



# Central New Jersey Route 1 Research Study



# Background: Route 1 Corridor

- ◆ Traffic volumes in the Corridor are estimated to increase by 55% by Year 2020
- ◆ Only 2% of work trips are currently made by transit, primarily due to lack of service availability
- ◆ NJ TRANSIT's Forecasting Department estimates 31,200 weekday trips on the BRT
- ◆ BRT could reduce auto person trips by an estimated 11,000
- ◆ BRT would support smart growth in the Corridor

# Research Goals

- ◆ Gather travel and demographic input required for ridership forecasting
- ◆ Identify important attributes of BRT
  - ◆ All-day survey of corridor bus routes
  - ◆ Focus groups with people who live and work in the Route 1 BRT service area
  - ◆ Conjoint Analysis (trade-off) to identify BRT features

# Background: Bus

- ◆ Routes included in the survey:
  - ◆ **Route 600**  
(Princeton Forrestal Village to Trenton Rail Station)
  - ◆ **Route 603**  
(Lawrence Center to Mercer Mall)
  - ◆ **Route 605**  
(Quakerbridge Mall to Montgomery Center)
  - ◆ **Route 606**  
(Rider University to Princeton Care Center)



# Methodology of Bus Survey

- ◆ All-day onboard survey of all inbound and outbound buses along the corridor from April 24 to 27, 2007
- ◆ Surveys were collected on-board and via mail
- ◆ A total of 643 completed questionnaires returned from 2,264 customers (28.4%)
- ◆ Census, no sampling error
- ◆ Margin of error is 3.9%
- ◆ Results at 95% confidence interval



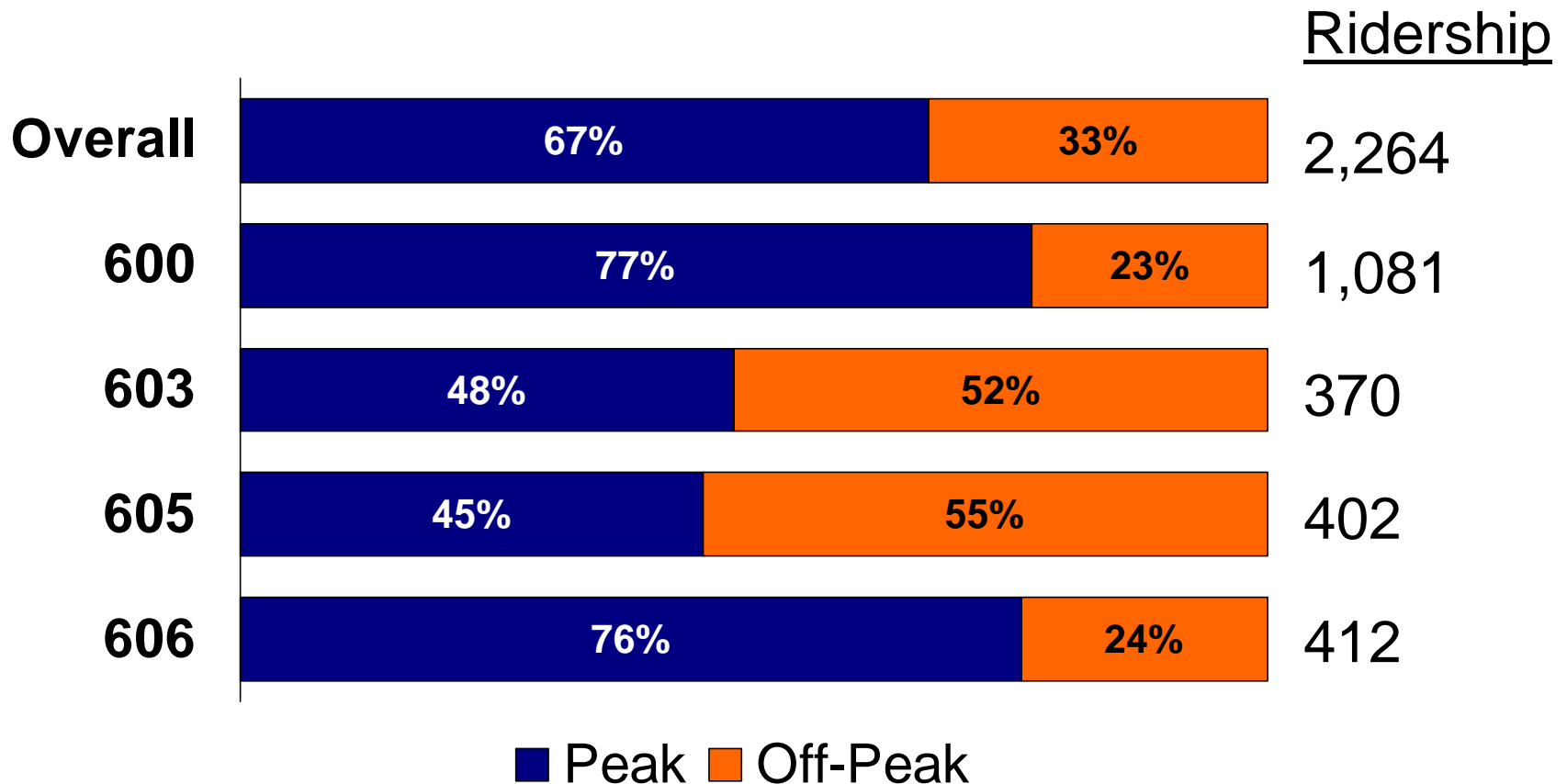
# 600 Bus Route is Most Utilized in the Study Area

Route	One-Day Ridership	Percent
600	1,081	48%
603*	370	16%
605	402	18%
606*	412	18%
<b>Overall</b>	<b>2,264</b>	<b>100%</b>

\*Only a segment of these routes were surveyed, as the remaining segments were outside the study area



# Majority of Bus Ridership is at Peak Times



Number of rider trips per day is double the ridership

# Bus Ridership Flows

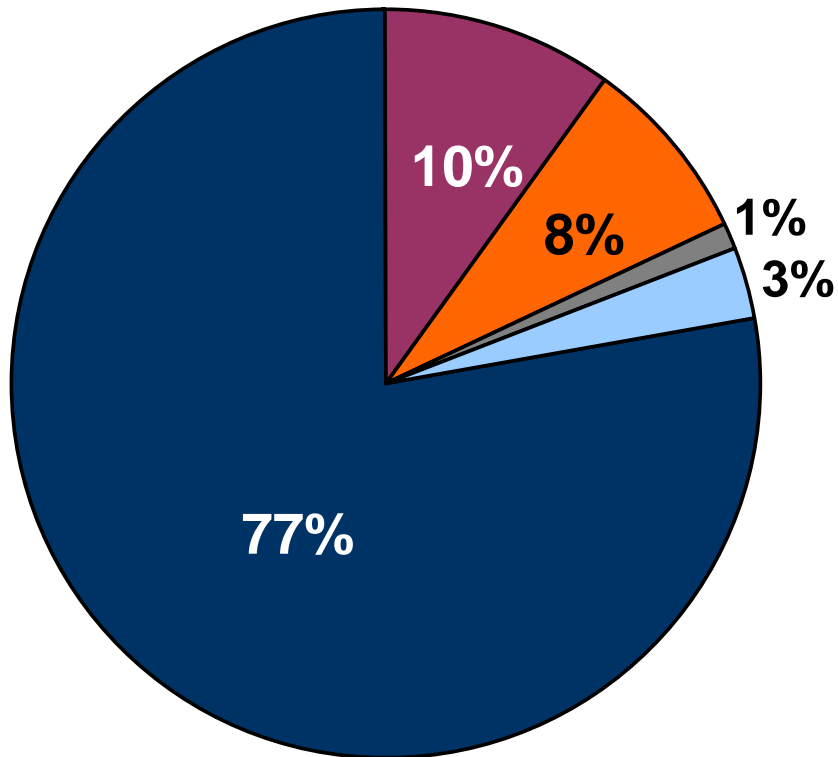
Boarding Town	# of Riders	Deboarding Towns
Overall	1,615	Princeton (32%), Trenton (31%), Lawrence (14%)
Princeton	613	Trenton (35%), Princeton (34%)
Lawrence	355	Trenton (57%), Princeton (19%)
Trenton	307	Princeton (45%), Lawrence (26%), Trenton (19%)
West Windsor	183	Princeton (38%), Plainsboro (35%)
Plainsboro	82	West Windsor (63%), Princeton (17%)
Montgomery	15	Princeton (100%)
Hamilton	13	Princeton (50%), Plainsboro (29%), Lawrence (21%)



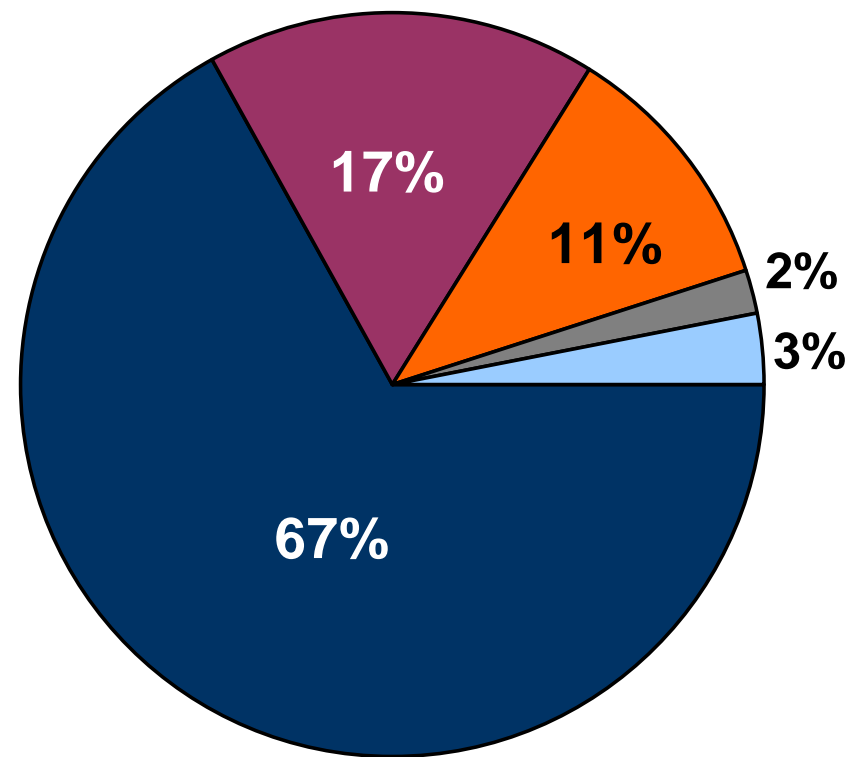


# Majority of Riders Walk to/from the Bus Stop

## To Bus Stop

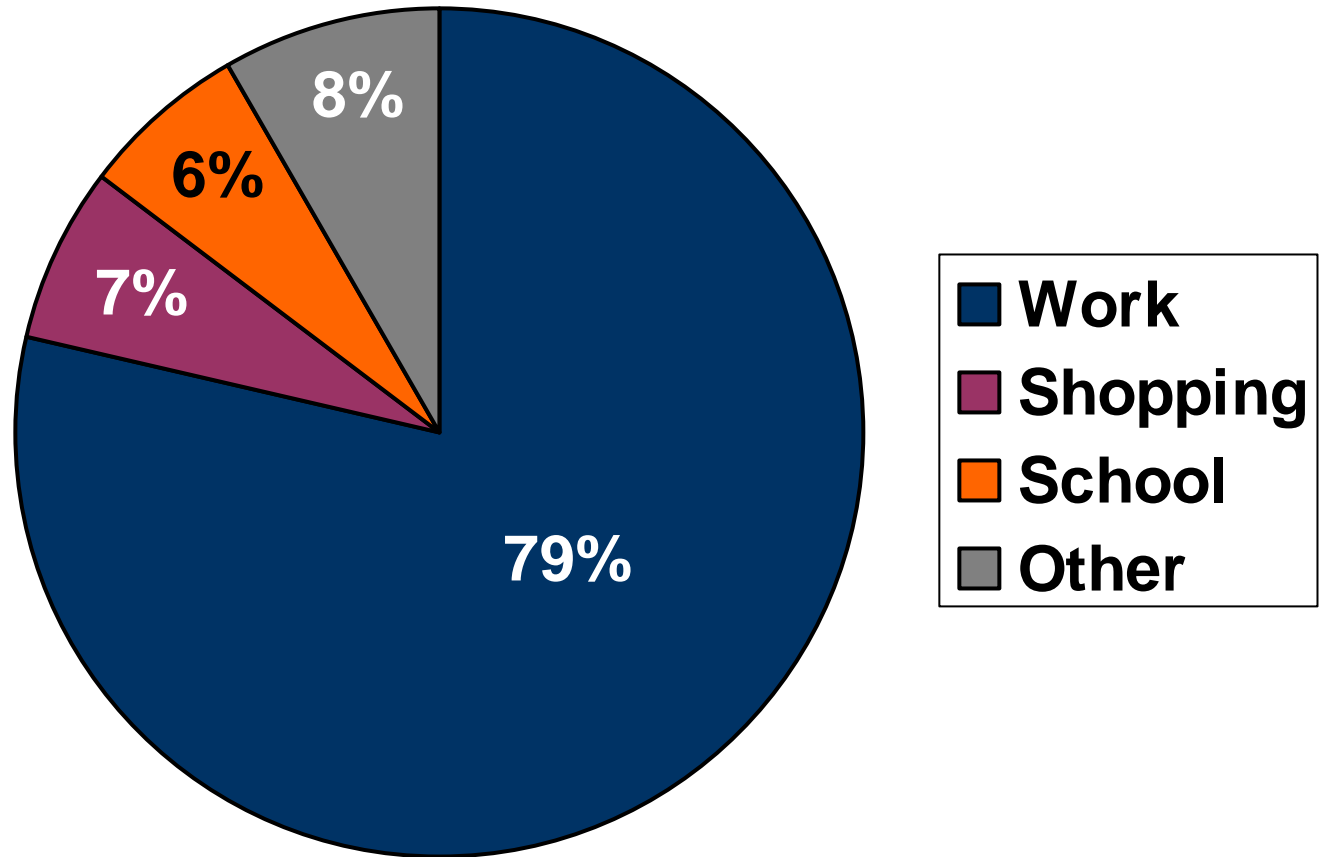


## From Bus Stop

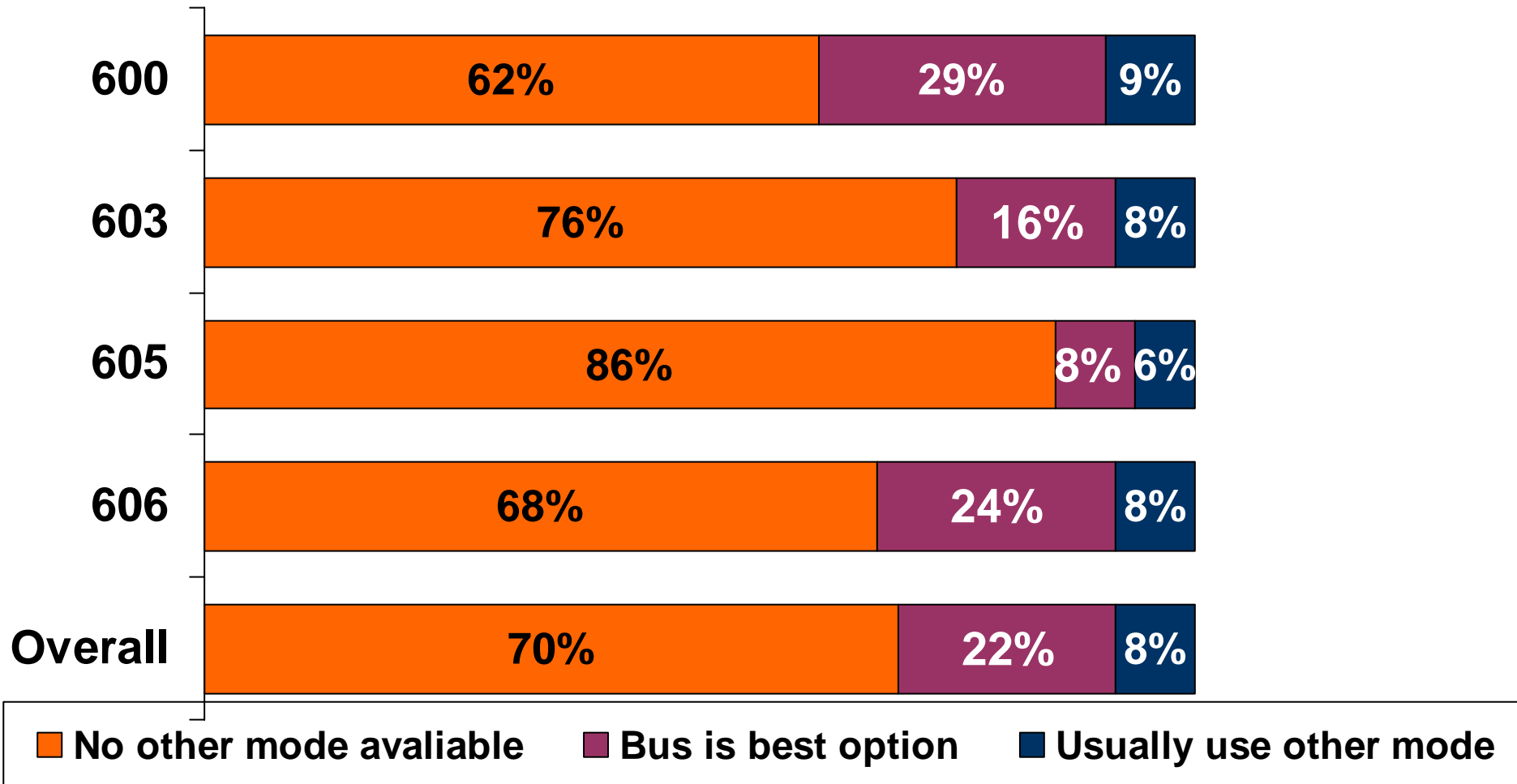


■ Walked Only ■ Another Bus ■ NJT Train ■ RiverLINE ■ Other

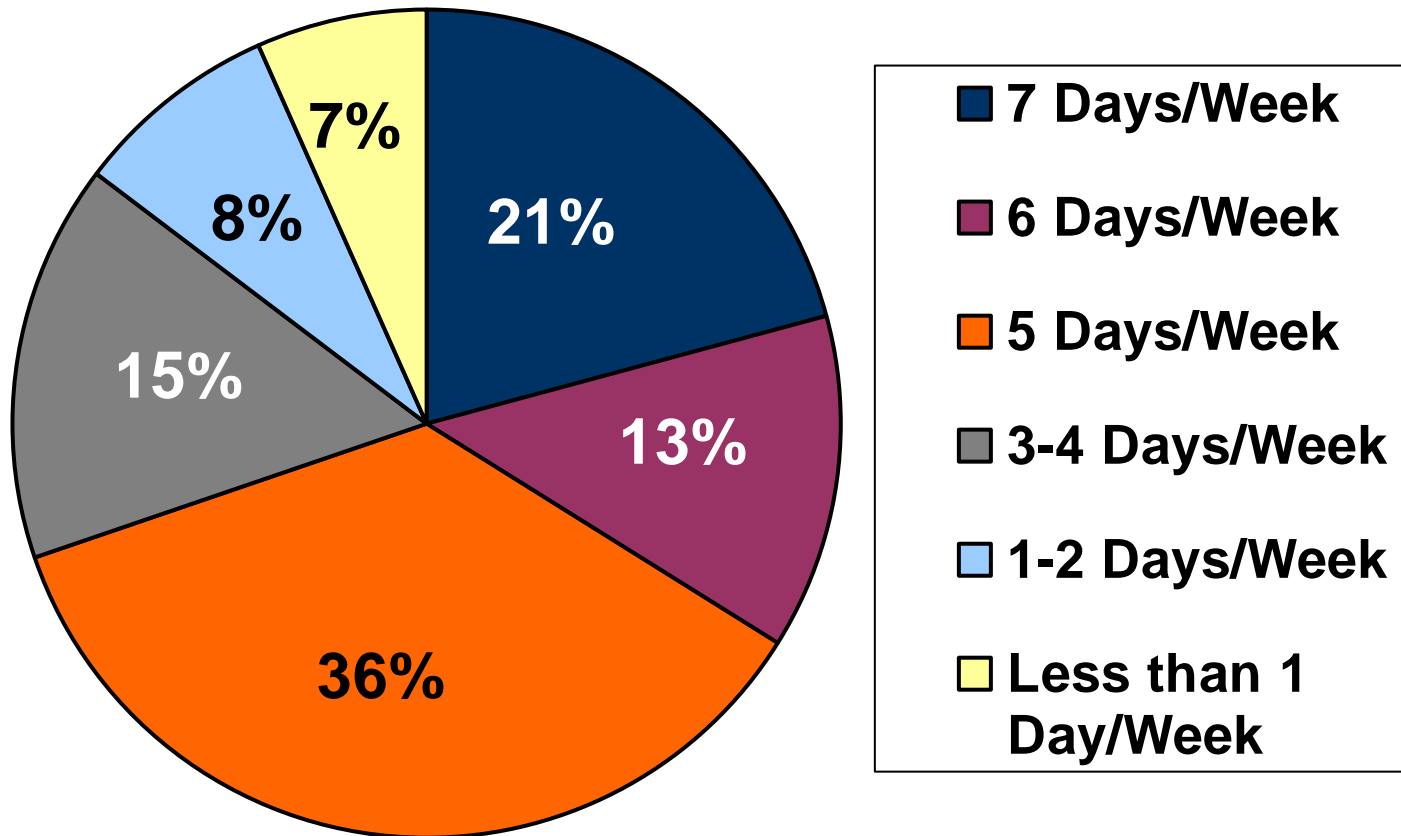
# Majority of Bus Customers are Making Work Trips



# Majority of Bus Riders Have No Other Way to Travel



# Most Bus Customers Travel 5-7 Days Per Week



# Most Important Bus Improvements

	Choice	Overall
<b>More Buses/More Frequent</b>	<b>43%</b>	<b>36%</b>
<b>More Routes/Trips/Stops/Expanded Service</b>	<b>11%</b>	<b>23%</b>
<b>On-time/Reliable</b>	<b>20%</b>	<b>21%</b>
<b>Good Service/No Change</b>	<b>8%</b>	<b>9%</b>
<b>Improved/Expanded Weekend Service</b>	<b>7%</b>	<b>8%</b>
<b>Better/More Courteous Drivers</b>	<b>3%</b>	<b>5%</b>
<b>Better Scheduling With Trains/Other Buses</b>	<b>10%</b>	<b>5%</b>



# Demographic Profile of Bus Riders

Demographic	600	603	605	606	Overall
Female	45%	61%	72%	61%	55%
Average Age	37 years	40 Years	41 Years	42 years	39 years
Black	39%	60%	27%	56%	44%
Hispanic	10%	13%	17%	13%	12%
Management/ Professional	33%	12%	22%	13%	24%
Average Household Income	\$51,400	\$25,200	\$39,200	\$41,700	\$43,400



# Focus Group Research Background & Methodology

- ◆ Conducted four focus groups in July 2007
- ◆ Focus group composition included:
  - ◆ 85% auto drive to work
  - ◆ 10% drive/drop at Princeton Train
  - ◆ 5% bus rider
- ◆ Demographics: White, male, professionals with average household income of \$95K
- ◆ Participants completed questionnaires as part of the focus group/conjoint research sessions

# Focus Group Results

- ◆ Significant variation in peak Travel Time
  - ◆ “Depending on traffic, the trip can take 10 minutes to 30 minutes”
  - ◆ “My trip would take 15 minutes on the weekend, but it ends up taking a half hour to 45 minutes during a weekday”



# Focus Group Results

- ◆ What do you like about your commute?
  - ◆ “I like being on my own schedule”
  - ◆ “My car is quiet, and I don’t have to listen to everyone else talking”
- ◆ What do you dislike about your commute?
  - ◆ “Traffic has gotten worse on Route 1 over the past few years”



# Focus Group Results

- ◆ What is an Ideal Bus Service?
  - ◆ “Frequent service, 10-15 minutes during the peak”
  - ◆ “An express bus, with minimal stops”
  - ◆ “On-time service and good transfers”
  - ◆ “An ideal bus should operate like a train”



# Focus Group Results

- ◆ Would you use a Route 1 BRT?
  - ◆ “I would use it, if it had dedicated lanes, picked me up near home and dropped me off near work”
  - ◆ “I would love to use it if it offered parking and helped get some of the cars off Route 1”

# Conjoint/Trade-Off Background & Methodology

- ◆ Trade-off methods produce more robust, accurate measures of customer priorities
- ◆ In other words, trade-offs force decisions within a meaningful context—you can't have it all, so what's most important to you?
- ◆ Discrete choice experiment with a set of three to six service alternatives using Max/Diff: Sum of “bests” and Sum of “worst”

# Conjoint/Trade-Off Findings

- ◆ Most Important BRT Features
  - ◆ Frequency of service 10-15 minutes peak, 20-30 off peak
  - ◆ BRT stop is within walking distance of work
  - ◆ Bus has its own Right of Way, takes 10 minutes less than current trips

# Conjoint/Trade-Off Findings

- ◆ Next Most Important Features:
  - ◆ BRT within walking distance of home
  - ◆ Bus vehicle interior attributes (clean, comfortable)
  - ◆ Bus Cost vs. Auto Cost (Bus costs less by \$2 a trip). Value of time estimated to be \$14.50 per hour or \$0.24 per minute.
  - ◆ Real Time information while waiting for bus
  - ◆ Enclosed Stations & Waiting areas weather protected.



# Conjoint/Trade-Off Findings

- ◆ Features that rated Neutral
  - ◆ 5 minute Bus time savings vs. Auto
  - ◆ Bus Propulsion (Hybrid)
  - ◆ Pre-Boarding Ticket Payment
  - ◆ Signal Priority or Queue Jump (minor time savings)
  - ◆ Quality of Walk (Sidewalks) to Work
- ◆ Less Important Features
  - ◆ Station Platforms level with Bus Floor
  - ◆ BRT Branding (i.e. Rt. 1 Express)
  - ◆ POP Fare Inspection
  - ◆ Sidewalks from home to Bus Stop.



# Conclusions – Bus Survey

- ◆ Bus Route 600 carries the largest volume of customers (1,081 or 48%) in the corridor
- ◆ Majority (67%) of bus customers travel in the peak and make work trips (79%)
- ◆ Princeton, Trenton, & Lawrence are the major origin and destinations among bus customers in the corridor
- ◆ A significant percentage (70%) of customers travel 5 days a week or more
- ◆ If current routes are modified, current riders would require an affordable alternative as rider captivity is high and rider average income is low (\$43,400)



# Conclusions – Bus Survey

- ◆ Majority of riders walk to their access points (77%) and from egress points (67%)
- ◆ High captivity (70% no other way to travel), low car availability rates (80% without car) coupled with low average household incomes (\$43,500), suggests a ridership that is transit dependent
- ◆ Route 600 customers have higher incomes with significant choice ridership, including significant use as a feeder to rail at Princeton Junction



# Conclusions – Focus Groups

- ◆ Auto travelers don't like their commute, due to traffic, but feel public transportation is not a viable option
- ◆ Traffic on Route 1 is backed up consistently during rush hour, making a typical trip up to 3 times longer than during the non-rush hour
- ◆ Auto travelers like the idea of a BRT along Route 1 and many suggested that they would take it if there was a dedicated lane, the trip was convenient, and it stopped near work and home
- ◆ Travel time to work varies considerably during peak period depending on travel. Many participants change their work schedules to avoid traffic.

# Conclusions – Conjoint

- ◆ BRT Features should include:
  - ◆ Frequent service: 10-15 min peak, 20 min off-peak
  - ◆ Stops within walking distance of work and home
  - ◆ Own right of way: takes 10 minutes less than current trip
  - ◆ Cost \$2 less than current auto cost
  - ◆ Bus vehicle interior (clean, comfortable)