


URS

Princeton Transit Study

Progress and Preliminary Findings

Public Meeting

Carl Fields Center, Princeton University

Saturday, November 9, 2013 9:00 AM to 12:30 PM

Presentation Outline

Princeton Transit Study - Presentation Outline

- Introduction
- Project's Goals
- Previous study work
- Who uses public transportation in Princeton?
- What specific problem are we focusing on?
- What transit alternatives were examined?
- What works best?
  - Bus Rapid Transit or Enhanced Bus options
  - Light Rail options
  - Streetcar options
- Next Steps
- What do you think?

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Project Goals

Project Goals

1. Improve Transit Mobility, Connectivity, and Accessibility
2. Provide Cost Effective and Efficient Transportation Services
3. Encourage Sustainable Economic Development
4. Maintain/Enhance Livability and Quality of life

1. Improve Transit Mobility, Connectivity and Accessibility

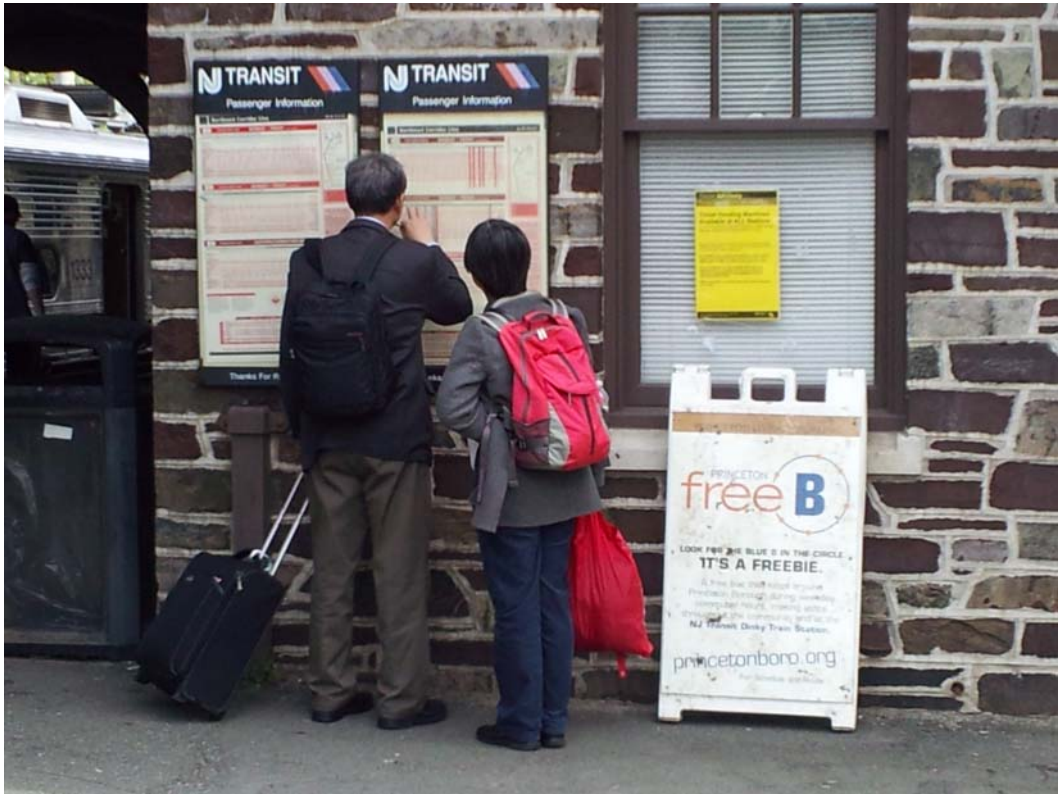
- Provide connections to existing and future transit services.
- Increase transit demand.
- Accommodate future transit demand.
- Maintain existing commuter level of service.
- Maintain existing comfort of service.
- Minimize transfers within the transportation system.
- Improve operating speed.
- Maintain bicycle friendly atmosphere.

2. Provide Cost Effective & Efficient Transportation Services

- Implement within a reasonable time frame.
- Implement at a reasonable capital cost.
- Minimize operating and maintenance costs per passenger mile.
- Consistent with NJT or Princeton University operating technologies.
- Maintain emergency vehicles access to system.
- Maintain access to arterial roadways.
- Maintain access to existing and future users.
- Minimize property acquisition.
- Ability to phase construction.
- Minimize turning radii that meet current alignments.

3. Encourage Sustainable Economic Development

- Improve connection between residential/commercial/educational destinations.
- Stimulate economic development



4. Maintain/Enhance Livability and Quality of Life

- Minimize/avoid impacts on historic resources.
- Minimize encroachment on view corridors.
- Minimize construction impacts.
- Reduce vehicle congestion emissions and noise.
- Reduce system congestion emissions and noise.
- Improve energy efficiency.

Previous Study Work

Previous Studies

- Draft Princeton Residential Mixed Use (RMU) Zoning Code
- Princeton Community Master Plan
- Community Transportation Coordination Initiative
- Princeton University Campus Plan
- Viability of Personal Rapid Transit in New Jersey
- Penns Neck Area Environmental Impact Statement
- Princeton University Arts and Transit Neighborhood Plan
- Redevelopment Plan for Hibben-Magie Site
- Others

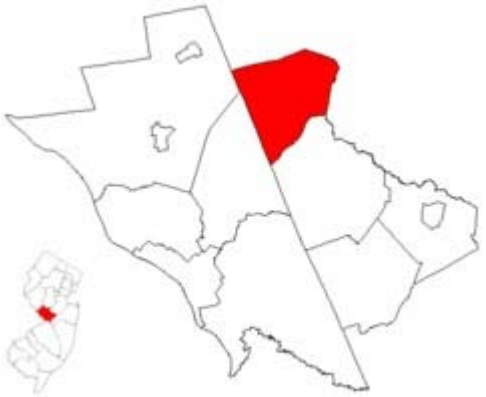
Summary of previous study findings

- Numerous efforts to address transportation needs in the Princeton area have been put forward
- Traffic congestion continues to grow in the community and circuitous transit routes tend not to work
- Multi-modal solutions should be considered
- Need to coordinate transit connections with existing transit and rail services
- Public is divided about future of development in the community
- Relocation of Princeton Station for the Dinky is an opportunity to explore improving connectivity to downtown

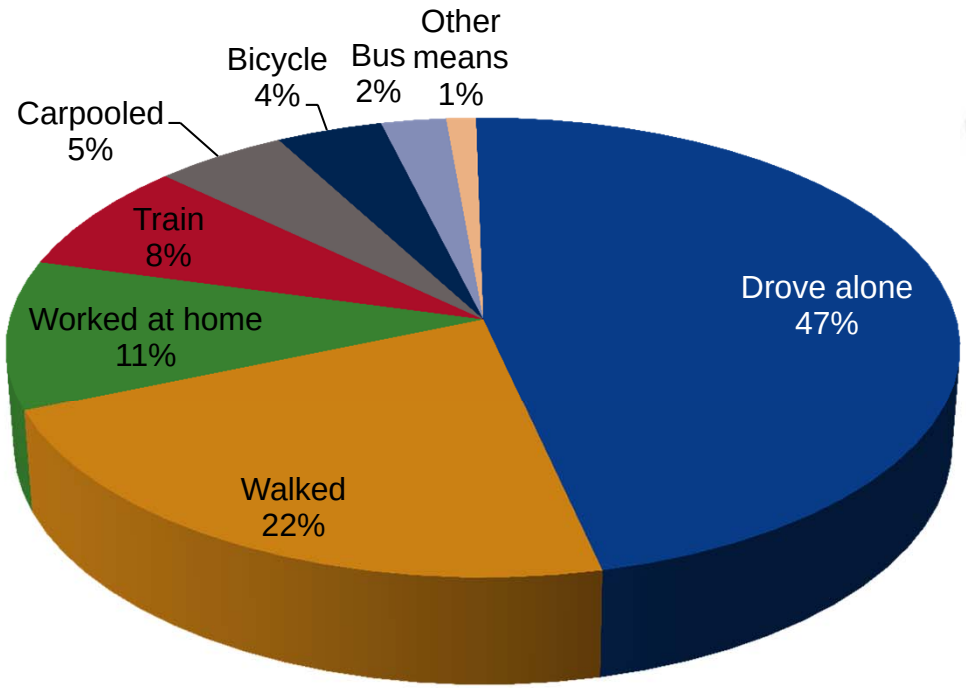
Who uses public transportation in Princeton?

Ways people commute within Princeton

Total Population = 28,717



Commute to Work Mode Split - Princeton



Source: 2011 American Community Survey 5-Yr. estimates including Township and Borough

Dinky - Ridership

TOTAL DAILY EASTBOUND RIDERSHIP: 1050

NORTHEAST CORRIDOR LINE
PRINCETON BRANCH
WEEKDAY SURVEY - APRIL 26th 2012

EASTBOUND					WESTBOUND				
TRAIN NO.	PRINCE. TIME	PRIN. JCT. TIME	PSGRS COUNT		TRAIN NO.	PRIN. JCT. TIME	PRINCE. TIME	PSGRS COUNT	
4106	5:00AM	5:05AM	10		4105	4:50 AM	4:55 AM	1	
4108	5:25AM	5:30AM	4		4107	5:12 AM	5:17 AM	1	
4110	5:55 AM	6:00 AM	16		4109	5:39AM	5:44AM	1	
4112	6:27AM	6:32AM	21		4111	6:09 AM	6:14 AM	2	
4114	6:52 AM	6:57 AM	31		4113	6:42 AM	6:47 AM	4	
4116	7:17AM	7:22AM	69		4115	7:07AM	7:12AM	4	
4118	7:47AM	7:52AM	37		4117	7:27AM	7:32AM	9	
4120	8:12 AM	8:17 AM	55		4119	7:57AM	8:02AM	18	
4122	8:53AM	8:58AM	36		4121	8:33AM	8:38AM	71	
4124	9:19AM	9:24AM	25		4123	9:09AM	9:14AM	56	
4126	9:52AM	9:57AM	17		4125	9:32AM	9:37AM	26	
4128	10:17 AM	10:22 AM	34		4127	10:06 AM	10:11AM	94	
4132	11:15AM	11:20AM	18		4131	11:04 AM	11:09AM	44	
4134	11:50AM	11:55AM	26		4133	11:27AM	11:32AM	77	
4136	12:17PM	12:22PM	15		4135	12:00PM	12:05PM	66	
4138	12:46PM	12:51PM	18		4137	12:27PM	12:32PM	53	
4140	1:14PM	1:19PM	30		4139	12:59PM	1:04PM	32	
4142	1:47 PM	1:52 PM	23		4141	1:26PM	1:31PM	24	
4144	2:16PM	2:21PM	20		4143	2:02PM	2:07PM	37	
4146	2:45PM	2:50PM	46		4145	2:26PM	2:31PM	39	
4148	3:18 PM	3:23 PM	26		4147	2:56PM	3:01PM	12	
4150	3:44PM	3:49PM	32		4149	3:28 PM	3:33 PM	16	
4152	4:13PM	4:18PM	39		4151	4:00PM	4:05PM	2	MISSED NY CONNECTION
4154	4:37PM	4:42PM	58		4153	4:25PM	4:30PM	52	
4156	5:05PM	5:10PM	69		4155	4:47PM	4:52PM	20	
4158	5:42PM	5:47PM	44		4157	5:18PM	5:23PM	44	
4160	6:09PM	6:14PM	58		4159	5:57PM	6:02PM	56	
4162	6:31 PM	6:36 PM	20		4161	6:21 PM	6:26 PM	44	
4164	6:51 PM	6:56 PM	13		4163	6:41 PM	6:46 PM	38	
4166	7:13PM	7:18PM	17		4165	7:03PM	7:08PM	50	
4168	7:35 PM	7:40 PM	24		4167	7:25PM	7:30PM	29	
4170	7:56 PM	8:01 PM	3		4169	7:45 PM	7:50 PM	38	
4172	8:25 PM	8:30 PM	14		4171	8:15PM	8:20PM	20	
4174	8:52PM	8:57PM	12		4173	8:40PM	8:45PM	28	
4176	9:55 PM	10:00 PM	40		4175	9:45 PM	9:50 PM	16	
4178	10:35PM	10:40PM	1		4177	10:20PM	10:25PM	13	
4180	11:05 PM	11:10 PM	4		4179	10:52PM	10:57PM	10	
4182	11:50PM	11:55PM	4		4181	11:28PM	11:33PM	20	
4100	12:16AM	12:21AM	2		4183	12:06AM	12:11AM	14	
4102	12:58AM	1:03AM	12		4101	12:32AM	12:37AM	2	
4104	1:27AM	1:32AM	7		4103	1:17AM	1:22AM	2	
TOTAL			1,050		TOTAL			1185	

TOTAL DAILY WESTBOUND RIDERSHIP: 1185

Based on April 26, 2012 NJT Ridership survey

Princeton Junction Rail Station Boardings

NJTransit Stations with the Highest Boarding Levels

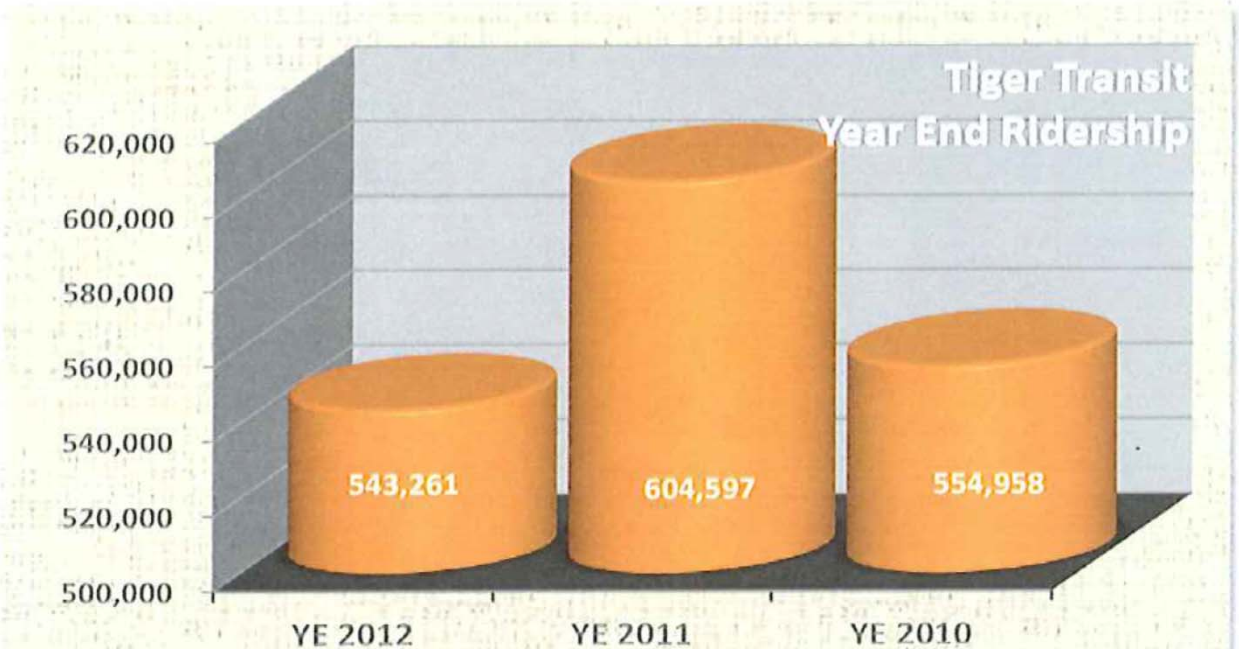
Avg. Weekday Boardings

Penn Station New York (Rail) 79,616
Port Authority Bus Terminal (Bus)..... 72,200
Newark Penn Station (Rail) 27,189
Hoboken Terminal (Rail) 16,297
Metropark Station (Rail) 7,447
Princeton Junction (Rail) 6,816

Approximately 15% of those boarding at Princeton Junction arrived by the Dinky.

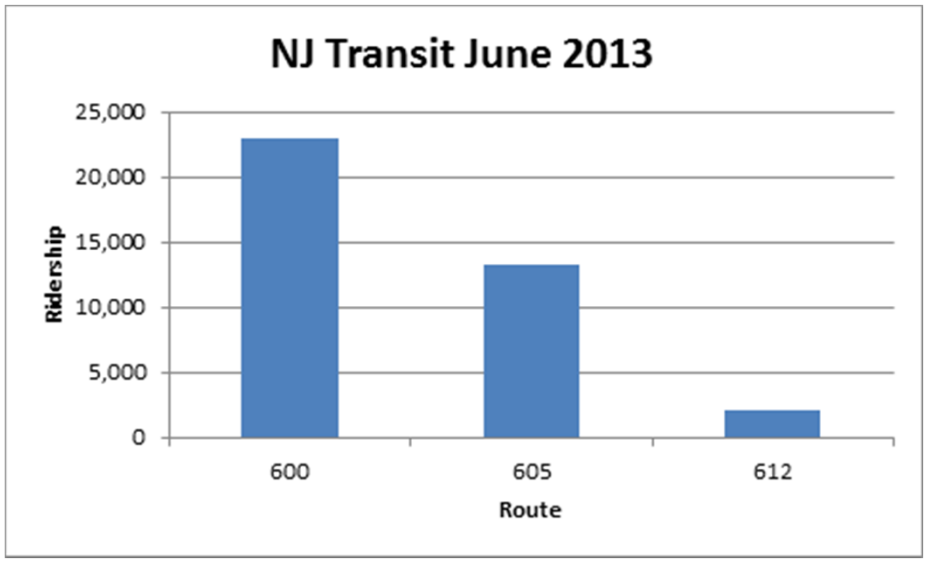
Based on data in *NJT Transit Facts at a Glance,* March 2013, and NJT Ridership survey, April 26, 2012

Other Princeton Ridership Data – Tiger Transit



567,605 average annual ridership, over past three years

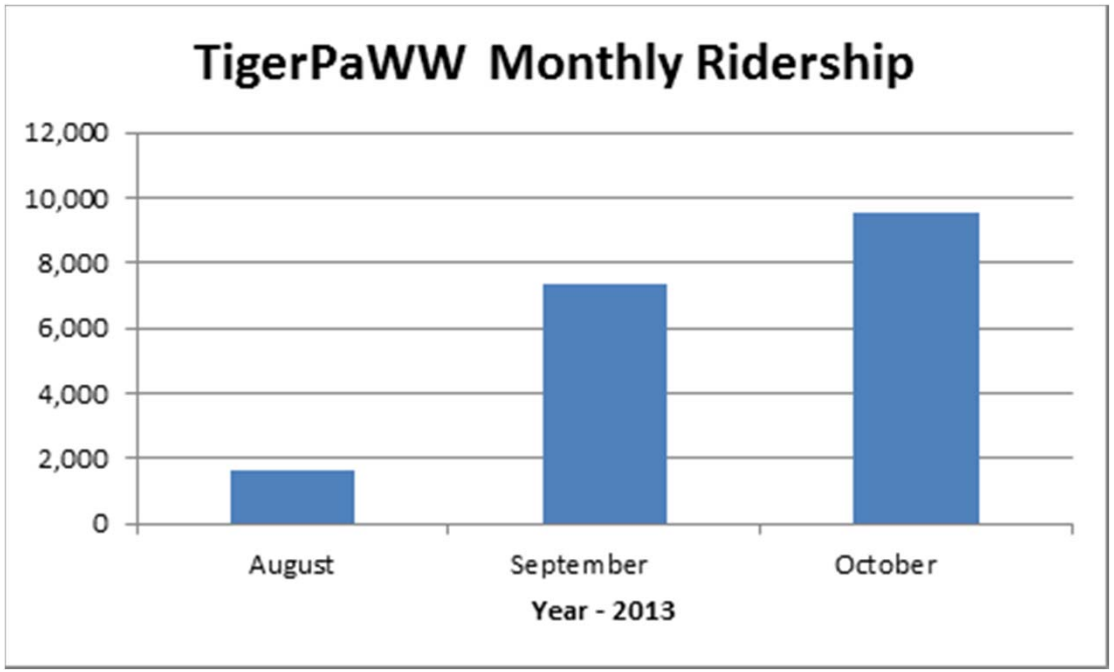
Other Princeton Ridership Data



Ridership on three NJ Transit but routes serving Princeton (not all data available)

Source:
NJ Transit rider survey 2012.

Other Princeton Ridership Data



Tiger PaWW service began in August 2013

New TigerPaWW service

Temporary service provided during construction of the Arts and Transit Neighborhood. Mirrors the Dinky schedule "arrival at" and "departure from" times for Princeton Junction Station. Stops at:

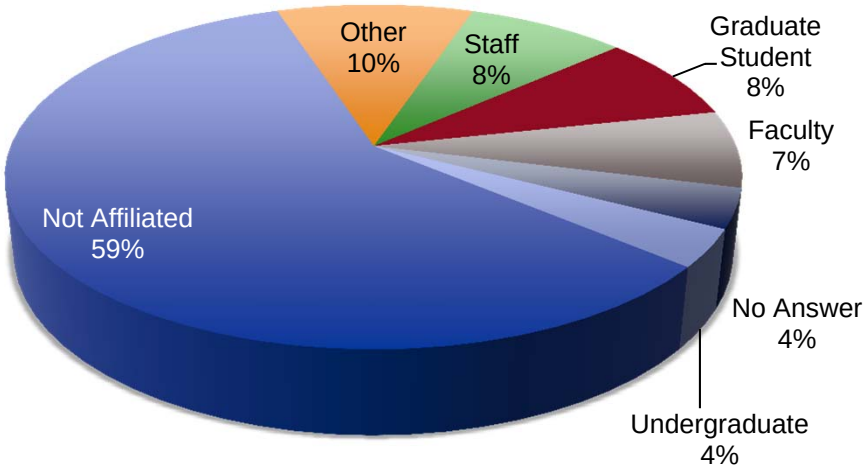
- **Princeton Junction**
- **Princeton Station**
- **University Place**

(Former "Dinky" Station)

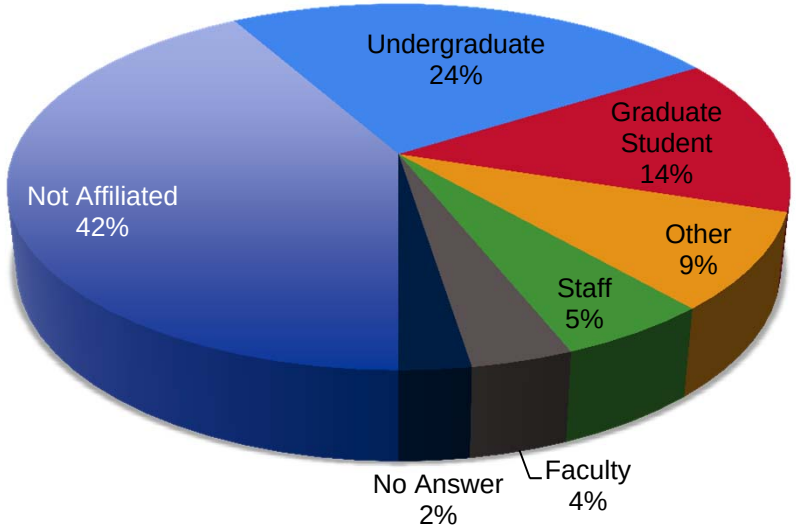
Source:
Princeton University
Tiger Transit 2013

Dinky - Passenger Mix

Weekday



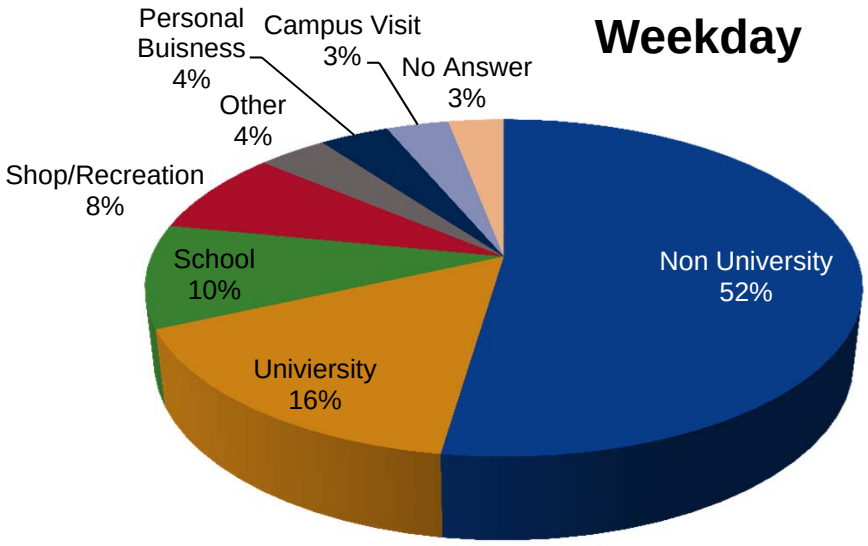
Saturday

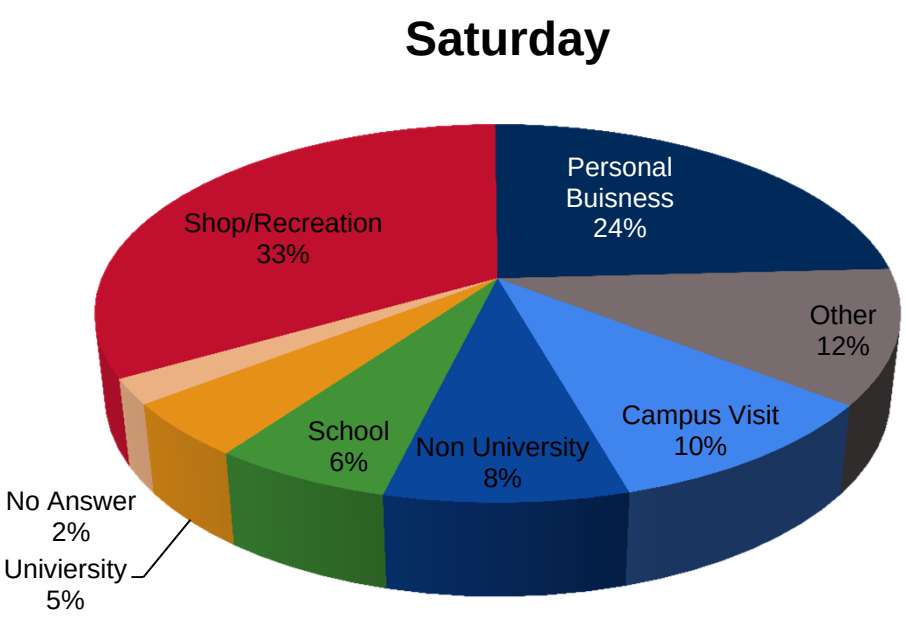


Overall, Dinky passengers close to 50% university based and 50% other.

Based on Dinky Survey results, 2007

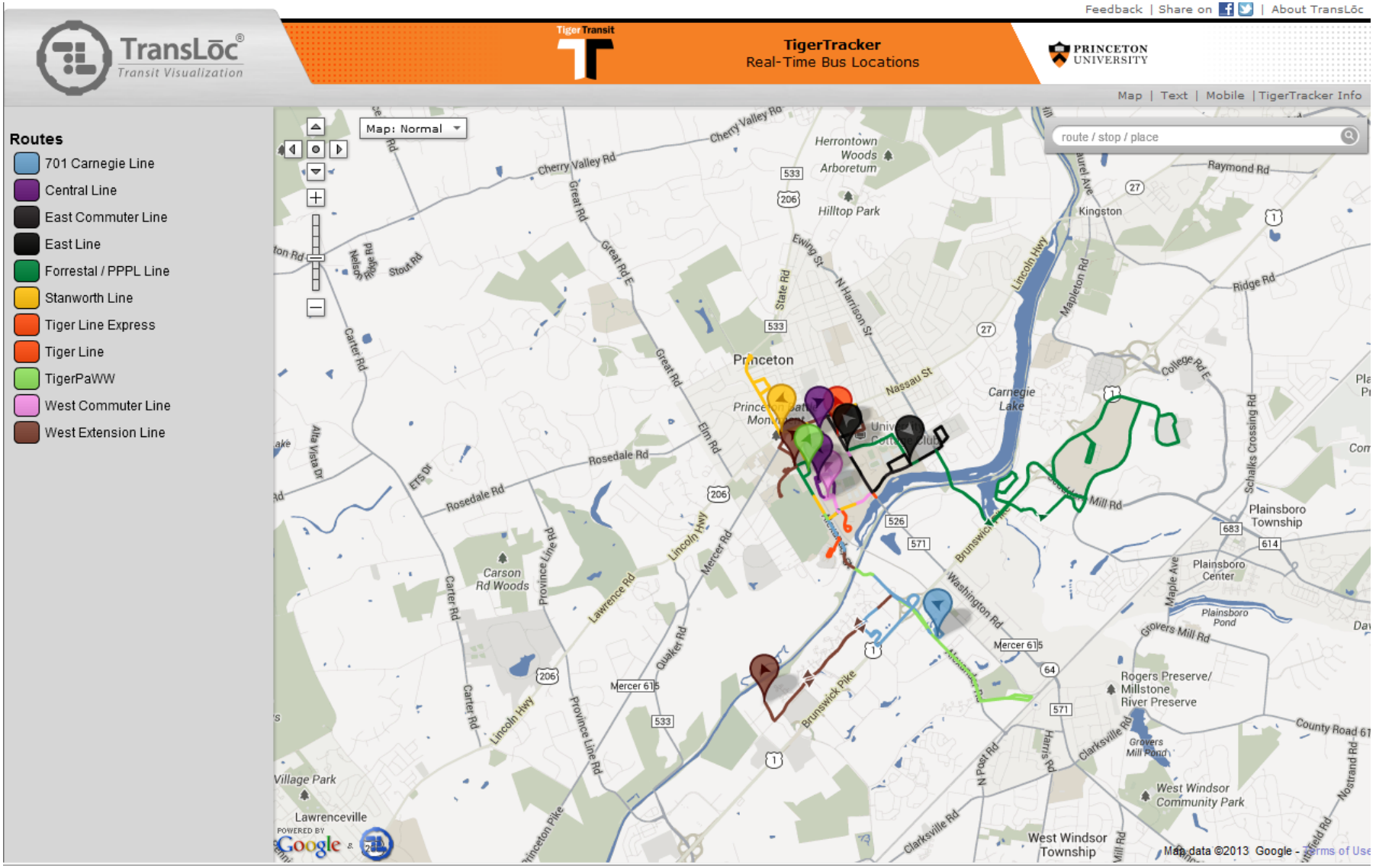
Dinky – Trip Purpose





Based on Dinky Survey results, 2007

Random look at Tiger Tracker – concentration of service



What specific problem are we focusing on?

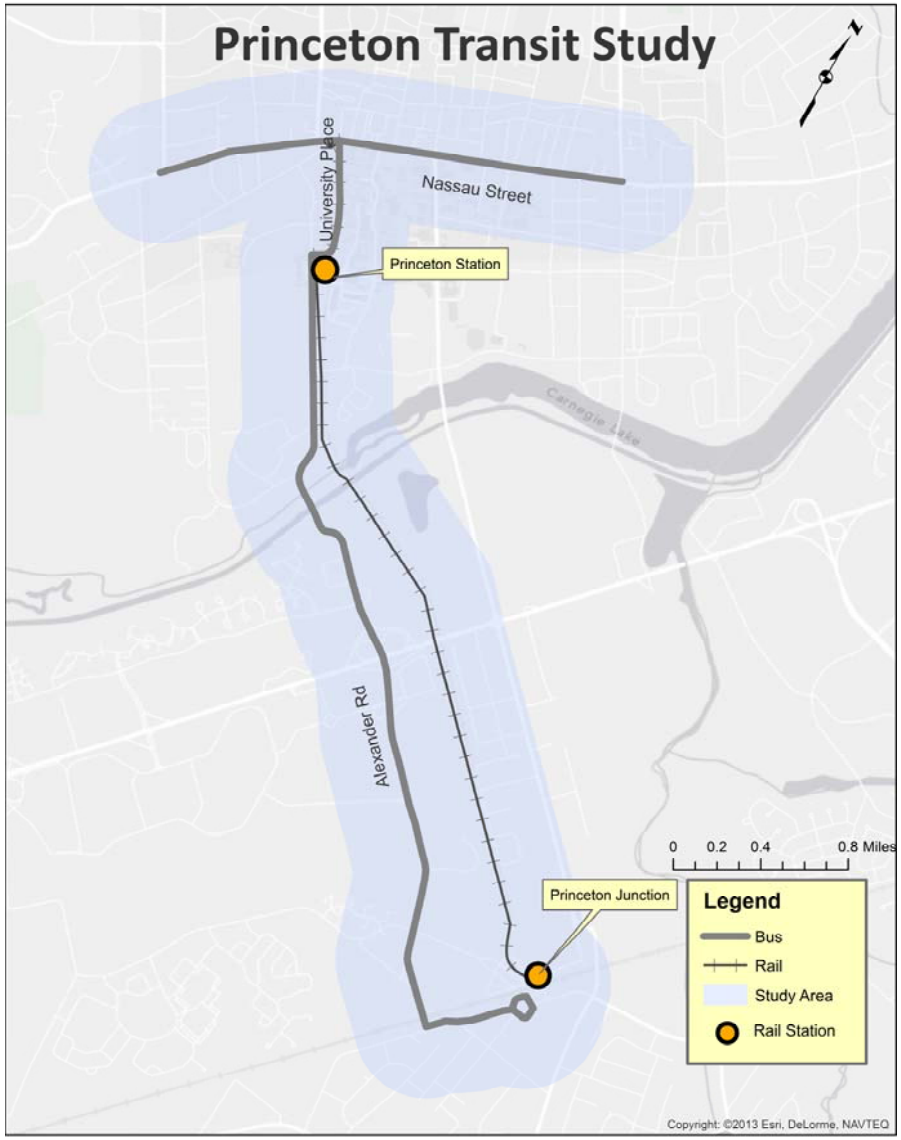
What were we tasked to do

Specific focus: Improve transit connection between Princeton Junction and Nassau Street (Downtown Princeton).

Evaluate:

- One Seat Ride from Princeton Junction to Nassau Street (rail or bus)
- Option for circulator service to supplement the Dinky – two seat or three seat ride from Princeton Junction to Nassau Street

Study area


Princeton Transit Study
N
University Place
Nassau Street
Princeton Station
Carnegie Lake
Alexander Rd
Princeton Junction
0 0.2 0.4 0.8 Miles
Legend
Bus
Rail
Study Area
Rail Station
Copyright: ©2013 Esri, DeLorme, NAVTEQ

What transit alternatives were examined?

Options Considered to achieve transit goals

Many transit mode options were considered including:

- Commuter Rail extension
- Rapid Transit
- Bus Rapid Transit
- Light Rail Transit
- Personal Rapid Transit
- Enhanced Bus Operations
- Streetcar
- Others

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What works best?

Bus Rapid Transit or Enhanced Bus options

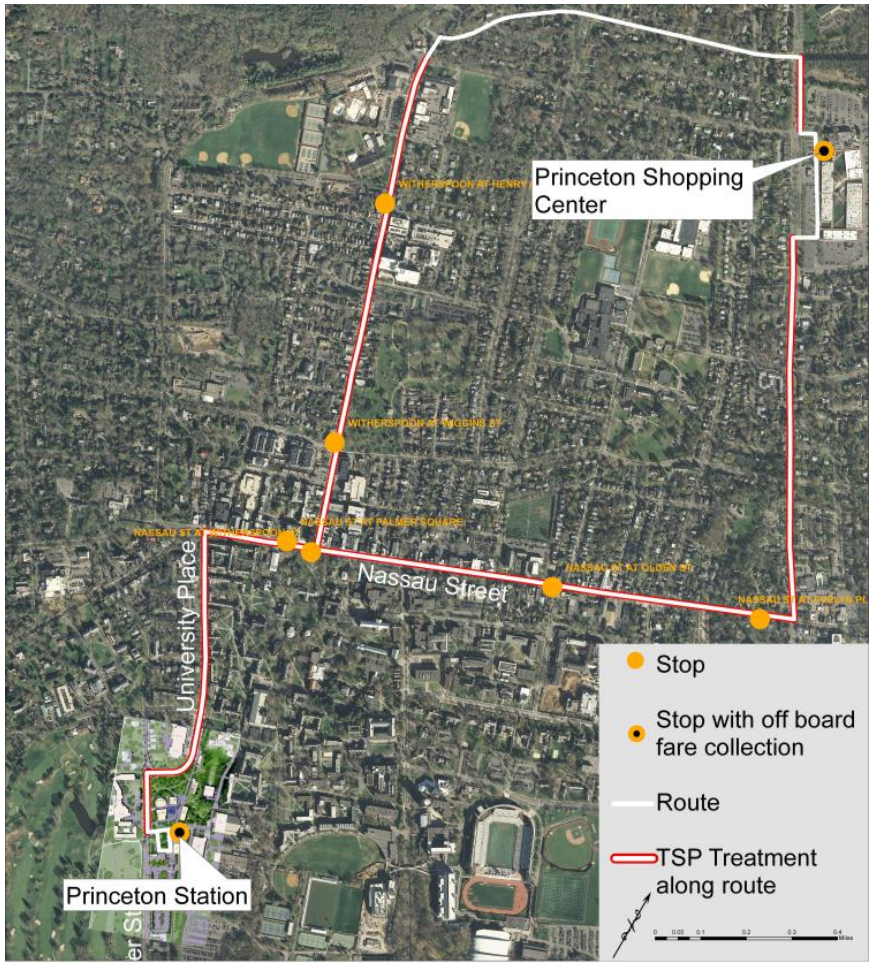
Bus Rapid Transit or Enhanced Bus

Buses (conventional, hybrid and state-of-the art) operating on exclusive roadway, or busway, that is access-controlled.

- Standard Bus or special vehicles available
- Separated Guideway Typical, but Street operations possible
- Moderate Capacity
- Highway Speeds
- Normal street geometry acceptable

BRT

Option 2A

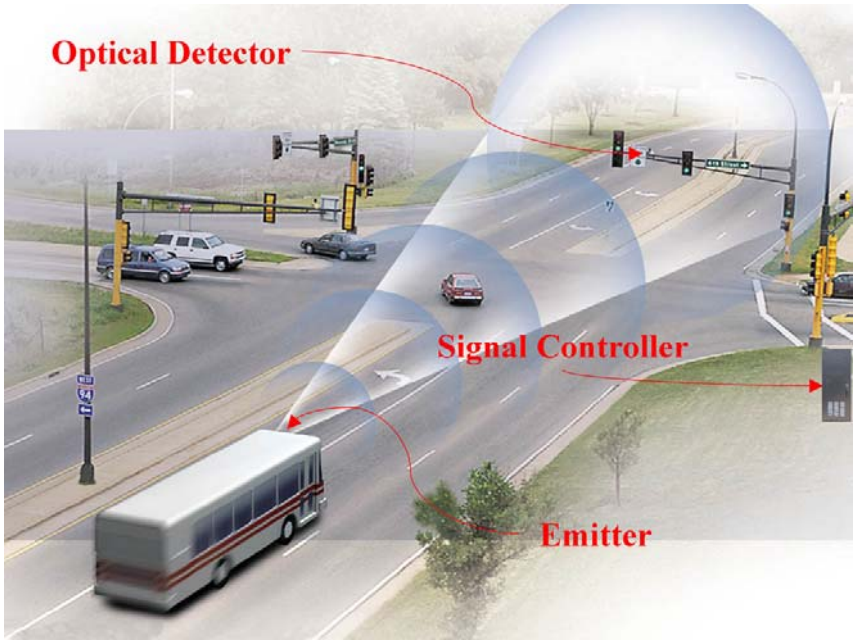


Option 2B

BRT Elements

Off Board Fare Collection and Level Boarding

Transit Signal Priority



Source: sustainabletransportationholland.org

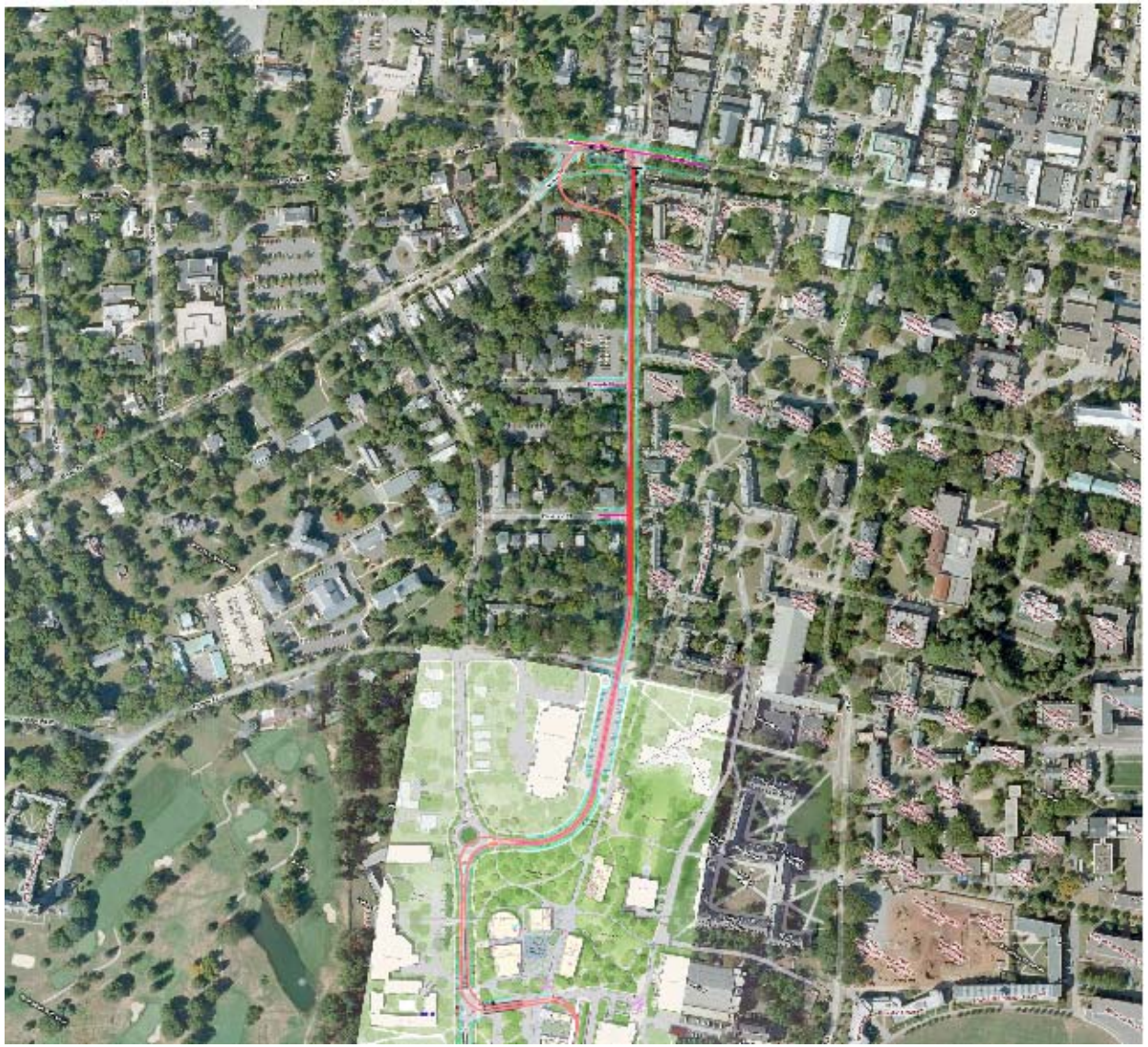
Light Rail Transit (LRT) options

Light Rail Transit (LRT)

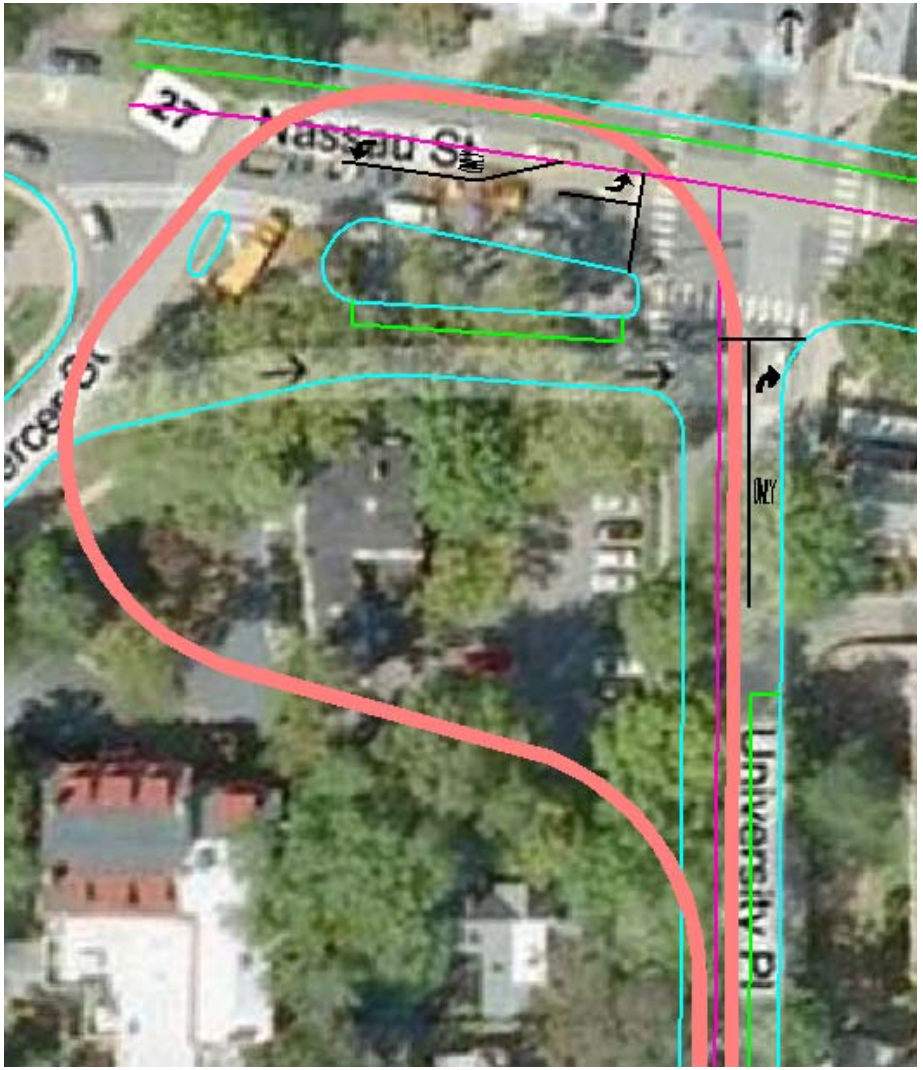
Light Rail Transit is a primarily at-grade rail mode, usually in an exclusive right of way, with electric powered vehicles receiving current from an overhead wire (catenary). Can also operate with other traffic along existing roadways.

- Single Cars/Short Trains
- Generally in Exclusive or Separated Right of Way
- Occasionally in Streets
- Higher Capacity and Speeds (up to 60 mph)
- Larger Curves (min 82 feet)
- Station spacing one-half to one mile apart

Overview of Potential LRT route



Issues with turning radii at University Pl and Nassau



New Traffic Circle on Alexander

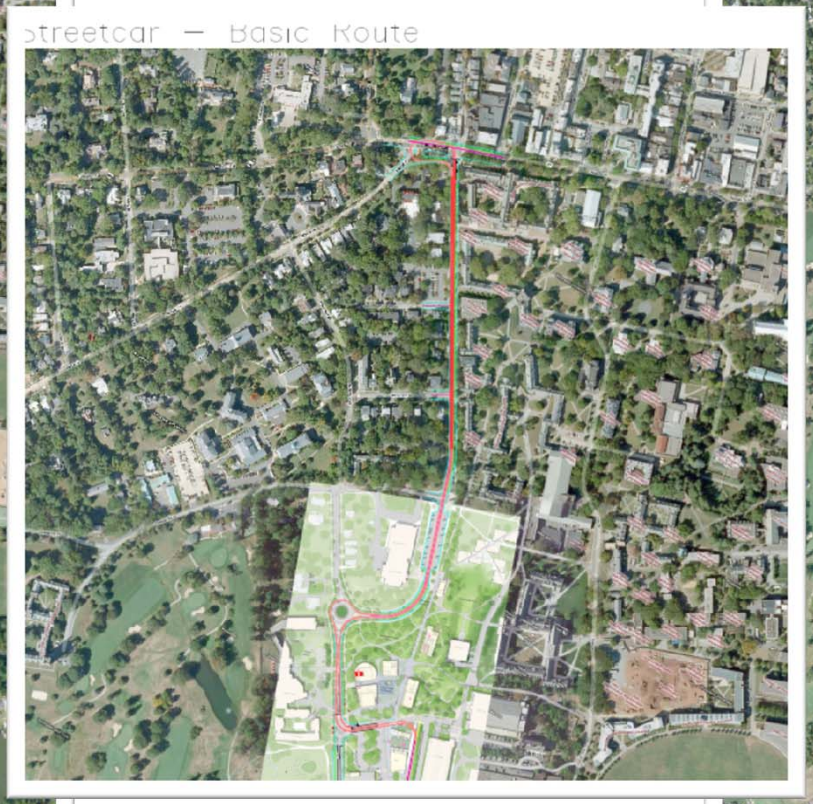
Streetcar options

Modern Streetcar

Modern streetcars run on an at-grade fixed track with mixed traffic along existing roadways. The modern streetcar uses a low-floor vehicle design that is basically a smaller version of a light rail car.

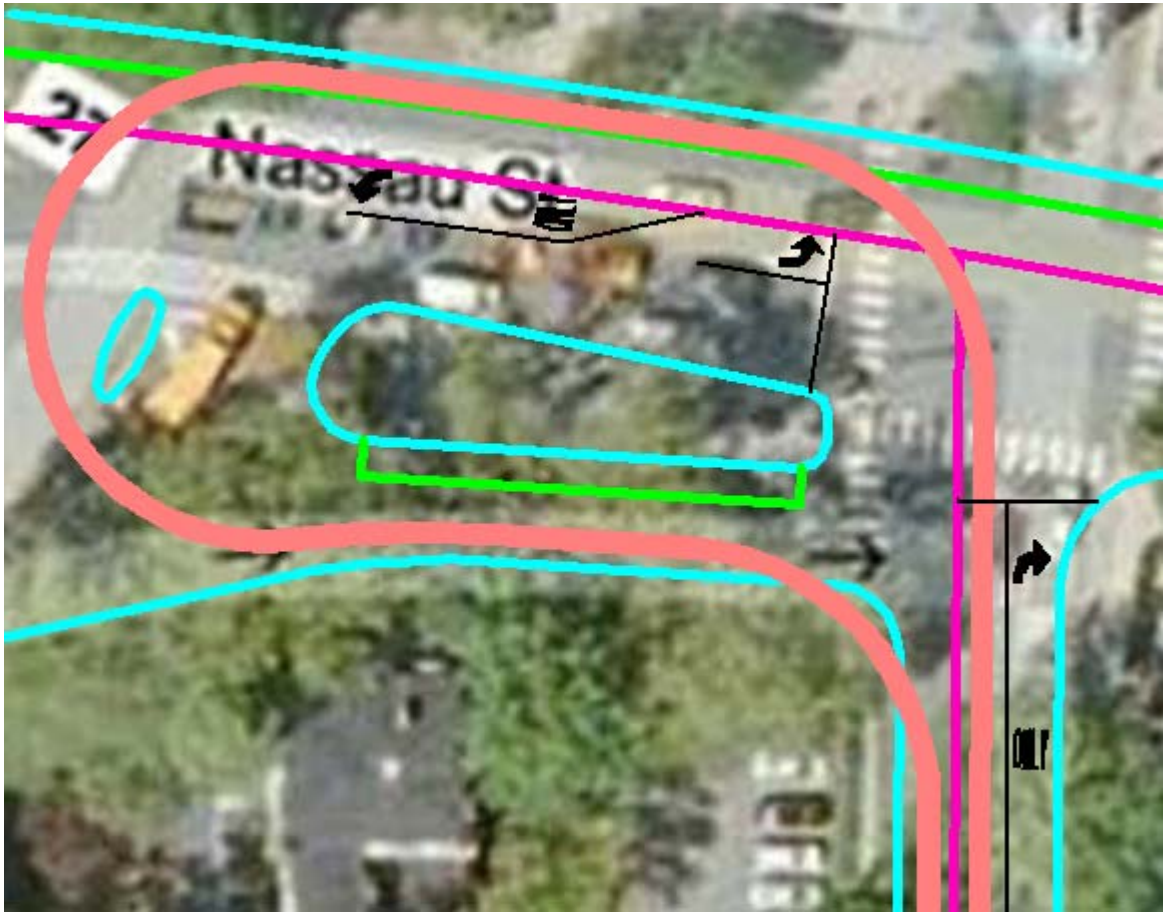
- Single Cars
- Generally in Streets with traffic
- Speeds up to 40/50 mph
- Tight Curves possible (min 50 feet)
- Rolling Stock available includes:
  - Modern Cars
  - Heritage Cars
  - New Replica Cars
  - Hybrid

Route Options

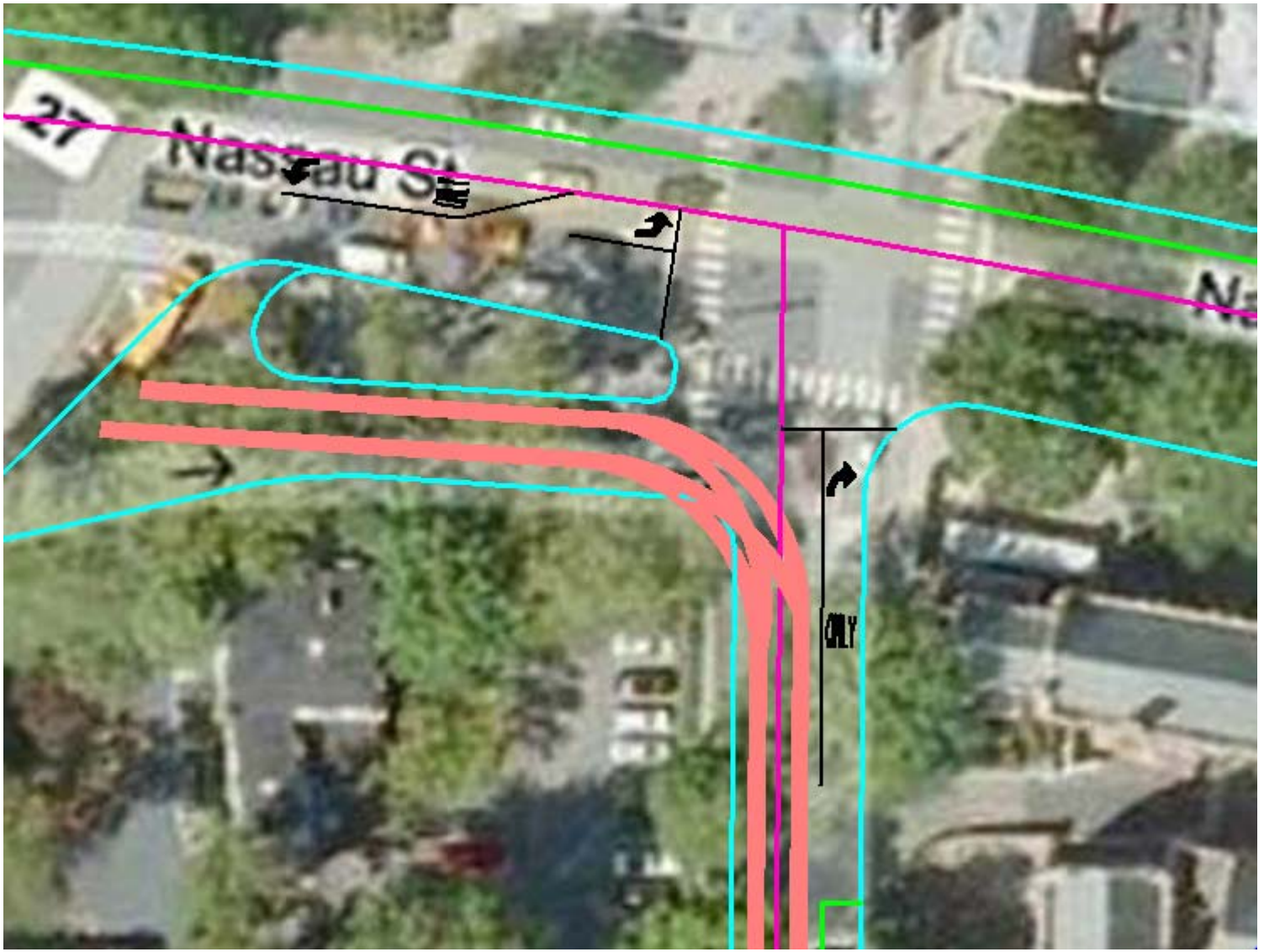


Streetcar in one way loop – University Pl – Nassau – Mercer - Alexander

Potential Loop at Nassau Street

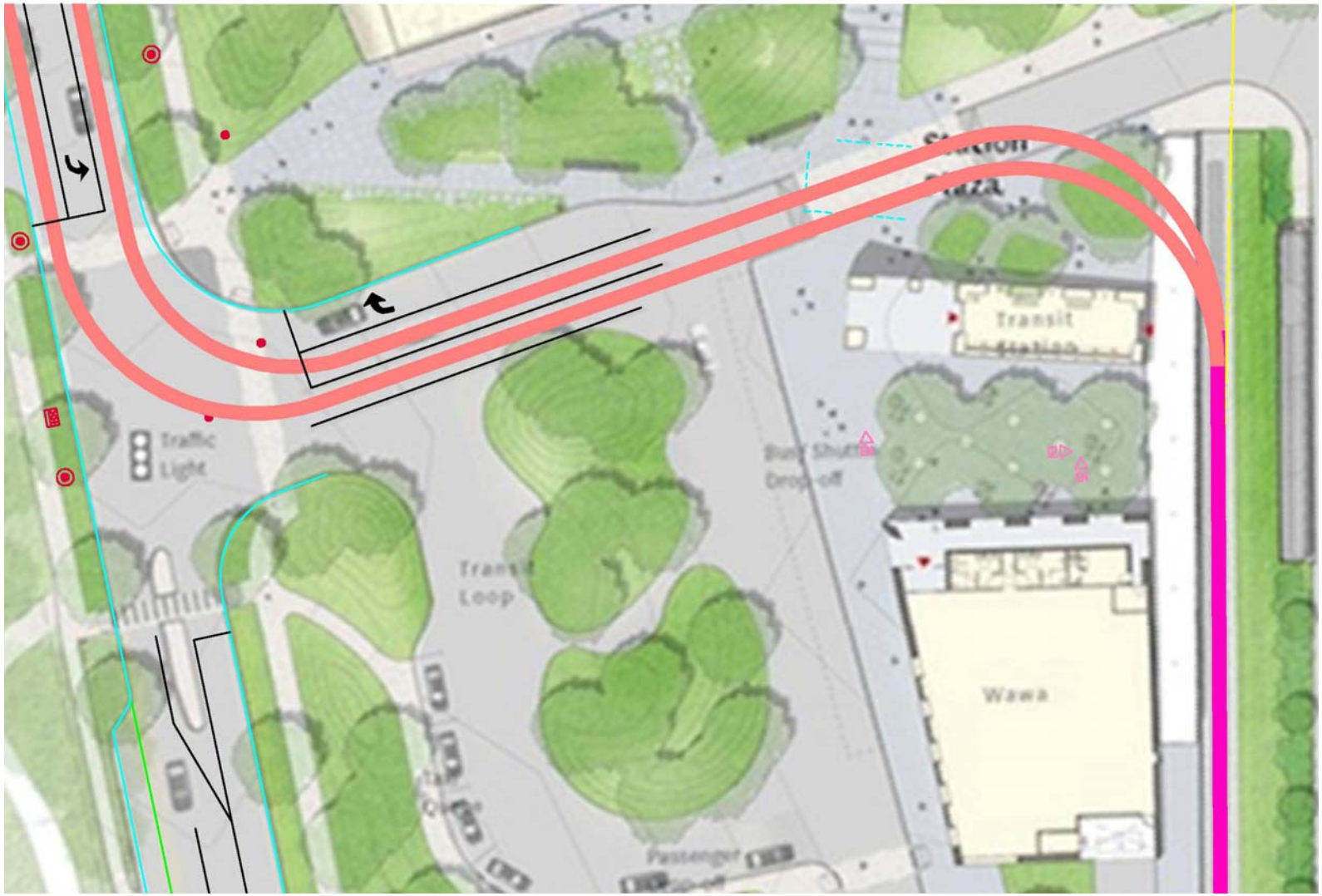


Potential bi-directional service at Nassau

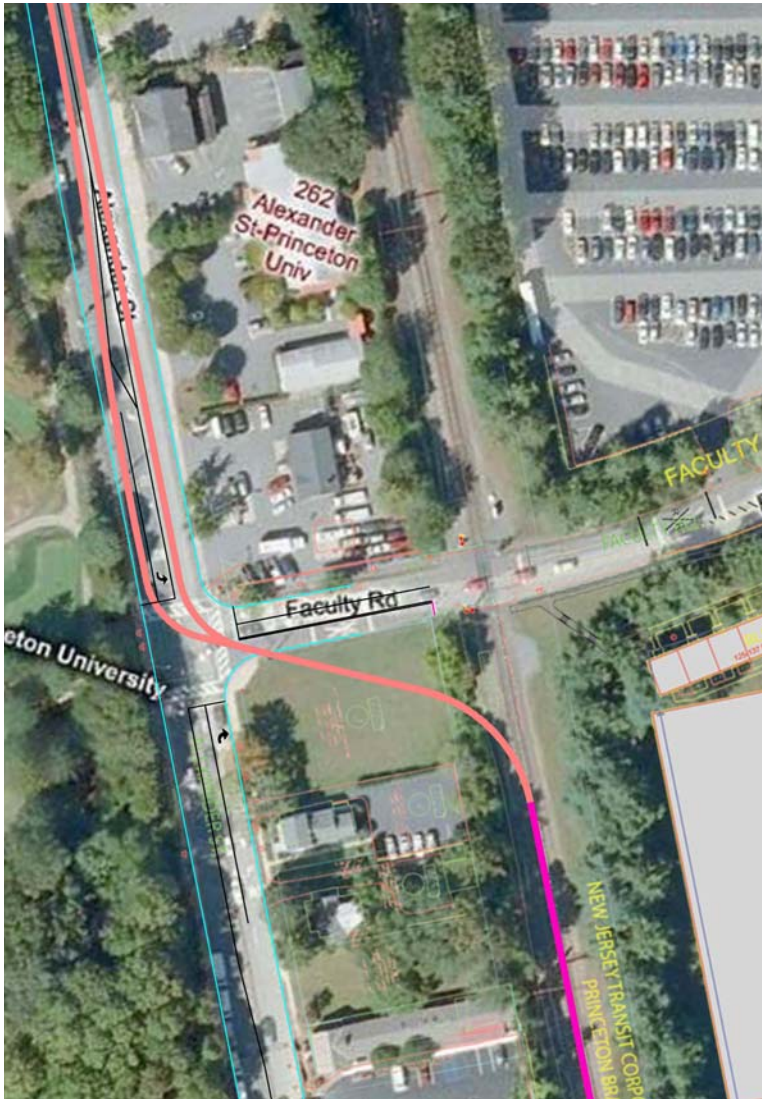


Streetcar at new roundabout on Alexander

Princeton Station transition



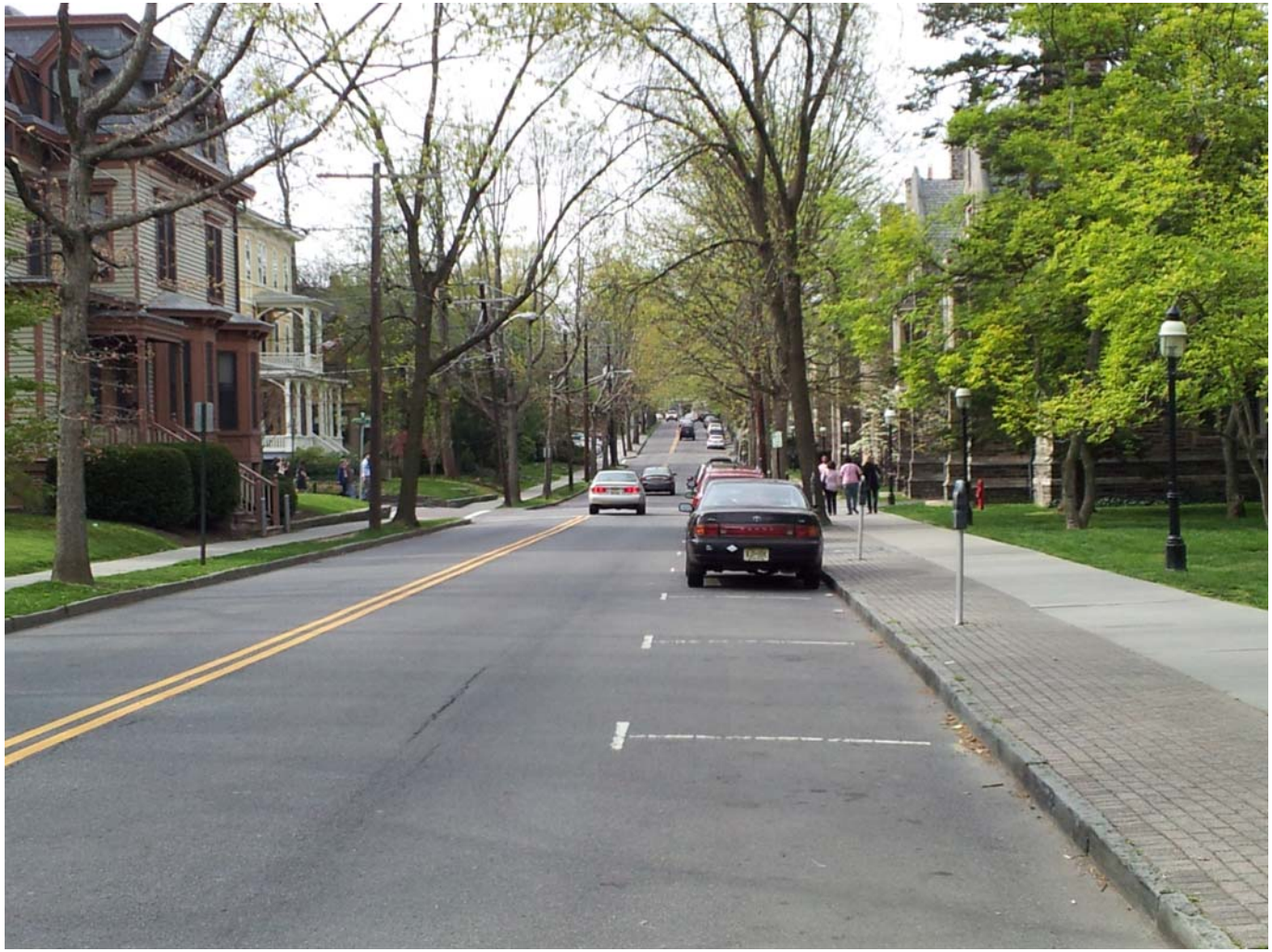
Alternatives to get on Alexander Street sooner



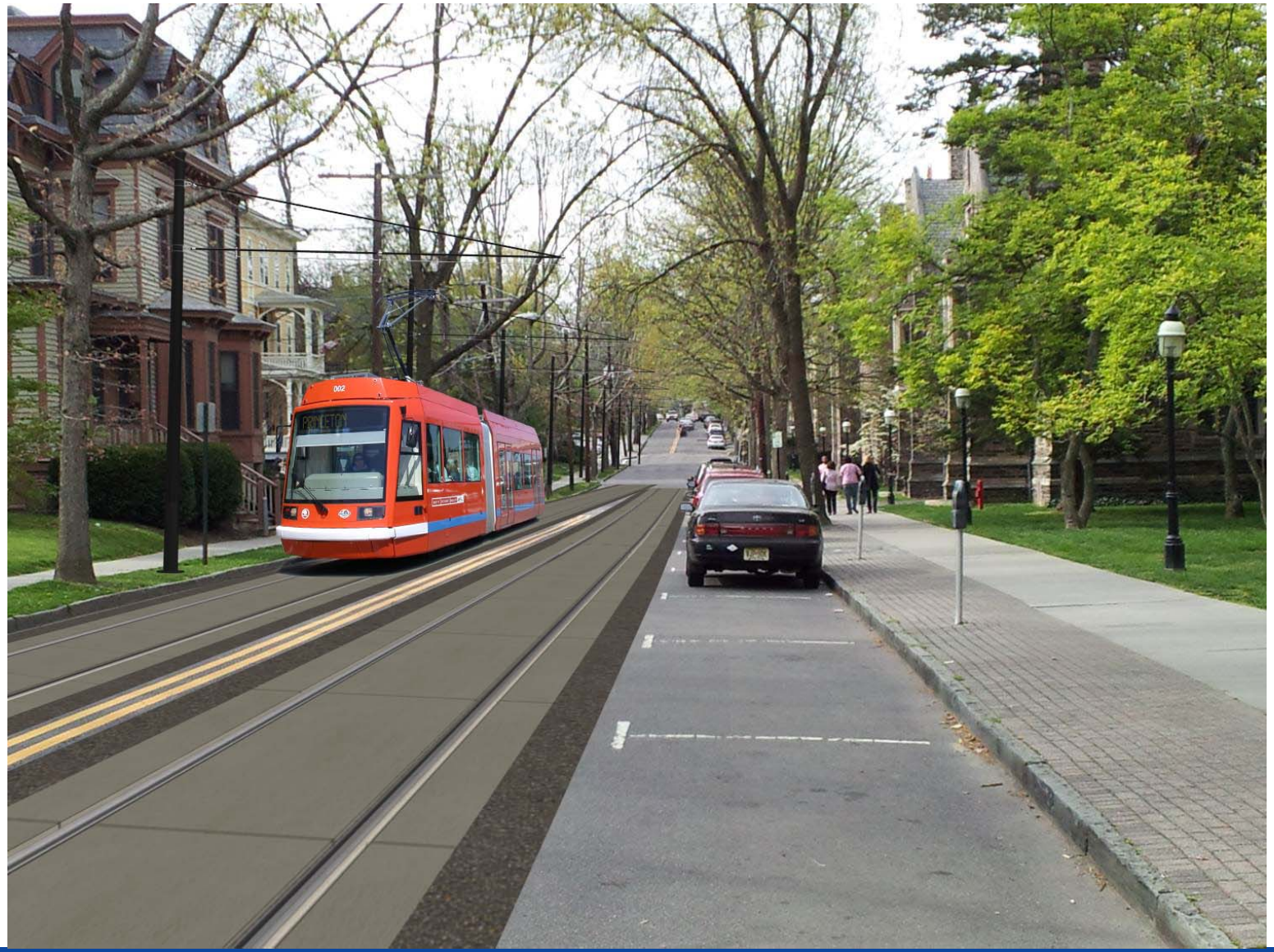
Conversion of Dinky line to streetcar/LRT

- New substation required
- Separation from Northeast Corridor at Princeton Junction
- Same wire may be kept
- Speeds would be similar to existing Dinky
- Voltage differences (12.5kV vs. 650 vDC)
- Separate maintenance facility required for streetcar or LRT.

University Place - 2013



University Place – with visualization of streetcar operating on it



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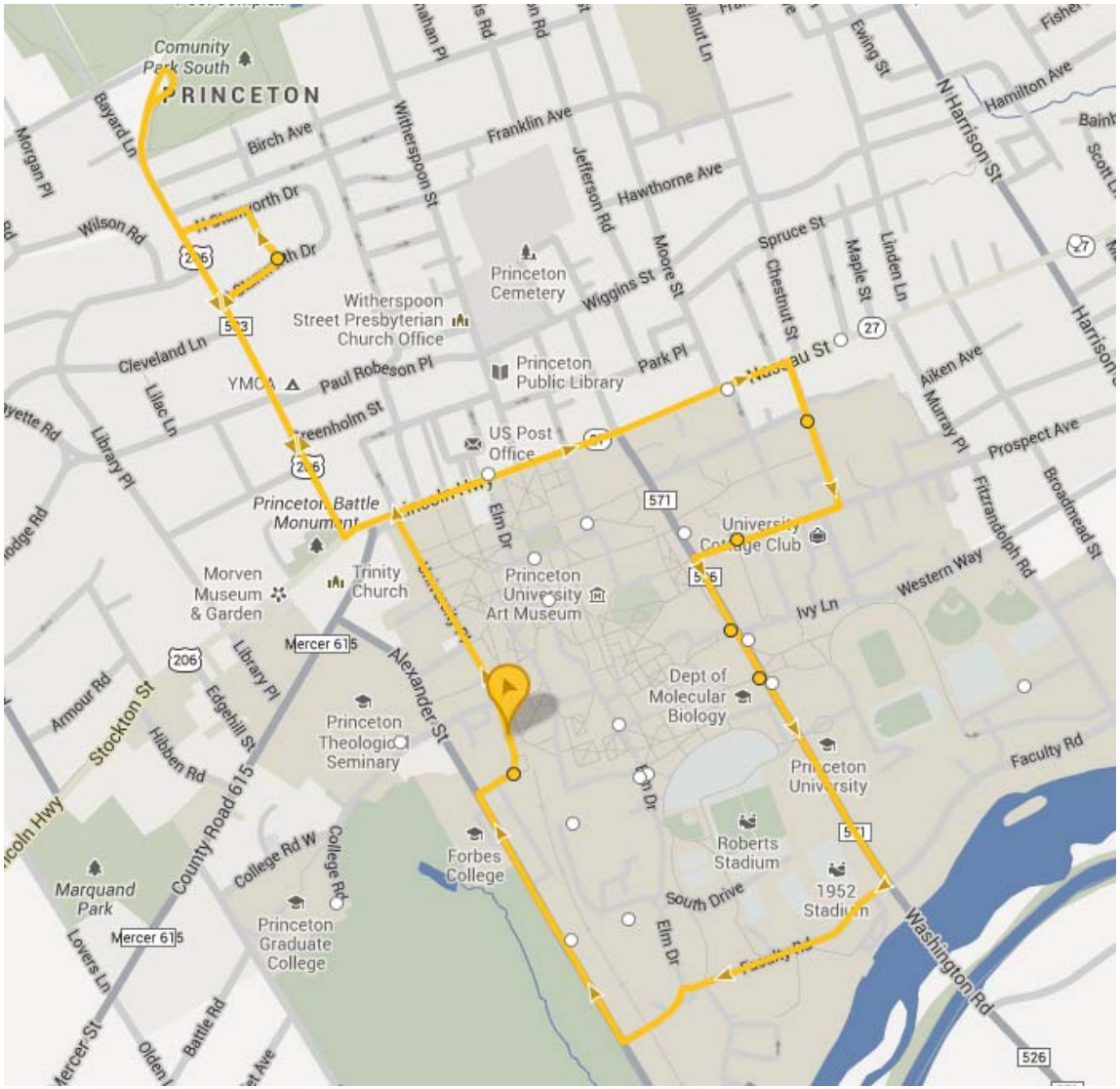
Two-seat ride options

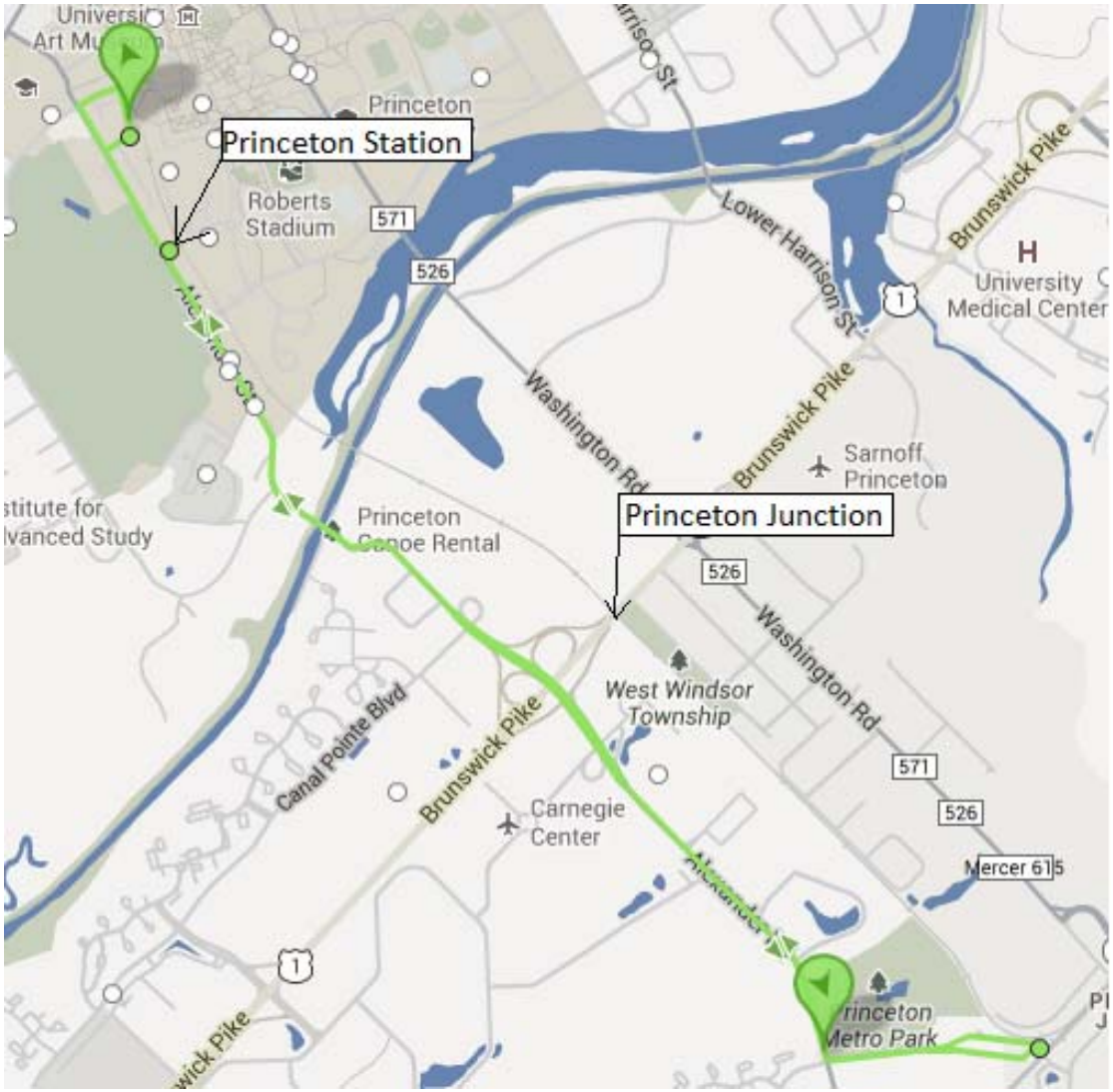
Existing circulator service operated by Tiger Transit



Potential Circulator service

Potential ‘figure 8’ circulator connecting with Princeton station, serving center of University campus, Nassau Street and points North.

New Tiger PaWW service – W. Windsor - Princeton



Next Steps

Next Steps

- Invite, Involve the Public; Review public input
- Estimate ridership for each alternative
- Estimate costs
- Prepare preliminary schedules and operating plan
- Evaluate integration with other modes like bicycle and pedestrian
- Prepare evaluation matrix of options

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What do you think?