Future Directions for Multimodal Research and Practice

TRB Standing Committee on Transportation Issues in Major Cities

Multimodal Transportation Planning Best Practices

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Center for Urban Transportation Research

Research and Training Objectives

Model Multimodal Transportation Element:

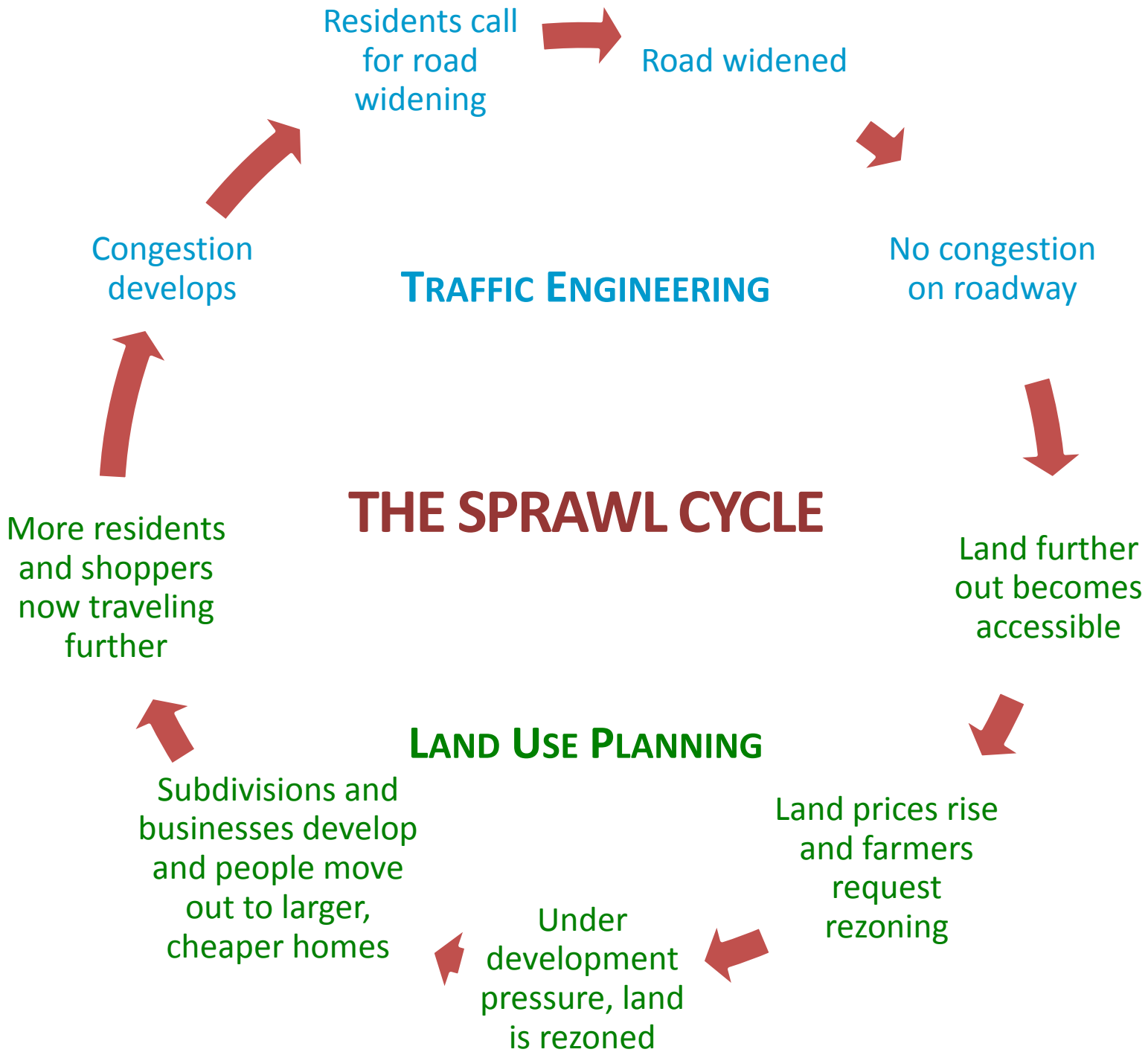
- **DEFINE** requirements of Florida's 2011 Community Planning Act.
- **DOCUMENT** professionally accepted multimodal planning best practices.
- **CLARIFY** how to coordinate the local transportation element with other elements and other plans.

2011 Community Planning Act

"The transportation element shall provide for a *safe*, *convenient multimodal* transportation system,

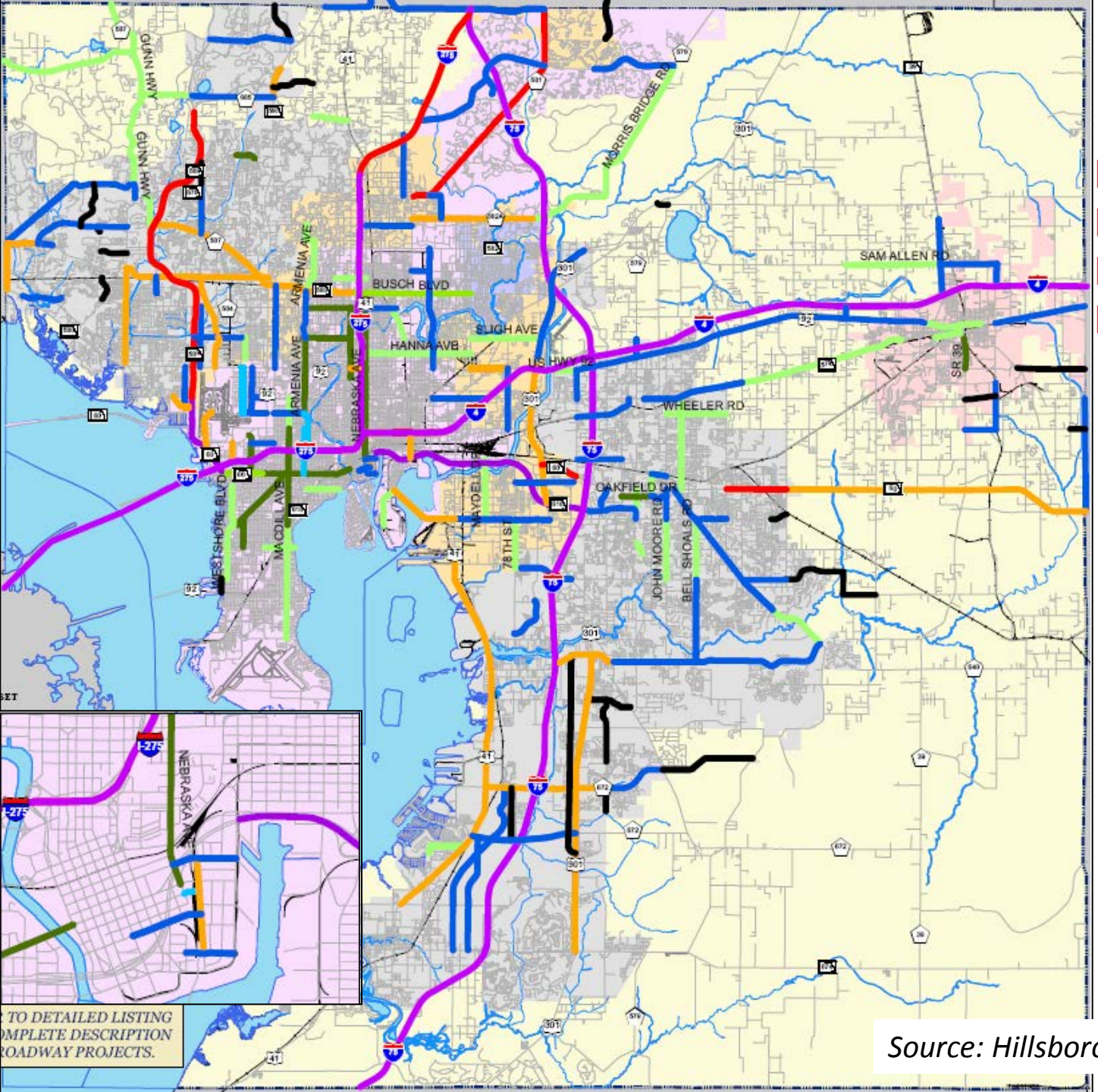
- coordinated with the *future land use map* or map series, and designed to support all elements of the comprehensive plan."

- §163.3177(6)(b) F.S.


Residents call for road widening
Road widened
No congestion on roadway
Land further out becomes accessible
Land prices rise and farmers request rezoning
Under development pressure, land is rezoned
Subdivisions and businesses develop and people move out to larger, cheaper homes
More residents and shoppers now traveling further
Congestion develops
TRAFFIC ENGINEERING
LAND USE PLANNING
THE SPRAWL CYCLE

"On urban commuter expressways, peak-hour traffic congestion rises to meet maximum capacity."

Anthony Downs. "The law of peak-hour express-way congestion." *Traffic Quarterly* , 1962, Vol 16, No 3.



Major Roadway Projects Needed

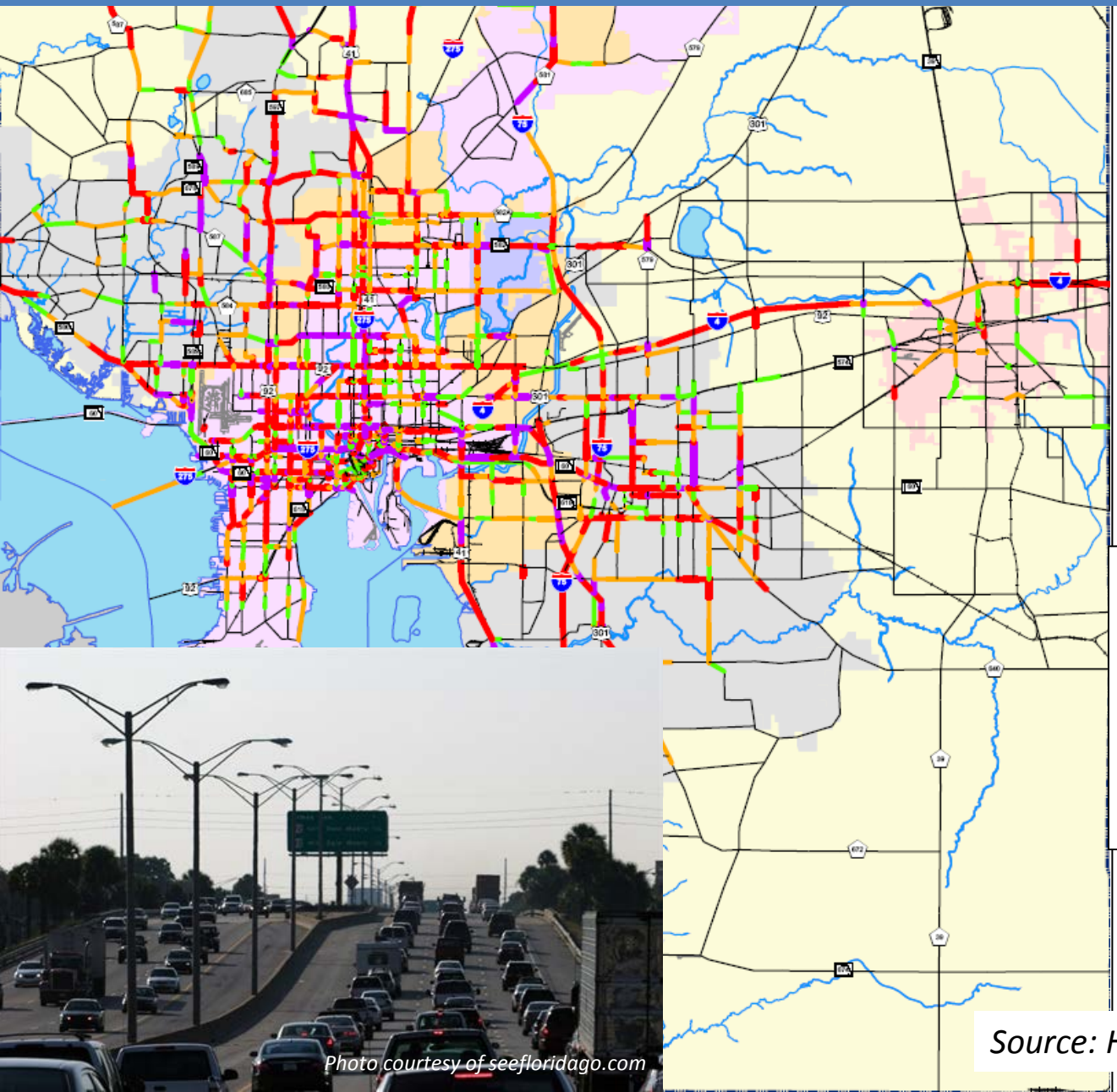
LANEAGE

- 2 Lanes
- 3 Lanes
- 4 Lanes
- 6 Lanes
- 8 Lanes
- 10 + Lanes
- 2 Lanes Enhanced
- 4 Lanes Enhanced
- 6 Lanes Enhanced
- 2 Lane Frontage Roads
- Gandy Blvd (PCA)

Cost estimate:
$15 billion

Source: Hillsborough County MPO

This is not the future we want…



Still-Congested Roads 2035

Volume to Capacity Ratio

- 0.00 - 0.90
- 0.91 - 1.00
- 1.01 - 1.20
- 1.21 - 1.50
- > 1.50

Photo courtesy of seefloridago.com

Source: Hillsborough County MPO

Think Mobility

- Look beyond roadway level of service
- Higher priority on managing the system
- Lower priority on preventing future congestion

Photos courtesy of seefloridago.com

Main Street COPPELL

Where Community Meets Commerce

more emphasis

In Urban Cores and Centers

expanding and reinforcing mode choice, improving walkability, and promoting a diverse mix of land uses in close proximity

relieving auto congestion through roadway expansion projects

less emphasis

Target walkability investments

- Focus on those areas with the greatest potential and prioritize the pedestrian in those areas
- Improve other areas as opportunities arise

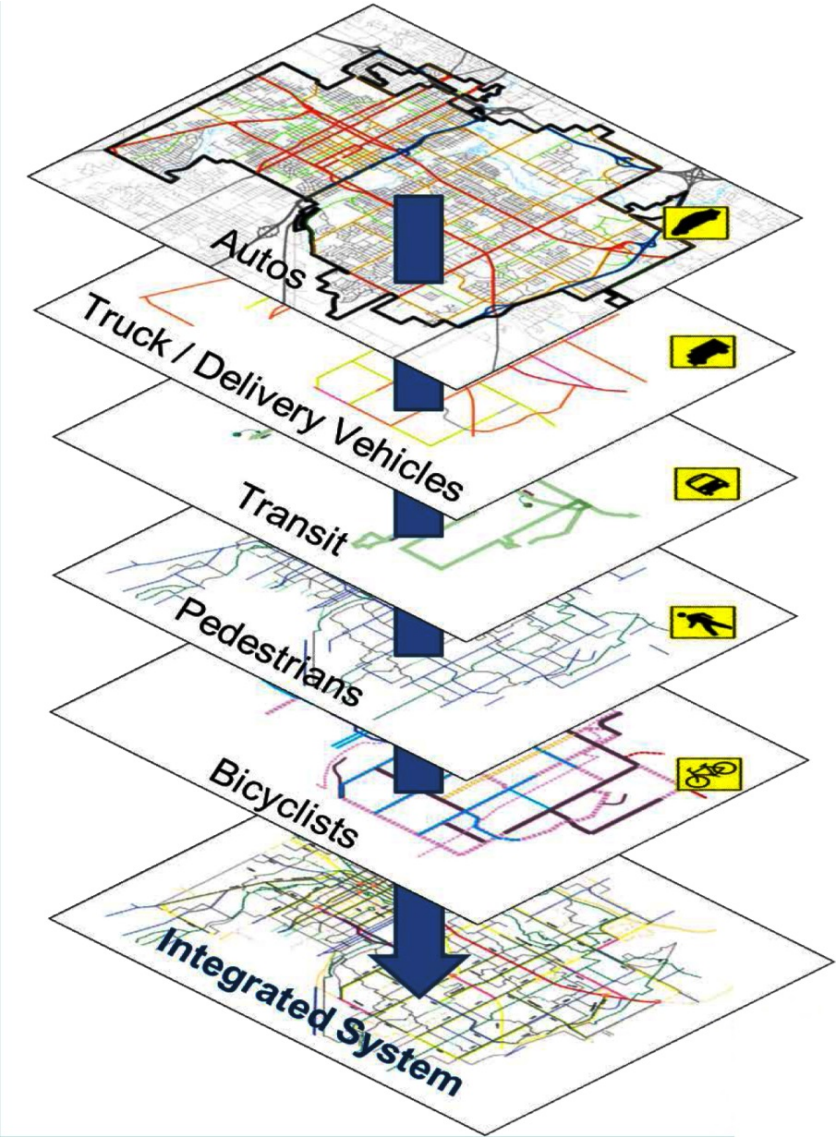
Make transit viable

- Focus premium transit service on key corridors
- Density, TOD
- Link walkable centers

Leverage bicycling as transportation

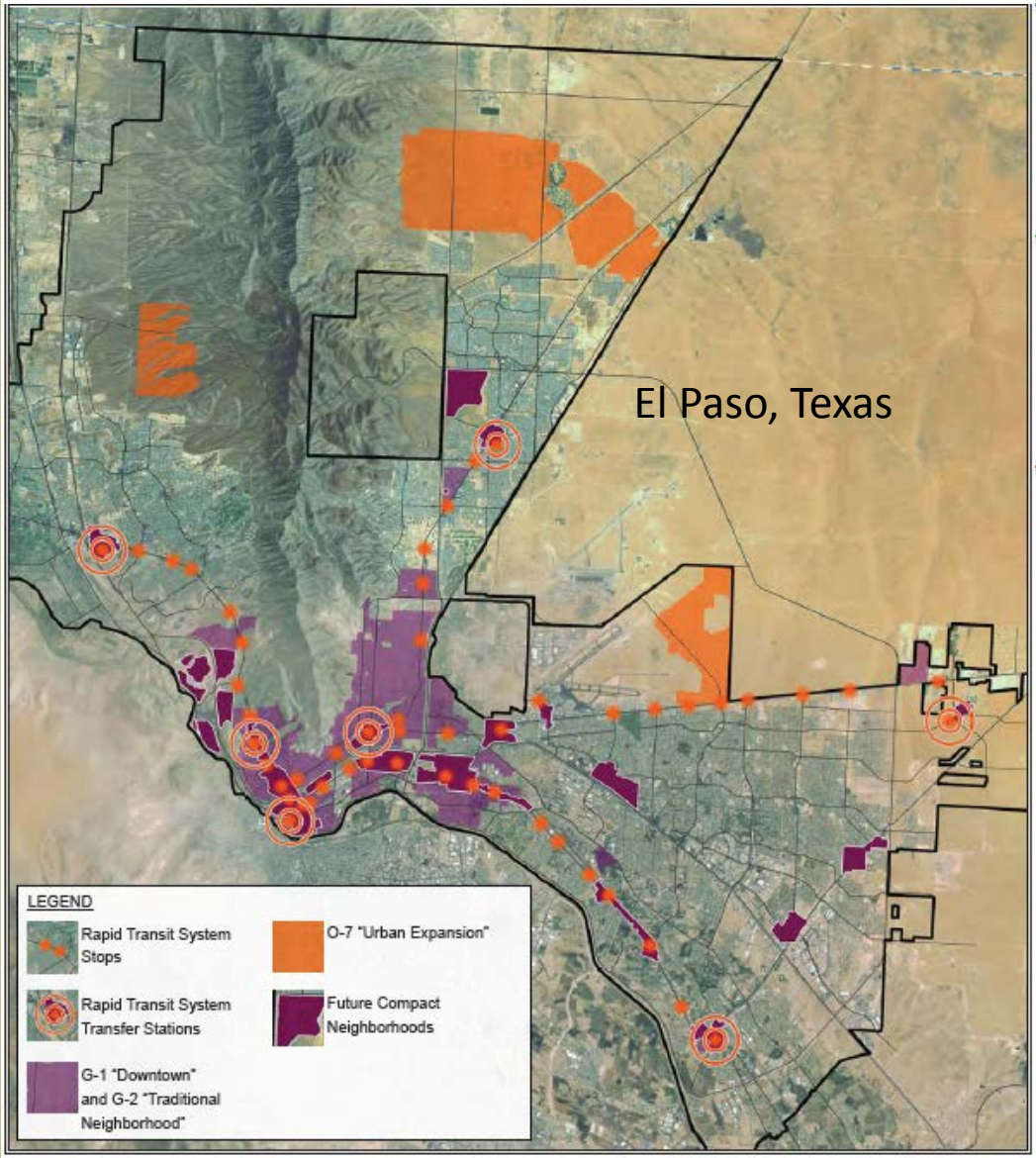
- Prioritize links to key destinations and maintain continuity
- Biking to buses is an important part of a multimodal trip
- Provide supporting facilities, including parking

Identify Priority Routes by Mode



Credit: ITE

Integrate Land Use



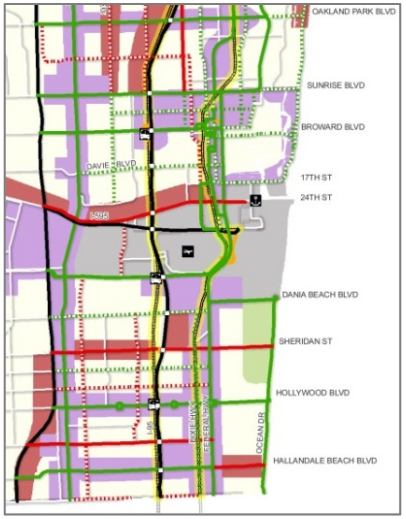
Define place types and general land use vision

Clarify what is to be considered "compact urban" versus suburban and rural

Locate mixed-use "town centers" along rapid transit lines

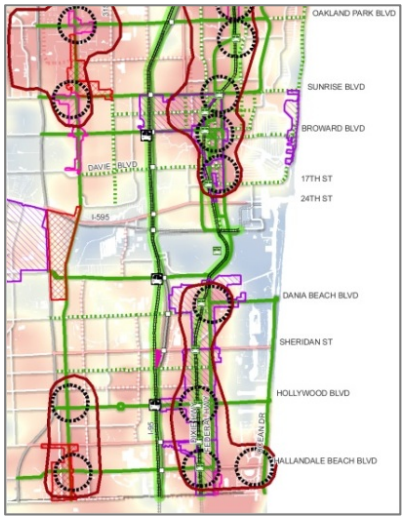
Integrate Land Use

- Include a map series relating the transportation and land use elements



Facility Types and Generalized Future Land Use Vision

Facility Types and Place Types



Aspirational Future Scenario

FacilityTypes
- SIS Road Corridor
- SIS Rail Corridor
- Primary Commerce
- Commerce
- Primary Multimodal
- Multimodal
- SIS Connectors

Generalized Future Land Use
- Residential
- Commercial
- Industrial
- Mixed
- Other

- Tri Rail
- Airport
- FEC Rail
- Seaport

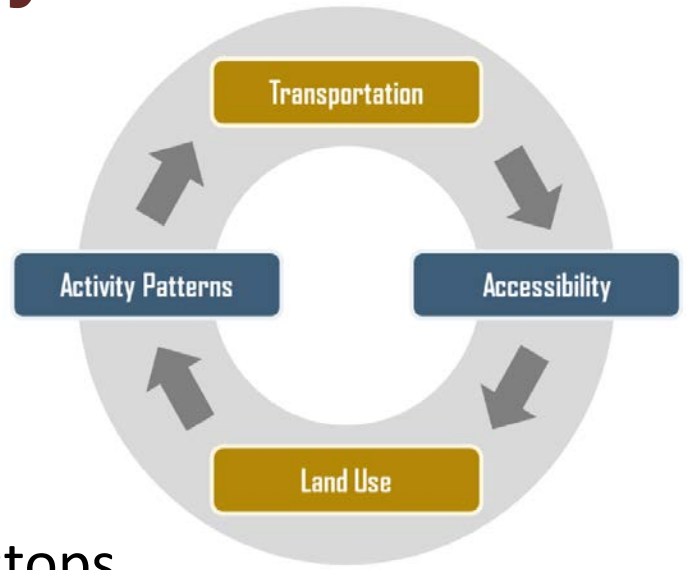
Place Types

Multimodal
- District
- Nodes

Freight/Goods
- District
- Center

- Multimodal Nodes
- Multimodal District
- LAC
- RAC
- TOD
- TransitOrientedCorridor

Land Use & Accessibility Best Practices



- Promote a mix of land uses in centers
- Focus major generators:
  - in urban cores
  - in district centers
  - near major public transportation stops
- Locate day-to-day facilities in local centers so they are accessible by walking and cycling
- Accommodate housing in existing urban areas
- Put retail and entertainment in the urban core first, then edge of core, then fringe

Enhance the Multimodal Environment

Urban-Advantage.com

Set Future Q/LOS Standards, Performance Measures, and Benchmarks

bicycle and pedestrian quality of service or performance standards

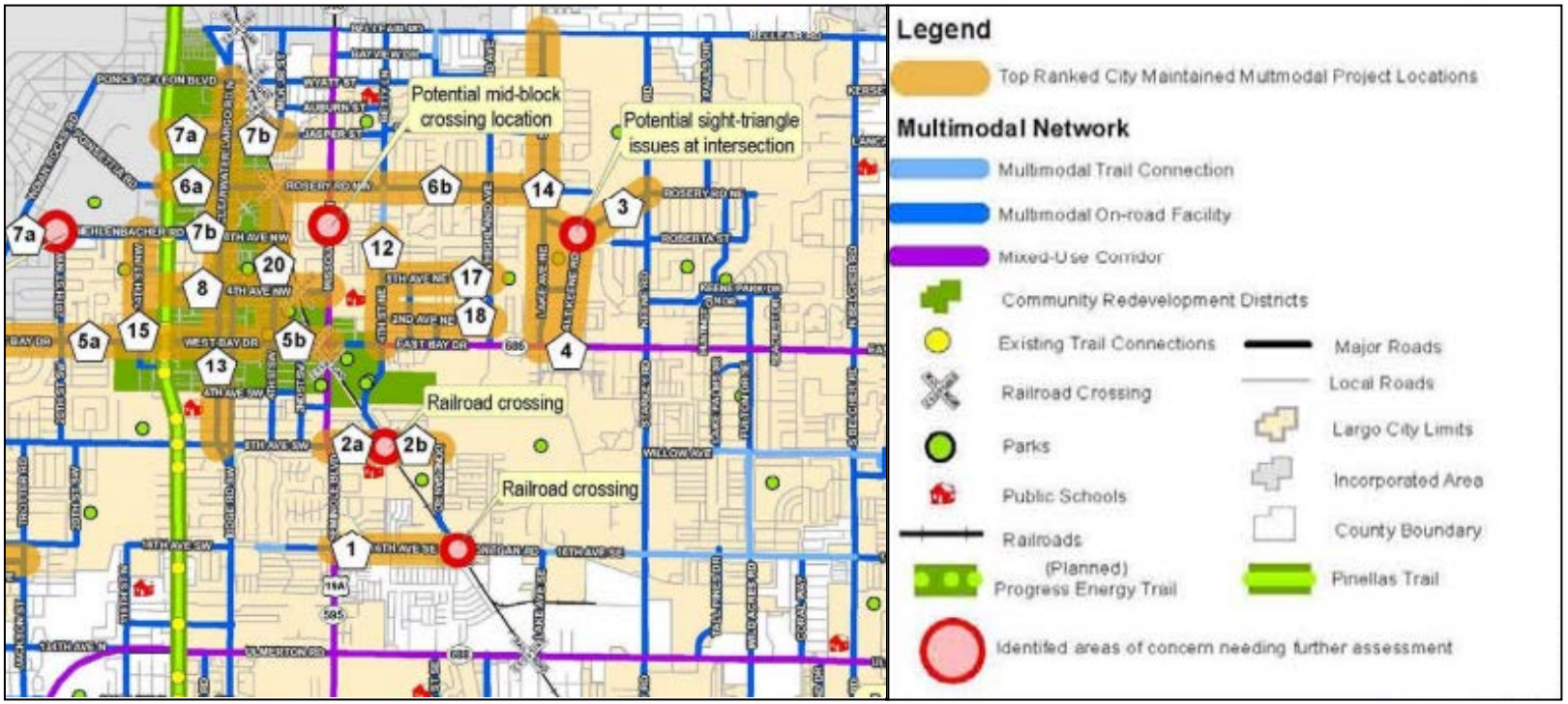
public transportation quality of service

roadway level of service

Prioritize Projects and Strategies

- Level of Service
- Pedestrian Needs
- Community Resource Connectivity
- Transit Connectivity
- Bicycle Needs
- Safety
- Public Support
- Supports Local Plans

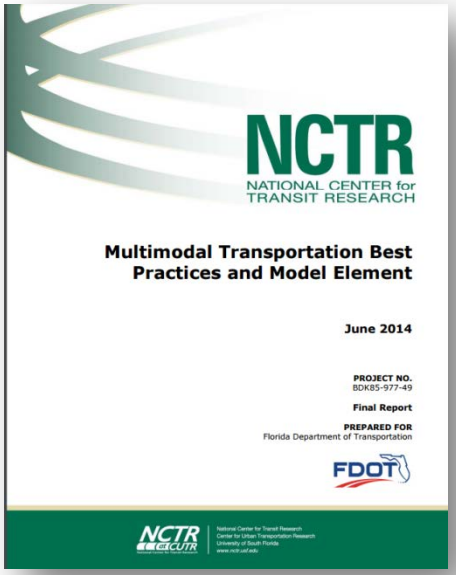
Identified Top Ranked City Projects

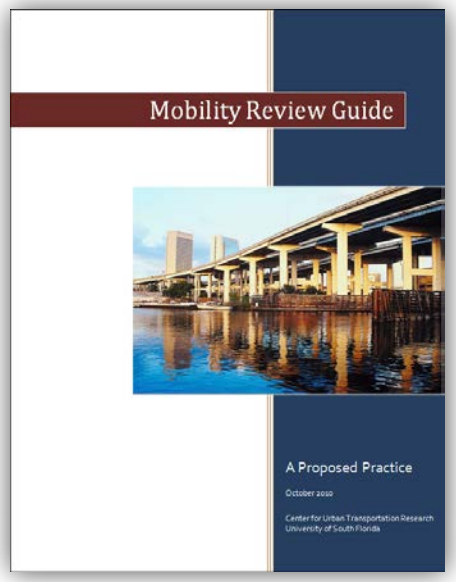


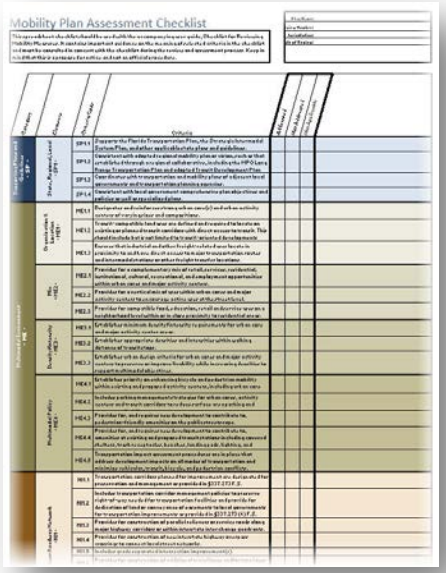
Source: City of Largo Multimodal Plan

For Further Information

- Multimodal Best Practices and Model Element:
  - http://www.nctr.usf.edu/wp-content/uploads/2015/08/77954.pdf
- Mobility Review Guide and Checklist:
  - http://www.dot.state.fl.us/planning/systems/programs/sm/mobility/default.shtm







Thank you!

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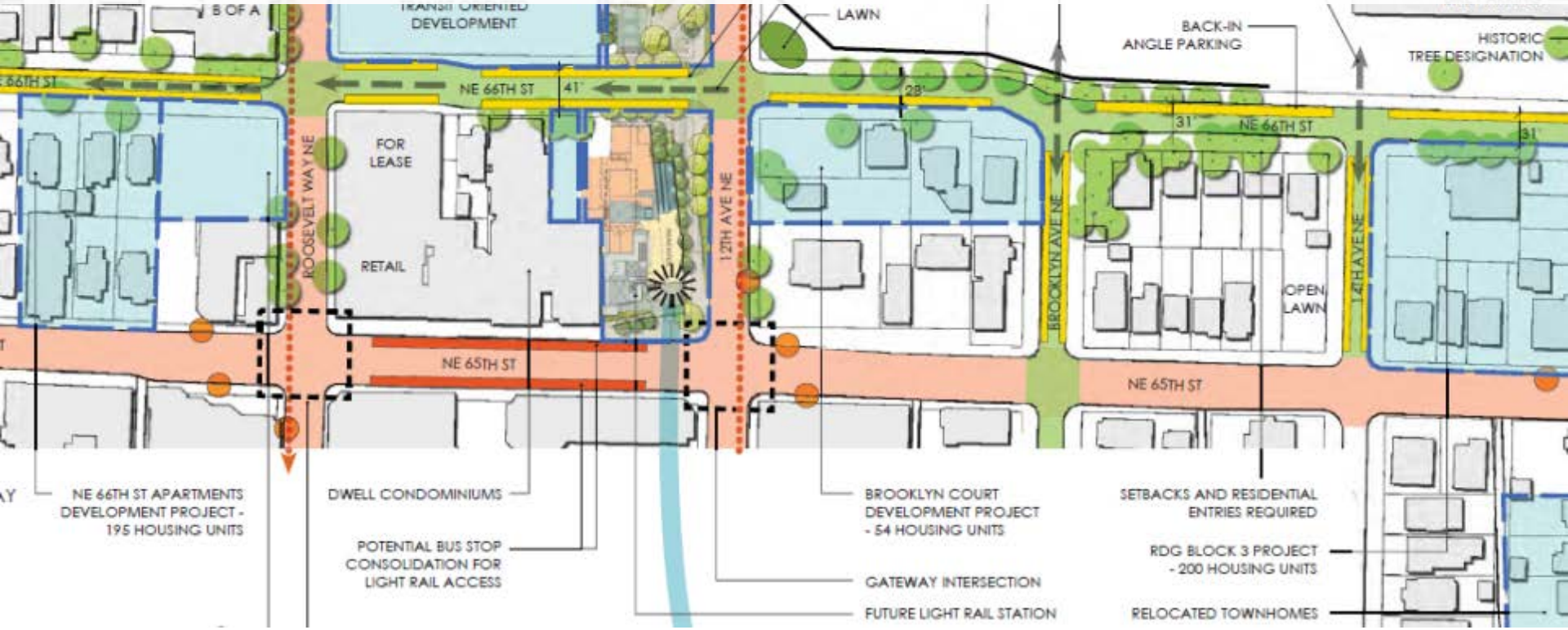
813-974-9807

Moving from Policy to Pavement

Institutionalizing Complete Streets



Transportation Research Board

Darby Watson

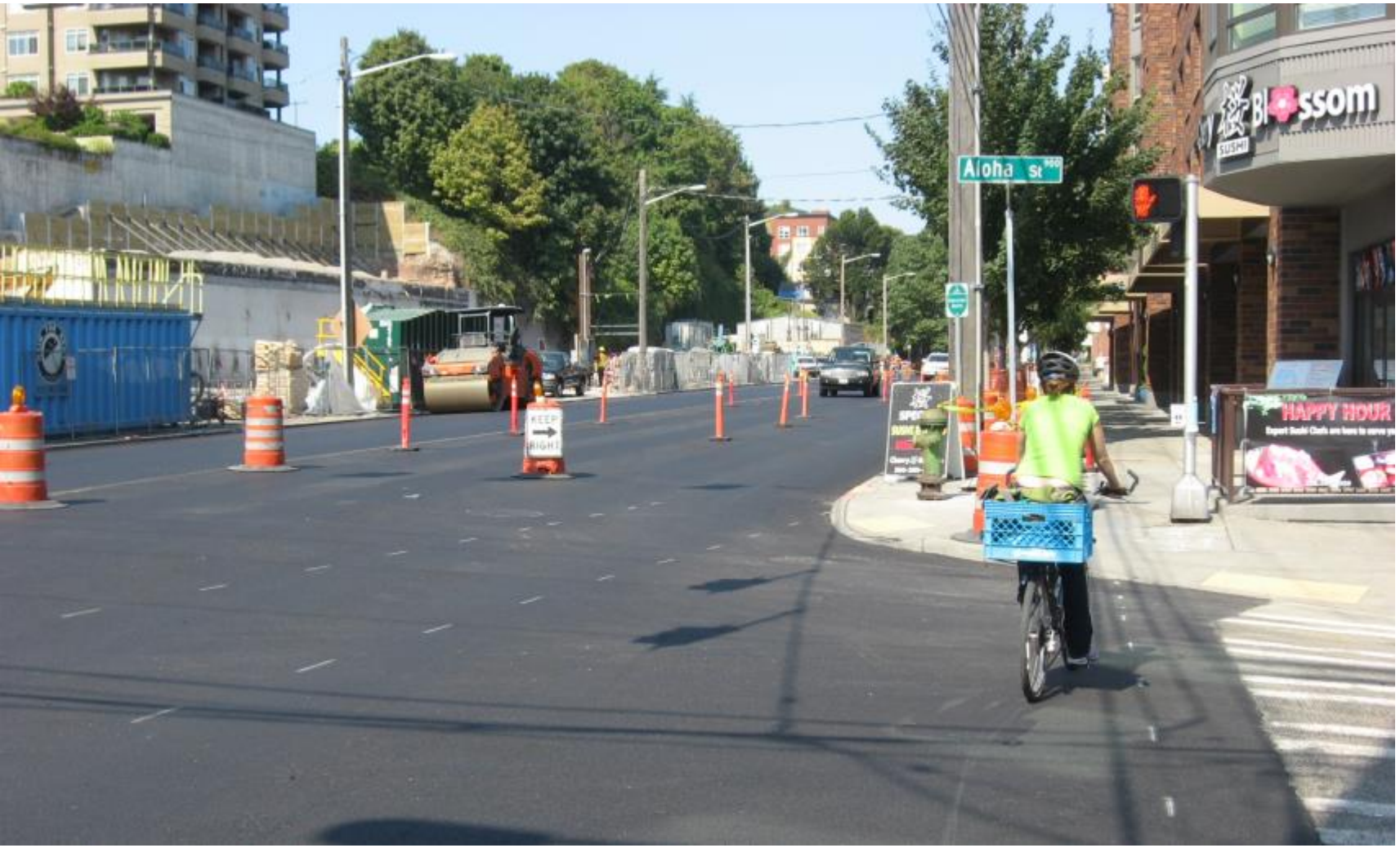
December 9, 2015

Policies are in place

Policies are in place -practices are not

Context is everything – and…

Think through construction



Review ALL data

Field work

Field work

Field work

Robust evaluation

Speed

Speed data was recorded between 6th Avenue W and 3rd Avenue W in June, 2007. Prior to the project, the 85th-percentile speeds in both directions exceeded the speed limit: 40.6 mph westbound and 44.0 mph eastbound. Approximately 90 percent of drivers exceeded the speed limit. Speed data was collected at the same location after rechannelization in February, 2011. The 85th percentile declined to 33.1 mph westbound and 33.3 eastbound. After rechannelization, the percent of speeders declined by two-thirds and the percent of drivers exceeding the speed limit by 10 or more miles per hour dropped by more than 90 percent.

85th Percentile Speed between 3rd Avenue W and 6th Avenue W

Speed in miles per hour

	Before	After	Change
Westbound	40.6	33.1	-18%
Eastbound	44.0	33.3	-24%

Speeders

Percent driving over the speed limit

	Before	After	Change
Westbound	88%	32%	-64%
Eastbound	91%	34%	-63%

Top End Speeders

Percent 10+ mph over the speed limit

	Before	After	Change
Westbound	17%	1.4%	-92%
Eastbound	38%	1.5%	-96%

Great plans and policies are flexible

Challenges: internal resistance

Challenges: legacy silos

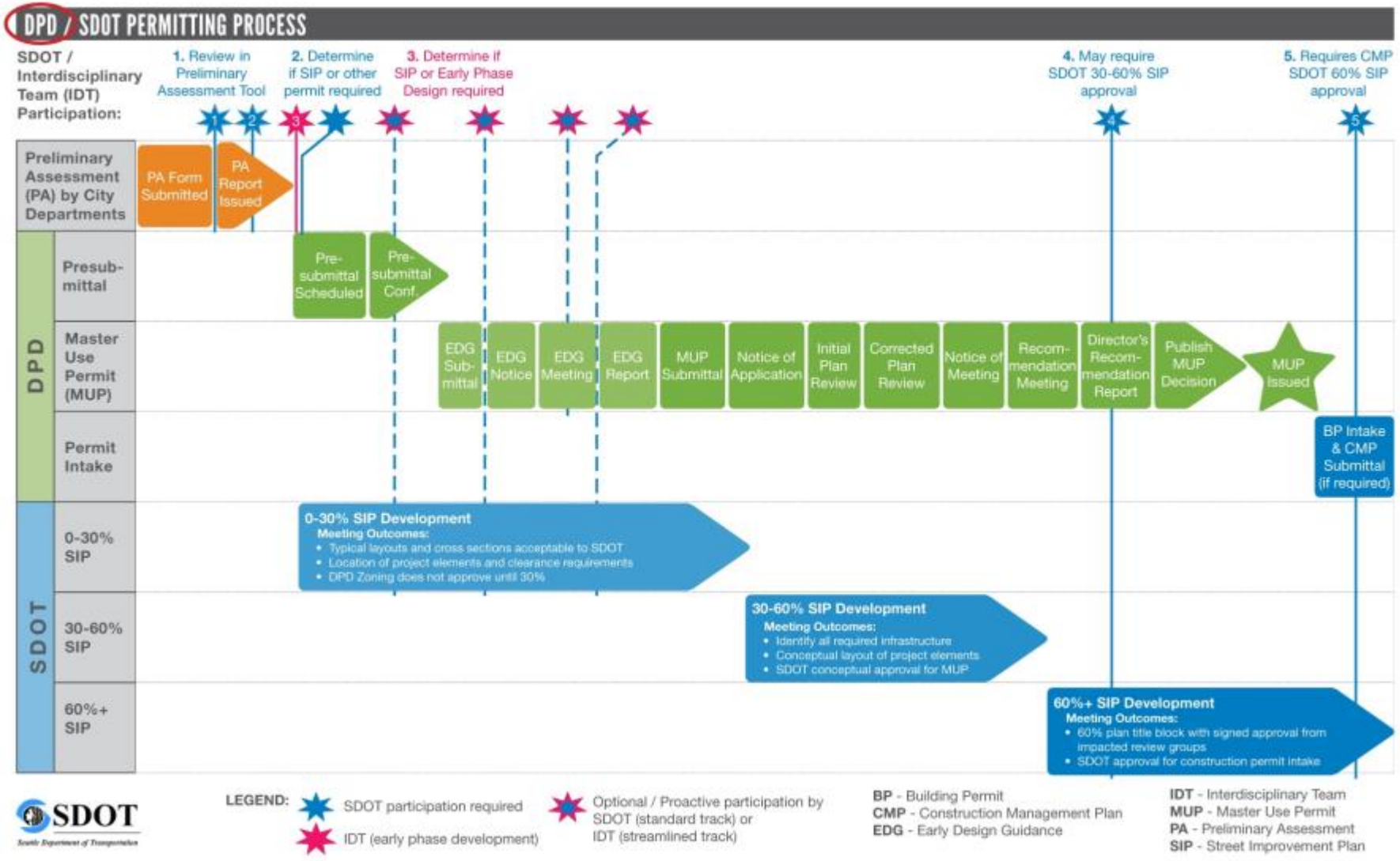
Challenges: legacy silos

Capital Program Descriptions

The CIP is comprised of 16 Capital Programs as listed in the table below. These programs are designed to ensure investments in line with the agency's strategic goals and priorities.

CAPITAL PROGRAM	DESCRIPTION
Accessibility	Plan, design and construct improvements to improve the accessibility of the transportation system in San Francisco
Bicycle	Plan, design and construct bicycle facilities including bike lanes and parking, bike sharing, bike boulevards and cycletracks
Central Subway	Plan, design, engineer and construct the Muni Metro T Third line Phase II extension to Chinatown
Communications/IT Infrastructure	Plan, design and implement technology infrastructure to improve efficiency and effectiveness and provide a better customer experience
Facility	Acquire, develop and/or rehabilitate transit station areas and maintenance facilities used for transit, traffic, and parking operations
Fleet	Purchase buses, trains and support vehicles for transit and sustainable street needs
Parking	Plan, design, rehabilitate and construct public parking facilities or street infrastructure related to public parking
Pedestrian	Plan, design, and construct street redesign projects to improve the safety of the pedestrian environment
Safety	Plan, design, and implement infrastructure improvements to maintain and enhance the safety of SFMTA daily operations and workplace safety
School	Plan, design, and engineer improvements to streets in school zones to enable safe travel to school for children who walk, bike and take transit
Security	Plan, design, construct and/or implement systems to improve the security of the transportation system
Taxi	Plan, design, construct and implement improvements to the taxi system that provide a better customer experience
Traffic Calming	Plan, design, and construct street redesign projects to address traffic problems and improve safety for all customers
Traffic / Signals	Plan, design, engineer and construct infrastructure and traffic signals to decrease transit travel time and improve mobility and safety of San Francisco roadways
Transit Fixed Guideways	Plan, design, and construct transit improvements to rail track, overhead wires and train control technology

Process focused



Questions?

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www.seattle.gov/transportation



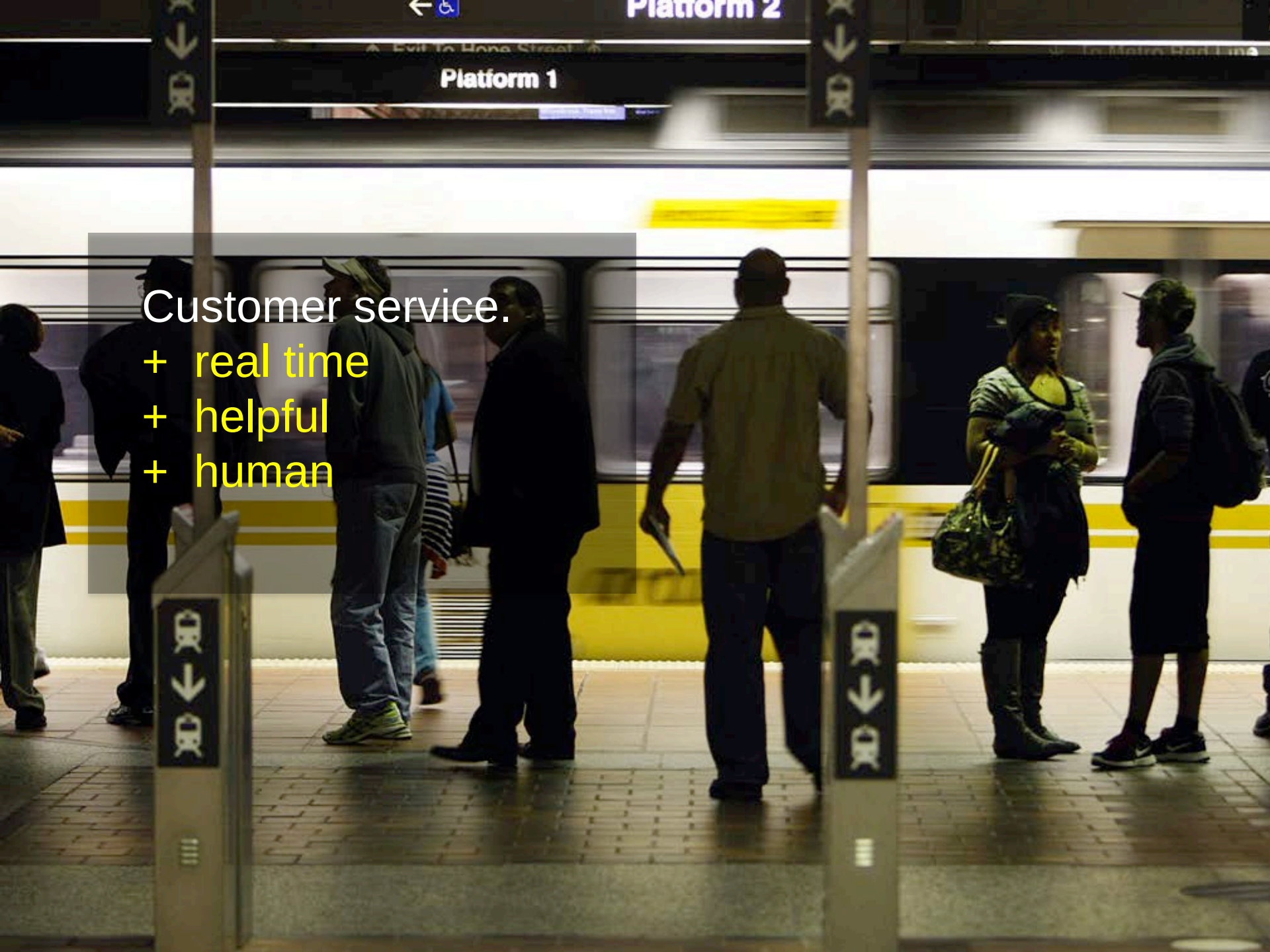


THE ROLL OF SOCIAL MEDIA
IN LARGE SCALE
MULTI-MODAL SYSTEMS


Social media is about…
+ experiences
+ access
+ personalization
+ a means to an end
+ data
+ segmentation


Metro and social.
+ ridership
+ customer service
+ resource advocacy


Ridership
+ accessible
+ behavior
+ authenticity



Customer service.
+ real time
+ helpful
+ human

Resource advocacy.

+ scale
+ transparency
+ impact

Challenges.

+ digital capacity
+ customer diversity
+ demo changes
+ tech evolution
+ always on

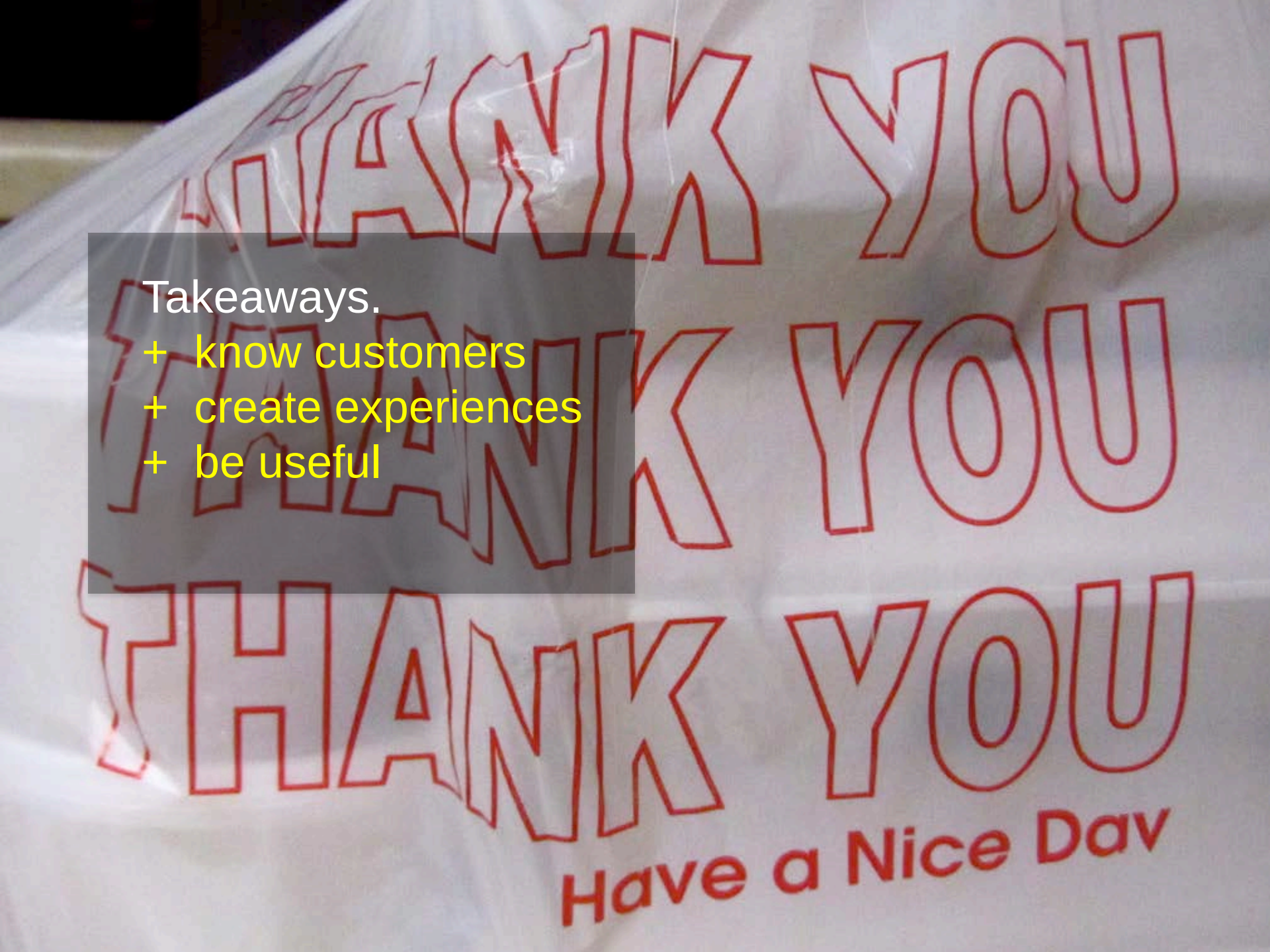
CUSTOMERS HAVE DIFFERENT LOCATIONS, DESTINATIONS, MODES, TIME CONSTRAINTS & OPTIONS.

Metro social now.

+ customized
+ targeted
+ collaborative
+ interest-driven


EXPERIENCE MAPS ARE
INTEREST BASED, MULTI-MODAL,
SHAREABLE & CUSTOMIZABLE.


Metro social then.
+ platform neutral
+ personalized
+ real-time incentives



Takeaways.

+ know customers
+ create experiences
+ be useful

Remix

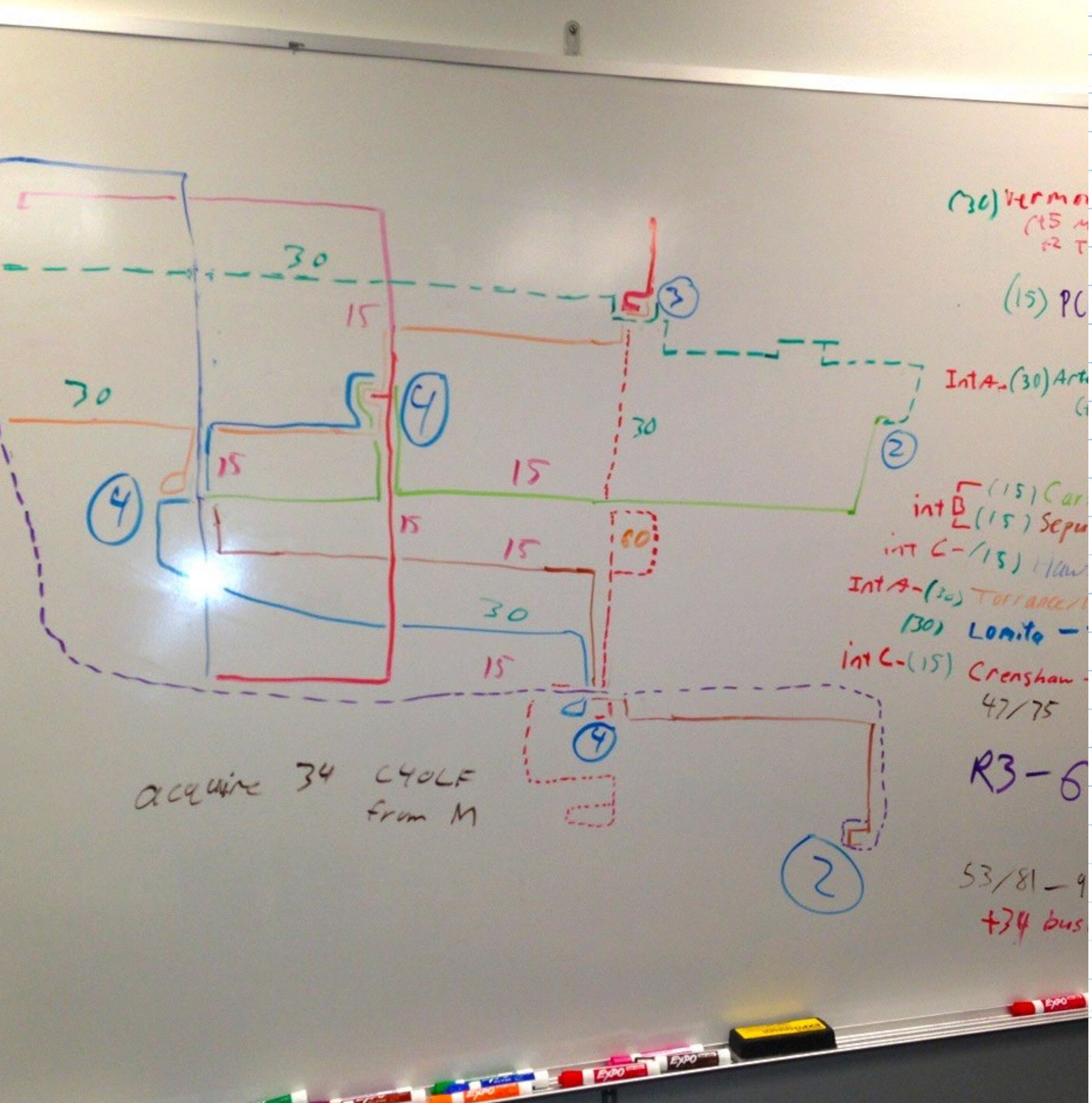
Infusing technology into transit planning

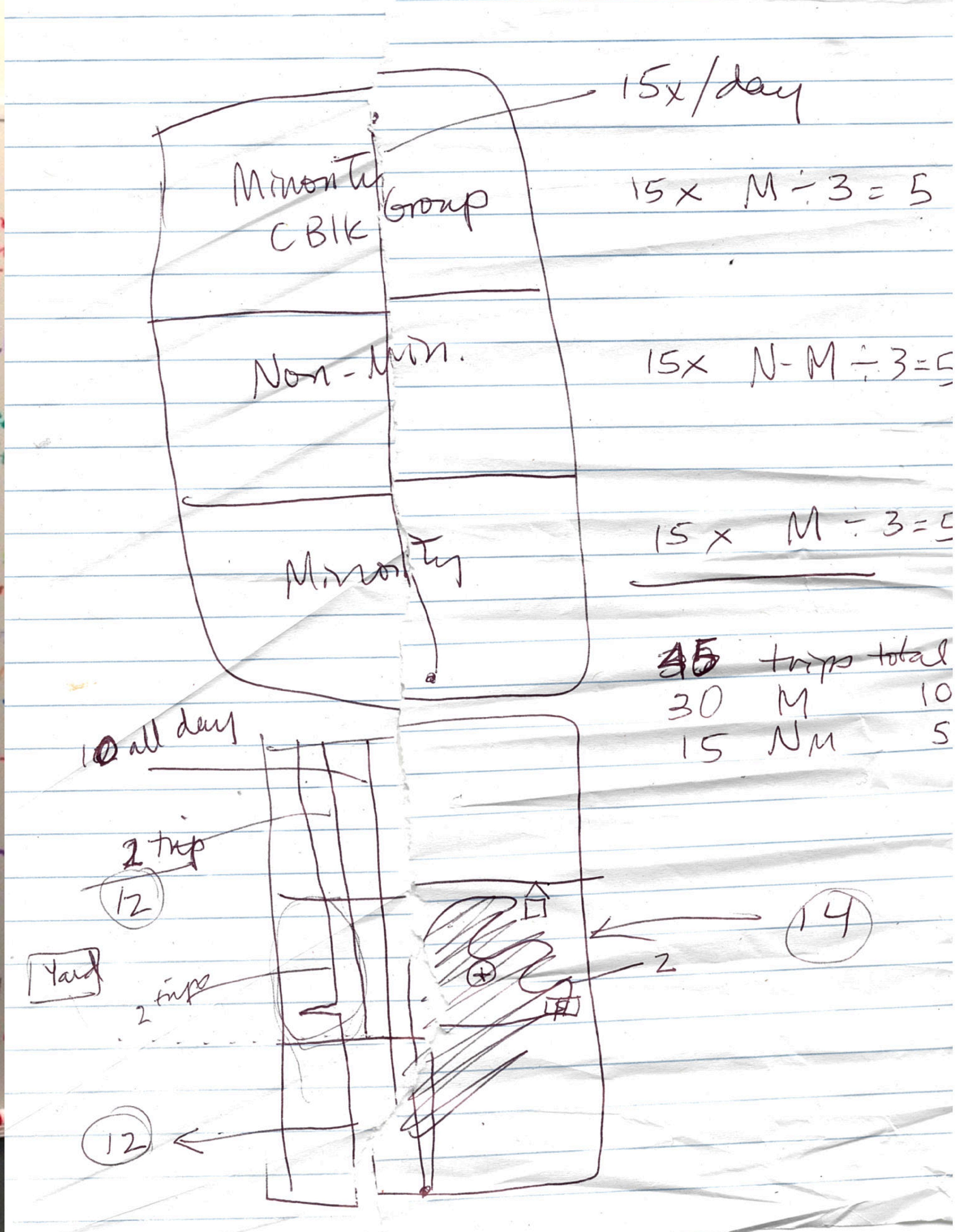
PAUL SUPAWANICH, Remix
paul@getremix.com
getremix.com
@remixcities

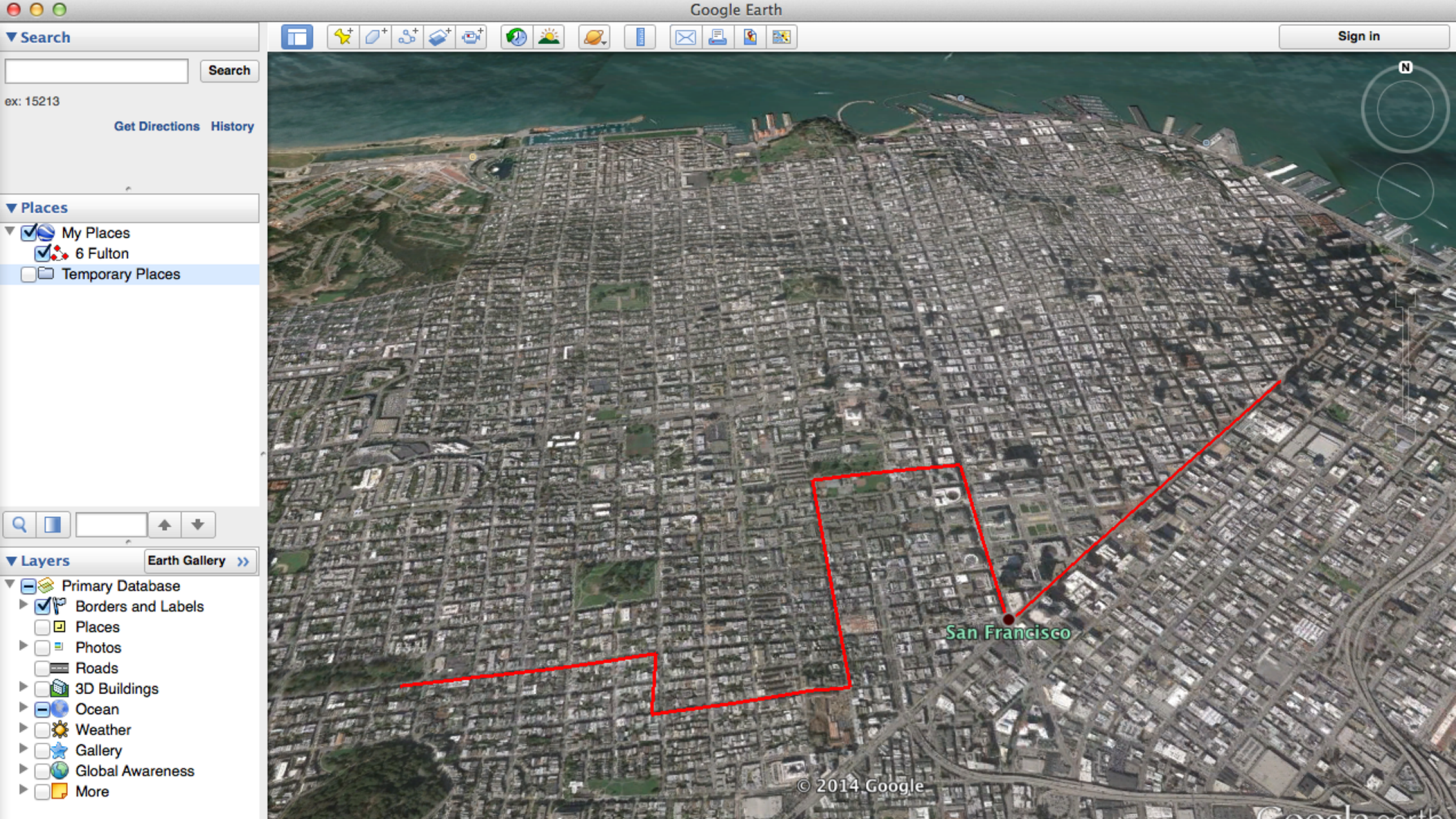
Outline

1. Transit planning today
2. Designing a better way
3. Demonstration
4. Case studies

THE PLANNING PROCESS TODAY


30
15
60
(30) Vermo
(15) PC
Int A-(30) Art
int B (15) Car
(15) Sepu
int C-(15) Haw
Int A-(30) Torrance/
(30) Lomita
int C-(15) Crenshaw
47/75
R3-6
53/81
+34 bus
acquire 34 C40LF
from M


15x/day
Minority Group
CBlk
Non-Min.
Minority
15x M ÷ 3 = 5
15x N-M ÷ 3 = 5
15x M ÷ 3 = 5
45 trips total
30 M 10
15 NM 5
10 all day
2 trip
12
Yard
2 trips
14
2
12


Google Earth
Search
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ex: 15213
Get Directions
History
Places
My Places
6 Fulton
Temporary Places
Layers
Earth Gallery
Primary Database
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
Sign in
N
San Francisco
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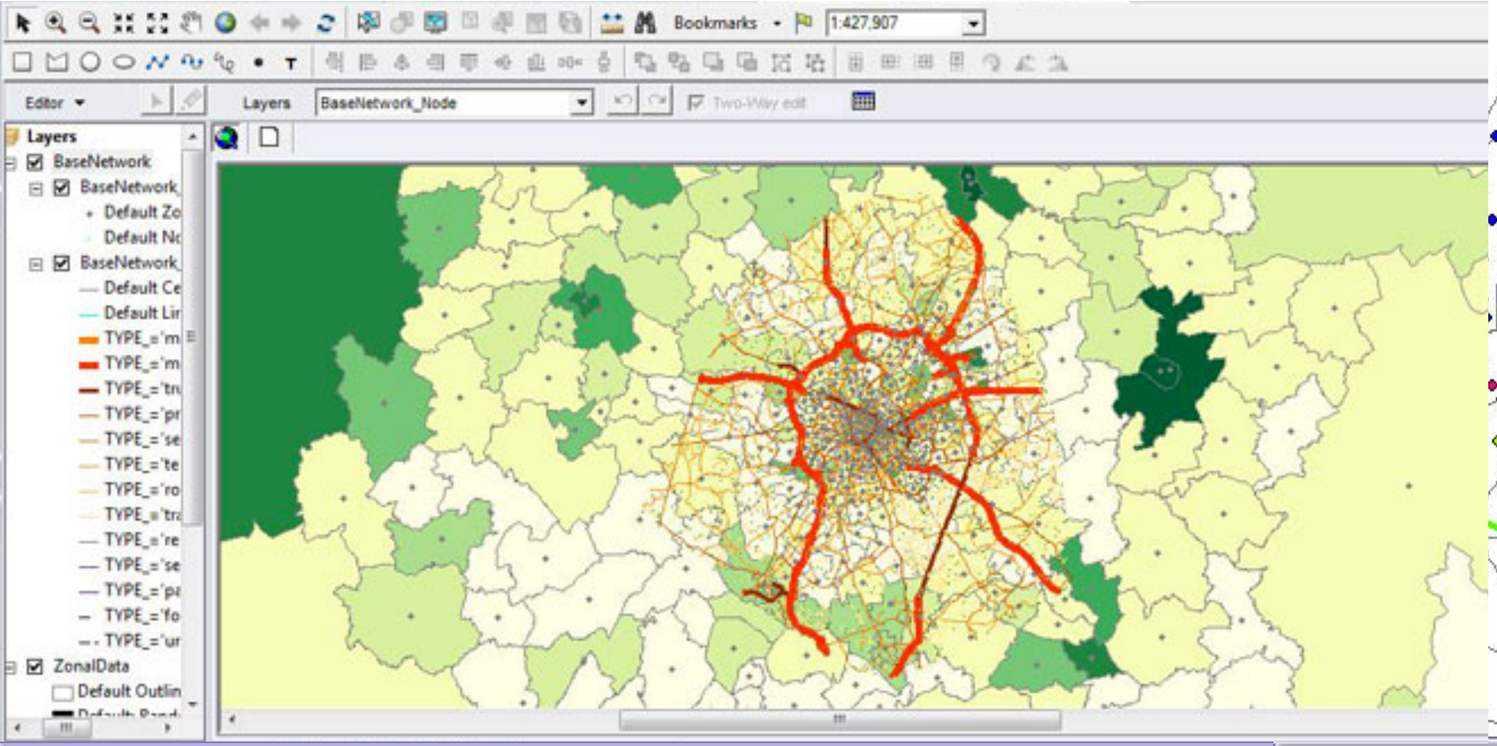

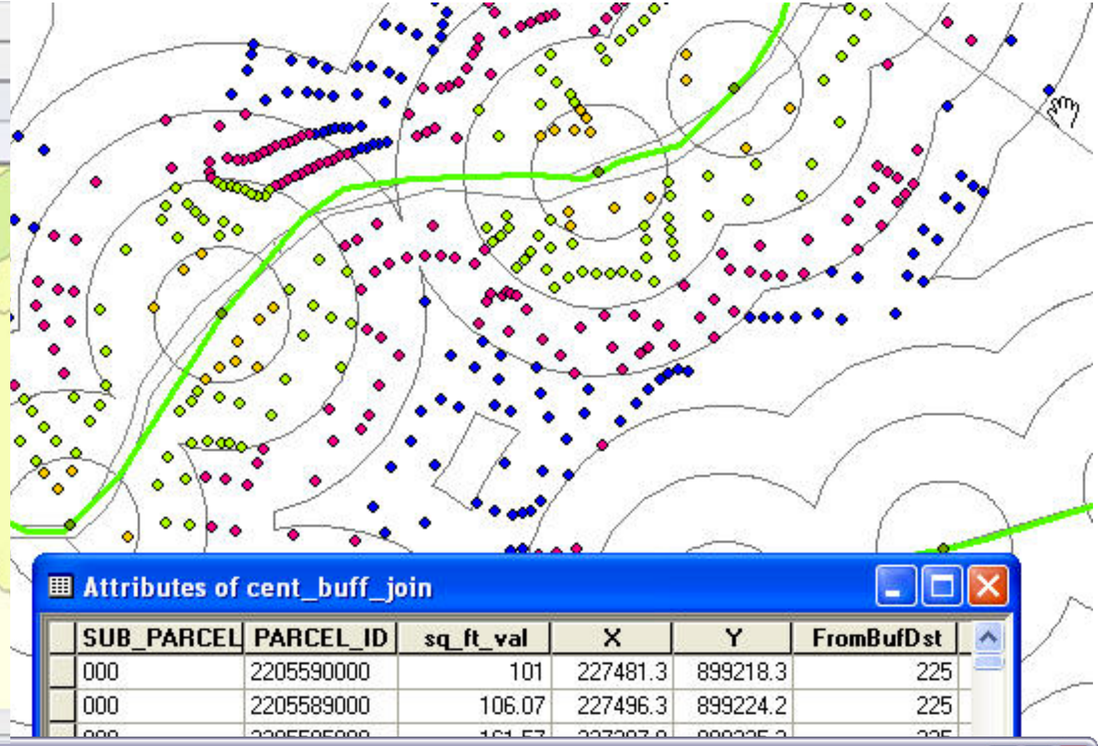

Attributes of cent_buff_join

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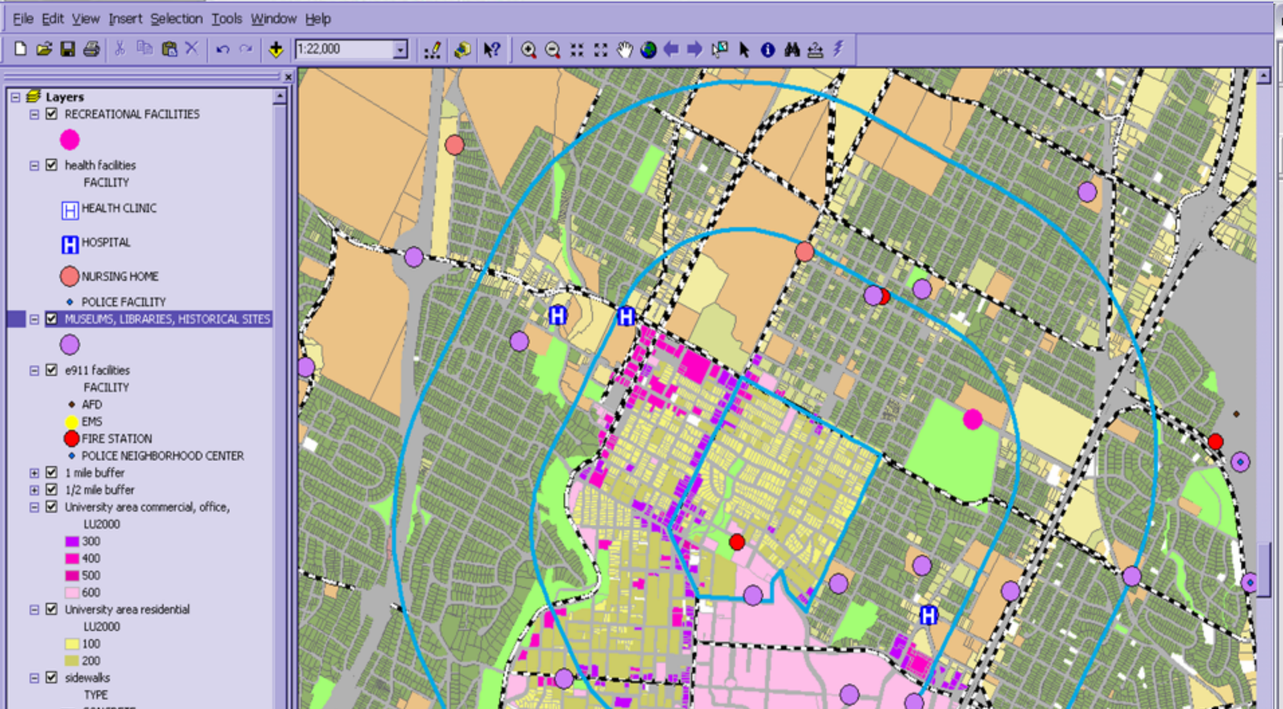
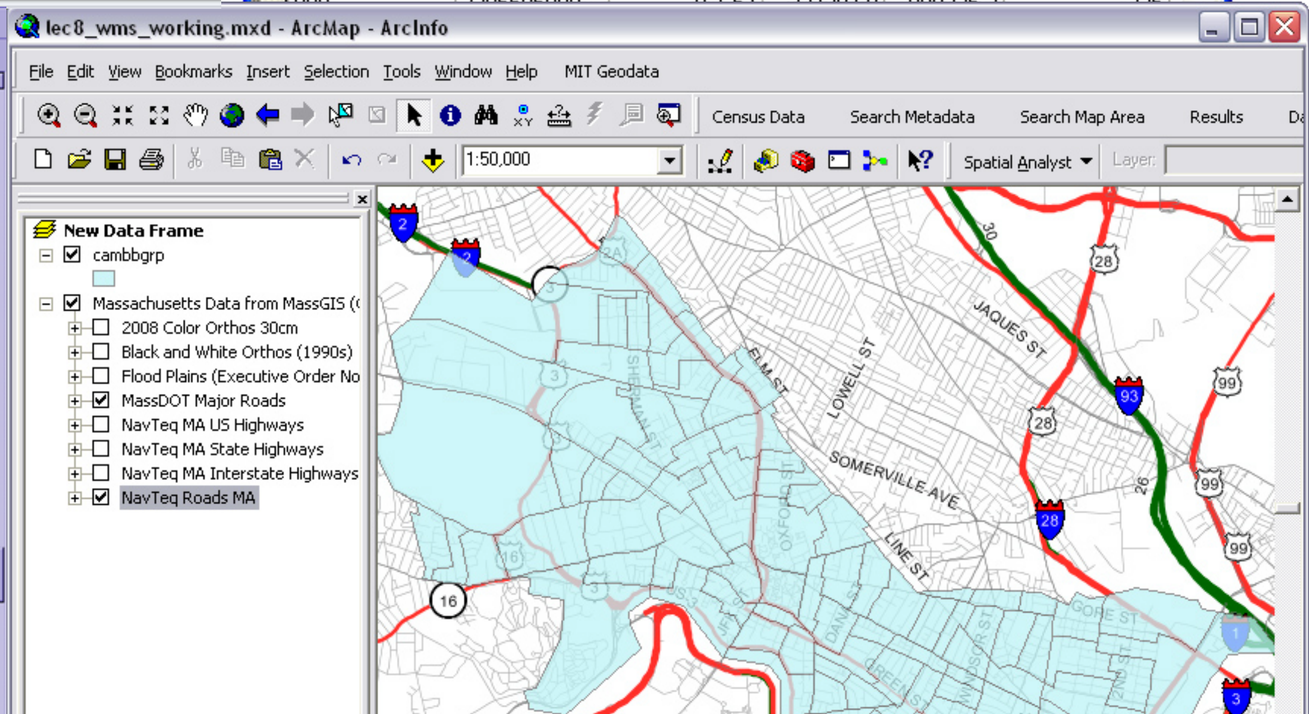




v2.3.1a (Mar 2013)

THIS SCENARIO: **Fleet Plan 2040 V6 Baseline model: Rev Aug 2013 (WEEKDAY)**

BASE DATA: Fleet Plan 2020 V6 Baseline model: Rev Aug 2013 (WEEKDAY)

Route	Vehicle Type		Weekday One-Way Trips		Differential	Weekday Vehicle Miles		Differential	Weekday Service Hours		Differential
	Proposed	Base Data	Proposed	Base Data		Proposed	Base Data		Proposed	Base Data	
1	T Std	T Std	370	370	0	2,081	2,081	0	316	316	0
1 Short	T Std	T Std	112	112	0	314	314	0	61	61	0
1AX	M Std	M Std	48	48	0	279	279	0	32	32	0
1BX	M Artic	M Artic	54	54	0	213	213	0	30	30	0
2	T Std	M Std	144	132	12	748	686	62	123	113	10
2 Short	T Std	T Std	168	136	32	503	407	96	94	77	17
3		0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0
5 Short	T Artic	T Artic	188	179	9	919	877	42	127	121	6
5, 5L	T Artic	T Artic	278	259	19	2,082	1,943	139	243	225	18
6	T Std	T Std	182	180	2	1,318	1,303	14	209	207	2
8X, 8BX	M Artic	M Artic	271	261	10	2,786	2,683	103	303	293	10
8AX	M Artic	M Artic	83	80	3	0	0	0	60	58	3
9	M Std	M Std	188	188	0	1,688	1,688	0	206	206	0
9L	M Std	M Std	158	173	(15)	1,150	1,262	(112)	141	154	(13)
10	M Std	M Std	243	182	61	1,852	1,387	465	257	194	63
10 Short	M Std	M Std	60	50	10	101	84	17	22	20	2
11	M Std	M Std	164	178	(14)	739	802	(63)	134	141	(7)
12	M Std	M Std	0	0	0	0	0	0	0	0	0
14	M Artic	M Artic	274	267	8	2,282	2,220	63	312	304	8
14 Short	M Artic	M Artic	0	0	0	0	0	0	0	0	0
14L	T Artic	T Artic	225	211	14	1,749	1,639	110	217	205	12
14X	M Artic	M Artic	70	60	10	621	536	85	49	44	5
16X	M Std	M Std	48	48	0	352	352	0	38	38	0
17	M Std	M Std	124	114	10	1,073	986	87	85	77	8
18	M Std	M Std	110	110	0	823	823	0	75	75	0
19	M Std	M Std	142	142	0	669	669	0	112	112	0
			0	0	0	0	0	0	0	0	0
21	T Std	T Std	265	209	56	1,173	925	248	197	156	41
22	T Std	T Std	228	196	32	1,267	1,089	178	211	183	28
22 Short	T Artic		142			533			99		
23	M Std	M Std	132	116	16	1,094	962	133	107	96	11

CHALLENGES

v2.3.1a (Mar 2013)

THIS SCENARIO: **Fleet Plan 2040 V6 Baseline model: Rev Aug 2013 (WEEKDAY)**

BASE DATA: Fleet Plan 2020 V6 Baseline model: Rev Aug 2013 (WEEKDAY)

Vehicle Type			Weekday One-Way Trips			Weekday Vehicle Miles			Weekday Service Hours		
			Proposed	Base Data	Differential	Proposed	Base Data	Differential	Proposed	Base Data	Differential
1	T Std	T Std	370	370	0	2,081	2,081	0	316	316	0
1 Short	T Std	T Std	112	112	0	314	314	0	61	61	0
1AX	M Std	M Std	48	48	0	279	279	0	32	32	0
1BX	M Artic	M Artic	54	54	0	213	213	0	30	30	0
2	T Std	M Std	144	132	12	748	686	62	123	113	10
2 Short	T Std	T Std	168	136	32	503	407	96	94	77	17
3		0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0
5 Short	T Artic	T Artic	188	179	9	919	877	42	127	121	6
5, 5L	T Artic	T Artic	278	259	19	2,082	1,943	139	243	225	18
6	T Std	T Std	182	180	2	1,318	1,303	14	209	207	2
8X, 8BX	M Artic	M Artic	271	261	10	2,786	2,683	103	303	293	10
8AX	M Artic	M Artic	83	80	3	0	0	0	60	58	3
9	M Std	M Std	188	188	0	1,688	1,688	0	206	206	0
9L	M Std	M Std	158	173	(15)	1,150	1,262	(112)	141	154	(13)
10	M Std	M Std	243	182	61	1,852	1,387	465	257	194	63
10 Short	M Std	M Std	60	50	10	101	84	17	22	20	2
11	M Std	M Std	164	178	(14)	739	802	(63)	134	141	(7)
12	M Std	M Std	0	0	0	0	0	0	0	0	0
14	M Artic	M Artic	274	267	8	2,282	2,220	63	312	304	8
14 Short	M Artic	M Artic	0	0	0	0	0	0	0	0	0
14L	T Artic	T Artic	225	211	14	1,749	1,639	110	217	205	12
14X	M Artic	M Artic	70	60	10	621	536	85	49	44	5
16X	M Std	M Std	48	48	0	352	352	0	38	38	0
17	M Std	M Std	124	114	10	1,073	986	87	85	77	8
18	M Std	M Std	110	110	0	823	823	0	75	75	0
19	M Std	M Std	142	142	0	669	669	0	112	112	0
			0	0	0	0	0	0	0	0	0
21	T Std	T Std	265	209	56	1,173	925	248	197	156	41
22	T Std	T Std	228	196	32	1,267	1,089	178	211	183	28
22 Short	T Artic		142			533			99		
23	M Std	M Std	132	116	16	1,094	962	133	107	96	11

Read Me | User Notes | Summary | Trips, Miles, Hours | Headways | Vehicles | 1 | 1 Short | 1AX | 1BX | 2 | 2 Short | 3 | 5 | 5, 5L

CHALLENGES

1. Discourages exploration

v2.3.1a (Mar 2013)

THIS SCENARIO: **Fleet Plan 2040 V6 Baseline model: Rev Aug 2013 (WEEKDAY)**

BASE DATA: Fleet Plan 2020 V6 Baseline model: Rev Aug 2013 (WEEKDAY)

Vehicle Type			Weekday One-Way Trips			Weekday Vehicle Miles			Weekday Service Hours		
			Proposed	Base Data	Differential	Proposed	Base Data	Differential	Proposed	Base Data	Differential
1	T Std	T Std	370	370	0	2,081	2,081	0	316	316	0
1 Short	T Std	T Std	112	112	0	314	314	0	61	61	0
1AX	M Std	M Std	48	48	0	279	279	0	32	32	0
1BX	M Artic	M Artic	54	54	0	213	213	0	30	30	0
2	T Std	M Std	144	132	12	748	686	62	123	113	10
2 Short	T Std	T Std	168	136	32	503	407	96	94	77	17
3		0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0
5 Short	T Artic	T Artic	188	179	9	919	877	42	127	121	6
5, 5L	T Artic	T Artic	278	259	19	2,082	1,943	139	243	225	18
6	T Std	M Std	217	203	14	1,317	1,303	14	209	207	2
8X, 8BX	M Artic	M Artic	271	261	10	2,786	2,683	103	303	293	10
8AX	M Artic	M Artic	83	80	3	0	0	0	60	58	3
9	M Std	M Std	188	188	0	1,688	1,688	0	206	206	0
9L	M Std	M Std	158	173	(15)	1,150	1,262	(112)	141	154	(13)
10	M Std	M Std	243	182	61	1,852	1,387	465	257	194	63
10 Short	M Std	M Std	60	50	10	101	84	17	22	20	2
11	M Std	M Std	164	178	(14)	739	802	(63)	134	141	(7)
12	M Std	M Std	0	0	0	0	0	0	0	0	0
14	M Artic	M Artic	274	267	8	2,282	2,220	63	312	304	8
14 Short	M Artic	M Artic	0	0	0	0	0	0	0	0	0
14L	T Artic	T Artic	225	211	14	1,749	1,639	110	217	205	12
14X	M Artic	M Artic	70	60	10	621	536	85	49	44	5
16X	M Std	M Std	48	48	0	352	352	0	38	38	0
17	M Std	M Std	124	114	10	1,073	986	87	85	77	8
18	M Std	M Std	110	110	0	823	823	0	75	75	0
19	M Std	M Std	142	142	0	669	669	0	112	112	0
			0	0	0	0	0	0	0	0	0
21	T Std	T Std	265	209	56	1,173	925	248	197	156	41
22	T Std	T Std	228	196	32	1,267	1,089	178	211	183	28
22 Short	T Artic		142			533			99		
23	M Std	M Std	132	116	16	1,094	962	133	107	96	11

Read Me | User Notes | Summary | Trips, Miles, Hours | Headways | Vehicles | 1 | 1 Short | 1AX | 1BX | 2 | 2 Short | 3 | 5 | 5, 5L

CHALLENGES

1. Discourages exploration
2. Hard to communicate trade-offs

v2.3.1a (Mar 2013)

THIS SCENARIO: **Fleet Plan 2040 V6 Baseline model: Rev Aug 2013 (WEEKDAY)**

BASE DATA: Fleet Plan 2020 V6 Baseline model: Rev Aug 2013 (WEEKDAY)

Vehicle Type			Weekday One-Way Trips			Weekday Vehicle Miles			Weekday Service Hours		
			Proposed	Base Data	Differential	Proposed	Base Data	Differential	Proposed	Base Data	Differential
1	T Std	T Std	370	370	0	2,081	2,081	0	316	316	0
1 Short	T Std	T Std	112	112	0	314	314	0	61	61	0
1AX	M Std	M Std	48	48	0	279	279	0	32	32	0
1BX	M Artic	M Artic	54	54	0	213	213	0	30	30	0
2	T Std	M Std	144	132	12	748	686	62	123	113	10
2 Short	T Std	T Std	168	136	32	503	407	96	94	77	17
3		0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0
5 Short	T Artic	T Artic	188	179	9	919	877	42	127	121	6
5, 5L	T Artic	T Artic	278	259	19	2,082	1,943	139	243	225	18
6	T Std	T Std	[illegible]	[illegible]	[illegible]	[illegible]	1,303	14	209	207	2
8X, 8BX	M Artic	M Artic	271	261	10	2,786	2,683	103	303	293	10
8AX	M Artic	M Artic	83	80	3	0	0	0	60	58	3
9	M Std	M Std	188	188	0	1,688	1,688	0	206	206	0
9L	M Std	M Std	158	173	(15)	1,150	1,262	(112)	141	154	(13)
10	M Std	M Std	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	257	194	63
10 Short	M Std	M Std	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22	20	2
11	M Std	M Std	164	178	(14)	739	802	(63)	134	141	(7)
12	M Std	M Std	0	0	0	0	0	0	0	0	0
14	M Artic	M Artic	274	267	8	2,282	2,220	63	312	304	8
14 Short	M Artic	M Artic	0	0	0	0	0	0	0	0	0
14L	T Artic	T Artic	225	211	14	1,749	1,639	110	217	205	12
14X	M Artic	M Artic	70	60	10	621	536	85	49	44	5
16X	M Std	M Std	48	48	0	352	352	0	38	38	0
17	M Std	M Std	124	114	10	1,073	986	87	85	77	8
18	M Std	M Std	110	110	0	823	823	0	75	75	0
19	M Std	M Std	142	142	0	669	669	0	112	112	0
			0	0	0	0	0	0	0	0	0
21	T Std	T Std	265	209	56	1,173	925	248	197	156	41
22	T Std	T Std	228	196	32	1,267	1,089	178	211	183	28
22 Short	T Artic		142			533			99		
23	M Std	M Std	132	116	16	1,094	962	133	107	96	11

Read Me | User Notes | Summary | Trips, Miles, Hours | Headways | Vehicles | 1 | 1 Short | 1AX | 1BX | 2 | 2 Short | 3 | 5 | 5, 5L

CHALLENGES

1. Discourages exploration
2. Hard to communicate trade-offs
3. Don’t know key info until it’s too late

v2.3.1a (Mar 2013)

THIS SCENARIO: Fleet Plan 2040 V6 Baseline model: Rev Aug 2013 (WEEKDAY)

BASE DATA: Fleet Plan 2020 V6 Baseline model: Rev Aug 2013 (WEEKDAY)

Vehicle Type			Weekday One-Way Trips			Weekday Vehicle Miles			Weekday Service Hours		
			Proposed	Base Data	Differential	Proposed	Base Data	Differential	Proposed	Base Data	Differential
1	T Std	T Std	370	370	0	2,081	2,081	0	316	316	0
1 Short	T Std	T Std	112	112	0	314	314	0	61	61	0
1AX	M Std	M Std	48	48	0	279	279	0	32	32	0
1BX	M Artic	M Artic	54	54	0	213	213	0	30	30	0
2	T Std	M Std	144	132	12	748	686	62	123	113	10
2 Short	T Std	T Std	168	136	32	503	407	96	94	77	17
3		0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0
5 Short	T Artic	T Artic	188	179	9	919	877	42	127	121	6
5, 5L	T Artic	T Artic	278	259	19	2,082	1,943	139	243	225	18
6	T Std	T Std	[illegible]	[illegible]	[illegible]	[illegible]	1,303	14	209	207	2
8X, 8BX	M Artic	M Artic	271	261	10	2,786	2,683	103	303	293	10
8AX	M Artic	M Artic	83	80	3	0	0	0	60	58	3
9	M Std	M Std	188	188	0	1,688	1,688	0	206	206	0
9L	M Std	M Std	158	173	(15)	1,150	1,262	(112)	141	154	(13)
10	M Std	M Std	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	257	194	63
10 Short	M Std	M Std	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22	20	2
11	M Std	M Std	164	178	(14)	739	802	(63)	134	141	(7)
12	M Std	M Std	0	0	0	0	0	0	0	0	0
14	M Artic	M Artic	274	267	[illegible]	2,282	2,220	63	[illegible]12	304	8
14 Short	M Artic	M Artic	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
14L	T Artic	T Artic	[illegible]25	[illegible]13	[illegible]4	[illegible]1,[illegible]46	[illegible]1,[illegible]36	[illegible]	[illegible]	205	12
14X	M Artic	M Artic	70	60	10	621	536	85	49	44	5
16X	M Std	M Std	48	48	0	352	352	0	38	38	0
17	M Std	M Std	124	114	10	1,073	986	87	85	77	8
18	M Std	M Std	110	110	0	823	823	0	75	75	0
19	M Std	M Std	142	142	0	669	669	0	112	112	0
			0	0	0	0	0	0	0	0	0
21	T Std	T Std	265	209	56	1,173	925	248	197	156	41
22	T Std	T Std	228	196	32	1,267	1,089	178	211	183	28
22 Short	T Artic		142			533			99		
23	M Std	M Std	132	116	16	1,094	962	133	107	96	11

Read Me | User Notes | Summary | Trips, Miles, Hours | Headways | Vehicles | 1 | 1 Short | 1AX | 1BX | 2 | 2 Short | 3 | 5 | 5, 5L

CHALLENGES

1. Discourages exploration
2. Hard to communicate trade-offs
3. Don’t know key info until it’s too late
4. Big picture of planning is lost in the details

Vehicle Type			Weekday One-Way Trips			Weekday Vehicle Miles			Weekday Service Hours		
			Proposed	Base Data	Differential	Proposed	Base Data	Differential	Proposed	Base Data	Differential
1	T Std	T Std	370	370	0	2,081	2,081	0	316	316	0
1 Short	T Std	T Std	112	112	0	314	314	0	61	61	0
1AX	M Std	M Std	48	48	0	279	279	0	32	32	0
1BX	M Artic	M Artic	54	54	0	213	213	0	30	30	0
2	T Std	M Std	144	132	12	748	686	62	123	113	10
2 Short	T Std	T Std	168	136	32	503	407	96	94	77	17
3		0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0
5 Short	T Artic	T Artic	188	179	9	919	877	42	127	121	6
5, 5L	T Artic	T Artic	278	259	19	2,082	1,943	139	243	225	18
6	T Std	T Std	[illegible]	[illegible]	[illegible]	[illegible]	1,303	14	209	207	2
8X, 8BX	M Artic	M Artic	271	261	10	2,786	2,683	103	303	293	10
8AX	M Artic	M Artic	83	80	3	0	0	0	60	58	3
9	M Std	M Std	188	188	0	1,688	1,688	0	206	206	0
9L	M Std	M Std	158	173	(15)	1,150	1,262	(112)	141	154	(13)
10	M Std	M Std	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	257	194	63
10 Short	M Std	M Std	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22	20	2
11	M Std	M Std	164	178	(14)	739	802	(63)	134	141	(7)
12	M Std	M Std	0	0	0	0	0	0	0	0	0
14	M Artic	M Artic	274	267	[illegible]	2,282	2,220	63	[illegible]12	304	8
14 Short	M Artic	M Artic	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
14L	T Artic	T Artic	[illegible]25	[illegible]2	[illegible]4	[illegible]	[illegible]1	[illegible]	[illegible]	205	12
14X	M Artic	M Artic	70	60	10	621	536	85	49	44	5
16X	M Std	M Std	48	48	0	352	352	0	38	38	0
17	M Std	M Std	124	114	10	1,073	[illegible]86	87	[illegible]85	[illegible]7	8
18	[illegible]	[illegible]	[illegible]10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	142	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]2	[illegible]
			0	0	0	0	0	0	0	0	0
21	T Std	T Std	265	209	56	1,173	925	248	197	156	41
22	T Std	T Std	228	196	32	1,267	1,089	178	211	183	28
22 Short	T Artic		142			533			99		
23	M Std	M Std	132	116	16	1,094	962	133	107	96	11

DESIGNING A BETTER WAY

06:30	07:00	12 min	63.0 min
07:00	08:00	8 min	67.0 min
08:00	08:30	4 min	71.3 min
08:30	11:00	8 min	72.9 min
11:00	14:30	12 min	75.4 min
14:30	15:30	10 min	74.9 min
15:30	19:30	8 min	75.0 min
19:30	22:00	20 min	66.9 min
22:00	25:00	30 min	59.5 min

Saturday

FROM	TO	EVERY	RUNTIME
05:45	09:00	20 min	58.9 min
09:00	18:30	15 min	68.2 min

8.24 miles & 20 buses

49,190 hours / yr

within .25 mi of stops

58,699 people

220,787 jobs

DESIGNING A BETTER WAY

1. Make it intuitive and attractive

Saturday			
FROM	TO	EVERY	RUNTIME
05:45	09:00	20 min	58.9 min
09:00	18:30	15 min	68.2 min
18:30	19:30	20 min	64.8 min
19:30	22:00	20 min	66.9 min
22:00	25:00	30 min	59.5 min
06:30	07:00	12 min	63.0 min
07:00	08:00	8 min	67.0 min
08:00	08:30	4 min	71.3 min
08:30	11:00	8 min	72.9 min
11:00	14:30	12 min	75.4 min
14:30	15:30	10 min	74.9 min
15:30	19:30	8 min	75.0 min

8.24 miles & 20 buses

49,190 hours / yr

within .25 mi of stops

58,699 people

220,787 jobs

DESIGNING A BETTER WAY

1. Make it intuitive and attractive
2. Leverage existing open data

06:30	07:00	12 min	63.0 min
07:00	08:00	8 min	67.0 min
08:00	08:30	4 min	71.3 min
08:30	11:00	8 min	72.9 min
11:00	14:30	12 min	75.4 min
14:30	15:30	10 min	74.9 min
15:30	19:30	8 min	75.0 min
19:30	22:00	20 min	66.9 min
22:00	25:00	30 min	59.5 min

Saturday

FROM	TO	EVERY	RUNTIME
05:45	09:00	20 min	58.9 min
09:00	18:30	15 min	68.2 min

8.24 miles & 20 buses

49,190 hours / yr

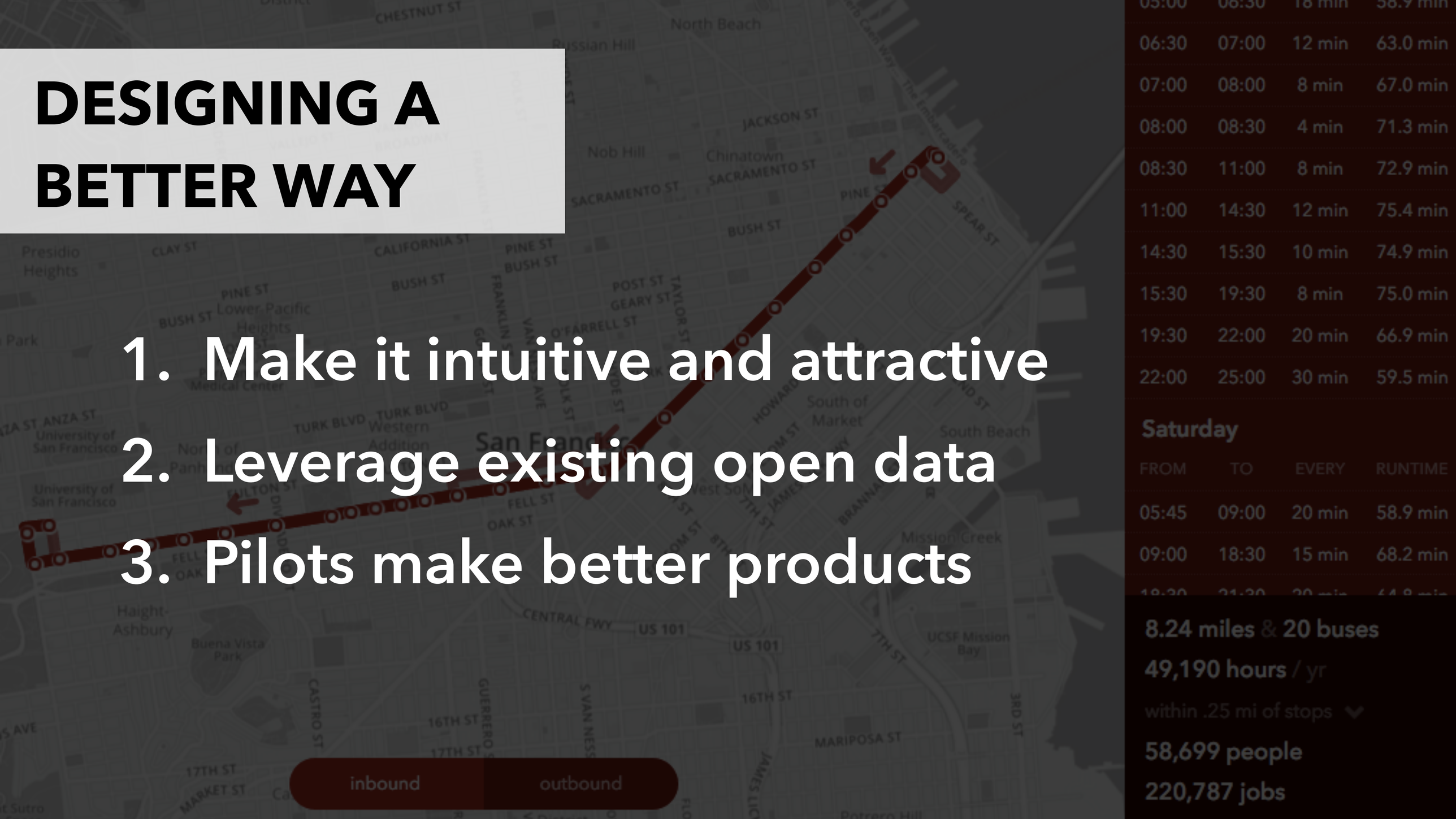
within .25 mi of stops

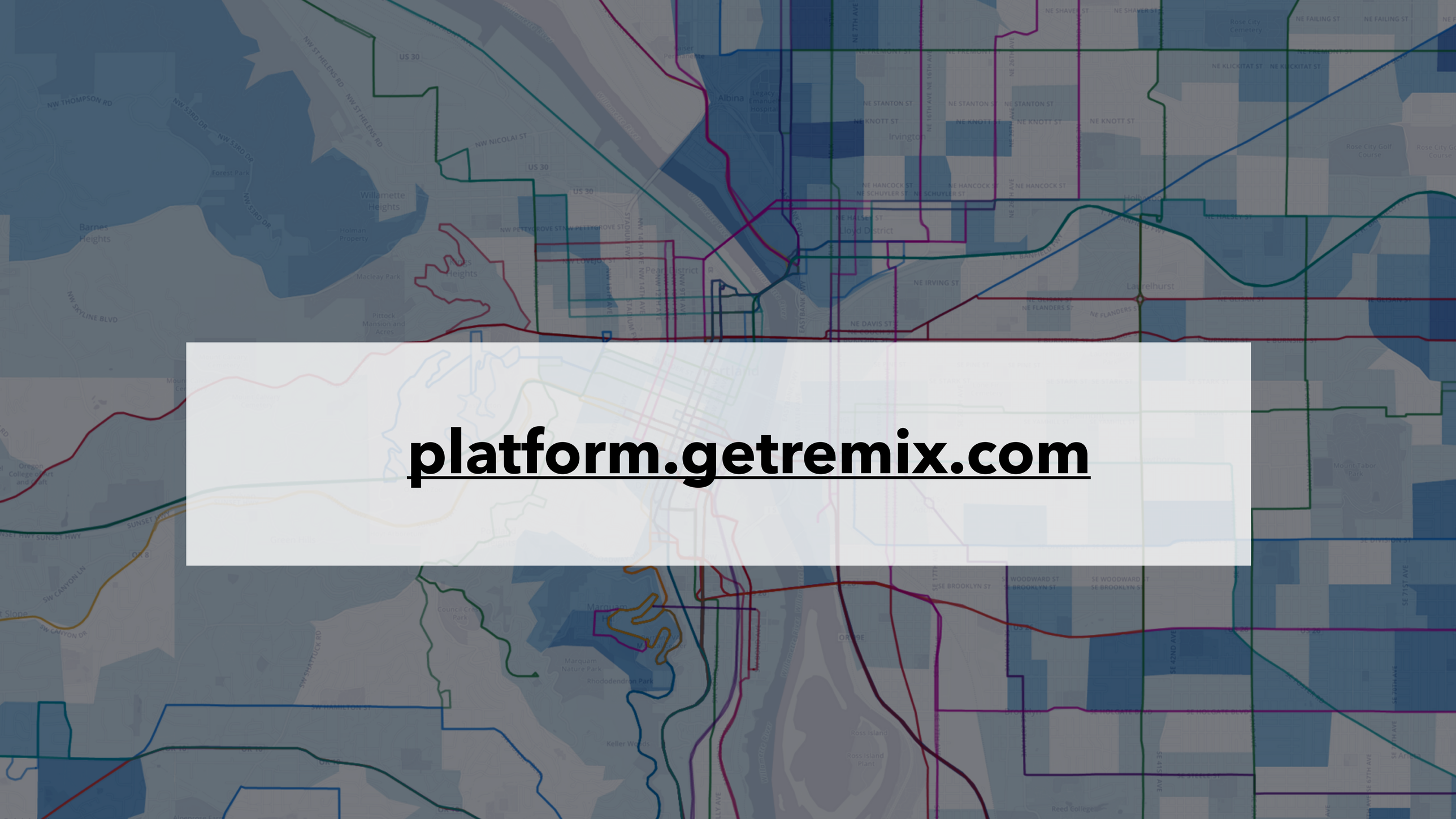
58,699 people

220,787 jobs

DESIGNING A BETTER WAY

1. Make it intuitive and attractive
2. Leverage existing open data
3. Pilots make better products




platform.getremix.com

TARC (Louisville, KY): Service Change Requests

Responding to numerous requests and what-ifs from management, stakeholders, and the community. With Remix, planning team now spends 20% of the time than it used to take.

Foothill Transit: Making the business case for BRT

Testing routes for the future LA Metro Gold Line Extension, investigating BRT corridors

USE CASE: REGIONAL CAPACITY-BUILDING

Oregon DOT: Technical assistance for better planning

State is supporting all Oregon agencies to improve planning, what-if scenarios, regional collaboration

Remix

Infusing technology into transit planning

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