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.
<table>
<thead>
<tr>
<th>Route Number</th>
<th>County Name</th>
<th>End Milepoint</th>
<th>End Reference Marker</th>
<th>State Highway Number</th>
<th>Section Length</th>
<th>No. Lanes</th>
<th>Grade</th>
<th>Shoulder Width</th>
<th>Pavement Width</th>
<th>Pavement Type</th>
<th>Surface</th>
<th>Cross</th>
<th>AADT</th>
<th>% Trucks</th>
<th>Year</th>
<th>Class</th>
<th>Crew</th>
<th>SR</th>
<th>FF</th>
<th>LF</th>
<th>Work Type</th>
</tr>
</thead>
</table>
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

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

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

Where:

- \( S_{\text{Bicycles}} \) = Bicycle Suitability Score
- \( S_{\text{Width}} \) = Factor Score for Shoulder or Travel Lane Width
- \( S_{\text{AADT}} \) = Factor Score for Traffic Volume
- \( S_{\text{Pavement}} \) = 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

<table>
<thead>
<tr>
<th>Bicycle Suitability Range Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>+6 to +10</td>
<td>Most Suitable for Bicycling.</td>
</tr>
<tr>
<td>+2 to +6</td>
<td>Suitable for Bicycling.</td>
</tr>
<tr>
<td>-2 to +2</td>
<td>Caution Advised for Bicycling.</td>
</tr>
<tr>
<td>-2 to -6</td>
<td>Bicycling Discouraged</td>
</tr>
<tr>
<td>-6 to -10</td>
<td>Not Recommended for Bicycling.</td>
</tr>
</tbody>
</table>
# Bicycle Suitability Measure

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Most Suitable for Bicycling</td>
<td>+6 to +10</td>
</tr>
<tr>
<td>2</td>
<td>Suitable for Bicycling</td>
<td>+2 to +6</td>
</tr>
<tr>
<td>3</td>
<td>Caution Advised for Bicycling</td>
<td>-2 to +2</td>
</tr>
<tr>
<td>4</td>
<td>Bicycling Discouraged</td>
<td>-2 to -6</td>
</tr>
<tr>
<td>5</td>
<td>Not Recommended for Bicycles</td>
<td>-6 to -10</td>
</tr>
</tbody>
</table>
Region 6, Steuben, Chemung & Schuyler Counties
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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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