OKI 2050 Metropolitan Transportation Plan Update

Project Prioritization Process

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Ohio · Kentucky · Indiana
Regional Council of Governments

Overview

This project prioritization (scoring) process is intended to assist in the selection of worthy roadway, public transportation, bicycle/pedestrian, freight, and Transportation System Management & Operations (TSMO) projects for the *OKI 2050 Metropolitan Transportation Plan*. OKI's project prioritization process has been in effect for many years and has been cited as a "best practice" by the Federal Highway Administration. This status has been achieved by periodically evaluating the process and revising as appropriate. The project prioritization process was reviewed, updated and approved by the OKI Executive Committee by resolution OKI 2015-26 on September 10, 2015. This update reflects increased focus on a performance-based planning approach as prescribed in The Moving Ahead for Progress in the 21st Century Act (MAP-21) and continued in the FAST Act and Bipartisan Infrastructure Law (BIL). In preparation for this 2050 Plan Update, staff reviewed the process with the Board at its September 2023 meeting.

The prioritization process provides a systematic approach to ranking the numerous projects which will need to be evaluated in the development of a financially constrained metropolitan transportation plan. The process makes best use of available data and points of emphasis in the federal transportation bill. Maintenance projects are not included since they are of high importance and are assumed to be part of the plan.

A numeric ranking for each project will be determined for a relative comparison with other projects. This scoring process is meant to provide information for decision-making and development of a recommended list of projects in the plan. Public input and OKI leadership will determine the final recommended list of projects.

Several criteria are evaluated in the scoring process. A description of the scoring factors for the Plan is provided in the narrative that follows. A table containing the factors, measures and point values follows each section's narrative. The process consists of a process to accommodate each mode (roadway, public transportation, bike/pedestrian and freight) as well as factors common to all modes.

Planning Factors for All Projects (55 points)

There are seven factors that follow provide a potential of 55 points to each transportation project recommendation.

The **Environmental Justice** factor awards points to projects that will have an overall net benefit to minority and low-income population groups per Executive Order 12898 issued by President Clinton in February 1994. The basis for Environmental Justice is Title VI of the Civil Rights Act of 1964. OKI also examines a project's impact on zero-car households, elderly persons and persons with disabilities. The overall net benefit in the scoring indicates a subjective consideration of both POSITIVE and NEGATIVE impacts. It is understood that when federal funds are involved there are federal guidelines that must be met to ensure that services and benefits are fairly distributed to all people, regardless of race, national origin or income, and that they have access to meaningful participation (Please refer to Title 42 of the United States Code). Potential elements that could be impacted by transportation projects include, but are not limited to travel times, division of neighborhoods and changes in noise and/or air pollution levels. Projects are awarded point values as follows:

- Positive impact 5 points
- No impact 3 points
- Negative impact 0 points

The link between transportation and the benefits of commerce is well established. The **Economic Vitality** factor awards points for projects that serve to support existing, expanding or new non-retail employment centers. Projects are awarded point values based on the existing employment within ½ mile of the project as follows:

- 5000+ 10 points
- 2500 - 4999 8 points
- 1000 - 2488 6 points
- 750 – 999 4 points
- 500 – 749 2 points
- 0 – 499 0 points

The **Air Quality/Energy** factor relates to continued efforts to improve the regional air quality and encourage investment in more environmentally friendly forms of fuel use. A reduction in vehicle miles of travel (VMT), vehicle hours of travel (VHT), and the use of cleaner vehicles will be considered in the allocation of up to 10 points based on anticipated reduction of vehicle emissions. A maximum score of 10 points could be awarded for projects involving a location with high average daily traffic (ADT), a high percentage of trucks, high current congestion, and a potential for a large improvement in congestion due to project implementation. Examples of potential improvements include construction of a new roadway link reducing circuitous travel (VMT reduced), additional intersection turn lanes (VHT reduced), addition of a new bus on an existing route reducing headway (VMT and VHT reduced), or the replacement of older diesel buses with new hybrid electric buses (cleaner vehicles). Projects are awarded point values as follows:

- Significant Impact 7 to 10 points
- Moderate Impact 4 to 6 points
- Low Impact 0 to 3 points

The **Environmental Impact** score was derived by overlaying proposed projects on the OKI Environmental Viewer, an OKI GIS tool that shows regionally significant resources. The projects were awarded more points if it did not intersect with GIS layers in the viewer. The breakdown of points awarded were as follows:

- Lowest Environmental Impact (Does not intersect environmental data) 5 points
- Lower Environmental Impact (intersects 1 layer) 4 points
- Moderate Environmental Impact (intersects 2 layers) 3 points
- Moderately High Environmental Impact (intersects 3 layers) 2 points
- High Environmental Impact (intersects 4 layers) 1 point
- Most Environmental Impact (intersects 5 layers) 0 points

The **Complete Streets/Multimodal/Intermodal** factor awards points based on the project's ability to include and/or enhance multimodal elements in the final project. Each element of a complete street is assessed. Each element added or included in the final project is awarded 2 points. For example a roadway which is enhanced by adding sidewalks and bike lanes would receive 6 points (2 for road, 2 for pedestrian and 2 for bike). If the route carries fixed route transit, an additional 2 points is awarded. Projects may earn additional points for street calming or new intermodal connections. An example of intermodal investment is a transit operator proposed a project for a park-and-ride lot/transfer center that included a linkage to an existing bike path and provided bike racks. Two points are awarded for each mode added or improved in the final design:

- Roadway 2 points
- Pedestrian 2 points
- Bike 2 points
- Transit 2 points
- Traffic calming or new intermodal connection 2 points

The **Corridor Study/Comprehensive Plan/Local Priority** factor awards up to 10 points for projects identified as high priority through a formal publicly-vetted corridor study or comprehensive planning process. This is meant to recognize the significant overall detailed planning invested in key transportation corridors. Important yet lower priority projects included in such a study or plan may be awarded five points. It is important that OKI have a sense of the local situation and preference for solutions to transportation problems. Local communities are asked to review and prioritize all projects within their area or jurisdiction. Projects with little or no status relative to a corridor study or a comprehensive plan will be scored zero points in this category. Projects are awarded point values as follows:

- High Priority 10 points
- Medium or Low Priority 6 points
- No Status 0 points

Transportation Factors for Roadway Projects (45 points)

There are eight criteria that provide a potential of 45 points to each roadway-specific transportation project recommendation.

The score for **safety** is based on the cost of excessive expected crashes in dollars per mile for roadway segments or per intersection. Safety performance functions are derived using data from the OKI region and are based on roadway geometry, traffic volumes and area type (urban vs rural) for roadway segments. For intersections, functions are based on stop control, traffic volume and area type (urban vs rural). Crash costs are estimated using FHWA and Center for Disease Control (CDC) national values. High cost indicates the project area is experiencing a high magnitude and/or number of severe crashes. Only segments or intersections that have excess expected costs would score 1 to 5 points all others are zero Projects are awarded point values as follows:

Urban Roadway Segments

Excess Expected Cost

- >$1,500,000 5 points
- $650,001 - $1,500,000 4 points
- $275,001 - $650,000 3 points
- $120,001 - $275,000 2 points
- $1 – $120,000 1 point
- $0 0 points

Safety Rural Roadway Segments

Excess Expected Cost

- >$200,000 5 points
- $80,001 - $200,000 4 points
- $40,001 - $80,000 3 points
- $15,001 - $40,000 2 points
- $1 – $15,000 1 point
- $0 0 points

Safety Urban Intersection

Excess Expected Cost

- >$60,000 5 points
- $25,001 - $60,000 4 points
- $13,001 - $25,000 3 points
- $5,001 - $13,000 2 points
- $1 – $5,000 1 point
- $0 0 points

Safety Rural Intersection

Excess Expected Cost	
• >$20,000	5 points
• $11,001 - $20,000	4 points
• $5,001 - $11,000	3 points
• $2,001 - $5,000	2 points
• $1 – $2,000	1 point
• $0	0 points

The scoring process also takes into consideration the **Impact on Safety** which assesses the extent to which the project will have a positive impact on improving the level of safety for roadway travelers. The impact on safety criterion ranges from zero to five points. New facilities will be scored based on existing routes that the project is designed to alleviate, if any. Appendix A provides detail on impact by roadway type. Projects are awarded point values as follows:

- High Impact 5 points
- Medium Impact 3 points
- Low Impact 0 points

The **Average Daily Traffic (ADT) or Facility Type** criterion combines two features which are a barometer of a roadway's significance in the regional system. This combination allows for the consideration of both current volume and functional hierarchy. This combination permits the roadways with high volumes to be assigned a high score even if the facility is not high on the functional class system. ADT and functional class are both readily available data. ADT measures the current traffic volumes in the project area. The facility type is directly related to the formal designation of the federal functional classification of the roadway. A roadway must be classified as a collector or "higher" to be eligible for federal funding. High volume roadways on the interstate system will score highly (up to 10 points) and low volume local roads will be scored zero. Projects are awarded the highest point value of either data source as follows:

- 40k+ or Freeway/Expressway 10 points
- 30k+ or Principal Arterial 8 points
- 20k+ or Minor Arterial 6 points
- 10k+ or Collector 4 points
- Less than 10k or Local Road 0 points

Travel Time. Level of Travel Time Reliability (LOTTR) is used to measure the extent of unexpected delay. This data is provided to OKI through the National Performance Measure Research Data Set (NPMRDS). The measure compares the longer travel time (80^{th} percentile) with the "normal" travel time (50^{th} percentile) over three weekday time periods (6-10 AM, 10 AM – 4 PM, 4-8 PM) and one weekend time period (6 AM – 8 PM). OKI has observed data available for locations on the National Highway System. Travel time index will be used where LOTTR is unavailable.

For example, a roadway segment with a free-flow speed of 60 mph where the observed peak period travel speed is 40 mph would have a LOTTR value of 1.5. When a roadway segment has

an LOTTR value of 1.5 or greater, that segment is considered unreliable. When peak period travel speed is greater than free-flow speed, LOTTR is recorded as 0.00, and considered reliable. Refer to https://gis.oki.org/paa/. For links without a LOTTR staff may revert to travel time index (TTI) as a secondary source.

- Level of Travel Time Reliability
- Unreliable >= 1.5 5 points
- Moderately reliable >= 1.25 to < 1.5 3 points
- Reliable 1.0 to < 1.25 0 points

2050 Level of Service (LOS) is a measure used to grade the traffic flow properties of roadway segments and intersections. The Highway Capacity Manual and American Association of State Highway and Transportation Office's (AASHTO) Geometric Design of Highways and Streets ("Green Book") provides descriptions for levels of service. The OKI Travel Demand Model provides estimates of future traffic volumes and roadway capacity from which LOS is derived.

- F = Forced or breakdown flow 5 points
- E = Unstable flow 5 points
- D = Approaching unstable flow 4 points
- C = Stable flow 3 points
- B = Reasonably free flow 2 points
- A = Free flow 1 point

Impact on 2050 Level of Service is the extent to which the proposed project alleviates the future level of congestion (impact on 2050 LOS) has a range of zero to five points. If the proposal does not improve the congestion at all, zero points are awarded. Any new facility will be scored based on existing routes it is designed to alleviate, if any. Projects are awarded point values as follows:

- High impact on reducing future congestion 5 points
- Medium impact on reducing future congestion 3 points
- Low or no impact on reducing future congestion 0 points

The **Freight** factor provides points for corridors with a high value commodity flow using the federal Freight Analysis Framework (FAF) network. Truck percentage will be used for routes not on the FAF network. Refer to the scoring summary tables for roadways for point values. Up to five points are available.

Value ($M /day)

- > 35,000 5 points
- 9,501 - 35,000 4 points
- 3,001 – 9500 3 points
- 501 - 3000 2 points
- 1 – 500 1 points
- 0 0 points

Truck Percentage

- 12% trucks or greater 5 points
- 8% to <12% trucks 4 points
- 5% to <8% trucks 3 points
- 3% to <5% trucks 2 points
- 1% to <3% trucks 1 point
- Less than 1% trucks 0 points

Some projects have greater **Feasibility** than others due to engineering, economic or social constraints. Others may lack political or public will, right-of-way availability or other elements. The feasibility criterion is an indication of the likelihood of a project to advance to construction or implementation based on these factors. Those projects which appear to be highly feasible will be scored five points. Those projects perceived as unfeasible will score zero points. Projects are awarded point values as follows:

- Highly feasible 5 points
- Moderately feasible 3 to 4 points
- Marginally feasible 1 to 2 points
- Not feasible 0 points

Transportation Factors for Transit Projects (45 points)

There are four criteria that follow provide a potential of 45 points to each public transportation or transit-specific transportation project recommendation.

The **Type** factor awards points based on the type of project requesting funding. The term "type" may include but not necessarily be limited to vehicle replacement, service support, fixed facilities such as park and ride, stations or bus barns and vehicle expansion. The range reflects the importance of maintaining and supporting the existing service, an expressed goal of the OKI 2050 Metropolitan Transportation Plan, as opposed to expansion activities. Projects can receive up to 10 points in this category as follows:

- Expansion of bus or BRT vehicles or facilities 10 points
- Replacement of transit vehicles 7 points
- Rail Transit 6 points
- Transit Center 6 points
- Park and Ride 5 points
- Maintenance Facility 4 points
- Fare collection or other support equipment 2 points

An important component of transit projects is their **Ridership Impact**. The point values reflect a project's ability to maintain or increase ridership. A high increase in ridership will be awarded 15 points and no increase in ridership zero points. The range of points available are awarded as follows:

- High increases ridership 15 points
- Medium increase in ridership 9 points
- Low increase in ridership 8 points
- No increase in Ridership 0 points

The **Safety and Security** factor awards points for the impact the project will have on safety and security. For example, a new bus or rail transit vehicle may be equipped with video and audio equipment to increase security. In addition, the new bus or rail transit vehicle may have additional safety features not found on the vehicle it is replacing. The existing safety and security problem must be documented along with a plan to address these problems. Up to 10 points are available and are awarded as follows:

- Essential to safety/security 10 points
- Significant to safety/security 8 points
- Moderately impacts safety/security 6 points
- Minimally impacts safety/security 4 points
- No impact on safety/security 0 points

Geographic Scope

- Regional 10 points
- Multi-county 8 points
- County 6 points

- Corridor 4 points
- Local 0 points

Transportation Factors for Bike and Pedestrian Projects (45 points)

There are four criteria that provide a potential of 45 points to each bicycle- and/or pedestrian-specific transportation project recommendation.

Safety is an important consideration in project selection process. The annual average number of crashes in the project area over a five year period involving bike or pedestrians is used as the metric for assigning up to 10 points. Projects are awarded point values as follows:

- Greater than five crashes 10 points
- 3 to 5 Crashes 6 points
- 1 to 3 Crashes 1 points
- O Crashes 0 points

The scoring process also takes into consideration the **Impact on Safety** which assesses the extent to which the project will have a positive impact on improving the level of safety for bicyclists and pedestrians. The impact on safety criterion ranges from zero to five points. New facilities will be scored based on existing routes that the project is designed to alleviate, if any. Projects are awarded point values as follows:

- High Impact 5 points
- Medium Impact 3 points
- Low Impact 0 points

The OKI process seeks to give priority to regional connections. The **Facility Type** element awards up to 20 points for regional network components and two points for non-network components. Projects are awarded point values as follows:

- Regional Network Component 20 points
- Connection to Regional Network 15 points
- Local Network Component 10 points
- Non-Network Component 0 points

Some projects have greater **Feasibility** than others due to engineering, economic or social constraints. Others may lack political or public support, right-of-way availability or other elements. The feasibility criterion is an indication of the likelihood of a project to advance to construction or implementation based on these factors. Projects are awarded point values as follows:

- Highly feasible 10 points
- Moderately feasible 5 points
- Marginally feasible 3 points
- Not feasible 0 points

Transportation Factors for Non Roadway Freight Projects (45 points)

There are four criteria that provide a potential of 45 points to each non-roadway, freight-specific transportation project recommendation.

The **Mode Specific Traffic Flow** factor awards points based on volume to capacity (V/C) ratios in the project area. Projects greater than a 1.0 ratio indicate a high level of congestion and will receive the most available points. Projects are awarded point values as follows:

- Mode V/C >1.0 10 points
- Mode V/C .75 to <1.0 8 points
- Mode V/C .50 to <.75 6 points
- Mode V/C .25 to <.50 4 points
- Mode V/C <.25 0 points

The **Impact on Roadway Congestion** factor provides points based on the extent to which the project with work to remove large trucks from roadways in the OKI region, thereby alleviating the current level of congestion. A high reduction in trucks cannot be awarded to a project that does not document an existing congestion problem. Consideration will be given to the type of roadway facilities impacted, its current peak period capacity, congestion levels and the effect of large truck-equivalent reductions. Up to 15 points are available and awarded as follows:

- High Number of Trucks Removed per Day 15 points
- Medium Number of Trucks Removed per Day 10 points
- Low Number of Trucks Removed per Day 5 points
- No Trucks Removed per Day 0 points

The **Safety and Security** factor awards points to projects that can be linked to improving safety conditions in the project area. The existing safety and security problem must be documented along with a plan to address these problems. Up to 10 points are available and are awarded as follows:

- High Positive Impact 10 points
- Medium Positive Impact 6 points
- Low Positive Impact 2 points
- No Impact 0 points

Each non-roadway, freight transportation project included in this plan utilizes and is assigned to either a rail **or** water facility. The rail or water port **Facility Type** criterion for non-highway, freight projects is intended to serve a similar purpose as the hierarchy of facility types for highways. A potential of 10 points is awarded based on facility type. In all cases a public benefit must be demonstrated.

- **Rail**

  Like highways, railroad track is categorized according to function. Scoring is based on the type or category of railroad track that will be improved by the project. Main tracks handle through-train movements between and through stations and terminals, as opposed to switching or terminal movements. Main tracks typically experience higher train volumes and train speeds

of rail cars. Projects associated with main tracks will be awarded 10 points. Passing tracks or sidings are tracks used primarily along main tracks for meeting and passing trains and to ensure safe and efficient deliveries. Projects associated with passing tracks will receive up to eight points. A branch line is a railroad line that typically carries freight from its origin to a main line. Projects associated with a branch line will be awarded up to six points. Lastly, a side track, switching track, and industrial track are tracks used for the loading, unloading, and storage of rail cars. Rail yard improvements would also be included in this category. Projects associated with side tracks will be awarded up to four points.

- Mainline Track 10 points
- Passing Track 8 points
- Branch Line 6 points
- Side, Switching and Industrial Track (yard) 4 points

- **Water Port**

The water port facility type criterion is not designated similarly as roadways or rail in terms of function. There is no type or category for water ports. Therefore, the points for this criterion are awarded first, on whether the proposed project is located along or serves any navigable waterway and second, if the project is examined for direct access to road and/or rail. Up to 10 points are available and are awarded as follows:

- Located on Navigable Waterway with Direct Roadway and Rail Access 10 points
- Located on Navigable Waterway with Direct Roadway or Rail Access 6 points
- Ancillary Port Activity Serving Navigable Waterway 2 points

Factors for Other Projects

In some cases, OKI will include projects that do not fit the highway, transit, bike/ped or non-freight project definition. In these cases, staff will subjectively rank the project(s) taking into account the relative benefits and costs of the project.

Appendix A

Highway Crash Reduction Factors (CRF) Used for Impact on Safety

Improvement Type	Crash Reduction Factor	Definition	Score
Highway/Railroad Crossing	90	Improving existing highway and railroad crossing intersections primarily by constructing grade separations.	5
2 lane to 4 lane divided	55	The upgrade of an existing 2-lane highway to a 4-lane divided facility to increase traffic flow. Widen 2 an existing divided highway to 4 lanes.	5
Arterial to Full Control	40	Upgrading a road serving major traffic movements (high-speed, high volume) for travel between major points to a limited access divided arterial highway.	5
Grade Separation	40	Improving an intersection by separating traffic through physical means such as an overpass to allow different flows of traffic.	5
Arterial to Partial Control	35	Upgrading a road serving major traffic movements (high-speed, high volume) for travel between major points to alleviate congestion and reduce impediments to traffic flow. Include indirect left turn or similar movements. Add access management	4
Add medians	35	Replace TWTL with a divided median cross section with no additional capacity. Add non-traversable median. Access management.	4
Improve Intersection	30	Install turn lane (s), roundabout installation, major horizontal realignment	4
Improve Interchange	25	Improving traffic flow at an existing interchange by changing the ramp configuration or type of interchange. Convert diamond to diverging diamond, modifying left-turn phasing on one intersection approach etc.	3
Add Lane to Full Control Fac.	25	The addition of a full lane of travel to an Interstate or existing full access-controlled facility.	3
Geometric improvements	20	Realignment or reconstruction to bring geometric (vertical, horizontal) deficiencies up to modern standards. To include minor widening of lanes and shoulders, reconstruction, safety hazard eliminations, spot improvements	3
Install Two-way Left Turn Lane	20	Widening existing pavement through addition of two way left turn lane to reduce turning related crashes such as rear-end and head-on on two lane roads.	3
Add Closed Loop Signal System	15	Add coordinated closed loop signal system	2
Intelligent transportation system projects	15	Install ramp meters, cameras, dynamic message signs, queue detection and alerts	2
Full Control to Interstate	10	Improving an existing freeway to interstate design standards primarily by increasing shoulder width and/or bridge clearances.	1

Auxiliary Lanes or Operational Improvement	10	Add continuous auxiliary lane for weaving between entrance ramp and exit ramp or other interchange improvements.	1
Add Signal System	5	New or upgraded signals	1
Construct Road in new location	0	Bypass, new route, new interchange, route relocation	0
Interchange Ramps	0	The addition of lanes to ramps of an existing grade separated interchange.	0
Maintenance Improvement	0	Drainage improvements, rock fall, landslides, rest area rehab, resurfacing, rock fall mitigation, signs, signals, weigh station rehab	0
Transportation Studies	0	Scoping studies, feasibility studies, PE & environmental, phase 1 design, small urban area, strategic corridor	0
Other improvement types	0	Any improvement types not included previously. Bike/ped, miscellaneous widening not specifically mentioned.	0

Appendix B

Air Quality Cost-Effectiveness

Modified from FHWA CMAQ Cost-Effectiveness Summary Table – Updated July 2020
https://www.fhwa.dot.gov/environment/air_quality/cmaq/reference/cost_effectiveness_tables/index.cfm#toc37055060

Strong	**Points**
Idle Reduction (diesel engines)	5
Diesel Engine Retrofits	5
Intermodal Freight Facilities	5
Incident Management	5
Transit Service Expansion	5
Mixed	
Traffic signal synchronization (high volume corridor >40k ADT or major ITS)	4
Electric Vehicle Charging	4
Rideshare programs	4
Park-n-Ride	3
Transit amenity	3
Roundabouts	3
Bus replacements (CNG, electric, hybrid)	3
Traffic signal synchronization	3
Weak	
Bicycle/pedestrian facility (regional network component)	2
Intersection improvement (intersection LOS D or F)	2
Bikeshare	2
Access management	2
Bus replacements (diesel)	1
Bicycle/pedestrian facility (non-regional network component)	1
Intersection improvement (intersection LOS A-C)	1
New road or major widening (not CMAQ eligible)	1
No Impact	
Roadway resurfacing/reconstruction and minor widening	0
Lighting/guardrail replacement	0
Replacing existing sidewalks	0
Resurfacing existing bike/pedestrian facility	0
Bridge replacement	0
Transit maintenance and facility renovation	0