

# TSMO-TIP and SISP Project Selection and Prioritization

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NOCoe Innovative Procurement and Contracting Peer Exchange  
Microsoft Teams: 10:30am EST Session

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# WisDOT Bureau of Traffic Operations (BTO)

- BTO is responsible for:
  - Traffic signals and ITS devices located on state owned roadways
  - Supporting communication networks
  - Systems used to manage traffic signals and ITS devices
  - New signal and ITS technology research and implementation (Ex: Camera Analytics, CAV DSRC, non-intrusive traffic detection, smart traffic signals)
  - Traffic Management Center (TMC), Signing, Marking, Work Zones, Safety Engineering and Analysis, TIME/ETO, all things traffic operations.



# WisDOT TSMO Programming

- WisDOT Project Development
  - Transportation Systems Management and Operations Traffic Infrastructure Process (TSMO-TIP) (new ITS)
  - Safety Certification and Operations Certification (signals)
- WisDOT Project Funding
  - Signals and ITS Standalone Program (SISP)
  - Highway Improvement Projects
  - Highway Safety Improvement Program (HSIP) (if >50% cost roadway improvement and meets safety certification requirements)



# TSMO-TIP Overview

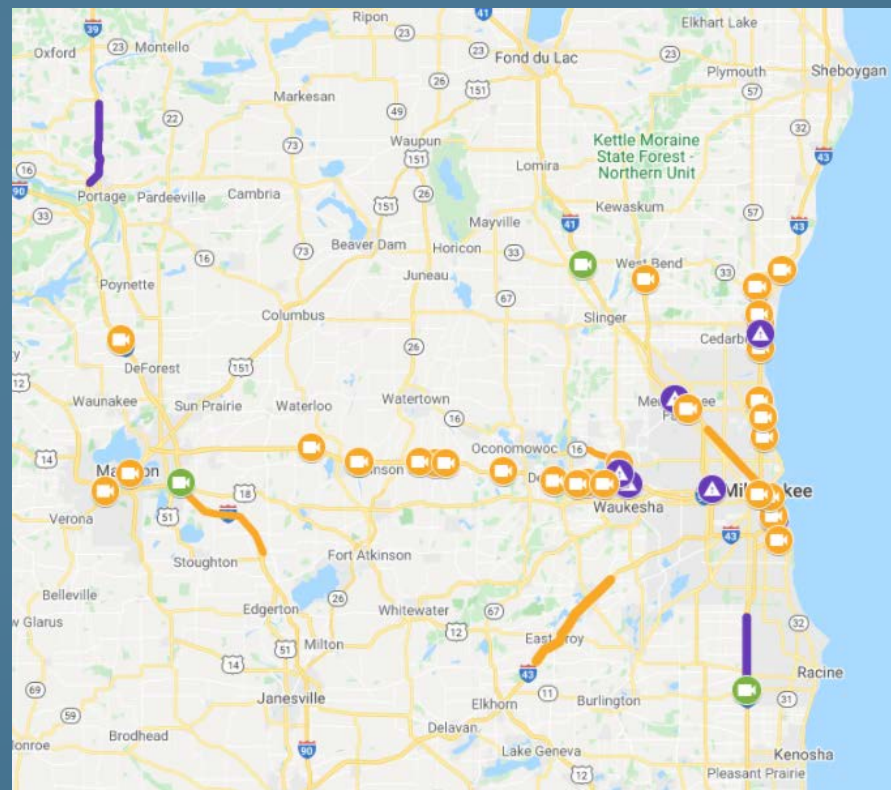
- Transportation Systems Management and Operations Traffic Infrastructure Process (TSMO-TIP)
  - Program in place since 2016 - replaced a traditional planning process
  - **BI-ANNUAL** evaluation process (Spring and Fall)
  - Created to be **AGILE**
  - Takes advantage of available **DATA** resources
  - Consistent statewide **METHODOLOGY**
  - Increases **EFFICIENCY** and **EFFECTIVENESS** of limited funding resources
  - TSMO-TIP Webpage: <https://topslab.wisc.edu/research/tsmo/tip/>



# TSMO-TIP Project Development

## Project Development Mechanisms

- Scoping for Highway Improvement Projects
- ITS Strategic Plan (2017)
- Regional recommendations
- Traffic Management Center (TMC) recommendations aka “ITS wish list”
- Life cycle replacements
- Safety Certification Process



# TSMO-TIP Evaluation Process

## Identify Need

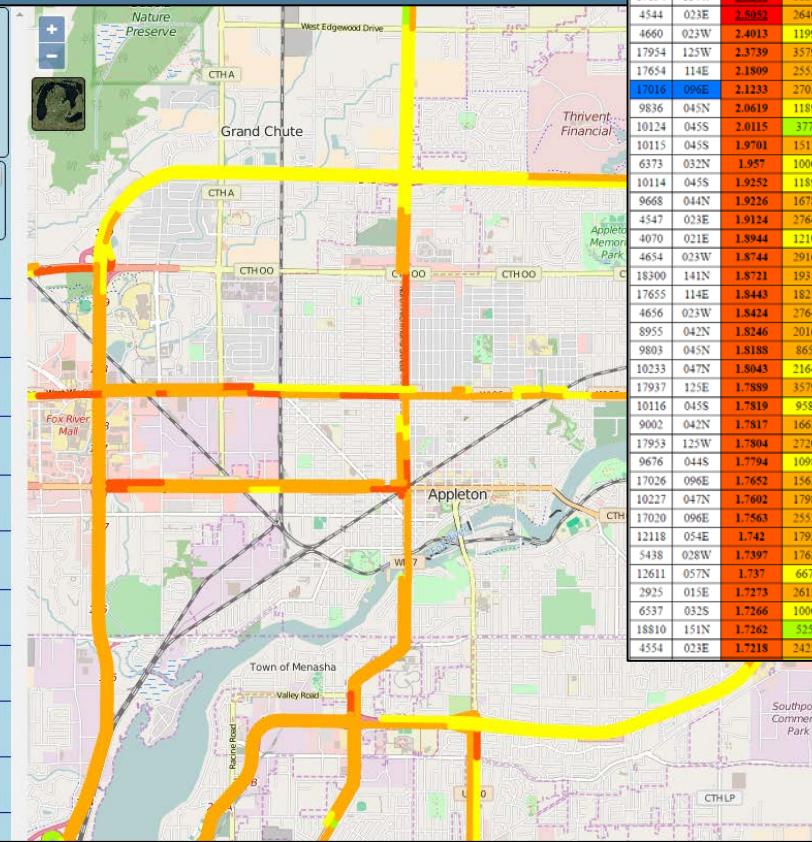
- Needs Analysis Tool
  - Developed by UW Madison-TOPS Lab with SPR Funding
  - Application continues to be supported with annual SPR Funds
  - Utilizes WisDOT Metamanager Data (2020)

TIP Segments  
 Relative Need: low | medium | high  
 Metamanager Segments  
 ITS Inventory Layers

Presets: Safety | Make Report  
 Region: Northeast  
 Version: May 2016

AADT: 0.0 | 100.0 | 20.0%  
 AADT Future: 20 | 0.0 | 100.0 | 0.0%  
 Growth: 20 | 0.0 | 100.0 | 0.0%  
 Truck: 1 | 0.0 | 100.0 | 0.0%  
 LOS: 0.0 | 100.0 | 0.0%  
 LOS Future: 20 | 0.0 | 100.0 | 0.0%  
 Crash Rate: 0.0 | 100.0 | 40.0%  
 Severity: 0.0 | 100.0 | 40.0%  
 Weather: 0.0 | 100.0 | 0.0%  
 Event: 0.0 | 100.0 | 0.0%

Show Help



pdp_id	hwy_dir	weighted score	aadtyr_1	aadtyr_20	crash_rate	crash_severity	event	growth_20	losyr_1	losyr_20	trkdyr_1	weather
17694	114W	2.5146	18210	22180	5265.07	199	6.0	21.8	3.32	3.45	8.8	40.0
4544	023E	2.5052	26490	32270	14405.8	53	7.0	21.82	4.19	6.04	8.8	38.0
4660	023W	2.4013	11990	13870	21894.0	38	7.0	15.68	4.91	5.22	8.8	38.0
17954	125W	2.3739	35790	41650	2228.58	215	6.0	16.37	6.38	6.63	8.8	43.0
17654	114E	2.1809	25520	30190	4308.52	72	6.0	18.3	3.59	4.33	8.8	40.0
17016	099E	2.1233	27030	29050	1424.3	187	6.0	7.47	4.23	4.45	8.8	43.0
9836	045N	2.0619	11890	14480	1888.56	255	8.0	21.78	2.1	2.15	8.8	36.0
10124	045S	2.0115	3770	4060	3291.22	134	7.0	7.69	3.45	3.47	8.8	39.0
10115	045S	1.9701	15110	17430	6079.97	35	8.0	15.35	3.19	3.25	8.8	36.0
6373	032N	1.957	10000	11980	5426.61	47	11.0	19.8	2.96	3.15	8.8	43.0
10114	045S	1.9252	11890	14480	7998.62	26	8.0	21.78	2.1	2.15	8.8	36.0
9668	044N	1.9226	16780	20430	1877.46	93	9.0	21.75	3.3	3.39	8.8	35.0
4547	023E	1.9124	27640	32710	901.97	158	7.0	18.34	4.28	6.1	8.8	38.0
4070	021E	1.8944	12100	14740	3162.74	89	8.0	21.82	3.13	3.2	8.8	36.0
4654	023W	1.8744	29160	34560	948.66	130	7.0	18.52	3.42	5.47	8.8	39.0
18300	141N	1.8721	19310	23610	2009.47	73	12.0	22.27	3.59	3.72	8.8	44.0
17655	114E	1.8443	18210	22180	1861.61	75	6.0	21.8	3.32	3.45	8.8	40.0
4656	023W	1.8424	27640	32710	966.98	119	7.0	18.34	4.28	6.1	8.8	38.0
8955	042N	1.8246	20160	23050	1651.03	76	4.0	14.34	3.89	4.0	8.8	41.0
9803	045N	1.8188	8650	9300	1310.26	103	7.0	7.51	3.57	3.63	8.8	39.0
10233	047N	1.8043	21640	25170	733.9	231	6.0	16.31	3.47	3.64	8.8	43.0
17937	125E	1.7889	35790	41650	972.79	88	6.0	16.37	6.38	6.63	8.8	43.0
10116	045S	1.7819	9580	10300	2739.31	58	9.0	7.52	2.14	2.19	8.8	36.0
9002	042N	1.7817	16620	17860	1311.08	94	4.0	7.46	2.37	2.4	8.8	41.0
17953	125W	1.7804	27200	28040	1021.92	94	6.0	3.99	4.24	4.31	8.8	43.0
9676	044S	1.7794	10980	13370	4008.51	36	9.0	21.77	2.68	2.72	8.8	35.0
17026	096E	1.7652	15630	15880	1012.89	121	6.0	1.8	3.16	3.17	7.2	44.0
10227	047N	1.7602	17980	19590	1452.39	76	6.0	8.95	3.23	3.28	8.8	43.0
17020	096E	1.7563	25520	28140	1464.94	62	6.0	10.27	4.11	4.27	7.2	43.0
12118	054E	1.742	17920	19270	844.9	127	12.0	7.53	3.95	4.01	8.8	44.0
5438	028W	1.7397	17620	21560	1912.42	54	5.0	22.36	2.37	2.45	3.8	41.0
12611	057N	1.737	6670	7180	2832.36	59	4.0	7.65	1.71	1.74	13.7	46.0
2925	015E	1.7273	26150	31840	598.96	143	6.0	21.76	3.83	5.51	8.8	44.0
6537	032S	1.7266	10000	11980	3515.22	37	12.0	19.8	2.96	3.15	8.8	43.0
18810	151N	1.7262	5250	5950	5671.75	45	6.0	13.33	1.0	1.0	7.2	41.0
4554	023E	1.7218	24220	29190	588.92	149	7.0	20.52	6.66	6.78	8.8	39.0



# TSMO-TIP Evaluation Process

## Consider Options

- Benefit Analysis Tool

- Used for DMS, CCTV, Communication Infrastructure, and other ITS deployments
- Calculates estimated annual benefits
- Data inputs vary for each item
- Developed with Kimley-Horn

**Safety Benefits**

S1. How many crashes, by type, occurred in the past year at this intersection or corridor?

	Fatal Crashes
	Incapacitating Injury Crashes
	Non-incapacitating Injury Crashes
	Possible Injury Crashes
	Property Damage Only Crashes

**Mobility Benefits**

M1 (W1). What is the estimated AADT for all vehicles entering the intersection?  vehicles per day

M2 (W1). What is the average Relative Need at this intersection according to the Needs Analysis Tool - Service preset?

M1 (W2, W3, W4, W6). Estimate the average number of traffic events that occur per year within site distance of the proposed camera(s).

M2 (W2, W3, W4, W6). Estimate the average number of traffic events that occur per year within site distance of the proposed camera.

M3 (W2, W3, W4, W6). Provide the current number of traffic events that occur per year within site distance of the proposed camera.

**Productivity Benefits**

It is assumed that productivity benefits will be realized through reduced maintenance efforts. Estimate

P1. for how long maintenance efforts have been increasing at the proposed device replacement location(s).

P2. How many Cartegraph tickets have been required at this location over the length of time indicated above in P1? (if request is for multiple intersections, include cumulative total here)  tickets

P3. What was the total cost of these tickets?

P4. What is the anticipated percent reduction of maintenance tickets due to the proposed project?

**Energy and Environment Benefits**

Estimated Annual Energy and Environment Benefit:

**Project Benefits - Dynamic Message Sign (DMS)**

New DMS deployment.

Region:

Proposed Project Name:

Requested By:

What is the anticipated cost of the project (total design, construction, and communication cost)?

Please complete the Guidance Analysis below to help define the intent of the project.

Summary of your results is listed here:

G1, Weather Conditions	WARRANTED
G2, Traffic Conditions	NOT WARRANTED
G3, Traffic Control	NOT WARRANTED
G4, Special Events	NOT WARRANTED

Guidance below was completed by an ENTERPRISE Pooled Fund Study and is used here to help define the intent of the project.

**- To Inform Travelers of Weather Conditions**

Location	Response
Location is prone to weather situations that travelers would not otherwise be forewarned by staff members or automated through a condition	YES
Locations, bridges that ice early, mountain passes with weather that	
Location for the area downstream of the candidate DMS location	
Descriptions of weather conditions to be displayed on the	
Specific descriptions (rather than simply activating a flashing "Flashing")	
Services or services, that might be described on the DMS, where	
Not proven to generate responses from travelers.	
Number of crashes or road closures which have major	

DMS Guidance #1 is:  WARRANTED



# TSMO-TIP Evaluation Process

## Project Review

- Project Summary Package
  - Documentation Checklist
  - Exhibits from Needs Analysis Tool
  - Project Information Sheet
  - Project Operations and Maintenance Considerations
  - Benefit Tool Evaluation Sheet
  - Map showing location of project
  - Crash analysis (if needed)
- Funding source determined independently of the TSMO-TIP

Wisconsin Department of Transportation  
 Transportation System Management and Operations - Traffic Infrastructure Process  
**Documentation Checklist**

Region:   
 Proposed Project Name:   
 Requested By:

1 Each of the following items should be completed and included in the potential project documentation package. Upload one combined PDF with all documentation in the appropriate regional SharePoint folder:   
 Region\_Project Name\_Contact:

Wisconsin Department of Transportation  
 Transportation System Management and Operations - Traffic Infrastructure Process  
**Project Information**

Region:   
 Proposed Project Name:   
 Requested By:

1 Using each of the following Needs Analysis Tool presets, provide the anticipated level of need in the vicinity of the proposed project:

Default TIP	<input type="text" value="0"/>
Safety	<input type="text" value="0"/>
Mobility (Present)	<input type="text" value="0"/>
Mobility (Future)	<input type="text" value="0"/>
Service	<input type="text" value="0"/>
Freight Performance	<input type="text" value="0"/>

1 Indicate whether the following operations and maintenance items have been considered:

- Who - Who are the stakeholders involved with the system?
- What - What are the elements and the high-level capabilities of the system?
- Where - What is the geographic and physical extent of the system?
- When - What is the sequence of activities that will be performed?
- Why - What is the problem or opportunity addressed by the system?
- How - How will the system be developed?
- How - How will the system be operated? Are there available resources to take on this responsibility or will additional resources be required? Will additional training be required?
- How - How will the system be maintained? Are there available resources to take on this responsibility or will additional resources be required?

2 Indicate any further information that will be helpful to document pertaining to operations and maintenance of the proposed deployment.

3 Indicate any other information that will be relevant when considering this project.





# SISP Overview

- Signals and ITS Standalone Program (SISP)
  - Annual funding program started in 2013 (\$10 million per fiscal year)
  - Average of 40-50 projects funded and managed each year
  - Potential funding source for TSMO-TIP projects
  - Streamlined with TSMO-TIP
  - Consistent statewide methodology of evaluation and prioritization BI-ANNUAL process (Spring and Fall)
  - SISP Website: <https://wisconsindot.gov/Pages/doing-bus/local-gov/astnce-pgms/highway/sisp.aspx>



# SISP Process

## Project Application

- Projects applied for by Regions, BTO, and Connecting Highway Municipalities
  - Project description
  - Existing conditions
  - Performance goals and objectives
  - Mobility, safety, environmental benefits
  - Project cost and schedule
  - Funding restricted to ITS and signal projects

*Wisconsin Department of Transportation (WisDOT)*  
**Signals and ITS Standalone Program**  
**Project Application Form**

**1. Project Identification**

PROJECT NAME (consistent with TSMO-TIP documentation if applicable)		
FILE NAME		
COUNTY	CITY/TOWN	REGION
MUNICIPAL (YES / NO)*	MUNICIPAL PRIORITIES (if 2 applications are submitted, select priority)	<input type="checkbox"/> 1 <sup>ST</sup> <input type="checkbox"/> 2 <sup>ND</sup>

\*Municipal projects require a 10% funding commitment from the requesting agency.

**2. Project Type**

Identify the proposed project type:

<input type="checkbox"/> 1. New Signal Installation	Install new traffic signal.
<input type="checkbox"/> 2. Signal Rehabilitation	Upgrade, install or replace existing signal detection, controllers, battery backup, LED upgrades, etc.; construct minor geometric improvements.
<input type="checkbox"/> 3. Signal Retrofit	Install monotubes, flashing yellow arrows, or other safety improvements at existing traffic signal; install adaptive signal systems, replacement of TS1 cabinets.
<input type="checkbox"/> 4. Signal Retiming	Collect and evaluate data; develop signal timing plan; develop and implement corridor coordination plan. <b>Municipal owned signals not eligible for this project type per Form DT1199.</b>
<input type="checkbox"/> 5. Intersection Communication	Construct and integrate fiber communication for signals; install and integrate wireless communication, including cellular modems and radios, for signals.
<input type="checkbox"/> 6. New ITS Device Installation	Install new ITS infrastructure, including cameras, backbone fiber, network equipment, etc.
<input type="checkbox"/> 7. ITS Device Rehabilitation	Upgrade, install or replace existing detection, controllers, battery backup, cameras, ramp meter LED's, etc.
<input type="checkbox"/> 8. System Software	Upgrade, install, or replace software.
<input type="checkbox"/> 9. Life-cycle Replacement	Replace existing end-of-life signals and/or ITS equipment including cameras, controllers, LED's, etc. <b>Municipal owned signals not eligible for this project type per Form DT1199.</b>
<input type="checkbox"/> 10. Other	Examples include: <ul style="list-style-type: none"> <li>• Performance Measures Applications</li> <li>• Research and Development Projects</li> <li>• CAV Deployments and Applications</li> <li>• Studies, Plans, and Evaluations</li> </ul>



# SISP Process

## Project Review

- Evaluation committee with statewide representation (6 evaluators)
- Evaluation Based Selection
  - Region Ranking (20%)
  - Mobility (20%)
  - Operations and Maintenance (15%)
  - Preservation (30%)
  - Safety (15%)
- Projects are scored and ranked

Evaluation Category	Regional Status	Mobility	Operations and Maintenance	Preservation			Safety	Safety							
Weighted Point Value (100 points total)	20 Points	20 Points	15 Points	25 Points			5 Points	10 Points	5 Points						
Points	20	20	15	25			5	10	5						
Evaluation Criteria	Region Ranking	Facility Operations	Efficient Use of Operations and Maintenance Funds	Lifecycle Replacement			Energy and Environment	Safety Impacts	Safety Impacts						
Application Request	Rank based on the Regional Ranking Spreadsheets submitted by each region.	In some detail, describe the anticipated mobility improvements of the proposed project and how they will be measured (i.e., detection will be avoided to decrease before and after peak hour delay).	In some detail, describe how this project will efficiently use or reduce operations and maintenance funds. Provide a summary of past maintenance issues that will be impacted by this project (i.e. cost of maintenance tickets, etc.).	Describe the existing conditions of the existing infrastructure. For example: type and age of current infrastructure; what is its current condition?			In some detail, describe the anticipated energy and environmental impacts of the proposed project.	In some detail, describe the anticipated safety improvements of the proposed project.							
Evaluation Rubric	Pnts	Mobility Impact (based on project application response)	Pnts	O&M Impact	Pnts	System Age	Pnts	Existing Condition	Pnts	Energy and Environmental Impact	Pnts	Safety Impact (Region Only - Based on Intersection Spreadsheet)	Pnts	Safety Impact - PSI (Region Only - Based on Intersection Spreadsheet)	Pnts
		Project is expected to provide exceptional mobility improvements. (Annual mobility benefits are expected to be greater than the capital cost of the project)	3	REMOVED	3	Much Past End of Life (past 5 years of end-of-life)	3	Out of Commission	3	Project is expected to provide significant positive energy and environmental impacts. (Annual energy benefits are expected to be greater than the capital cost of the project)	3	Level of Service of Safety (LOSS) of 4.	3	20	5
		Project is expected to provide significant mobility improvements. (Annual mobility benefits are expected to be greater than half of the capital cost of the project)	2	The intent of this project is to reduce Operations and Maintenance funding. A history of maintenance issues that will be reduced due to this project has been demonstrated.	2	Past End of Life (within 5 years past end-of-life)	2	Disrepair	2	Project is expected to provide some positive energy and environmental impacts. (Annual energy benefits are expected to be greater than \$0)	2	Level of Service of Safety (LOSS) of 3.	2		
		Project is expected to provide some mobility improvements. (Mobility benefits analysis is greater than \$0)	1	Operations and Maintenance is expected to be reduced.	1	Nearing End of Life (within 3 years of expected end-of-life)	1	Fair	1	Project is not expected to impact the natural environment.	1	Level of Service of Safety (LOSS) of 2.	1	0.5	1
		Project is not expected to provide mobility improvements.	0	Operations and Maintenance is not expected to be impacted.	0	Current or New Installation	0	Acceptable	0	Project is expected to negatively impact the natural environment.	0		0	Negative	0
Level of Objectiveness	Objective	Moderately Objective	Moderately Objective	Objective	Objective	Moderately Objective	Objective	Objective							

Evaluation Rubric



# Program Management

- TSMO-TIP/SISP group meet bi-monthly
  - Region and BTO representatives
  - Discuss program updates, policies, and procedures
- Continue outreach efforts to make sure stakeholders can provide feedback to guide program evolution
  - Updated project application and evaluation rubric in 2020 and 2021
  - Plan on creating FAQ and guidance document for website in 2021



# Lessons Learned

- TSMO-TIP/SISP programs will evolve over time
- Transition from single year projects to multi-year projects requires additional planning
- Need exceeds funding availability-strong evaluation process necessary
- Current processes support fiscal justification, even during a pandemic
- Consistent delivery will aid in administrative support for the programs
- Regional support key to success



# Contact Information

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