Scoring Criteria Guide

Surface Transportation Block Grant Program

2020 Call for Projects

For the St. Louis Region

Guidance Document for STP-S Project Evaluation

EAST-WEST GATEWAY
Council of Governments

Creating Solutions Across Jurisdictional Boundaries

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Overview

The current federal transportation law, Fixing America's Surface Transportation (FAST) Act, continues the reforms initiated by the previous law, Moving Ahead for Progress in the 21st Century (MAP-21). This includes transitioning to a performance-driven, outcome-based program, and establishing performance goals for federal-aid highway programs. Performance-based planning and programming ensures that resources are invested in projects that make progress toward achieving critical outcomes for the St. Louis region.

The East-West Gateway Council of Governments (EWG) Board of Directors adopted *Connected2045*, the long-range transportation plan for the St. Louis region, in June 2019. Projects in the Transportation Improvement Program (TIP) must be consistent with the 10 guiding principles of *Connected2045*, which are described in **Table 1**. These 10 principles guide transportation system evaluation and decision making, including the competitive selection of the Surface Transportation Block Grant Program (STP-S).

Table 1: *Connected2045* 10 Guiding Principles

Guiding Principles	Description
(1) Preserve & Maintain the Existing System	Ensure the transportation system remains in a state of good repair.
(2) Support Public Transportation	Invest in public transportation to spur economic development, protect the environment, and improve quality of life.
(3) Support Neighborhoods & Communities	Connect communities to opportunities and resources across the region.
(4) Foster a Vibrant Downtown & Central Core	Improve access to and mobility within the central core by all modes to increase attractiveness of St. Louis and strengthen the regional economy.
(5) Provide More Transportation Choices	Create viable alternatives to automobile travel by providing bicycle and pedestrian facilities.
(6) Promote Safety & Security	Provide a safe and secure transportation system for all users.
(7) Support a Diverse Economy with a Reliable System	Reduce congestion and improve travel time reliability to support the diverse economic sectors of the region.
(8) Support Quality Job Development	Support the growth of wealth producing jobs that allow residents to save and return money to the economy.
(9) Strengthen Intermodal Connections	Support freight movement and connections that are critical to the efficient flow of both people and goods.
(10) Protect Air Quality & Environmental Assets	Encourage investments that recognize the linkages between the social, economic, and natural fabric of the region.

EWG has identified seven types of potential projects. These project types are identified below, followed by example activities:

1. **Road** – road resurfacing or reconstruction. Routine maintenance is not eligible.
2. **Bridge** – bridge rehabilitation or replacement, or bridge preventive maintenance program.
3. **Traffic Flow** – addition of travel lanes, two-way turn lanes, new roads, new or modified interchanges, intersection improvements (e.g., roundabouts, channelization), Intelligent Transportation Systems (ITS) improvements, or traffic signal optimization.
4. **Safety** – systemic safety improvements (e.g., guardrail or rumble strip installation), sight distance improvements (e.g., road realignment), signage upgrades, two-way turn lanes, intersection/crossing safety improvements (e.g., turn lanes, roundabouts, channelization, crossing), through lane reduction, railway-highway grade separation, or shoulders.
5. **Active Transportation** – shared-use paths, on-street bicycle facilities, sidewalks, or bicycle and pedestrian bridges and underpasses.

6. **Transit:**
    a. **Transit Asset Management & System Upgrades** – revenue replacement vehicles, transit facility/station or bus stop upgrades, or maintenance facility for revenue vehicles. Routine facility maintenance is not eligible.
    b. **Expansion** – vehicle fleet expansion, new transit shelters/stations, or new transfer centers for geographic service expansion.
7. **Freight/Economic Development** – road or bridge projects that improve the flow of freight or promote economic development, railway-highway grade separation, traffic signal optimization, or truck parking facilities.

Each project type will be evaluated based on how it meets the guiding principles established in *Connected2045*. **Table 2** details the performance criteria values for each project type.

Table 2: Project Type and Performance Criteria Values

	STP-S Project Type							
***Connected2045* Guiding Principles (Criteria)**	**Road***	**Bridge***	**Traffic Flow**	**Safety**	**Active Transportation**	**Transit Asset Management & System Upgrades**	**Transit Expansion****	**Freight / Economic Development*****
(1) Preserve & Maintain the Existing System	65 or 72	65 or 69	5	8	-	45	-	5
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	12 or 5	9 or 5	11	10	30	24	64 or 69	10
(3) Support Neighborhoods & Communities	4	4	4	4	22	8	8	4
(4) Foster a Vibrant Downtown & Central Core	-	-	-	-	10	1	1	-
(6) Promote Safety	8	13	10	70	35	7	7	10
(7) Support a Diverse Economy with a Reliable System	1	-	50	-	-	5	5	10
(8) Support Quality Job Development	4	4	5	-	-	-	5 or 0	0 or 60
(9) Strengthen Intermodal Connections	5	5	5	8	-	-	-	60 or 0
(10) Protect Air Quality & Environmental Assets	1	-	10	-	3	10	10	1
Total Performance Points	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

**Road and bridge projects are categorized as either 'within community' or 'outside community.' The point values under Preserve & Maintain the Existing System and Multimodal vary depending on the project category.*
***Transit expansion projects can include either adding capacity projects or geographic expansion projects. The point values under Multimodal and Support Quality Job Development vary depending on the project type.*
****This project type includes freight or economic development activities. The point values under the Support Quality Job Development and Strengthen Intermodal Connections vary depending on the project type.*

All application submittals are expected to have one primary project type. The component of the project that is most significant is considered the primary type (i.e., the primary purpose). Many of the projects could fall into multiple project types. For example, if a sponsor is planning on resurfacing a road and adding a bicycle lane, the project is considered multimodal. Assuming that the roadway resurfacing is the primary activity, the project would be evaluated as a road project type and can earn points for providing more transportation choices.

All projects will be scored and ranked based on the primary project type indicated by the project sponsor. Each project type has a maximum of 10 criteria, and metrics are used to assign performance points. Certain criteria do

not apply to all project types. For example, a road project type is assessed for nine out of the 10 criteria (11 metrics) and an active transportation project type is assessed for six out of the 10 criteria (16 metrics). The criteria are held constant across the project types, however, the measures and metrics vary depending on the project type. In addition, criterion can contain multiple measures and metrics.

Each project type can receive a maximum of 100 performance points. Each project type has a primary purpose that includes the measures and metrics that are most important to the project type. For example, the measure that has the most amount of points in the road project type is the road condition, worth 60 points. This is because the primary purpose of road type projects is to preserve the roadway. As noted before, the measures and metrics are specific to each project type. The evaluation scheme tables in each project type section that follows in this Guide give details on the criteria, measures, and metrics pertaining to each specific project type. All project types compete against each other for the available STP-S funding. Funding is not set aside in silos by project type.

Project usage and cost points will be included in the final scoring of each project, which is worth an additional 25 points. Projects can receive up to five points for usage and up to 20 points for cost. Person Miles of Travel (PMT) will be calculated for each project type to determine the facility usage. The purpose of the cost metric is to place emphasis on projects requesting a lower amount of STP-S funding, as well as to spread funding around to more projects. Cost points are assigned based on the amount of federal funds requested compared to the total funds available in Missouri, and the amount of construction/construction engineering (CE) funds requested compared to the adjusted construction/CE funds available in Illinois. The percentage values are grouped into ranges. Within each percentage range, the points assigned to each project are scaled based on the percentage requested. The projects in the lowest percentage range are adjusted on a curve. **Table 3** shows the usage allocation breakdown for Illinois and Missouri. **Table 4** shows the cost allocation breakdown for Illinois and Missouri.

Table 3: Usage Allocation Breakdown – Illinois and Missouri

Illinois			Missouri	
Usage Ranges – PMT	**Points**		**Usage Ranges – PMT**	**Points**
4,001+	5		10,001+	5
2,001-4,000	4		5,001-10,000	4
1,101-2,000	3		2,001-5,000	3
501-1,100	2		701-2,000	2
1-500	1		1-700	1

Table 4: Cost Allocation Breakdown – Illinois and Missouri

Illinois	
Adjusted Construction Cost Range*	**Point Range**
min(x)% ≤ x < 10%	17.4 < x ≤ 20
10% ≤ x < 12%	12.1 < x ≤ 17.4
12% ≤ x < 14%	8.1 < x ≤ 12.1
14% ≤ x < 17%	4.1 < x ≤ 8.1
17% ≤ x < 20%	1 < x ≤ 4.1
x ≥ 20%	0
**The adjusted construction/CE funds available = IDOT STP-S funding mark/0.8*	
Missouri	
Federal Project Cost Range	**Point Range**
min(x)% ≤ x < 2%	18.8 < x ≤ 20
2% ≤ x < 3%	14.8 < x ≤ 18.8
3% ≤ x < 4%	10.8 < x ≤ 14.8
4% ≤ x < 5%	6.8 < x ≤ 10.8
5% ≤ x < 10%	4.1 < x ≤ 6.8
10% ≤ x < 15%	2.8 < x ≤ 4.1
x ≥ 15%	0

Road Project Type

Table 5 outlines the scheme for evaluating road projects. Road projects are assessed for nine out of the 10 criteria and include 11 metrics. Road projects are assigned to a geographic scale, which is based on the project's population and employment index (PEI). A road project with a PEI of 1.45 or higher (weighted average) is categorized as a 'within community' type project. Road projects with a PEI less than 1.45 are considered an 'outside community' type project. A map of the PEI is included in **Appendix A**. Projects that are 'within community' emphasize safe, multimodal connections and access to community resources. Projects that are 'outside community' emphasize mobility to ensure the region is well connected. The geographic scale enables project evaluation to vary across each scale, with multimodal improvements and regional transportation significance (i.e., functional classification) weighted by level of significance for each scale. A project sponsor can request the project's PEI designation prior to final application submittal and can also request to change the designation. Please see the STP-S Project Development Workbook for more information. Further information on the metrics used to evaluate road projects follows.

Table 5: Road Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**		**Points**
(1) Preserve & Maintain the Existing System	Road condition	PASER rating		60
	Significance	Functional classification	Within community:	5
			Outside community:	12
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Multimodal accommodation	Elements of other modes being implemented as part of the project	Within community:	12
			Outside community:	5
(3) Support Neighborhoods & Communities	Addressing social equity	Project falls in or partially located in an Environmental Justice area		4
(4) Foster a Vibrant Downtown & Central Core	n/a	n/a		n/a
(6) Promote Safety	Safety countermeasures	1. Total crash rate		4
		2. Fatal & serious injury crash rate		4
(7) Support a Diverse Economy with a Reliable System	Improved facility efficiency	Management and operations elements		1
(8) Support Quality Job Development	Access to jobs	Job density		4
(9) Strengthen Intermodal Connections	Regional freight significance	1. Commercial vehicle countermeasure		3
		2. Freight proximity		2
(10) Protect Air Quality & Environmental Assets	Impact to the environment	Environmental infrastructure elements		1

Preserve & Maintain the Existing System

Projects will be assessed in terms of how they contribute to the preservation of existing infrastructure assets. The first metric evaluates the condition of the pavement. The second metric evaluates the project's significance by looking at the functional classification of the roadway.

Road Condition (60 points)

Pavement condition will be assessed using the Pavement Surface Evaluation and Rating (PASER) Guide, which is a visual rating system. PASER ratings range from 1-10, with 1 being 'very poor' condition and 10 being 'excellent' condition. Facilities with a PASER rating of 1.5 or less are assigned a lower priority to encourage preventive maintenance prior to this level of deterioration. Examples of the types of improvements typically used on roadways with different pavement ratings, as well as their associated scores, are listed below. This is meant to be illustrative, and not an exhaustive list of improvements eligible for funding.

60 points	PASER 1.6-4.5 – Includes improvements such as mill and overlay, extensive slab replacement, joint rehabilitation, or full-depth pavement repairs.
57 points	PASER 4.6-5.5 – Includes project elements that are primarily focused on preservative treatments and non-structural surface repairs.
53 points	PASER 5.6-7.5 – Includes project elements that are primarily focused on preservative treatments, non-structural surface repairs, routine sealing, and minor patching of pavement to prevent further deterioration.
40 points	PASER 1.5 or less – Includes full reconstruction of the facility, regardless of pavement condition. Reconstruction may be due to deterioration or deficient design.
30 points	PASER 7.6-8.5 – Includes standard roadway maintenance.
Zero points	PASER 8.6-10 – Includes pavement in new or like-new condition with no maintenance required.

Regional Transportation Significance (5 or 12 points)
This measure evaluates how critical the route's location is to the regional network. Scoring is based on the functional classification of the road. A project that is categorized as 'within community' can receive up to five points under this measure. **Note**: local and rural minor collectors are not eligible road projects.

5 points	Principal arterial.
4 points	Minor arterial.
3 points	Major collector.
1 point	Urban minor collector.
Zero points	Project is on the state system.

'Outside community' projects will be evaluated for regional transportation significance as follows:

12 points	Principal arterial.
10 points	Minor arterial.
7 points	Major collector.
3 points	Urban minor collector.
Zero points	Project is on the state system.

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

This measure relates to *Connected2045*'s goal of fostering a multimodal transportation system. Incorporating bicycle and pedestrian facilities in road projects is an efficient and cost-effective way for communities to create multimodal networks. In addition, road projects can provide multiple benefits to public transit, including better mobility for transit vehicles and better access for users of all ages and abilities.

EWG encourages context-sensitive facilities and taking a flexible approach to achieving multimodal transportation networks. Projects that are categorized as 'within community' can score up to 12 points for the following features being included in and newly constructed by the project. Projects that score over the 12 points will be capped at 12 points. 'Outside community' road projects are capped at five points. **Note**: a project does not need to satisfy all improvements listed below to earn points.

Facility Type	
6 points	Corrects existing sidewalk deficiencies along entire limits (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' sidewalks (residential) or 8' sidewalks (commercial) on both sides of road; OR **4 points** if project corrects existing sidewalk deficiencies along entire limits or new 5' sidewalks (residential) or 8' sidewalks (commercial) on one side of road.
3 points	Partial sidewalk slab replacements to a > 5' sidewalk on both sides of road; OR **2 points** for partial sidewalk slab replacements to a > 5' sidewalk on one side of road. *
2 points	Partial sidewalk slab replacements to a < 5' sidewalk on both sides of road; OR **1 point** for partial sidewalk slab replacements to a < 5' sidewalk on one side of road. *
2 points	Reconstruction of curb ramps. **Note**: to receive these points, the curb ramps must connect to a non-deficient pedestrian facility.
8 points	10' to 14' shared-use path or physically protected bike lanes; OR **6 points** for 8' to < 10' shared-use path.
6 points	Buffered bike lanes on roads at 40 mph or less; OR **5 points** for buffered bike lanes on roads at 45 mph.
4 points	Conventional bike lanes on roads at 30 mph or less; OR **2 points** for conventional bike lanes on roads at 35 mph.
4 points	4' to 8' paved shoulders.
Transit / Land Use	
2 points	Project is located on a transit route.
2 points	Physical improvements to transit system (e.g., benches, ADA landing pads, shelters, bike racks); OR **1 point** for new or upgraded bicycle and/or pedestrian facility connection to transit system. **
2 points	New or upgraded bicycle and/or pedestrian connection to activity center in areas that do not have transit proximity. **
2 points	New or upgraded bicycle and/or pedestrian facility directly touching school property (grades K-12 and college/university); OR **1 point** if new or upgraded bicycle and/or pedestrian facility is within ½ mile of school. **
Safety / Design / Crossing Treatments	
3 points	Safety improvements to at-grade rail crossing.
3 points	Extensive speed or volume control solutions to reduce modal conflicts (e.g., road diet, bulb-outs, speed humps, raised refuge islands/medians, reduced curb radii); OR **1 point** for minimal speed or volume solutions. ***
3 points	Extensive crossing treatments at intersections or uncontrolled locations (e.g., pedestrian countdown signals, high visibility crosswalks (continental or ladder style), raised crosswalks, Rectangular Rapid Flashing Beacon (RRFB), Pedestrian Hybrid Beacon (PHB), bicycle intersection crossing markings); OR **1 point** for minimal crossing treatments. ***
1 point	Pedestrian-scale lighting along bicycle/pedestrian facility.
1 point	Landscaped buffer between roadway and sidewalk on roads at 35 mph and over.
1 point	Physical or innovative improvements to the bicycle network (i.e., bicycle-friendly grates, bike racks, bike boxes).

*If project includes sidewalk slab replacements, the entire facility along the project corridor must be ADA compliant. A passing space is to be provided at intervals no greater than 200' for sidewalks widths less than 5'.
**To receive points, the new or upgraded bicycle and/or pedestrian facility must be low-stress and/or have no deficiencies.
***Points assigned based on the application of countermeasure(s) and the speed, volume, and configuration of the roadway. For example: for a four-lane roadway with an AADT exceeding 9,000 at 40 mph, a marked midblock high visibility crosswalk alone is insufficient and the treatment should occur in conjunction with other substantial safety and crossing improvements.

Support Neighborhoods & Communities

This measure is included to account for projects that are located in Environmental Justice (EJ) areas. The purpose of EJ is to focus federal attention on the environmental and human health effects of federal actions on minority or low-income populations with the goal of achieving environmental protection for all communities. EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability. The EJ policy ensures that populations that have traditionally been underserved have safe access to community resources and meaningful choices in transportation. Census data and GIS analysis is used to determine if the project is located in an EJ area. A map of the EJ areas is provided in **Appendix A**.

4 points	Project falls in, or partially in, an EJ area with high concentration of low-income persons or minorities.
3 points	Project falls in, or partially in, an EJ area with high concentration of zero-vehicle households.
1 point	Project falls in, or partially in, an EJ area with high concentration of seniors or persons with a disability.
Zero points	Project is not located in an EJ area or project imposes a burden on EJ area.

Promote Safety

EWG is focusing on lowering the number of fatalities and serious injuries caused by vehicle crashes. To meet this goal, all projects should strive to correct safety issues in high-crash locations or use a systemic approach to address future crashes. The two metrics relate to the current conditions on the roadway by looking at the total crash rate and the fatal and serious injury crash rate. This helps prioritize projects that are in locations experiencing a current problem. To receive points under metric one (total crash rate) and metric two (fatal and serious injury crash rate), the project must include a safety countermeasure that addresses the current safety problem. Project sponsors must provide five years of crash data (2013-2017). Sponsors should provide the number of crashes and not the total number of injuries or people involved. The total crash rate and the fatal and serious injury crash rate will be calculated by EWG.

A list of countermeasures, and the associated Crash Modification Factor (CMF), is provided in **Appendix B**. Project sponsors may also utilize the FHWA Crash Modification Factors Clearinghouse website to identify possible safety countermeasures for roadway projects: http://www.cmfclearinghouse.org/.

Note: road resurfacing/reconstruction in general is not a safety countermeasure. High friction surface treatment technology is used to address site-specific safety issues. For more information on high friction surface treatments, view: https://www.fhwa.dot.gov/innovation/everydaycounts/edc-2/pdfs/fhwa-cai-14-019_faqs_hfst_mar2014_508.pdf.

Total Crash Rate (4 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

4 points	Top third
3 points	Middle third
2 points	Bottom third

Fatal and Serious Injury Crash Rate (4 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

4 points	Top third
3 points	Middle third
2 points	Bottom third

Preventive Countermeasures: if a project has no crashes on the project limits, but includes a preventive safety countermeasure, the project can receive two total points. If a project includes a preventive safety countermeasure, but does not address crashes occurring along the project limits, the project can receive two total points.

Support a Diverse Economy with a Reliable Transportation System

Management and operations (M&O) strategies are defined as integrated strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system. Examples of M&O strategies include: traffic operational improvements, ITS technologies, or other integrated technology component to increase facility efficiency and reliability. This metric evaluates the integration of M&O strategies into roadway projects.

1 point	Project includes M&O strategies.
Zero points	Project does not include M&O strategies.

Support Quality Job Development

Access to jobs is an important function of the transportation system. The *OnTheMap* tool is derived from census data and will be used to assess where workers are employed in the region. Employment density will be used as a metric in determining how important improvements to transportation facilities are in the surrounding area.

4 points	High jobs/sq. mile
3 points	Medium-high jobs/sq. mile
2 points	Medium jobs/sq. mile
1 point	Medium-low jobs/sq. mile
Zero points	Low jobs/sq. mile

Strengthen Intermodal Connections

This measure relates to *Connected2045*'s goal of supporting freight movement and connectivity by ensuring resilient access to freight job centers by all modes. The two metrics below will be used to evaluate how the proposed project safely improves freight movement to freight intensive industries.

Commercial Vehicle Countermeasure (3 points)

Projects that include a commercial vehicle countermeasure that improves freight efficiency, security, or safety will earn points under this metric. Common techniques related to commercial vehicle accommodations include improving shoulder width and pavement structure, intersection design, parking, acceleration/deceleration lanes, truck and car separation, accommodating tonnage requirements, and increasing overpass clearances.

3 points	Project improves freight movement with appropriate commercial vehicle countermeasures.
Zero points	Project does not include commercial vehicle countermeasures.

Freight Proximity (2 points)
In 2013, EWG completed the St. Louis Regional Freight Study. The study identified key industrial areas that influence the freight industry in the St. Louis region. Industrial site areas are centers of employment and are connected by a series of transportation networks. Projects that improve access to an industrial site area or a freight facility will earn points under this metric. To receive points under this metric, the project must score points under the first metric, commercial vehicle countermeasure.

2 points	Project meets one of the following criteria: • Improves freight access into, out of, or within an industrial site area. • Improves freight access to an intermodal freight facility, serves a major freight generator, logistic center, manufacturing and warehouse industrial land, or navigable waterway or port facility, or other freight intensive industry.

PROTECT AIR QUALITY & ENVIRONMENTAL ASSETS

Transportation projects should limit the impacts on the natural environment. Green infrastructure is a design approach to managing stormwater, the urban heat island effect, public health, and air quality. Sustainable stormwater management treats and slows runoff from impervious roadways, sidewalks, and building surfaces. Examples of green infrastructure include bioswales, rain gardens, pervious pavement, and green bulb-outs. This metric evaluates the integration of green infrastructure into roadway projects. For more information on green infrastructure, view: https://www.epa.gov/green-infrastructure.

1 point	Project includes green infrastructure elements.
Zero points	Project does not include green infrastructure.

Bridge Project Type

Table 6 outlines the scheme for evaluating bridge projects. Bridge projects are assessed for seven out of the 10 criteria and include seven metrics. Bridge projects are assigned to a geographic scale, which is based on the project's population and employment index (PEI). A bridge project with a PEI of 1.45 or higher (weighted average) is categorized as a 'within community' type project. Bridge projects with a PEI less than 1.45 are considered an 'outside community' type project. A map of the PEI is included in **Appendix A**. Projects that are 'within community' emphasize safe, multimodal connections and access to community resources. Projects that are 'outside community' emphasize mobility to ensure the region is well connected. The geographic scale enables project evaluation to vary across each scale, with multimodal improvements and regional transportation significance (i.e., functional classification) weighted by level of significance for each scale. A project sponsor can request the project's PEI designation prior to final application submittal and can also request to change the designation. Please see the STP-S Project Development Workbook for more information. Further information on the metrics used to evaluate bridge projects follows.

Table 6: Bridge Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**		**Points**
(1) Preserve & Maintain the Existing System	Bridge condition	Bridge sufficiency rating		60
	Significance	Functional classification	Within community:	5
			Outside community:	9
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Multimodal accommodation	Elements of other modes being implemented as part of the project	Within community:	9
			Outside community:	5
(3) Support Neighborhoods & Communities	Addressing social equity	Project falls in or partially located in an Environmental Justice area		4
(4) Foster a Vibrant Downtown & Central Core	n/a	n/a		n/a
(6) Promote Safety	Structural deficiency	Condition ratings		13
(7) Support a Diverse Economy with a Reliable System	n/a	n/a		n/a
(8) Support Quality Job Development	Access to jobs	Job density		4
(9) Strengthen Intermodal Connections	Regional freight significance	Bridge weight limits		5
(10) Protect Air Quality & Environmental Assets	n/a	n/a		n/a

Preserve & Maintain the Existing System

Projects will be assessed in terms of how they contribute to the preservation of existing infrastructure assets. The first metric evaluates the condition of the bridge. The second metric evaluates the project's significance by looking at the functional classification of the roadway.

Bridge Condition (60 points)

Bridge conditions will be assessed using the bridge sufficiency rating system approved by Federal Highway Administration (FHWA). Bridge sufficiency ratings range from 0-100, with 0 being 'completely deficient' and 100 being a 'new' bridge. The ratings are based on several factors, including: width, vertical clearance, load capacity, essentiality for public use, and structural safety.

60 points	Bridge sufficiency rating 0-39.9 (very poor)
57 points	Bridge sufficiency rating 40-49.9 (poor)
50 points	Bridge sufficiency rating 50-59.9 (fair) OR systemic preventive maintenance activity is proposed

30 points	Bridge sufficiency rating 60-79.9 (good)
Zero points	Bridge sufficiency rating 80-100 (excellent)

Note: preventive maintenance activities may be eligible for funding if the sponsor has in place a systematic process, such as a Bridge Management System, which demonstrates the cost effectiveness of extending the service life of the bridge. Preventive maintenance activities must be previously reviewed and approved by FHWA.

Regional Transportation Significance (5 or 9 points)
This measure evaluates how critical the route's location is to the regional network. Scoring is based on the functional classification of the road. A project that is categorized as 'within community' can receive up to five points under this measure.

5 points	Principal or minor arterial.
3 points	Major or minor collector.
2 points	Local.
Zero points	Project is on the state system.

'Outside community' projects will be evaluated for regional transportation significance as follows:

9 points	Principal or minor arterial.
7 points	Major or minor collector.
6 points	Local.
Zero points	Project is on the state system.

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

This measure relates to *Connected2045*'s goal of fostering a multimodal transportation system. The USDOT *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations* (2010) identifies sections of the United States Code (U.S.C.) that pertain to walking and bicycling: "In any case where a highway bridge deck being replaced or rehabilitated with federal financial participation is located on a highway on which bicycles are permitted to operate at each end of such bridge, and the Secretary determines that the safe accommodation of bicycles can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations" (23 U.S.C. 217(e)). Although this requirement only mentions bicycles, the USDOT encourages states and local governments to apply this same policy to pedestrian facilities as well.

EWG encourages context-sensitive facilities and taking a flexible approach to achieving multimodal transportation networks. Projects categorized as 'within community' can score up to nine points for the following features being included in and newly constructed by the project. Projects that score over the nine points will be capped at nine points. 'Outside community' road projects are capped at five points. **Note**: a project does not need to satisfy all improvements listed below to earn points.

Facility Type	
6 points	Corrects existing sidewalk deficiencies (deficiencies = fair/poor sidewalk conditions or existing width < 5') or new 5' sidewalks (residential) or 8' sidewalks (commercial) on both sides of road; OR **4 points** if project corrects existing sidewalk deficiencies or new 5' sidewalks (residential) or 8' sidewalks (commercial) on one side of road.

2 points	Reconstruction of curb ramps. **Note**: to receive these points, the curb ramps must connect to a non-deficient pedestrian facility.
8 points	10' to 14' shared-use path or physically protected bike lanes; OR **6 points** for 8' to < 10' shared-use path.
6 points	Buffered bike lanes on roads at 40 mph or less; OR **5 points** for buffered bike lanes on roads at 45 mph.
4 points	Conventional bike lanes on roads at 30 mph or less; OR **2 points** for conventional bike lanes on roads at 35 mph.
2 points	5' to 8' paved shoulders on a bridge with 2,000 ADT or more.
2 points	4' paved shoulders on a 'within community' bridge with 401 to 1,999 ADT.
2 points	Shared lanes on an 'outside community' bridge with 2,000 ADT or less.
Transit / Land Use	
2 points	Project is located on a transit route.
1 point	New or upgraded bicycle and/or pedestrian connection within ½ mile of transit system OR new or upgraded bicycle and/or pedestrian connection within ½ mile of activity center.*
2 points	New or upgraded bicycle and/or pedestrian connection within ½ mile of school (grades K-12 and college/university).*
Safety / Design	
3 points	Bicycle/pedestrian railing and/or protective screening between roadway and facility.
1 point	Pedestrian-scale lighting along bicycle/pedestrian facility.

*To receive points, the new or upgraded bicycle and/or pedestrian facility must be low-stress and/or have no deficiencies.

Support Neighborhoods & Communities

This measure is included to account for projects that are located in Environmental Justice (EJ) areas. The purpose of EJ is to focus federal attention on the environmental and human health effects of federal actions on minority or low-income populations with the goal of achieving environmental protection for all communities. EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability. The EJ policy ensures that populations that have traditionally been underserved have safe access to community resources and meaningful choices in transportation. Census data and GIS analysis is used to determine if the project is located in an EJ area. A map of the EJ areas is provided in **Appendix A**.

4 points	Project falls in, or partially in, an EJ area with high concentration of low-income persons or minorities.
3 points	Project falls in, or partially in, an EJ area with high concentration of zero-vehicle households.
1 point	Project falls in, or partially in, an EJ area with high concentration of seniors or persons with a disability.
Zero points	Project is not located in an EJ area or project imposes a burden on EJ area.

Promote Safety

Bridges are regularly inspected for safety on a scale of zero to nine. FHWA, through the National Performance Management Measures final rule, identified three bridge classifications: good, fair, and poor. Condition-based performance measures for bridges is based on the National Bridge Inventory condition ratings for four key items:

- Deck
- Superstructure
- Substructure
- Culvert

The ratings of each of these four items determines the classification of the bridge. If the lowest rating for one item is less than or equal to four, the classification is poor (i.e., structurally deficient). If the lowest rating for one item is below seven but above four, the classification is fair. If the lowest rating for one item is greater than or equal to seven, the bridge is classified as good. Projects will be assessed based on if the bridge involves a replacement or rehabilitation, or a preventive maintenance program.

Bridge Replacement or Rehabilitation

13 points	Poor rating (≤ 4) for at least three of the four key items.
11 points	Poor rating (≤ 4) for at least two of the four key items.
9 points	Poor rating (≤ 4) for at least one of the four key items.
5 points	Fair rating (> 4 and < 7) for at least one of the four key items.
Zero points	Good rating (≥ 7) for all four key items.

Preventive Maintenance Program

10 points	Fair rating (> 4 and < 7) for at least one of the four key items.
7 points	Good rating (≥ 7) for all four key items.
Zero points	Poor rating (≤ 4) for at least one of the four key items.

SUPPORT QUALITY JOB DEVELOPMENT

Access to jobs is an important function of the transportation system. The *OnTheMap* tool is derived from census data and will be used to assess where workers are employed in the region. Employment density will be used as a metric in determining how important improvements to transportation facilities are in the surrounding area.

4 points	High jobs/sq. mile
3 points	Medium-high jobs/sq. mile
2 points	Medium jobs/sq. mile
1 point	Medium-low jobs/sq. mile
Zero points	Low jobs/sq. mile

STRENGTHEN INTERMODAL CONNECTIONS

In 1975, Congress enacted the Bridge Formula to limit the weight-to-length ratio of a vehicle crossing a bridge. Posted weight limits impact the movement of freight as trucks may have to detour to avoid a weight restricted bridge. Projects that rehabilitate or replace a load-limited bridge to improve freight movement will earn points under this metric. Preventive maintenance activities can also earn points as this will delay the bridge(s) from receiving a posted weight limit.

5 points	The bridge has a posted weight limit of at least 20 tons.
3 points	The bridge has a posted weight limit between 20.1 and 40 tons.
2 points	The bridge has a posted weight limit above 40 tons OR systemic preventive maintenance activity is proposed.
Zero points	The bridge does not have a posted weight limit.

Traffic Flow Project Type

Table 7 outlines the scheme for evaluating traffic flow projects. Traffic flow projects are assessed for nine out of the 10 criteria and include 12 metrics. Further information on the metrics used to evaluate traffic flow projects follows.

Table 7: Traffic Flow Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**		**Points**
(1) Preserve & Maintain the Existing System	Road or bridge condition	PASER rating or bridge sufficiency rating		5 (avg)
	ITS condition	Preserving ITS components		
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Multimodal accommodation	Elements of other modes being implemented as part of the project		11
(3) Support Neighborhoods & Communities	Addressing social equity	Project falls in or partially located in an Environmental Justice area		4
(4) Foster a Vibrant Downtown & Central Core	n/a	n/a		n/a
(6) Promote Safety	Safety countermeasures	1. Total crash rate		5
		2. Fatal & serious injury crash rate		5
(7) Support a Diverse Economy with a Reliable System	Improved mobility and congestion	Road segment:	Reduction in total travel time	50
		Intersection:	Reduction in total vehicle delay	50
(8) Support Quality Job Development	Access to jobs	Job density		5
(9) Strengthen Intermodal Connections	Regional freight significance	1. Commercial vehicle countermeasure		3
		2. Freight proximity		2
(10) Protect Air Quality & Environmental Assets	Impact to the environment	1. Environmental infrastructure elements		1
		2. Reduction in VOC & NO_x		9

PRESERVE & MAINTAIN THE EXISTING SYSTEM

Projects will be assessed in terms of how they contribute to the preservation of existing infrastructure assets. The first metric evaluates the condition of the pavement or bridge. Sponsors can score points under preservation if they are improving the condition of the facility. Roadways or bridges with low pavement/sufficiency ratings will receive a higher preservation score. The second metric relates to the replacement of ITS components. If the sponsor receives points in the first metric and the second metric, the scores of the two metrics will be averaged.

Road or Bridge Condition (5 points)

Pavement condition will be assessed using the Pavement Surface Evaluation and Rating (PASER) Guide, which is a visual rating system. PASER ratings range from 1-10, with 1 being 'very poor' condition and 10 being 'excellent' condition.

5 points	PASER 2.5 or less
4 points	PASER 2.6-3.5
3 points	PASER 3.6-5.5
2 points	PASER 5.6-7.5
1 point	PASER 7.6-8.5
Zero points	PASER 8.6-10

Bridge conditions will be assessed using the bridge sufficiency rating system approved by FHWA. Bridge sufficiency ratings range from 0-100, with 0 being 'completely deficient' and 100 being a 'new' bridge. State DOTs calculate the ratings based on several factors, including: width, vertical clearance, load capacity, essentiality for public use, and structural safety.

5 points	Bridge sufficiency rating 0-39.9 (very poor)
4 points	Bridge sufficiency rating 40-49.9 (poor)
3 points	Bridge sufficiency rating 50-59.9 (fair)
2 points	Bridge sufficiency rating 60-79.9 (good)
Zero points	Bridge sufficiency rating 80-100 (excellent)

ITS Components (5 points)
Project can earn points if existing ITS components will be preserved, repaired, improved, or upgraded (e.g., signals, traffic sensors). To receive points, the ITS components must be within the project limits.

5 points	Existing ITS components are inoperable or require repairs, improvements, or upgrades.

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

This measure relates to *Connected2045*'s goal of fostering a multimodal transportation system. Incorporating bicycle and pedestrian facilities in road projects is an efficient and cost-effective way for communities to create multimodal networks. In addition, road projects can provide multiple benefits to public transit, including better mobility for transit vehicles and better access for users of all ages and abilities.

EWG encourages context-sensitive facilities and taking a flexible approach to achieving multimodal transportation networks. Projects can score up to 11 points for the following features being included in and newly constructed by the project. Projects that score over the 11 points will be capped at 11 points. **Note**: a project does not need to satisfy all improvements listed below to earn points.

Facility Type	
6 points	Corrects existing sidewalk deficiencies along entire limits (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' sidewalks (residential) or 8' sidewalks (commercial) on both sides of road; OR **4 points** if project corrects existing sidewalk deficiencies along entire limits or new 5' sidewalks (residential) or 8' sidewalks (commercial) on one side of road.
3 points	Partial sidewalk slab replacements to a > 5' sidewalk on both sides of road; OR **2 points** for partial sidewalk slab replacements to a > 5' sidewalk on one side of road. *
2 points	Partial sidewalk slab replacements to a < 5' sidewalk on both sides of road; OR **1 point** for partial sidewalk slab replacements to a < 5' sidewalk on one side of road. *
2 points	Reconstruction of curb ramps. **Note**: to receive these points, the curb ramps must connect to a non-deficient pedestrian facility.
8 points	10' to 14' shared-use path or physically protected bike lanes; OR **6 points** for 8' to < 10' shared-use path.
6 points	Buffered bike lanes on roads at 40 mph or less; OR **5 points** for buffered bike lanes on roads at 45 mph.
4 points	Conventional bike lanes on roads at 30 mph or less; OR **2 points** for conventional bike lanes on roads at 35 mph.
4 points	4' to 8' paved shoulders.

Transit / Land Use	
2 points	Project is located on a transit route.
2 points	Physical improvements to transit system (e.g., benches, ADA landing pads, shelters, bike racks); OR **1 point** for new or upgraded bicycle and/or pedestrian facility connection to transit system. **
2 points	New or upgraded bicycle and/or pedestrian connection to activity center in areas that do not have transit proximity. **
2 points	New or upgraded bicycle and/or pedestrian facility directly touching school property (grades K-12 and college/university); OR **1 point** if new or upgraded bicycle and/or pedestrian facility is within ½ mile of school. **
Safety / Design / Crossing Treatments	
3 points	Safety improvements to at-grade rail crossing.
3 points	Extensive speed or volume control solutions to reduce modal conflicts (e.g., road diet, bulb-outs, speed humps, raised refuge islands/medians, reduced curb radii); OR **1 point** for minimal speed or volume solutions. ***
3 points	Extensive crossing treatments at intersections or uncontrolled locations (e.g., pedestrian countdown signals, high visibility crosswalks (continental or ladder style), raised crosswalks, Rectangular Rapid Flashing Beacon (RRFB), Pedestrian Hybrid Beacon (PHB), bicycle intersection crossing markings); OR **1 point** for minimal crossing treatments. ***
1 point	Pedestrian-scale lighting along bicycle/pedestrian facility.
1 point	Landscaped buffer between roadway and sidewalk on roads at 35 mph and over.
1 point	Physical or innovative improvements to the bicycle network (i.e., bicycle-friendly grates, bike racks, bike boxes).

*If project includes sidewalk slab replacements, the entire facility along the project corridor must be ADA compliant. A passing space is to be provided at intervals no greater than 200' for sidewalks widths less than 5'.
**To receive points, the new or upgraded bicycle and/or pedestrian facility must be low-stress and/or have no deficiencies.
***Points assigned based on the application of countermeasure(s) and the speed, volume, and configuration of the roadway. For example: for a four-lane roadway with an AADT exceeding 9,000 at 40 mph, a marked midblock high visibility crosswalk alone is insufficient and the treatment should occur in conjunction with other substantial safety and crossing improvements.

SUPPORT NEIGHBORHOODS & COMMUNITIES

This measure is included to account for projects that are located in Environmental Justice (EJ) areas. The purpose of EJ is to focus federal attention on the environmental and human health effects of federal actions on minority or low-income populations with the goal of achieving environmental protection for all communities. EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability. The EJ policy ensures that populations that have traditionally been underserved have safe access to community resources and meaningful choices in transportation. Census data and GIS analysis is used to determine if the project is located in an EJ area. A map of the EJ areas is provided in **Appendix A**.

4 points	Project falls in, or partially in, an EJ area with high concentration of low-income persons or minorities.
3 points	Project falls in, or partially in, an EJ area with high concentration of zero-vehicle households.
1 point	Project falls in, or partially in, an EJ area with high concentration of seniors or persons with a disability.
Zero points	Project is not located in an EJ area or project imposes a burden on EJ area.

PROMOTE SAFETY

EWG is focusing on lowering the number of fatalities and serious injuries caused by vehicle crashes. To meet this goal, all projects should strive to correct safety issues in high-crash locations or use a systemic approach to address future crashes. The two metrics relate to the current conditions on the roadway by looking at the total crash rate and the fatal and serious injury crash rate. This helps prioritize projects that are in locations experiencing a current problem. To receive points under metric one (total crash rate) and metric two (fatal and serious injury crash rate), the project must include a safety countermeasure that addresses the current safety problem. Project sponsors must provide five years of crash data (2013-2017). Sponsors should provide the number of crashes and not the total number of injuries or people involved. The total crash rate and the fatal and serious injury crash rate will be calculated by EWG.

A list of countermeasures, and the associated Crash Modification Factor (CMF), is provided in **Appendix B**. Project sponsors may also utilize the FHWA Crash Modification Factors Clearinghouse website to identify possible safety countermeasures for roadway projects: http://www.cmfclearinghouse.org/.

Total Crash Rate (5 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

5 points	Top third
4 points	Middle third
3 points	Bottom third

Fatal and Serious Injury Crash Rate (5 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

5 points	Top third
4 points	Middle third
3 points	Bottom third

Preventive Countermeasures: if a project has no crashes on the project limits, but includes a preventive safety countermeasure, the project can receive three total points. If a project includes a preventive safety countermeasure, but does not address crashes occurring along the project limits, the project can receive three total points.

SUPPORT A DIVERSE ECONOMY WITH A RELIABLE TRANSPORTATION SYSTEM

Improving congested roadways benefits the movement of people and goods. Projects will be evaluated based on how well they improve travel conditions along a roadway or intersection during peak hour.

Road Segment

Total Travel Time (50 points)

For road segment projects, points will be assigned based on the reduction in total travel time in seconds during peak hour. The change in total travel time is derived from the project length, peak hour volume, and speed (before and after improvements).

50 points	300,001+
47 points	150,001-300,000
45 points	75,001-150,000

40 points	25,001-75,000
30 points	5,001-25,000
20 points	2,501-5,000
Zero points	≤ 2,500

Intersection

Total Delay (50 points)
For intersection projects, points will be assigned based on the reduction in total vehicle delay in seconds during peak hour. The change in delay is derived from peak hour volume entering the intersection and delay per vehicle (before and after improvements).

50 points	60,001+
47 points	30,001-60,000
45 points	15,001-30,000
40 points	5,001-15,000
30 points	1,001-5,000
20 points	501-1,000
Zero points	≤ 500

SUPPORT QUALITY JOB DEVELOPMENT

Access to jobs is an important function of the transportation system. The *OnTheMap* tool is derived from census data and will be used to assess where workers are employed in the region. Employment density will be used as a metric in determining how important improvements to transportation facilities are in the surrounding area.

5 points	High jobs/sq. mile
4 points	Medium-high jobs/sq. mile
3 points	Medium jobs/sq. mile
2 points	Medium-low jobs/sq. mile
Zero points	Low jobs/sq. mile

STRENGTHEN INTERMODAL CONNECTIONS

This measure relates to *Connected2045*'s goal of supporting freight movement and connectivity by ensuring resilient access to freight job centers by all modes. The two metrics below will be used to evaluate how the proposed project safely improves freight movement to freight intensive industries.

Commercial Vehicle Countermeasure (3 points)
Projects that include a commercial vehicle countermeasure that improves freight efficiency, security, or safety will earn points under this metric. Common techniques related to commercial vehicle accommodations include improving shoulder width and pavement structure, intersection design, parking, acceleration/deceleration lanes, truck and car separation, accommodating tonnage requirements, and increasing overpass clearances.

3 points	Project improves freight movement with appropriate commercial vehicle countermeasures.
Zero points	Project does not include commercial vehicle countermeasures.

Freight Proximity (2 points)
In 2013, EWG completed the St. Louis Regional Freight Study. The study identified key industrial areas that influence the freight industry in the St. Louis region. Industrial site areas are centers of employment and are connected by a series of transportation networks. Projects that improve access to an industrial site area or a freight facility will earn points under this metric. To receive points under this metric, the project must score points under the first metric, commercial vehicle countermeasure.

2 points Project meets one of the following criteria:

- Improves freight access into, out of, or within an industrial site area.
- Improves freight access to an intermodal freight facility, serves a major freight generator, logistic center, manufacturing and warehouse industrial land, or navigable waterway or port facility, or other freight intensive industry.

AIR QUALITY & ENVIRONMENT ASSETS

Transportation projects should limit the impacts on the natural environment. The first metric evaluates the incorporation of green infrastructure to reduce environmental impacts. The second metric evaluates the project's impact on air quality benefits.

Environment (1 point)
Green infrastructure is a design approach to managing stormwater, the urban heat island effect, public health, and air quality. Sustainable stormwater management treats and slows runoff from impervious roadways, sidewalks, and building surfaces. Examples of green infrastructure include bioswales, rain gardens, pervious pavement, and green bulb-outs. For more information on green infrastructure, view: https://www.epa.gov/green-infrastructure.

1 point	Project includes green infrastructure elements.
Zero points	Project does not include green infrastructure.

Air Quality (9 points)
A major objective of the transportation planning process is to ensure that the projects in the TIP help to reduce, where possible, and minimize the air quality impacts of transportation projects in accordance with federal, state, and local air quality standards, regulations, and priorities. The St. Louis region is in maintenance of the 2008 eight-hour ozone standard and portions of the region are in marginal non-attainment for the 2015 eight-hour ozone standard.

To measure the project's impact on air quality, an analysis will be performed to determine the emissions reduction of the precursors of ground-level ozone formation (volatile organic compounds and oxides of nitrogen will be averaged).

9 points	0.41+ kg/day
7 points	0.081-0.4 kg/day
5 points	0.031-0.08 kg/day
3 points	0.011-0.03 kg/day
Zero points	0-0.01 kg/day

Safety Project Type

Table 8 outlines the scheme for evaluating safety projects. Safety projects are assessed for six out of the 10 criteria and include 11 metrics. Further information on the metrics used to evaluate safety projects follows.

Table 8: Safety Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**	**Points**
(1) Preserve & Maintain the Existing System	Road or bridge condition	PASER rating or bridge sufficiency rating	8 (avg)
	ITS condition	Preserving ITS components	
	Safety hardware condition	Preserving safety hardware	
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Multimodal accommodation	Elements of other modes being implemented as part of the project	10
(3) Support Neighborhoods & Communities	Addressing social equity	Project falls in or partially located in an Environmental Justice area	4
(4) Foster a Vibrant Downtown & Central Core	n/a	n/a	n/a
(6) Promote Safety	Safety countermeasures and benefit cost	1. Total crash rate	10
		2. Fatal & serious injury crash rate	10
		3. Benefit/cost analysis	50
(7) Support a Diverse Economy with a Reliable System	n/a	n/a	n/a
(8) Support Quality Job Development	n/a	n/a	n/a
(9) Strengthen Intermodal Connections	Regional freight significance	1. Commercial vehicle countermeasure	3
		2. Freight proximity	2
		3. Regional transportation significance	3
(10) Protect Air Quality & Environmental Assets	n/a	n/a	n/a

Preserve & Maintain the Existing System

Projects will be assessed in terms of how they contribute to the preservation of existing infrastructure assets. The first metric evaluates the condition of the pavement or bridge. Sponsors can score points under preservation if they are improving the condition of the facility. Roadways or bridges with low pavement/sufficiency ratings will receive a higher preservation score. The second metric relates to the replacement of ITS components. The third metric relates to the replacement of safety components. If the sponsor receives points in at least two of the three metrics, the scores of the metrics will be averaged.

Road or Bridge Condition (8 points)

Pavement condition will be assessed using the Pavement Surface Evaluation and Rating (PASER) Guide. PASER ratings range from 1-10, with 1 being 'very poor' condition and 10 being 'excellent' condition.

8 points	PASER 2.5 or less
6 points	PASER 2.6-3.5
4 points	PASER 3.6-5.5
2 points	PASER 5.6-7.5
1 point	PASER 7.6-8.5
Zero points	PASER 8.6-10

Bridge conditions will be assessed using the bridge sufficiency rating system approved by FHWA. Bridge sufficiency ratings range from 0-100, with 0 being 'completely deficient' and 100 being a 'new' bridge. State DOTs calculate the ratings based on several factors, including: width, vertical clearance, load capacity, essentiality for public use, and structural safety.

8 points	Bridge sufficiency rating 0-39.9 (very poor)
6 points	Bridge sufficiency rating 40-49.9 (poor)
4 points	Bridge sufficiency rating 50-59.9 (fair)
2 points	Bridge sufficiency rating 60-79.9 (good)
Zero points	Bridge sufficiency rating 80-100 (excellent)

ITS Components (8 points)
Project can earn points if existing ITS components will be preserved, repaired, improved, or upgraded (e.g., signals, traffic sensors). To receive points, the ITS components must be within the project limits.

8 points	Existing ITS components are inoperable or require repairs, improvements, or upgrades.

Safety Hardware (8 points)
Project can earn points if existing safety hardware will be repaired, improved, or upgraded (e.g., signage, guardrails, crash cushion). To receive points, the safety hardware must be within the project limits.

8 points	Existing safety hardware requires repairs, improvements, or upgrades.

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

This measure relates to *Connected2045*'s goal of fostering a multimodal transportation system. Incorporating bicycle and pedestrian facilities in road projects is an efficient and cost-effective way for communities to create multimodal networks. In addition, road projects can provide multiple benefits to public transit, including better mobility for transit vehicles and better access for users of all ages and abilities.

EWG encourages context-sensitive facilities and taking a flexible approach to achieving multimodal transportation networks. Projects can score up to 10 points for the following features being included in and newly constructed by the project. Projects that score over the 10 points will be capped at 10 points. **Note**: a project does not need to satisfy all improvements listed below to earn points.

Facility Type	
6 points	Corrects existing sidewalk deficiencies along entire limits (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' sidewalks (residential) or 8' sidewalks (commercial) on both sides of road; OR **4 points** if project corrects existing sidewalk deficiencies along entire limits or new 5' sidewalks (residential) or 8' sidewalks (commercial) on one side of road.
3 points	Partial sidewalk slab replacements to a > 5' sidewalk on both sides of road; OR **2 points** for partial sidewalk slab replacements to a > 5' sidewalk on one side of road. *
2 points	Partial sidewalk slab replacements to a < 5' sidewalk on both sides of road; OR **1 point** for partial sidewalk slab replacements to a < 5' sidewalk on one side of road. *
2 points	Reconstruction of curb ramps. **Note**: to receive these points, the curb ramps must connect to a non-deficient pedestrian facility.
8 points	10' to 14' shared-use path or physically protected bike lanes; OR **6 points** for 8' to < 10' shared-use path.
6 points	Buffered bike lanes on roads at 40 mph or less; OR **5 points** for buffered bike lanes on roads at 45 mph.

4 points	Conventional bike lanes on roads at 30 mph or less; OR **2 points** for conventional bike lanes on roads at 35 mph.
4 points	4' to 8' paved shoulders.
Transit / Land Use	
2 points	Project is located on a transit route.
2 points	Physical improvements to transit system (e.g., benches, ADA landing pads, shelters, bike racks); OR **1 point** for new or upgraded bicycle and/or pedestrian facility connection to transit system. **
2 points	New or upgraded bicycle and/or pedestrian connection to activity center in areas that do not have transit proximity. **
2 points	New or upgraded bicycle and/or pedestrian facility directly touching school property (grades K-12 and college/university); OR **1 point** if new or upgraded bicycle and/or pedestrian facility is within ½ mile of school. **
Safety / Design / Crossing Treatments	
3 points	Safety improvements to at-grade rail crossing.
3 points	Extensive speed or volume control solutions to reduce modal conflicts (e.g., road diet, bulb-outs, speed humps, raised refuge islands/medians, reduced curb radii); OR **1 point** for minimal speed or volume solutions. ***
3 points	Extensive crossing treatments at intersections or uncontrolled locations (e.g., pedestrian countdown signals, high visibility crosswalks (continental or ladder style), raised crosswalks, Rectangular Rapid Flashing Beacon (RRFB), Pedestrian Hybrid Beacon (PHB), bicycle intersection crossing markings); OR **1 point** for minimal crossing treatments. ***
1 point	Pedestrian-scale lighting along bicycle/pedestrian facility.
1 point	Landscaped buffer between roadway and sidewalk on roads at 35 mph and over.
1 point	Physical or innovative improvements to the bicycle network (i.e., bicycle-friendly grates, bike racks, bike boxes).

*If project includes sidewalk slab replacements, the entire facility along the project corridor must be ADA compliant. A passing space is to be provided at intervals no greater than 200' for sidewalks widths less than 5'.
**To receive points, the new or upgraded bicycle and/or pedestrian facility must be low-stress and/or have no deficiencies.
***Points assigned based on the application of countermeasure(s) and the speed, volume, and configuration of the roadway. For example: for a four-lane roadway with an AADT exceeding 9,000 at 40 mph, a marked midblock high visibility crosswalk alone is insufficient and the treatment should occur in conjunction with other substantial safety and crossing improvements.

Support Neighborhoods & Communities

This measure is included to account for projects that are located in Environmental Justice (EJ) areas. The purpose of EJ is to focus federal attention on the environmental and human health effects of federal actions on minority or low-income populations with the goal of achieving environmental protection for all communities. EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability. The EJ policy ensures that populations that have traditionally been underserved have safe access to community resources and meaningful choices in transportation. Census data and GIS analysis is used to determine if the project is located in an EJ area. A map of the EJ areas is provided in **Appendix A**.

4 points	Project falls in, or partially in, an EJ area with high concentration of low-income persons or minorities.
3 points	Project falls in, or partially in, an EJ area with high concentration of zero-vehicle households.
1 point	Project falls in, or partially in, an EJ area with high concentration of seniors or persons with a disability.
Zero points	Project is not located in an EJ area or project imposes a burden on EJ area.

PROMOTE SAFETY

EWG is focusing on lowering the number of fatalities and serious injuries caused by vehicle crashes. To meet this goal, all projects should strive to correct safety issues in high-crash locations or use a systemic approach to address future crashes. The two metrics relate to the current conditions on the roadway by looking at the total crash rate and the fatal and serious injury crash rate. This helps prioritize projects that are in locations experiencing a current problem. To receive points under metric one (total crash rate) and metric two (fatal and serious injury crash rate), the project must include a safety countermeasure that addresses the current safety problem. The third metric (benefit/cost analysis) quantifies the benefits resulting from a countermeasure and the project's total cost. Project sponsors must provide five years of crash data (2013-2017). Sponsors should provide the number of crashes and not the total number of injuries or people involved. The total crash rate and the fatal and serious injury crash rate will be calculated by EWG.

A list of countermeasures, and the associated Crash Modification Factor (CMF), is provided in **Appendix B**. Project sponsors may also utilize the FHWA Crash Modification Factors Clearinghouse website to identify possible safety countermeasures for roadway projects: http://www.cmfclearinghouse.org/.

Total Crash Rate (10 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

10 points	Top third
8 points	Middle third
6 points	Bottom third

Fatal and Serious Injury Crash Rate (10 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

10 points	Top third
8 points	Middle third
6 points	Bottom third

Preventive Countermeasures: if a project has no crashes on the project limits, but includes a preventive safety countermeasure, the project can receive six total points. If a project includes a preventive safety countermeasure, but does not address crashes occurring along the project limits, the project can receive six total points.

Benefit/Cost Analysis (50 points)

This metric compares all of the project's benefits associated with a countermeasure to the cost of implementing the countermeasure. Comprehensive costs are used for the benefit/cost analysis.

50 points	Benefit/cost ratio ≥ 7
47 points	Benefit/cost ratio ≥ 5 and < 7
45 points	Benefit/cost ratio ≥ 3 and < 5
43 points	Benefit/cost ratio ≥ 1 and < 3
40 points	Benefit/cost ratio ≥ 0 and < 1 (and identified in a safety plan/study)*
Zero points	Benefit/cost ratio = 0

*To receive 40 points, the location and/or safety countermeasure must be identified in the state's strategic highway safety plan, the respective county strategic highway plan, or a safety study that was completed for the specific project location.

STRENGTHEN INTERMODAL CONNECTIONS

This measure relates to *Connected2045*'s goal of supporting freight movement and connectivity by ensuring resilient access to freight job centers by all modes. The three metrics below will be used to evaluate how the proposed project safely improves freight movement to freight intensive industries, and how critical the route's location is to the regional transportation network.

Commercial Vehicle Countermeasure (3 points)

Projects that include a commercial vehicle countermeasure that improves freight efficiency, security, or safety will earn points under this metric. Common techniques related to commercial vehicle accommodations include improving shoulder width and pavement structure, intersection design, parking, acceleration/deceleration lanes, truck and car separation, accommodating tonnage requirements, and increasing overpass clearances.

3 points	Project improves freight movement with appropriate commercial vehicle countermeasures.
Zero points	Project does not include commercial vehicle countermeasures.

Freight Proximity (2 points)

In 2013, EWG completed the St. Louis Regional Freight Study. The study identified key industrial areas that influence the freight industry in the St. Louis region. Industrial site areas are centers of employment and are connected by a series of transportation networks. Projects that improve access to an industrial site area or a freight facility will earn points under this metric. To receive points under this metric, the project must score points under the first metric, commercial vehicle countermeasure.

2 points Project meets one of the following criteria:

- Improves freight access into, out of, or within an industrial site area.
- Improves freight access to an intermodal freight facility, serves a major freight generator, logistic center, manufacturing and warehouse industrial land, or navigable waterway or port facility, or other freight intensive industry.

Regional Transportation Significance (3 points)

This measure evaluates how critical the route's location is to the regional network. Scoring is based on the functional classification of the road.

3 points	Principal or minor arterial.
2 points	Collector.
1 point	Local.

Active Transportation Project Type

Table 9 outlines the scheme for evaluating active transportation projects. Active transportation projects are assessed for six out of the 10 criteria and include 16 metrics. Further information on the metrics used to evaluate active transportation projects follows.

Table 9: Active Transportation Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**	**Points**
(1) Preserve & Maintain the Existing System	n/a	n/a	n/a
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Improved transit connections and linkages to existing facilities	1. Transit proximity	1
		2. Physical improvements to transit	2
		3. System connectivity	25
		4. Barrier elimination	2
(3) Support Neighborhoods & Communities	Connecting communities to opportunities	1. Project falls in or partially located in an Environmental Justice area	4
		2. Access to schools	6
		3. Access to community resources	5
		4. Access to cultural resources	2
		5. Planning efforts	5
(4) Foster a Vibrant Downtown & Central Core	Multimodal needs of residents and access to employment	Population and employment density	10
(6) Promote Safety	Bicycle & pedestrian level of stress/comfort and safety treatments	1. Number of crashes	2
		2. Pedestrian/bicycle facility type	24
		3. Safety and design improvements	4
		4. Pedestrian-scale lighting	1
		5. Crossing treatments	4
(7) Support a Diverse Economy with a Reliable System	n/a	n/a	n/a
(8) Support Quality Job Development	n/a	n/a	n/a
(9) Strengthen Intermodal Connections	n/a	n/a	n/a
(10) Protect Air Quality & Environmental Assets	Impact to the environment	Environmental infrastructure elements	3

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

Active transportation projects should enhance connections between neighborhoods and activity centers through access to transit and comprehensive bicycle and pedestrian facilities. The three metrics below will be used to evaluate the project's impact on transit access and connectivity.

Transit Proximity (1 point)

Bicycling and walking are complementary to transit. The Gateway Bike Plan states, "Targeting the provision of safe and convenient bicycle facilities such as lanes, trails, and bicycle parking can increase the service radius of a transit stop." The Federal Transit Administration (FTA) determined in a 2011 policy statement that all pedestrian improvements located within ½ mile and all bicycle improvements located within 3 miles of a public transportation stop or station shall have a *de facto* physical and functional relationship to public transportation.

1 point	Pedestrian project is located within ½ mile or bicycle project is within 3 miles of a bus stop, transfer center, or station.
Zero points	Project does not satisfy the above.

Physical Improvements to Transit (2 points)

A walking or bicycling trip can be longer if it involves transit. Bus stops that have access via sidewalks and appropriate street crossing locations ensure personal safety for pedestrians who use transit. In addition, improvements to transit infrastructure can encourage seniors or persons with a disability to utilize public transportation. Physical improvements to a bus stop include: landing pads, bus shelters, benches, bike racks, etc. Access improvements to public transportation include: sidewalks to transit facilities, removing obstructions blocking access, enhanced street crossings near bus stop, etc.

2 points	Project includes physical improvements to transit system (i.e., includes transit amenities).
1 point	Project includes new or upgraded sidewalk connection to public transportation <u>only</u> (i.e., does not include transit amenities).
Zero points	Project does not include any transit-related improvements.

System Connectivity (25 points)

System connectivity is a factor related to linking existing pedestrian or bicycle facilities to complete a network. This measure relates to *Connected2045*'s goal of providing comprehensive pedestrian and bicycle facilities, which allows opportunities for users to connect to intended destinations. Sidewalk projects will be evaluated based on its pedestrian connectivity, and bicycle projects will be evaluated based on its bicycle connectivity. If a sponsor proposes both pedestrian and bicycle facilities, the scores for each facility type will be averaged. Both the proposed and connecting segments will be analyzed in the evaluation.

25 points	Constructing a new facility that provides a *high* level of pedestrian/bicycle connectivity (e.g., sidewalk is connected to continuous sidewalks where there are significant opportunities for pedestrians to reach destination(s), bike facility closes a gap between two existing bicycle facilities, project provides a large coverage area for pedestrian/bicycle travel).
23 points	Upgrading an existing facility that provides a *high* level of pedestrian/bicycle connectivity (e.g., sidewalk is connected to continuous sidewalks where there are significant opportunities for pedestrians to reach destination(s), bike facility closes a gap between two existing bicycle facilities, project provides a large coverage area for pedestrian/bicycle travel).
20 points	Constructing a new facility that provides a *medium* level of pedestrian/bicycle connectivity (e.g., project connects on one end to an existing bicycle facility, sidewalk provides some opportunities for pedestrians, but adjacent physical gaps are still present where pedestrian travel is reasonably expected).
18 points	Upgrading an existing facility that provides a *medium* level of pedestrian/bicycle connectivity (e.g., project connects on one end to an existing bicycle facility, sidewalk provides some opportunities for pedestrians, but adjacent physical gaps are still present where pedestrian travel is reasonably expected).
15 points	Constructing a new facility or upgrading an existing facility that provides a *low* level of pedestrian/bicycle connectivity (e.g., no physical connections are established to existing facilities, but existing facility is within a ¼ mile radius).
5 points	Constructing a new facility that provides *no* pedestrian/bicycle connectivity (e.g., project is isolated with no existing facility within a ¼ mile radius).

Barrier Elimination (2 points)
Addressing gaps and barriers will improve network convenience and continuity. Physical barriers to walking and biking can be natural or man-made and include railroad corridors, rivers and streams, and freeways or multi-lane highways. The metric evaluates how the project will overcome physical barriers or system gaps. To receive points, the project must provide a connection to an existing facility.

2 points	Removal of a total barrier (i.e., a person physically cannot get to a location by walking or bicycling; there is no other reasonably direct, suitable route alternative within a ¼ mile radius).
1 point	Removal of a minor barrier (i.e., a person must take a less direct route than desirable - - within a ¼ mile radius).
Zero points	Project does not eliminate a barrier to walking and bicycling or no barrier present.

SUPPORT NEIGHBORHOODS & COMMUNITIES

Active transportation projects should connect communities to opportunities across the region. The five metrics below will be used to evaluate the project's impact on neighborhoods and communities.

Environmental Justice (4 points)
This measure is included to account for projects that are located in Environmental Justice (EJ) areas. The purpose of EJ is to focus federal attention on the environmental and human health effects of federal actions on minority or low-income populations with the goal of achieving environmental protection for all communities. EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability. The EJ policy ensures that populations that have traditionally been underserved have safe access to community resources and meaningful choices in transportation. Census data and GIS analysis is used to determine if the project is located in an EJ area. A map of the EJ areas is provided in **Appendix A**.

4 points	Project falls in, or partially in, an EJ area with high concentration of low-income persons or minorities.
3 points	Project falls in, or partially in, an EJ area with high concentration of zero-vehicle households.
2 points	Project falls in, or partially in, an EJ area with high concentration of seniors or persons with a disability.
Zero points	Project is not located in an EJ area.

Access to Schools (6 points)
This metric is included to account for projects that provide safe routes to schools (grades K-12 and college/university). Making bicycling and walking to school a safer and more appealing transportation choice encourages a healthy and active lifestyle from an early age.

6 points	Project provides direct access to a school.
3 points	Project is within ½ mile of a school.
Zero points	Project is not within a ½ mile of a school.

Access to Community Resources (5 points)
Transportation investments that connect residents to local community resources can have a profound impact on public health. This metric evaluates improved access to community resources. Examples of community resources include: parks, recreational facilities, medical centers, civic buildings, public libraries, grocery stores, etc.

5 points	Project provides direct access to multiple community resources
3 points	Project provides direct access to one community resource.
2 points	Project is within ½ mile of a community resource.
Zero points	Project does not provide access to a community resource.

Access to Cultural Destinations (2 points)
Promoting modes other than driving, such as biking and walking, to access cultural destinations can be beneficial to communities, especially when vehicle parking is limited. This metric evaluates improved pedestrian and/or bicycle access to a cultural destination (i.e., tourism destination, heritage/historic site, natural area).

2 points	Project provides direct access to a cultural destination.
Zero points	Project does not provide access to a cultural destination.

Planning (5 points)
This metric is included to identify and add significance to roadway segments or trail corridors that are identified in a locally adopted plan or has undergone a comprehensive planning process.

5 points	Project is specifically prioritized in a planning document or has been through a comprehensive planning process.
2 points	Project is consistent with planning document or Complete Streets policy.
Zero points	No planning documentation provided to support project.

FOSTER A VIBRANT DOWNTOWN & CENTRAL CORE

Improving access to and mobility within communities is a goal of *Connected2045*. Projects will be evaluated on how well they are served by pedestrian- and bicycle-supportive densities. A map of the population and employment index (PEI) is included in **Appendix A**.

10 points	Average PEI 4+
8 points	Average PEI 3-3.9
6 points	Average PEI 2-2.9
5 points	Average PEI 1-1.9
3 points	Average PEI < 1

PROMOTE SAFETY

Per the 2010 USDOT *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*, every transportation agency has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. The USDOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. The four metrics below will be used to evaluate the project's multimodal safety elements.

Number of Crashes (2 points)
This metric relates to *Connected2045*'s goal of creating a safe transportation system. Projects that improve locations with pedestrian and/or bicycle crashes will receive points if the project includes an appropriate safety countermeasure.

2 points	The project corridor has locations with pedestrian-involved or bicycle-involved crashes (2013-2017) AND project addresses the safety issue with an appropriate countermeasure.
Zero points	Project does not satisfy the above.

Pedestrian/Bicycle Facility Type (24 points)
Active transportation projects can include pedestrian facilities, bicycle facilities, or both. If a sponsor proposes both pedestrian and bicycle facilities, the scores for each facility type will be averaged.

Pedestrian facilities with a high-level of comfort will earn points under this metric.

24 points	Project corrects existing sidewalk deficiencies (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' (min) sidewalks (residential) or 8' (min) sidewalks (commercial) on both sides of road.
16 points	Project corrects existing sidewalk deficiencies (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' (min) sidewalks (residential) or 8' (min) sidewalks (commercial) on one side of COLLECTOR or LOCAL road.
14 points	Project corrects existing sidewalk deficiencies (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' (min) sidewalks (residential) or 8' (min) sidewalks (commercial) on one side of ARTERIAL road.
Zero points	Project does not satisfy the above.

Bicycle facilities with a low-level of stress will earn points under this metric.

24 points	Physically protected bike lanes or 10' to 14' shared-use path (min); OR **16 points** for 8' to < 10' shared-use path.
18 points	Buffered bike lanes on roads at 40 mph or less; OR **14 points** for buffered bike lanes on roads at 45 mph.
16 points	Bicycle boulevard incorporating directional markings and wayfinding signage on roads at 25 mph or less.
12 points	Conventional bike lanes on roads at 30 mph or less; OR **6 points** for conventional bike lanes on roads at 35 mph.
Zero points	Project does not satisfy the above OR project proposes a high-stress bicycle facility (zero points will be included in facility type average).

Safety and Design Improvements (5 points)
Safety and design improvements can improve stress levels for bicyclists and comfort levels for pedestrians. Examples of safety and design improvements include: at-grade rail crossing improvements, bulb-outs, speed humps, raised refuge islands/medians, sidewalk/roadway buffer on roads at 35 mph and over, reduced curb radii, etc. Projects can earn up to four points for incorporating safety measures. Points assigned based on the application of countermeasure(s) and the speed, volume, and configuration of the roadway. For example: one bulb-out alone along a corridor may provide minimal safety whereas providing multiple bulb-outs in combination with other traffic calming strategies may provide optimal safety conditions for people walking and/or biking.

4 points	Project incorporates extensive safety measures to reduce modal conflicts.
1 point	Project incorporates minimal safety measures.
Zero points	Project does not incorporates safety measures.

Pedestrian-Scale Lighting (1 point)
Pedestrian-scale lighting can increase comfort, security, and safety. Projects can earn one point for including pedestrian-scale lighting. **Note**: overhead cobra-head lamps provide baseline standards for lighting the sidewalk, but this type of lighting does not enhance pedestrian safety. For more information on pedestrian-scale lighting, view: http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=8.

1 point	Project includes pedestrian-scale lighting along pedestrian/bicycle facility.
Zero points	Project does not include pedestrian-scale lighting.

Crossing Treatments (4 points)
Design for intersections should reduce conflict between pedestrians/bicyclists and vehicles by heightening the level of visibility and indicating a clear right-of-way. Examples of crossing treatments include: pedestrian countdown timers, high visibility crosswalk markings and signs, raised crosswalks, Rectangular Rapid Flash Beacon (RRFB), Pedestrian Hybrid Beacon (PHB), bicycle intersection crossing markings, etc. Pedestrian and bicycle projects must have logical termini. Projects can earn up to four points for incorporating crossing treatments. Points are assigned depending on the application of countermeasure(s) and the speed, volume, and configuration of the roadway. For example: for a four-lane roadway with an AADT exceeding 9,000 at 40 mph, a marked midblock high visibility crosswalk alone is insufficient and the treatment should occur in conjunction with other substantial crossing improvements.

Note: enhanced brick crosswalks can be more attractive than continental crosswalks, however their visibility is less than that of continental crosswalks, textured surfaces can be difficult for wheelchairs, and the cost of maintenance must also be considered. For guidance on pedestrian safety at uncontrolled crossing locations, view: https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf.

4 points	Project incorporates extensive crossing treatments at intersections or uncontrolled locations.
1 point	Project incorporates minimal crossing treatments at intersections or uncontrolled locations.
Zero points	No crossing treatments where warranted.

PROTECT AIR QUALITY & ENVIRONMENTAL ASSETS

Transportation projects should limit the impacts on the natural environment. Green infrastructure is a design approach to managing stormwater, the urban heat island effect, public health, and air quality. Sustainable stormwater management treats and slows runoff from impervious roadways, sidewalks, and building surfaces. Examples of green infrastructure include bioswales, rain gardens, pervious pavement, and green bulb-outs. For more information on green infrastructure, view: https://www.epa.gov/green-infrastructure.

3 points	Project includes multiple green infrastructure elements.
1 point	Project includes one green infrastructure element.
Zero points	Project does not include green infrastructure.

Transit Project Type – Asset Management and System Upgrades

Table 10 outlines the scheme for evaluating transit asset management and system upgrades projects. Transit asset management and system upgrades projects are classified as either vehicle replacements or system upgrades, which can include transit station/stop upgrades, transit maintenance facilities, etc. Both project types are assessed for eight out of the 10 criteria. Vehicle replacements include eight metrics and system upgrade projects include nine metrics. Further information on the metrics used to evaluate transit asset management and system upgrades projects follows.

Table 10: Transit Asset Management & System Upgrades Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**		**Points**
(1) Preserve & Maintain the Existing System	State of good repair	Vehicle replacements:	Average mileage of replacement vehicles	45
		System upgrades:	1. Asset condition	20
			2. Transit system connections	25
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Impact to service levels	Increase, expansion, or continuation of service		20
	First- and last-mile trip impacts	Multimodal options		4
(3) Support Neighborhoods & Communities	Addressing social equity	Project serves or located within Environmental Justice community		8
(4) Foster a Vibrant Downtown & Central Core	Multimodal needs of residents and access to employment	Access improvements in central core		1
(6) Promote Safety	Improved safety	Safety and/or security elements at facilities or on transit vehicles		7
(7) Support a Diverse Economy with a Reliable System	Service and customer improvements	ITS elements or other service enhancing technologies		5
(8) Support Quality Job Development	n/a	n/a		n/a
(9) Strengthen Intermodal Connections	n/a	n/a		n/a
(10) Protect Air Quality & Environmental Assets	Impact to the environment	Zero- or low-emission bus replacements or environmental infrastructure elements		10

PRESERVE & MAINTAIN THE EXISTING SYSTEM

Maintaining transit assets and upgrading the system can help maintain and attract ridership and improve regional mobility. Transit asset management and system upgrades projects will be evaluated under this criterion depending on the type of project submitted: vehicle replacements or system upgrades. Vehicle replacements will be evaluated based on the average mileage of vehicles to be replaced. System upgrades will be evaluated by two metrics: the asset condition and the average weekday MetroLink boardings or average weekday boardings on bus route(s) directly connected to the project.

Vehicle Replacements

Average mileage of replacement vehicles (45 points)

This metric relates to the maintenance of the transit system. Preventive maintenance can extend the lifespan of buses. The average mileage of the vehicles to be replaced is the metric used to evaluate preservation of the system. Vehicles and facilities must meet or exceed their useful life by the fiscal year federal funds are programmed.

Light-duty vehicles:

45 points	Average mileage of vehicles to be replaced is 250,001+.
40 points	Average mileage of vehicles to be replaced is 150,001-250,000.
35 points	Average mileage of vehicles to be replaced is ≤ 150,000.

Medium size, light-duty transit buses:

45 points	Average mileage of vehicles to be replaced is 300,001+.
40 points	Average mileage of vehicles to be replaced is 200,001-300,000.
35 points	Average mileage of vehicles to be replaced is ≤ 200,000.

Medium-duty transit buses:

45 points	Average mileage of vehicles to be replaced is 350,001+.
40 points	Average mileage of vehicles to be replaced is 250,001-350,000.
35 points	Average mileage of vehicles to be replaced is ≤ 250,000.

Small, heavy-duty transit buses, 30':

45 points	Average mileage of vehicles to be replaced is 500,001+.
40 points	Average mileage of vehicles to be replaced is 400,001-500,000.
35 points	Average mileage of vehicles to be replaced is ≤ 400,000.

Large, heavy-duty transit buses and articulated buses, 35'-40' or larger:

45 points	Average mileage of vehicles to be replaced is 650,001+.
40 points	Average mileage of vehicles to be replaced is 550,001-650,000.
35 points	Average mileage of vehicles to be replaced is ≤ 550,000.

System Upgrades

Asset Condition (20 points)
FTA uses the Transit Economic Requirements Model (TERM) 5-point scale to evaluate asset condition and transit agencies must use this scale to report asset condition to the National Transit Database. Projects that demonstrate a greater need will receive more points.

20 points	Asset has a condition rating of 2.9 or below (poor/marginal) on the FTA TERM scale OR infrastructure has a performance restriction.
15 points	Asset has a condition rating of 3.0-3.9 (adequate) on the FTA TERM scale.
10 points	Asset has a condition rating of 4.0+ (good/excellent) on the FTA TERM scale OR project includes bus stop enhancement only.

Transit system connections (25 points)
Projects will be prioritized based on the average weekday MetroLink boardings or average weekday boardings on the bus route(s) directly connected to the project. Projects affecting a larger number of passenger trips will have a greater impact than projects affecting fewer passenger trips.

25 points	≥ 20,000 average weekday boardings.
23 points	10,000-19,999 average weekday boardings.
20 points	5,000-9,999 average weekday boardings.
18 points	3,000-4,999 average weekday boardings.
15 points	1,000-2,999 average weekday boardings.
10 points	500-999 average weekday boardings.
5 points	≤ 499 average weekday boardings.

To calculate the number of boardings, use the following:

- Bus stops: use the ratio of average weekday boardings of the line to the number of stops on the line multiplied by the number of stops impacted. If passenger counts are available for individual stops, use the sum of the average weekday boardings for each stop impacted.
- MetroLink station: use the sum of the average weekday boardings for each station impacted.
- Transfer centers / transit maintenance facility / infrastructure (e.g., tunnels, bridges): use the average weekday ridership of route(s) directly connected to project.
- Park and ride lots: use the number of passengers boarding at the park and ride lot.

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

Impact to Service Levels (20 points)
Ensuring a good state of repair of transit assets and system upgrades has a direct impact on maintaining the existing transit ridership base. Transit ridership is a reflection of vehicle condition, scheduling and operations, and access. Projects that will significantly increase service levels will receive more points than projects that only maintain service. Sponsors must demonstrate that failure to replace or upgrade will negatively impact service levels by documenting inadequate asset availability and the related delays on the route.

20 points	Project provides a 10% or higher increase in service levels along route.
17 points	Project provides at least a 5% but less than 10% increase in service levels along route.
13 points	Project is necessary to preserve the viability of existing service.
Zero points	Failure to replace or upgrade asset(s) will not cause any decreases in service levels.

First- and Last-Mile Trip Options (4 points)
A goal of *Connected2045* is to create viable alternatives to private automobile travel. Biking and walking provide critical first- and last-mile connections to transit. Project sponsors will be required to provide information on any bicycle or pedestrian elements that are included as part of the total project and how they improve multimodal access. Examples of multimodal elements include bike racks on buses or at facilities, bicycle/pedestrian access to facilities, passenger wayfinding, and stop/station design.

4 points	Project includes multimodal infrastructure.
2 points	Project includes multimodal equipment only.

Zero points	Project does not include any multimodal elements or equipment.

Support Neighborhoods & Communities

This measure is included to account for projects that serve Environmental Justice (EJ) populations. Project sponsors will be required to provide information on how the project serves EJ populations.

8 points	Project serves an EJ population or is located within an EJ area.
Zero points	Project does not serve an EJ population or is not located within an EJ area.

Foster a Vibrant Downtown & Central Core

Improving access to and mobility within the central core is a goal of *Connected2045*. Project sponsors will be required to provide information on how the transit project improves access to the central core.

1 point	Project improves access to or mobility within the central core.
Zero points	Project does not serve the central core.

Promote Safety

This criterion relates to *Connected2045*'s goal of creating a safer transportation system. This metric evaluates the impact the project will have on safety and security.

7 points	Project is a safety critical transit project OR project incorporates safety technology (e.g., object detection or collision warning systems) to reduce transit vehicle crashes.
5 points	Safety and/or security measures at facility, station, and/or stop (lighting, cameras, emergency call stations, etc.).
3 points	Measures to provide safe services on vehicles for passengers (interior/exterior cameras, audio equipment, low-floor/kneeling buses, extendable ramps, wheelchair securement, etc.).
Zero points	Project does not include safety measures.

Support a Diverse Economy with a Reliable Transportation System

Deployment of ITS technologies can improve the operation and service of a transit network. This metric evaluates the integration of ITS technologies. Projects that include both operation and service enhancing ITS technologies will receive five points.

5 points	Projects incorporates the use of ITS to enhance operations and passenger information/ experience.
3 points	Project incorporates the use of ITS to enhance operations (automated vehicle technology, transit signal priority, etc.).
2 points	Project incorporates the use of ITS to enhance passenger information/experience (onboard voice and digital announcements of next stop information, real time bus arrival information, etc.).
Zero points	Project does not include ITS enhancing technologies to enhance operations or passenger information/experience.

PROTECT AIR QUALITY & ENVIRONMENTAL ASSETS

Transportation projects should limit the impacts on the natural environment. The project's air quality benefits or the integration of green infrastructure will be evaluated. Replacing diesel buses with zero- or low-emission buses has a positive benefit on air quality. Replacing older diesel buses with newer buses can also provide air quality benefits. Incorporating green infrastructure into transit street design also provides positive benefits to the natural environment. Examples of green infrastructure include bioswales, rain gardens, pervious pavement, and green bulb-outs. For more information on green infrastructure, view: https://www.epa.gov/green-infrastructure. A maximum of ten points are available under this criterion.

10 points	Project replaces bus with zero-emission bus (e.g., electric).
7 points	Project replaces bus with low-emission bus (e.g., hybrid, CNG, LNG).
5 points	Project incorporates green infrastructure at facilities.
4 points	Project replaces older diesel bus with a new diesel bus.
Zero points	Project does not provide air quality benefits.

Transit Project Type – Transit Expansion

Table 11 outlines the scheme for evaluating transit expansion projects. Transit expansion projects are classified as either an adding capacity project or a geographic expansion project. Adding capacity projects are assessed for eight out of the 10 criteria and include eight metrics. Geographic expansion projects are assessed for seven out of the 10 criteria and include eight metrics. Further information on the metrics used to evaluate transit expansion projects follows.

Table 11: Transit Expansion Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**		**Points**
(1) Preserve & Maintain the Existing System	n/a	n/a		n/a
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Project impact to system	Adding capacity:	Ridership	60
		Geographic expansion:	1. Population and employment density	30
			2. Transit service frequency	35
	First- and last-mile trip impacts	Multimodal options		4
(3) Support Neighborhoods & Communities	Addressing social equity	Project serves or located within Environmental Justice community		8
(4) Foster a Vibrant Downtown & Central Core	Multimodal needs of residents and access to employment	Access improvements in central core		1
(6) Promote Safety	Improved safety	Safety and/or security elements at facilities or on transit vehicles		7
(7) Support a Diverse Economy with a Reliable System	Service and customer improvements	ITS elements or other service enhancing technologies		5
(8) Support Quality Job Development	Access to jobs	Adding capacity:	Job density	5
		Geographic expansion:	n/a	n/a
(9) Strengthen Intermodal Connections	n/a	n/a		n/a
(10) Protect Air Quality & Environmental Assets	Impact to the environment	Zero- or low-emission bus replacements or environmental infrastructure elements		10

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

Transit expansions can help reduce congestion and improve regional mobility by improving reliability and access for more people to more locations. Transit expansion projects will be evaluated under this criterion depending on the type of project submitted: adding capacity or geographic expansion. Projects that add capacity to the existing system will be evaluated based on the percent increase in ridership. Projects that propose to expand the service area will be evaluated by two metrics: the area served in terms of population and employment and the service frequency proposed.

Adding Capacity

Ridership (60 points)

Improving frequency can help to increase annual transit boardings system-wide. It has been documented that an increase in frequency corresponds to increases in ridership. Projects that propose to add capacity to the system will be evaluated by the extent to which it is likely to result in increased transit ridership.

60 points	Project provides 10% or higher increase in ridership along route.
55 points	Project provides 8 to < 10% increase in ridership along route.
50 points	Project provides 6 to < 8% increase in ridership along route.

40 points	Project provides 4 to < 6% increase in ridership along route.
30 points	Project provides 2 to < 4% increase in ridership along route.
Zero points	Project provides less than 2% increase in ridership along route.

Geographic Expansion

Population and employment density (30 points)
Implementing transit expansion projects where existing land uses best support the project's success is the key metric under this criterion. EWG developed a population and employment index (PEI) to evaluate potential ridership. Expansion projects that are located in supportive residential and employment densities will score higher. Points will be assigned based on the average score of a buffer of 0.5 miles of a non-express bus route and a buffer of 1 mile of an express bus stop. A map of the PEI is included in **Appendix A**.

30 points	Average PEI 4+
28 points	Average PEI 3-3.9
25 points	Average PEI 2-2.9
20 points	Average PEI 1-1.9
15 points	Average PEI < 1

Transit service frequency (35 points)
In addition to evaluating the PEI, geographic expansion projects will also be evaluated by the frequency of the service for peak (6-9 am and 3-6 pm), off-peak, and weekend periods.

35 points	8+/hour weekday peak, 5+/hour weekday off-peak, 2+/hour weekend
33 points	6+/hour weekday peak, 3+/hour weekday off-peak, 2+/hour weekend
30 points	4+/hour weekday peak, 2+/hour weekday off-peak, 1/hour weekend
20 points	2+/hour weekday peak, 1+/hour weekday off-peak, 1/hour weekend
10 points	Weekday service <u>only</u>

Adding Capacity and Geographic Expansion

First- and Last-Mile Trip Options (4 points)
A goal of *Connected2045* is to create viable alternatives to private automobile travel. Biking and walking provide critical first- and last-mile connections to transit. Project sponsors will be required to provide information on any bicycle or pedestrian elements that are included as part of the total project and how they improve multimodal access. Examples of multimodal elements include bike racks on buses or at facilities, bicycle/pedestrian access to facilities, and stop/station design.

4 points	Project includes multimodal infrastructure.
2 points	Project includes multimodal equipment <u>only</u>.
Zero points	Project does not include any multimodal elements or equipment.

Support Neighborhoods & Communities

This measure is included to account for projects that serve Environmental Justice (EJ) populations. Project sponsors will be required to provide information on how the project serves EJ populations.

8 points	Project serves an EJ population or is located within an EJ area.
Zero points	Project does not serve an EJ population or is not located within an EJ area.

Foster a Vibrant Downtown & Central Core

Improving access to and mobility within the central core is a goal of *Connected2045*. Project sponsors will be required to provide information on how the transit project improves access to the central core.

1 point	Project improves access to or mobility within the central core.
Zero points	Project does not serve the central core.

Promote Safety

This criterion relates to *Connected2045*'s goal of creating a safer transportation system. This metric evaluates the impact the project will have on safety and security.

7 points	Project incorporates safety technology (e.g., object detection or collision warning systems) to reduce transit vehicle crashes.
5 points	Safety and/or security measures at facility, station, and/or stop (lighting, cameras, emergency call stations, etc.).
3 points	Measures to provide safe services on vehicles for passengers (interior/exterior cameras, audio equipment, low-floor/kneeling buses, extendable ramps, wheelchair securement, etc.).
Zero points	Project does not include safety measures.

Support a Diverse Economy with a Reliable Transportation System

Deployment of ITS technologies can improve the operation and service of a transit network. This metric evaluates the integration of ITS technologies. Projects that include <u>both</u> operation and service enhancing ITS technologies will receive five points.

5 points	Projects incorporates the use of ITS to enhance operations <u>and</u> passenger information/ experience.
3 points	Project incorporates the use of ITS to enhance operations (automated vehicle technology, transit signal priority, etc.).
2 points	Project incorporates the use of ITS to enhance passenger information/experience (onboard voice and digital announcements of next stop information, real time bus arrival information, etc.).
Zero points	Project does not include ITS enhancing technologies to enhance operations or passenger information/experience.

SUPPORT QUALITY JOB DEVELOPMENT – *ADDING CAPACITY ONLY*

Access to jobs is an important function of the transportation system. The *OnTheMap* tool is derived from census data and will be used to assess where workers are employed in the region. Employment density will be used as a metric in determining how important transit improvements are in the surrounding area.

5 points	High jobs/sq. mile
4 points	Medium-high jobs/sq. mile
3 points	Medium jobs/sq. mile
2 points	Medium-low jobs/sq. mile
Zero points	Low jobs/sq. mile

PROTECT AIR QUALITY & ENVIRONMENTAL ASSETS

Transportation projects should limit the impacts on the natural environment. The project's air quality benefits or the integration of green infrastructure will be evaluated. Zero- or low-emission buses have a positive benefit on air quality. Incorporating green infrastructure into transit street design also provides positive benefits to the natural environment. Examples of green infrastructure include bioswales, rain gardens, pervious pavement, and green bulb-outs. For more information on green infrastructure, view: https://www.epa.gov/green-infrastructure. A maximum of ten points are available under this criterion.

10 points	Project incorporates zero-emission bus (e.g., electric).
7 points	Project incorporates low-emission bus (e.g., hybrid, CNG, LNG).
5 points	Project incorporates green infrastructure at facilities.
Zero points	Project does not provide air quality benefits.

Freight/Economic Development Project Type

Table 12 outlines the scheme for evaluating freight/economic development projects. Projects are classified as either those that improve the flow of freight or those that promote economic development. Freight projects are assessed for eight out of the 10 criteria and include 11 metrics. Economic development projects are assessed for eight out of the 10 criteria and include 12 metrics. Further information on the metrics used to evaluate freight/economic development projects follows.

Table 12: Freight/Economic Development Project Type Evaluation Scheme

***Connected2045* Guiding Principles (Criteria)**	**Measure**	**Metric**		**Points**
(1) Preserve & Maintain the Existing System	Road or bridge condition	PASER rating or bridge sufficiency rating		5 (avg)
	ITS condition	Preserving ITS components		
Multimodal: (2) Support Public Transportation / (5) Provide More Transportation Choices	Multimodal accommodation	Elements of other modes being implemented as part of the project		10
(3) Support Neighborhoods & Communities	Addressing social equity	Project falls in or partially located in an Environmental Justice area		4
(4) Foster a Vibrant Downtown & Central Core	n/a	n/a		n/a
(6) Promote Safety	Safety countermeasures	1. Total crash rate		5
		2. Fatal & serious injury crash rate		5
(7) Support a Diverse Economy with a Reliable System	Travel time reliability	1. Planning Time Index and Travel Time Index (avg) or volume/capacity		10 (avg)
		2. Strategy		
(8) Support Quality Job Development	Access to jobs	Freight:	n/a	n/a
		Economic development:	1. Average income of industry supported	30
			2. Number of jobs created	20
			3. Cost per job created	10
(9) Strengthen Intermodal Connections	Intermodal significance	Freight:	1. Project located within an industrial site area	25
			2. Provides connection to intermodal facility and commercial vehicle countermeasure	35
		Economic development:	n/a	n/a
(10) Protect Air Quality & Environmental Assets	Impact to the environment	Environmental infrastructure elements		1

Preserve & Maintain the Existing System

In order to preserve and maintain the existing transportation system, projects will be assessed in terms of how they contribute to the preservation of existing infrastructure assets. The first metric evaluates the condition of the pavement or bridge. Sponsors can score points under preservation if they are improving the condition of the facility. Roadways or bridges with low pavement/sufficiency ratings will receive a higher preservation score. The second metric relates to the replacement of ITS components. If the sponsor receives points in the first metric and the second metric, the scores of the two metrics will be averaged.

Pavement/Bridge Condition (5 points)

Pavement condition will be assessed using the Pavement Surface Evaluation and Rating (PASER) Guide, which is a visual rating system. PASER ratings range from 1-10, with 1 being 'very poor' condition and 10 being 'excellent' condition.

5 points	PASER 2.5 or less
4 points	PASER 2.6-3.5
3 points	PASER 3.6-5.5
2 points	PASER 5.6-7.5
1 point	PASER 7.6-8.5
Zero points	PASER 8.6-10

Bridge conditions will be assessed using the bridge sufficiency rating system approved by FHWA. Bridge sufficiency ratings range from 0-100, with 0 being 'completely deficient' and 100 being a 'new' bridge. State DOTs calculate the ratings based on several factors, including: width, vertical clearance, load capacity, essentiality for public use, and structural safety.

5 points	Bridge sufficiency rating 0-39.9 (very poor)
4 points	Bridge sufficiency rating 40-49.9 (poor)
3 points	Bridge sufficiency rating 50-59.9 (fair)
2 points	Bridge sufficiency rating 60-79.9 (good)
Zero points	Bridge sufficiency rating 80-100 (excellent)

ITS Components (5 points)
Project can earn points if existing ITS components will be preserved, repaired, improved, or upgraded (e.g., signals, traffic sensors). To receive points, the ITS components must be within the project limits.

5 points	Existing ITS components are inoperable or require repairs, improvements, or upgrades.

MULTIMODAL: SUPPORT PUBLIC TRANSPORTATION / PROVIDE MORE TRANSPORTATION CHOICES

This measure relates to *Connected2045*'s goal of fostering a multimodal transportation system. Incorporating bicycle and pedestrian facilities in road projects is an efficient and cost-effective way for communities to create multimodal networks. In addition, road projects can provide multiple benefits to public transit, including better mobility for transit vehicles and better access for users of all ages and abilities.

EWG encourages context-sensitive facilities and taking a flexible approach to achieving multimodal transportation networks. Projects can score up to 10 points for the following features being included in and newly constructed by the project. Projects that score over the 10 points will be capped at 10 points. **Note**: a project does not need to satisfy all improvements listed below to earn points.

Facility Type	
6 points	Corrects existing sidewalk deficiencies along entire limits (deficiencies = fair/poor sidewalk conditions, existing width < 5', cross slopes > 2%, etc.) or new 5' sidewalks (residential) or 8' sidewalks (commercial) on both sides of road; OR **4 points** if project corrects existing sidewalk deficiencies along entire limits or new 5' sidewalks (residential) or 8' sidewalks (commercial) on one side of road.
3 points	Partial sidewalk slab replacements to a > 5' sidewalk on both sides of road; OR **2 points** for partial sidewalk slab replacements to a > 5' sidewalk on one side of road. *
2 points	Partial sidewalk slab replacements to a < 5' sidewalk on both sides of road; OR **1 point** for partial sidewalk slab replacements to a < 5' sidewalk on one side of road. *
2 points	Reconstruction of curb ramps. **Note**: to receive these points, the curb ramps must connect to a non-deficient pedestrian facility.

8 points	10’ to 14’ shared-use path or physically protected bike lanes; OR **6 points** for 8’ to < 10’ shared-use path.
6 points	Buffered bike lanes on roads at 40 mph or less; OR **5 points** for buffered bike lanes on roads at 45 mph.
4 points	Conventional bike lanes on roads at 30 mph or less; OR **2 points** for conventional bike lanes on roads at 35 mph.
4 points	4’ to 8’ paved shoulders.
Transit / Land Use	
2 points	Project is located on a transit route.
2 points	Physical improvements to transit system (e.g., benches, ADA landing pads, shelters, bike racks); OR **1 point** for new or upgraded bicycle and/or pedestrian facility connection to transit system. **
2 points	New or upgraded bicycle and/or pedestrian connection to activity center in areas that do not have transit proximity. **
2 points	New or upgraded bicycle and/or pedestrian facility directly touching school property (grades K-12 and college/university); OR **1 point** if new or upgraded bicycle and/or pedestrian facility is within ½ mile of school. **
Safety / Design / Crossing Treatments	
3 points	Safety improvements to at-grade rail crossing.
3 points	Extensive speed or volume control solutions to reduce modal conflicts (e.g., road diet, bulb-outs, speed humps, raised refuge islands/medians, reduced curb radii); OR **1 point** for minimal speed or volume solutions. ***
3 points	Extensive crossing treatments at intersections or uncontrolled locations (e.g., pedestrian countdown signals, high visibility crosswalks (continental or ladder style), raised crosswalks, Rectangular Rapid Flashing Beacon (RRFB), Pedestrian Hybrid Beacon (PHB), bicycle intersection crossing markings); OR **1 point** for minimal crossing treatments. ***
1 point	Pedestrian-scale lighting along bicycle/pedestrian facility.
1 point	Landscaped buffer between roadway and sidewalk on roads at 35 mph and over.
1 point	Physical or innovative improvements to the bicycle network (i.e., bicycle-friendly grates, bike racks, bike boxes).

*If project includes sidewalk slab replacements, the entire facility along the project corridor must be ADA compliant. A passing space is to be provided at intervals no greater than 200’ for sidewalks widths less than 5’.
**To receive points, the new or upgraded bicycle and/or pedestrian facility must be low-stress and/or have no deficiencies.
***Points assigned based on the application of countermeasure(s) and the speed, volume, and configuration of the roadway. For example: for a four-lane roadway with an AADT exceeding 9,000 at 40 mph, a marked midblock high visibility crosswalk alone is insufficient and the treatment should occur in conjunction with other substantial safety and crossing improvements.

Support Neighborhoods & Communities

This measure is included to account for projects that are located in Environmental Justice (EJ) areas. The purpose of EJ is to focus federal attention on the environmental and human health effects of federal actions on minority or low-income populations with the goal of achieving environmental protection for all communities. EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability. The EJ policy ensures that populations that have traditionally been underserved have safe access to community resources and meaningful choices in transportation. Census data and GIS analysis is used to determine if the project is located in an EJ area. A map of the EJ areas is provided in **Appendix A**.

4 points	Project falls in, or partially in, an EJ area with high concentration of low-income persons or minorities.
3 points	Project falls in, or partially in, an EJ area with high concentration of zero-vehicle households.
1 point	Project falls in, or partially in, an EJ area with high concentration of seniors or persons with a disability.

Zero points	Project is not located in an EJ area or project imposes a burden on EJ area.

PROMOTE SAFETY

EWG is focusing on lowering the number of fatalities and serious injuries caused by vehicle crashes. To meet this goal, all projects should strive to correct safety issues in high-crash locations or use a systemic approach to address future crashes. The two metrics relate to the current conditions on the roadway by looking at the total crash rate and the fatal and serious injury crash rate. This helps prioritize projects that are in locations experiencing a current problem. To receive points under metric one (total crash rate) and metric two (fatal and serious injury crash rate), the project must include a safety countermeasure that addresses the current safety problem. Project sponsors must provide five years of crash data (2013-2017). Sponsors should provide the number of crashes and not the total number of injuries or people involved. The total crash rate and the fatal and serious injury crash rate will be calculated by EWG.

A list of countermeasures, and the associated Crash Modification Factor (CMF), is provided in **Appendix B**. Project sponsors may also utilize the FHWA Crash Modification Factors Clearinghouse website to identify possible safety countermeasures for roadway projects: http://www.cmfclearinghouse.org/.

Total Crash Rate (5 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

5 points	Top third
4 points	Middle third
3 points	Bottom third

Fatal and Serious Injury Crash Rate (5 points)

EWG will group all projects that have crashes into thirds and assign points as follows:

5 points	Top third
4 points	Middle third
3 points	Bottom third

Preventive Countermeasures: if a project has no crashes on the project limits, but includes a preventive safety countermeasure, the project can receive three total points. If a project includes a preventive safety countermeasure, but does not address crashes occurring along the project limits, the project can receive three total points.

SUPPORT A DIVERSE ECONOMY WITH A RELIABLE TRANSPORTATION SYSTEM

Improving congested roadways benefits the movement of people and goods. Projects will be evaluated based on how well they improve travel conditions. The first metric relates to the existing non-recurring congestion on the project corridor. The second metric relates to the strategy used to mitigate congestion. The scores of the two metrics will be averaged to determine the points under this criterion.

Travel Time Reliability (10 points)

Non-recurring congestion will be assessed using the Planning Time Index (PTI) and the Travel Time Index (TTI), or the volume to capacity (V/C) ratio. The PTI and TTI are derived from HERE data from the Regional Integrated Transportation Information System (RITIS). The PTI and TTI will only be calculated on roadways for which probe data is available. The points assigned for the PTI and the TTI will be averaged to determine the travel time reliability score. Roads with lower functional classifications will be evaluated based on the V/C ratios established in EWG's travel demand model.

Probe data is available in RITIS for project length:

Planning Time Index		Travel Time Index	
10 points	PTI 2.5+	**10 points**	TTI 2+
8 points	PTI 2.1-2.49	**8 points**	TTI 1.75-1.99
6 points	PTI 1.7-2.09	**6 points**	TTI 1.5-1.74
4 points	PTI 1.35-1.69	**4 points**	TTI 1.25-1.49
2 points	PTI 1.1-1.34	**2 points**	TTI 1-1.24
Zero points	PTI 1.0 or less	**Zero points**	TTI 0.9 or less

Probe data is not available in RITIS for project length:

Volume/Capacity Ratio	
10 points	V/C 1.1+
8 points	V/C 0.96-1.0
6 points	V/C 0.85-0.95
4 points	V/C 0.7-0.84
Zero points	V/C 0.69 or less

Strategy (10 points)
A higher PTI and TTI or V/C ratio is indicative of higher levels of congestion. The Strategic Highway Research Program (SHRP 2) has identified strategies that have a direct relationship to travel time reliability. The strategies can be used to mitigate the presence of congestion. The strategies fall into four levels, and each strategy has a proven effect on delay reduction. Projects that incorporate Level 1 or Level 2 strategies will score more points. The strategies are provided in **Appendix C**.

10 points	Level 1 strategy (delay reduction up to 50%) or Level 2 strategy (delay reduction up to 20%).
6 points	Level 3 strategy (delay reduction up to 10%).
4 points	Level 4 strategy (other improvements such as safety and capacity).
Zero points	Level 5 strategy or no strategy.

SUPPORT QUALITY JOB DEVELOPMENT – *ECONOMIC DEVELOPMENT ONLY*

A goal of *Connected2045* is to support the growth of jobs that allow residents to save and return money to the economy. Transportation connectivity is a major contributing factor to the performance and competiveness of industries. This measure is included to account for how well the project supports the development of high quality industries within the region through improved transportation access. The first metric evaluates the relationship between the average income of the industry being supported to the average income of all industries. The second metric evaluates the number of full-time jobs created. The third metric evaluates the cost per job created.

Average Income of Industry Supported (30 points)
To be an eligible project type, the project must provide a direct transportation linkage to a development site. The development site may include the redevelopment of underutilized properties or industrial sites, business expansion, or planned industrial development. A direct transportation linkage is defined as an eligible publicly-owned and maintained transportation facility from the entrance of the development site to a public road. The average income by industry for the EWG region is provided in **Appendix D**.

30 points	Project provides a direct transportation linkage to a business development with an average industry income that is greater than the average income of all industries.
25 points	Project provides a direct transportation linkage to a business development with an average industry income that is the same as the average income of all industries.
20 points	Project provides a direct transportation linkage to a business development with an average industry income that is ¾ of the average income of all industries.
15 points	Project provides a direct transportation linkage to a business development with an average industry income that is ½ of the average income of all industries.
10 points	Project provides a direct transportation linkage to a business development with an average industry income that is ¼ of the average income of all industries.

Number of Full-Time Jobs Created (20 points)
Projects that provide a direct transportation linkage to a greater number of jobs will earn more points under this metric.

20 points	Project supports the creation of 250 or more full-time direct jobs.
15 points	Project supports the creation of 100-249 full-time direct jobs.
10 points	Project supports the creation of 50-99 full-time direct jobs.
5 points	Project supports the creation of 20-49 full-time direct jobs.
Zero points	Project supports the creation of 19 or less full-time direct jobs.

Cost per Job Created (10 points)
The number of full-time direct jobs will be used to determine a ratio of estimated jobs by project cost. The average income of the development industry type will be multiplied by the number of full-time direct jobs created and then divided by the project cost. The average income by industry for the EWG region is provided in **Appendix D**.

10 points	8.1+
8 points	6.1-8
6 points	4.1-6
4 points	2.1-4
Zero points	0-2

STRENGTHEN INTERMODAL CONNECTIONS – *FREIGHT ONLY*

The St. Louis region is well positioned to capture some of the expected growth in nationwide freight movement for all modes, given the region's central location, access to rivers, low traffic congestion, and lack of tolling. Future growth will depend on coordinating public and private freight decision making and investments, ensuring reliable truck travel times, strengthening multi-modal connections to key industrial site areas, and ensuring the region's workforce can access freight employment opportunities. This measure addresses freight mobility as well as local freight planning initiatives. The first metric relates to the project's location within an industrial site area and the significance of each site. The second metric evaluates if the project will improve the movement of freight to a freight facility by incorporating a commercial vehicle countermeasure.

Industrial Site Area (25 points)
In 2013, EWG completed the St. Louis Regional Freight Study. The study identified 22 key industrial site areas that influence the freight industry in the St. Louis region. Industrial site areas are centers of employment and are connected by a series of transportation networks. Each industrial site area falls into one of three tiers: mega, major, or intermediate. The methodology used to tier industrial site areas is based on core metrics related to total industrial space, employment, train counts, truck counts, and crashes. To receive points under this metric, the project must be located within an industrial site area.

25 points	Mega freight center.
20 points	Major freight center.
15 points	Intermediate freight center.

Intermodal Connections and Commercial Vehicle Countermeasure (35 points)
To receive points, the project must include a commercial vehicle countermeasure that improves freight movement. Examples of common techniques related to commercial vehicle accommodations include improving shoulder width and pavement structure, intersection design, parking, acceleration or deceleration lanes, truck and car separation, accommodating tonnage requirements, and increasing overpass clearances.

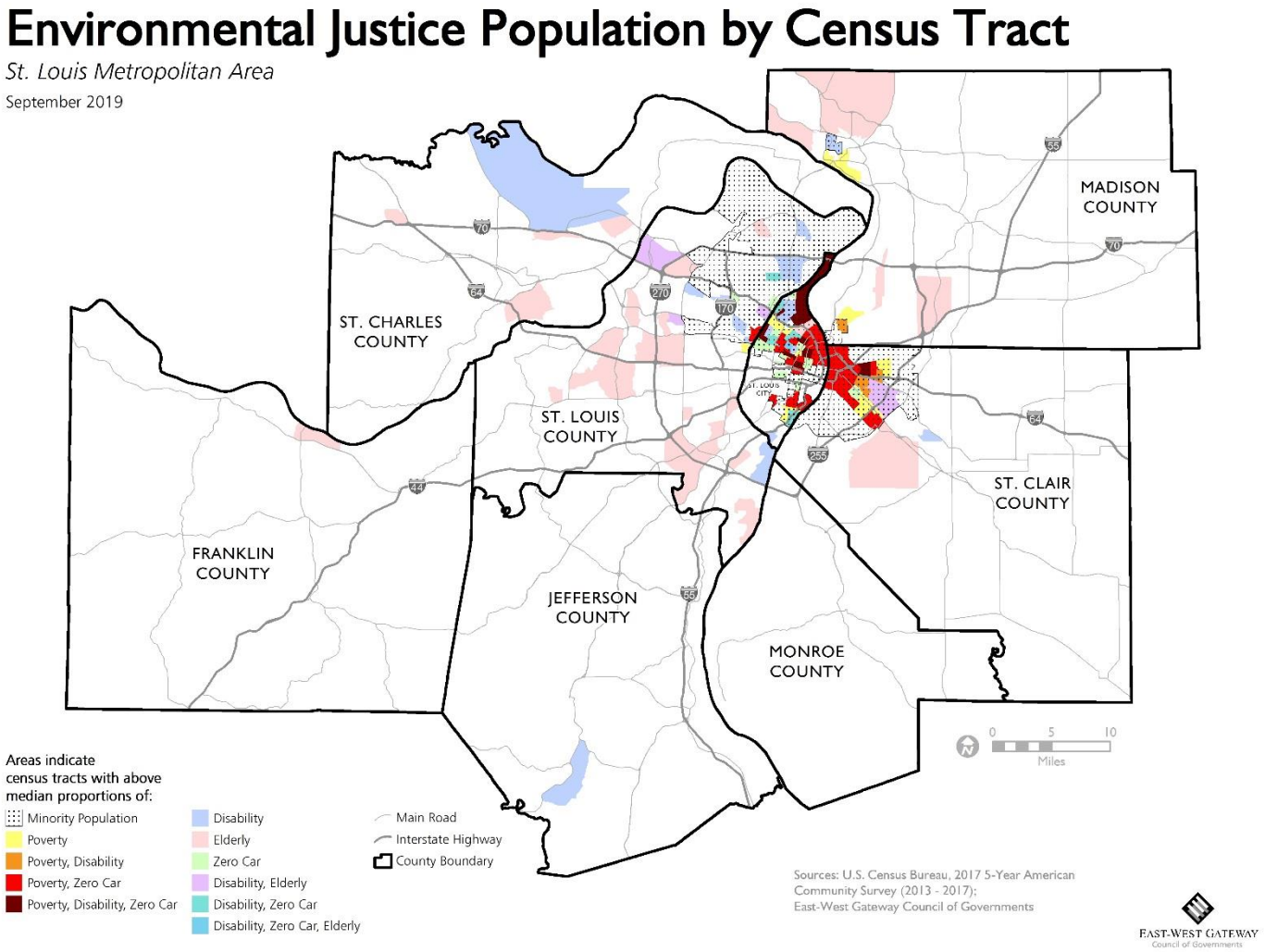
35 points	Project improves the movement of freight to an intermodal freight facility, major freight generator, logistic center, manufacturing and warehouse industrial facility, navigable waterway or port facility, or other freight intensive industry.

PROTECT AIR QUALITY & ENVIRONMENTAL ASSETS

Transportation projects should limit the impacts on the natural environment. Green infrastructure is a design approach to managing stormwater, the urban heat island effect, public health, and air quality. Sustainable stormwater management treats and slows runoff from impervious roadways, sidewalks, and building surfaces. Examples of green infrastructure include bioswales, rain gardens, pervious pavement, and green bulb-outs. For more information on green infrastructure, view: https://www.epa.gov/green-infrastructure.

1 point	Project includes green infrastructure elements.
Zero points	Project does not include green infrastructure.

Appendix A: Maps

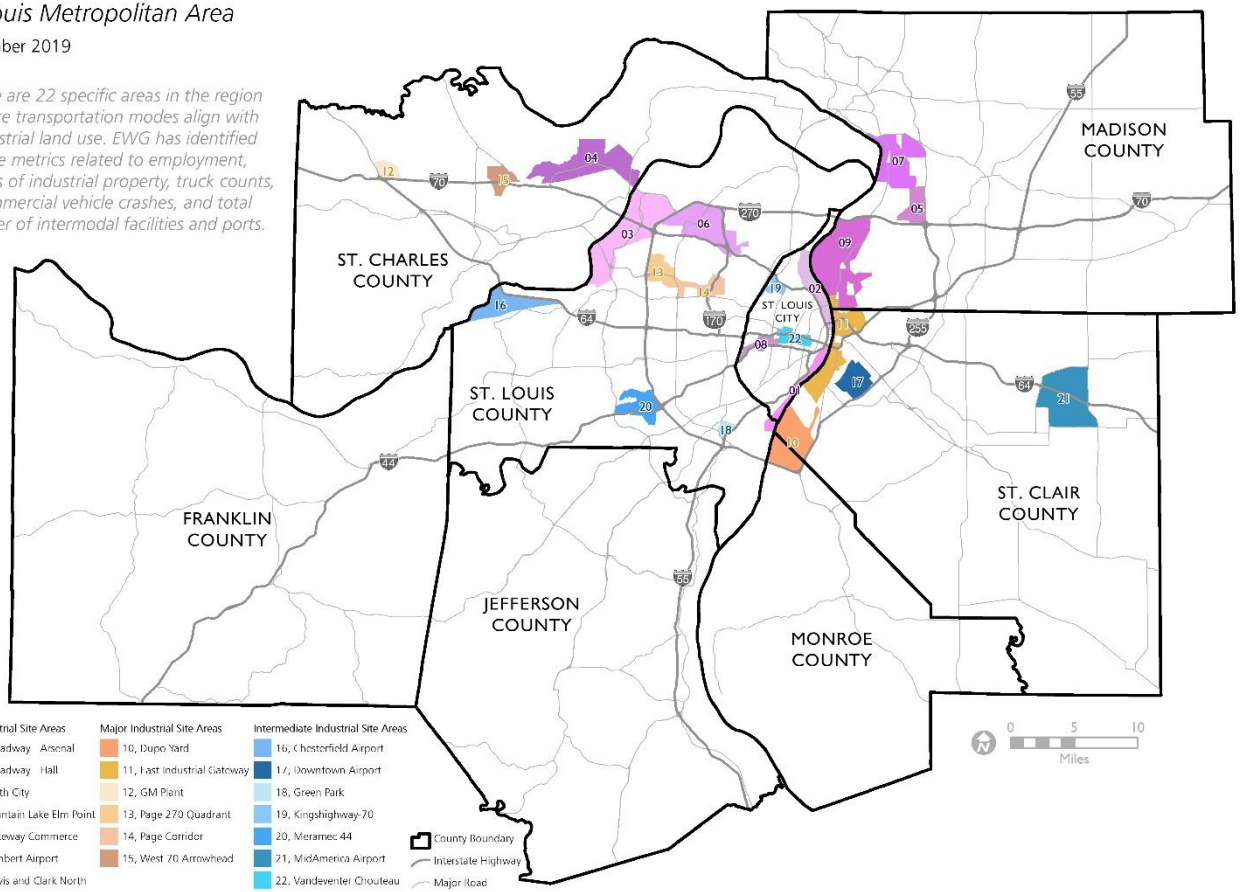


Industrial Site Areas

St. Louis Metropolitan Area

September 2019

There are 22 specific areas in the region where transportation modes align with industrial land use. EWG has identified core metrics related to employment, clusters of industrial property, truck counts, commercial vehicle crashes, and total number of intermodal facilities and ports.



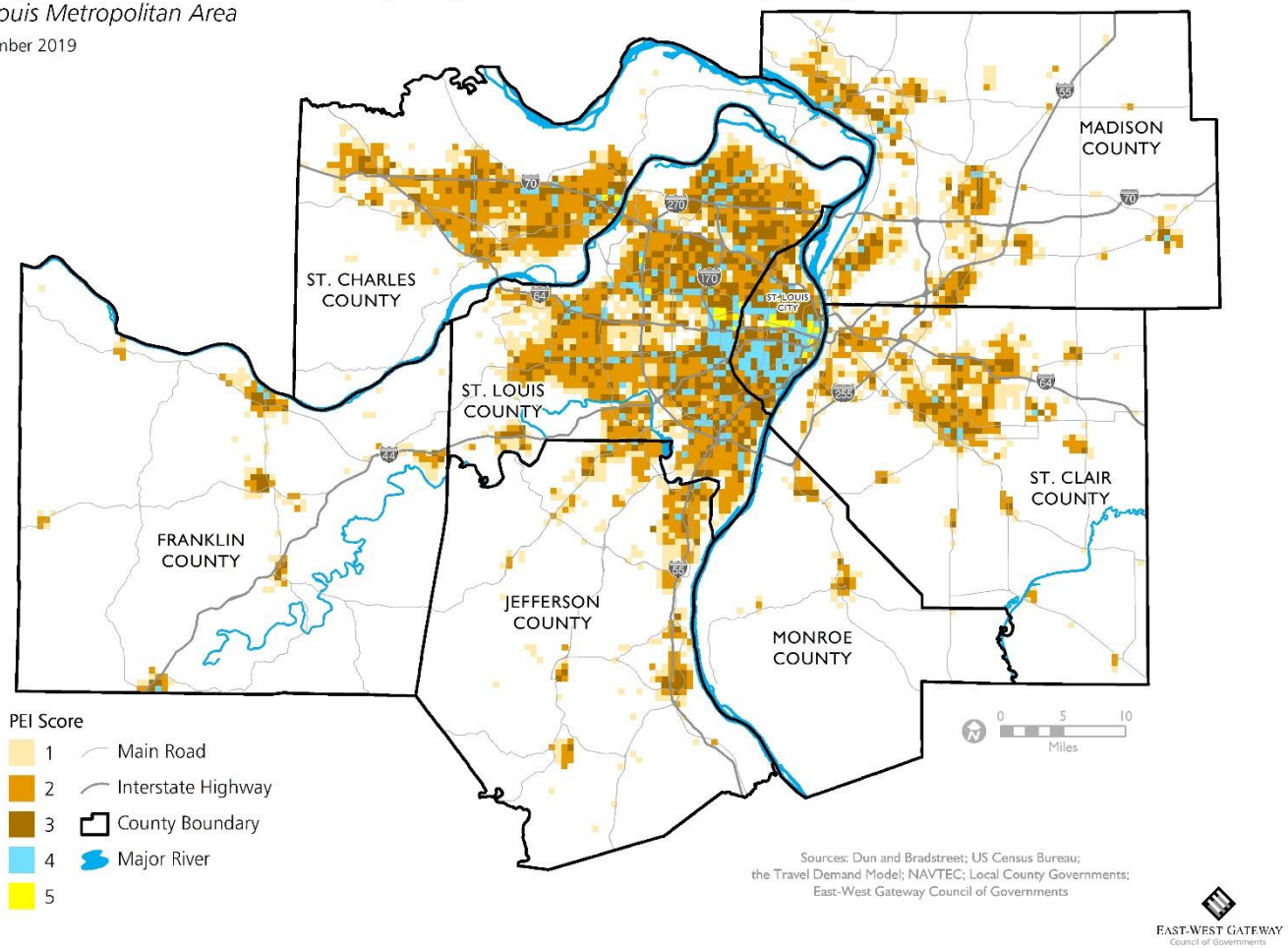
Source: East-West Gateway Council of Governments

EAST-WEST GATEWAY
Council of Governments

Population and Employment Index (PEI)

St. Louis Metropolitan Area

September 2019



Appendix B: Safety Countermeasures

Countermeasure Category	Countermeasure	CMF	Crash Type	Crash Severity	CMF Clearing-house ID
Access management	Provide a raised median	0.61	All	Fatal, Serious Injury, Minor Injury	21
Access management	Increase intersection median width by 3 ft increments	0.96	Multiple vehicle	All	298
Access management	Replace direct left-turn with right-turn/U-turn	0.8	All	All	351
Alignment	Increase in horizontal curvature by one degree	1.05	Run off road	All	60
Alignment	Increase vertical grade by 1%	1.04	Run off road, Single vehicle	All	61
Alignment	Flatten crest vertical curve	0.49	All	Fatal, Serious Injury, Minor Injury	721
Bicyclists	Install bicycle lanes	1.05	All	All	2159
Bicyclists	Install bicycle boulevard	0.37	Vehicle / bicycle	All	3092
Delineation	Install post-mounted delineators	1.04	All	Serious Injury, Minor Injury	80
Delineation	Place standard edgeline marking (4-6 in)	0.97	All	Serious Injury, Minor Injury	83
Delineation	Place centerline markings	0.99	All	Serious Injury, Minor Injury	87
Delineation	Add lane lines on multilane roadway segments	0.82	All	All	89
Delineation	Install edgelines and centerlines at sites with higher incidences of crashes	0.87	All	All	100
Delineation	Place edgeline and centerline markings	0.76	All	Serious Injury, Minor Injury	101
Delineation	Install edgelines, centerlines, and post-mounted delineators	0.55	All	Serious Injury, Minor Injury	102
Delineation	Provide "Stop Ahead" pavement markings	0.69	All	All	397
Delineation	Install wider edgelines (4 in to 6 in)	0.83	All	All	4736
Delineation	Install wider markings and edgeline rumble strips with resurfacing	0.76	All	Fatal, Serious Injury, Minor Injury	4778
Highway lighting	Provide intersection illumination	0.62	Nighttime	Serious Injury, Minor Injury	433
Intersection geometry	Convert four-leg intersection into two three-leg intersections	1.35	All	Serious Injury, Minor Injury	200

Countermeasure Category	Countermeasure	CMF	Crash Type	Crash Severity	CMF Clearing-house ID
Intersection geometry	Conversion of stop-controlled intersection into single-lane roundabout	0.28	All	All	206
Intersection geometry	Conversion of signalized intersection into single- or multi-lane roundabout	0.26	All	Serious Injury, Minor Injury	212
Intersection geometry	Convert intersection with minor-road stop control to modern roundabout	0.56	All	All	227
Intersection geometry	Convert all-way, stop-controlled intersection to roundabout	1.03	All	All	242
Intersection geometry	Provide a channelized left-turn lane on both major- and minor-road approaches	0.73	All	Serious Injury, Minor Injury	249
Intersection geometry	Painted channelization of left-turn lane on major road	0.78	All	Serious injury, Minor injury	251
Intersection geometry	Provide a left-turn lane on one major-road approach	0.56	All	All	253
Intersection geometry	Provide a left-turn lane on both major-road approaches	0.52	All	All	268
Intersection geometry	Provide a right-turn lane on one major-road approach	0.86	All	All	285
Intersection traffic control	Convert minor-road stop control to all-way stop control	0.25	Angle	All	310
		0.82	Rear-end	All	311
		0.52	All	All	315
Intersection traffic control	Install a traffic signal	0.86	All	Fatal, Serious Injury, Minor Injury	316
		0.33	Angle	Fatal, Serious Injury, Minor Injury	320
Intersection traffic control	Remove unwarranted signal (one-lane, one-way streets, excluding major arterials)	0.76	Angle, Left turn, Right turn	All	329
		0.76	All	All	332
Intersection traffic control	Change from permitted or permitted-protected to protected	0.01	Angle	All	333
		0.99	All	All	334
Intersection traffic control	Permit right-turn-on-red	1.43	Vehicle / pedestrian	All	369
Intersection traffic control	Modify change plus clearance interval to ITE 1985 Proposed Recommended Practice	0.92	All	All	380
		1.12	Rear-end	All	381

Countermeasure Category	Countermeasure	CMF	Crash Type	Crash Severity	CMF Clearing-house ID
Intersection traffic control	Replace Night-Time Flash with Steady Operation	0.66	Angle, Nighttime	All	388
		0.65	Nighttime	All	389
Intersection traffic control	Prohibit left-turns with "No Left Turn" sign	0.36	Left turn	All	390
		0.32	All	All	391
On-street parking	Prohibit on-street parking	0.58	All	All	155
On-street parking	Implement time-limited parking restrictions	0.89	All	All	161
On-street parking	Convert angle parking to parallel parking	0.65	All	All	163
On-street parking	Prohibit on-street parking	0.78	All	Fatal, Serious Injury, Minor Injury	4574
		0.72	All	Property Damage Only (PDO)	4575
Pedestrians	Installation of a High intensity Activated crossWalK (HAWK) pedestrian-activated beacon at an intersection	0.71	All	All	2911
Pedestrians	Install crosswalk on one minor approach	0.35	All	All	3019
Roadside	Flatten sideslope from 1V:3H to 1V:4H	0.58	All	Serious Injury, Minor Injury	26
Roadside	Increase distance to roadside features from 3.3 ft to 16.7 ft	0.78	All	All	35
Roadside	New guardrail along embankment	0.93	Run off road	All	39
Roadway	Decrease lane width from 11 ft to 10 ft	1.09	All	All	2
Roadway	Increase lane width from 11 ft to 12 ft	0.95	All	All	3
Roadway	Install centerline rumble strips	0.86	All	All	124
Roadway	Road diet (Convert 4-lane undivided road to 2-lanes plus turning lane)	0.71	All	All	199
Roadway	Introduce TWLTL (two-way left turn lanes) on rural two lane roads	0.64	All	All	583
Roadway	Convert 12 ft lanes and 6 ft shoulders to 10 ft lanes and 3 ft shoulders	1.13	Run off road	All	2002

Countermeasure Category	Countermeasure	CMF	Crash Type	Crash Severity	CMF Clearing-house ID
Roadway	Install transverse rumble strips on stop controlled approaches in rural areas (minor arterial)	1.22	All	All	2698
Roadway	Install edgeline rumble strips	0.71	Run off road	Fatal, Serious Injury, Minor Injury	3388
Shoulder treatments	Widen paved shoulder from 3 ft to 4 ft	0.97	All	All	10
Shoulder treatments	Pave a 3 to 4 ft sod shoulder	0.81	All	All	18
Shoulder treatments	Install curb and gutter	0.89	All	All	2375
Shoulder treatments	Installation of safety edge treatment	0.92	All	All	4303
Signs	Install signs to conform to MUTCD	0.85	All	Serious Injury, Minor Injury	62
		0.93	All	Property Damage Only (PDO)	63
Signs	Install combination horizontal alignment/ advisory speed signs	0.87	All	Serious Injury, Minor Injury	73
		0.71	All	Property Damage Only (PDO)	74
Signs	Install chevron signs and curve warning signs	0.59	All	All	1905
		0.66	Nighttime	All	1906
Speed management	Apply converging chevron pattern markings on roadway segments	0.68	All	All	112
Speed management	Traffic calming	0.68	All	All	128
Speed management	Install speed humps	0.6	All	Serious Injury, Minor Injury	132
Speed management	Install transverse rumble strips as traffic calming device	0.66	All	All	138
Speed management	5% reduction in mean speed	0.83	All	Fatal	141
Speed management	Area-wide or corridor-specific traffic calming	0.89	All	Serious Injury, Minor Injury	586

Source: Missouri Department of Transportation Safety Handbook for Locals (S-HAL)

Appendix C: Congestion Strategies

Level 1 Strategies: Delay Reduction of Up to 50%						
Category	**Strategy**	**Treatment**	**Application to Sources of Congestion**	**Key Quantitative Benefit**	**Overall Cost Range[a]**	**Effectiveness–Cost Rank**
Information collection and dissemination	Pre-trip information	National Traffic and Road Closure Information	Weather, work zones	Reduces delays (early and late arrivals) by 50%	Low–medium	1-B
Incident and special event management	Pre-event assistance	Service patrols	Traffic incidents	Can reduce incident response by 19% to 77% and incident clearance time by 8 min	High	1-E
	Post-event assistance	On-scene incident management (incident responder relationship, high-visibility garments, clear buffer zones, incident screens)	Traffic Incidents	Traffic incident management programs have reported reductions in incident duration from 15% to 65%	Low	1-A
		Work zone management	Work zones	Reduces work zone–related delays by 50% to 55%	Variable (depends on addition of infrastructure)	1-D
Infrastructure improvements and demand optimization	Signal timing, ITS	TMC	Traffic-control devices, special events, weather, work zones, traffic incidents	Reduces delay by 10% to 50%	High	1-E
		Traffic adaptive signal control, advanced signal systems	Traffic-control devices	Adaptive signal control systems have been shown to reduce peak period travel times by 6% to 53%	Medium–high	1-C
	Congestion pricing	Electronic toll collection (ETC)	Physical bottlenecks	Electronic toll collection (ETC) reduces delay by 50% for manual-cash customers and by 55% for automatic-coin-machine customers, and increases speed by 57% in the express lanes	High	1-E

Source: Evaluating Alternative Operations Strategies to Improve Travel Time Reliability SHRP2

Level 2 Strategies: Delay Reduction of Up to 20%						
Category	**Strategy**	**Treatment**	**Application to Sources of Congestion**	**Key Quantitative Benefit**	**Overall Cost Range[a]**	**Effectiveness–Cost Rank**
Information collection and dissemination	Surveillance and detection	Remote verification (CCTV)	Traffic-control devices, special events, weather, traffic incidents	5% reduction in travel times in nonrecurring congestion; overall 18% reduction in travel times	Medium	2-C
	Real-time information	Pretrip information by 511, websites, subscription alerts, radio	Traffic-control devices, special events, weather, work zones, traffic incidents	Potential reduction in travel time from 5% to 20%	Variable	2-E
		Road weather information systems	Weather	Reduces delays by up to 12%	Low–medium	2-B
	Roadside messages	Travel time message signs for travelers (DMS, VMS)	All	Improves trip-time reliability, with delay reductions ranging from 1% to 22%	High	2-F
Infrastructure improvements and demand optimization	Geometric design treatments	Bottleneck removal (weaving, alignment)	Physical bottlenecks	Reduces travel time by 5% to 15%.	Medium–high	2-D
	Signal timing, ITS	Signal retiming, optimization	Traffic-control devices	Reduction in travel time and delay of 5% to 20% when traffic-signal retiming was used	Low	2-A
		Advanced transportation automation systems, signal priority, and AVL	Traffic-control devices	Reduces transit delays by 12% to 21%	Low–medium	2-B
	Traffic demand metering	Ramp metering, ramp closure	All	An increase of mainline peak-period flows from 2% to 14% because of on-ramp metering, according to a study of ramp meters in North America	Low–medium	2-B
	Congestion pricing	Cordon pricing (areawide)	Physical bottle-necks, fluctuation in normal traffic, special events	A decrease in inner city traffic by about 20% from congestion pricing in London	Low–medium	2-B
	Lane treatments	Managed lanes: HOV, HOT, and TOT lanes	Physical bottle-necks, fluctuation in normal traffic, traffic incidents	Reduces travel times up to 16%	Medium–high	2-D

Source: Evaluating Alternative Operations Strategies to Improve Travel Time Reliability SHRP2

Level 3 Strategies: Delay Reduction of Up to 10%						
Category	**Strategy**	**Treatment**	**Application to Sources of Congestion**	**Key Quantitative Benefit**	**Overall Cost Range**	**Effectiveness–Cost Rank**
Information collection and dissemination	Pretrip information	Planned special events management	Special events	Reduces delay caused by special events	Low–medium	3-B
	Real-time information	Freight shipper congestion information, commercial vehicle operations	Traffic-control devices, special events, weather, work zones, traffic incidents	Reduces freight travel time by up to 10% and screening time by up to 50%	Low	3-A
Vehicle technologies	Driver-assistance products	Electronic stability control; obstacle detection systems; lane-departure warning systems; road-departure warning systems	Traffic incidents	Reduces accidents involving vehicles by up to 50%; reduces travel times by 4% to 10%	Low	3-A
Infrastructure improvements and demand optimization	Signal timing, ITS	Traffic-signal pre- emption at grade crossings	Traffic-control devices	Reduces delays by up to 8% at grade crossings, according to simulation models	Medium	3-C

Source: Evaluating Alternative Operations Strategies to Improve Travel Time Reliability SHRP2

Level 4 Strategies: Other Improvements						
Category	**Strategy**	**Treatment**	**Application to Sources of Congestion**	**Key Quantitative Benefit**	**Overall Cost Range**	**Effectiveness–Cost Rank**
Information collection and dissemination	Surveillance and detection	Driver qualification	Traffic incidents	Reduces non-recurring congestion by reducing accidents	Low	4-A
		Automated enforcement	Traffic incidents, bottlenecks	Reduces travel time and improves safety	Variable (high if done by agencies, low if by contractors)	4-D
	Probe vehicles and point detection	GPS, video detection, microwave radar, Bluetooth MAC Readers	Traffic-control devices	No direct benefit to reducing congestion	Low	4-A
Infrastructure improvements and demand optimization	Geometric design treatments	Geometric improvements (interchange, ramp, intersections, narrow lanes, temporary shoulder use)	Physical bottlenecks, traffic incidents	An increase in overall capacity by 7% to 22% from geometric improvements	Medium	4-C
	Variable speed limits	Variable speed limits	Physical bottlenecks, special events	Increases through- put by 3% to 5%	Low–medium	4-B

Source: Evaluating Alternative Operations Strategies to Improve Travel Time Reliability SHRP2

Appendix D: Average Income by Industry for the EWG Region

Industry	Average Pay (2014-2018)
Agriculture, forestry, fishing and hunting	$30,867
Mining, quarrying, and oil and gas extraction	$70,688
Utilities	$68,400
Construction	$49,220
Manufacturing	$60,758
Wholesale trade	$54,807
Retail trade	$27,736
Transportation and warehousing	$46,955
Information	$47,911
Finance and insurance	$67,757
Real estate and rental and leasing	$38,139
Professional, scientific, and technical services	$68,021
Management of companies and enterprises	$82,611
Administrative and support and waste management services	$30,875
Educational services	$36,550
Health care and social assistance	$46,108
Arts, entertainment, and recreation	$27,800
Accommodation and food services	$16,108
Other services except public administration	$31,700
Public administration	$52,946
EWG Region Average	**$47,798**

Sources: Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), East-West Gateway Council of Governments

Note: Estimates are in real 2018 dollars (adjusted for inflation using the Consumer Price Index)