modal breakdown of freight volumes. The FAF, produced through a partnership between the Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA), integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. Starting with data from the 2012 Commodity Flow Survey and international trade data from the Census Bureau, FAF incorporates data from agriculture, extraction, utility, construction, service, and other sectors.

- ✓ **Number of intermodal facilities for freight movements**

  Intermodal facilities have become a more important component of freight movements as containerized freight is increasingly used to transport goods. Intermodal movements allow shippers to use a combination of modes and thereby utilize the efficiencies of each mode to reduce cost. Through the FAF, IDOT will determine the number of intermodal facilities utilized for freight movements.

- ✓ **Number of intermodal facilities with National Highway System (NHS) connections**

  Intermodal connectors serve heavy truck volumes moving between freight terminals and the NHS, primarily in major metropolitan areas. Connectors are short, averaging less than two miles in length and generally have a lower design than mainline NHS routes, which are primarily Interstates and arterials. IDOT will determine the number of NHS connections that currently meetexpectations of connecting intermodal facilities to the National Highway System.

- ✓ **Truck Travel Time Reliability (TTTR) index**

  Truck travel time reliability is a federally required performance measure, per MAP-21. TTTR is defined as the consistency of dependability in travel times, as measured from day-t0-day and/or across different times of the day. Data source options for this include the NPMRDS or an equivalent data set. IDOT will use NPMRDS and set targets by the federal deadline.

- ✓ **ITS Statewide Architecture and Strategic Plan Update**

  The purpose of the ITS Statewide Architecture and Strategic Plan is to assist stakeholders in using the architecture for project definition and program planning. Furthermore, stakeholders can better ensure they take advantage of system integration opportunities, develop a correct system design, and create systems that interoperate with other technical systems throughout the state. IDOT will provide an annual project status of the update of the plan.

- ✓ **Live, internet-based, intermodal dashboard of approved freight routes, current travel times and rerouting suggestions**

  An interactive dashboard on the IDOT website will help IDOT manage the complexities of freight movements and streamline the delivery of freight within Illinois.

- ✓ **Number of studies concerning commercial CAV and impacts on the freight transportation network**

  Autonomous vehicle technology is rapidly advancing, and as these vehicles are incorporated into the transportation network, adaption will be essential. For example, operations may become more productive, freight may move faster, and federal regulations could be dramatically altered to accommodate a new driving environment. IDOT will work with freight industry leaders to analyze the potential changes and challenges via various studies, and help prepare the industry for a new trucking environment.

IMPLEMENTATION:

- ✓ **Begin outreach efforts to freight companies and stakeholders in an effort to identify and address issues related to freight transportation in Illinois.**

  Lead: IDOT Office of Planning and Programming, IDOT Bureau of Communications Services

  Partner(s): IDOT Districts, Freight Companies, Freight Stakeholders

- ✓ **Support efforts to freight stakeholders to explore where modal connections can be improved to facilitate shipments by rail, water and air.**

  Lead: IDOT Office of Planning and Programming

  Partner(s): Local Government, Planning Agencies, Freight Companies, Freight Stakeholders

- ✓ **Provide resources to MPOs on using the NPMRDS data source to measure performance.**

  Lead: IDOT Office of Planning and Programming

  Partner(s): MPOs

- ✓ **Identify how ITS can improve freight movement within and through the state.**

  Lead: IDOT Office of Planning and Programming, IDOT Bureau of Operations

  Partner(s): Freight Stakeholders

- ✓ **Develop live, internet-based, intermodal dashboard of approved freight routes, current travel times and rerouting suggestions.**

  Lead: IDOT Bureau of Operations

  Partner(s): Freight Stakeholders, IDOT Office of Planning and Programming

OBJECTIVE 2.

Invest in and support multimodal transportation infrastructure improvements and strategic performance-based expansion of services that support the effective movement of passengers.

RECOMMENDED ACTIONS/STRATEGIES:

- **Identify and define regional multimodal demands and needs, and/or associated costs across the state.**

  To be efficient and fair, a transportation network must serve diverse demands. Physically, economically, and socially disadvantaged people in particular need diverse mobility options. IDOT will utilize comprehensive transportation models that consider multiple modes, generated traffic impacts, and the effects of various mobility management strategies (e.g. price changes, public transit service quality improvements) to determine regional travel demands and their associated costs.

- **Identify shifts in population and employment centers and ensure adequate services are provided to these areas.**

  It is necessary to understand demographic and socioeconomic trends to better estimate the future characteristics of a population, as well as forecast its demand for services and the extent to which those demands can be met. IDOT will work with local governments to understand future characteristics of a population and forecast demand for services. From these development forecasts, estimates of magnitude and distribution of future land uses are used to project future trips and travel in the region.

- **Develop tools for identification and development of Complete Streets projects.**

  The Complete Streets movement aims to develop an interconnected street network that is accessible and safe for users of all ages, abilities, and modes of transportation. Complete Streets support not only changes to community streets, but also a shift in the decision-making process and policies. IDOT will develop best practices to integrate into their own policy documents to foster effective development of Complete Streets projects.

- **Work with Human Services Transportation Planning (HSTP) coordinators and adjacent transit providers to determine the feasible times and locations for transit transfers between providers.**

  Human Service Transportation generally refers to transportation services catered to the "transportation disadvantaged" elderly, disabled, and low-income populations. The State of Illinois is divided into 11 HSTP regions, each of which develops their own human service transportation plan. IDOT will work with them to identify feasible times and locations for transit transfers between providers.

- **Identify the need for transit signal prioritization and other related technologies/strategies for improving multimodal corridors.**

  Several corridors throughout the state present significant transportation challenges. Signal priority is simply the idea of giving special treatment to transit vehicles at signalized intersections. Implementing signal prioritization on multimodal corridors will increase the person throughput of a corridor and address several corridor challenges. Other technologies/strategies for improving multimodal corridors include bus rapid transit, bus-only/managed lanes, bicyclist signals or express bus.

- **Increase the coordination between freight rail, intercity passenger rail, and commuter rail networks and other transportation modes.**

  Both freight rail and passenger rail have experienced increased demand in recent years throughout the state on many parts of the Illinois rail network. The differing operational needs for freight and passenger railroads can make operations coordination challenging, and it is important for IDOT when implementing increased freight and/or passenger rail operations to understand those issues.

- **Develop a statewide bike/pedestrian facilities inventory and prioritize projects to fill in gaps in the overall system.**

  The inventory will be summarized in an existing conditions report, and will be catalogued using GIS software for ease of future use. This inventory will assist IDOT to prioritize existing facilities and plan for building future facilities. The inventory should be updated periodically to reflect changes made at the county level.

- **Ensure use of performance-based project selection processes on all new IDOT projects.**

  Illinois residents deserve to understand how priorities are set for investments in maintaining, modernizing, and expanding the state's roads, bridges, bicycle and pedestrian facilities and transit. The use of a performance-based project selection process is a transparent process IDOT will use in the selection of projects. The data-driven collaborative process leads to clear transportation priorities.

- **Foster a collaborative environment for CAV work and innovations, specifically focusing on the movement of freight.**

  In an effort to set standards for connected, autonomous vehicles, IDOT should form a coalition between state agencies and academic institutions. The overall goal of the coalition will be to support research, testing, policy, funding pursuits and deployment, as well as share data and provide unique opportunities for the movement of freight by connected, autonomous vehicles.

- **Percent of funding programmed on projects that provide access to multimodal choices**

  IDOT will review the STIP and MYP to determine projects with an accessibility component to another transportation mode. The costs of the selected projects will be totaled and compared against the total programmed on all projects in that fiscal year. The resulting amount will be analyzed to determine whether IDOT is focusing enough of its funding on projects with multimodal accessibility.

- **Establishment of facilities inventory**

  IDOT will develop a scope of work outlining what is specifically to be included in the facilities inventory and how the data is to be collected. The inventory will include all facilities managed by IDOT within the State of Illinois.

- **Number of multimodal facilities for passenger movement and use**

  IDOT will determine the number of multimodal facilities within the State of Illinois using the proposed inventory of IDOT facilities database. IDOT will further analyze these facilities to determine their fundamental use, including but not limited to, number of transfers at the facility, number of rides performed at the facility, and origin/destination routes possible for a user of the facility.

- **Percent of funding programmed on projects with bicycle/pedestrian/alternative transportation elements**

  IDOT will review the STIP and MYP to determine projects with a bicycle/pedestrian/alternative transportation element. The costs of the selected projects will be totaled and compared against the total programmed on all projects in that fiscal year. The resulting amount will be analyzed to determine whether IDOT is focusing enough of its funding on bicycle/pedestrian/alternative transportation projects.

- **Creation or expansion of the Transit Riders Information Project (TRIP), or similar system**

  Providing information on transit routes and schedules will improve transit riders' experience and make riding transit a more appealing choice. One tool for providing that information is a website or cell phone application that provides route and schedule information for riders. IDOT will create or expand a technology system for relaying that information.

- **Number of transit signal priority measures implemented**

  IDOT will determine, using data collected in the proposed facilities inventory, the number of corridors operating with signal priority measures (i.e. advanced traffic controls and bus automatic vehicle location systems).

- **Percentage of completion of passenger rail system**

  IDOT will annually track passenger rail projects completed within the state by cross-referencing the STIP. The most recent passenger rail project, still under construction in segments throughout the state, is the high-speed rail initiative.

- **Number of complete street projects completed**

  IDOT will review the For the Record publication to identify how many complete street projects are completed.

IMPLEMENTATION:

- ✓ **Continue to develop technology enhancements to relay information to the traveling public.**

  Lead: IDOT Office of Intermodal Project Implementation, IDOT Office of Communications

  Partner(s): Transit Providers

- ✓ **Begin analyzing NPMRDS data for Illinois and generate initial data sets for performance measures.**

  Lead: IDOT Office of Planning and Programming

  Partner(s): Metropolitan Planning Organizations

- ✓ **Maintain and adjust policies that will ensure the continued efficacy and improvement of multimodal facilities/connection points and HTSP providers.**

  Lead: IDOT Office of Intermodal Project Implementation

  Partner(s): IDOT Office of Planning and Programming

- ✓ **Monitor all STIP projects featuring pedestrian and bicycling facilities. Log all newly constructed facilities.**

  Lead: IDOT Office of Planning and Programming

  Partner(s): IDOT Office of Intermodal Project Implementation

OBJECTIVE 3.

Increase route efficiency and safety for all users by improving infrastructure condition and addressing capacity issues.

RECOMMENDED ACTIONS/STRATEGIES:

- **Identify and rank worst bottlenecks and chokepoints to establish an action plan to remediate selected areas.**

  Precise bottleneck identification is one of the best ways traffic engineers can demonstrate the need for, and the benefits of, investing in transportation improvements. IDOT should identify potential bottlenecks, rank bottlenecks to obtain candidate locations, and conduct detailed analysis of the candidates to obtain accurate performance characteristics and to identify specific problems causing the bottlenecks.

- **Focus on roadway system preservation by performing needed maintenance before segments/structures are in critical need of repair.**

  The demands on IDOT's highway network and available transportation funding are greater than ever. These demands, combined with growing, public expectations for safety, quality, and performance, require highway agencies to maintain the highest level of service practical. To meet these demands, IDOT is developing a Transportation Asset Management Plan to maximize asset life while maintaining assets regularly. Therefore, IDOT is working to make the system work better, run more smoothly, and last longer.

- **Focus on bridge repair and replacement by addressing the most critical needs and performing required maintenance.**

  IDOT is faced with significant challenges in addressing highway bridge preservation and replacement needs. A successful bridge program seeks a balanced approach to preservation and replacement. The objective of a good bridge preservation program is to employ cost effective strategies and actions to maximize the useful life of bridges. The process for accomplishing this is through the Transportation Asset Management Plan where the goals are to maximize asset life by providing maintenance solutions at appropriate intervals in asset life.

- **Incorporate safety design elements in all new roadway plans and ensure design policies support freight-friendly design elements in roadway plans.**

  Safety is the principal design consideration on all IDOT projects. All roadway plans have maximum safety as their overall objective. IDOT should develop a framework for integrating safety into roadway design using proven effective safety counter measures and managing speed, taking into consideration safety effects of design variations, thinking beyond nominal design values, consider supplementing safety effects of variations in different design elements. Given Illinois' level of freight moving through the system – freight friendly design elements should be considered as well.

- **Promote safety through awareness programs and alerts regarding areas experiencing high crash rates.**

  IDOT develops average crash rates for different types of intersection and roadway segment cross-sections for statewide analyses. IDOT should update the Safer Roads Index (SRI) Ratings to include potential safety promotion programs.

- **Promote rail and highway safety by identifying and improving hazardous highway at-grade crossings.**

  To avoid at-grade collisions, warning/control devices are required at grade crossings. IDOT should work with the FRA and the FRA GradeDec[15] evaluation tool to improve hazardous at-grade crossings. GradeDec provides a full set of standard benefit cost metrics for a rail corridor, a region, or an individual grade crossing. Model output allows a comparative analysis of grade crossing alternatives designed to mitigate highway-rail grade crossing accident risk and other components of user costs.

- **Promote non-motorized safety by identifying and improving high accident locations for non-motorized users.**
- **IDOT should work to identify high accident locations for non-motorized users and develop and implement effective counter measures to increase safety of non-motorized users.**
- **Explore various congestion management strategies for implementation within Illinois metropolitan areas.**

  Congestion continues to rise in Illinois. Existing road infrastructure is not able to keep pace with this increase in congestion – actually, it is impractical to build enough roads and infrastructure to effectively accommodate the demand. Therefore, congestion management strategies are essential to managing predicted future demand. IDOT should consider transportation demand management for the State's metropolitan areas, reviewing the following strategies and the application of each: conventional toll roads, high occupancy vehicle lanes, variable priced lanes, bicycle and pedestrian infrastructure, transit, and others determined through stakeholder involvement.

PERFORMANCE MEASURES:

The Moving Ahead for Progress in the 21st Century (MAP-21) Act and the Fixing America's Surface Transportation (FAST) Act placed an increased emphasis on performance measurement, requiring the establishment of national performance measures. These national measures will help IDOT evaluate the effectiveness of transportation investments, and better communicate the performance of Illinois' transportation system to the public. The following required MAP-21 performance measures will be integrated throughout IDOT's planning and programming process, regarding Objective 3 of the overall mobility goal. These measures are comprehensive in nature and require no further explanation:

- ✓ Number and rate of fatalities (per 100 Million VMT and mode)
- ✓ Number and rate of serious injuries (per 100 Million VMT and mode)
- ✓ Number of non-motorized fatalities and non-motorized serious injuries
- ✓ Percentage of NHS bridges classified as being in good condition
- ✓ Percentage of NHS bridges classified as being in poor condition
- ✓ Percentage of Interstate pavement in good condition
- ✓ Percentage of Interstate pavement in poor condition
- ✓ Percentage of non-Interstate NHS pavement in good condition
- ✓ Percentage of non-Interstate NHS pavement in poor condition
- ✓ Percentage of person-miles traveled on the Interstate considered reliable
- ✓ Percentage of person-miles traveled on the non-Interstate NHS considered reliable
- ✓ Truck travel time reliability index
- ✓ Annual hours of peak hours excessive delay, per capita
- ✓ Percent of non-SOV travel

15 https://www.fra.dot.gov/Page/P0337, accessed February 15, 2018.

In addition to the required reporting for MAP-21, as identified above, IDOT has identified the following performance measures to help track route efficiency and related capacity issues. Again, the majority of these are comprehensive in nature and need no further explanation.

- ✓ Mileage of highly congested routes
- ✓ Number of rail-crossing fatalities, serious injuries and crashes reported
- ✓ Number of congestion management strategies

Congestion management strategies are required in metropolitan areas with population exceeding 200,000. Example strategies include managed lanes, bus-on-shoulder, car pools, and employer flex hours. IDOT will determine the number of strategies utilized within required metropolitan areas in Illinois.

IMPLEMENTATION:

- ✓ **Increase participation in and continue support of the Strategic Highway Safety Plan, working towards "Driving Zero Fatalities to a Reality."**

  Lead: IDOT Bureau of Safety Programs and Engineering

  Partner(s): MPOs, Counties, Municipalities

- ✓ **Develop and share crucial safety information and support educational programs aimed at reducing dangerous behaviors committed by transportation users and operators.**

  Lead: IDOT Bureau of Safety Programs and Engineering

  Partner(s): IDOT Office of Communications

- ✓ **Develop and share bottleneck analysis and action plan to remediate selected areas.**

  Lead: IDOT Office of Planning and Programming

  Partner(s): IDOT Districts, Metropolitan Planning Organizations, Local Governments

- ✓ **Prepare and implement the Transportation Asset Management Plan**

  Lead: IDOT Office of Planning and Programming

  Partner(s): IDOT Districts

- ✓ **Work to coordinate transportation demand programs occurring throughout the state.**

  Lead: IDOT Office of Planning and Programming

  Partner(s): IDOT Districts, Metropolitan Planning Organizations, Local Governments

4.4.2 IMPLEMENTATION SUMMARY

Mobility is always evolving and as such, implementation strategies will continue to evolve; however, the State's long-term vision will remain to provide support for the implementation of mobility projects. Taken as a whole, the following implementation strategies represent the State's current understanding on what actions could be taken to ensure the LRTP's objectives are achieved. The implementation strategies are organized into four defined categories, pertinent to the aspect it implements.

TABLE 4.2: Implementation Actions

IMPLEMENTATION ACTION	LEAD EQUITY	PARTNER(S)
Collaboration/Outreach & Engagement		
Begin outreach efforts to freight companies and stakeholders in an effort to identify and address issues related to freight transportation in Illinois.	IDOT Office of Planning and Programming, IDOT Bureau of Communications Services	IDOT Districts, Freight Companies, Freight Stakeholders
Support efforts to freight stakeholders to explore where modal connections can be improved to facilitate shipments by rail, water and air.	IDOT Office of Planning and Programming	Local Government, Planning Agencies, Freight Companies, Freight Stakeholders
Develop live, internet-based, intermodal dashboard of approved freight routes, current travel times and rerouting suggestions.	IDOT Bureau of Operations	Freight Stakeholders, IDOT Office of Planning and Programming
Continue to develop technology enhancements to relay information to the traveling public.	IDOT Office of Intermodal Project Implementation, IDOT Office of Communications	Transit Providers
Increase participation in and continue support of the Strategic Highway Safety Plan, working towards "Driving Zero Fatalities to a Reality."	IDOT Bureau of Safety Programs and Engineering	MPOs, Counties, Municipalities
Work to coordinate transportation demand programs occurring throughout the state.	IDOT Office of Planning and Programming	IDOT Districts, MPOs, Local Governments
Plans/Guidance		
Begin analyzing NPMRDS data for Illinois and generate initial data sets for performance measures.	IDOT Office of Planning and Programming	Metropolitan Planning Organizations
Maintain and adjust policies that will ensure the continued efficacy and improvement of multimodal facilities/connection points and HTSP providers.	IDOT Office of Intermodal Project Implementation	IDOT Office of Planning and Programming
Develop and share bottleneck analysis and action plan to remediate selected areas.	IDOT Office of Planning and Programming	IDOT Districts, MPOs, Local Governments
Provide resources to MPOs on using the NPMRDS data source to measure performance.	IDOT Office of Planning and Programming	Metropolitan Planning Organizations
Prepare and implement the Transportation Asset Management Plan	IDOT Office of Planning and Programming	IDOT Districts
Multimodal		
Identify how ITS can improve freight movement within and through the state.	IDOT Office of Planning and Programming, IDOT Bureau of Operations	Freight Stakeholders
Develop and share crucial safety information and support educational programs aimed at reducing dangerous behaviors committed by transportation users and operators.	IDOT Bureau of Safety Programs and Engineering	IDOT Office of Communications
Funding		
Monitor all STIP projects featuring pedestrian and bicycling facilities. Log all newly constructed facilities.	IDOT Office of Planning and Programming	IDOT Office of Intermodal Project Implementation