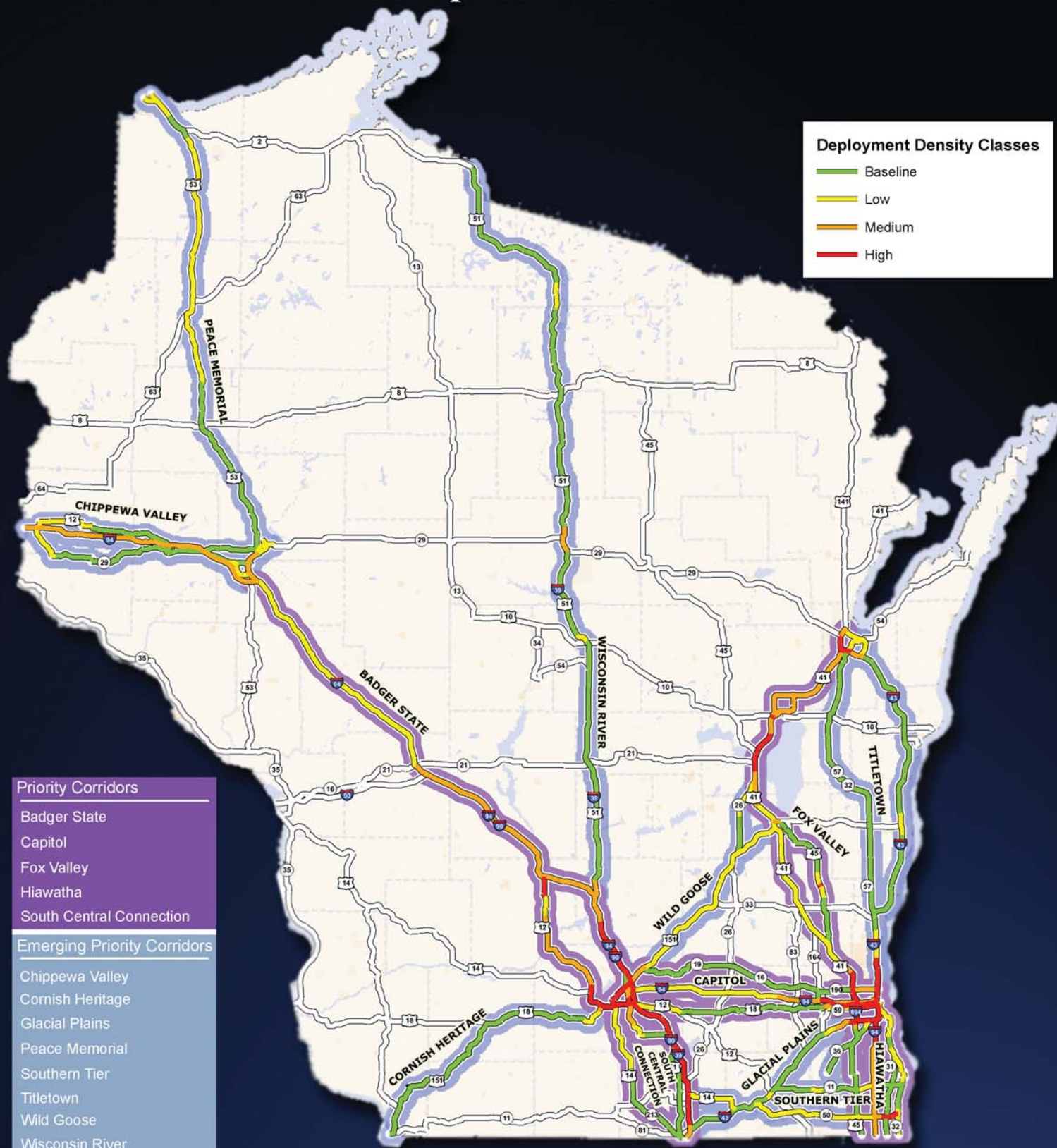


# Statewide Traffic Operations Recommendations

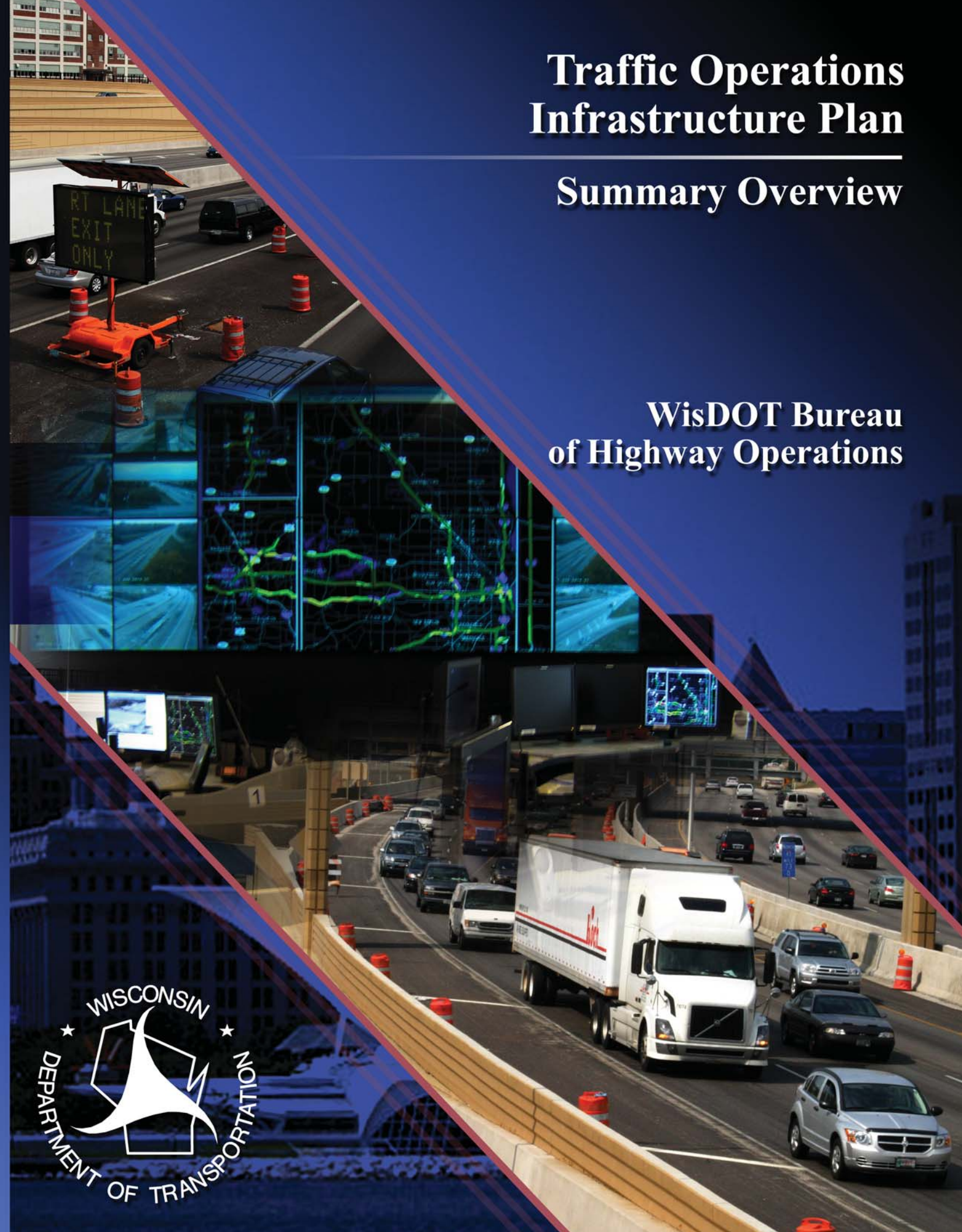


For further detail, visit the project web site at <http://www.topslab.wisc.edu/workgroups/toip.html>  
or contact John Corbin at [john.corbin@dot.state.wi.us](mailto:john.corbin@dot.state.wi.us)

## Traffic Operations Infrastructure Plan

### Summary Overview

WisDOT Bureau  
of Highway Operations







## Purpose and Need for a Plan

In July 2006, the Wisconsin Department of Transportation (WisDOT) initiated preparation of a *Traffic Operations Infrastructure Plan* (TOIP) with the goal of developing a methodology and associated tool that will enable the Bureau of Highway Operations (BHO) to evaluate operational projects in the same manner as traditional infrastructure projects, as well as to integrate operations into the WisDOT planning process. The planning effort has resulted in a quantifiable method for that evaluation, designed to build upon current WisDOT planning and programming processes.

The *Plan* integrates four separate planning efforts that, when folded together, present a comprehensive vision for the future of Wisconsin's statewide traffic operations program. These four areas are: the Corridor Planning Methodology for Traffic Operations; Freeway Surveillance and Ramp Control; Travel Warning and Information Systems; and Traffic Signal Systems.

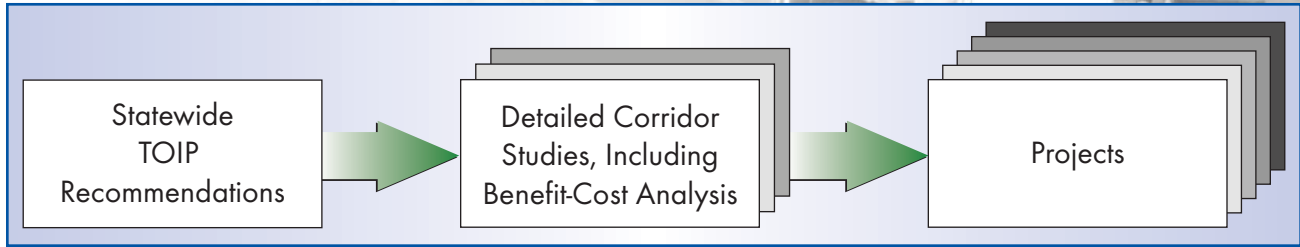
Contained within the brochure are brief overviews of the:

- Goals of the TOIP;
- Methodologies used to assess roadway needs and prioritize corridors;
- Corridor prioritization process results;
- Estimated expenditures; and
- Final recommendations of the TOIP.

## Using the Plan

TOIP recommendations can aid WisDOT regional and central office planners by providing guidance for operations/ITS deployments from a statewide perspective. The development of a long-range vision for traffic operations infrastructure enables WisDOT to integrate operations/ITS deployments into highway improvement projects and to link deployment and operations and maintenance (O&M) financial commitments. The TOIP includes sketch-level operations/ITS deployment needs, recommendations for potential technology solution sets, and the estimated investment in capital, maintenance, operations, and replacement necessary to fund long-range operations solutions to improve roadway safety and performance. The TOIP was developed to integrate with established WisDOT regional planning processes including the WisDOT Corridor Management Process and its results were utilized in the latest update of the long-range plan. The figure below shows how the TOIP's statewide recommendations are intended to be employed in intermediate corridor-level studies prior to the formation of specific projects.

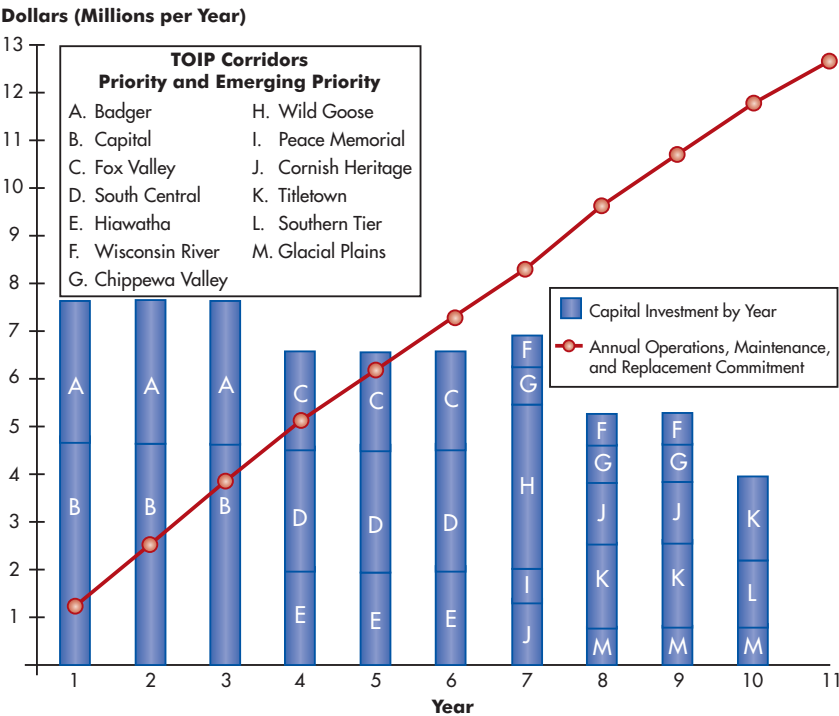
### From Recommendations to Projects



## Estimating the Costs

The cost to not only build but maintain projects is of paramount consideration whenever a strategic planning effort is being developed. The TOIP provides an unparalleled level of details in this regard, providing WisDOT planner and designers with a variety of cost breakouts for operations/ITS projects. For the top 13 corridors, detailed cost estimates and potential annualized schedules were developed. The Annualized Infrastructure and Operations Cost Profile is presented below. The blue bars represent the capital investment by year (employing the staging of projects and levels of investment recommended within the TOIP). The red line represents the annual operations, maintenance, and replacement commitment. The total annual O&M commitment after full build-out (an estimated 11 years following the initial capital investments) is \$12.5 million. The total capital investment after full build-out is estimated to be \$64 million. All costs are in 2007 dollars and include expenditures for statewide initiatives such as 511 (though costs associated with the STOC are not included). The TOIP final report also includes cost breakdown by operational functions such as traveler information, traffic flow management, and incident management.

### Estimated Project Expenditure Timeline



## Conclusions

The TOIP is a major step forward for the Bureau of Highway Operations and all of WisDOT as we strive to integrate operations into the planning process. It provides a quantitative approach and tool that analyzes operational needs of the Wisconsin highway system and provides a structured approach to operations/ITS recommendations across the State. The TOIP also creates a statewide operations/ITS program that allows planners and programmers to understand not only capital program cost implications, but ongoing maintenance, operations, and replacement requirements. The long-term success of the TOIP will ultimately be measured on how effectively it is integrated into standard WisDOT practices and procedures. The BHO is leading the effort to ensure the TOIP is not only maintained and updated in a structured manner, but recommendations of the TOIP process are utilized as new corridor studies are undertaken and design projects are considered throughout the State.

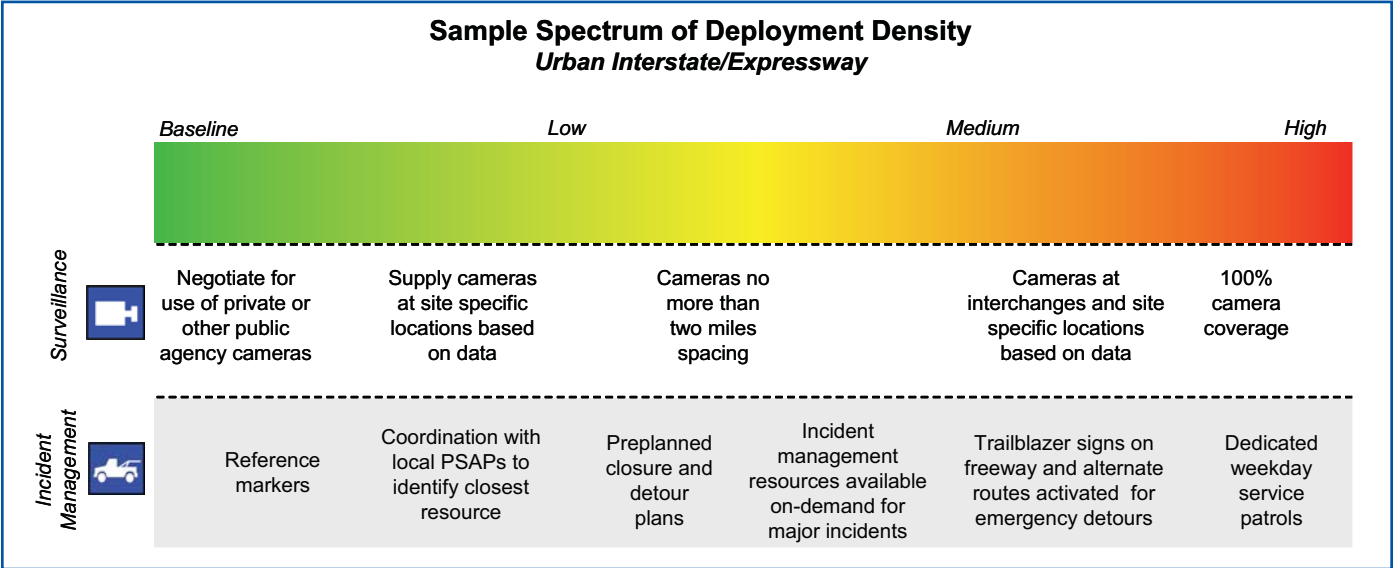




## Identifying Specific Operational Solutions

As can be seen in the previous spread, operational solutions to meet roadway needs are shown in the form of sign-post icons on Corridor maps. Each icon recommendation was determined by a thorough professional review of the roadway’s unique characteristics and is linked to a set of potential solutions. The following sample technology spectrum shows recommended surveillance and incident management operational infrastructure deployments for an urban Interstate/expressway. A complete technology spectrum also includes detection, traffic flow management, traffic signal, traveler information, and regional/statewide recommendations. There are separate spectrums for rural Interstate/expressway and arterials within the TOIP.

Sample Spectrum of Deployment Density



## Identifying Priority Corridors

Once the operational needs of all of the Corridor Network roadways were assessed, the 37 Multimodal Corridors were prioritized based on need using a quantifiable ranking process. Those Corridors requiring the highest levels of operations deployment were selected as **Priority Corridors**. The remaining Corridors with significant operational needs were identified as **Emerging Priority Corridors**. The Statewide Traffic Operations Recommendations Map on the back cover illustrates the **Priority** and **Emerging Priority** Corridors for the State.

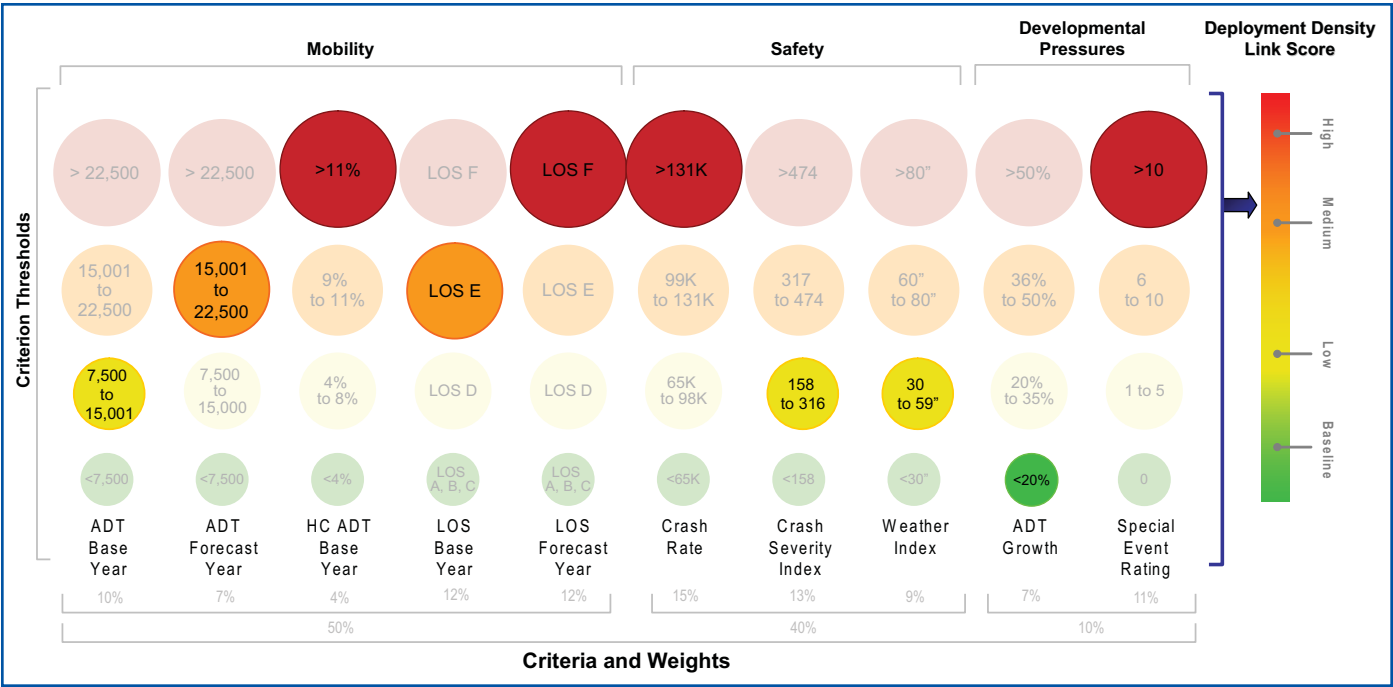
Collectively, these 13 Corridors connect almost every major metro area in Wisconsin and encompass the most critical freight and tourism routes in the State. They are intended to be the focus of traffic operations infrastructure investment. The operational needs of Wisconsin roadways are most significant in the high traffic areas of Milwaukee, Madison, the Fox Valley and the Chippewa Valley, plus the roadway connections between these activity centers and external activity centers such as Chicago and Minneapolis. However, operational needs also appear where there are significant safety, weather, or special event needs. Even roadways with baseline DDCs are recommended to receive a variety of statewide network service services including: 511, STOC-Intercad, STOC-RWIS, and PCMS Fleet. Many of these elements are either in place or committed/funded deployments that will provide a basic traveler warning and information service.

## Determining Roadway Needs

One of the principal TOIP results is a Deployment Density Class (DDC) recommendation for every roadway included in the 2030 Multimodal Corridor Network. The DDC describes the level of operational needs for each roadway and is reached through an analysis represented visually in the following figure. Each of 10 critical inputs are grouped into tiers which represent different levels of operational needs. For every roadway segment, the different criteria levels (which include traffic volumes and patterns, safety, and the impact of weather and special events) contribute to an overall score. Weights, selected by WisDOT stakeholders, capture the importance of each criteria as a driver for operational needs and influence the contribution of each criteria to the overall score. The data utilized by the TOIP methodology were pulled from established WisDOT sources, primarily Meta Manager.

This score is represented in the form of a baseline, low, medium, or high operational deployment recommendation. These uniform standards for operations technology needs are intended to be easily communicable and useful for both long-range planning, as well as more detailed corridor-level planning. Following designation, roadways are paired with operations technology solution sets.

Roadway Segment Scoring







Sample TOIP Corridor Recommendations Map

