Integrated Five-Year Work Plan
Roadway & Intersection Prioritization Methodology
Last updated August 2022

The Roadway and Intersection methodology is used to rank major capital projects in the Roads and Intersections sections of ACHD's Integrated Five-Year Work Plan (IFYWP).

This method combines the Roadways and Intersections projects into a consolidated ranking for comparison across types and puts the final scores on a 0-100 scale. Projects are then ranked according to the accumulated points. Project prioritization is just one input in the programming process of the IFYWP.

Table 1. Roads and Intersections Metrics.

Metric	Description	Weight
Annual Safety Benefit / Cost Ratio	Does the project have a high safety benefit per cost ratio?	10%
Annual Congestion Benefit/Cost Ratio	Does the project have a high congestion benefit per cost ratio?	10%
Partner Agency Support	Is the project supported by partner agencies (based on annual ranking)?	15%
Pavement Condition	Is the project improving roadways in poor condition?	5%
Bridge Condition	Is the project improving bridges in poor condition?	5%
Sidewalks -ADA Compliance	Does the project include improvements identified in the PTP?	10%
Existing Deficiencies	Does the project address a deficiency identified in the CIP?	15%
Priority Corridor/Mobility Corridor	Is the project located on a priority or mobility corridor?	5%
Level of Traffic Stress	Does the project address a high-stress condition?	5%
Adopted Plan Implementation	Is the project included in an adopted plan?	15%
Traffic Safety	Does the project address a location in the High Crash Location report?	5%

Metric 1: Annual Safety Benefit/Cost Ratio

This metric uses ACHD's annual safety benefit/cost ratio methodology. The annual safety benefit is determined by calculating the annual cost of crashes on a facility (roadway or intersection) for the last three years and multiplying it by the Crashes Reduction Factor, as determined by ACHD Traffic Services. The calculation is:

Annual Safety Benefit = Annual Cost x Crash Reduction Factor

Because roundabouts reduce crashes at different rates, there is a separate formula used for roundabouts:

*Annual Safety Benefit = Annual Property Damage * Property Damage Reduction (PDO) + Annual Injury * Injury Reduction*

Generally, crash reduction factors will use the following crash reduction factors but may be modified depending on the circumstances of a project.

Improvement Type	Crash Reduction Factor
Roadways	
Widening that adds a center turn lane (2 to 3 or 5 lanes, 4 to 5 lanes)	0.25
Widening that adds thru lanes only (3 to 5 lanes, 5 to 7 lanes)	0.10
Access management project	0.25
New Signal	
Convert from two-way stop control to signalized intersection	0.25 (all)
Convert from all-way stop control to signalized intersection	0.00 (all)
Signal Rebuild	
Adding right turn lanes on all approaches	0.06 (0.015 each)
Adding single left turn lanes on all approaches	0.34 (0.017 each pair)
Adding additional left-turn lanes on all approaches	0.14 (0.007 each pair)
Roundabout	
Converting an intersection to a roundabout (PDO crashes)	.40
Converting an intersection to a roundabout (A, B C, Fatality Crashes)	.75

The annual cost of crashes is calculated by totaling the cost of all crashes on the facility over the previous three years and dividing it by 3. For roundabouts, this must be broken down into PDO cost and injury cost.

The following costs are used for each type of crash:

Crash Type	Estimated Cost
Property Damage Only (PDO)	$3,243
Possible Injury (Class C)	$64,013
Visible Injury (Class B)	$125,360
Incapacitating Injury (Class A)	$460,257
Fatality	$460,257

The final annual safety benefit is then divided by the estimated project cost to calculate the annual safety benefit/cost ratio. The purpose of this metric is to reward projects that have a high safety benefit relative to cost.

Weighting and Scale: This metric makes up 10% of the total weighting and is based on the following 0-10 scale:

Points Scale Details
0: Project is not in the top 15 projects for annual safety benefit/cost ratio
4: Project is within the top 11 to 15 projects for annual safety benefit/cost ratio
7: Project is within the top 6 to 10 projects for annual safety benefit/cost ratio
15: Project is within the top 5 projects for annual safety benefit/cost ratio

Metric 2: Annual Congestion Benefit/Cost Ratio

This metric uses ACHD's annual congestion benefit/cost ratio methodology. The annual congestion benefit is determined by multiplying the annual congestion reduction for a given project by the hourly congestion cost. The hourly congestion cost equals the mean hourly wage in the Boise MSA as defined by the US Bureau of Labor Statistics. The annual congestion reduction is determined by multiplying the daily congestion reduction for a given project by 205, which is the assumed number of work days in a year. Daily congestion reduction is determined by modeling the impact of each project's proposed improvements on the transportation system.

The final annual congestion benefit is then divided by the estimated project cost to calculate the annual congestion benefit/cost ratio. The purpose of this metric is to reward projects that have a high congestion benefit relative to cost.

Weighting and Scale: This metric makes up 10% of the total weighting and is based on the following 0-10 scale:

Points Scale Details
0: Project is not in the top 15 projects for annual congestion benefit/cost ratio
3: Project is within the top 11 to 15 projects for annual congestion benefit/cost ratio
7: Project is within the top 6 to 10 projects for annual congestion benefit/cost ratio
10: Project is within the top 5 projects for annual congestion benefit/cost ratio

Metric 3: Partner Agency Support

This metric is determined based on submissions from partner agencies. As part of the submission process, partner agencies must rank their submitted projects. The purpose of this metric is to reward projects that are ranked as a high priority for partner agencies.

Weighting and Scale: This metric makes up 15% of the total weighting and is based on the following 0-15 scale:

Points Scale Details
0: No partner agency support
1: Project ranked as #10 or lower priority for partner agency
2: Project ranked as #9 for a partner agency
3: Project ranked as #8 for a partner agency
4: Project ranked as #7 for a partner agency
5: Project ranked as #6 for a partner agency
7: Project ranked as #5 for a partner agency
9: Project ranked as #4 for a partner agency
11: Project ranked as #3 for a partner agency
13: Project ranked as #2 for a partner agency
15: Project ranked as #1 for a partner agency or listed in the top ten by multiple partner agencies

Metric 4: Pavement Condition

This metric is determined based on the ACHD pavement condition index for all roadways in the county. The ranking used for pavement condition is as follows:

Ranking	Pavement Condition Index (PCI)
Very Good	>75
Good	75-50
Poor	50-30
Very Poor	<30

The purpose of this metric is to reward projects that will address an area with a low pavement condition index.

Weighting and Scale: This metric makes up 5% of the total weighting and is based on the following 0-5 scale:

Points Scale Details
0: Project will replace existing asphalt with a PCI greater than 75
3: Project will replace existing asphalt with a PCI between 61-75
4: Project will replace existing asphalt with a PCI between 51-60
5: Project will replace existing asphalt with a PCI of less than 50

Metric 5: Bridge Condition

This metric is determined based on the ACHD bridge condition sufficiency rating of all bridges in the county. The purpose of this metric is to reward projects that will replace a bridge or bridges with a low sufficiency rating.

Weighting and Scale: This metric makes up 5% of the total weighting and is based on the following 0-5 scale:

Points Scale Details
0: Project will not replace any bridges with a sufficiency rating of less than 80
3: Project will replace one bridge with a sufficiency rating of less than 80
5: Project will replace two or more bridges with a sufficiency rating of less than 80

Metric 6: Sidewalks – ADA Compliance

This metric is determined based on the ACHD Pedestrian Transition Plan, which contains an inventory of all sidewalks and pedestrian ramps with an indication of their compliance with the Americans with Disabilities Act. They are prioritized and rated as High, Medium, Low, and No Deficiency based on how they were constructed and the proximity of their location to certain civic destinations. The purpose of this metric is to reward projects that will address an ADA compliance location.

Weighting and Scale: This metric makes up 10% of the total weighting and is based on the following 0-10 scale:

Points Scale Details
0: Project will not address any identified improvements from the Transition Plan inventory
2: Project will address one identified medium/low priority improvements from the Transition Plan inventory
5: Project will address two or more identified medium/low priority improvements from the Transition Plan inventory
8: Project will address one identified high priority improvements from the Transition Plan inventory
10: Project will address two or more identified high-priority improvements from the Transition Plan inventory

Metric 7: Existing Deficiencies

This metric is determined based on ACHD Capital Improvement Plan (CIP) Level of Service (LOS) data. ACHD has set planning capacity thresholds that are deemed existing deficiencies. The purpose of this metric is to reward projects that address known deficiencies.

Weighting and Scale: This metric makes up 10% of the total weighting and is based on the following 0-10 scale:

Points Scale Details
0: The project is currently at a level of service D or better
3: The project is identified as an existing deficiency in the CIP
7: The project is currently at a level of service E but is not identified as an existing deficiency in the CIP
10: The project is currently at a level of service F but is not identified as an existing deficiency in the CIP

Metric 8: Priority Corridor/Mobility Corridor

This metric is determined based if the project is located on either a Priority Corridor or Mobility Corridor. Priority Corridors have been identified by the ACHD Commission, with the recommendation of the ACHD Capital Investment Citizens Advisory Committee. Mobility Corridors are a designation given to a roadway that reflects its primary purpose to serve high volumes and regional movements. The purpose of this metric is to reward projects that address conditions on either a priority or mobility corridor.

Weighting and Scale: This metric makes up 5% of the total weighting and is based on the following 0-5 scale:

Points Scale Details
0: The project is not on a priority corridor or mobility corridor
5: The project is located on a priority or mobility corridor

Metric 9: Level of Traffic Stress (LTS)

This metric uses ACHD's LTS methodology for bicycles and pedestrians. The metric is determined based on if and by how much the LTS level changes with the completion of the project. The purpose of the metric is to reward projects that result in a low level of stress for bicycles and pedestrians.

Weighting and Scale: This metric makes up 5% of the total weighting and is based on the following 0-5 scale:

Points Scale Details
0: Project does not change existing LTS to level 1 or 2. Project will remain a level 3 or 4.
1: Project changes existing LTS from level 2 to level 1
2: Project changes existing condition LTS from level 3 to level 2, or existing conditions are a level 1 or 2, and the project will not change the LTS
3: Project changes existing condition LTS from level 3 to level 1
4: Project changes existing condition LTS from level 4 to level 2
5: Project changes existing condition LTS from level 4 to level 1

Metric 10: Capital Improvement Plan Implementation

This metric is determined using the ACHD Capital Improvement Plan (CIP) based on the horizon years of when the project is needed. The purpose of this metric is to reward projects that have been identified through a planning process as a future need, with those that have the nearest need receiving the highest points.

Weighting and Scale: This metric makes up 15% of the total weighting and is based on the following 0-15 scale:

Points Scale Details
0: Not identified as a project needed in the CIP
4: Identified in the CIP as a project needed between the sixteenth and twentieth year
8: Identified in the CIP as a project needed between the eleventh and fifteenth year
12: Identified in the CIP as a project needed between the sixth and tenth year
15: Identified in the CIP as a project needed in the first five years

Metric 11: Traffic Safety

This metric is determined based on an annual review of high crash locations throughout the County. The purpose of this metric is to reward projects that are located at a high crash location, allowing for the opportunity for safety measures to be implemented.

Weighting and Scale: This metric makes up 5% of the total weighting and is based on the following 0-5 scale:

Points Scale Details
0: The project is not identified in the most recent High Crash Location report
3: The project will address a location ranked below 10 in the most recent High Crash Location report
5: The project will address a location ranked in the top 10 in the most recent High Crash Location report