

Westchester County Department of Transportation Central Avenue Bus Rapid Transit Study



*Public Meeting #2
June 16, 2008*

What did we learn?

NEAR TERM SOLUTIONS! Add service to Yonkers Raceway and Cross County Shopping Center.

IT WORKS! BRT is feasible on the Central Avenue corridor.

SAVES TIME! What would you do with an extra 20 to 48 minutes per day? BRT could offer tremendous travel time savings.

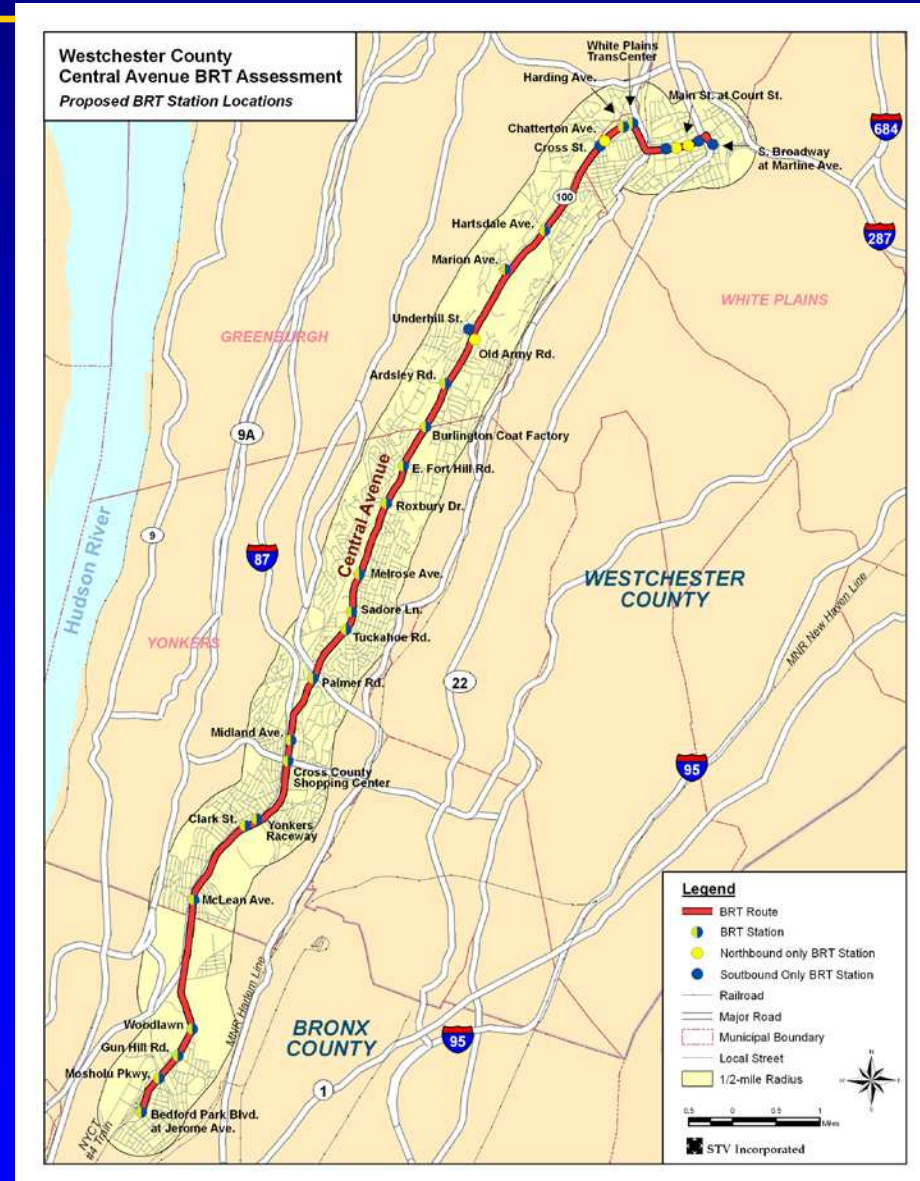
ATTRACTS NEW RIDERS! BRT could help grow corridor ridership by 35%.

CHANGE! BRT can help change Westchester County's perception of bus travel.



The Central Avenue Corridor

- Serves Westchester County between White Plains and Yonkers, and links Westchester to New York City.
- 14.4 mile long corridor.
- Major destinations include:
 - ✓ Downtown White Plains
 - ✓ Westchester County Center
 - ✓ Shopping areas along Central Avenue
 - ✓ Cross County Shopping Center
 - ✓ Yonkers Raceway
 - ✓ New York City Subway
 - ✓ Other Bee-Line routes



Central Avenue Corridor: 3 Bee-Line Bus Routes

- Route 20 (local) and 21 (limited) connect Westchester with the New York City subway and bus – approximately 30% of Bee-Line customers transfer.
- Route BxM4C (Westchester – Manhattan Express) links Westchester to Midtown and Lower Manhattan.
- 3.6 million annual riders.
- Average Route 20 daily weekday ridership approximately 12,000 riders – 10% of Bee-Line system ridership.



High Concentration of Residential, Retail and Commercial Development



- High density residential and retail uses provide opportunities to attract more riders.
- Underutilized or vacant properties have potential to be redeveloped.



Incomplete or narrow sidewalks and wide crossings are challenging for pedestrians



Traffic Signals and Bus Stops

- 71 bus stops in corridor, spaced approximately every 2/10 of a mile.
- 44 traffic signals along corridor, approximately every 3/10 of a mile.



Objective of the Central Avenue Bus Rapid Transit Assessment

To identify components of Bus Rapid Transit for the Central Avenue Corridor that will:

- Reduce travel times.
- Attract new riders.
- Improve mobility in corridor.
- Create an integrated and customer friendly transit service.
- Improve operating efficiency.

What is Bus Rapid Transit (BRT)?

- BRT is based on light-rail transit principles. It combines the most attractive features of light rail transit with the lower cost elements of bus technology.
- Instead of trains and tracks, BRT invests in improvements to vehicles, stations, operations, roadways, rights-of-way, intersections and traffic signals to speed up bus transit service.

Existing Conditions Analyses

In order to understand conditions along the Central Avenue corridor, the following analyses were conducted:

- Public involvement
- Bus ridership
- Traffic
- Travel time analysis
- Land use

Public Involvement

- Project website and newsletter created.
- Public Open House – June 26, 2007.
- On board customer survey – Fall 2007.
- Customer feedback.
 - ✓ All comments supported BRT service!
 - ✓ Want more Central Avenue corridor service.
 - ✓ Increase service hours.
 - ✓ More frequent and reliable service.
 - ✓ Strong support for BRT, particularly enhanced station amenities (shelters, seating and TVMs) and real time bus arrival signs.

Listening to our customers

- Surveyed Routes 20, 21 and BxM4C customers in Fall 2007.
- 567 survey responses.
- 53 questions.
- Purpose of survey was to know who rides, how customers like the service today and what customers want in the future.

Listening to our customers – at stations

On a 1 to 5 scale (5 most desired), customers want:

- Availability of bus schedules at bus stops 4.6
- Seating at bus stops 4.2
- Real time message signs at bus stops 4.2
- Ticket machines (cash, credit/debit/ATM card) 4.1
- Call boxes for emergency assistance 4.0
- Lighting 4.0
- Security cameras 3.8
- Bus maps 3.6
- Ticket machines accepting only CC/ATM cards 3.5
- Real time arrival info sent to cell phone/PDA 3.3
- Artwork 2.7
- Landscaping 2.6

Listening to our customers – on the bus

On a 1 to 5 scale (5 most desired), customers want:

- New buses 3.7
- Buses with more seats, less standing room 3.7
- Fare collection – board at any door 3.6
- Stylish, sleek looking buses 3.0
- Buses with less seats, more standing room 2.2

We've been using these results to identify ways to improve service!

Existing Conditions – Bus Ridership

- Accounts for more than 10% of the total system ridership (over 12,000 boardings on Routes 20 and 21).
- Approximately 30% of Central Avenue customers use Routes 20 and 21 to connect to the NYC subway.
- Between 2003 and 2007, Central Avenue bus services experienced the following:
 - Route 20 weekday boardings increased by 23%.
 - Route 21 weekday boardings increased by 11%.

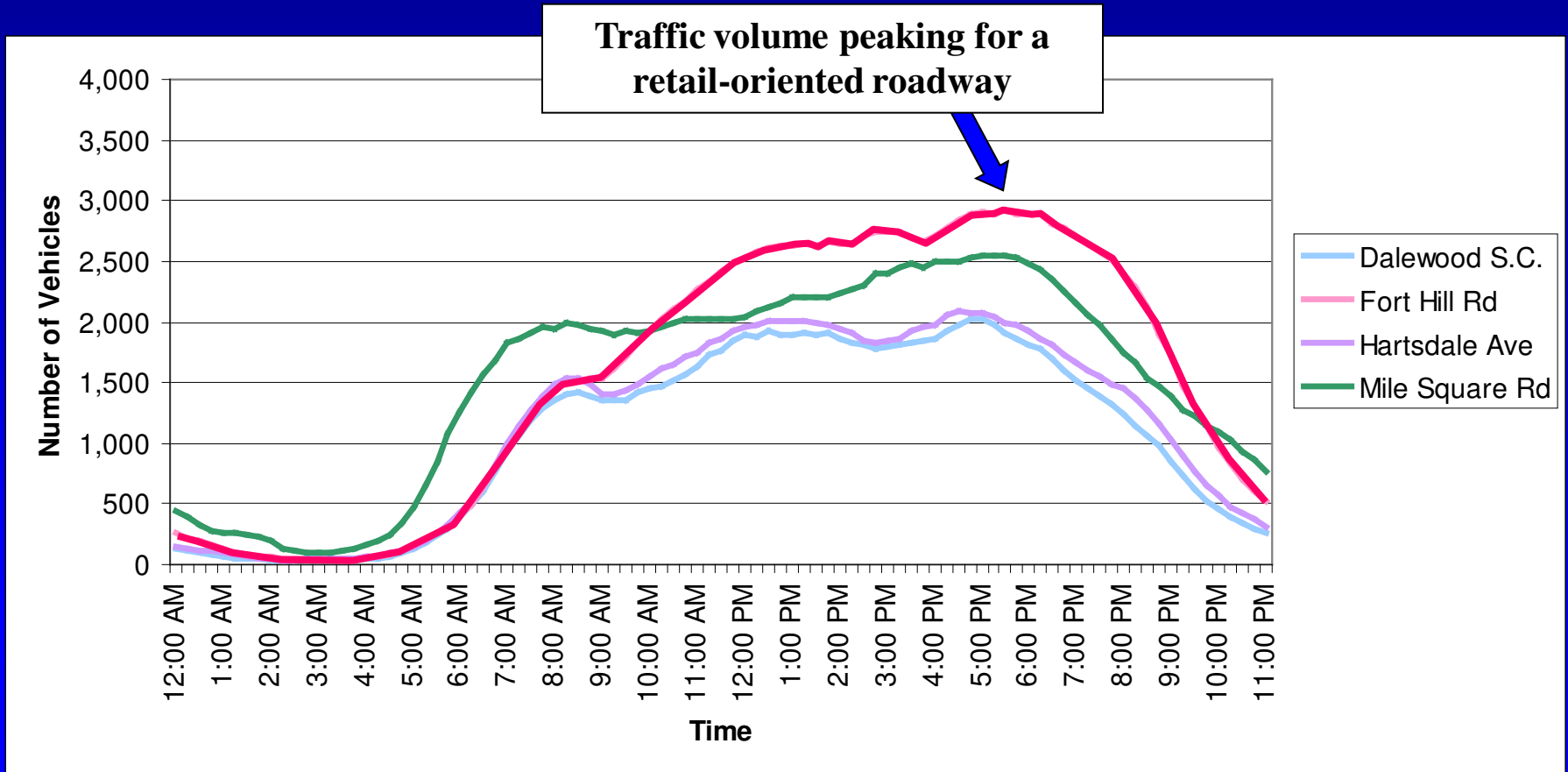
Existing Conditions – Bus Ridership

What caused ridership to increase between 2003 and 2007?

- Introduction of MetroCard (April 2007) allows for a one-fare ride from Westchester County to Manhattan.
- Opening of Empire City at Yonkers Raceway (October 2006).
- Growth in Downtown White Plains.

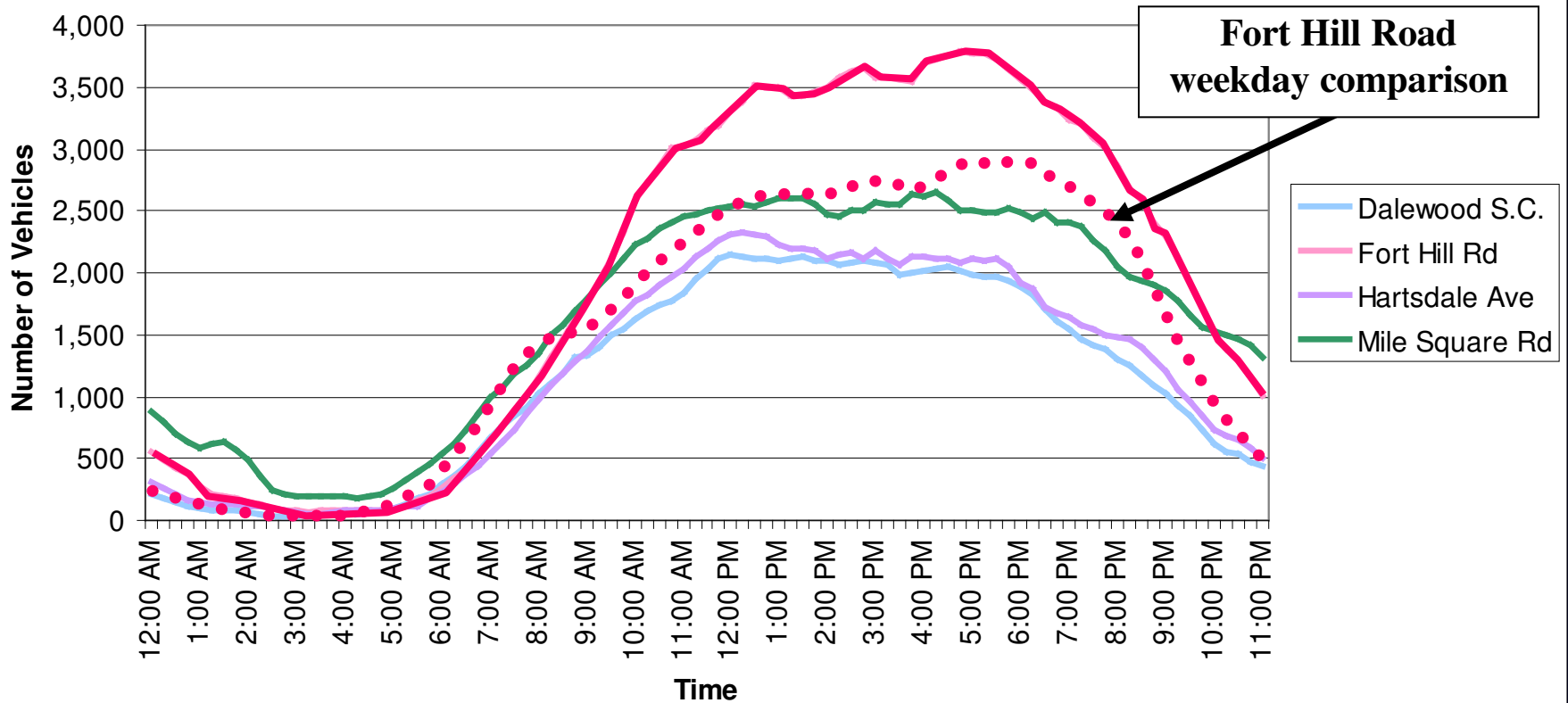
Existing Conditions - Traffic

Average Weekday Volumes



Existing Conditions - Traffic

Average Saturday Volumes



Existing Conditions – Travel Time Analysis

Why did we do this?

- To understand first hand how buses lose time traveling from route origin to terminal.
- To better understand the corridor as a customer.
- To develop targeted solutions that fit the unique characteristics of the corridor.

Existing Conditions – Travel Time Analysis

Today, how does a Central Avenue bus spend its time traveling from route origin to terminal?

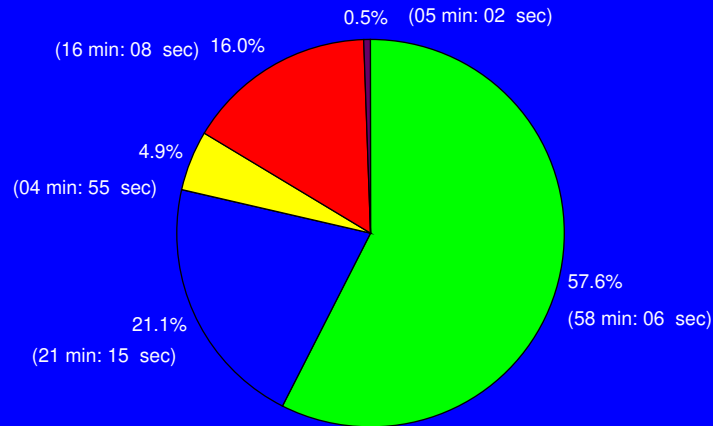
Five components of travel time:

- Operating speed. Run time from stop to stop.
- Dwell times at stops.
- Merging back into traffic lanes.
- Waiting for red signals.
- Miscellaneous delays (i.e., accidents, police action).

Existing Conditions – Travel Time Analysis

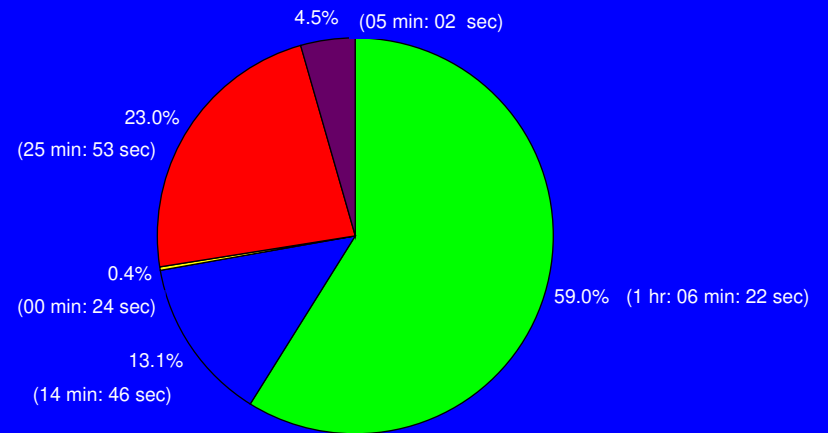
Findings

Midday Southbound Route 20



■ In Motion Time ■ Time at Bus Stops ■ Merge Time ■ Signal Delay ■ Other Delay

Saturday Midday Southbound Route 20



■ In Motion Time ■ Time at Bus Stops ■ Merge Time ■ Signal Delay ■ Other Delay

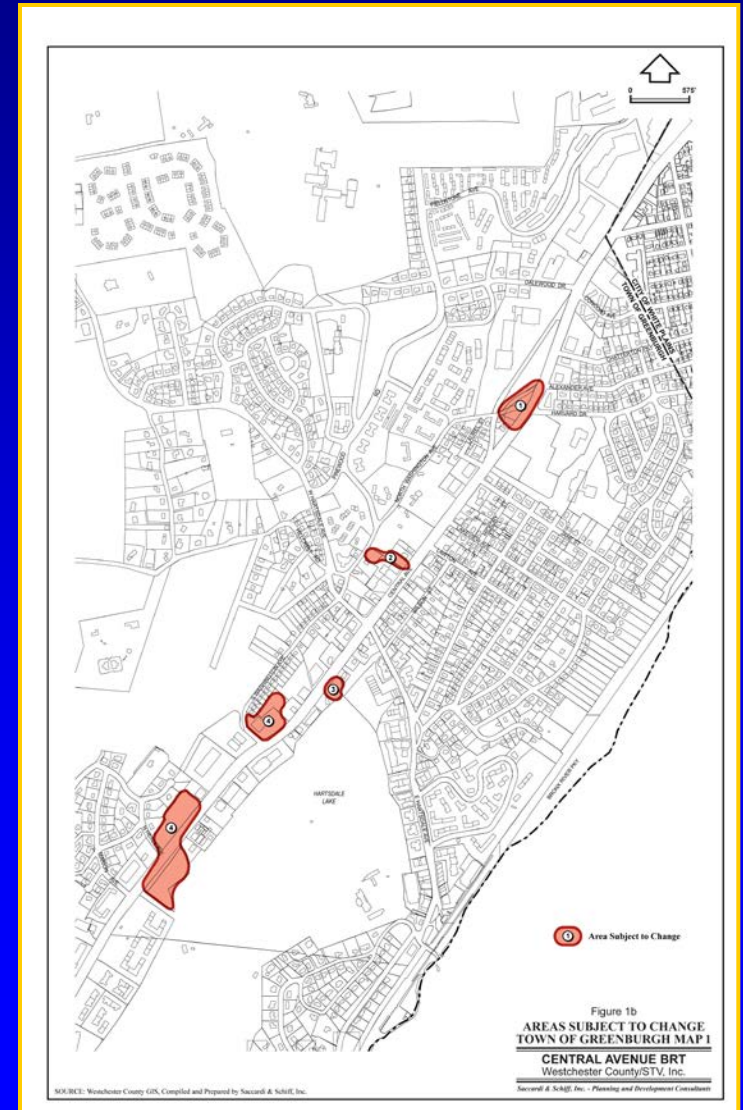
EXISTING CONDITIONS – Travel Time Analysis Findings

- Central Avenue is not a traditional “journey to work” corridor, but mainly a “retail corridor.”
- There is little congestion in the AM peak.
- Most congestion occurs during mid-days and the PM peak.

Existing Conditions – Land Use

BRT system design, especially station locations, is influenced by land use and zoning.

- Evaluated areas subject to change such as:
 - ✓ Vacant parcels
 - ✓ Underutilized properties
 - ✓ Proposed station areas
- Corridor has variety of land uses. Predominantly mixed commercial uses from White Plains to northern Yonkers. Mainly residential in southern Yonkers.



BRT Concepts for Central Avenue

- Faster operations.
- Intelligent Transportation Systems (ITS).
- Preferential lane treatments.
- Attractive stations with customer amenities.
- Stylized vehicles with low floor boarding.
- Access to stations.
- Faster fare collection.
- Strong brand identity.
- Transit-Oriented Development (TOD).

BRT Concepts for Central Avenue

Operations Solutions

- BRT service will run daily.
- BRT will operate every 10-15 minutes.
- Only 25 BRT stations on BRT route.
- Fewer stops means faster travel times.
- Free transfers between BRT and local buses. Existing free transfers to NYCT subways and buses remain.

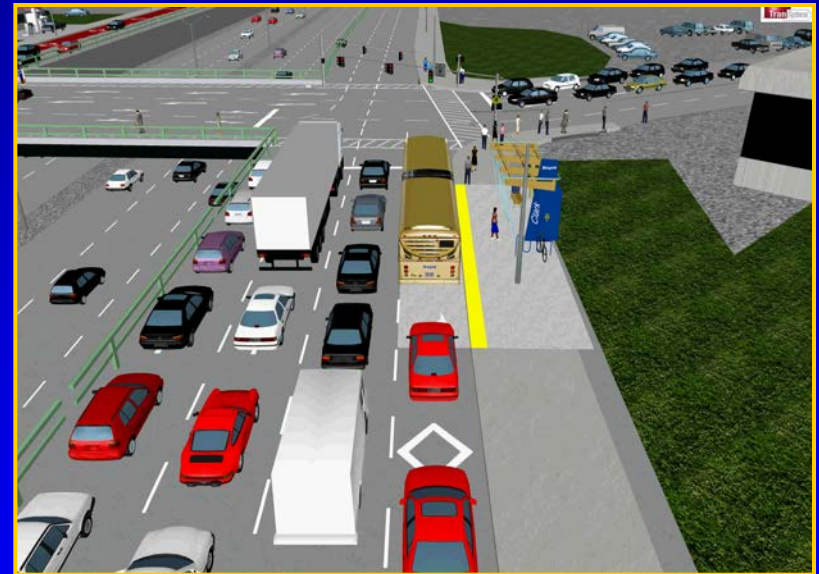
Route 20 Service

Stations	Route 20	BRT	Supp. BRT
Jerome Ave @ Bedford Park Blvd	●	●	●
Jerome Ave @ E Mosholu Pkwy	●	●	●
Jerome Ave @ E Gun Hill Rd	●	●	●
Jerome Ave @ Bainbridge Ave (Woodlawn Subway Station)	●	●	●
Jerome Ave @ E 233rd St	●	●	●
Central Park Ave @ DeLeon Ave	●	●	●
Central Park Ave @ McLean Ave	●	●	●
Central Park Ave @ Huntington Dr	●	●	●
Central Park Ave @ Hall Pl	●	●	●
Central Av @ Hillview Res Overpass	●	●	●
Central Park Ave @ Clark St	●	●	●
Central Park Ave @ Yonkers Ave	●	●	●
Central Park Ave @ Kettell Ave	●	●	●
Central Park Ave @ Mile Square Rd	●	●	●
Central Park Ave @ Mildred Ave	●	●	●
Cross County Shopping Ctr	●	●	●
Central Park Ave @ Midland Ave	●	●	●
Central Park Ave @ Rutland Rd	●	●	●
Central Park Ave @ Palmer Rd	●	●	●
Central Park Ave @ Arlington St	●	●	●
Central Park Av @ Library Overpass	●	●	●
Central Park Ave @ Yonkers Library	●	●	●
Central Park Ave @ Tuckahoe Rd	●	●	●
Central Park Ave @ Sadore La	●	●	●
Central Park Ave @ Ballot Dr	●	●	●
Central Park Ave @ Underhill St	●	●	●
Central Park Ave @ Melrose Ave	●	●	●
Central Park Ave @ Northrup Ave	●	●	●
Central Park Ave @ Verona Ave	●	●	●
Central Park Ave @ Chester Dr	●	●	●
Central Park Ave @ Alta Vista Dr	●	●	●
Central Park Ave @ Roxbury Dr	●	●	●
Central Park Ave @ Crisfield St	●	●	●
Central Park Ave @ Kohl Shopping Ctr	●	●	●
Central Park Ave @ E Fort Hill Rd	●	●	●
Central Park Av @ Burlington Coat	●	●	●
Central Park Av @ Central Plaza Shopping Ctr	●	●	●
Central Park Ave @ Clifton Rd	●	●	●
Central Park Av Opp Midway Shopping Ctr	●	●	●
Central Park Ave @ Ardsley Rd	●	●	●
Central Park Ave @ Henry St	●	●	●
Central Park Ave @ Mount Joy Ave	●	●	●
Central Park Av @ A & P Market	●	●	●
Central Park Ave @ Old Army Rd	●	●	●
Central Av @ European Health Spa	●	●	●
Central Park Ave @ Dromore Rd	●	●	●
Central Park Ave @ S Healy Ave	●	●	●
Central Park Av Opp Treasure Island	●	●	●
Central Park Ave @ Marion Ave	●	●	●
Central Park Av @ Global Gatherings	●	●	●
Central Park Ave @ S Washington Ave	●	●	●
Central Park Ave @ E Hartsdale Ave	●	●	●
Central Park Ave @ Lawton Ave	●	●	●
Central Park Ave @ Lakeview Ave	●	●	●
N Central Ave @ Jane St	●	●	●
Central Park Ave @ Harvard Dr	●	●	●
Central Park Ave @ Chatterton Pkwy	●	●	●
Central Park Ave @ Concord Ave	●	●	●
Central Ave @ Battle Ave	●	●	●
Central Av @ Vitamin Shoppe	●	●	●
Central Ave @ Chatterton Ave	●	●	●
Central Ave @ Harding Ave	●	●	●
White Plains TransCenter	●	●	●
Main St @ Galleria Mall	●	●	●
Main St @ Court St	●	●	●
Main St @ S Broadway	●	●	●

BRT Concepts for Central Avenue

ITS Treatments

- **Traffic Signal Priority** at most intersections except:
 - ✓ At those with split north/southbound signal phasing (e.g., Yonkers Ave and Tuckahoe Rd).
 - ✓ Side streets operating at or overcapacity during peak periods (i.e., Hartsdale Ave and Ardsley Rd).
 - ✓ Intersections with a high volume of bus movements on intersecting approaches (i.e., near TransCenter).
- **Queue Jumpers** at selected intersections that are wide enough for a queue jump lane (e.g., Hartsdale Avenue).



Signal priority and queue jumpers give BRT vehicles a head start over traffic.

BRT Concepts for Central Avenue

Preferential Roadway Treatments

- Exclusive lanes for BRT and other Bee-Line buses on Central Avenue.
- Reduce travel times by allowing buses to run faster and avoid other traffic.
- Could be implemented from Yonkers/Greenburgh line to Sadore Lane with minor parking impacts.



Rendering of proposed exclusive lane at Ft. Hill Road.

BRT Concepts for Central Avenue

Stations

- Stations are the gateway to BRT.
- Designed to provide both shelter and information to customers.
- At BRT stations, free transfers to Route 20 local bus.



Rendering of proposed BRT station at Fort Hill Road

BRT Concepts for Central Avenue

Vehicle solutions

- 60-foot vehicle offers higher passenger capacity.
- Low-floor vehicles paired with level platforms at stations speed boarding.
- 3 door vehicles and POP reduce time spent at stations.
- Light Rail Transit inspired design reinforces BRT's image as a premium service.



BRT Concepts for Central Avenue

Fare Collection

- Proof-of-payment (POP) system.
- Fares can be prepaid at station.
- Tickets purchased at Ticket Vending Machines (TVM).
- POP allows customers to board BRT vehicle using all available doors, reducing delays on vehicles.



Example of TVM for Los Angeles Orange Line BRT

BRT Concepts for Central Avenue

Strong brand identity

- Branding creates an image and identity that differentiates it from other existing transit services as a premium service.
- Branding elements may include:
 - ✓ Stations and vehicle design.
 - ✓ Passenger information systems (websites, schedules, and publicity materials).
 - ✓ Dedicated logos/color schemes.



Some examples of famous premium brands

BRT Concepts for Central Avenue

Transit Oriented Development (TOD) Solutions

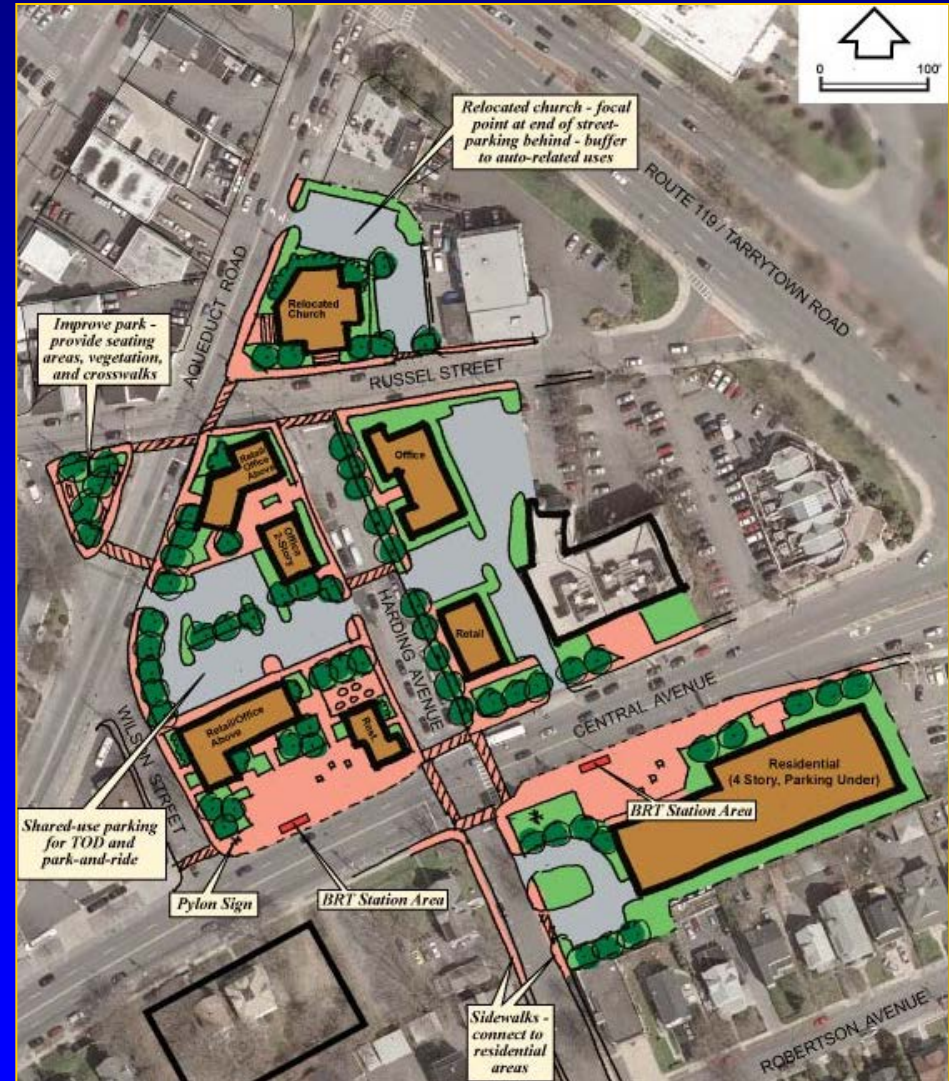
- 3 areas selected for conceptual TOD designs:
 - ✓ Harding Avenue in White Plains.
 - ✓ Former Barnes & Noble site in Greenburgh.
 - ✓ Former Yonkers Avenue Parking Garage in Yonkers.

- Identified opportunities/constraints and potential new uses at each site.

BRT Concepts for Central Avenue

TOD solution – Harding Avenue

- Mixed use residential, office and retail.
- Streetscape improvements to sidewalks and crosswalks.
- Possible park & ride.



Proposed TOD uses at Harding Avenue.

BRT Concepts for Central Avenue

TOD solution – Former Barnes & Noble site

- Mixed use residential, office and retail.
- Streetscape improvements to sidewalks and crosswalks.
- Possible park & ride.



Proposed TOD uses at former Barnes & Noble site.

BRT Concepts for Central Avenue

TOD Solution – Former Yonkers Avenue Parking Garage

- Mixed use hotel and retail.
- Improved streetscapes such as sidewalks, street trees and seating area.
- Possible park & ride.



Proposed TOD uses at former Yonkers Avenue parking garage site.

BRT Travel Time Savings

Solutions:

- Limited stops.
- Headway based dispatching.
- Transit priority (BRT lanes, queue jumpers, signal priority).
- Prepaid boarding (POP, all-door boarding, level or near level boarding).
- In-line station at Cross County Shopping Center.

Potential Time Savings Weekdays - Southbound direction

Time savings category	Low	Midpoint	High
Limited stop operation (fewer bus stops compared to Route 20)	3.00	6.00	9.00
Headway based dispatching (no intermediate timepoints)	1.00	2.00	3.00
Pre-paid, POP fare collection, all door boarding, level boarding	5.00	6.50	8.00
Transit priority: BRT lanes, queue jumpers, traffic signal priority	2.00	4.25	6.50
In-line Cross County Station - more direct Cross County shopping center routing – Southbound direction time savings	7.00	8.25	10.50
Time savings with In-line Cross County Station	18.00	27.00	37.00
Current Route 20 travel time:	63.00	75.50	88.00
BRT travel time:	45.00	48.50	51.00
% time savings	28.57%	35.76%	42.05%

Potential Time Savings Saturdays - Southbound direction

Time savings category	Low	Midpoint	High
Limited stop operation (fewer bus stops compared to Route 20)	3.00	6.00	9.00
Headway based dispatching (no intermediate timepoints)	1.00	2.00	3.00
Pre-paid, POP fare collection, all door boarding, level boarding	5.00	6.50	8.00
Transit priority: BRT lanes, queue jumpers, traffic signal priority	1.50	4.00	6.50
In-line Cross County Station - more direct Cross County shopping center routing – Southbound direction time savings	6.00	8.25	10.50
Total Time Savings	16.50	26.75	37.00
Current Route 20 travel time:	60.00	76.50	93.00
BRT travel time:	43.50	49.75	56.00
% time savings	27.50%	34.97%	39.78%

Findings

- Near term solutions can improve service.
- BRT is feasible on the Central Avenue corridor.
- BRT could offer travel time savings of 20 to 48 minutes per day.
- With BRT, ridership in corridor could increase by 35%.
- BRT can help change Westchester County's perception of bus travel.



BRT...it's about time!

Next Steps

- Review additional public comments received.
- Refine concepts as needed.
- Develop costs and phased implementation plan for appropriate BRT components.
- Develop final report.

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