

Developing a Bicycle Level of Service Map for New York State

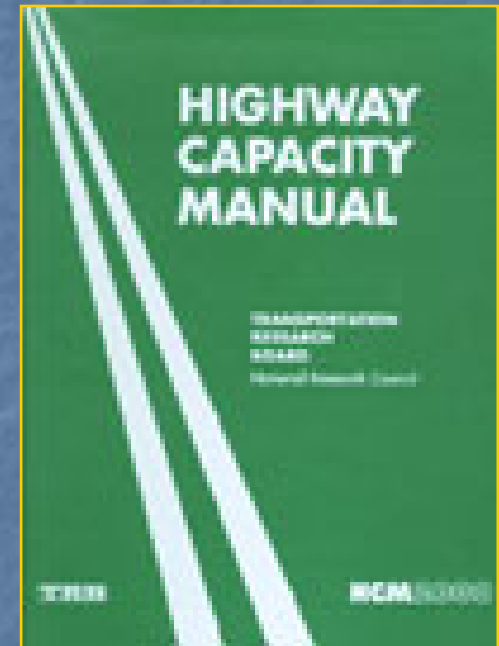


What is Bicycle Level of Service?

- It is an instrument that can be used by practitioners to predict a bicyclists' perceptions of a specific roadway environment, and to evaluate the capability of a variety of roadways to accommodate both motorists and bicyclists using geometric and operational characteristics such as lane width, vehicle speed, and traffic volume.

Bicycle Level of Service

- Bicyclists have the same issues as motorists.
- **Level of Service** is based on a users perception of the qualitative measure that characterize the operation of the roadway.
- Speed, Travel Time, Traffic Interruptions, Comfort, Convenience and Freedom to Maneuver



Bicyclists' Perception



Striped Shoulder Offset



Wide Curb Lane



Marked Lane with
On-Street Parking

Why Develop a NYS BLOS Map?

- Section 1230 NYS V&T Law grants bicyclists the same rights as motor vehicles to operate on the highways of NYS, where permitted.
- All roadways are bicycle facilities.
- Bicyclists are our customers.
- The Department needs a method to quantitatively define and assess a roadways compatibility for both bicycles and motor vehicles.



Advantage of a NYS BLOS Map

- Specifically, the BLOS can be used in several ways:
 - Identify gaps or deficiencies in a regional or statewide bicycle network.
 - Prioritize bicycle improvement projects based on BLOS score.
 - Assist bicyclists with selecting a safe and direct route through a region or state.
 - Evaluate alternative treatments (e.g. addition of a bicycle lane vs. removal of parking) for improving the BLOS for a roadway.

Advantages of a NYS BLOS Map

- Continued:

- New roadway or roadways that are being designed or retrofitted can be assessed to determine whether they are bicycle compatible. (e.g. bike lane vs. wide outside curb lane)
- Data could be used for long range planning forecasts to assess a roadway's bicycle compatibility, and develop regional bicycle transportation plans.

Assessing New York's Needs

- Factors to consider in developing a bicycle suitability criteria:
 - Meeting NYSDOT Needs.
 - Meeting Bicyclists Needs.
 - Need to Keep the Rating Simple.
 - Incorporate Basic Elements of Bicycle Suitability.
 - Utilize Data Readily Available in State Roadway Inventory.



Bicycle LOS Criteria

- The compatibility criteria being considered include:
 - Shoulder Width or Width of Outside Curb Lane
 - Average Annual Daily Traffic (AADT).
 - Pavement surface condition ratings.
 - Percentage of Trucks.
 - Volume / Capacity Ratio
 - Posted speed limits (not collected, but can be obtained).
- Most of this information is already routinely collected by the Department as part of its Highway Sufficiency Rating.

LOCATION / IDENTIFICATION						PHYSICAL CHARACTERISTICS								TRAFFIC				CONDITION INFORMATION				WORK			
Route Number	County Name	Region/County	End Milepoint	End Reference Marker	State Highway Number	Section Length	No. Lanes	Roadways	Shoulder Width	Pavement Width	Pavement Type	Subbase	Func Class	AADT	Act/Est	% Trucks	Class Year	Surface Score				IRI - (in/mi)	Dom Distress	Yr Last Work	Work Type
																		1998	1999	2000	2001				
17	CMG	62	04.79	17 6205 1048	55-5	2.49	4	2	06	48	0	2	12	29300	E	17	98	6599	9		63		99	1	
17	CMG	62	04.79	EXIT 51 CR 35																					
17	CMG	62	05.67	17 6205 1057	55-5	0.88	4	2	06	48	0	2	12	31400	E	16	99	6599	8		59		99	1	
17	CMG	62	06.08	17 6205 1061	53-6	0.41	4	2	10	48	0	5	12	31400	E	16	99	6698	8		60		99	1	
17	CMG	62	06.30		53-6	0.22	4	2	10	48	A	7	12	31400	E	16	99	9777	7		93		95	5	
17	CMG	62	06.30	TOWN OF HORSEHEADS VILLAGE OF HORSEHEADS																					
17	CMG	62	06.40	COUNTY RD 64 OVER WITH CONNS INT #52 52A																					
17	CMG	62	06.84	17 6205 1069	358	0.54	4	2	10	48	A	7	12	31400	E	16	99	9777	7		99		95	5	
17	CMG	62	06.84	EXIT 52 RT 14 HORSEHEADS																					
17	CMG	62	07.09	14 6201 3057	69-3	0.25	4	2	10	48	A	7	12	32800	E	17	98	9777	7		103		95	5	
17	CMG	62	07.15		53-5	0.05	4	2	10	48	0	5	12	32800	E	17	98	6777	7		86		98	2	
17	CMG	62	07.76	14 6201 3050	53-5	0.61	4	2	10	48	0	5	12	32800	E	17	98	6766	6		136		98	2	
17	CMG	62	07.76	GRAND CENTRAL AVE																					
17	CMG	62	08.14	14 6201 3047	53-5	0.38	4	2	10	48	0	5	12	32800	E	17	98	6877	7		121		98		
17	CMG	62	08.14	OLD RT 13 HORSEHEADS																					
17	CMG	62	08.27	14 6201 3045	53-5	0.13	4	2	10	48	0	5	12	27800	E	19		6866	6		130		85		
17	CMG	62	08.27	VILLAGE HORSEHEADS TWN HORSEHEADS																					
17	CMG	62	08.51	14 6201 3042	54-15	0.24	4	2	06	48	0	2	12	27800	E	19		6987	7		102		98	2	
17	CMG	62	08.51	EXIT 54 RT 13																					
17	CMG	62	09.07	14 6201 3037	54-15	0.56	4	2	06	48	0	2	12	23400	A	18	98	6988	7		71		98	2	
17	CMG	62	10.86	14 6201 3018	54-15	1.79	4	2	06	48	0	2	12	23400	A	18	98	6988	7		60		98	2	
17	CMG	62	11.32	14 6201 3014	54-15	0.46	4	2	06	48	0	2	12	23400	A	18	98	6988	7		69		98	2	
17	CMG	62	11.32	ELMIRA N CITY LN																					
17	CMG	62	00.00	CITY OF ELMIRA																					
17	CMG	62	01.37	14 6201 3000	54-15	1.37	4	2	06	48	0	2	12	23400	A	18	98	6987	U		91				
17	CMG	62	01.37	EXIT 56 RT 352 CHURCH ST																					
17	CMG	62	01.80	17 6205 1131	54-15	0.49	4	2	06	48	0	2	12	22200	E	19		6987	7		64		98	2	
17	CMG	62	01.80	EXIT 57 WATER ST																					
17	CMG	62	02.05	17 6205 1133	5207	0.26	4	2	06	48	0	5	12	19200	A	19		6977	7		76		98	2	
17	CMG	62	02.17		46-3	0.12	4	2	06	48	0	5	12	19200	A	19		5977	7		84		98	2	
17	CMG	62	02.59	17 6205 1139	46-3	0.42	4	2	06	48	0	5	12	19200	A	19		9877	7		66		97	1	
17	CMG	62	02.59	ELMIRA S CITY LN																					
17	CMG	62	00.00	TOWN OF ELMIRA																					
17	CMG	62	02.87	17 6205 1168	5207	2.87	4	2	06	48	0	5	02	19200	A	25		9877	6		74		97	1	
17	CMG	62	03.28		5207	0.42	4	2	06	48	0	5	02	19200	A	25		9877	6		83		97	1	
17	CMG	62	03.90		5207	0.62	4	2	06	48	0	5	02	19200	A	25		65U6	9				01	1	
17	CMG	62	04.05		5207	0.18	4	2	06	48	0	5	02	19200	A	25		65U9	8				00	2	
17	CMG	62	04.56	17 6205 1186	5207	0.52	4	2	06	48	P	5	02	19200	A	25		65UK	K				00	6	
17	CMG	62	04.56	CR 8 LOWMAN																					
17	CMG	62	04.79	17 6205 1188	5207	0.23	4	2	06	48	P	5	02	18700	A	24	98	65UK	9		119		00	6	
17	CMG	62	04.99		5207	0.26	4	2	08	48	A	5	02	18700	A	24		6559	8				00	6	
17	CMG	62	06.36	17 6205 1203	5048	1.37	4	2	04	48	0	5	02	18700	A	24	98	6555	5				88		
17	CMG	62	06.62	17 6205 1206	67-4	0.26	4	2	10	48	P	5	02	18700	A	24	98	6666	6		248		SiF	71	
17	CMG	62	06.62	OLD RT 17 CR 60																					
17	CMG	62	09.84	17 6205 1238	67-4	3.22	4	2	10	48	P	5	02	18700	A	22	98	6655	5		217		SiF	71	
17	CMG	62	09.84	EXIT 59 RT 427 CHEMUNG																					
17	CMG	62	10.43	17 6205 1343	67-4	0.59	4	2	10	48	P	5	02	18400	A	25		6666	6		193		SgF	71	
17	CMG	62	12.10		69-5	1.67	4	2	10	48	P	5	02	18400	A	25		6666	6		185		SgF	70	

Bicycle LOS Criteria

- Key variables would be weighted with a score between -2 and +2.
- GIS would assign a value to each segment of highway based on its physical characteristics; Traffic Volume, Surface Score, Shoulder Width, Percentage of Trucks and Vehicle to Capacity Ratio based Condition Information from the HSM.
- A total value would then be tallied and assigned a color.

Assigned Values

Suitability Factor	Value Range	Factor Score
Shoulder Width [If no shoulder, Curb / Travel Lane width in brackets]	1.8 M (6 Ft.) or greater [4.8 M (16 ft) or greater]	+ 2
	1.2 M (4 Ft.) – 1.8 M (6 Ft) [4.5 M (15 ft)]	+1
	0.6 M (2 Ft.) – 1.2 M (4 Ft) [4.3 M (14Ft)]	0
	0 M - 0.6 M (2 Ft) [3.9M (13 Ft)]	- 1
	0 M (no Shoulder) [Less than 3.6 M (12 Ft.)]	- 2
Traffic Volume (AADT)	Less than 5,000	+2
	5,000 – 10,000	+1
	10,000 – 15,000	0
	15000 – 25,000	- 1
	25,000 or Greater	- 2
Volume / Capacity Ratio (V/C)	<0.1 – 0.4	+2
	0.4 - 0.7	0
	0.7 – 1.0	-2
Percentage of Trucks	Low Volume (0% – 3%)	+2
	Medium Volume (3% - 6%)	0
	High Volume (> 6%)	-2
Road Surface Type and Condition	New or very good condition (8 – 9)	+2
	Good Condition (5 – 7)	0
	Poor to Very Poor Condition (< 5)	- 2

Bicycle Suitability Formula

$$\text{Bicycle Suitability Score} = S_{\text{Bicycles}} = S_{\text{Width}} + S_{\text{AADT}} + S_{\text{Pavement}} + S_{\% \text{ Trucks}} + S_{\text{V/C Ratio}}$$

Where:

- S_{Bicycle} = Bicycle Suitability Score
- S_{Width} = Factor Score for Shoulder or Travel Lane Width
- S_{AADT} = Factor Score for Traffic Volume
- S_{Pavement} = Factor for Shoulder or Travel Lane Pav't Condition
- $S_{\% \text{ Trucks}}$ = Factor Score for Truck Percentage
- $S_{\text{V/C Ratio}}$ = Factor for Volume – to – Capacity Ratio

(Currently each BLOS Criteria is Weighted Evenly. Further input by department staff or bicyclist groups could lead to later refinements, such as differential weighting of criteria.)

Interpretation of Bicycle Suitability Scores

Bicycle Suitability Range Score	Interpretation
+6 to + 10	Most Suitable for Bicycling.
+2 to +6	Suitable for Bicycling.
-2 to +2	Caution Advised for Bicycling.
-2 to – 6	Bicycling Discouraged
-6 to – 10	Not Recommended for Bicycling.




Bicycle Suitability Measure

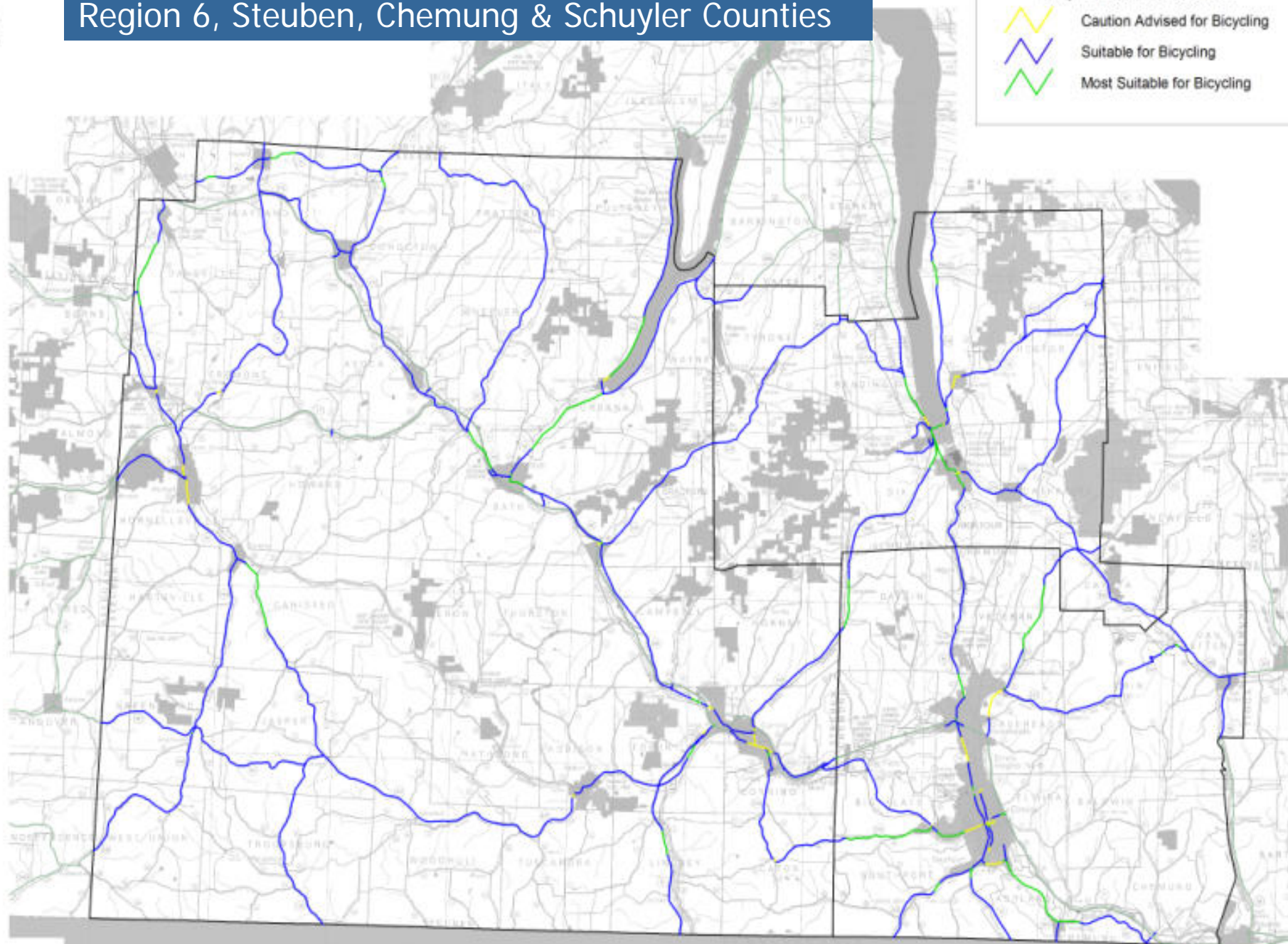




Region 6, Steuben, Chemung & Schuyler Counties

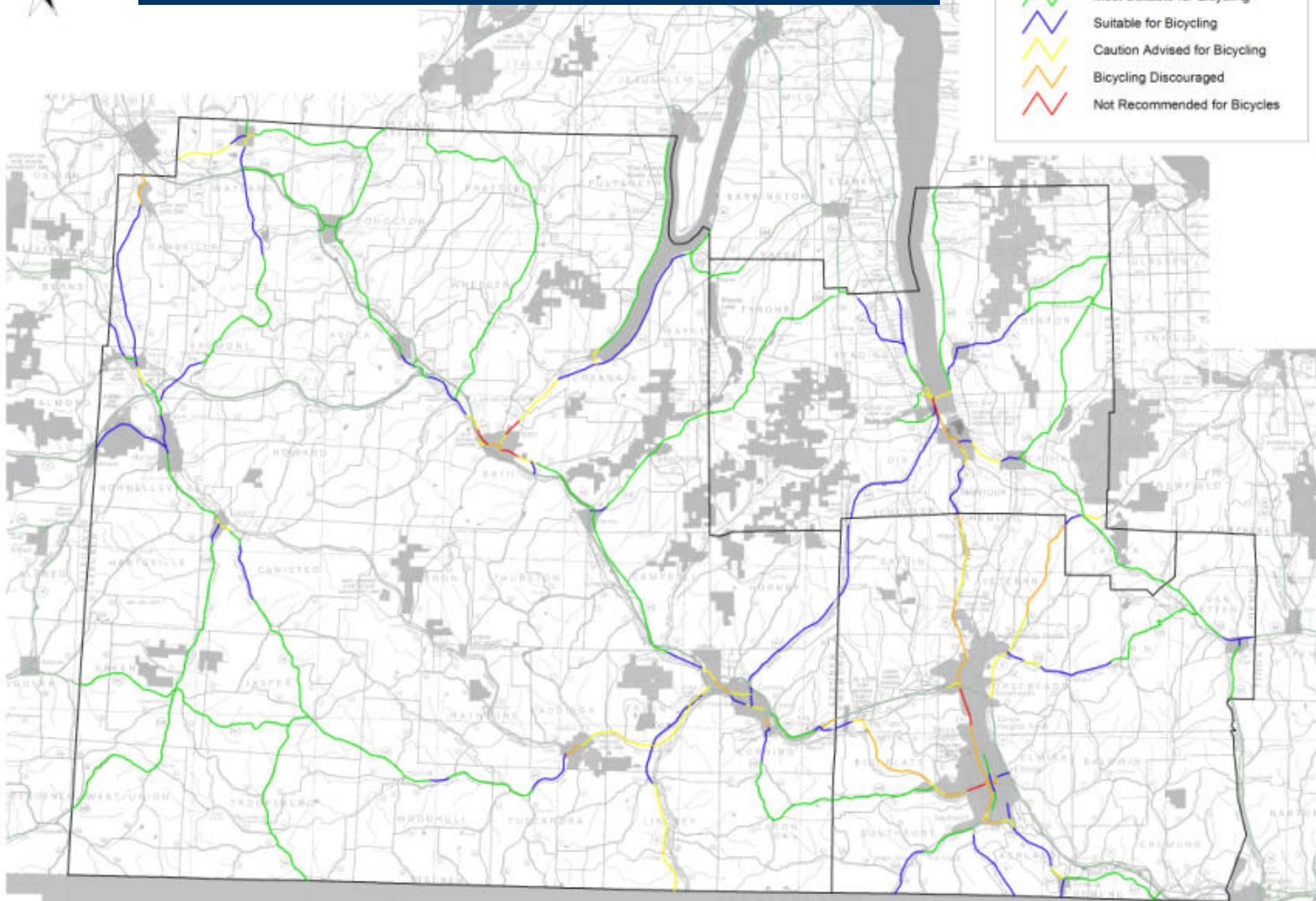
Bicycle Level Of Service

-  Caution Advised for Bicycling
-  Suitable for Bicycling
-  Most Suitable for Bicycling







Region 6, Steuben, Chemung & Schuyler Counties

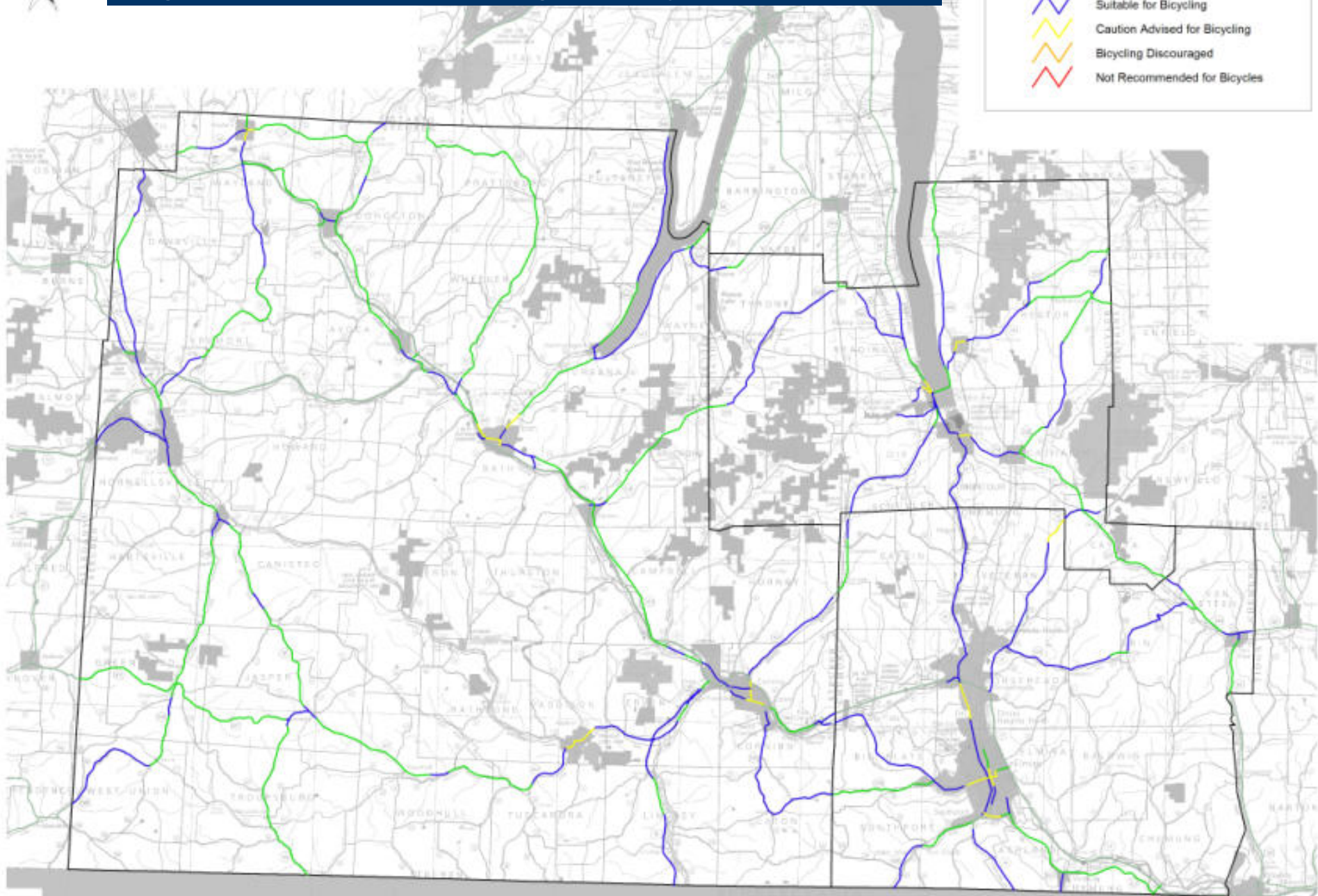




Region 6, Steuben, Chemung & Schuyler Counties

BLOS-VC 1st iteration: Sum Range: +8 to -8

-  Most Suitable for Bicycling
-  Suitable for Bicycling
-  Caution Advised for Bicycling
-  Bicycling Discouraged
-  Not Recommended for Bicycles



Target Customers

- The target customers for these BLOS maps include:
 - Experienced NYS bicyclists.
 - Groups or individuals looking to bicycle in / through NYS.
 - I love NY Tourism.
 - State Professional Engineers and Planners.
 - Local MPO's and municipalities.
 - Businesses that cater to bicyclists.
 - Economic Development.

Limitations of Map

- Difficult to use in urban areas.
- Doesn't include the local highway networks.
- Doesn't provide site specific information (speed limits, on-street parking, driveways, Intersections)
- Doesn't provide information on vertical changes in grade.
- Needs to be updated annually to be accurate.
- Users may be unsure why segments of highway is colored Red, Yellow or Green (AADT, shoulder width, vehicle speed, % Trucks)

Summary

- The maps are designed to provide an easy to understand overview of a highway's suitability for bicycling.
- Bicyclists will still have to make their own decision based upon their personal experiences, comfort level and ability.
- Simple to develop, understand and utilize.
- Updated on an annual basis with HSM.

Summary Cont'd

- The BLOS map may initially reside in on the Department's IntraDOT system, and eventually be placed on the Department's web site.
- Used as a tool to help Professional Planners and Engineers to make informed policy and program decisions for bicyclists.
- May still require input from the Department staff and bicyclist groups.
- Basis for new Department EI that will discourage any operational or maintenance activity from lowers a highway's current Bicycle LOS score.



THE END

Cyclists on State Bicycle Route 5

For Additional Information, Please Contact:

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