Network-Focused Bicycle Planning

The Importance of Planning for Users and the Level of Traffic Stress Methodology

May 18, 2016
Agenda

Planning for People on Bikes
- Who might ride a bike?
- What’s stopping them?
- Obvious facts about bikes!

Facility-Focused Planning
- Shortcomings of choosing facilities for “safety”

Network-Focused Planning
- What do you need your bike network to do?
- What’s already there, doing that?
  - Level of Traffic Stress Methodology
- What’s missing?
  - Bethesda Case Study
- How do you choose the right facility to bridge the gap?
- What if everyone will fight you about it?
PLANNING FOR PEOPLE ON BIKES
Almost 70% of people are interested in riding a bike.

What’s Stopping Them?

They don’t feel safe.

Only 13% of people feel confident and comfortable riding their bikes to get around, under current conditions.
Obvious Facts About Bikes!

➢ Bikes are ridden by people

➢ People travel to get places

➢ People only travel in ways that make them feel safe

➢ They have to feel safe for the WHOLE TRIP

"DAMN, THE ROAD LANE ENDS AGAIN! I HATE SHARING THE TRACKS WITH THE TRAIN."
Implications of these Facts

➢ For someone to consider riding a bike to do something, network of streets and bike facilities that they can ride on has to feel safe the entire way, without interruption.
  ▪ Their whole route has to be “low stress”
  ▪ Picture a setting where you’d feel comfortable with a middle school aged child riding

➢ This doesn’t mean that a bike lane is necessary on every street.

➢ It also doesn’t mean that a bike lane on every street would be enough.
Implications of these Facts

- The majority of this large group of potential bicyclists are not comfortable in a standard bike lane

- 80% of “interested but concerned” bicyclists feel comfortable or very comfortable in a separated bike lane or cycletrack
Bicycle Facilities

Each of these facilities or markings is useful in its correct context.
Is it Enough to Build a Safe Facility?

Maryland SHA

Table 2.1 – Marked Bike Lanes

<table>
<thead>
<tr>
<th>POSTED SPEED LIMIT</th>
<th>TRUCK VOLUMES (%ADT)</th>
<th>SHOULDER/LANE WIDTH*</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 35 MPH</td>
<td></td>
<td>4 FEET</td>
</tr>
<tr>
<td>&gt; 35 MPH and ≤ 45 MPH</td>
<td>≤ 8% trucks</td>
<td>5 FEET</td>
</tr>
<tr>
<td></td>
<td>&gt; 8% trucks</td>
<td>6 FEET</td>
</tr>
<tr>
<td>&gt; 45 MPH</td>
<td></td>
<td>6 FEET</td>
</tr>
</tbody>
</table>
Facility Focused Planning

- Each link is evaluated separately and individually
  - Network connectivity not considered and prioritized
  - Intersections and transitions not considered

- Limited number of bicycle facility types
  - New bicycle facilities and treatments have been developed for different contexts

- Even if facilities are chosen so that they create a low stress street, they’re only useful if they connect people to places
Network Focused Planning

If you’re a bicyclist who lives at point A, and wants to get to point B, what do you need your bike network to do?
Network Focused Planning

What streets are already doing the necessary work of the bicycle network? Low stress local streets.

If the green and blue lines are these low stress local streets, and all others are too high stress to ride, how would a bicyclist get from point A to point B?
Network Focused Planning

If the green and blue lines are the safe and comfortable roads on which to ride a bike, how would a bicyclist get from point A to point B?
Network Focused Planning

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Network Focused Planning

If the green and blue lines are the safe and comfortable roads on which to ride a bike, how would a bicyclist get from point A to point B?
DOWNTOWN BETHESDA
CASE STUDY
Downtown Bethesda
The Level of Traffic Stress methodology identifies four stress levels based on key facility and traffic factors:

- Stress level 1 – Requires little attention, suitable for children
- Stress level 2 – Low traffic stress, but only suitable for most adults
- Stress level 3 – Moderate traffic stress for all bicyclists
- Stress level 4 – High stress, only suitable for experienced bicyclists

Key factors include:

- Presence and type of facility
- Width of dedicated bicycle facility
- Number of vehicle lanes
- Vehicle speed and volume
- Density of driveways, intersections, and other conflicts with facility
Bike Network for the **Strong and Fearless**

Existing Network

Bike Plan Network
Bike Network for the **Enthused and Confident**

Existing Network  Bike Plan Network
Bike Network for the Interested but Concerned

Existing Network

Bike Plan Network
Planning for the Interested but Concerned
Planning for the **Interested but Concerned**
Proposed Montgomery County Approach

1. Identify Corridor
2. Select Design User
3. Determine Desired Facility
4. Assess Feasibility
   - Feasible: Design
   - Infeasible: Explore Alternatives...
Proposed Montgomery County Approach

Identify Corridor
Select Design User
Determine Desired Facility
Assess Feasibility

Feasible
Design

Infeasible
Explore Alternatives...

Downgrade Target User Group

Identify Parallel Route for General Population

Less than 30% Diversion
Identify Desired Facility and Design

More than 30% Diversion
Reconsider Project Scope
Facility Selection

Designing for the General Population

- 10,000+ Volume: Physically separated facility or bike lane with buffer
- 9,000 Volume: Physically separated facility
- 8,000 Volume: Wide bike lane (buffer optional)
- 7,000 Volume: Mixed traffic or sharrow
- 6,000 Volume: Wide bike lane (buffer preferred)
- 5,000 Volume: Physically separated facility or bike lane with buffer
- 4,000 Volume: Physically separated facility
- 3,000 Volume: Bike lane, buffer optional
- 2,000 Volume: Mixed traffic or sharrow
- 1,000 Volume: Mixed traffic or sharrow

Designing for Confident Cyclists

- 50,000+ Volume: Physically separated facility or bike lane with buffer
- 45,000 Volume: Physically separated facility
- 40,000 Volume: Bike lane, buffer optional
- 35,000 Volume: Mixed traffic or sharrow
- 30,000 Volume: Mixed traffic or sharrow
- 25,000 Volume: Mixed traffic or sharrow
- 20,000 Volume: Mixed traffic or sharrow
- 15,000 Volume: Mixed traffic or sharrow
- 10,000 Volume: Mixed traffic or sharrow
- 5,000 Volume: Mixed traffic or sharrow
- 0 Volume: Mixed traffic or sharrow
Spring Street, Silver Spring
Spring Street, Silver Spring

Designing for the General Population:
- Physically separated facility or bike lane with buffer
- Wide bike lane (buffer optional)
- Mixed traffic or sharrow

Designing for Confident Cyclists:
- Physically separated facility or bike lane with buffer
- Bike lane, buffer optional
- Mixed traffic or sharrow
Dorset Avenue, Bethesda
Dorset Avenue, Bethesda

Designing for the General Population

- 10,000+
  - Physically separated facility or bike lane with buffer
- 9,000
  - Physically separated facility
- 8,000
  - Wide bike lane (buffer optional)
- 7,000
  - Mixed traffic or sharrow
- 6,000
  - Wide bike lane (buffer preferred)
- 5,000
  - Physically separated facility or bike lane with buffer
- 4,000
  - Mixed traffic or sharrow
- 3,000
  - Wide bike lane (buffer optional)
- 2,000
  - Mixed traffic or sharrow
- 1,000
  - Wide bike lane (buffer preferred)
- 0 < 15
  - Physically separated facility or bike lane with buffer

Designing for Confident Cyclists

- 50,000+
  - Physically separated facility
- 45,000
  - Physically separated facility or bike lane with buffer
- 40,000
  - Bike lane, buffer optional
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- 10,000
  - Mixed traffic or sharrow
- 5,000
  - Mixed traffic or sharrow
- 0 < 15
  - Mixed traffic or sharrow

Spring St

- 55 60+
  - Physically separated facility
- 50
  - Physically separated facility or bike lane with buffer
- 45
  - Bike lane, buffer optional
- 40
  - Mixed traffic or sharrow
- 35
  - Mixed traffic or sharrow
- 30
  - Wide bike lane (buffer optional)
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  - Mixed traffic or sharrow
- 0 < 15
  - Mixed traffic or sharrow

Speed (Mph)
East-West Highway, Silver Spring
East-West Highway, Silver Spring

Volume (veh/day)

Designing for the General Population

- 10,000+
- 9,000
- 8,000
- 7,000
- 6,000
- 5,000
- 4,000
- 3,000
- 2,000
- 1,000

0 <15 20 25 30 35 40 45 50 55 60+

- Mixed traffic or sharrow
- Wide bike lane (buffer optional)
- Wide bike lane (buffer preferred)
- Physically separated facility or bike lane with buffer

Designing for Confident Cyclists

- 50,000+
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0 <15 20 25 30 35 40 45 50 55 60+

- Mixed traffic or sharrow
- Bike lane, buffer option
- Physically separated facility
- Physically separated facility or bike lane with buffer
- Physically separated facility or bike lane with buffer
Some Final Thoughts

- A transportation network that goes nearly everywhere, and respects the human need of travelers to be and feel safe for their whole trip already exists.
  - But only for cars.

- When “bicycle level of service” is assessed and then compared to intersection level of service, we are comparing one street user’s CONVENIENCE to another street user’s SAFETY.

- Since bicycling currently doesn’t feel safe to most people, the people who will currently do it are the least risk averse among us.
  - Remember this when people argue against bicycle infrastructure on the basis of the behavior of people who ride bikes.
Some Final Thoughts

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