

5 Freight Performance Measures

As part of the OKI freight planning effort, a first iteration of freight performance measures was developed to evaluate potential freight system investments. This chapter provides a freight performance management framework for OKI and suggested metrics that could be applied to evaluate projects and initiatives identified as part of the recommendations in Chapter 7.

5.1 Goals from OKI Long-Range Plan

To develop freight system performance measures, the OKI 2030 Regional Transportation Plan was leveraged as a starting point to identify relevant goals. While the four-year update of the plan is just being initiated, the goals articulated in the plan are not likely to change drastically. Starting with these pre-existing goals will enable OKI to conform the metrics to the 2030 plan, thereby maintaining consistency with the overall regional transportation plans. The 2030 plan goals, which lay the foundation for freight system performance measures, are as follows:

1. Improve travel safety
2. Improve accessibility and mobility options for people and goods
3. Protect and enhance the environment
4. Enhance the integration and connectivity of the transportation system
5. Promote efficient system management and operation
6. Emphasize the preservation of the existing transportation system
7. Support economic vitality
8. Consider regional security
9. Strengthen the connection between infrastructure and land use

For the purposes of the OKI Regional Freight Plan, the following five freight performance goals were selected:

1. Mobility and Intermodal Connectivity
2. Economic Vitality
3. Environment and Public Health
4. Safety and Security
5. System Preservation and Condition

Cross-referencing the original nine goals from the 2030 plan and assigning them to one of the five freight performance goals enables a more manageable performance management process without losing sight of OKI's original mission in implementing a metropolitan transportation plan. Table 5-1 shows the relationship between the 2030 plan goals and the freight plan goals.

Table 5-1: OKI 2030 Plan Goals Cross-Referenced with OKI Freight Goals

OKI 2030 Long-Range Plan Goals	Proposed OKI Freight Goals
1. Safety	Safety and Security
2. Accessibility and Mobility Options	Mobility and Intermodal Connectivity
3. Environment	Environment and Public Health
4. Intermodal Connectivity	Mobility and Intermodal Connectivity
5. Efficient Management and Operation	Mobility and Intermodal Connectivity
6. System Preservation	System Preservation and Condition
7. Economic Vitality	Economic Vitality
8. Regional Security	Safety and Security
9. Land Use	Environment and Public Health

Source: OKI 2030 Regional Transportation Plan goals

The following changes were made to tailor the goals specifically to OKI's Regional Freight Plan:

- Safety and security goals were combined because of the interplay between the two areas and the overlap of measures.
- Mobility was changed to include intermodal connectivity as both focus on system performance and strive for the efficient movement of goods.
- Environment was combined with public health because of impacts to all things natural and/or organic. This also reflects the goal as previously developed by OKI.
- System preservation was renamed "System Preservation and Condition" to reflect the goal as previously developed by OKI.
- The interests and connections of land use and transportation were included within the freight goal addressing environment and public health.

These proposed OKI freight goals are also consistent with other recent freight planning efforts, in their focus on freight mobility, economic impact, environment, safety and security, and infrastructure conditions. Ideally, stakeholder outreach and public participation should drive the goal articulation process and tailor the criteria setting process specific to OKI's regional needs. By providing a forum to debate the merits of these goals, OKI is being mindful of the diversity and breadth of freight stakeholders, thereby achieving greater transparency and credibility while securing cooperation in building a new platform of performance metrics. For the purposes of this project, OKI's freight performance management system will begin with these five metrics. For each category a goal will be defined, followed by the objective or criteria that will be applied and the key performance indicator (actual metric) that will be used to measure the criteria.

5.2 Performance Measures

Once goals are established, criteria can be developed to measure the goals and evaluate freight investment decisions. Whereas the goals describe *what* is being measured, the criteria describe *how* the project will be measured. Typically, the criteria developed for freight performance measurement are quantifiable. Despite the ability to quantify many of the benefits, some are not as easily measurable. The process of selecting projects wades through a myriad of complex issues, many of which are nebulous, contentious, and subjective. Examples of qualitative criteria include

geographical and political considerations, socioeconomic and community impacts, relationship to any pending legislation or regulatory hurdles and project implementation obstacles. Because there is no clear-cut answer or method to measuring these issues, qualitative criteria often require discussions, negotiations, consensus building, and compromise. Furthermore, because of the different natures of projects across the various transportation modes, comparing these projects' benefits is challenging. Realistically speaking, performance metrics will be rooted in a combination of straightforward, quantitative metrics and complex, qualitative and subjective debates.

Table 5-2 presents a framework that *suggests* the kind of goals and criteria that may be applied to freight projects. The tables are broken out by modes and are meant to serve as guidance and introduction to the criteria that may be applied to freight projects. For the purposes of this first iteration of performance metrics, a high level *qualitative screening* of freight projects was conducted. The high level screening entailed a quick analysis of whether the project is likely to address a specific goal and whether any immediate concerns or issues emerged to be considered in the more in-depth analytical iterations informed by real data. The extent to which the project meets the criteria will have to be properly measured and analyzed in these subsequent iterations of performance metrics.

5.3 Evaluation Methodology

As part of the first iteration of performance measures, each proposed recommendation was evaluated against the goals and criteria developed in this first iteration. Through a high-level screening process that assesses whether the project is likely to meet the criteria upon an initial review, a preliminary overview of whether the project is likely to meet any of the criteria and any concerns or issues with respect to the criteria were identified at the outset of the initial screening.

This process was sequestered and repeated by mode. For example, only highway projects were evaluated against other highway projects, rail projects were evaluated against other rail projects, and so forth. In reality, these projects will eventually need to be considered in tandem, which adds another layer of complexity. But for the purposes of a first iteration of performance measures, cross-comparing projects was not conducted.

Table 5-2: Freight Performance Measure Framework Broken Out by Mode

Trucking Performance Metric Framework					
	Mobility & Intermodal Connectivity	Economic Vitality	Environment & Public Health	Safety & Security	System Preservation & Condition
Goal	Improve freight mobility of trucks in the region by reduction of traffic congestion.	Promote economic development by lowering the operating cost of trucking and increased reliance on just-in-time delivery.	Promote environmental protection through improved air quality and reduced energy consumption. Reduce harmful impacts of truck emissions to human health.	Enhance safety of highways.	Invest continuously in highway maintenance.
Criteria # 1	Improved Travel Time	Public Sector Benefits	Air Quality impacts to environment and human health	Crash Fatality and Disabling Injuries	Pavement Conditions
Key Performance Indicator	1) Actual travel time savings	1) Number of permanent jobs created	1) Volume of GHG Emissions and volatile organic compounds (VOCs)	1) Number of annual crash fatalities and disabling injuries	Pavement condition index.
	2) Transfer time between modes	2) Financial impact to tax revenue	2) Reduction in truck emissions impacts on human health	2) Consecutive number of days without incidents	
	3) Percentage on time performance	3) Financial impact to regional GDP			
	4) Time lost to congestion				
Criteria # 2	Improve Intermodal Connections	Private Sector benefits	Energy Savings	Reduction of HAZMAT incidents	Repair of potholes and sinkholes.
Key Performance Indicator	1) Percentage of modal balance	1) Reduction of Financial cost per mile	1) Fuel Cost Savings	Number of accidents and highway crashes involving HAZMAT materials	Number of potholes repaired by state DOTs.
	2) Number of intermodal facilities	2) Increase in TEU or tonnage of freight moved	2) NOx reduction		
	3) Transfer time between modes	3) Reduction in number of "empty miles"			

Table 5-2: Freight Performance Measure Framework Broken Out by Mode (continued)

Rail Performance Metric Framework					
	Mobility & Intermodal Connectivity	Economic Vitality	Environment & Public Health	Safety & Security	System Preservation & Condition
Goal	Promote freight movement via rail.	Promote economic growth via the rail industry in the OKI region	Increase environmental benefits of rail freight	Reduce rail safety incidents involving accidents.	Enhance rail system performance through improved rail infrastructure
Criteria # 1	Diversion of truck to rail	Public Sector Benefits	Diversion of truck to rail	Reduction of railroad crashes	Increase rail freight capacity
Key Performance Indicator	Rail movement as a proportion of total regional freight movement (in tons)	1) Number of permanent jobs created 2) Financial impact to tax revenue 3) Financial impact to regional GDP 4) Number of rail carriers available to provide service	1) Rail movement as a proportion of total regional freight movement (in tons) 2) Fuel cost savings	Number of railroad crash incidents	Number of capital projects that invest in new or improved alignments, connections and rail yards
Criteria # 2	Improve dwell time in rail yards and address rail bottlenecks at grade crossings	Private Sector benefits	Air Quality impacts to environment and human health as a result of modal diversion to rail		Rail infrastructure conditions
Key Performance Indicator	Dwell time in rail yards Number of grade crossing delays	1) Reduction of Financial cost per mile 2) Increase in TEU or tonnage of freight moved 3) Reduction in Number of "empty miles"	1) Volume of GHG Emissions and volatile organic compounds (VOCs) 2) Reduction in truck emissions impacts on human health		1) Rail track conditions

Table 5-2: Freight Performance Measure Framework Broken Out by Mode (continued)

Inland Waterway Performance Metric Framework					
	Mobility & Intermodal Connectivity	Economic Vitality	Environment & Public Health	Safety & Security	System Preservation & Condition
Goal	Improve the movement of freight along the Ohio River.	Focus on growing the inland waterway system to transport greater volume of freight cargo along the Ohio River.	Utilize inland water movements to divert freight from trucks.	Minimize impacts from river floods and other natural disasters	Improve infrastructure along the Ohio River by replacing or expanding dams and locks.
Criteria # 1	Maintain existing throughput.	Stimulate growth of manufacturers and shippers along the riverfront.	Diversion of freight from trucks to inland water transportation.	Flood disasters.	Improvement of dams and locks.
Key Performance Indicator	Number cargo tons moved by inland water way	1) Number of industries attracted to the riverfront. 2) Incentive packages to lure shippers/ manufacturers	Inland water movement as a proportion of total regional freight movement (in tons).	Mitigation strategies to contain flooding along the Ohio River	Number of projects and investment levels focused on replacing new locks and dams.
Criteria # 2	Intermodal connectivity	Public Sector Benefits	Air Quality impacts to environment and human health as a result of modal diversion to inland water		Continuous inspections and monitoring of infrastructure conditions.
Key Performance Indicator	1) Number of connections 2) time/distance to highways and rail	1) Number of permanent jobs created 2) Financial impact to tax revenue 3) Financial impact to regional GDP 4) Number of rail carriers available to provide service	1) Volume of GHG Emissions and volatile organic compounds (VOCs) 2) Reduction in truck emissions impacts on human health		Number of periodic inspections.

Table 5-2: Freight Performance Measure Framework Broken Out by Mode (continued)

Aviation Performance Metric Framework					
	Mobility & Intermodal Connectivity	Economic Vitality	Environment & Public Health	Safety & Security	System Preservation & Condition
Goal	Maintain or improve air cargo movements and landside connectivity.	Preserve OKI as a competitive market for air freight.	Monitor the environmental and health impacts related to air cargo movements	Enhance safety and security measures at air cargo terminals.	Ensure adequate capacity to continue air cargo operations.
Criteria # 1	Track intermodal connections.	Public Sector Benefits	Air Quality impacts to environment and human health as a result of modal diversion to inland water	Monitor incidents and potential threats.	Monitor airfield conditions.
Key Performance Indicator	Number of projects focused on enhancing or building intermodal and landside connections to the airport.	1) Number of permanent jobs created 2) Financial impact to tax revenue	1) Volume of GHG Emissions and volatile organic compounds (VOCs) 2) Reduction in truck and plane emissions impacts on human health	1) Number of aircraft threats and incidents 2) Number of security breaches at cargo terminals	Pavement condition index for runways.
Criteria # 2	Air cargo processing cost and time	Private Sector benefits	Noise Impacts		
Key Performance Indicator	Financial cost/ton of cargo moved	1) Reduction of Financial cost per mile 2) Increase in TEU or tonnage of freight moved	Percentage decibel reduction from air cargo and truck movements		

5.4 Future Considerations

Implementing a freight performance management system is a monumental effort. The system requires not only the upfront data, tools, technical skills and “hard resources” for building and launching this complex system, but also requires a steady commitment of “soft resources” including human capital, political will, buy-in, and cooperation from a spectrum of people who will manage, provide, scrub, and analyze the data.

Performance management may also require collecting new data that has never been collected before, making that cooperation even more important. Without cooperation, it becomes nearly impossible to insist on a discipline of consistent performance monitoring. The agency must achieve organizational buy-in from all those who will be held responsible for not only reporting on these metrics, but effecting change based on policy and investment decisions. This is particularly challenging in an environment that has not had a culture of performance monitoring and accountability. Furthermore, if the data are to come from a variety of sources outside of the jurisdiction of the main organization (in this case OKI) then securing cooperation with independent agencies will further challenge the sponsor organization. This may require constant negotiation, compromise and trust building, which are vital to the program’s core mission. Recruiting, training, and developing the right professionals to execute a performance management program will need to be a vision and plan articulated at the top of the organization.

In addition to human capital, tools are equally important factors of performance management. Building a performance management system may require investment in information technology that will collect, track and warehouse the data. It may even require building new platforms that interface with different data programs in order to capture the information in one system. However, despite the technology challenges, it is the people management that requires greater priority, eventually sustaining this performance management effort.

Finally, achieving buy-in, both internally and externally, will ensure collaboration from those who will participate in the performance management program. By illustrating the benefits of a performance management system—and how this system will create more transparency in the policy and investment decision process—the sponsor organization can build credibility with these independent organizations and obtain the information needed. For this to be successful, these other organizations and agencies must see the results of this effort, particularly how they contributed toward the decisions that were made. They will realize that their contribution means they have a stake in a process that will help them make a compelling case for their own capital and operational needs.