IOWA DOT
GETTING YOU THERE

Bicyclists and Pedestrian **Systemic Safety Analysis**

Systemic
Safety Analysis

"The systemic approach to safety involves widely implemented Improvements based on high-risk roadway features correlated with specific severe crash types. The approach provides a more comprehensive method for safety planning and implementation that supplements and complements traditional site analysis." *

*FHWA. 2013. Systemic Safety Project Selection Tool. Safety.fhwa.dot.gov/systemic/fhwasa13019/. U.S. Department of Transportation, Federal Highway Administration. July.

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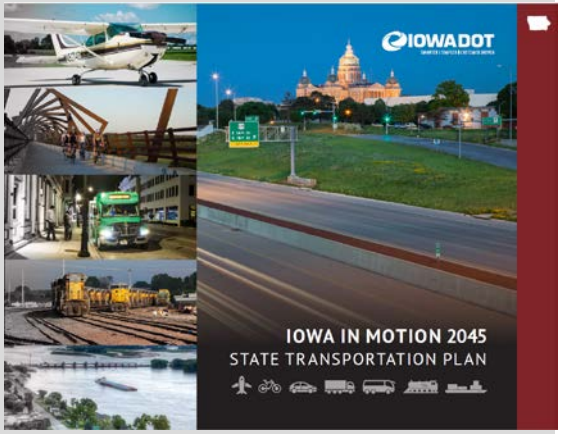
Bicyclists and Pedestrian Systemic Safety Analysis

Iowa in Motion 2045



"Evaluate Key safety challenges pertaining to bicycling and walking and develop crash reduction strategies"

Iowa Bicycle and Pedestrian Long Range Plan

"Identify the primary urban and rural crash types occurring in Iowa and develop strategies for reducing crashes"

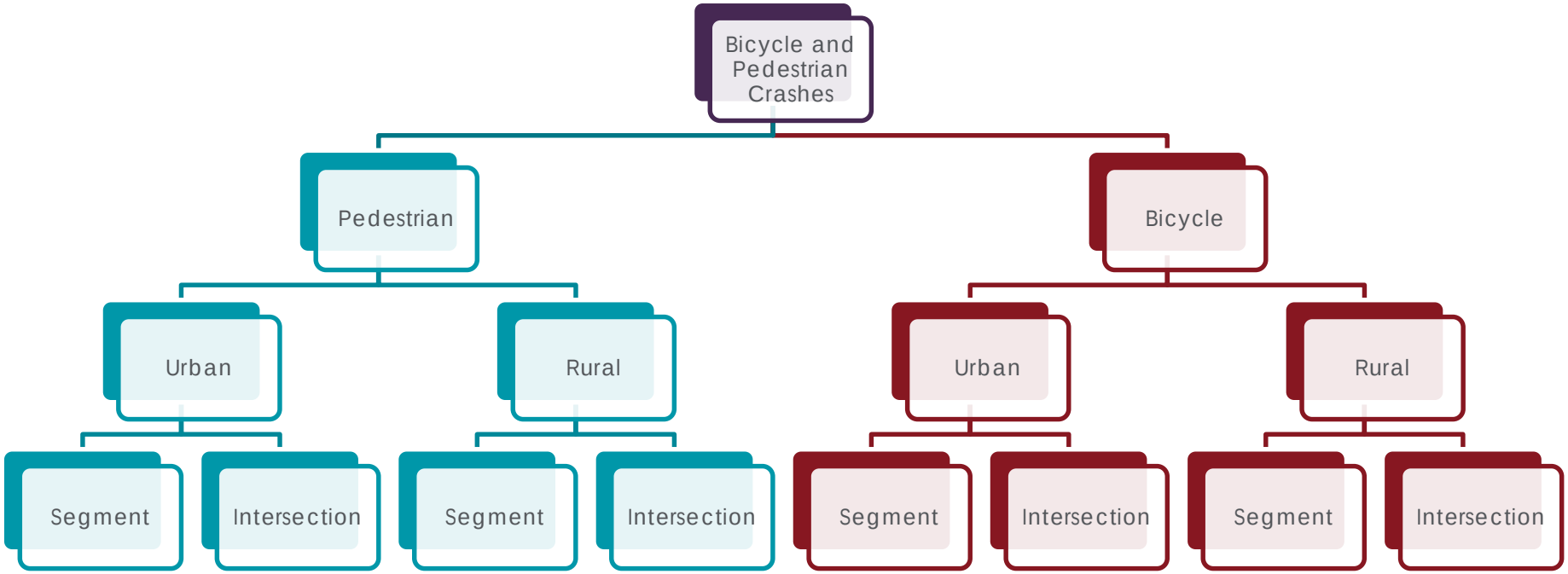
"Develop methodology for bicycle and pedestrian safety audits of high crash corridors and intersections to identify adequate counter measures"

Iowa SHSP

"Conduct enforcement campaigns related to bicycle and pedestrian awareness at targeted intersections"

- Data Sources
  - Crash Data 2009-2018
  - Intersection Database
  - Roadway Data (RAMS)
- Software
  - ArcGIS
  - SQL Developer

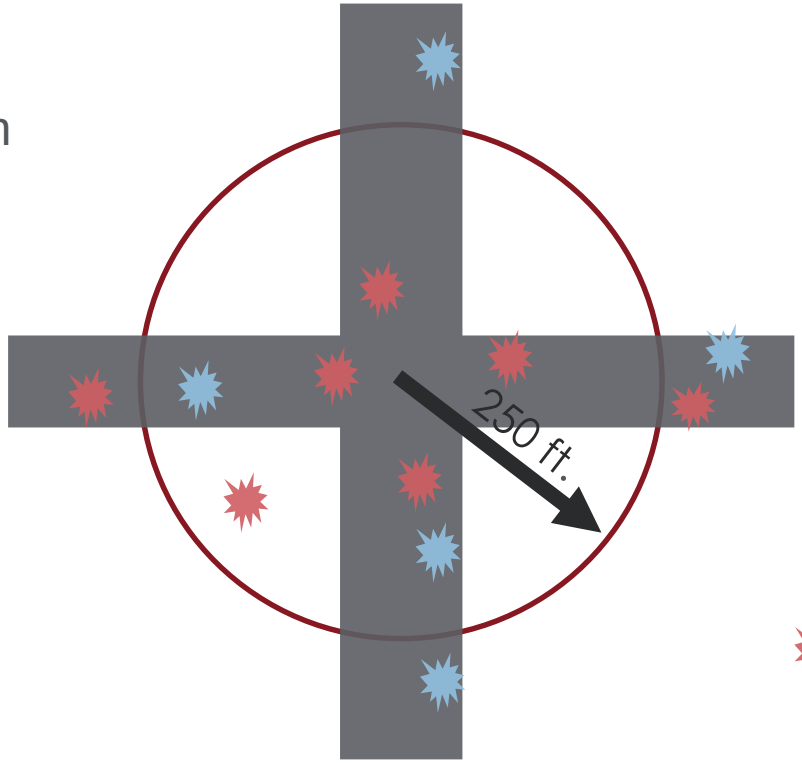
Bicyclist and Pedestrian Systemic Safety Analysis



Defining Intersection Crashes

Condition 1

- Must be coded as an intersection



Condition 2

- Must be within 250ft of the intersection

Segment Coded Crashes

Intersection Coded Crashes

Intersections

- Attributes included
  - AADT
  - Intersection Angle
  - Intersection type
  - Number of Lanes
  - Number of Legs
  - Speed Limit
  - Traffic Control

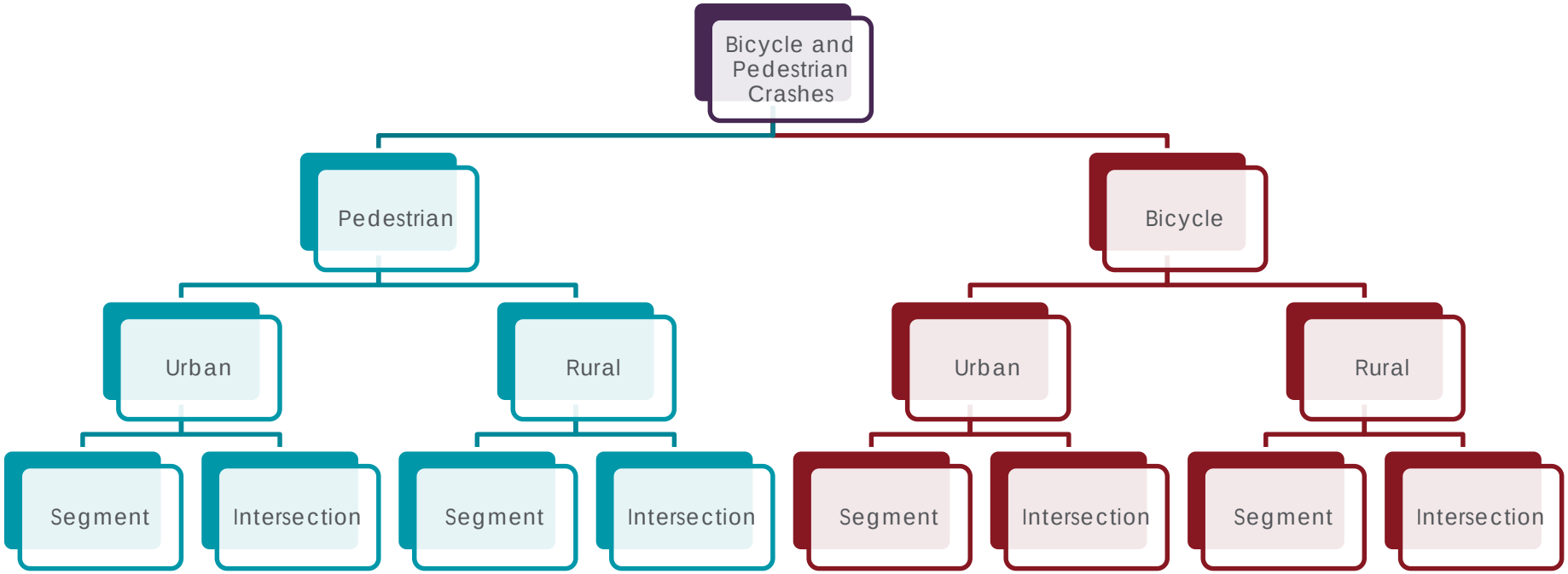
Segments

- Attributes included
  - AADT
  - Median Type
  - Number of Lanes
  - Parking Type
  - Shoulder Rumble
  - Shoulder Type
  - Shoulder Width
  - Speed Limit

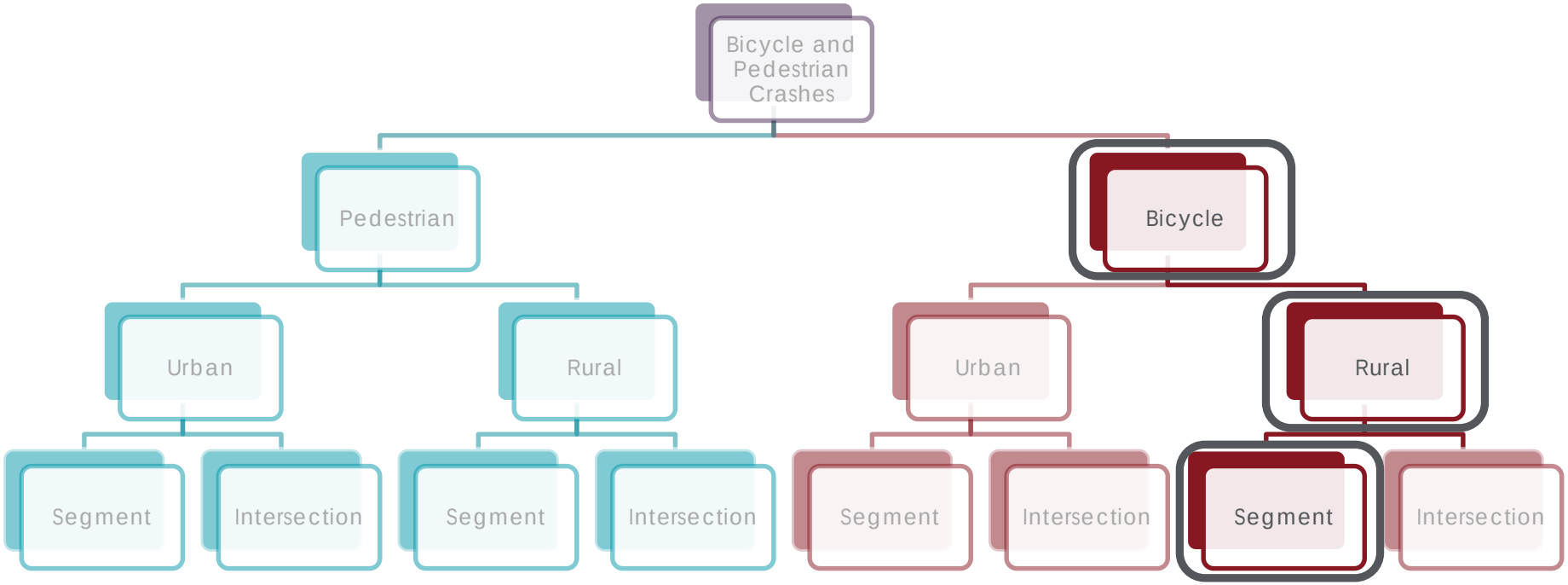
Normalization, Weighting, and Composite score

- Normalization
  - For each element a rate is developed based on the number of crashes and associated mileage related to that attribute.
  - A normalized Score of 1-10 is developed based on the range of possible values for each element attribute.
- Weighting
  - Once all the elements have been normalized to a common scale a weighting multiplier is applied.
  - This is essentially done for two reasons
    - To eventually have a composite score from 0-100
    - In the future the ability to emphasize elements over each other.
- Composite Scores
  - After weighting, all the weighted element scores are added together for each segment or intersection which makes up a composite score.

Bicyclist and Pedestrian Systemic Safety Analysis



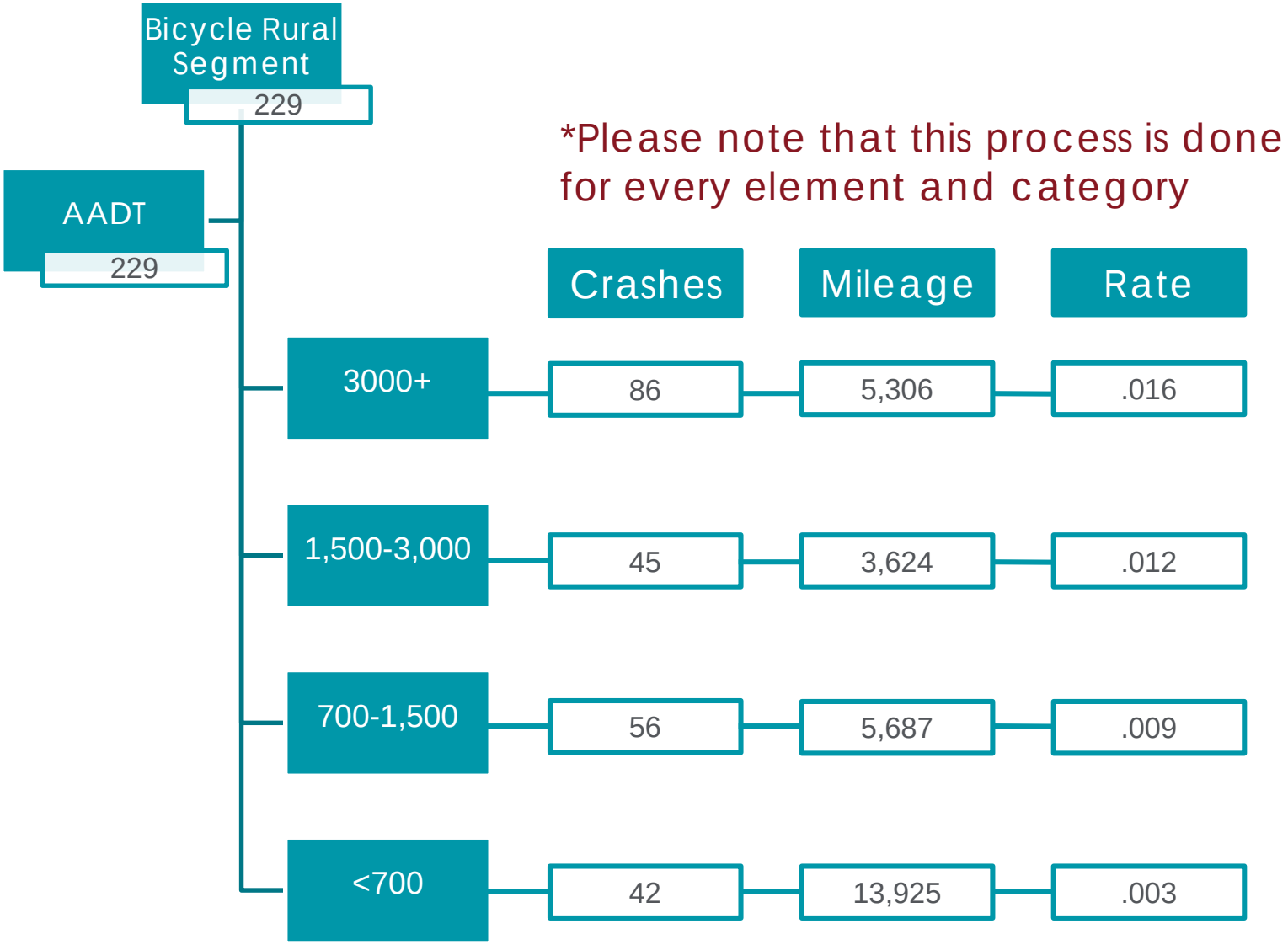
Bicyclist and Pedestrian Systemic Safety Analysis



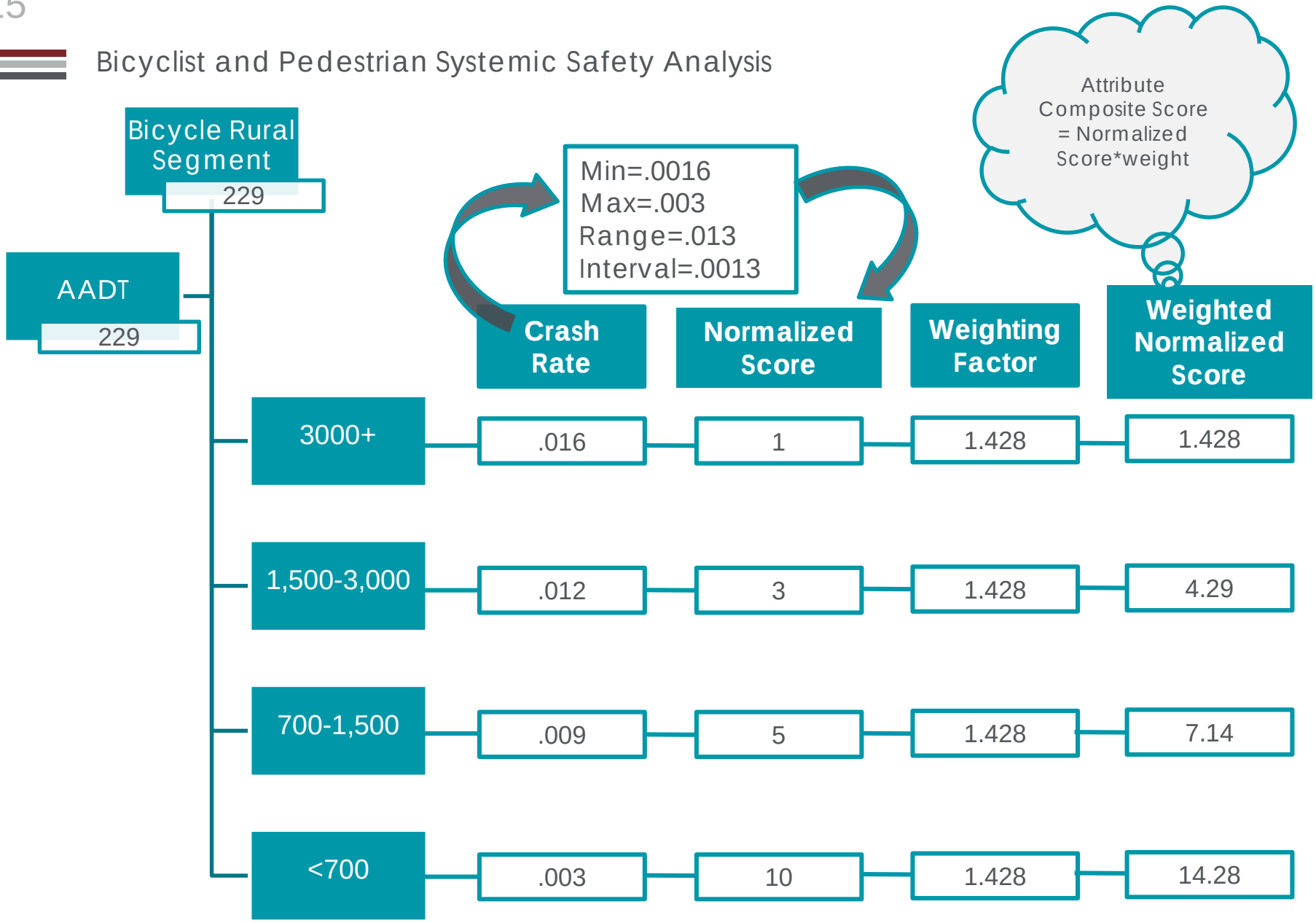
Segments

- Attributes included
  - AADT
  - Median Type
  - Number of Lanes
  - Parking Type
  - Shoulder Rumble
  - Shoulder Type
  - Shoulder Width
  - Speed Limit

Bicyclist and Pedestrian Systemic Safety Analysis



Bicyclist and Pedestrian Systemic Safety Analysis



Composite Scoring

- Elements
  - AADT → 14.28
  - Speed Limit → 12.85
  - Number of Lanes → 14.28
  - Shoulder Width → 1.42
  - Shoulder Type → 12.85
  - Median Type → 1.42
  - Shoulder Rumble → 14.28

= **71.38**

Additional Elements to Consider

- Spatial Elements
  - Proximity to existing non-motorist infrastructure
  - Proximity to transit stops
  - Proximity to schools
- Crash Data
  - Segment level non-motorist crashes
- Estimated exposure
  - University of Iowa study/analysis

Anticipated Outputs

- Segment and intersection based results
  - Statewide network screening
- Deliverables
  - Technical memo
  - Interactive online maps
  - Special Requests
- Emphasis
  - User friendly
  - Interactive

THANK YOU FOR YOUR TIME AND ATTENTION

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