Wisconsin DOT ITS Sketch Plans

Corridor Sketch Plan Methodology

presented to
OTEC

presented by
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October 29, 2008

Background

- Early Adopter
  - MONITOR System in Milwaukee metro area
  - Gary-Chicago-Milwaukee (GCM) Corridor: Traveler Information System
- Later Funding Challenges
  - Seen as competing for construction dollars
- Loss of Focus for the Program

CAMBRIDGE SYSTEMATICS

Project Goals

- **Provide Statewide plan for ITS/Operations deployment**
  - **Where to deploy**
  - **Where NOT to deploy**
- **Integrate into traditional planning processes**
  - **Utilize current processes as much as possible**
    - **LRTP Corridors**
- **Complement vs. Compete with traditional infrastructure**

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Context

- Unanimous support for a mechanism by which Operations/ITS needs can be identified across the state
  - Prioritized list
  - Guidelines for implementation (field device density and type)
- Operations/ITS needs to be reflected at the policy level
  - System Preservation Theme
- What *NOT* to do….
  - Do not create a mechanism which prolongs the project development timeline

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2 Goals – 2 Methodologies

1st Goal: Develop ITS Solutions by Corridors

Criteria

ITS Projects appropriate for each corridor

2nd Goal: Prioritization Process

Criteria

ITS Projects appropriate for all the corridors

By Corridor

Corridor Methodology

Data Collection

Utilizes traditional planning metrics that are readily available and updated frequently

- Meta Data
- TOPS Weather Data
- WisDOT Event Data

1

Scoring

Utilizes metrics and associated thresholds to score links statewide for their operations importance

2

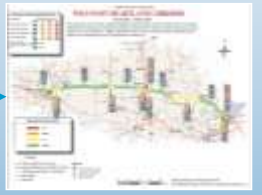
Technology Recommendations

Scores lead operations and technology solutions density recommendations

3

Results

Process provides priority corridors for operations as well as deployment density recommendations for all corridors throughout the State



4

Weighting Criteria

Criteria	Weight
Mobility	50%
ADT Base Year	10%
ADT Forecast Year	7%
HC ADT Base Year	4%
Peak Hour V/C – LOS	12%
Congestion Forecast Year – LOS	12%
Safety	40%
Crash Rate	15%
Crash Severity	13%
Weather Index	9%
Developmental Pressures	10%
ADT Growth	7%
Event/Traffic Generators	11%

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Data for Sketch Planning Methodology

- **Meta-Manager Data**
  - **DTIM - Bureau of State Highway Programs**
    - AADT
    - AADT Future
    - HCADT
    - V/C - LOS
    - LOS Future
    - Crash Rate
    - Crash Severity Index
    - **Roll-up**
- **Weather Data**
  - **UW TOPS Lab Data**
- **Event Data**
  - **Bureau of Traffic Forecasting**

Weather Data

- **University of Wisconsin TOPS Laboratory**
  - **Application of Road Weather Safety Audit to the Wisconsin Highway System**
    - **Qin, Noyce, Martin, and Khan**
- **Two data sets**
  - **Weather observation data**
  - **Weather-related crash data**
    - **Selected Conditions Data**
      - Minimal variation over time
      - Crash data requires updating in future years
      - Crash data requires additional manipulation

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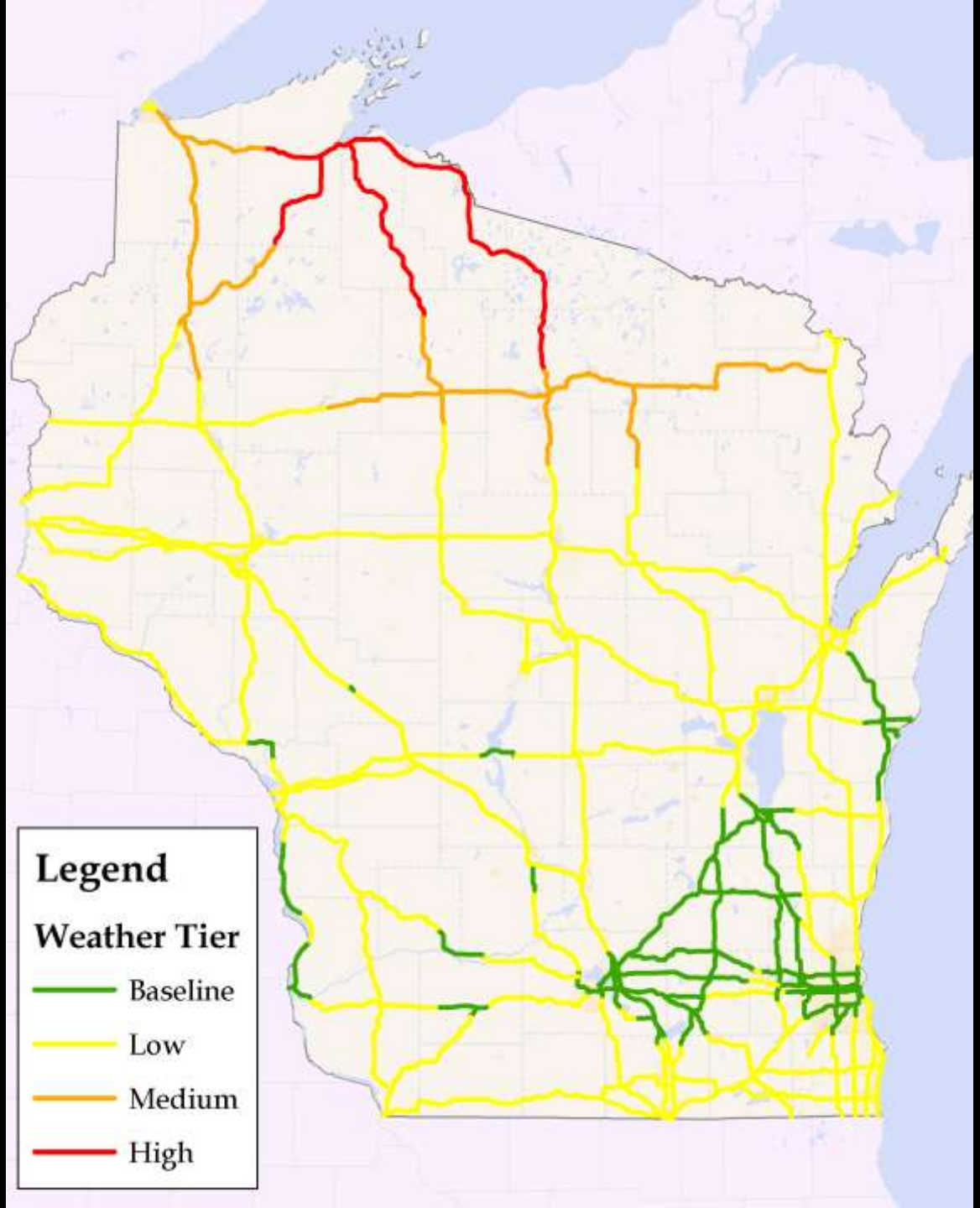
Legend
Weather Tier
Baseline
Low
Medium
High

Event Data

- **WisDOT - Bureau of Traffic Forecasting**
  - **86 events across the state**
    - **Names**
    - **Location**
    - **Duration**
    - **Frequency**
    - **Attendance**

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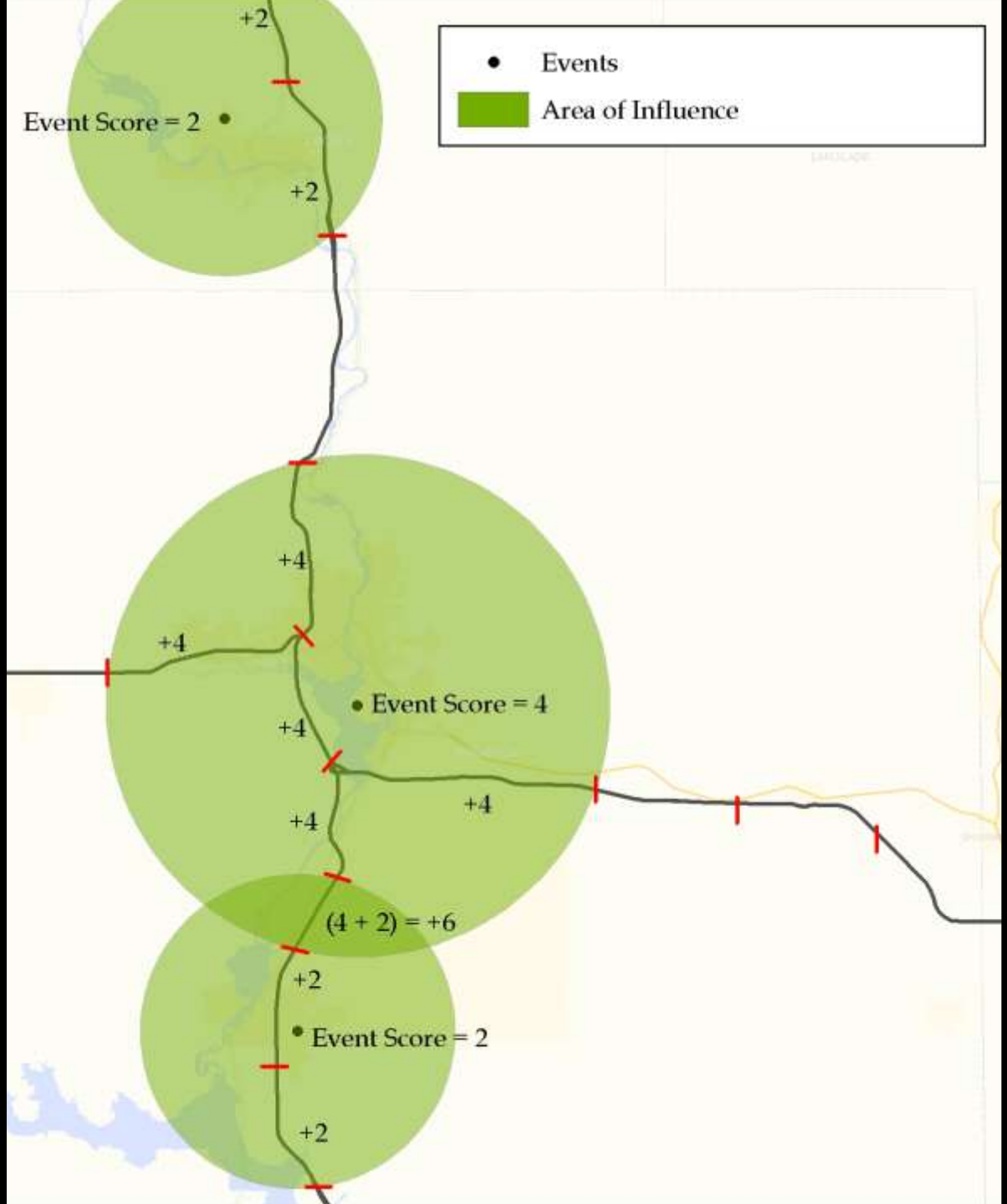
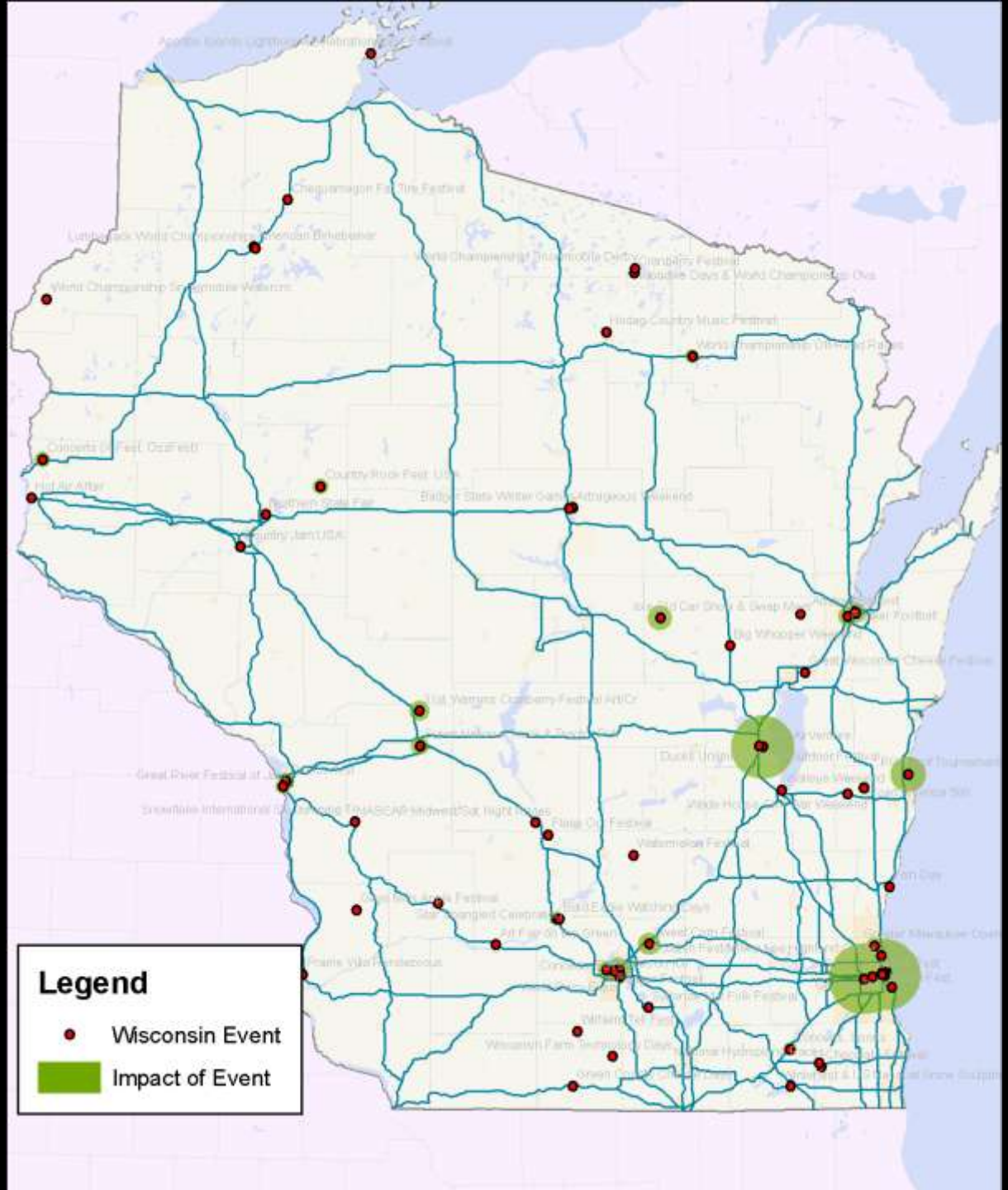
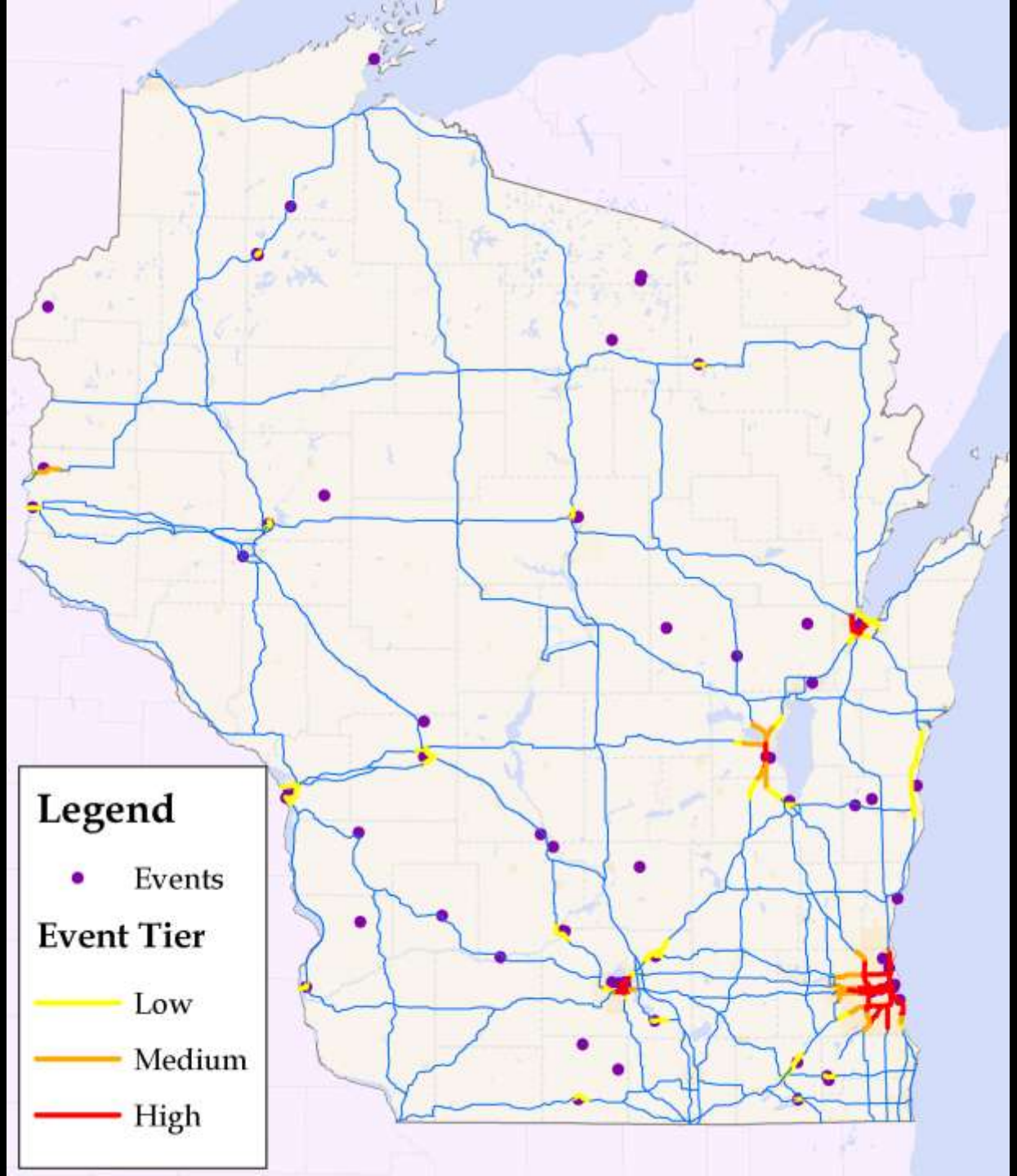
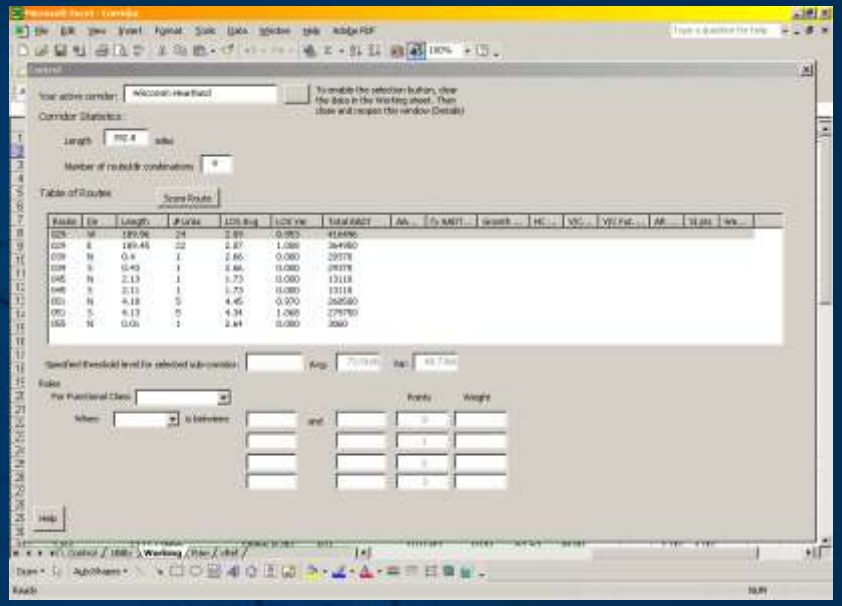

Events
Area of Influence
Event Score = 2
+2
+2
+4
+4
Event Score = 4
+4
+4
+4
(4 + 2) = +6
+2
Event Score = 2
+2


Legend
Wisconsin Event
Impact of Event


Legend
Events
Event Tier
Low
Medium
High

Sketch Planning Tool

- **Excel VB Tool**
  - **Includes Thresholds and Weights**
    - **Sensitivity Analysis**
  - **Allows Scenario Specific Analysis**
  - **Includes GIS Output for All Corridors**
  - **Includes Scores for:**
    - **Sketch Plan Links**
    - **Meta-Manager Links**



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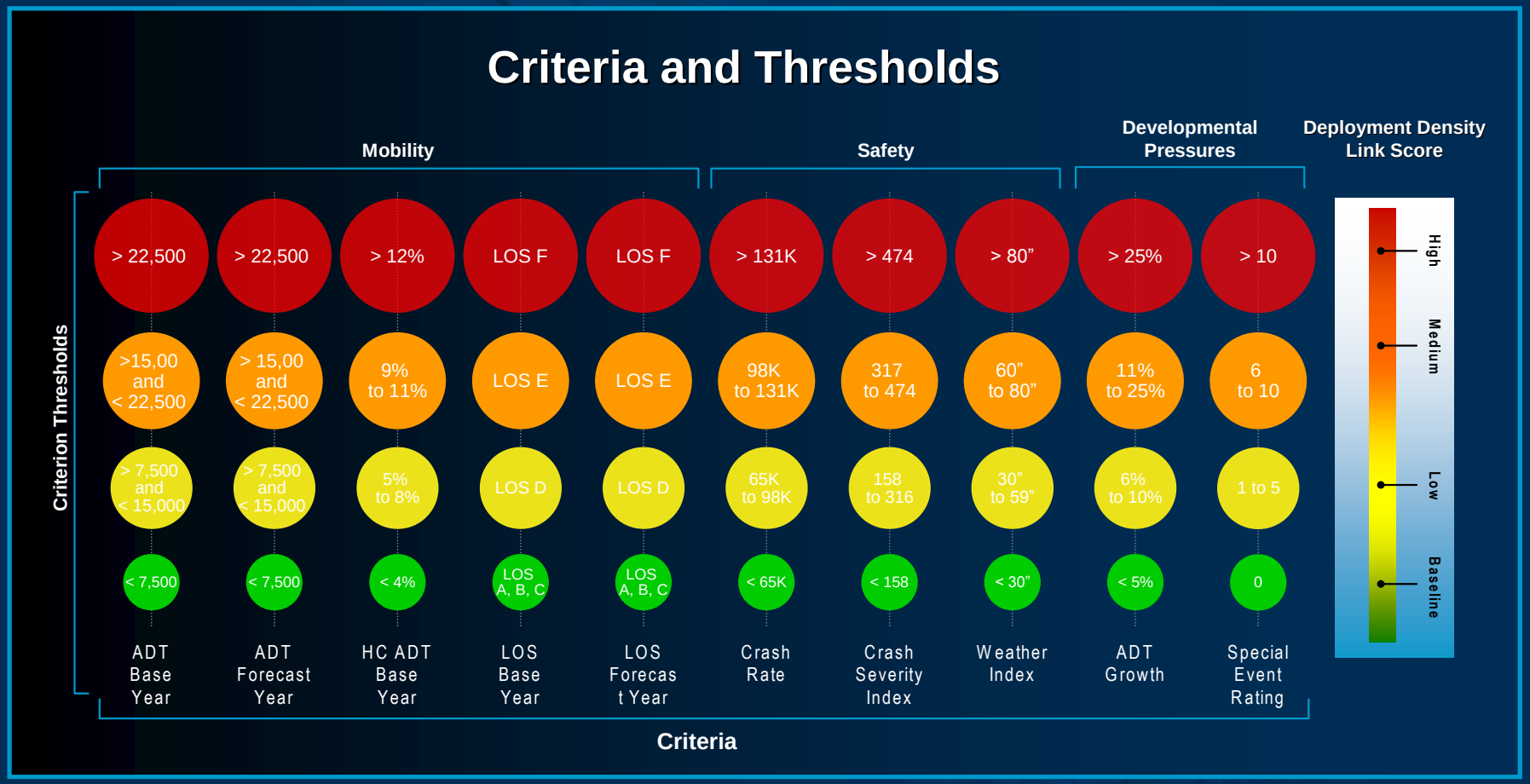
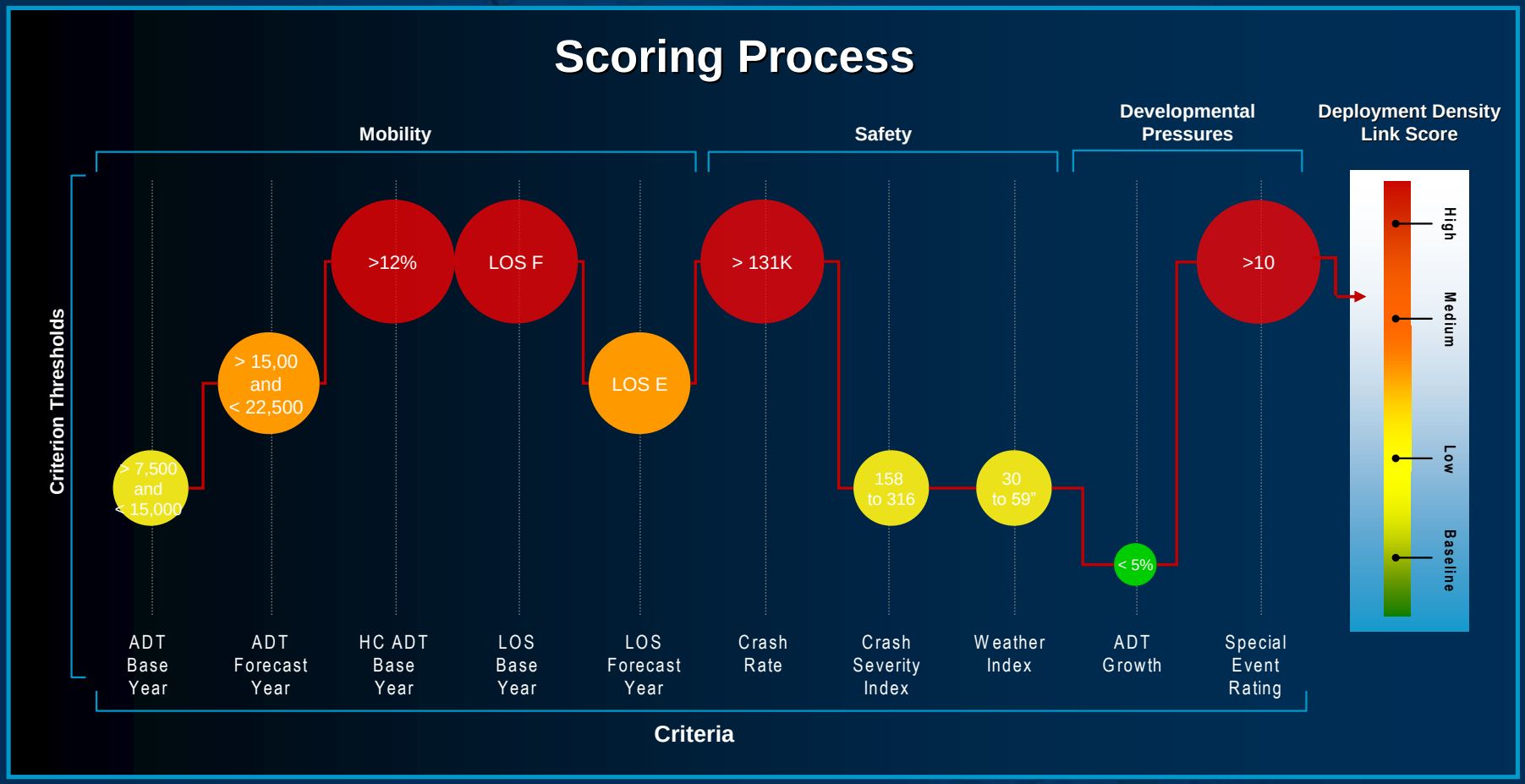
1 Data Collection

- Criteria are chosen to reflect areas of Mobility, Safety, and Development Pressure
- Include impacts of severe weather and special events



2 *Scoring*

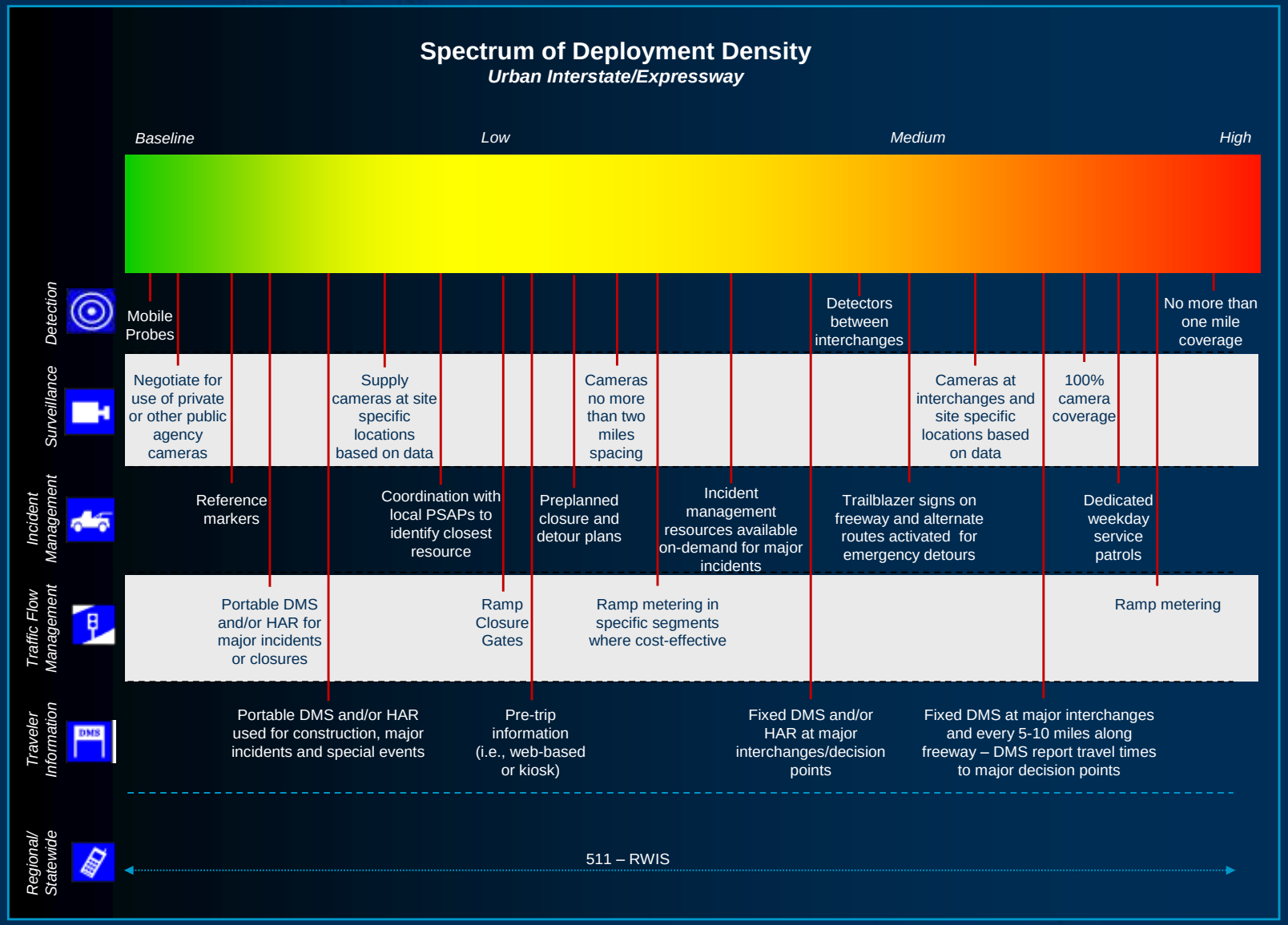
- Roadway links are scored based on Criteria
- Weights are applied to generate overall Deployment Density Class




Deployment Density Classes
Baseline
Low
Medium
High

3 Technology Recommendations

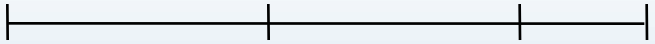
- Based on Deployment Density Class and Roadway Functional Class
- Are provided as a range of options



Sample Roadway

1

Data are gathered for roadway links.



2

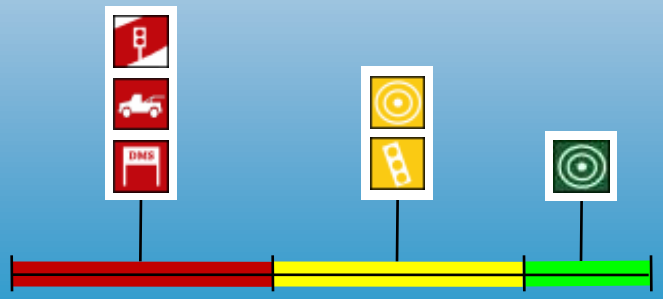
Links are scored to determine Deployment Density Class (DDC).

3

+

4

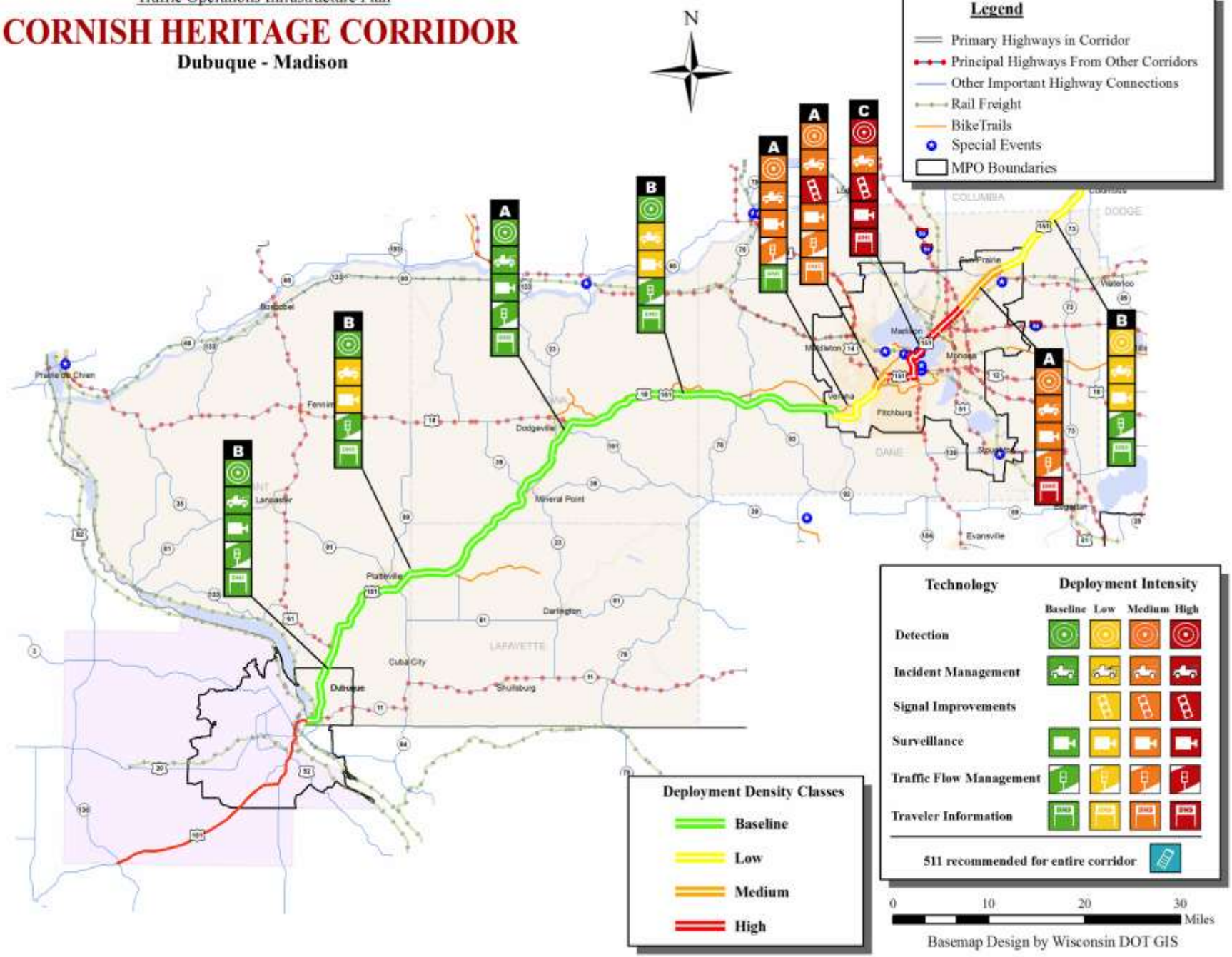
Technology recommendations are assigned based on DDC, functional class, and professional review.



Traffic Operations Infrastructure Plan

CORNISH HERITAGE CORRIDOR

Dubuque - Madison



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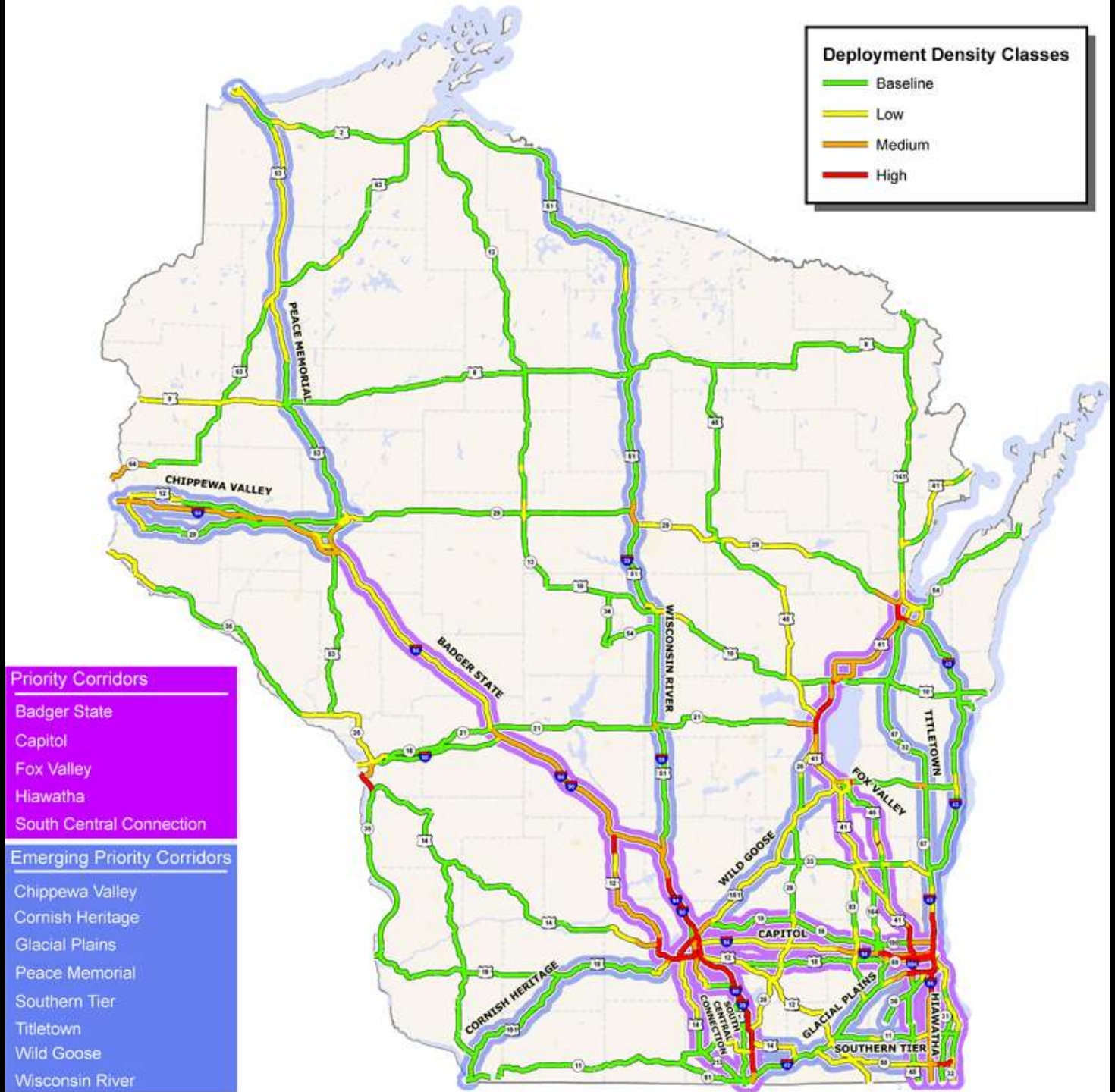
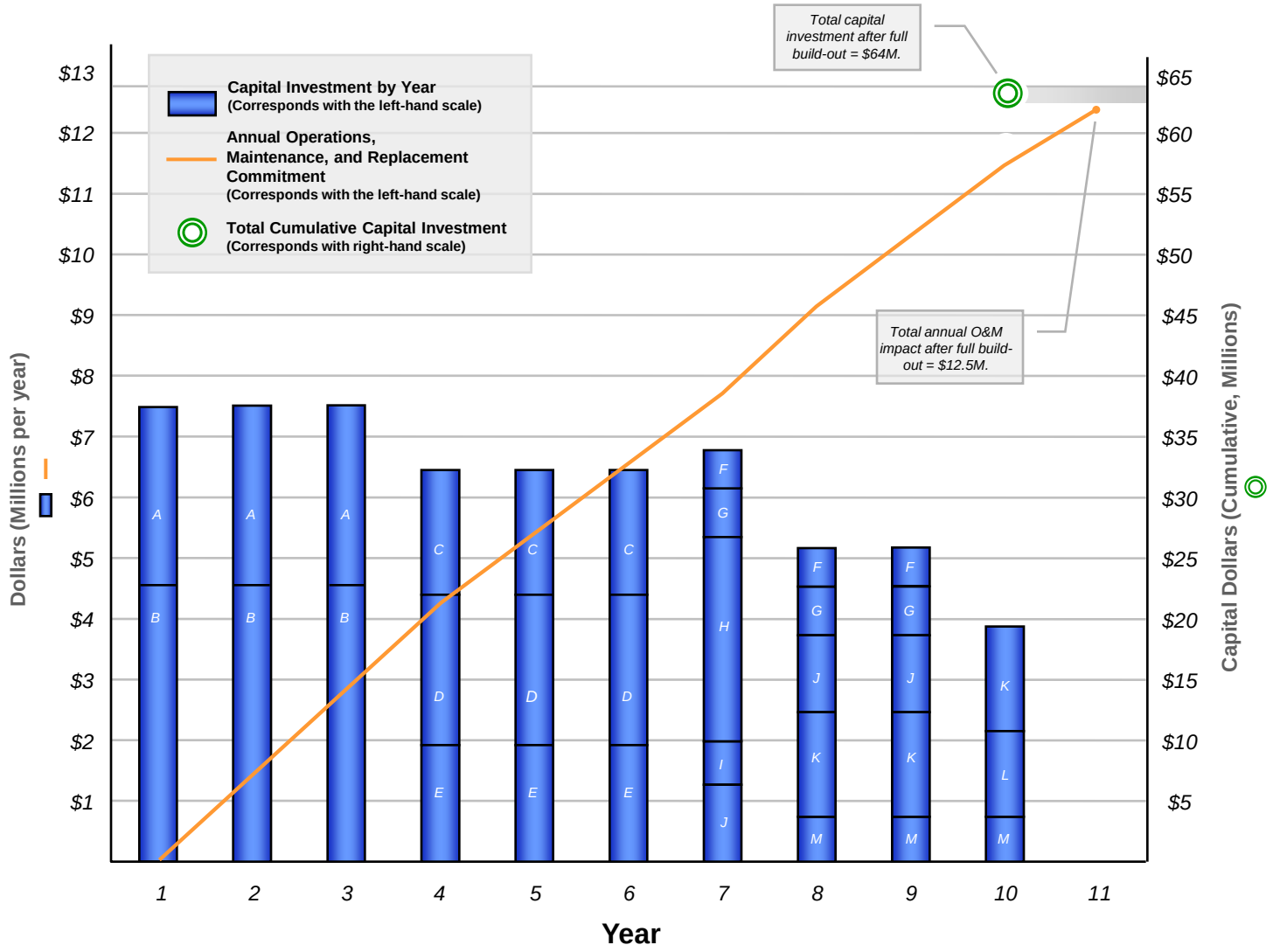

Deployment Density Classes
Baseline
Low
Medium
High
Priority Corridors
Badger State
Capitol
Fox Valley
Hiawatha
South Central Connection
Emerging Priority Corridors
Chippewa Valley
Cornish Heritage
Glacial Plains
Peace Memorial
Southern Tier
Titletown
Wild Goose
Wisconsin River
PEACE MEMORIAL
CHIPPEWA VALLEY
BADGER STATE
WISCONSIN RIVER
TITLETOWN
FOX VALLEY
WILD GOOSE
CAPITOL
CORNISH HERITAGE
SOUTH CENTRAL CONNECTION
GLACIAL PLAINS
HIAWATHA
SOUTHERN TIER



Key Points

- All costs presented in 2007 dollars.
- Capital investments per year (blue bars) include multiple projects associated with the TOIP Corridors listed below.
- Larger scale corridor projects' cost were spread out over multiple years (max of three years).
- Costs associated with the STOC are not included in this estimate; but statewide initiatives such as 511 are included.
- Details on these costs, including assumptions, can be found in the WisDOT TOIP final report dated May 2008.

TOIP Corridors

Priority and Emerging Priority

A. Badger	H. Wild Goose
B. Capital	I. Peace Memorial
C. Fox Valley	J. Cornish Heritage
D. South Central	K. Titletown
E. Hiawatha	L. Southern Tier
F. Wisconsin River	M. Glacial Plains
G. Chippewa Valley	

Staging of projects was driven by TOIP corridor prioritization process.

WisDOT Traffic Operations Infrastructure Plan

Deployment Cost Schedule