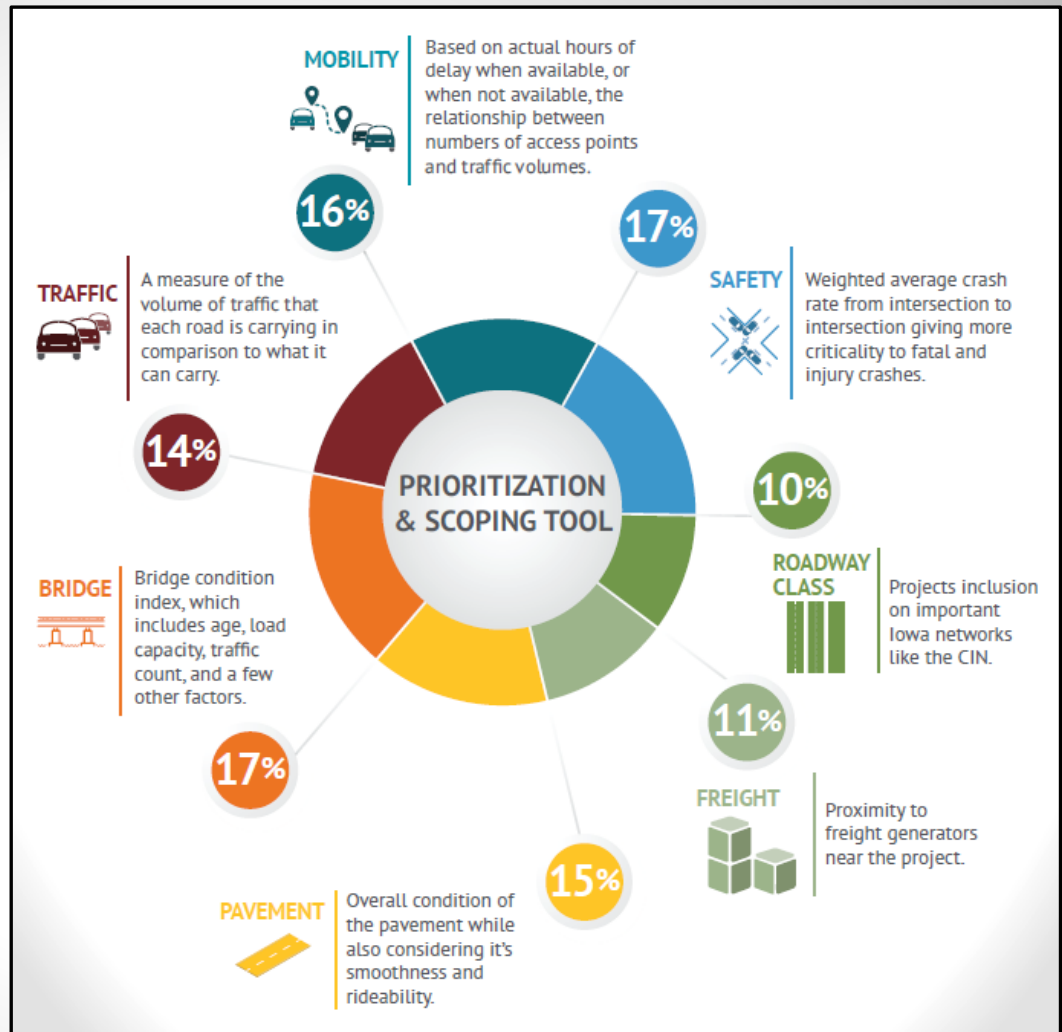# Iowa DOT Project Prioritization Scores & Weightings

December, 2018
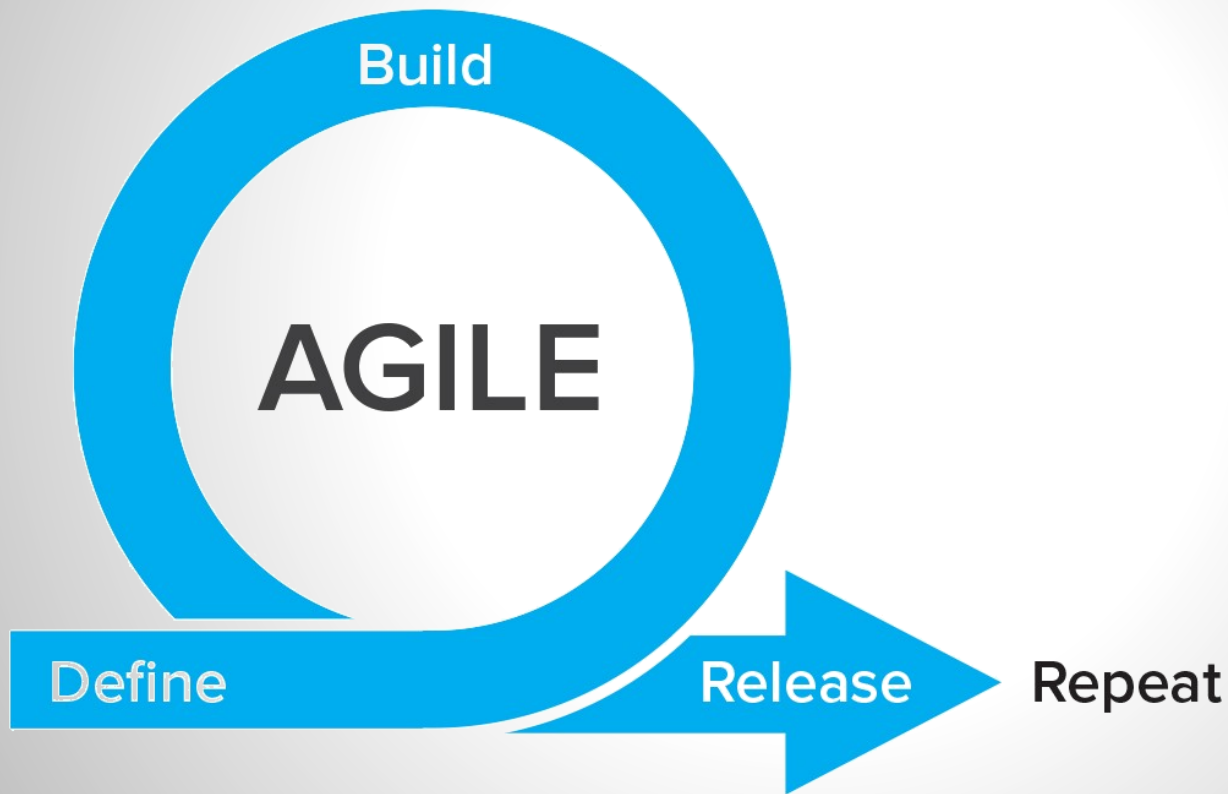
Brad Hofer
Office of Location & Environment

Current Weightings

MOBILITY — 16%
TRAFFIC — 14%
BRIDGE — 17%
PAVEMENT — 15%
FREIGHT — 11%
ROAD CLASS — 10%
SAFETY — 17%
100%

MOBILITY   – Traffic Operations
FREIGHT   – Freight Advisory Council
ROAD CLASS – System's Planning

IOWADOT

PROJECT PRIORITIZATION – BRIDGE SCORE

Each bridge is evaluated to determine its score based on condition index, age and deck area.
Thresholds for poor conditions or very old age are also identified.

PIN GEOMETRY	CONDITION INDEX	CALCULATE AGE	INDIVIDUAL SCORE	ADJUST BY AREA	FINAL SCORE
Structures are spatially joined with PIN geometry.	Index value 0–100	Bridge age 0–100	Combine condition index and bridge age.	Bridge score is applied and weighted.	Final score is assigned and flagged, as needed.

1 2 3 4 5 6

STEP 1

All bridges are grouped together.

STEP 2

The overall condition of each bridge within the project is evaluated and scored.

STEP 3

The age of each bridge is evaluated and scored.

STEP 4

The condition and age scores are combined to determine the individual score of each bridge.

STEP 5

The individual bridge score is applied to the deck area and weighted for each bridge
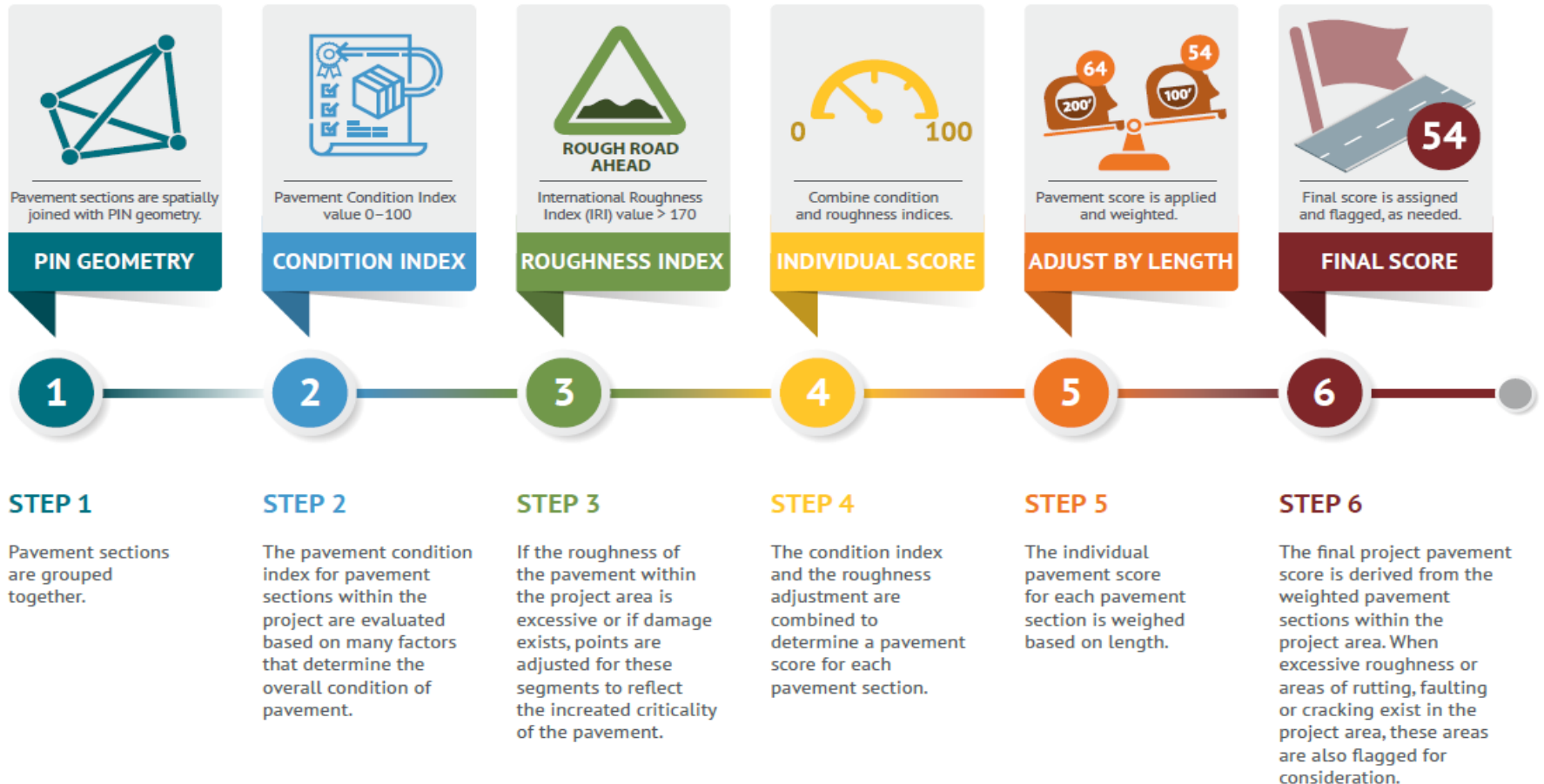
STEP 6

A final bridge score for the project is derived from the weighted scores of the combined bridges within the project area. If bridges within the project area are structurally deficient, functionally obsolete, fracture critical, or have excessive age, the project is also flagged for additional consideration.

IOWADOT

PAVEMENT

PROJECT PRIORITIZATION– PAVEMENT SCORE

Each section of pavement is evaluated to determine its score based on the pavement condition index (PCI) and federal good/fair/poor ratings. Thresholds for particularly poor sections of pavement are also identified.

Pavement sections are spatially joined with PIN geometry.	Pavement Condition Index value 0–100	International Roughness Index (IRI) value > 170	Combine condition and roughness indices.	Pavement score is applied and weighted.	Final score is assigned and flagged, as needed.
PIN GEOMETRY	**CONDITION INDEX**	**ROUGHNESS INDEX**	**INDIVIDUAL SCORE**	**ADJUST BY LENGTH**	**FINAL SCORE**
1	**2**	**3**	**4**	**5**	**6**

ROUGH ROAD AHEAD

0 — 100

64 — 200' / 54 — 100'

54

STEP 1

Pavement sections are grouped together.

STEP 2

The pavement condition index for pavement sections within the project are evaluated based on many factors that determine the overall condition of pavement.

STEP 3

If the roughness of the pavement within the project area is excessive or if damage exists, points are adjusted for these segments to reflect the increased criticality of the pavement.

STEP 4

The condition index and the roughness adjustment are combined to determine a pavement score for each pavement section.

STEP 5

The individual pavement score for each pavement section is weighed based on length.

STEP 6

The final project pavement score is derived from the weighted pavement sections within the project area. When excessive roughness or areas of rutting, faulting or cracking exist in the project area, these areas are also flagged for consideration.

IOWADOT

MOBILITY

PROJECT PRIORITIZATION – MOBILITY SCORE

The mobility score was created to quantify for comparative purposes the effect a PIN has on the mobility of the region. The score is evaluated by accessibility, county road density, INRIX, and ATMS.

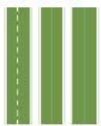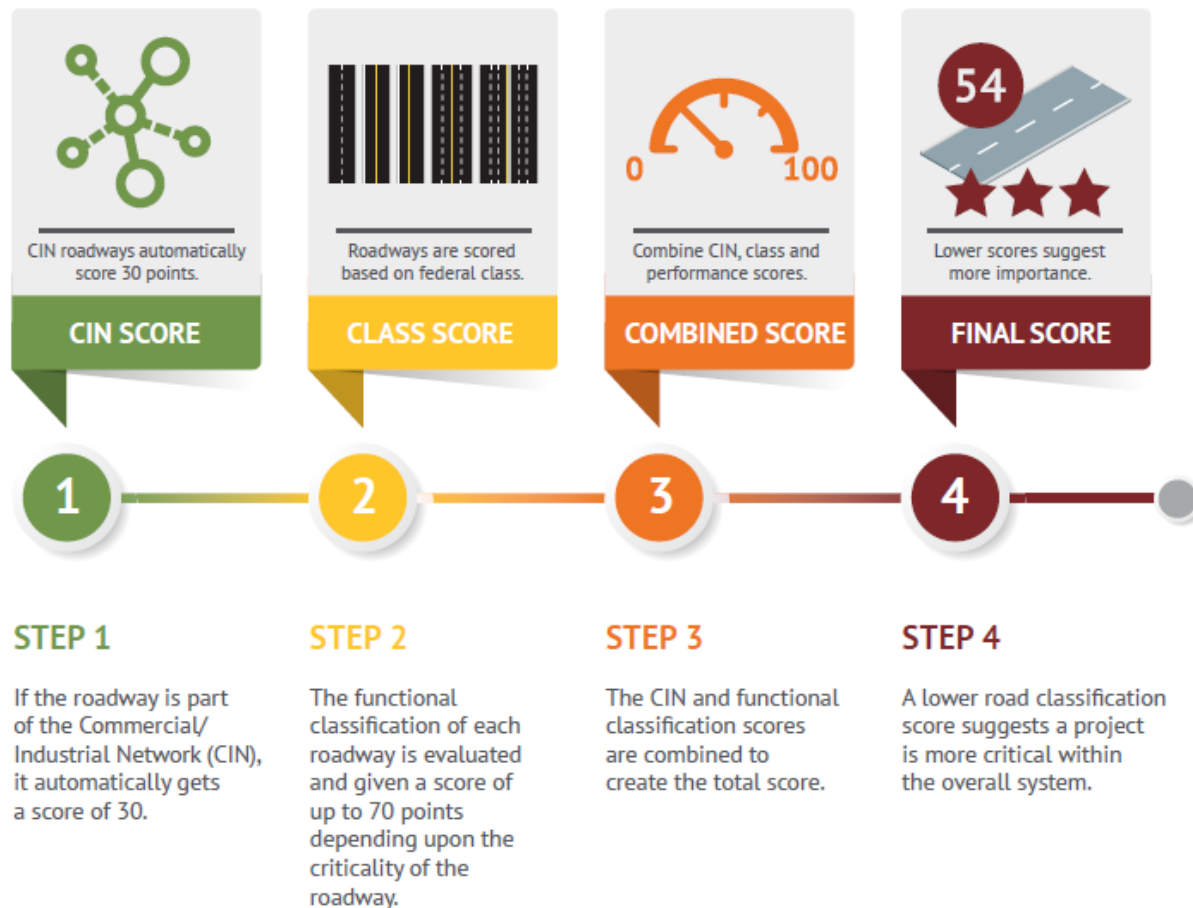|					
Four components are combined with PIN geometry.	Population, size and VMT by functional class calculated.	Score based on access points or corridor's system priority.	Normalized for a 0 to 100 scale.	Average congestion time is scored and flagged if needed.	Final score is assigned and flagged, as needed.
PIN GEOMETRY	**INRIX**	**ACCESS LOCATIONS**	**ATMS**	**ROAD DENSITY**	**FINAL SCORE**
1	**2**	**3**	**4**	**5**	**6**

STEP 1
The project area is evaluated to determine if actual delay, incident, and access information is available.

STEP 2
If available, INRIX data provides real time and historical delay information experienced by actual users on the roadway.

STEP 3
The relationship between the type of roadway, numbers of access points (when available), and volume of daily traffic also provides a measure of Mobility.

STEP 4
When traffic incident information is available, it also provides a measure of mobility.

STEP 5
County road density provides a measure of how important mobility is at a given project location.

STEP 6
The final score for the project is derived from the appropriate components based on the data that is available and how reliable that data is.

IOWADOT

PROJECT PRIORITIZATION– ROAD CLASSIFICATION SCORE

Road classification scores indicate a road's importance in the overall system. Scoring is based on the Commercial/Industrial Network (CIN) and the Federal Function Class of the roadway.

CIN roadways automatically score 30 points.	Roadways are scored based on federal class.	Combine CIN, class and performance scores.	Lower scores suggest more importance.
CIN SCORE	**CLASS SCORE**	**COMBINED SCORE**	**FINAL SCORE**
1	2	3	4

STEP 1

If the roadway is part of the Commercial/Industrial Network (CIN), it automatically gets a score of 30.

STEP 2

The functional classification of each roadway is evaluated and given a score of up to 70 points depending upon the criticality of the roadway.

STEP 3

The CIN and functional classification scores are combined to create the total score.

STEP 4

A lower road classification score suggests a project is more critical within the overall system.

ROADWAY CLASS

IOWADOT

SAFETY

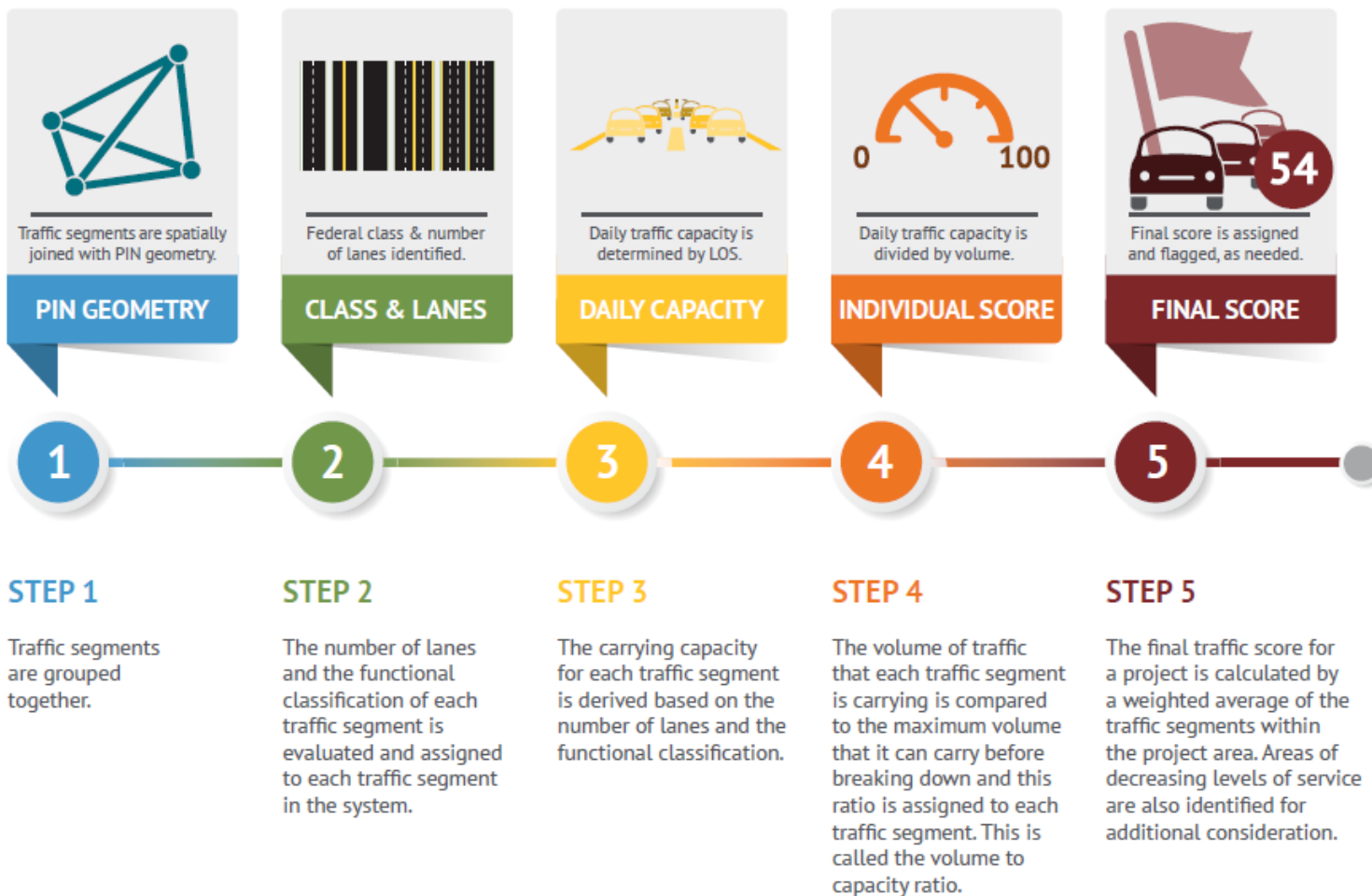## PROJECT PRIORITIZATION – SAFETY SCORE

Each segment of safety data is evaluated to determine its score based on the safety improvement candidate location (SICL) for the roadway segment. Thresholds for particularly unsafe intersections are also identified.

Traffic segments are spatially joined with PIN geometry.	Composite rank calculated to determine score.	Severity included to assign differences in crashes.	Severity value based on the level of injuries.	Combine vehicle miles traveled of each segment.	Final score is assigned and flagged, as needed.
PIN GEOMETRY	**COMPOSITE SCORE**	**SEVERITY**	**SEVERITY POINTS**	**INDIVIDUAL SCORE**	**FINAL SCORE**
1	**2**	**3**	**4**	**5**	**6**

STEP 1
All safety segments are grouped together within the system.

STEP 2
The number of total crashes per mile are calculated for each roadway within each grouping.

STEP 3
The total number of fatal and injury crashes per mile are also calculated for each roadway within the grouping.

STEP 4
Both crash rates are added together and normalized for all safety segment groupings.

STEP 5
A safety score is derived by evaluating and weighting the project against these safety segment groupings based on length.

STEP 6
A cost for crashes is also developed for the project area based on the types of project and severity.

IOWADOT

PROJECT PRIORITIZATION– TRAFFIC SCORE

TRAFFIC

Each segment of traffic data is evaluated to determine its score based on the desired level of service (LOS) for the road section. Thresholds for particularly congested roadway segments are also identified.

Traffic segments are spatially joined with PIN geometry.	Federal class & number of lanes identified.	Daily traffic capacity is determined by LOS.	Daily traffic capacity is divided by volume.	Final score is assigned and flagged, as needed.
PIN GEOMETRY	**CLASS & LANES**	**DAILY CAPACITY**	**INDIVIDUAL SCORE**	**FINAL SCORE**

1 — **2** — **3** — **4** — **5**

STEP 1

Traffic segments are grouped together.

STEP 2

The number of lanes and the functional classification of each traffic segment is evaluated and assigned to each traffic segment in the system.

STEP 3

The carrying capacity for each traffic segment is derived based on the number of lanes and the functional classification.

STEP 4

The volume of traffic that each traffic segment is carrying is compared to the maximum volume that it can carry before breaking down and this ratio is assigned to each traffic segment. This is called the volume to capacity ratio.

STEP 5

The final traffic score for a project is calculated by a weighted average of the traffic segments within the project area. Areas of decreasing levels of service are also identified for additional consideration.

PROJECT PRIORITIZATION – FREIGHT SCORE

Each project is assigned an economic score based on its proximity to known freight facilities, as well as its performance scores for bridges, safety, pavement and traffic.

Identify project location in relation to freight facilities.

PROJECT LOCALE

Proximity points 0–100

FREIGHT SCORE

Combine freight and proximity scores.

COMBINED SCORE

Lower scores suggest more nearby freight.

FINAL SCORE

1   2   3   4

STEP 1

Determine the distance of the project to known freight facilities.

STEP 2

Points are tallied based on proximity of freight generators located within 20 miles of the project.

STEP 3

If the segment is also on the freight network, 20 points are added to the score.

STEP 4

A lower final freight score suggests added criticality due to more freight facilities located near the project.

IOWADOT

Current Measure Proximity to Freight Generators:

- Barge Terminals
- Biodiesel Plants
- Coal Burning Facilities
- Distribution Centers
- Ethanol Plants
- Grain Facilities
- Intermodal Facilities
- Processing Facilities
- Transload Facilities
- Warehouses
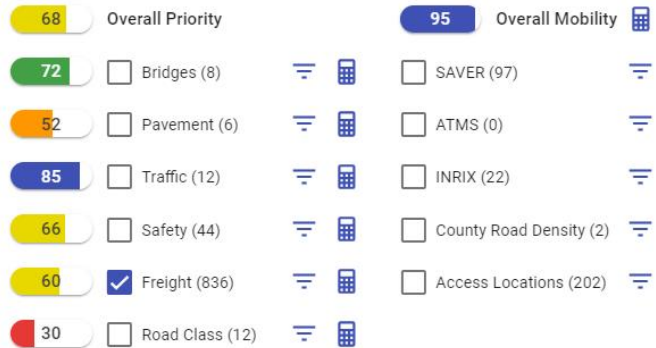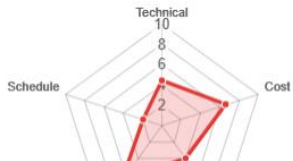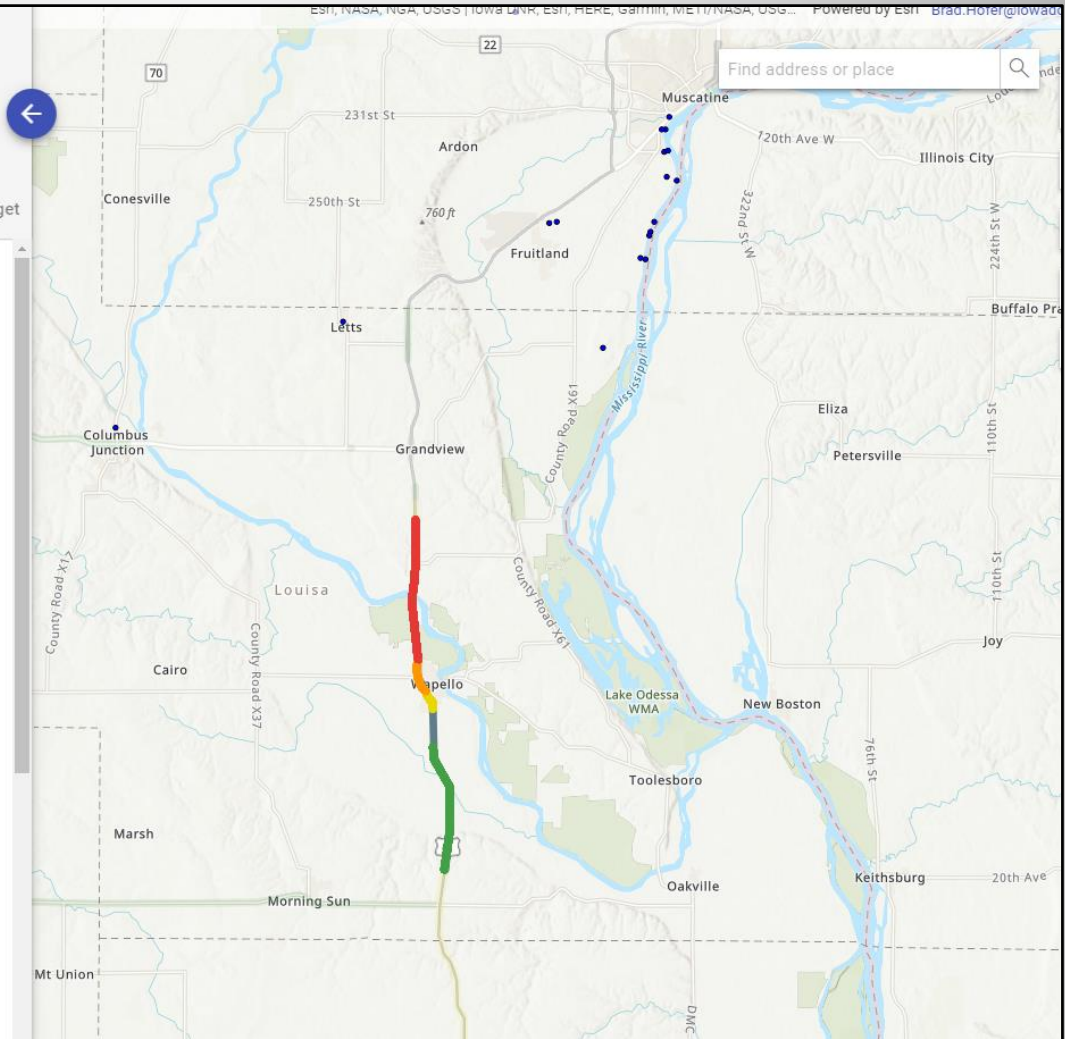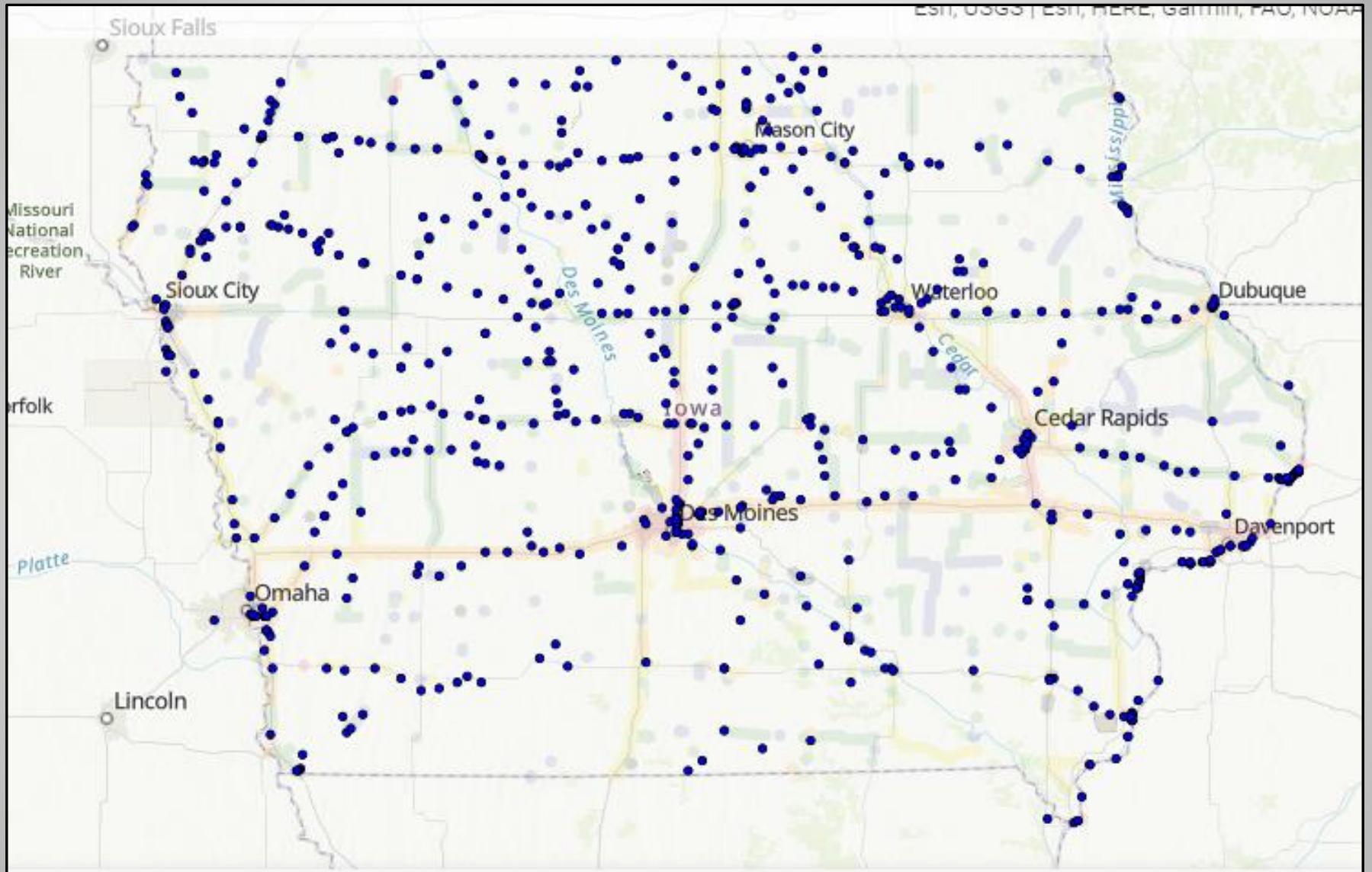
Discrete Objective Measures

MOBILITY   – 16%

TRAFFIC   – 14%

BRIDGE   – 17%

PAVEMENT   – 15%

FREIGHT   – 11%

ROAD CLASS   – 10%

SAFETY   – 17%

                        100%

IOWADOT

BRAD HOFER
LOCATION ENGINEER / ASSISTANT OFFICE DIRECTOR
OFFICE OF LOCATION & ENVIRONMENT
Brad.hofer@iowadot.us
Office: 515-239-1787

QUESTIONS ???

IOWADOT