Shared and Separated Off-street Paths

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April 20, 2016

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Today's presenters

Bartek Komorowski, Project Leader, Vélo Québec

Lennart Nout, Transport Planner, Mobycon

Robert Patten, Senior Planner, Toole Design Group

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Today's webinar presenters

Bartek Komorowski has worked with Vélo Québec since 2010—initially as an external consultant and, as of 2012, as Project Leader in the Research Department. Since earning the degree of Master of Urban Planning from McGill University in 2007, he has been involved in numerous research and consulting projects on cycling and active transportation for clients across Canada. With Vélo Québec, Bartek works on street design, bicycle and pedestrian master planning, and active transportation policy projects. He has collaborated with government agencies, large, urban municipalities such as Montreal, Toronto, and Ottawa, as well as with various rural and suburban communities across Quebec and Ontario. Bartek has a particular interest in design and maintenance practices for enabling year-round cycling in winter communities.

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Lennart Nout is an Urban Planner with five years' experience working in public transport planning, street design, corridor management plans, and integrated transport assessments with a focus on bicycle planning and design, both in The Netherlands and New Zealand. Most recently, he was project manager for the feasibility study for downtown Auckland's cycleway and a concept design for Franklin Road (Auckland). As a transit planner and engineer, Lennart has designed pedestrian and cycling infrastructure on different levels, from high level route design to scheme design.

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Bob Patten has worked in the field of multimodal transportation for 25 years. He has managed a number of trail planning and design projects and helped cities and counties develop area-wide bicycle transportation and trail plans. Bob has also served on a number of national research study teams working on bicycling and trail topics. While with Toole Design Group, he helped North Carolina State University develop a Shared Use Path Level of Service tool that can be used to guide trail design, especially trail width. Bob wrote the Study Guide for this tool, which is available from the Federal Highway Administration. Prior to working for the Toole Design Group, Bob worked for the District of Columbia as a trail planner and for the Rails-to-Trails Conservancy in their policy shop.

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Sharing is caring?

Introduction

- The bicyle is being rediscovered worldwide
- Competing with car, public transport and walking.
- Infrastructure is often absent; traffic safety issues

Introduction

- Many cities are playing catch-up with bicycle infrastructure
- Cycle infrastructure competes for space with parking, vehicle lanes, transit lanes, footpaths.
- On constrained corridors it is often politically difficult to implement segregated cycling infrastructure.

Formal vs Informal

- For safety reasons: flight to the sidewalk

- For directness reasons: cutting through pedestrian areas (streets, pedestrian malls, parks) or up the sidewalk

Acceptable result?

Best Friend Forever?

1. Is mixing of cyclists and pedestrians a good idea?

2. Are there quick solutions for any issues that arise?

Mixing is unsafe?

Traffic safety

- Accidents between cyclists and pedestrians are not well recorded
- In general, the amount of accidents between cyclists and pedestrians is low.
- Furthermore, accidents between cyclists and pedestrians are generally not severe.
- In general: bicycles are not considered a threat to pedestrians.

Target audience

Who are these people???

Wielrenner

Cyclist

MAMIL

Cyclist

Fietser

Cyclist

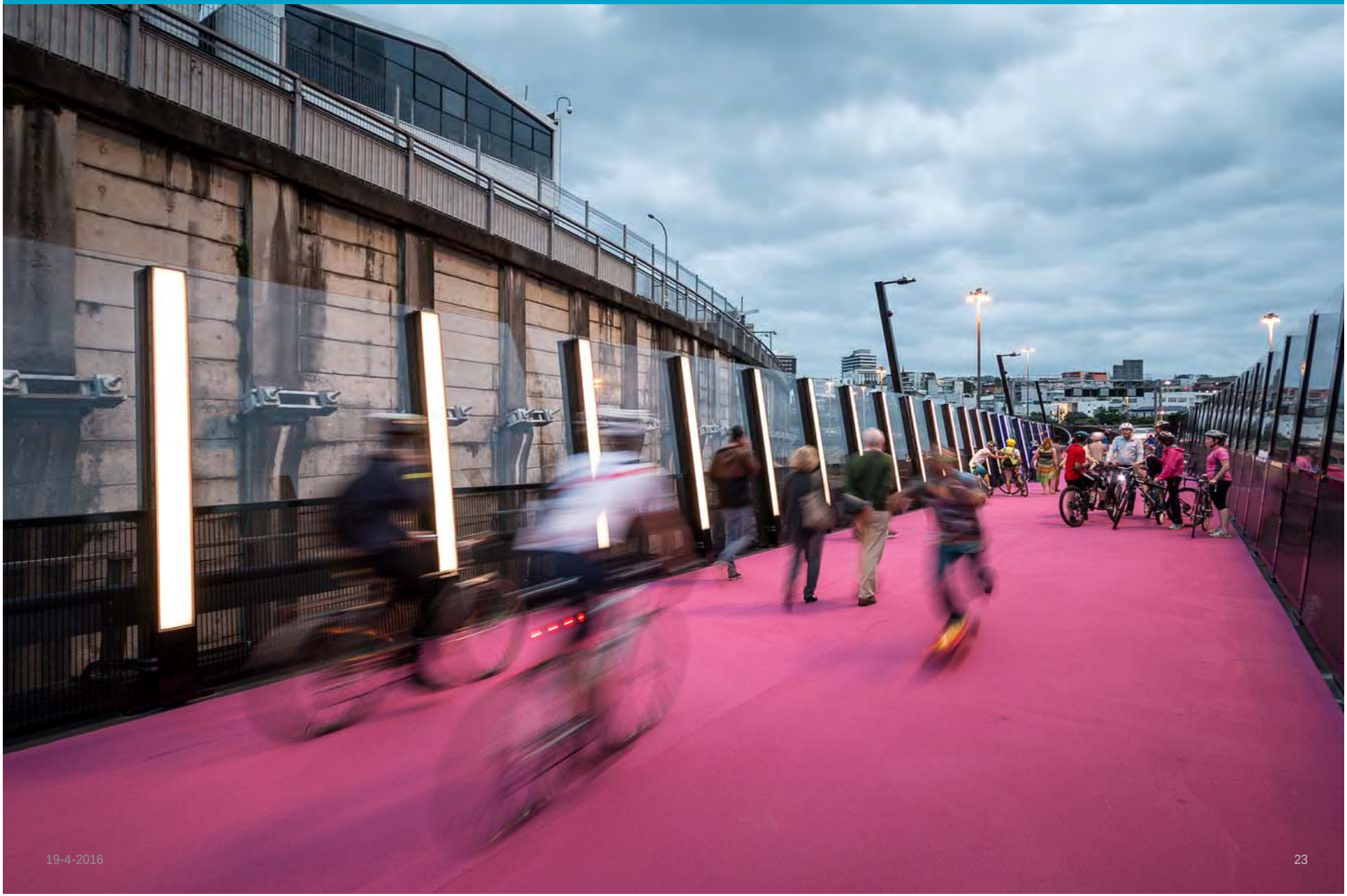
Types of shared environment

- *Shared space*
- Shared path/trail
- Pedestrian mall

Shared paths/trails

Width width width?

Width width width.



How wide is wide enough?

LOS Equation

Shared-Use Path Level of Service Score = 5.45 - 0.00809(E) - 15.9(RW) - 0.287(CL) - (DPF)

where:

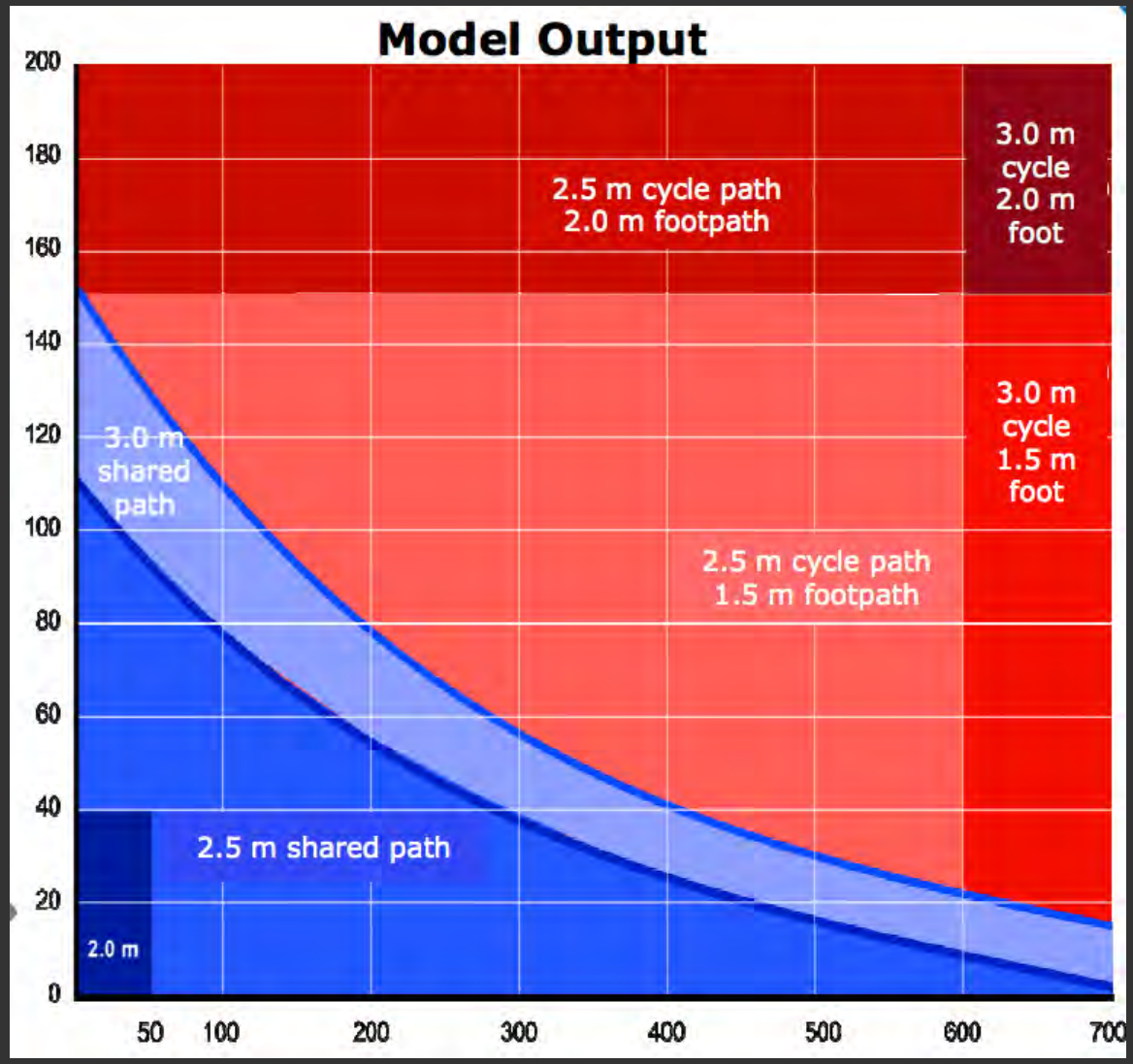
E = Events = Meetings per minute + 10(Active passes per minute)
RW = Reciprocal of path width (i.e., 1/path width, in feet)
CL = 1 if trail has a centerline, 0 if trail has no centerline
DPF = Delayed pass factor

LOS Scale

Score	Grade	Score	Grade
$X \geq 4.0$	A	$2.5 \leq X < 3.0$	D
$3.5 \leq X < 4.0$	B	$2.0 \leq X < 2.5$	E
$3.0 \leq X < 3.5$	C	$X < 2.0$	F

For a complete explanation of the derivation of the equation and scale, see the *Evaluation of Safety, Design and Operation of Shared-Use Paths: Final Report (Final Report).*[3]

How wide is wide enough?

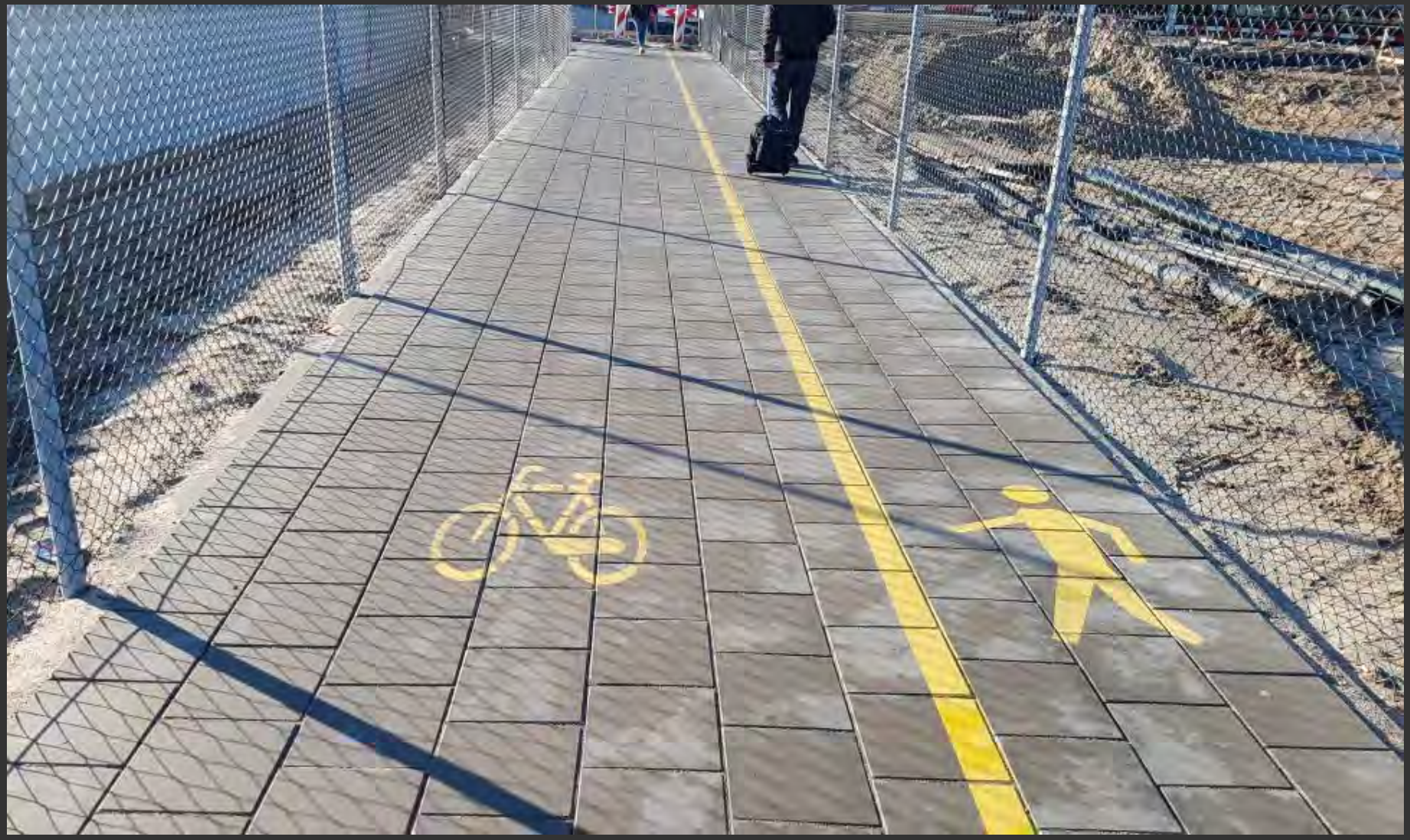


Number of pedestrians per peak hour

Number of cyclists per peak hour

Mix or Separate?

Mix or Separate?



Mix or separate?

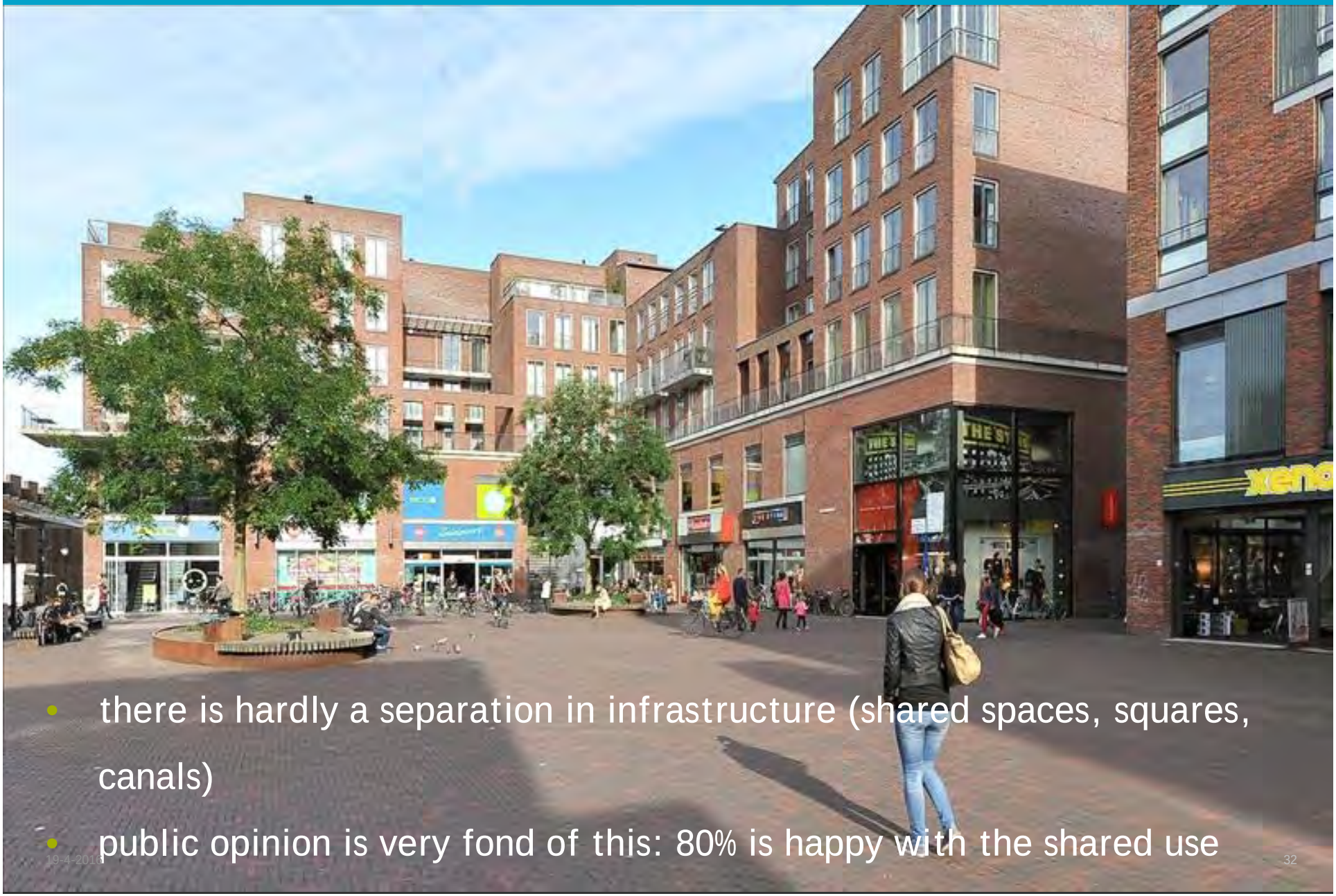
Separation vs Segregation

Pedestrianized zones

Case: Delft, the Netherlands

- the city of Delft (the Netherlands) opened up its pedestrianized inner city for cyclists in 2002
- cars are banned from most of the centre with retractable bollards

Case: Delft, the Netherlands

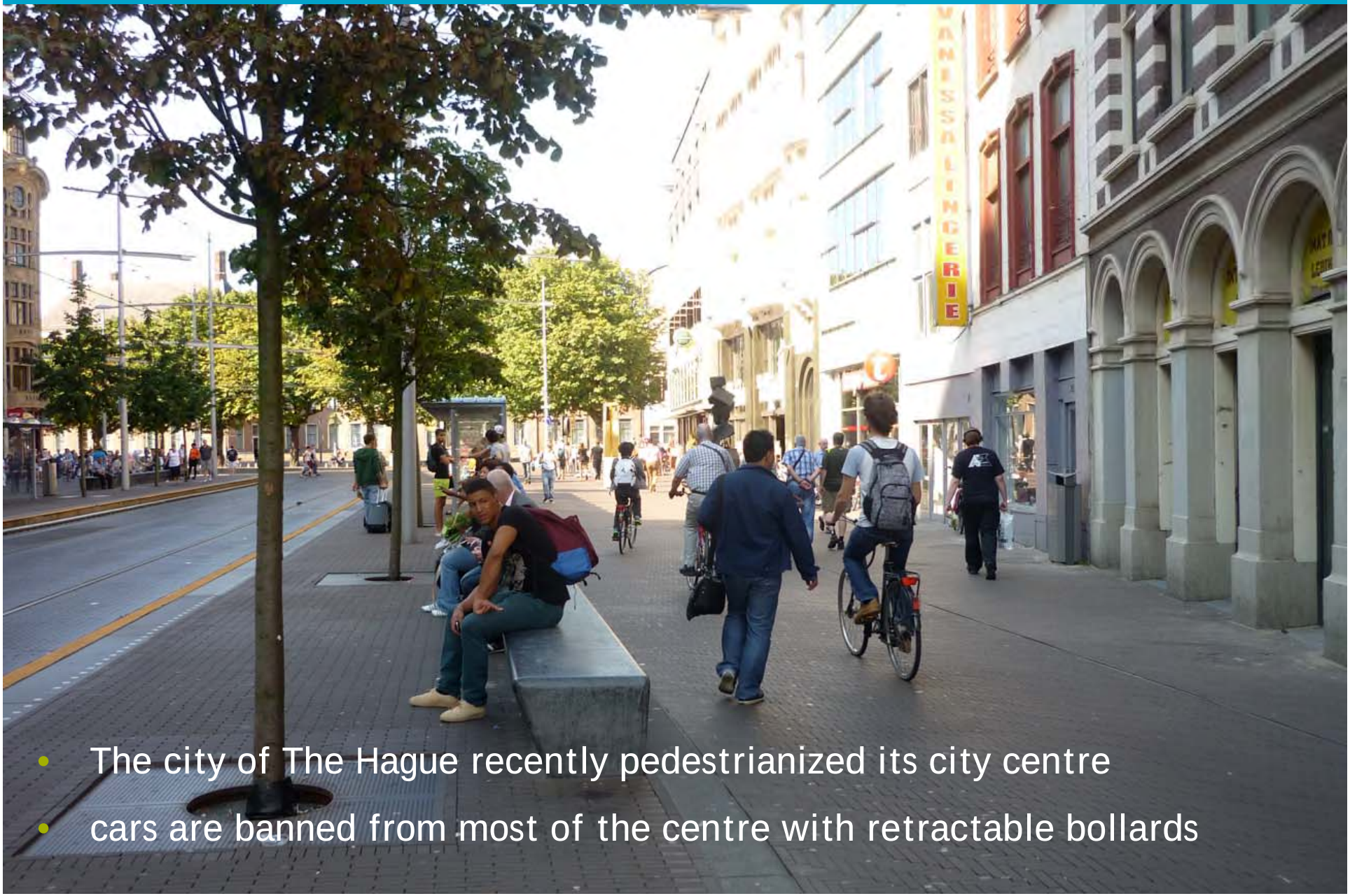


- there is hardly a separation in infrastructure (shared spaces, squares, canals)
- public opinion is very fond of this: 80% is happy with the shared use

Case: Delft, the Netherlands

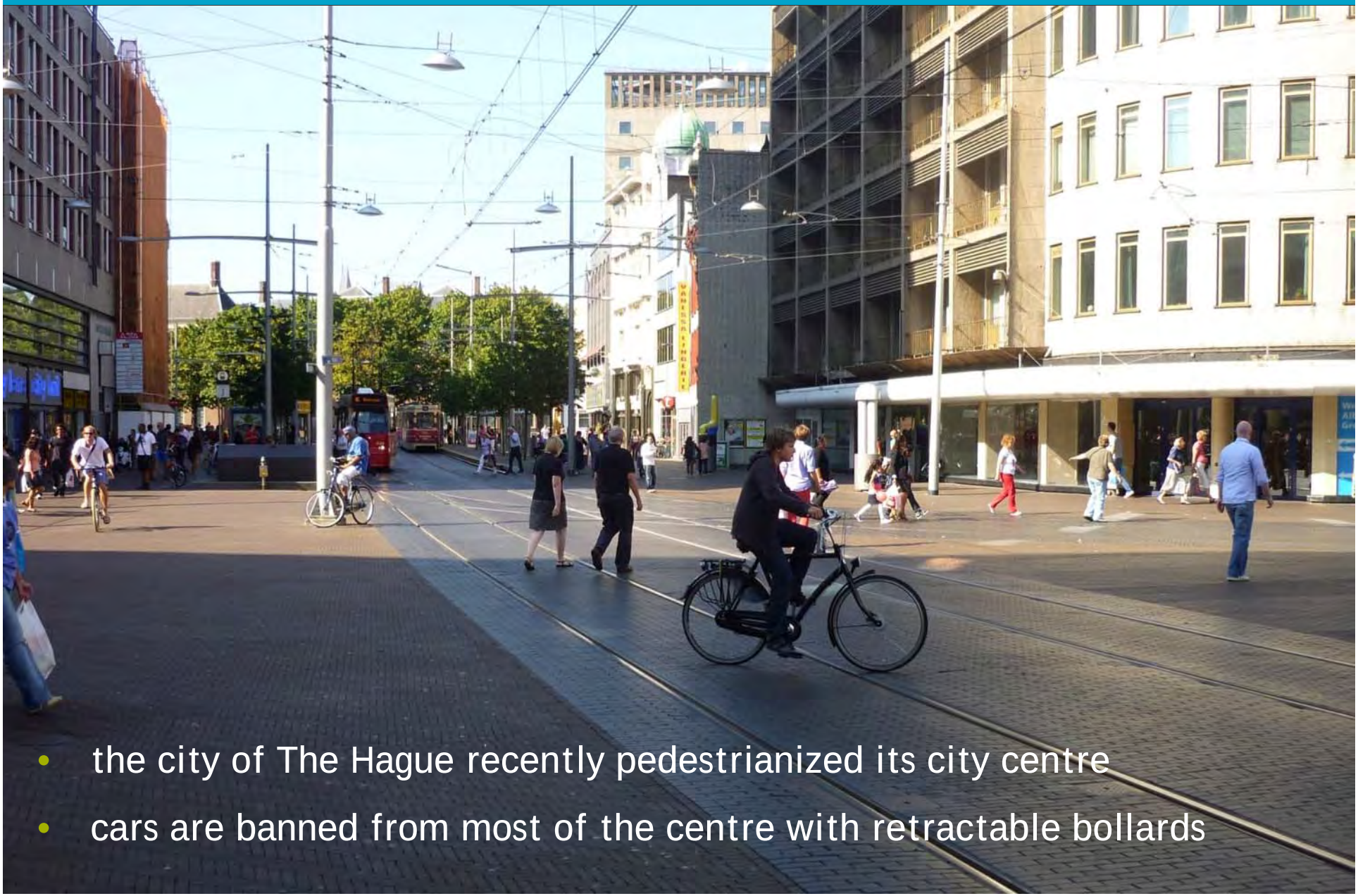
- At narrower area's cycling is not so easy. Cyclists cycle slow (5 km/h) or get off and walk.
- LESSON: the cyclists behave like guests (studies confirm this)

Case: The Hague, the Netherlands



- The city of The Hague recently pedestrianized its city centre
- cars are banned from most of the centre with retractable bollards

Case: The Hague, the Netherlands



- the city of The Hague recently pedestrianized its city centre
- cars are banned from most of the centre with retractable bollards

Case: The Hague, the Netherlands

- still, at through routes in the centre separated cycle space is present

Case: The Hague, the Netherlands

- LESSON: through traffic wants separation, even as space is lacking

What can we learn from this?

- Mixing of pedestrians and cyclists is *sometimes* possible
  - Width is important!
- Type of traffic matters
  - Through traffic vs. Destination traffic
- At higher pedestrian numbers, separation might be possible
- Think about growth! Don't build infrastructure that fails when it is succesful

So how do we solve the problems we have?

1. Add a cycle path ONLY when must and can.

Do you really need all that space or can we fit in a cycle path?

2. When needed, wide sidewalks or ped. areas can incorporate a bike lane.
3. Design matters. People respond to the design of infrastructure.

Just like cyclists want cars to behave in mixed-use roads, pedestrians like cyclists to behave on mixed-use sidewalks

Contactdetails

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Conclusions

1. So, yeah, mixing of cyclists and pedestrians can be a good idea

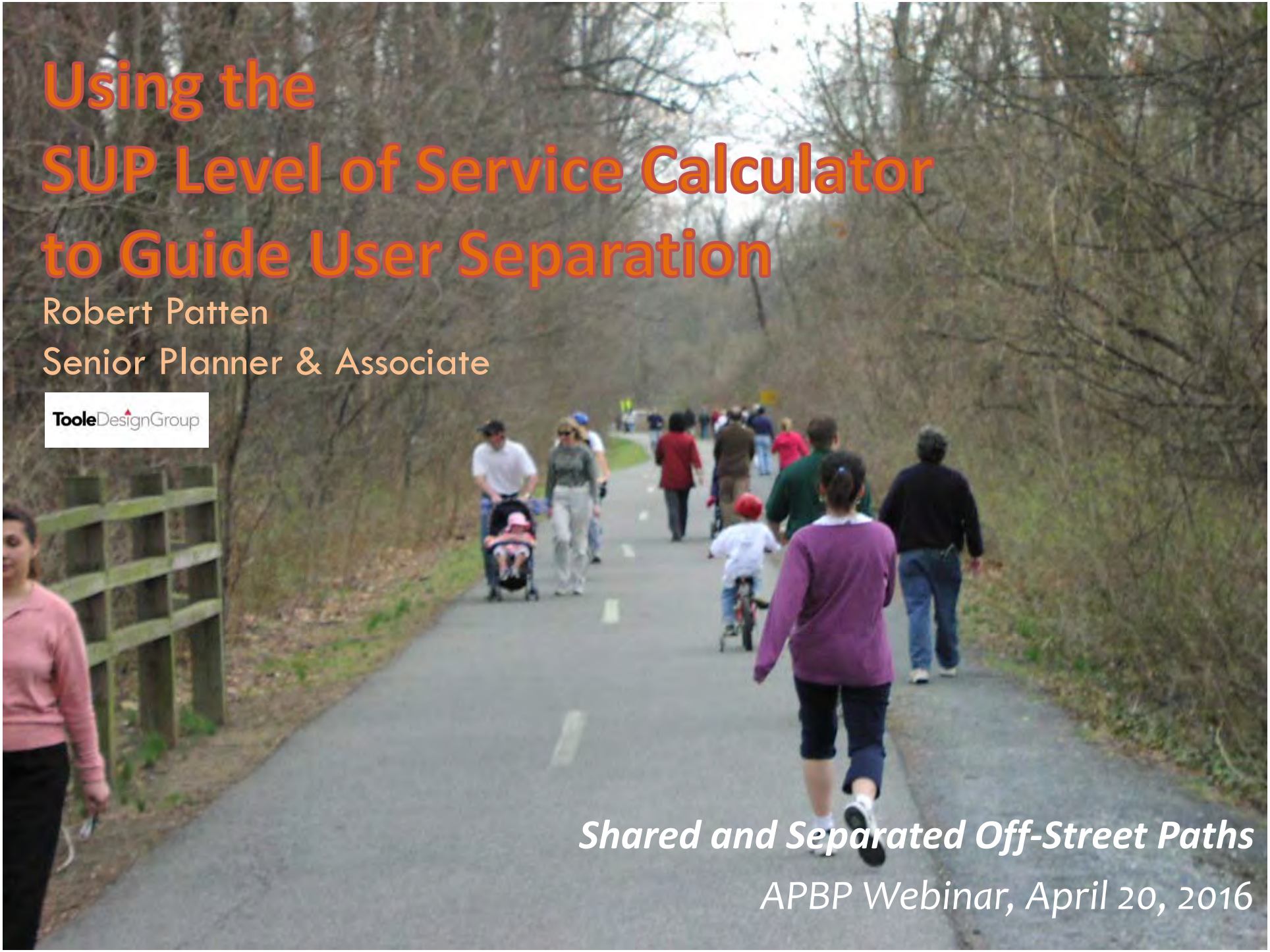
   This depends on the type of cyclists and the amount of pedestrians. Cylists will often adapt to the situation by themselves.

2. Campaigns can help to change cyclists behaviour.

   When needed, wide sidewalks or pedestrian areas can incorporate a bike lane.

Using the SUP Level of Service Calculator to Guide User Separation

Robert Patten
Senior Planner & Associate
ToolleDesignGroup

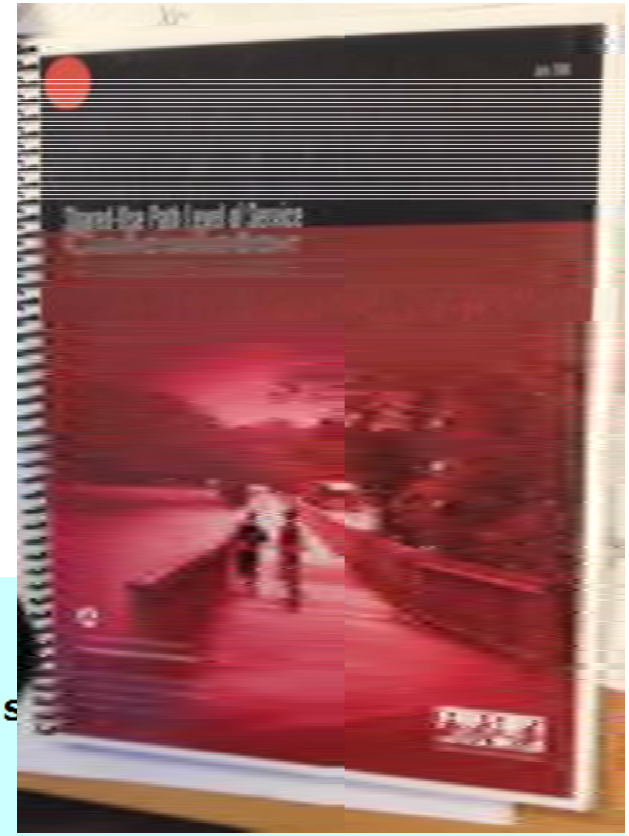


Shared and Separated Off-Street Paths

APBP Webinar, April 20, 2016

What is it?

- **User Guide**
- **Easy to Use Spreadsheet Calculator**



Shared Use Path Flow Analysis Tool

Trail Level of Service (LOS) Calculator

Draft Spreadsheet Based on Federal Highway Administration Shared Use Path S

North Carolina State University and Toole Design Group

ROW #1

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Typical Mode Split	10.0	0	185.0	55.0%	20.0%	10.0%	10.0%	5.0%	100.0%	2.53	D

Click Here for Default Mode Split

ROW #2

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
50/50 Mode Split	10.0	0	135.0	45.0%	30.0%	20.0%	2.0%	3.0%	100.0%	2.53	D

Where do you get this tool?

https://www.fhwa.dot.gov/publications/research/safety/pedbike/05138/

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REPORT

This report is an archived publication and may contain dated technical, contact, and link information

Federal Highway Administration > Publications > Research Publications > Safety > Pedestrian and Bicyclist Safety > 05138 > Shared-Use Path Level of Service Calculator

Publication Number: FHWA-HRT-05-138
Date: July 2006

Shared-Use Path Level of Service Calculator

A User's Guide

PDF Version (1298 KB)

PDF files can be viewed with the Acrobat® Reader®

Download the Shared Use Path Level of Service Calculator (Microsoft® Excel® format) 4.20 MB

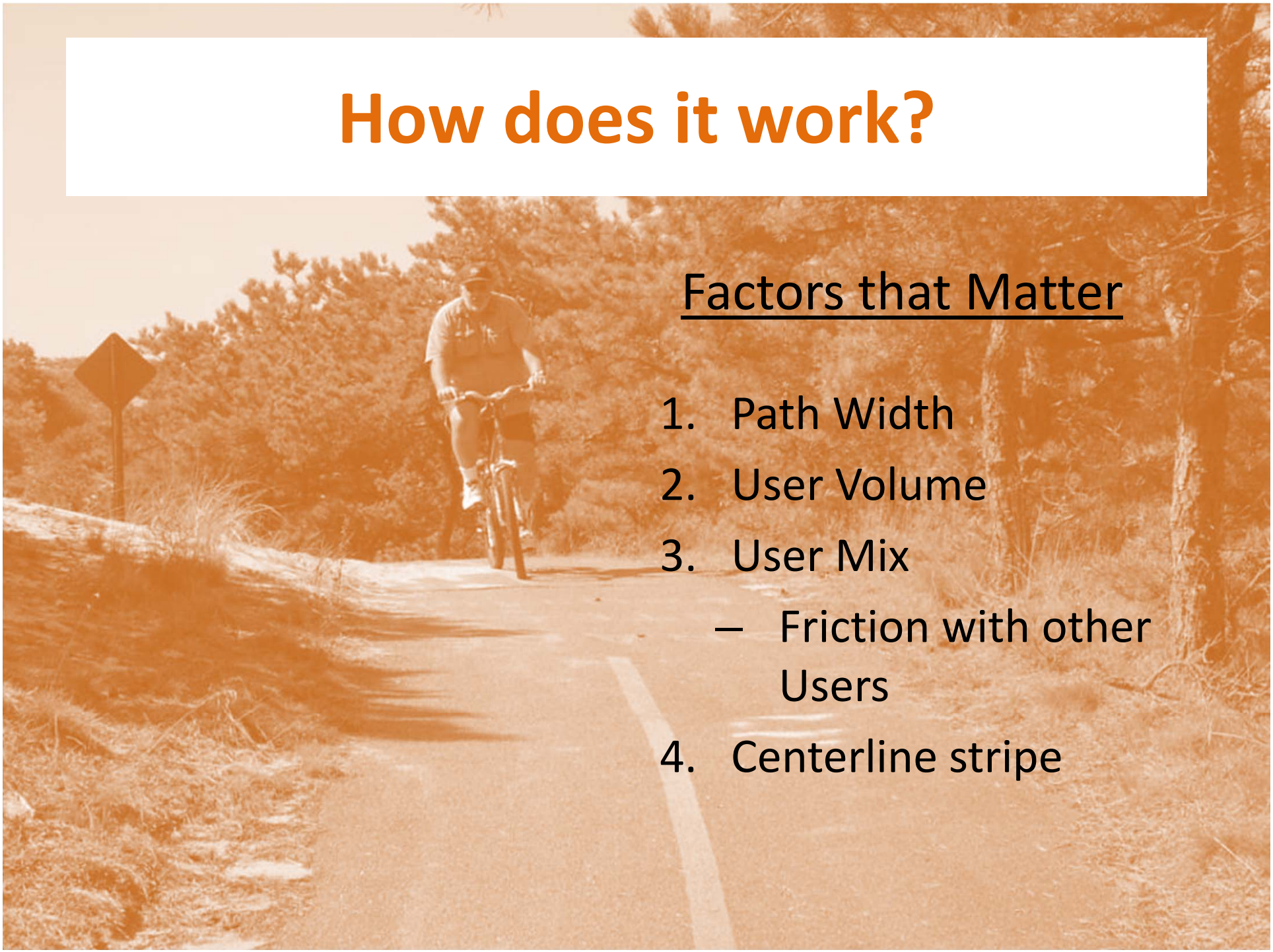
Who helped develop it?

- North Carolina State
  - Hummer and Rouphail
- Toole Design Group
  - Robert Schneider
  - Robert Patten
  - Jennifer Toole

What was it designed for?

- Plan widths for new/rehab trails
- Consider dual treadways/separation of user modes
- Evaluate LOS on existing trails; determine if growth can be accommodated
- As part of a crash or user conflict study
- Evaluate LOS based on temporal factors
  - Seasonal peaks
  - Time of day peaks
- Compare various sections of a long trail or trail system, based on BLOS not just user counts.

How does it work?



Factors that Matter

1. Path Width
2. User Volume
3. User Mix
   - Friction with other Users
4. Centerline stripe

Trail Users in the Mix

- Adult Bicyclists *(From the Bicyclist's Perspective)*
- Child Bicyclists
- Inline Skaters
- Pedestrians
- Runners

How does it work?

Using:

- **User Volume**
- **User Mix**
- **Flow Theory**

<u>Measures user friction created by speed differental</u>

- Meetings (passing by users in the opposite direction)
- Active Passes (need to pass slower users in same direction)
- Delayed Passes (user forced to slow instead of pass, because of oncoming traffic)

Based on 15 Study Trails

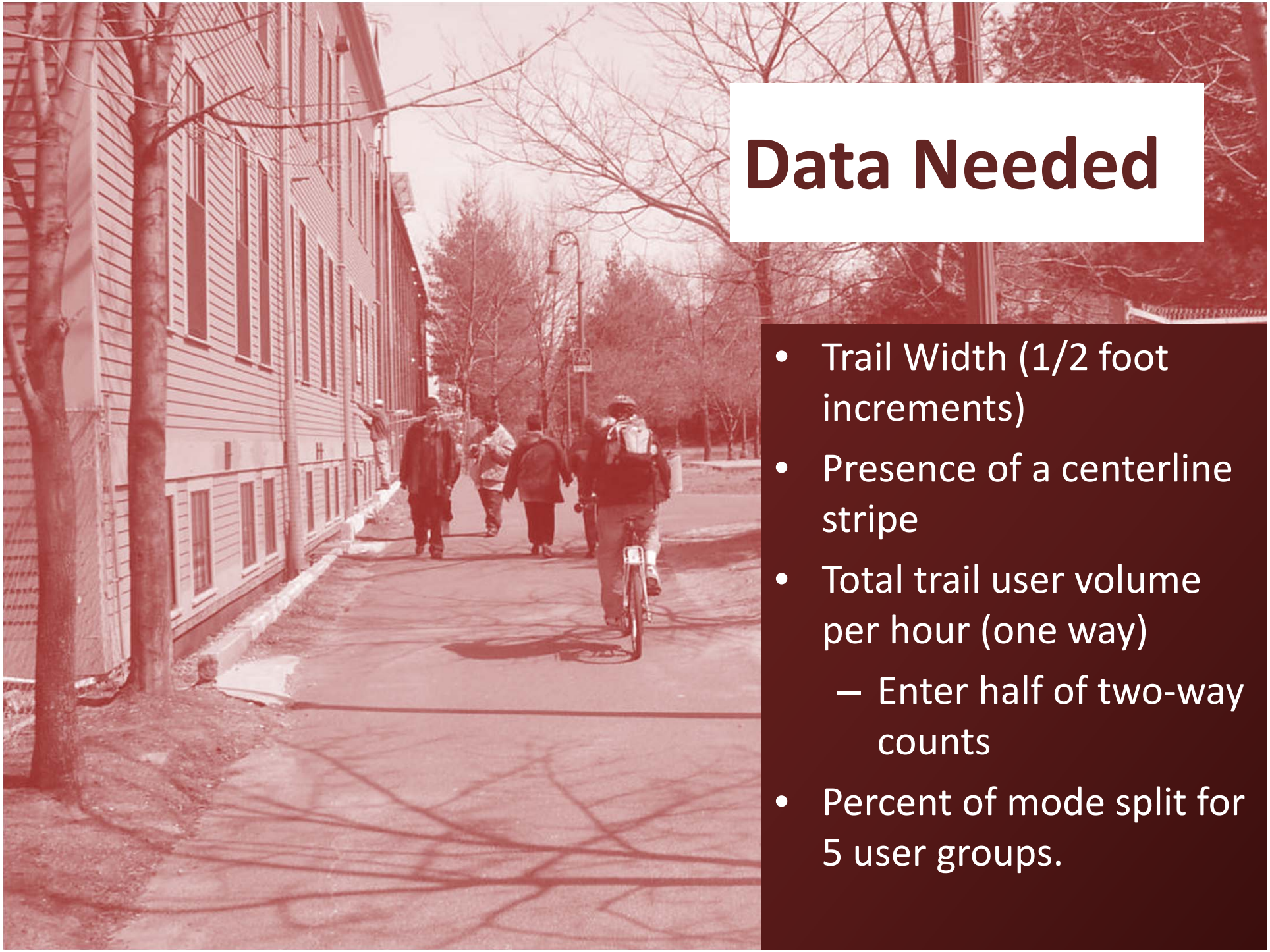
Eastern U.S.

- W&OD Trail (N. Virginia)
- Capital Crescent Trail (Bethesda, MD)
- Pinellas Trail (St. Pete, FL)
- Honeymoon Is. Trail (Dunedin, FL)
- Minuteman Bkwy (Arlington, MA)
- Charles River Bike Path (Boston)
- Lake Johnson Trail (Raleigh, NC)

Study Trails

Midwest & West

- Sammamish River Trail (Redmond, WA)
- Mill Valley–Sausalito Pathway (Marin, CA)
- South Bay Trail (Santa Monica, CA)
- Grant's Trail (Suburban St. Louis)
- Lakefront Trail (Chicago)
- White Rock Lake Trail (Dallas)
- White Creek Trail (Dallas)
- Forest Park Trail (St. Louis)



Data Needed

- Trail Width (1/2 foot increments)
- Presence of a centerline stripe
- Total trail user volume per hour (one way)
  - Enter half of two-way counts
- Percent of mode split for 5 user groups.

Use real data from a similar trail

Table 7. Study trail level of service grades and characteristics.

							Trail User Type Mode Split Percentage				
Path Name	**LOS Score**	**LOS Grade**	**Total Two-Way Volume (per hour)**	**One-Way Volume (per hour)**	**Trail Width (ft)**	**Center-line**	**Adult Bikes**	**Pedestrians**	**Runners**	**Skaters**	**Child Bikes**
Pinellas Trail	4.05	A	120	60	15.0	Yes	81.4	4.6	2.3	11.6	0.0
Honeymoon Island Trail	3.78	B	110	55	12.0	No	22.9	54.2	12.5	8.3	2.1
White Rock Lake Trail	3.75	B	252	126	14.0	Yes	71.6	13.6	8.0	3.4	3.4
Grant's Trail	3.72	B	122	111	12.0	Yes	59.2	16.3	4.1	10.2	10.2
W&OD Trail	3.50	B	44	22	10.0	Yes	73.7	5.3	15.8	5.3	0.0
Sammamish River Trail	3.31	C	418	209	10.0	No	78.9	3.4	3.4	6.0	8.4
Minuteman Bikeway	3.30	C	442	221	12.0	Yes	51.9	6.2	15.6	18.1	8.1
Capital Crescent Trail	3.15	C	159	80	10.0	Yes	55.9	17.0	18.6	3.4	5.1
White Creek Trail	3.07	C	216	108	8.0	No	64.8	9.9	6.6	14.3	4.4
South Bay Trail	2.39	E	616	308	14.0	Yes	40.3	17.4	12.5	25.0	4.9
Charles River Bike Path	2.37	E	438	219	8.0	Yes	72.3	8.2	3.8	14.7	1.1
Forest Park Trail	2.17	E	299	150	10.0	Yes	33.0	24.4	27.8	13.9	0.9
Mill Valley—Sausalito Pathway	1.94	F	641	320	9.5	No	62.8	7.8	27.8	0.0	1.7
Lake Johnson Trail	1.61	F	205	102	8.0	No	14.1	63.3	21.9	0.0	0.8
Lakefront Trail	0.0	F	2320	1160	20.0	Yes	48.8	20.5	17.7	12.3	0.7
Average Trail†	3.15	C	311	105	11.0	Yes	55.0	20.0	10.0	10.0	5.0

1 ft = 0.3 m

† The profile of the Average Trail was created by averaging the data for 13 of the 15 study trails. The high and low volume trails (W&OD and Lakefront) were dropped from the mix and the data of the remaining trails was averaged. The mode splits were rounded to the nearest increment of five.

LOS Grade for Adult Cyclist?

A—Excellent

B—Good

C—Fair

D—Poor

Time to think about separating users

E—Very Poor

F—Failing

Trail LOS Scale	
LOS Score	LOS Grade
X≥4.0	A
3.5≤X<4.0	B
3.0≤X<3.5	C
2.5≤X<3.0	D
2.0≤X<2.5	E
X<2.0	F

Break point at a Low "D" (~2.5)

Shared Use Path Flow Analysis Tool

Trail Level of Service (LOS) Calculator

Draft Spreadsheet Based on Federal Highway Administration Shared Use Path Study

North Carolina State University and Toole Design Group

Trail LOS Scale	
LOS Score	LOS Grade
X≥4.0	A
3.5≤X<4.0	B
3.0≤X<3.5	C
2.5≤X<3.0	D
2.0≤X<2.5	E
X<2.0	F

ROW #1

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Typical Mode Split	10.0	0	185.0	55.0%	20.0%	10.0%	10.0%	5.0%	100.0%	2.53	D

370 Users Per Hour (Peak hr.) *204 adult cyclists p/hr*

ROW #2

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
50/50 Mode Split	10.0	0	135.0	45.0%	30.0%	20.0%	2.0%	3.0%	100.0%	2.53	D

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

270 Users Per Hour (Peak hr.) *122 adult cyclists p/hr*

ROW #3

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Heavy Pedestrian	10.0	0	95.0	25.0%	50.0%	20.0%	2.0%	3.0%	100.0%	2.52	D

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

190 Users Per Hour (Peak hr.) *48 adult cyclists p/hr*

Wider trails serve larger volumes at a Low "D"

ROW #4

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Typical Mode Split	12.0	1	270.0	60.0%	20.0%	10.0%	5.0%	5.0%	100.0%	2.51	D

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

12 feet → 540 Users Per Hour (Peak hr.)

ROW #5

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Promenade	20.0	0	200.0	25.0%	55.0%	10.0%	8.0%	2.0%	100.0%	2.55	D

Heavy Pedestrian

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

20 feet → 400 Users Per Hour (Peak hr.)

- However, 400 users per hour on a Promenade is a low peak.
- Moreover, when do the pedestrians feel poor PLOS? At 20% wheels, 25%, 30%

What do you do?

Typical Crowding Issue

Shared Use Path Flow Analysis Tool

Trail Level of Service (LOS) Calculator

Draft Spreadsheet Based on Federal Highway Administration Shared Use Path Study

North Carolina State University and Toole Design Group

Trail LOS Scale	
LOS Score	LOS Grade
X≥4.0	A
3.5≤X<4.0	B
3.0≤X<3.5	C
2.5≤X<3.0	D
2.0≤X<2.5	E
X<2.0	F

Problem Situation

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
50/50 Mode Split	10.0	0	135.0	45.0%	30.0%	20.0%	2.0%	3.0%	100.0%	2.53	D

Click Here for Default Mode Split

Alternative 1

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Remove 100% Pedestrians	10.0	0	95.0	65.0%	0.0%	28.0%	3.0%	4.0%	100.0%	3.61	B

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

Alternative #2

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
85% Ped Compliance	10.0	0	101.0	60.0%	7.0%	27.0%	2.0%	4.0%	100.0%	3.44	C

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

Worksheet

Step 1: Calculate the raw numbers of users for each mode

Step 2: Select a compliance rating for pedestrians using alternate path

Step 3: Compute number of pedestrians to be removed from the main path

Step 4: Subtract pedestrians from the total number of path users per hour (divide in half to adjust the one way user volume.)

Step 5: Re-compute the mode share percentages based on the new number of total users.

	One Way Volume	Total Per Hour	Bike		Pedestrian		Runner		Skater		Child Bike		Grade	Score
Problem Trail	135	270	122	45%	81	30%	54	20%	5	2%	8	3%	D	2.53
		-81			-81									
Redirect Pedestrians	~95	189	122	65%	0		54	29%	5	3%	8	4%	B	3.61
		-67			-67									
85% Compliance	~101	203	122	60%	14	7%	54	27%	5	2%	8	4%	C	3.44

Single Treadway (4-Lanes)

Wheels & Runners and Pedestrians

11 Foot Shared Use Path w/ Dedicated Pedestrian Lanes

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
95% Compliance for Pedestrian Diversion	11.0	1	275.0	60.0%	5.0%	20.0%	10.0%	5.0%	100.0%	3.01	C

- Maximum Volume on Wheel/Runner Lanes: 550 Users p/hr

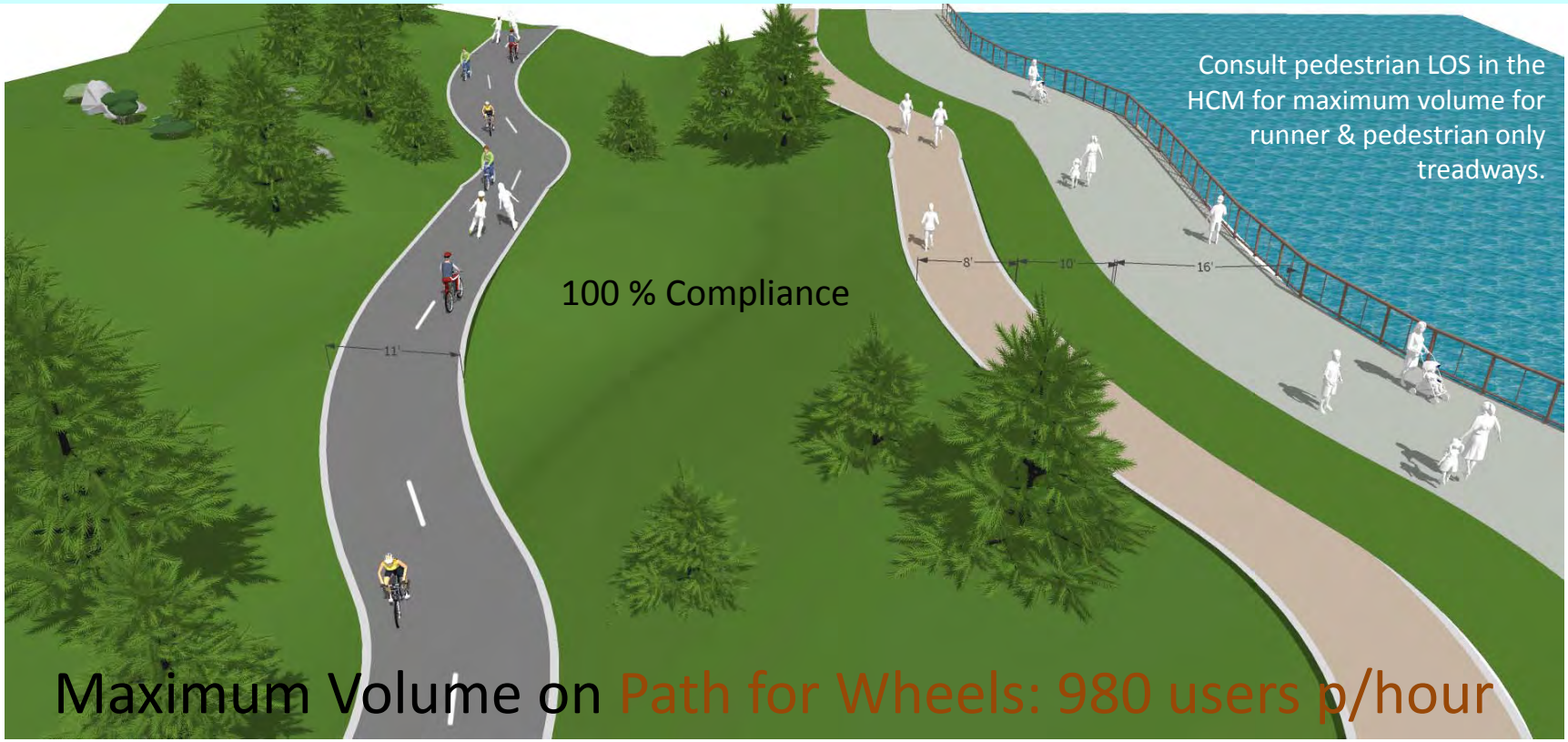
If pedestrian compliance is 95% there will be 261 p/hr in the pedestrian lanes.

Consult the Highway Capacity Manual (HCM) for pedestrian LOS for pedestrian only lanes.

Three Treadway Trail

Wheels, Runners and Pedestrians

11 Foot Bike/Skate Way w Dedicated Pedestrian and Runner Paths											
Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							Trail Level of Service	
	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**							
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	LOS Score	LOS Grade
Separate Walking and Running	11.0	1	490.0	70.0%	0.0%	0.0%	20.0%	10.0%	100.0%	3.01	C



- Maximum Volume on Path for Wheels: 980 users p/hour

Design For Pedestrians Based on Expected Volumes and Desired Behaviors

- Comfortable flow
- Walking side by side, or three or four abreast
- Accessories: Strollers, dogs on leash, etc.
- Children
- Seating & street furniture
- Window shopping
- Loitering on the edges
- Vehicle loading

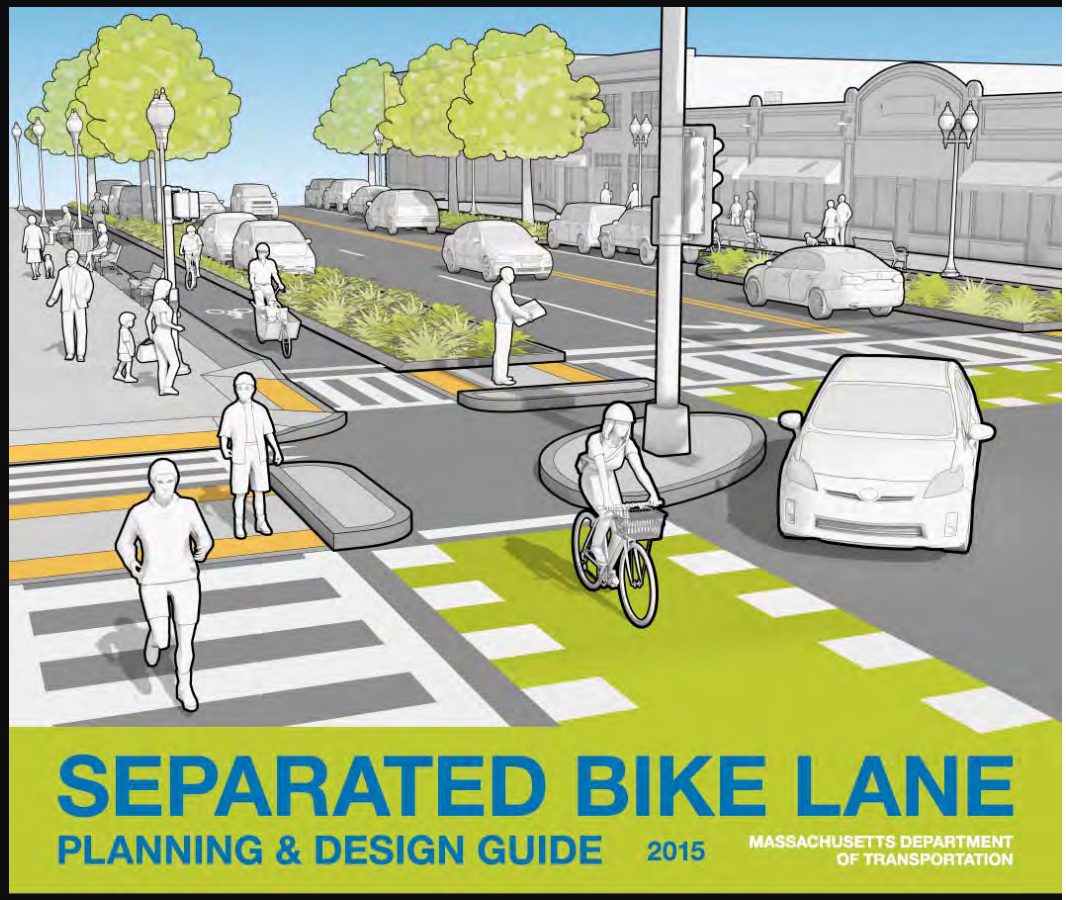
When to create a cycle track and sidewalk

MassDOT Separated Bike Lane Guide

- Released 11/4/2015
- First state DOT guidance on separated bike lanes
- First protected intersection guidance in the US

Download: goo.gl/stmXQG

Hardcover: goo.gl/wZsNgJ



Tips for Treadway Design

1. **A single treadway with multi-lane striping works best with sufficient space for 4 travel lanes, 2 in each direction—20+ feet.**

Contact Information:

- RPatten@tooledesign.com

2. **By assuming a compliance rating, single treadway configurations can be compared to user separated treadways.**

TO SHARE OR NOT TO SHARE

A context-based approach

Vélo Québec

PRESENTATION OVERVIEW

- Introduction
- Shared paths in road corridors
- Off-road shared paths
- Design Considerations

INTRODUCTION

Why shared use paths?

Advantages:

- Cheaper to build and maintain
- Smaller footprint

Disadvantages:

- Potential for pedestrian-cyclist conflict
  - Compromised safety
  - Reduced comfort
- Potential for cyclist-vehicle conflict at crossings

INTRODUCTION

Context-based approach: inferring the expected use of the path based on the physical and functional context

Why?

- No data on current pedestrian and cycling volumes
- No reliable models for predicting future volumes

SHARED PATHS IN ROAD CORRIDORS

Can cyclists be comfortably and safely accommodated on the road?

- Shared lanes if low volume and speed
  - Volume: 1,000-3,000 vehicles/day
  - Speed: 30-50 km/h
- Bicycle lanes if moderate volume and speed
  - Lanes: 1 or 2
  - Speed: 50 km/h or less
- Cycle tracks if high speed or high volume
  - Lanes: more than 2
  - Speed: more than 50 km/h

SHARED PATHS IN ROAD CORRIDORS

High speed rural road

✔

SHARED PATHS IN ROAD CORRIDORS

Low traffic residential street

?

SHARED PATHS IN ROAD CORRIDORS

Low traffic residential street

?

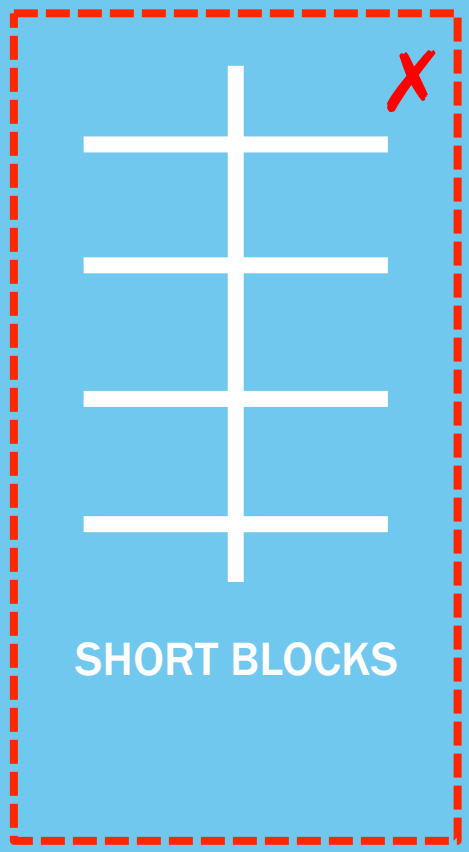
SHARED PATHS IN ROAD CORRIDORS

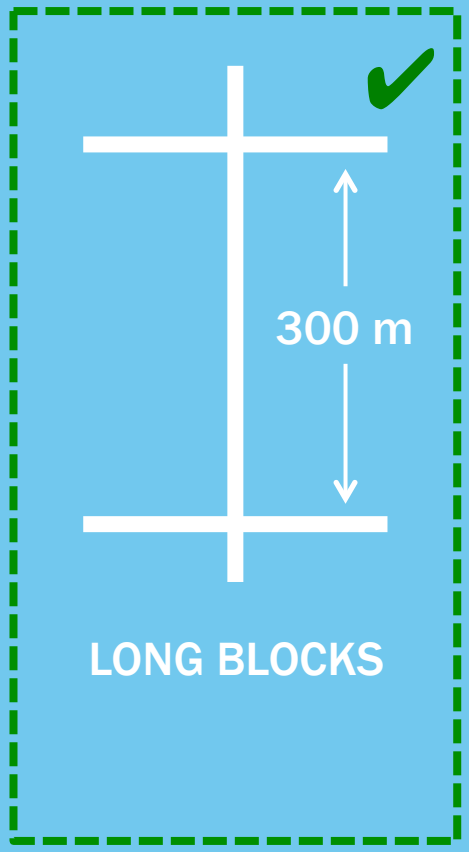
Intersections and driveways

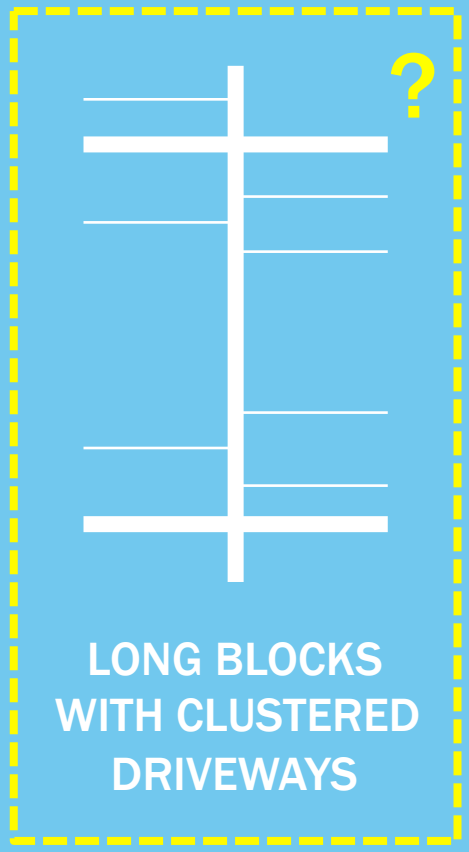
- Bicycles travel both ways on shared paths
- Shared paths are problematic at intersections and driveways
  - Avoid if intersections are close together
  - Avoid if there are many busy driveways

SHARED PATHS IN ROAD CORRIDORS

Intersections and driveways







SHARED PATHS IN ROAD CORRIDORS

Few intersections, no driveways

✔

SHARED PATHS IN ROAD CORRIDORS

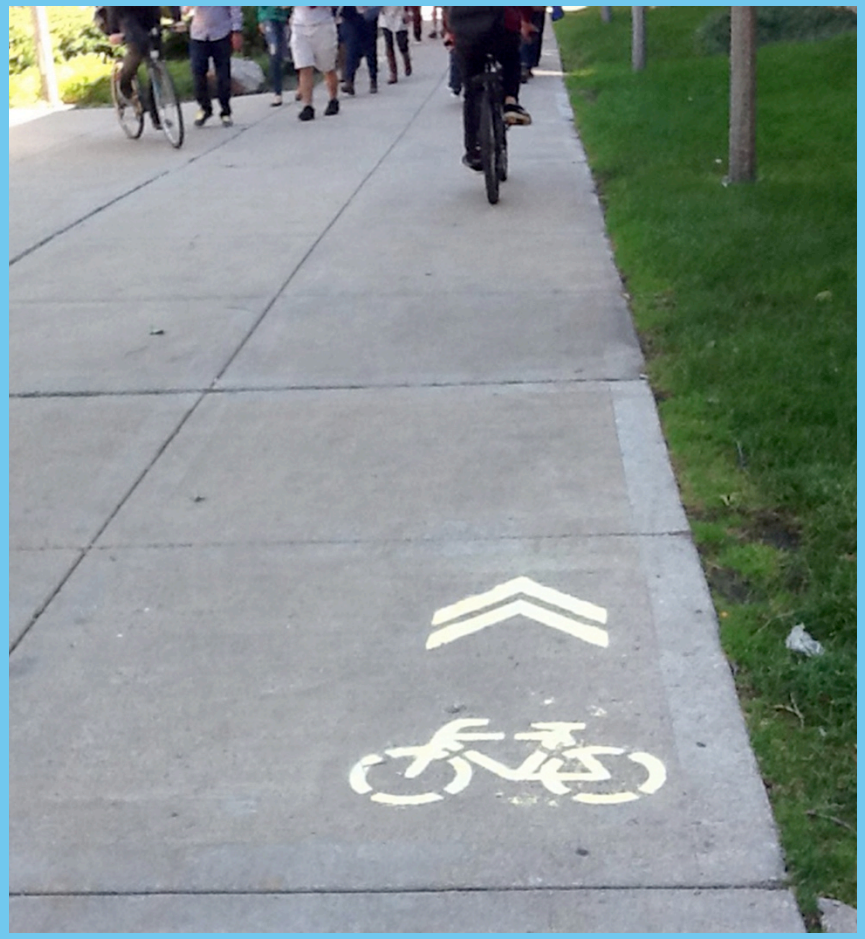
Few intersections, heavily used driveways

?

SHARED PATHS IN ROAD CORRIDORS

Land use

- Are abutting land uses going to generate pedestrian and bicycle traffic?
- Are buildings street-related?
  - Set close to the street
  - Facing the street



SHARED PATHS IN ROAD CORRIDORS

Pedestrian traffic generators

- Public transit
- Schools

SHARED PATHS IN ROAD CORRIDORS

Summary

A shared path can be implemented if all of these conditions are met:

- Cyclists cannot safely and comfortably be accommodated on the road
- Intersections are more than 300 m apart
- No clusters of busy driveways
- No street-related buildings
- No major pedestrian traffic generators

OFF-ROAD SHARED PATHS

- In rural areas, separation generally unnecessary
- In urban areas, separation warranted if:
  - Pedestrian and/or cyclist volumes are very high
  - Incompatible uses, especially on paths used by commuter cyclists

OFF-ROAD SHARED PATHS

Few commuters, no separation

OFF-ROAD SHARED PATHS

Popular route for commuters

DESIGN CONSIDERATIONS

- Different appearance than a two-way bicycle paths
  - Markings
  - Surface treatment

DESIGN CONSIDERATIONS

For paths in road corridors, to prevent conflict with vehicles at intersections:

- Set path back from parallel road
- Use dedicated traffic signals

THANK YOU!

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