Panel Discussion: Ticket to Ride
Bus Rapid Transit—Cleveland, San Francisco, New York, and Chicago

June 6, 2012

With support from:

Rockefeller Foundation
Innovation for the Next 100 Years
Follow us on Facebook or Twitter.

Tweet your comments to #BRTChicago
http://chicagotonight.wttw.com/2012/03/28/mexico-city%E2%80%99s-bus-rapid-transit-system
Greater Cleveland Regional Transit Authority

Joe Calabrese – General Manager
RTA Fleet
HealthLine
RTA’s Newest “Rapid”
Euclid Avenue History

- Streetcars disappeared in 1954
- #6 Bus Route put in service to connect the two major employment hubs
  - Great Service but not attractive to the "choice rider"
- Alternative Analysis
  - Subway or Light Rail
  - Do Nothing (keep the #6 bus)
  - Bus Rapid Transit (BRT)
Mode Selection Criteria

- Capacity (30,000 + daily customers)
- Connectivity
- Funding possibilities (FTA)
- Cost
  - Capital
  - Operating
- Economic development potential
- BRT Selected by Region
Branding of BRT

- “Better” Rapid Transit
  - Best characteristics of rail
    - Permanence
    - Image
    - Service level
  - Best characteristics of a bus
    - Flexibility
    - Lower Costs
Rail-Like Image ("Silver Line")

- Rail service on rubber tires
  - Fast
  - Simple
  - Safe
  - First Class
Euclid Corridor Project – 9.38 Miles

- 36 stations
- Travel time from 28 to 40 minutes
- Building face to building face
- Pedestrian friendly with bike lanes
- Landscape/hardscape treatment
  - 1,500 trees with irrigation
- Integrated/stand-alone public art
Funding Pie Charts - $200 Million

2000

FTA 80%

ODOT 20%

2004

FTA 50%

ODOT 25%

City

MPO

RTA
Faster Travel Times

Higher Speeds
- Exclusive Right-of-Way
  - Higher Travel Speed Limit
- Traffic Signal Prioritization

Shorter Stops
- Precision Docking
- Level Boarding “Stations”
- Off Board Fare Collection
“Rail-Like” Service and Image

- Hi-Frequency Service
  - 24x7
  - Peak every 5 minutes
  - Off-Peak every 8 to 15 minutes

- Rapid Transit Vehicles (RTV’s)
  - Train on Rubber Tires

- Use of latest technology
Level Boarding Bridge-Plates
Off Board Fare Collection
Fare Enforcement
Real Time Information

Healthline to Loy
Depart 4:24
Emergency Call Boxes
Cameras at Stations
Cameras on Vehicles

NOTICE
This vehicle is Under electronic Surveillance.
Downtown Station Design
Median Station Design
New Vehicle Design
New Vehicle Design
New Flyer Rapid Transit Vehicle "RTV"
Landscaping and Public Art
Landscaping
Branding The HealthLine

It's not a bus. It's not a train. It's the future.

Euclid Corridor Project
It's going to move you
Branding The HealthLine

$2.3 billion in business development.

Euclid Corridor Project
It’s going to move you
Economic Development
More than an RTA Project

- Economic Development success was achieved through the action of others leveraging RTA’s investment
The Rebirth

Josh Cribbs isn't supposed to be in the Pro Bowl, but don't tell him that.

Our presidential picks

Ah, the spa

where to pamper yourself this year

More than $507
in services

The renaissance

Euclid Corridor project has already brought
$43.3 billion in new investment to the city

The rebirth

Euclid Corridor has already brought
$43.3 billion in new investment to the city
Tracy Nichols - Director

City of Cleveland
Economic Development
Dick Pace - Principal

Cumberland Development LLC
Ari Maron - President

MRN & Associates
Branding - Naming Rights Agreement
HealthLine Ridership - 60% + increase

- 2009: 3,600,000
- 2010: 3,800,000
- 2011: 4,000,000
“HealthLine” Success
“HealthLine” Success
2010 ACEC Award

American Council of Engineering Companies

2010 Grand Award
Other HealthLine Award

Urban Land Institute

ULI 2011 Award for Excellence
“I can’t stress enough the importance of healthy arteries. The entire system depends on them to function properly. In some cases, a complete reconstruction is necessary to ensure a healthier future.”

Dr. Toby Cosgrove
Heart Surgeon/CEO, The Cleveland Clinic
Select Bus Service on the M15 in New York City:

A BRT Partnership Between
New York City DOT and MTA New York City Transit
Background

• MTA New York City Transit:
  – Operator of New York City’s public transit system
  – Part of Metropolitan Transportation Authority (New York State)
  – Over 5.2 million subway and 2.3 million bus trips per day

• New York City Department of Transportation:
  – Operator of New York City’s 6,000 miles of streets, 787 free bridges, 12,000 traffic lights, and the Staten Island Ferry

• Agency partnership key to project success
NYC has the highest bus ridership in the US, but slow bus speeds
Bus speeds have been slowing down, and bus ridership has stagnated even as subway ridership has grown

First Avenue/Second Avenue selected for BRT as part of citywide study of routes with most benefits, compatibility
M15 Corridor

• Over 54,000 weekday riders

• Within ¼ mile:
  • 537,000 residents
  • 78% of households—No car
  • 57% of residents commute by transit

• Lexington Avenue subway is a long walk – and is at capacity

• Avenues key part of citywide bicycle master plan
Sources of Bus Delay: M15

- Dwell Time: 22%
- Stop Delays: 21%
- In Motion Time: 54%
- Other Delays: 3%
M15 SBS: Features
M15 SBS: Bus Lanes

- "Offset" bus lanes used where possible
  - In effect 24/7
  - Parking/loading retained along curb
- Curbside bus lanes used where traffic is heavier
  - In effect 7am-10am, 2pm-7pm M-F
  - Commercial loading windows provided mid-day
- High visibility treatments used
  - Red paint
  - Overhead signage
M15 SBS: Bus Lanes
M15 SBS: Bus Lane Enforcement

- Bus Lane Video Cameras
- Additional NYPD Enforcement
- Extensive Education Campaign
M15 SBS: Off-Board Fare Collection
M15 SBS Performance: Ridership

36% increase from former Limited to SBS

5,000 new M15 trips per day

Bus ridership in Manhattan down 5% overall
M15 SBS Performance: Ridership

![Graph showing M15 Ridership Change and Manhattan Ridership Change from November 2010 to October 2011. The graph indicates fluctuations in ridership throughout the year with comparisons to the previous year.]
M15 SBS Performance: Travel Time

M15 Limited vs. M15 SBS

SBS 12 minutes (15%) faster than Limited
M15 SBS Performance: Traffic

Roadway speeds measured using GPS devices in in-service yellow taxis, for trips beginning and ending on First Avenue or Second Avenue.

Evaluation showed minimal changes in traffic speeds.

Traffic volumes also showed minimal changes.

Figure 12: Average Speeds from Taxi GPS data on First Avenue.

Average Speeds on Second Avenue.
Lessons Learned: Planning Process

• Good design can accommodate more street activity than existing conditions. Plan for all street users.
• Important to bring in stakeholders early in the process.
• “Community Advisory Committee” can help bring all parties to the table, so everyone can hear everyone’s comments.
• Business support is important on retail corridors.
Lessons Learned: Implementation

• Short implementation timeframes!
• Keep the public informed
• Agency Partnership key
• Customer ambassadors crucial.
• Red paint and overhead signs support bus lane compliance.
• Automated enforcement important.
Next Steps for BRT in NYC

• Finish Phase I Routes:
  – 34th Street (Nov 2011)
  – Hylan Blvd (9-2-12)
  – Nostrand/Rogers SBS
• Webster Avenue SBS
• LaGuardia Airport SBS
• TSP extended citywide
Van Ness Avenue
Bus Rapid Transit (BRT)

Chicago Architecture Foundation
06.06.12
San Francisco – Regional Transit Hub

- Rail does not go to north side of city
- BRT network proposed to fill in rail gap...
  ...and support local “rapid” + regional bus service
Van Ness Avenue – Existing Conditions

- **2 mile corridor**
  - Transit trunkway that carries multiple local and regional bus routes

- **US 101 in San Francisco**
  - 93’ wide, including 14’ median
  - 80,000 daily motorized person-trips
    - 20% transit motorized mode share

- Multiple agency jurisdiction/coordination
Project Purpose and Need

- Improve transit reliability, speed, connectivity and comfort
  - Separate autos from transit
  - Reduce delays associated with loading and unloading, and traffic signals
- Improve pedestrian comfort, amenities, and safety
- Enhance urban design and identity of Van Ness Avenue
- Accommodate safe multimodal circulation and access within the corridor

Frequencies of Muni 47/49 at Market Street
Alternative 2 – Side BRT Lanes

- OCS Pole / Streetlight replacement
- Branded Vehicles with level, all-door loading
- Transit Signal Priority
- Dedicated Bus Lanes
- High Quality Station Platforms
- Pedestrian Safety Treatments
Alternative 3 – Center BRT Lanes with Right Side Loading / Dual Medians
Alternative 4 – Center BRT Lanes with Left Side Loading / Center Median

- Vehicles have doors on both sides
Center BRT Best Meets Project Purpose and Need

- Design Option B has nearly twice the travel time savings and reliability benefits as Side BRT (Alternative 2)
  - 33% travel time savings
  - 50% reliability improvements
  - 35% ridership increase

- Nearly 3:1 public preference for Center BRT vs. Side
LPA Recommendation: Center-Running BRT with Right Side Loading/Center Median and Limited Left Turns

Graphic not to scale: for planning purposes only
Lessons Learned - Gold Standard BRT Is Challenging (but worth it)

- Need more proofs of concept for dense North American urban environments
- Some stakeholders want more (e.g., light rail) while others want less (e.g., everything but the dedicated lane)
- Cost and timeliness benefits tend to be during construction, not planning
- Whole is greater than sum of parts
  - Must maintain vision: danger of “scope attrition” rather than “scope creep”
Thank You!

www.vannessbrt.org
vannessbrt@sfcta.org
Chicago Architecture Foundation
Bus Rapid Transit
Chicago Architecture Foundation
Bus Rapid Transit
Chicago’s Approach to BRT

Goals
- Eliminate Bus Slow Zones – Make short and long-term investments in heavily traveled bus corridors to support more efficient and cost effective bus network
- Forward Compatible Investment – Make short-term improvements that can be built into long-term investments
- Implement Complete Streets – Rebalance streets to accommodate all modes safely and efficiently
- Grow ridership on the bus network

Short-Term Improvements
- Coordinate targeted bus lane pilot on Western and Ashland
- Transit Signal Priority
- Test BRT elements on Jeffery corridor
- Implement full BRT in loop between Ogilvie and Michigan Ave
- All improvements designed forward compatible

Long-Term Vision
- Develop citywide BRT plan
- Modular and incremental improvements built as funding permits
- Develop branded services and concept of third mode L, Bus, and BRT
Benefits of BRT

Riders
- 26% of Chicago households do not own cars
- Implement City’s Complete Streets Policy: Design roadway to accommodate all users
- Improves speed and reliability – critical to holding a job, particularly hourly workers
- Improves customer experience, neighborhood-focused

Efficient Use of Capital Dollars
- Modular and incremental investments allow use of more flexible sources (CMAQ, STP, etc)
- Improvements focused on pinch points – bus “slow zones”
- Allows short-term improvements and a steady investment in the corridor as different funding sources become available

Efficient Operations
- Establish minimum service standards
- Speed and reliability improvements will flow directly to bottom line through reduced operating expenditures
Chicago’s first BRT Route

- **Project Need:** Faster, more reliable service on local leg of well-used route that runs express to CBD via Lake Shore Drive
- **Status:** Currently in Final Design
- **Funding:** $11 million FTA Bus and Bus Facilities (5309) grant
- **Schedule:** Construction this Summer-Fall 2012.
- **Key Elements:**
  - Rush Hour Bus Lanes from 67th to 83rd Street
    - 7-9 AM Northbound and 4-6 PM Southbound
  - Transit Signal Priority (TSP) between 73rd–84th Streets (the longest section in Chicago)
  - Bus queue jump at 84th Street and Jeffery Boulevard (first queue jump in Chicago)
  - Enhanced CTA buses with unique branding and internal LED Bus Tracker screens
  - New and upgraded bus shelters with lighting and LED Bus Tracker screens
  - New street furniture and signage
Jeffery BRT

Estimated / Modeled Travel Times

<table>
<thead>
<tr>
<th>Route # 14 Actual Travel Time</th>
<th>Northbound Midday</th>
<th>Southbound Midday</th>
<th>Northbound Off Peak (with dedicated lanes)</th>
<th>Southbound Off Peak (with dedicated lanes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>71:33</td>
<td>66:54</td>
<td>62:54</td>
<td>70:40</td>
<td></td>
</tr>
<tr>
<td>BRT Estimated Travel Time</td>
<td>64:54</td>
<td>63:57</td>
<td>62:33</td>
<td>65:34</td>
</tr>
<tr>
<td>Average Travel Time Savings</td>
<td>6:30</td>
<td>2:58</td>
<td>3:21</td>
<td>5:25</td>
</tr>
<tr>
<td>% Saved per Trip</td>
<td>9.3%</td>
<td>4.4%</td>
<td>5.3%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Route # 14 Actual Travel Time</th>
<th>Northbound Midday</th>
<th>Southbound Midday</th>
<th>Northbound Off Peak (with dedicated lanes)</th>
<th>Southbound Off Peak (with dedicated lanes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:43</td>
<td>12:14</td>
<td>13:00</td>
<td>14:08</td>
<td></td>
</tr>
<tr>
<td>BRT Estimated Travel Time</td>
<td>9:50</td>
<td>10:53</td>
<td>11:38</td>
<td>10:17</td>
</tr>
<tr>
<td>Average Travel Time Savings</td>
<td>4:04</td>
<td>1:21</td>
<td>1:41</td>
<td>3:49</td>
</tr>
<tr>
<td>% Saved per Trip</td>
<td>26.0%</td>
<td>11.0%</td>
<td>12.9%</td>
<td>27.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Route # 14 Actual Travel Time</th>
<th>Northbound Midday</th>
<th>Southbound Midday</th>
<th>Northbound Off Peak (with dedicated lanes)</th>
<th>Southbound Off Peak (with dedicated lanes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24:56</td>
<td>23:56</td>
<td>15:11</td>
<td>16:10</td>
<td></td>
</tr>
<tr>
<td>Average Travel Time Savings</td>
<td>2:35</td>
<td>1:37</td>
<td>1:40</td>
<td>1:31</td>
</tr>
<tr>
<td>% Saved per Trip</td>
<td>10.4%</td>
<td>6.7%</td>
<td>11.0%</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

Nonstop between 67th/Jeffery and 11th/Columbus
Central Loop BRT
Union Station to Navy Pier

- **Project Need:**
  - Provide high-quality, high-capacity transit service connecting Union Station to the Loop to River North/Streeterville

- **Status:** Design

- **Funding Sources:**
  - $24.6M Federal Grant (Urban Circulator)
  - $4.7 M Federal Grant (CMAQ for terminal)
  - $7.3 M in TIF

- **Schedule:**
  - Complete design in Summer 2013
  - Complete construction by late Fall 2014

- **Key Elements:**
  - Dedicated bus lanes on Washington and Madison; colored pavement to increase awareness of bus lane
  - Protected bike lane on Washington
  - New off-street bus terminal at Union Station
Traffic Stats

Daily Volumes

<table>
<thead>
<tr>
<th></th>
<th>Vehicles</th>
<th>Pedestrians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>14,000</td>
<td>27,000</td>
</tr>
<tr>
<td>Madison</td>
<td>11,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Canal</td>
<td>11,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Clinton</td>
<td>4,000</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Traffic Facts

- Cars and trucks represent 64% of the traffic mix but only carry 37% of the total trips made by people across the Loop. Taxicabs are similar, being 28% of the traffic mix while carrying only 14% of trips.
- Because a single bus can carry so many people, while buses are only 4% of the total traffic mix they carry 47% of the trips made by people across the Loop in vehicles – a much more efficient means of travel.
- BRT improvements could improve overall bus travel times through the Central Loop corridor roadways by 3 to 9 minutes.
- BRT improvements such as dedicated lanes could reduce bus-related crashes by over 50%.
Central Loop: Total round-trip travel time benefit

Net average user benefit
(47% Bus; 51% Car/Taxi)

Option 1: +1.41 min
Option 2: +2.76 min
Option 3: +3.11 min
Western/Ashland Corridors BRT

- **Project Need:** Improve service on high-ridership bus corridor, opportunity to implement a new substantial cross-town, north-south transitways west of the central business district
- **Status:** Alternatives Analysis
- **Funding Sources:** $1.6 Million FTA Bus Livability Alternatives Analysis
- **Schedule:** Alternatives Analysis through 2012, future phases dependent on funding availability
- **Key Elements:**
  - Includes a 21-mile linear corridor on Western and Ashland
  - Studying options for near-term improvements.
  - Design to be determined
  - Wide ROW corridor provides potential to implement substantial improvements
Western/Ashland Corridors BRT
Potential Future Projects
- Downtown:
  - Extending Central Loop to Navy Pier
  - East-west connection north of river
  - North-south route on lakefront
- Lakefront:
  - North Lakeshore Drive Phase I (CDOT) for reconstruction of North Lakeshore Drive
  - Lakefront AA (CTA) evaluating transit improvements for feeder routes onto North and South LSD (Jeffery-style improvements)
- Rest of City:
  - System plan to evaluate other high-priority bus corridors

System Plan Scope
- Network of BRT lines
- Modular/incremental investment plan
- Financial plan
- Implementation Plan
Follow us on Facebook or Twitter.

Tweet your comments to #BRTChicago