Princeton Campus Mobility

9/26/2019 Transportation Advisory Council Workshop

Today's Agenda

- Coffee and Breakfast

- Introductions

- Welcome + Short Presentation

- Ivy University Game Part 1

- Ivy University Game Part 2

- Presentation

- Polling and discussion

Why are we here?

- We have a beautiful and historic campus - designed to bring people together to exchange ideas and share knowledge

- Walking is a critical part of the overall experience - belonging to the place, engaging with our surroundings, connecting with each other

- Mobility is changing - and our current transportation environment can hinder the walking experience vs. enhance

- Now is the time to evaluate and reimagine our mobility network and services - what is the right balance?

Less Yellowstone...

More Zion.

Project Vision

Campus Mobility Project will:

- Create TigerTransit 2.0

- Improve mobility options on campus

- Increase efficiency of $'s and reduce greenhouse gas emissions

- Be ready for future campus

- Improve rider communications

- "Make the experience of walking and biking irresistible"

Role of Advisory Council

- Transportation impacts everyone

- Princeton needs to hear from a wide range of campus voices on major transportation decisions

- TAC is an informed group that can help steer campus mobility into the future

- Act as ambassadors for the project to your group and others

Working Group
project sponsor: Chad Klaus VP University Services

Debby Foster, AVP Campus Services
Maureen McWhirter, ED Finance & Tech
Kim Jackson, Director, TTPS
Charlie Tennyson, Deputy Director, TTPS
Chris Foreman, Data & Tech Manager, TTPS

Consultant Team

Paulo Nunes-Ueno, NUC
Michelle Poyourow, JWA
Evan Landman, JWA
Mihir Bhosale, JWA

Advisory Council

Faculty and Staff	Undergraduate Students
AnneMarie Luijendijk	Aditya Shah
Elisabeth Donahue	Arthur Yan
Nicole Shelton	Carlie Littlefield
Amy Lewis Bristol	Celia Buchband
Ben Chang	Chitra Parikh
Carol Kondrach	Elizabeth Bailey
Daina Wilpon	Mashad Arora
Devin Livi	Zarnab Virk
Dorian Johnson	
Elizabeth Colagiuri	Graduate Students
Jennifer Poacelli	
Kaitlin Lutz	Ana Sekulic
Karen Jezierny	Jason Molesky
Kristin Appelget	Laura Bustamante
Lisa Schreyer	Laura Roberts
Lorine Murray-Mechini	Will Smith
Mollie Marcoux Samaan	
Natalie Shivers	
Paul Ominsky	
Polly Griffin	
Romy Riddick	
Shana Weber	
Tara Zarillo	
Thomas Dunne	
Toni Turano	

Project Timeline

| | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |

Stage Project (7/22)

Assess Current State (8/1 – 9/26)

Design Mobility Framework (11/1 – 2/1)

Planning for Engagement → **Engagement** → **Active Engagement** (11/12 – 3/31)

Princeton Review (4/15 – 5/1)

Princeton Review (5/15 – 6/15)

Procure Vendor for New Service (7/1 – 1/2021)

Planning for rider info systems → **Plan Deployment Strategies**

Support Implementation

Support Launch

Open House Surveys Tabling (2/27)

Advisory Council Meeting

Milestone dates: 7/22, 8/1, 9/8, 9/26, 11/1, 11/12, 11/15, 2/1, 2/27, 3/31, 4/15, 5/1, 5/15, 6/15, 7/1, 9/1, 1/2021

Bottom callouts:
- Kick-off
- Project Charter Visit
- Technical Review Meeting
- Stakeholder Workshop / 1st Advisory Council Meeting
- Design Retreat / Advisory Council invited to briefings
- Advisory Council Meeting
- EVP Sr. Staff (Possible Workshop) / Advisory Council Meeting
- Advisory Council Meeting
- Treby Final Decision
- Mini Design Retreat
- Launch New Svc with Current Vendor and vehicles
- GRAND OPENING / New contract / New vehicles

Today

Diamonds (deliverables):
- Current State Report
- Mobility Framework Report
- Decision Document
- Draft Mobility Plan
- Final Mobility Plan
- RFPs

Legend:
- Campus Visit
- Advisory Council Events
- Deliverable

Updated 9/24/19

12-month vehicle procurement lead time

10

Ivy University
Transit Planning Game
Part 1

Your job:

- Design a transit network for Ivy University
- For whom are you working?
  - University administration, certainly.
  - Who are the major stakeholders? You decide!
- We are visiting transportation experts who can help you with the technical stuff.

Why a fictional university?

- Common level of information
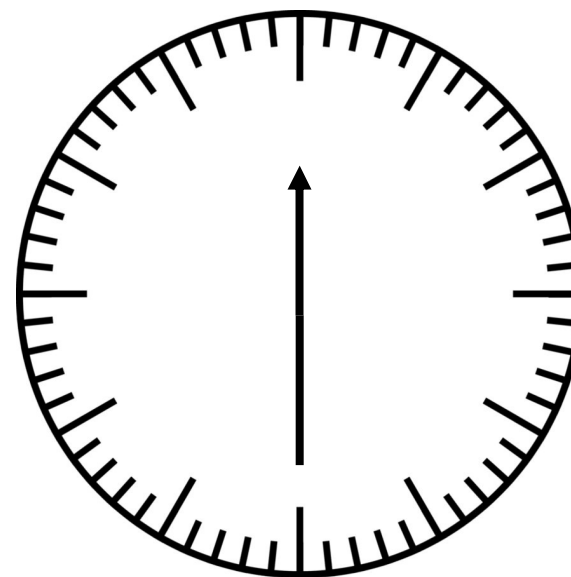- A chance to think about transit without needing to advocate for your self-interest
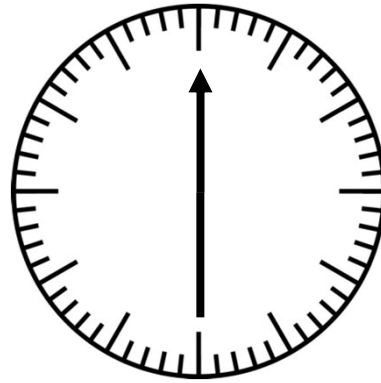- Altitude

Welcome to Ivy University

- Student population = 12,000
- Grid squares = 1/4 mile x 1/4 mile
- White lines show the transit-operable streets
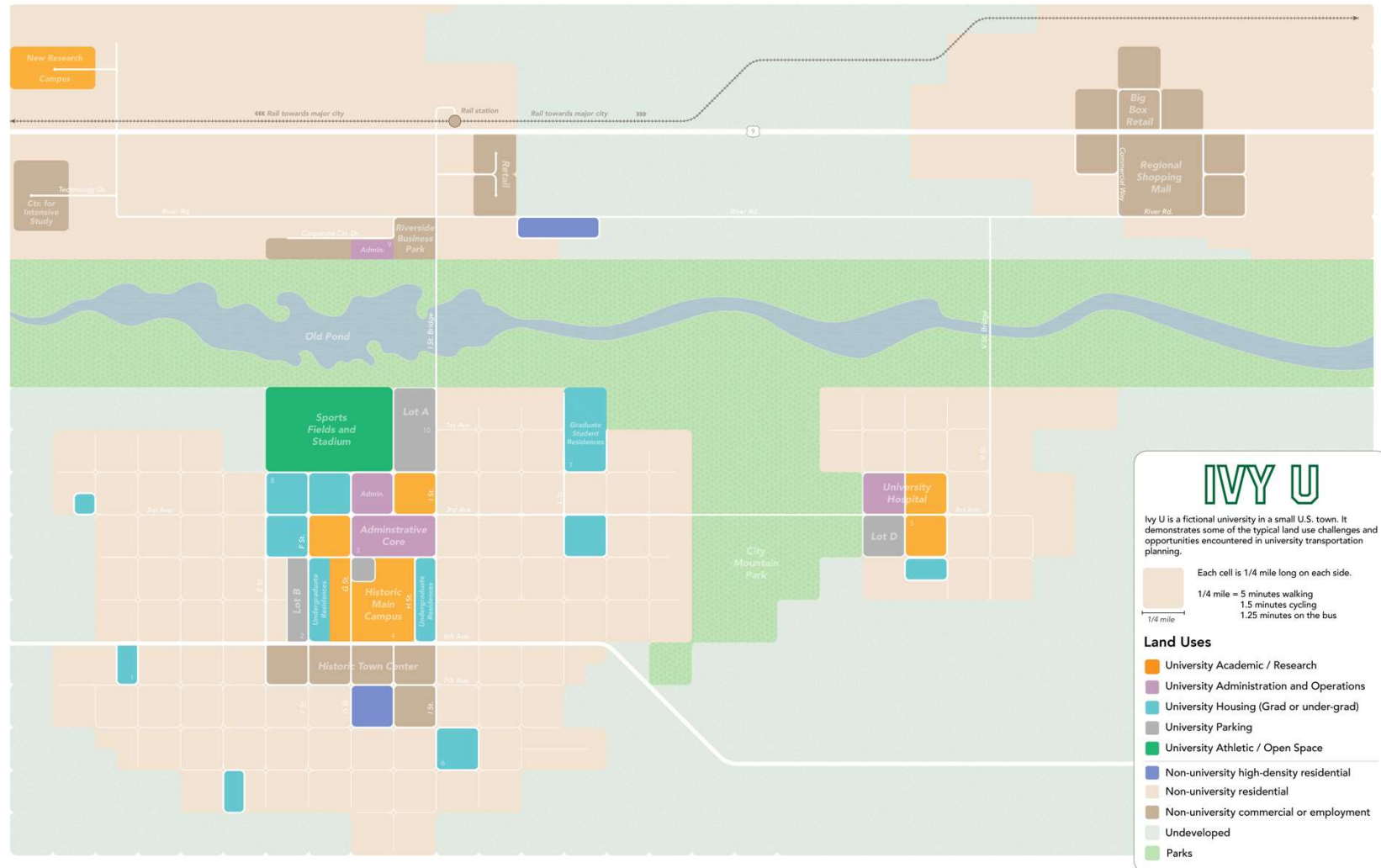
Your transit tools:

Stick color	Over a distance of…	A bus comes every…
Orange	1.5 miles	15 minutes
Green	6 miles	60 minutes

Your transit tools:

Stick color	Over a distance of…	A bus comes every…
Orange	1.5 miles	15 minutes
Green	6 miles	60 minutes

Your operating budget buys you 10 buses and drivers on the road each weekday, all day, i.e. 10 sticks.

Each stick represents two-way service.

You can make change!

Want more or less frequent service? Visit the bank.
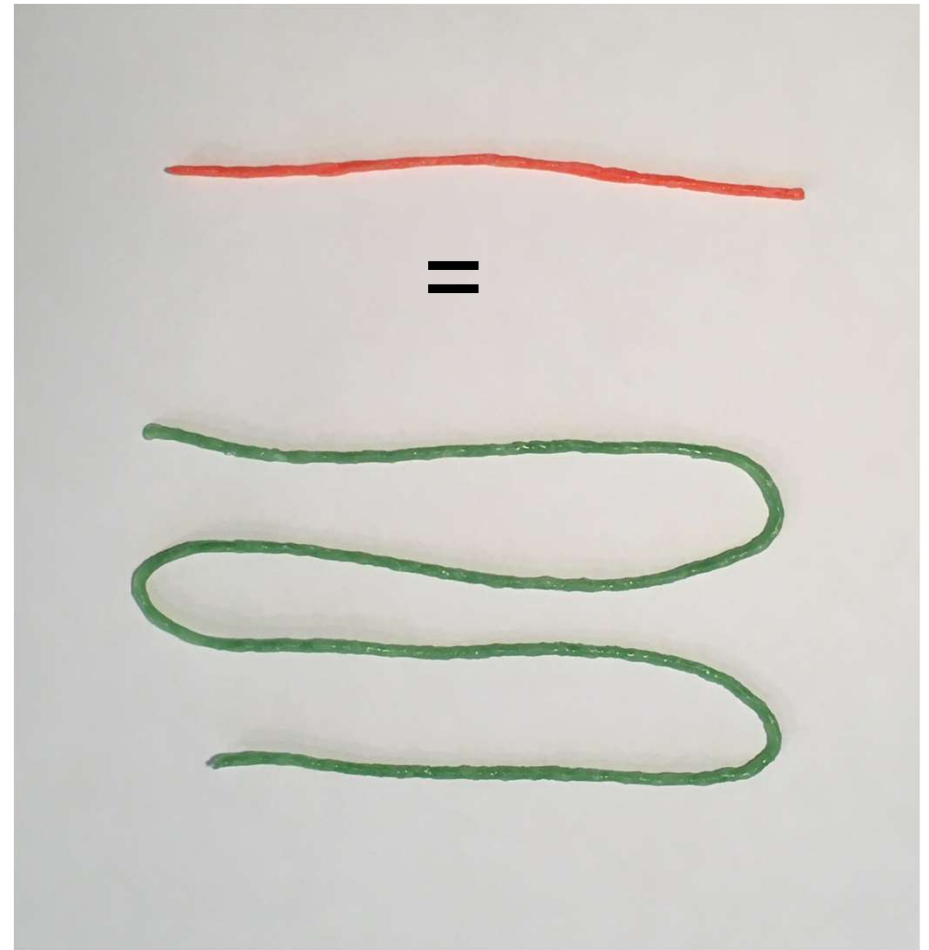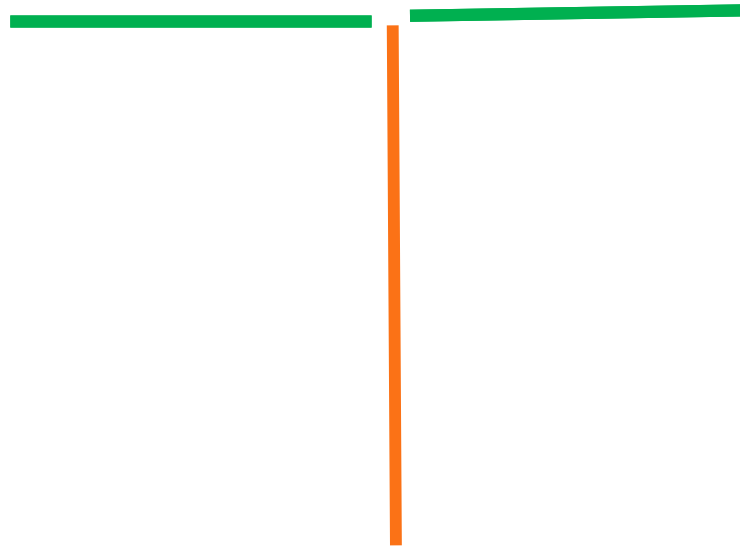
Caution about T-junctions:

This cannot be one route that takes people in two different directions, every 15 minutes, simultaneously.
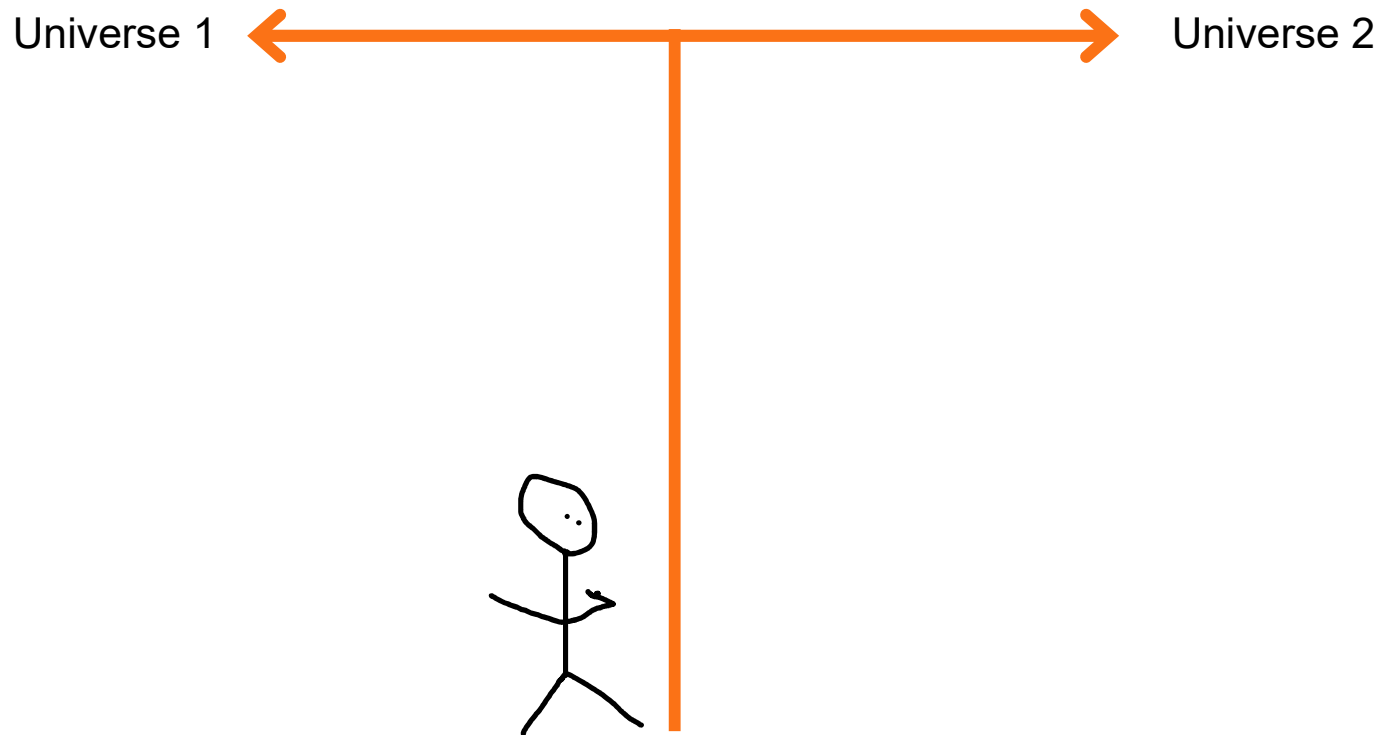
It must be two routes that intersect…
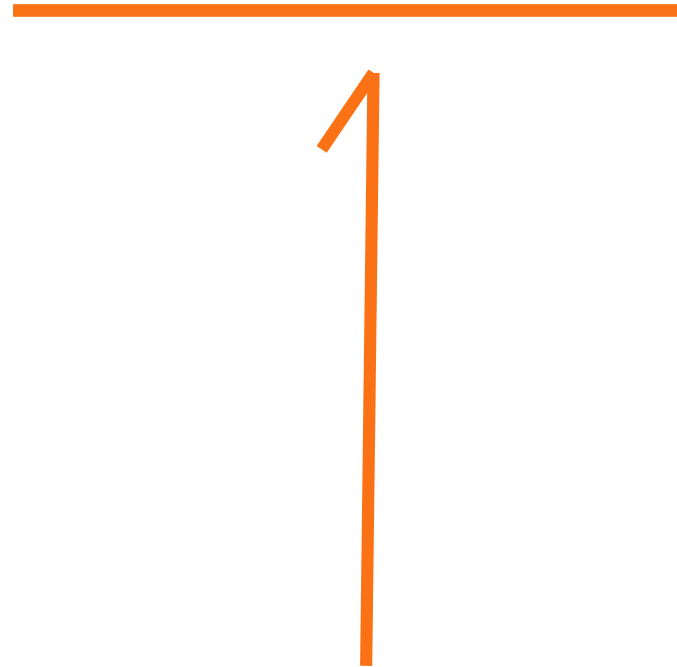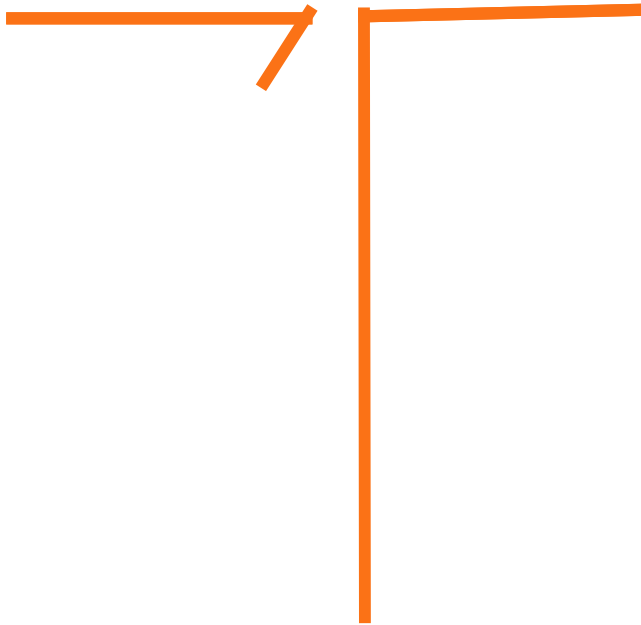
Or maybe it's one trunk route that splits into less-frequent branches.

Other cautions:

- Just because we labelled something doesn't mean you have to serve it.

- Beware the "milk run." Every shape you lay down someone has to ride through.

- You probably don't have enough transit budget to do everything you want.

Don't worry about:

- How buses turn around

- Weekend and summer services

- Nighttime and emergency rides

- Special events
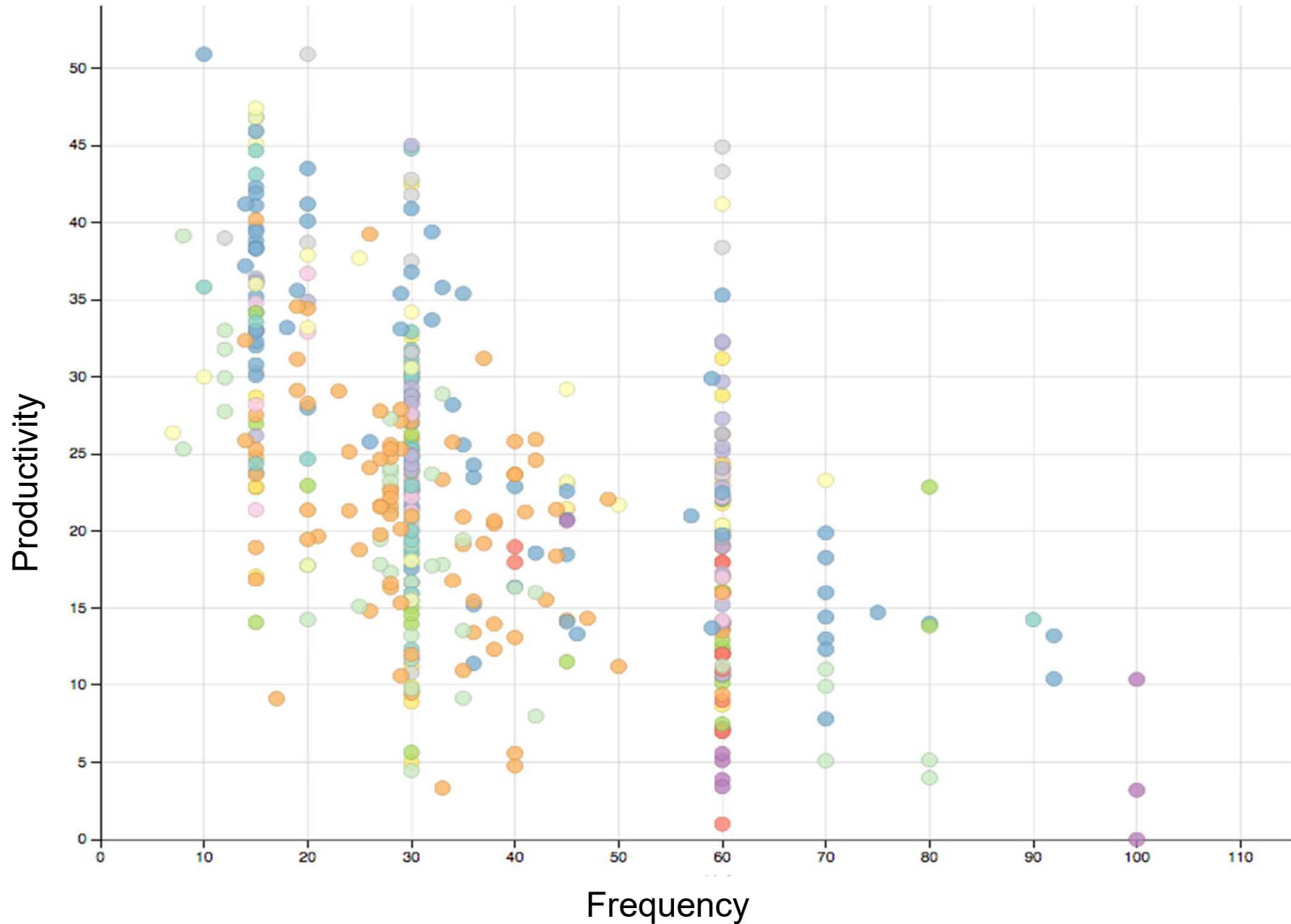
- ADA Paratransit

Let's play!

Stick color	Over a distance of…	A bus comes every…
Orange	1.5 miles	15 minutes
Green	6 miles	60 minutes

Your operating budget buys you 10 buses and drivers on the road each weekday, all day, i.e. 10 sticks.

Each stick represents two-way service.

Transit 101

Low frequency is hard to imagine if you don't use transit much.

- Elevators?
- Traffic signals?

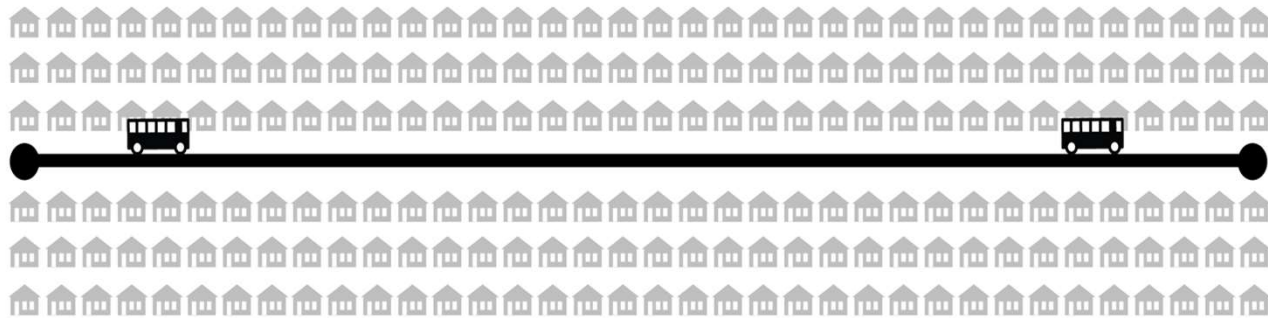A gate at the end of your driveway that opens only once an hour???

Land Use Drivers of Transit Ridership and Cost

- Density
- Walkability
- Linearity
- Proximity

Density

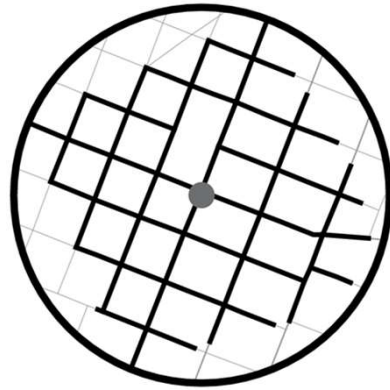How many people are going to and from the area around each stop?

Higher ridership

Lower ridership

Walkability

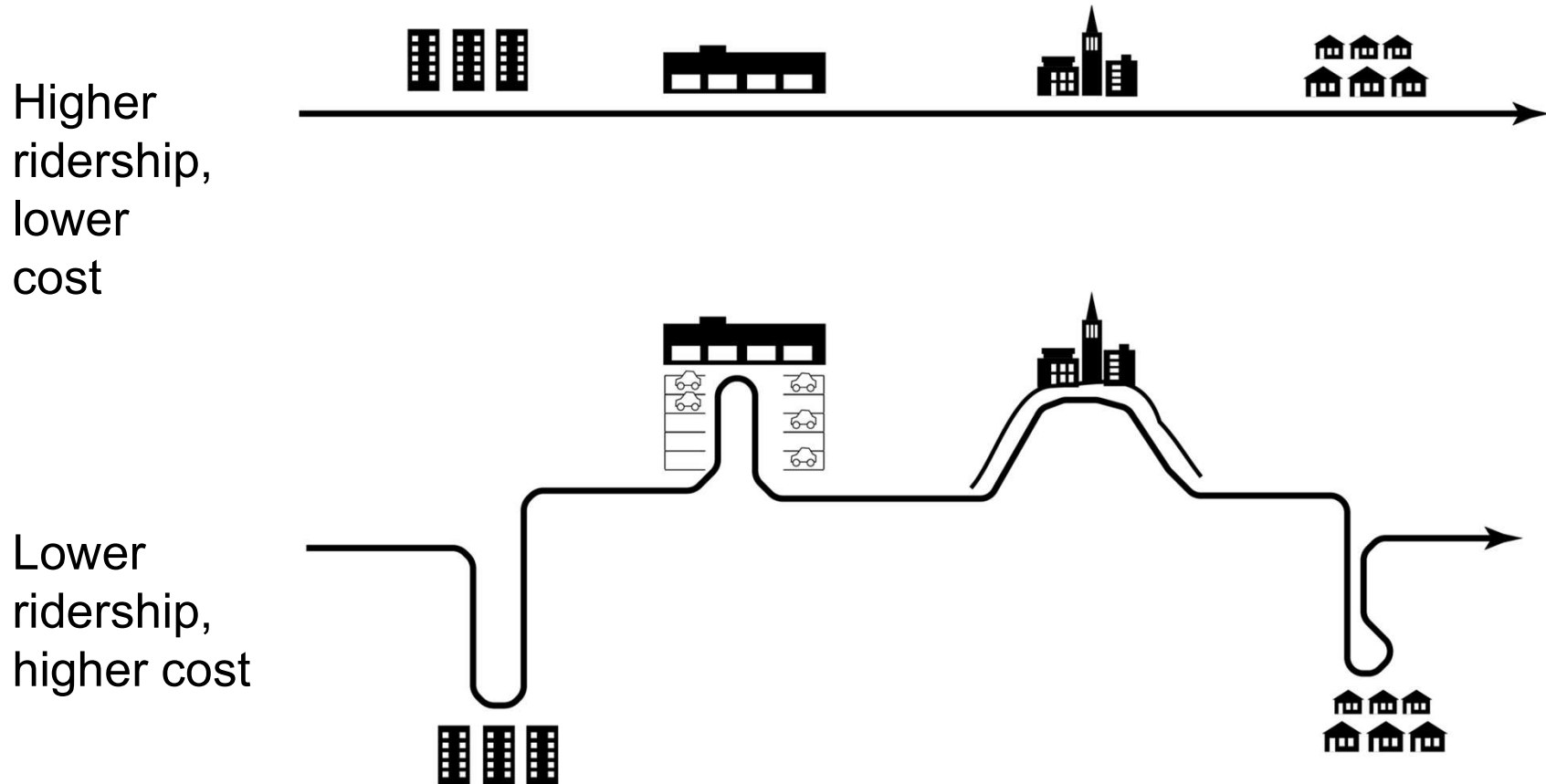Can the people around the stop walk to the stop?
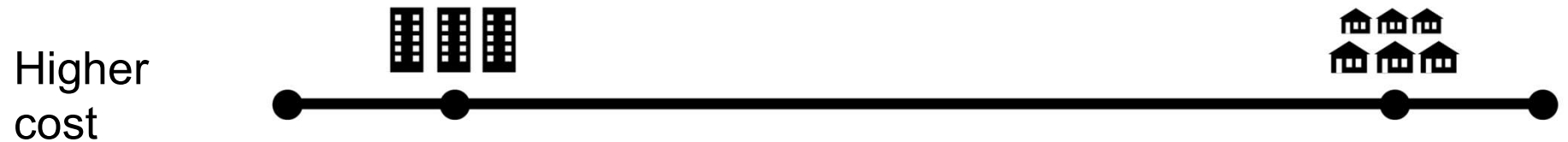
Higher ridership

Lower ridership

Linearity

Can transit run in straight lines that are useful to through-riders?

Higher ridership, lower cost

Lower ridership, higher cost

Proximity

Does transit have to cross long low-ridership gaps?

Lower cost

Higher cost
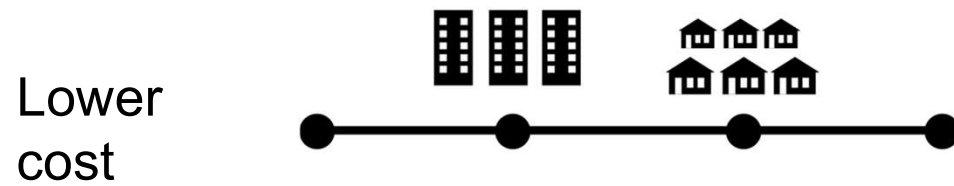
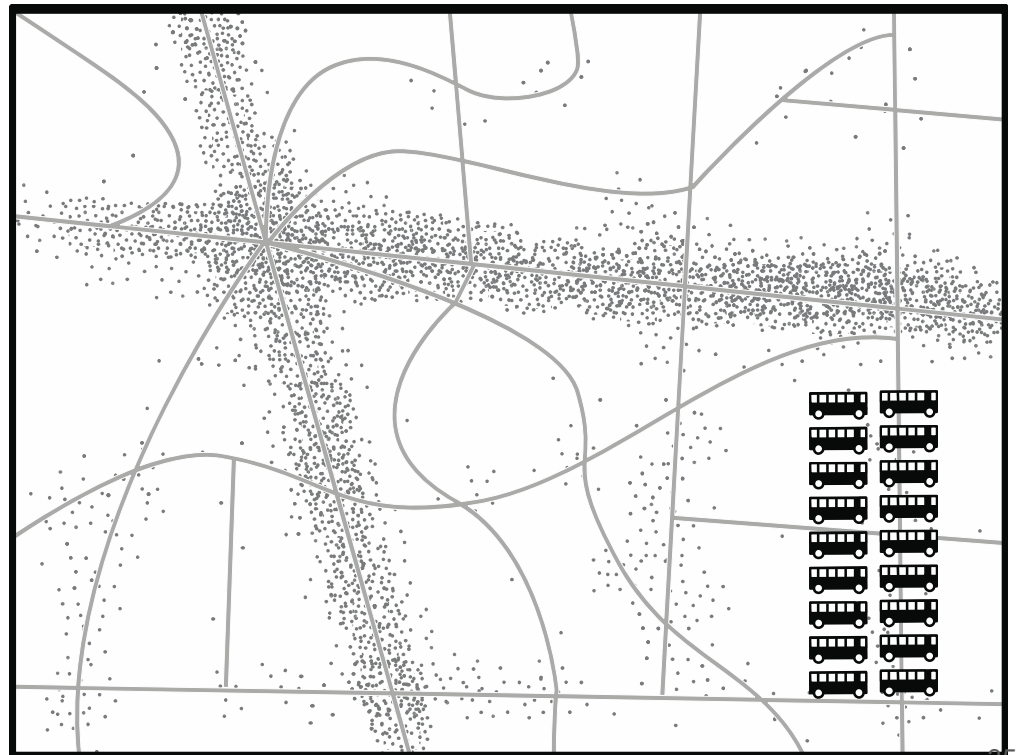# The Ridership-Coverage Tradeoff

- Maximizing ridership involves thinking like a business.

- Businesses choose which markets to enter, based on where their product can succeed.

- This is not the same as meeting people's *needs* or *expectations*.

How should a transit provider allocate its service?

Fictional town

Dots = residents and jobs

They have 18 buses

Ridership Goal "Maximize ridership"

Think like a business, choosing which markets to enter.

The straight lines offer density, walkability, and an direct transit path, so they focus service there.

Because all 18 buses are focused on two lines, they are frequent.
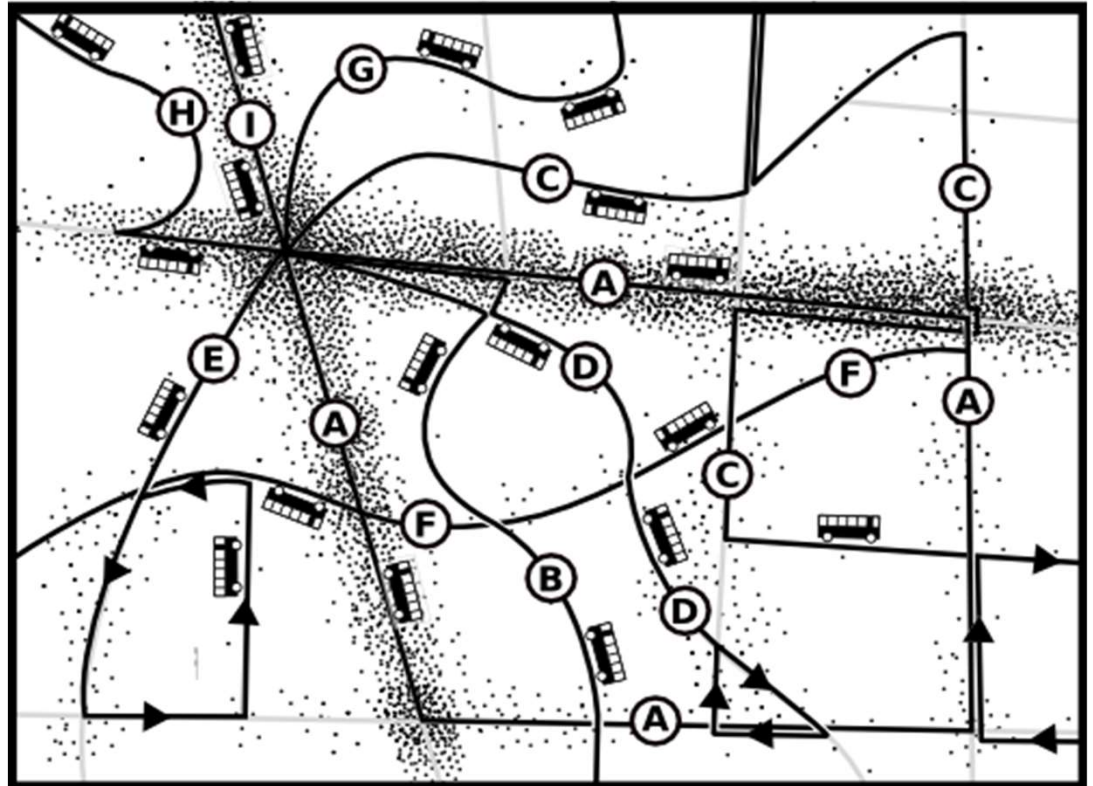

Performance Measure: Productivity
Ridership relative to cost

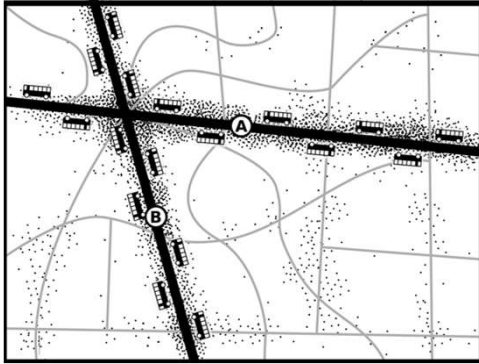# Coverage Goal "Some service for everyone"

Think like a government service. Try to serve everyone, even those in expensive-to-serve places.

The result is more routes covering everyone, but less frequency, more complexity, and lower ridership.

Performance Measure: Coverage
% of people near some service

Both goals are important,
… but they lead opposite directions!

Ridership Goal

Coverage Goal

- *"Think like a business."*
- Low subsidy per ride.
- Support dense and walkable development.
- Don't try to compete with biking and walking for short trips.
- Maximum VMT reduction.
- Protect town from congestion.
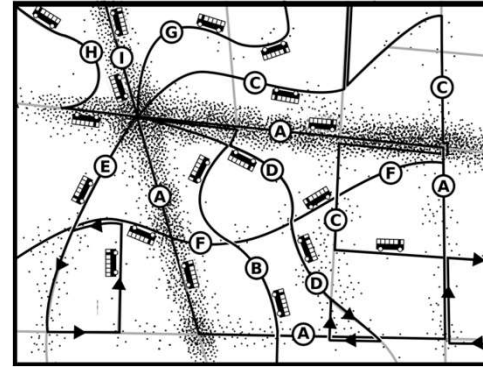
- *"Access for all"*
- Support low-density development.
- Some service for everyone, no matter where they live or work.
- Some service to every constituent.

Ivy U
Part 2

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Polling devices

- Later in our the discussion, we'll ask some multiple choice questions.
- Point your device at the laptop.
- Push the appropriate button on your device.
- If you change your mind, just push a different one.

These devices are not disposable!
Remember to return them at the
end of the day!

Practice poll: What do you think about e-scooters and hoverboards?

1. Amazing! Like flying!
2. Here to stay – figure out how to manage their impacts.
3. A flash in the pan, a fad – ignore them and they'll go away
4. They will destroy everything good about our campus! Ban them!
5. What's an e-scooter?

0%	0%	0%	0%	0%
1	2	3	4	5
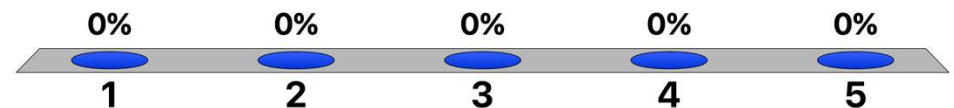
Optional network revisions

- Talk about walking distance/time

- Talk about the role of cycling, and cycling distance/time

Measure transit travel times

WAIT

RIDE

WAIT TO
TRANSFER

WALK

1

RIDE

4

WALK

Route Names

Ⓐ Central
Ⓑ 693 Alexander
Ⓒ East Commuter
Ⓓ PTS West
Ⓔ EQuad
Ⓕ Forrestal/PPPL
Ⓗ Evening Circulator
Ⓛ Lawrence/Lakeside
Ⓜ Merwick/Stanworth
Ⓞ 100 Overlook / 701 CC
Ⓢ Saturday/Sunday Shopper
Ⓦ Weekender

Princeton, NJ
TigerTransit Network

TigerTransit Services
Prevailing weekday midday frequencies

Ⓐ Every 15 minutes or better
Ⓜ Every 30 minutes or better
Ⓑ Every 60 minutes or better
Ⓑ Certain times only
Ⓢ Evening and weekend service

Map Symbols

Amtrak/NJ Transit Northeast Corridor
NJ Transit Princeton Branch/"Dinky"
Transit Hub

0   0.25   0.5   0.75   1 mi

Princeton University Campus

TigerTransit Network

TigerTransit Services
Prevailing weekday midday frequencies

A	Every 15 minutes or better
M	Every 30 minutes or better
B	Every 60 minutes or better
B	Certain times only
S	Evening and weekend service

Map Symbols

	NJ Transit Princeton Branch/"Dinky"
	Transit Hub

Routes

A	Central	H	Evening Circulator
B	693 Alexander	L	Lawrence/Lakeside
C	East Commuter	M	Merwick/Stanworth
D	PTS West	O	100 Overlook / 701 CC
E	EQuad	S	Sat/Sun Shopper
F	Forrestal/PPPL	W	Weekender

0   1000   2000 ft

47

Refer to map of campus

Princeton, NJ
Average Weekday Tiger Transit Boardings
Data Source: Tiger Transit APC, Fall 2018 - Spring 2019

< 5

5 - 10

10 - 20

20 - 50

50 - 150

> 150

0   0.25   0.5   0.75   1 mi

48
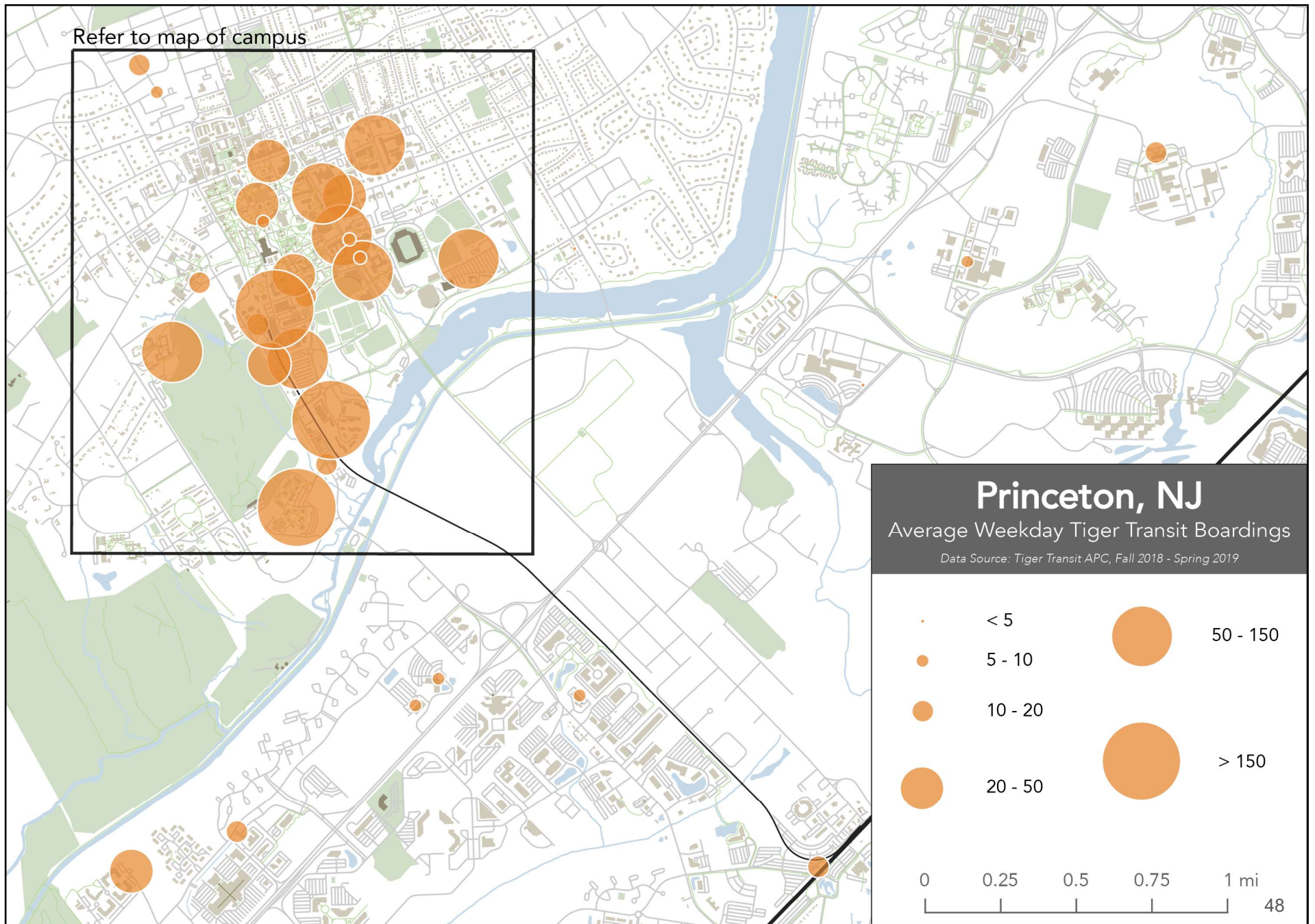
Productivity: ridership relative to cost

	Route name	Average boardings per hour (school-year)	Average operating cost per boarding
L	Lawrence/Lakeside	30	$4
S	Shopper	28	$5
A	Central	19	$7
C	East Commuter	12	$10
W	Weekender	12	$9
EQ	E-Quad	8	$17
B	693 Alexander (new route)	6	$21
D	PTS/West Line	6	$18
F	Forrestal / PPPL	4	$36
E	Merwick	3	$43
	On-Demand Bus Service	3	$47
O	701 CC Overlook (new route)	2	$61
B	693/701 Carnegie Center (old route)	2	$64

Mobility Framework

Our Early Impressions

P

Generalizations about groups of people moving around campus:

- Undergraduate students: Live and study in a pedestrian paradise.

- Staff and faculty: Mostly drive to work. Walk from parking 0.1 (1 min) to .6 miles (12 mins) to workplaces, or take TigerTransit.

- Graduate students: Prohibited from parking on campus. Walk from housing .6 mile (12 mins) to 1.4 (25-30 mins) to workplaces and classes. Bike mostly in mixed traffic with inconsistent bicycle facilities (7-10 mins) or take TigerTransit.

Prohibit

Discourage

Accommodate

Celebrate

Types of cyclists

Enthused and Confident

Interested but Concerned

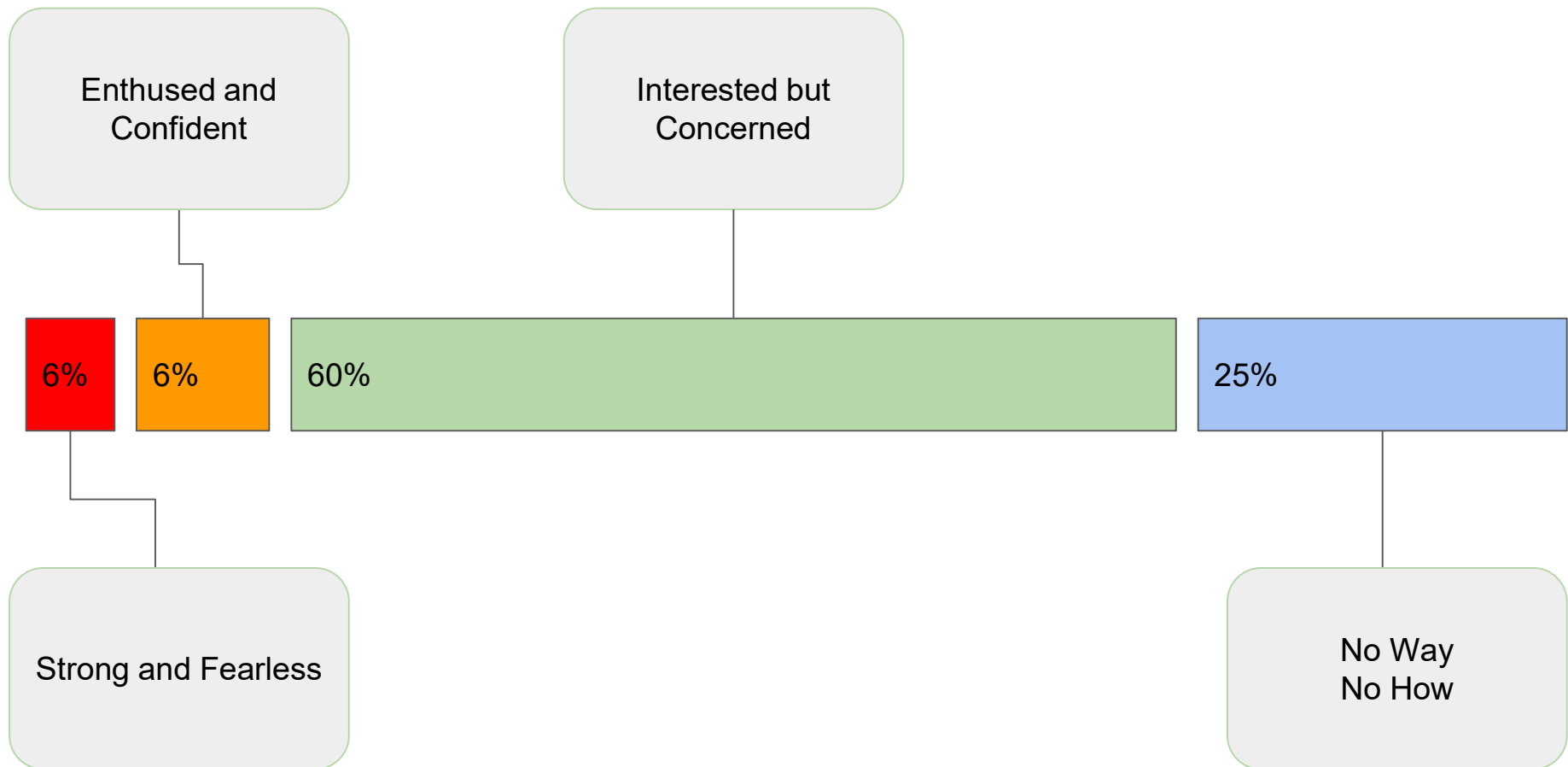| 6%	6%	60%		25%

Strong and Fearless

No Way No How
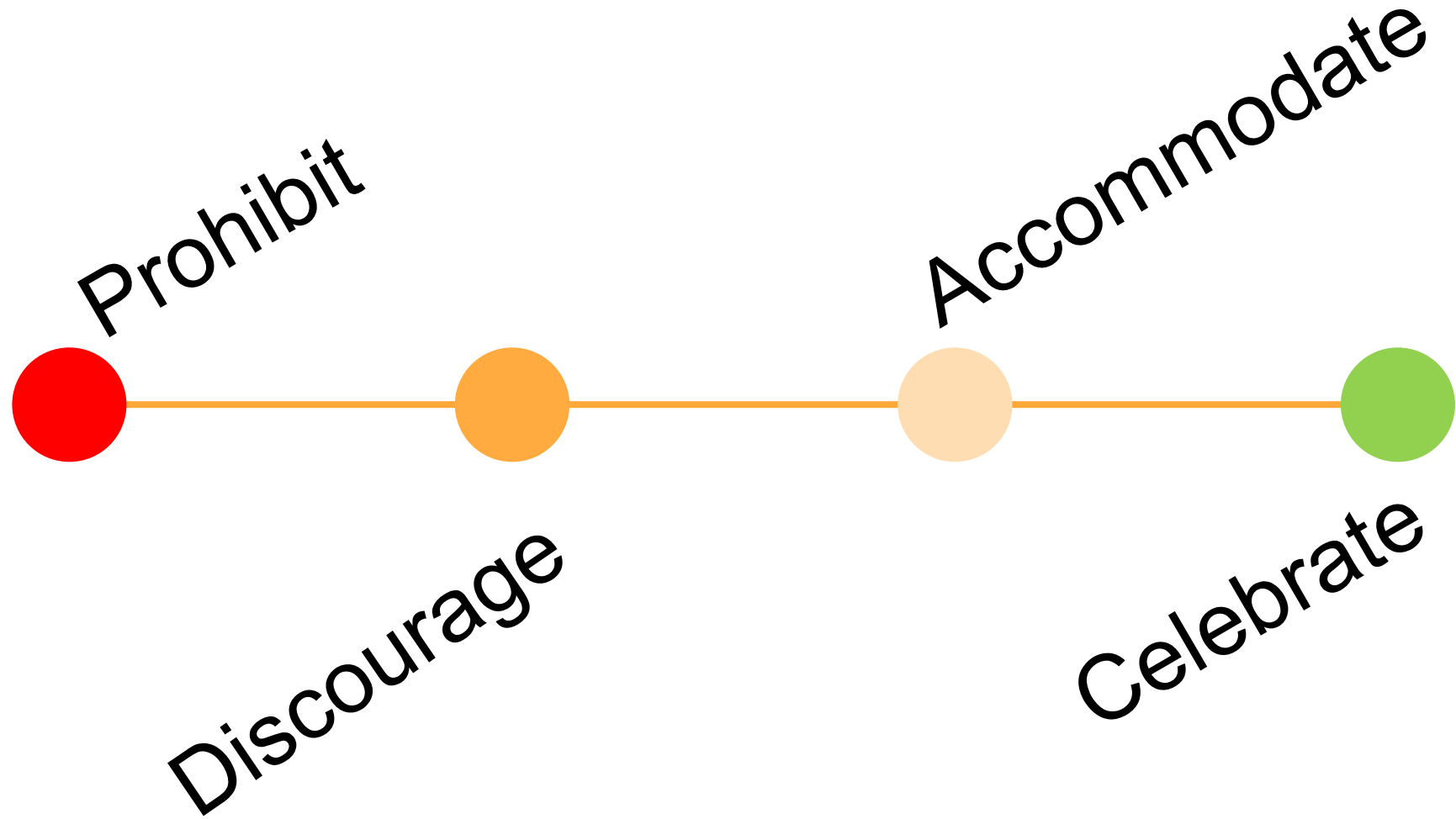
Roger Geller: Portland Bureau of Transportation

Jennifer Dill PhD: Portland State University
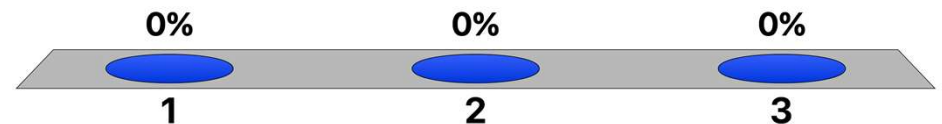
Level of Comfort

HIGH

LOW

Polling

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How important is reducing greenhouse gas emissions from campus transportation in the next 5 years?

1. Existential, we must do it as soon as possible

2. Really important, but there other priorities take precedence sometimes

3. Not very important

0%	0%	0%
1	2	3

P

For places that are too far from central campus to walk or difficult to bike, eg. trips across the lake and the Pike today, the University should provide:

1. 100% coverage – every Princeton building is walking distance to at least minimal service (even if hardly anyone rides it)

2. Service to only locations where the transit ridership suggests at least some GHG is saved, compared to car trips.

3. Service that maximizes ridership, by focusing high-frequency where transit can be useful to the most people.

M

0%   0%   0%

1   2   3
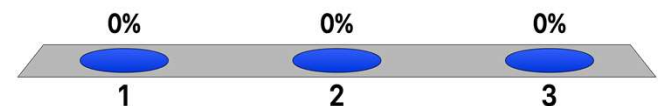
Minimize Walking
with closely-spaced routes coming every 60 mins.

WAIT

Average: 15 mins.

Full: 30 mins.
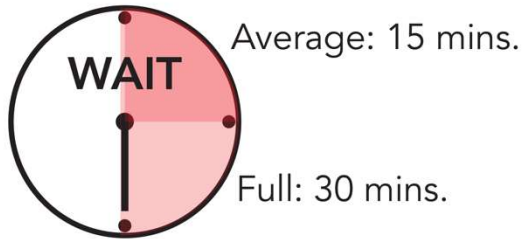
+4 MORE MINUTES WALKING
-7.5 FEWER MINUTES WAITING ON AVERAGE =
3.5 MINUTES FASTER

walk

1st 3rd 5th 7th 9th
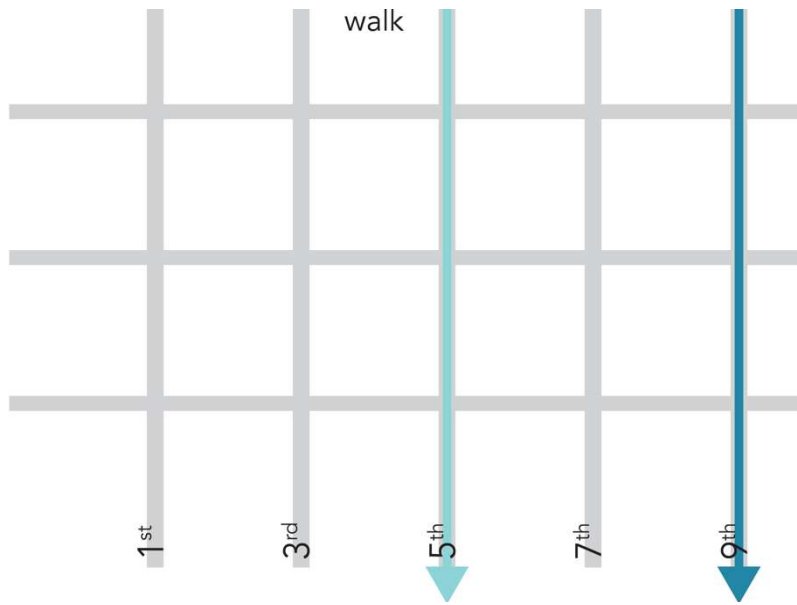
Minimize Waiting
with routes coming every 30 mins., more widely spaced.

WAIT

Average: 7.5 mins.

Full: 15 mins.

Ms. Smith

6 min. walk

1st 3rd 5th 7th 9th

M
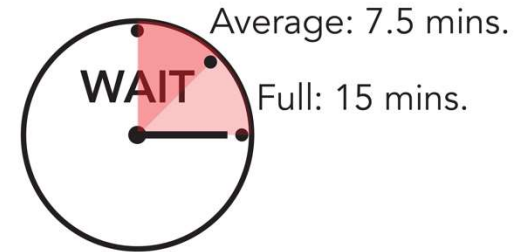
How do you feel about walking vs. waiting for transit trips?

1. I cannot or prefer not to walk. I'll wait a long time or travel at only certain times to get a short walk.

2. I'll walk a little bit, if I must.

3. I'm happy to walk some if it gets me there sooner.

4. I will do whatever gets me the quickest trip, even involves a long walk.

5. I love walking, so I'll choose a longer trip if I can walk.

M

0%	0%	0%	0%	0%
1	2	3	4	5
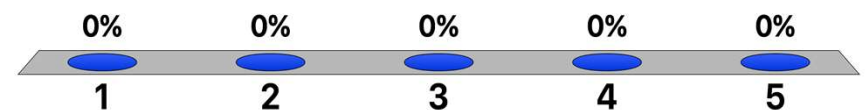
What do you think the expectation should be for all able-bodied people at Princeton, for a one-way commute?

1. We should barely be expected to walk at all – there should be 100% transit coverage even for short trips.

2. We should be expected to walk at least 5 minutes (1/4 mile).

3. …at least10 minutes (1/2 mile).

4. …at least 20 minutes (1 mile).

0%	0%	0%	0%
1	2	3	4

P

How likely are you to bike up Alexander?

1. I do!
2. I would today, I just need a bike or a reason to go that way.
3. If I must…if I'm late…
4. With tough-looking escorts front and back.
5. Never.

0%	0%	0%	0%	0%
1	2	3	4	5

P
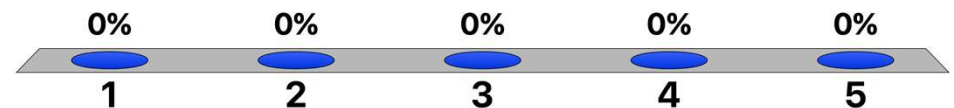
How likely are you to bike up Pyne?

1. I do!
2. I would today, I just need a bike or a reason to go that way.
3. If I must…if I'm late…
4. With tough-looking escorts front and back.
5. Never.

0%	0%	0%	0%	0%
1	2	3	4	5

P
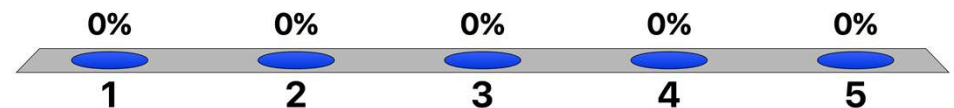
In the year 2030, would you like to see…

1. The same amount of biking on campus. (About 12% bike some or all the time.)

2. Less biking on campus – no more bikeshare and most people walk or take transit.

3. A little more biking – most people grab a bike at least once a month.

4. A lot more biking – nearly everyone uses a bike at least once week.

0%	0%	0%	0%
1	2	3	4

P

What else would need to change to make transportation really different on campus by 2030?

Timeline months: AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Dates: 7/22 · 8/1 · 9/8 · 9/26 · 11/1 · 11/12 · 11/15 · 2/1 · 2/27 · 3/31 · 4/15 · 5/1 · 5/15 · 6/15 · 7/1 · 9/1 · 1/2021

Stage Project

Assess Current State

Design Mobility Framework

Open House Surveys Tabling

Planning for Engagement — **Engagement** — **Active Engagement** — **Princeton Review** — **Princeton Review** — **Procure Vendor for New Service**

Planning for rider info systems — **Plan Deployment Strategies** — **Support Implementation** — **Support Launch**

Kick-off

Project Charter Visit

Technical Review Meeting

Stakeholder Workshop 1st Advisory Council Meeting

Design Retreat Advisory Council invited to briefings

Advisory Council Meeting

EVP Sr. Staff (Possible Workshop) Advisory Council Meeting

Advisory Council Meeting

Treby Final Decision

Mini Design Retreat

Launch New Svc with Current Vendor and vehicles

GRAND OPENING New contract New vehicles

Campus Visit

Advisory Council Events

Current State Report

Mobility Framework Report

Decision Document

Draft Mobility Plan

Final Mobility Plan

RFPs

Today

Updated 9/24/19

Deliverable

12-month vehicle procurement lead time

Next Steps

Current State Report:	November 1
TAC briefings on transit design:	November 12,13,14
TAC Meeting	November 15
Mobility Framework Recommendation:	February 2
EVP Sr. Staff and TAC Meeting:	February 26,27
Campus Engagement:	All February

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Thank you!