IV.6 Economic Impact Analysis

Transportation infrastructure facilitates the movement of goods and people to and from other regions. Adequate transportation infrastructure is critical for the continued sustenance and growth of a regional economy. Constraints in air and ground transportation capacity have the potential to slow economic development. Infrastructure improvements that enhance a region's accessibility and/or decrease travel costs can serve as catalysts for economic expansion.

O'Hare International Airport is currently the nation's second busiest airport. In 2005, O'Hare transported nearly 77 million passengers and 1.7 million tons of cargo serving as a vital transportation link between the Chicago region and the rest of the world[3]. However, its existing intersecting runway layout and operational characteristics contribute to high levels of congestion and delay, which are expected to become more severe over time. It is unlikely that O'Hare will be able to meet future national and regional aviation needs without significant expansion and improvement. In response to these future challenges, the O'Hare Modernization Program (OMP) has been proposed. The OMP includes reconfiguring O'Hare's runways into a modern parallel layout, the addition of a new western terminal facility, and provision of a western access, amongst other improvements (additional details regarding the program elements and implementation time frame can be found in the Transportation Infrastructure section of the report). Implementation of the OMP is expected to substantially reduce delays and increase flight capacity to meet future aviation needs. The Federal Aviation Administration (FAA) approved the OMP in September 2005.

Currently, O'Hare is accessed by interstate and arterial roadways and transit from the east. The proposed addition of a western roadway access and a new western terminal with more than 50 flight gates will have significant traffic impacts on the existing roadway network around the airport. To mitigate these traffic impacts, several new roadway and transit expansions have also been planned. Most of these roadway improvements, described in the section on Transportation Infrastructure, are to the west of O'Hare Airport in DuPage County.

This section quantifies the economic impact of implementing the OMP and the related roadway improvements on DuPage County[4]. A more detailed report outlining the assumptions of the analysis in detail is included in the Appendix. The economic impacts are measured in terms of the number of new jobs and people and the additional value of economic activity and net fiscal benefits attributable to the OMP and ground transportation improvements. The economic impact analysis results are presented up to the year 2030 to match the time frame of the overall study.

[3] Source: City of Chicago Airport Aviation Statistics, (http://www.flychicago.com)

[4] Transit alternatives discussed in earlier sections are not included in the analysis because these alternatives are still in the early visioning stage, and specific concepts have not yet been analyzed by associated transit agencies to generate the "transit ridership" data required for the economic analysis. However, if the CTA Blue Line, Metra, or DuPage "J" Bus Rapid Transit Line route extensions through DuPage County (as discussed in the prior section on transportation infrastructure) are implemented, the likely economic benefits would be greater than those shown in this section.

Analytical Framework

To measure the economic impact of the OMP and related ground transportation improvements, the following two future scenarios have been considered –

1) **Project Scenario:** In this scenario, the OMP and related ground transportation improvements are implemented. Air transportation demand[5] in DuPage County and the rest of the Chicago metropolitan region is "unconstrained." The impacts of increased traffic are offset by the OMP-related ground transportation improvements including Western Access, Western Bypass, and improvements on Irving Park Road (Illinois Route 19), in addition to other roadway projects that would be implemented in the County regardless of OMP implementation.
2) **No-Project Scenario:** In this scenario, a more modest set of capital improvements is implemented at O'Hare which does not include any runway reconfigurations or new terminal additions as proposed in the OMP. Air transportation demand in DuPage County and the Chicago metropolitan region is "constrained" and OMP-related ground transportation improvements are not implemented. Ground transportation improvements in the County are limited to roadway projects that would be implemented regardless of OMP implementation.

The economic impact analysis measures the difference between these two alternative future scenarios. This difference represents the economic contribution attributable to the OMP and related ground transportation improvements. Since the economic analysis is specifically calibrated for DuPage County (as described later in this section), the economic impact results apply to DuPage County only.

Overview of Methodology

This study involves measuring impacts of air transportation infrastructure and roadway infrastructure. These modes are interrelated because increased flight capacity and enplanements at O'Hare will result in increased automobile traffic from the increase in people traveling to and from the airport. However, since the input variables and analytical procedures associated with each transportation mode vary, they are discussed separately.

Airport Component

The OMP aims at increasing flight capacity and reducing delay times at O'Hare through major capital improvements that include acquisition of land, additions of new reconfigured runways, new airport terminals, and gates. Relative to the No-Project scenario, in which flight operations at O'Hare are projected to be capped at 974,000 (approximately reflecting current levels of

[5] This study uses forecasts for air transportation demand at O'Hare developed by the Federal Aviation Administration (FAA). It is not within the purview of the study to forecast an alternative view of enplanements and/or operations at O'Hare Airport or test the economic impacts of any alternate aviation demand forecasts that differs from the FAA forecasts.

operations at O'Hare), the Project scenario involving OMP implementation is projected to accommodate a 42% increase in flight operations to nearly 1.4 million by 2030[6]. The impacts from airport expansion and flight capacity increase can be divided into two major categories:

- **Airport expansion and visitor spending impacts:** These include an expansion in the scale of operations at O'Hare and associated airport employment, an increase in the number of air travelers and associated visitor spending in the local economy, and the negative impacts of land acquisition necessary for the physical expansion of the airport property[7].
- **Contribution of O'Hare as an economic facilitator:** Economic contributions of an airport extend beyond visitor spending and operations that are considered in most traditional airport impact studies. Major airports like O'Hare are gateways to the rest of the nation and the world, and allow businesses to gain access to markets outside the local region. In an increasingly global economy, enhanced access (in terms of an increase in the number of flights) to national and global markets, along with the reduction in delay time, will enhance the competitiveness and productivity of local businesses and facilitate economic growth.

Roadway Component

Relative to the No-Project scenario, where ground transportation improvements specifically attributable to O'Hare are not implemented, the Project scenario assumes the addition of nearly 50 expressway lane miles through the conversion of Thorndale Avenue into a limited-access highway (Elgin-O'Hare Expressway/Western Access) and the development of Western Bypass as a new limited-access expressway. The Project scenario also assumes that the realignment of IL 19 (Irving Park Road), necessitated by runway relocations, and the IL 19-York Road intersection improvement are completed. All other planned roadway improvements in DuPage County are assumed to occur in both Project and No-Project scenarios as part of the DuPage County Capital Improvements Plan. The impacts from roadway improvements can be divided into two categories:

- **Roadway construction and maintenance impacts:** This includes the construction of the new roadway improvements and the annual operations of the new roadways.
- **Contribution of roadway improvements as an economic facilitator:** The roadway improvements in the Project scenario will increase operating speed and reduce average travel times in the County relative to the No-Project scenario. The improved travel efficiency will lead to wider economic benefits for businesses in the form of reduced transportation costs, their ability to access new markets, and their increased size of labor catchment areas.

[6] Source: Final Environmental Impact Statement (FEIS).
[7] Airport construction impacts have not been considered in the economic analysis because it is not certain if any of the OMP construction contracts will be awarded to DuPage County-based construction companies.

Economic Modeling Software

An integrated package of REMI TranSight Airports and REMI TranSight was used for economic modeling. REMI TranSight Airports specifically deals with airport related economic impacts while REMI TranSight is designed for estimating economic impacts of roadway and transit improvements. Like other traditional economic impact software, REMI software incorporates an input-output model that allows estimation of the "multiplier affects" associated with the direct impacts of the expansion of airport operations, increased visitor spending, land acquisition, and roadway improvements by tracing the inter-industry linkages within the economy.

Direct economic activity associated with operations and maintenance of new/expanded transportation infrastructure or expenditures by new visitors to DuPage County will "ripple" through the economy indirectly, resulting in businesses purchasing products and services from each other, and in some cases resulting in increased production and employment within these related industries. This in turn will result in new induced spending within the County--the impacts of increased spending that result from the creation of jobs and income in the affected economic sectors. For example, some of the revenue from sales to visitors (arriving by air through O'Hare) at a retail store in the County would be used (by the retailer) to purchase retail commodities from a wholesaler, which in turn would be utilized to meet the wholesaler's payroll, leading to the purchase of more goods and services by the employees.

The models used for this analysis go beyond standard input-output models and incorporate time-series econometric relationships to account for substitution between factors of production, changes in business costs of production, population response to expected earnings and amenities, price and wage adjustments in response to supply and demand, and feedbacks of business competitiveness to market shares. By accounting for these complex relationships, this modeling provides a more realistic representation of the economy and a more accurate estimation of economic impacts over time than other economic impact models.

These models have the capacity to seamlessly integrate economic analysis with aviation and transportation model simulation results. Economic modeling for transportation projects involves translating the results of travel-demand simulation models (such as origin-destination enplanements and changes in operating travel speed) into economic values such as business cost savings, changes in market shares, and changes in the labor access index. These economic variables are run through REMI's forecasting and simulation model to produce multi-year economic and demographic impacts of the transportation upgrades. This relatively recent advancement in modeling technology is based on trade flow relationships between the 3,192 counties in the United States, and the use of distance decay parameters in a gravity-modeling framework to connect the effects of accessibility with regional competitiveness.

For more details on the information used to populate the model, see the Technical Report Compendium, Section VI (DuPage County Economic Development and Planning Department).

Sources of Airport Impacts

The number of enplanements, or the number of boarding passengers, is a key metric in aviation demand modeling. For this study, future projections of enplanements at O'Hare provide a key variable in estimating the magnitude of the various direct impacts of the proposed airport expansion. Therefore, enplanement projections for O'Hare are discussed prior to the specific sources of airport impacts.

According to the FEIS, O'Hare has the capacity to accommodate increases in air cargo service even without the implementation of the OMP. Therefore, the total cargo tonnage handled at O'Hare is expected to be the same in both the Project and No-Project Scenarios. Because the analysis focuses on the difference between the Project and No-Project scenarios, air cargo impacts are not considered in this study.

Enplanement Projections

Table 3 shows enplanement data for the Project and No-Project Scenarios, and the difference between them. More detailed enplanement projections for all years between 2005 and 2030 are shown in the Appendix.

Table 3: Projected Enplanements at O'Hare (in millions)

Year	No-Project	Project	Difference: Project vs. No-Project
2005	33.9	33.9	0
2015	42.5	45.8	3.3
2030	55.2	63.4	8.2

Source: Federal Aviation Administration (FAA), DuPage County Economic Development and Planning Department (DuPage County), Chicago O'Hare International Airport Final Environmental Impact Statement, 2005 (FEIS), and *S. B. Friedman & Company.*

As shown in **Table 3**, the total annual unconstrained enplanements at O'Hare are projected to be approximately 63 million by the year 2030, representing an 88% increase over current enplanement levels. The No-Project scenario enplanements are expected to increase by nearly 64% to approximately 55 million in 2030, even though, as previously indicated, flight operations in this scenario would be capped at about the current levels[8]. The difference in enplanements between the Project and No-Project scenarios is marginal until the satellite concourse of the new western terminal is constructed. By 2030, the difference in total annual enplanements between the Project and No-Project scenario is expected to be more than 8 million.

[8] Even though the flight operations at O'Hare are expected to be capped at current levels in the No-Project scenario to avoid delays significantly higher than 15 minutes per operations, there is an expected rise in the total number of enplanements, as airlines can respond to the restriction on operations by using larger aircrafts and scheduling off-peak flights. The Aviation Demand Forecast section in the FEIS, projects that by using these techniques, the total enplanements will increase even if the OMP is not implemented.

The total enplanement data includes connecting flights as well as passengers that originate from the greater Chicago region. Because the purpose of the analysis is to estimate the economic impact on DuPage County the key data variable necessary for the analysis is the number of enplaned passengers that originate from DuPage County.

The number of originating domestic and international passengers from the Chicago region was estimated based on FEIS data regarding the percentage of originating and connecting enplanements and the percentage of domestic and international enplanements. The projected difference in O'Hare enplanements that originate from DuPage County between the Project and No-Project scenarios was then estimated by assuming that 13.6% of all originating enplanements at O'Hare were from DuPage County. This is based on a DuPage County traffic model study completed by Wilbur Smith Associates, which estimated that 13.6% of all air passenger automobile trips to O'Hare originate from homes, offices/employment centers, and hotels in DuPage County. **Table 4** shows the projected difference in O'Hare enplanements that originate from DuPage County between the Project and No-Project scenarios.

Table 4: Projected Enplanements at O'Hare Originating from DuPage County

Difference: Project vs. No-Project		
Year	**Originating Domestic**	**Originating International**
2015	36,000	153,000
2030	157,000	372,000

Source: FAA, DuPage County, FEIS, and *S. B. Friedman & Company.*

Airport Expansion and Spending Impacts

The key input variables associated with airport modernization used for determining the DuPage County share of the direct impacts are shown in **Table 5** and discussed below. Additional details regarding the data sources, assumptions, and calculation methodology can be found in the Technical Report Compendium, Section VI (DuPage County Economic Development and Planning Department).

Table 5: Airport Expansion and Spending

	Difference: Project vs. No Project	
Key Sources of Impacts	**2015**	**2030**
Airport Employment In Western Terminal (Excludes concession stand employment)	10,500	12,700
Annual Visitor Spending (Millions; 2006 $s)	$81	$238
Concession Sales (Millions; 2006 $s)	$52	$72
Land Acquisition Impact	Employment Loss: 500 Population Loss : 1,130	

Source: FAA, DuPage County, FEIS, National Economic Research Associates, Inc. and *S. B. Friedman & Company.*

Airport Operations and Maintenance: Security badge data obtained from O'Hare indicates that in year 2002 approximately 35,000 employees were engaged in air-passenger related activity while the remaining 6,000 employees were related to cargo activity. Future increases in flights and enplanements will require expansions in the scale of operations at O'Hare and, therefore, a direct

increase in the number of employees serving the airport. Future air-passenger related employment at the new Western terminal within DuPage County in the Project Scenario was estimated based on future enplanements data, the ratio of employees per million enplanements (derived from 2002 data), labor productivity changes and the percentage of projected airline gates at the new terminal relative to the total number of gates in all terminals at O'Hare after OMP implementation.

Visitor spending: With more passengers embarking and disembarking at the airport, there will be more expenditure in DuPage County by visitors who arrive by air through O'Hare. The difference in visitor expenditures in DuPage County in the Project and No-Project Scenario was estimated based on survey data on average per capita visitor spending by domestic and international visitors in DuPage County and the difference in the number of domestic and international visitors to DuPage County between the Project and No Project scenarios.

Airport concession sales: Increased concession sales at the airport are yet another component of the spending prompted by increased flights and enplanements. A 1990 survey of concession customers at O'Hare provided information on concession sales and the profile of an average customer. Future concession sales in the new Western Terminal at DuPage County were estimated by assuming that the concession expenditures are likely to grow at the same rate as total enplaning passengers at the Terminal after adjusting for inflation. Because the Western Terminal would be physically located within DuPage County borders, the projected concession sales at this terminal will generate sales taxes for DuPage County.

Land Acquisition Impacts: Airport expansion for OMP will require the acquisition of developed property, resulting in a negative economic impact. Based on data shown in the FEIS, it appears that approximately 85 businesses and 533 residential units will be acquired within DuPage County. While the acquisition process will provide first preference for relocations within the affected communities and the County, it is still likely that there will be some businesses and households that choose to locate outside the County. To recognize the fact the business and resident loss would have a negative economic impact, the analysis assumes that 50% of the affected residential households and businesses will not relocate within the County.

Contribution of O'Hare as an Economic Facilitator

As previously mentioned, the real economic value of the OMP is the facilitation of increased economic activity by providing increased access to national and world markets and increasing business productivity by reducing delay times at the airport. The key input variables associated with access-related and time saving impacts and methodology for determining the DuPage County shares of the impacts are shown in **Table 6** and discussed below.

Table 6: Contribution of O'Hare as an Economic Facilitator

Key Sources of Impacts	Difference: Project vs. No Project	
	2015	2030
Annual O-D Business Enplanements (Access-related Impacts)	92,000	252,000
Annual Delay Time Savings for Business Passengers (hrs)	306,000	363,000

Source: FAA, DuPage County, FEIS, and *S. B. Friedman & Company.*

Access-related Impacts: An airport fosters economic development by allowing local businesses to gain access to markets at the national and global levels. The number of enplaned passengers that represent business travelers who work in DuPage County or are visiting the County for business is a key variable in estimating access related economic impacts. The originating business enplanements at O'Hare attributable to DuPage County businesses are estimated by multiplying the difference between originating enplanements from DuPage County in the Project and No-Project scenarios by the corresponding percentage of passengers traveling for business.

Delay-time Savings: As previously mentioned, the current runway configuration and operational capacity at O'Hare contributes to significant congestion and delays. Current average delay times are approximately 15 minutes per flight operation. One of the major benefits of the OMP is the reduction of delay time even with increases in flight operations and associated enplanements. After OMP implementation, the average annual delay time at O'Hare per operation is projected to be 17.1 minutes in the No-Project scenario compared to 5.8 minutes in the Project scenario, resulting in time savings of 11.3 minutes per flight operation. The annual delay time savings to DuPage County businesses travelers are estimated based on the annual enplanements attributable to DuPage County business and the average annual time savings per operation. These time savings reflect improved productivity for DuPage County businesses, and are entered into the economic model as cost savings for local businesses.

Sources of Roadway Impacts

As previously mentioned, the roadway improvements being considered for the economic analysis are the Elgin O'Hare Expressway providing a western access to the airport, the Western Bypass serving as a north south link, the realignment of IL 19 due to runway relocation, and the grade-separation of the IL 19-York Road intersection. All the key variables used for the economic analysis associated with the roadway impacts were derived from data provided by the DuPage County Department of Economic Development and Planning. Construction and maintenance costs of the OMP related roadway improvements are discussed first, followed by a discussion on how roadway improvements facilitate economic development.

Roadway construction and maintenance impacts

Construction impacts: The construction of new roadway improvements will generate short term construction impacts that will last the duration of the construction project. The magnitude of this impact is a function of the construction costs associated with the improvements. The combined construction costs of the three roadway projects are conservatively estimated to be approximately $1.85 billion including engineering costs, based on prevailing costs per mile for Illinois Department of Transportation (IDOT) and Illinois State Toll Highway Authority (ISTHA) expressways. Soft costs are not included in this estimate.

Maintenance impacts: Once completed, the new roadways will require annual maintenance. According to County staff, the average annual maintenance costs of roadway improvements per lane mile is $12,500. Therefore, the projected increase in maintenance costs of roadway improvements in the Project scenario is estimated to be $625,000.

Contribution of roadway improvements as an economic facilitator

The new roadway improvements in the Project scenario will serve to reduce travel times and increase travel efficiencies relative to the No-Project scenario, which in turn will facilitate economic growth by reducing transportation costs, creating enhanced access to markets, labor and supply pools. Analysis of these economic benefits of transportation improvements requires quantification of the variation in travel times and travel efficiency on County roadway networks with and without OMP related improvements (airport and roadway). To provide these key inputs for the economic impact analysis, DuPage County Planning and Development staff completed traffic model simulations for current and forecast roadway networks. Details regarding the traffic model simulation assumptions and methodology can be found in the "Technical Report II: Traffic Modeling Methods and Results" included in the Technical Report Compendium, Section V (DuPage County Economic Development and Planning Department).

The results of these traffic simulations for the Project and No-Project scenarios on the system-wide DuPage County network indicate that the overall system-wide operating speed is expected to be higher in the Project scenario relative to the No-Project scenario due to the development of fast flowing limited-access expressways in the County and the IL 19 roadway improvements. The system-wide operating speed is projected to increase by nearly 1% by 2015 and by approximately 2% by 2030 indicating that the OMP related roadway will serve to mitigate the negative traffic impacts from the expansion of O'Hare and improve traffic conditions due to normal growth. The resulting traffic model parameters are then converted to economic variables related to business cost, labor access parameters, and market share relationships, and modeled to generate the economic impact results.

Economic Impact Results

The OMP and associated roadway improvements will create a significant net positive impact on the DuPage County economy through the variety of sources described earlier in this section. These sources, which include increased operations and maintenance activity and increased visitor spending, will increase jobs and economic activity in the County. Other sources like improved access will further increase job and economic growth by reducing business costs and increasing their market shares. Job growth potential and overall transportation access benefits in turn make the region more attractive to people resulting in increased population in-migration into the County. New business creation, expansion of existing business and residential growth in the County, will in turn result in fiscal impacts for local taxing jurisdictions.

The economic benefits of implementing the OMP and the related roadway improvements to DuPage County are realized in the form of new jobs, additional population growth, increases in gross regional product, and net fiscal benefits to the various governmental jurisdictions. The summary results of the economic impacts for years 2015 and 2030 are shown in **Table 7**.

Table 7: Summary Impact Results

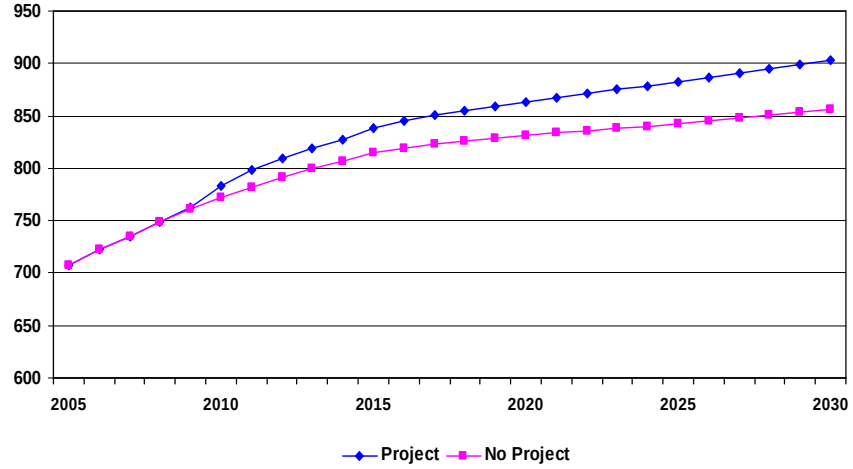
Difference: Project vs. No Project		
	2015	**2030**
Population	7,000	46,000
Employment	21,000	44,000
Gross Regional Product (Millions; 2006 $s)	$3,623	$10,084
Fiscal Impact (Millions; 2006 $s)		
Local Govt. Revenues	$34	$206
Local Govt. Expenses	$27	$185
Net Fiscal Impact	$7	$21

Source: *S. B. Friedman & Company* based on REMI model results.

The economic impact results for a given year represent the incremental economic benefit to DuPage County of the Project scenario over the No-Project scenario. As shown in **Table 7**, if the Project scenario is implemented, 7,000 people and 21,000 jobs are projected to be added to DuPage County by year 2015. In 2015, the job impact exceeds the population impact significantly because of the jobs created within the newly opened Western terminal. By 2030, with the projected addition of 46,000 people, population impacts are projected to slightly exceed the employment impact of 44,000 jobs. The annual gross regional product (the total value added) of the DuPage economy in 2006 dollars is estimated to increase by $3.6 billion in 2015 and more than $10 billion in 2030. The new development that is likely to be associated with the increased employment and population is estimated to result in a positive net fiscal impact on all the taxing jurisdictions in the County (such as the municipalities, school districts, and the County itself). The net annual fiscal impact, or the difference between the increased revenues and expenses on local taxing jurisdictions, is estimated to be $7 million in year 2015 and $21 million in year 2030.

The model was also used to forecast total County employment for the Project and No-Project scenarios. The projected economic change in terms of employment for each alternate future scenario is shown in **Figure 4.7**.

Figure 4.7: DuPage County Employment Forecasts: 2005-2030



Source: *S. B. Friedman & Company* based on REMI model results.

As shown in **Figure 4.7**, the Project and No-Project scenarios begin diverging noticeably from 2010 onwards, when the satellite concourse of the western terminal is projected to become operational and the various OMP related roadway improvements are under construction. DuPage County is estimated to have a total of 707,000 employees in 2005. In the No-Project scenario with constrained aviation forecasts, the County's employment is projected to be 856,000 by 2030. With no constraints on regional aviation and transportation demand, DuPage County employment is projected to near 900,000 by 2030.

Economic impact in terms of employment was further broken down by the various sources of impacts to illustrate which impact sources are expected to result in the maximum benefits to the County. **Table 8** shows the distribution of the employment impact in the years 2015 and 2030 by source of impact.

Table 8: Employment Impacts by Source of Impacts

Sources of Impacts	2015	2030
Airport and Roadway Contribution to Economic Growth	10,000	28,000
Airport and Roadway Operations and Maintenance (excluding concession employment)	11,000	15,000
Visitor Spending & Airport Concession Sales	1,000	2,000
Acquisition of Businesses and Housing	-1,000	-1,000
Total	**21,000**	**44,000**

Source: *S. B. Friedman & Company* based on REMI model results.

As shown in **Table 8**, by the year 2030, increased operational and spending impacts, which tend to be the focus of traditional economic impact studies, make up less than 40% of the total employment impacts. As shown in the results, the role of transportation infrastructure such as airports and expressways as economic facilitators is more significant. By 2030, improved access and business cost savings from an expanded and modernized O'Hare airport and new roadway infrastructure is projected to result in 28,000 new jobs, or nearly 65% of the total impact. While the net loss of 1,000 jobs due to the negative land acquisition impacts is substantial, the projected long-term economic benefits of the OMP and related roadway improvements are much more significant.