Greater Cleveland Regional Transit Authority

Transit System Developments
Ohio Transportation Engineering Conference
October 2015
Greater Cleveland RTA Overview

- Service Area Pop.: 1.5 million
- Annual Operating Budget: $255 million (2015)
- $77 million Annual Capital Budget (2015)
- 2,300 Employees
East 79th Street Station Land Use Plan

- 2014 Analysis examined potential closing of low-ridership stations
- 300 daily riders
- $15 million replacement cost
- ADA Requirement
East 79th Street Station Land Use Plan

- Analyzed transit system, land use and proposed development
- Conducted extensive outreach with stakeholders, transit users, residents

Greater Cleveland Regional Transit Authority
East 79th Street Station Land Use Plan

- Conclusion: Refurbish Red Line Station
  - Stakeholder and resident opposition to closing
  - Inconvenience for many existing riders
East 79th Street Station Land Use Plan

- Proposed city land use plan *reduced* area density
- City of Cleveland, area community development group committed to reinvestment
East 79th Street Station Land Use Plan

- City, RTA developing Station Area Plan
- Station area plan will help insure that new development from Opportunity Corridor is Transit-Supportive
Challenges

- More than $200 million in unfunded capital needs (state of good repair on existing infrastructure).
- Excludes replacement of all rail cars—RTA’s is the oldest rail fleet in the US.
What is the purpose and need?

**Purpose:**

- Provide more travel choices
- Improve access, mobility and connectivity
- Provide faster, more-reliable public transit services
- Support redevelopment and channel new development

**Need:**

- Population and employment migration
- Increasing suburbanization in the study area
- Decreasing access to public transit network
- Increasing vehicle trips
- Increasing congestion
- Lack of reliable travel times
Why improve public transport?

- Reduce Congestion
- Conserve Energy
- Improve Environment
- Increase Choices
Alternatives
Alternative B (Heavy Rail Transit/DMU)

PROPOSED RTA RED LINE/HEALTHLINE EXTENSION
ALTERNATIVE B

LEGEND

Euclid Park-N-Ride

ROUTE LENGTH = 5.72 MILES
Alternative E (Bus Rapid Transit)

East 300th Street / Shoregate Shopping Center
Alternative G (Bus Rapid Transit)

East 300th Street / Shoregate Shopping Center
Catalyst for redevelopment
TOD: What Do We Mean?

Patterns of land use and development that feature:

• Transit-supportive density within walking or shuttle distance
• Mixed-use station areas or corridors
• A safe, walkable environment
• Adapting the model to industrial employment centers
A Catalyst for Redevelopment

Why is transit-oriented development (TOD) so important?

- Increases ridership and revenue for RTA
- Stimulates sustainable, thriving communities
- Enhances value capture opportunities to fund the project
- Improves chances of FTA New Starts/Small Starts funding
More simply put:

Transit Investment

Returns to Community

Economic Benefits
TOD Choices Couldn’t Be More Different

Red Line Extension

- Several *stations*
- A swath of industrial land with job destinations but poor connectivity

HealthLine BRT Alternatives

- Several *corridors*
- In the fabric of downtown Euclid, neighborhoods, lakeshore, industry
Urban Fabric Analysis

Red Line/HealthLine Extension Major Transportation Improvement Analysis
Urban Fabric Analysis
Urban Fabric: BRT Extension

- How do Euclid Ave., Lakeshore Blvd., St. Clair Ave., and the connecting streets compare to the HealthLine median corridor?

- Can they accommodate:
  - Distinctive stations?
  - BRT running ways?
  - BRT on a complete street?
Euclid Avenue Cross Section (Downtown)
St. Clair Avenue at East 156th Street
Urban Fabric: Red Line Extension

- Station spacing and location

- Pedestrian connectivity:
  - station design concept
  - horizontal and vertical connections
  - Is there something to connect to?

- Industrial land:
  - Land recycling opportunities vs. active employment centers
  - Is there a concerted public policy to recycle and reposition?

- Last-mile shuttle connections
Drilling Down: GIS, Babbitt (Euclid)
Drilling Down: GIS, Five Points (Collinwood)
Drilling Down: Euclid Ave. (East Cleveland)
A TOD Vision for Red Line Extension

Boston MBTA Assembly Square: heavy rail infill station, 65-acre industrial brownfield transformed by transit-oriented development
A TOD Vision for Bus Rapid Transit

York “VIVA” BRT: multiple corridors, complete streets, TOD plans and policies, a new downtown
Vision – Euclid Avenue at Noble Road
The Business Case
Our objective: Provide an unbiased assessment of transit alternatives resulting in consensus for a preferred alternative.
FTA New Starts Project Evaluation Rating

Summary Rating

Project Justification Rating (50%)
- Environmental Benefits (16.66%)
- Cost Effectiveness (16.66%)
- Land Use (16.66%)

Financial Rating (50%)
- Current Conditions (25%)
- Commitment of Funds (25%)
- Reliability/ Capacity (50%)

Cost Effectiveness (16.66%)
- Mobility Improvements (16.66%)
- Economic Development (16.66%)

Environmental Benefits (16.66%)
- Congestion Relief (16.66%)
Alternatives Evaluation Criteria for Tier 2

- Cost Effectiveness
  - Capital and operating costs
  - Ridership
  - Cost per trip

- Mobility Improvements
  - Reduction in auto VMT
  - Trips per zero car household

- Land Use
  - Urban Fabric analysis
  - Current land use plans

- Economic Development
  - Market Assessment
  - Redevelopment potential
### Cost Effectiveness

**Annual capital and operating cost per trip.**

**Number of trips is not an incremental measure but simply the total estimated trips.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are we measuring?</td>
<td>Total annualized cost per project boarding</td>
</tr>
<tr>
<td>What are the sources?</td>
<td>FTA national transit model STOPS</td>
</tr>
<tr>
<td>Reporting methods</td>
<td>FTA standardized cost category workbook&lt;br&gt;Cost effectiveness template</td>
</tr>
<tr>
<td>How did FTA determine rating breakpoints?</td>
<td>Sampling of recent New Start project data.</td>
</tr>
</tbody>
</table>
## Cost Effectiveness Index Values

<table>
<thead>
<tr>
<th>Features</th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminus</td>
<td>Babbitt Road</td>
<td>East 260th Street</td>
<td>East 260th Street</td>
</tr>
<tr>
<td>Technology</td>
<td>HRT, DMU</td>
<td>Rapid + BRT, BRT Lite, BRT</td>
<td>Rapid + BRT, BRT Lite, BRT</td>
</tr>
<tr>
<td>Route Miles</td>
<td>6.5</td>
<td>8.8</td>
<td>8.7</td>
</tr>
</tbody>
</table>

### Cost Expenditures ($ millions)

<table>
<thead>
<tr>
<th></th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPEX</td>
<td>$917</td>
<td>$745</td>
<td>$745</td>
</tr>
<tr>
<td>Annualized CAPEX</td>
<td>$25.8</td>
<td>$30.7</td>
<td>$30.7</td>
</tr>
<tr>
<td>Annualized OPEX</td>
<td>$11.9</td>
<td>$16.3</td>
<td>$16.3</td>
</tr>
<tr>
<td>Annualized Total</td>
<td>$37.7</td>
<td>$47.0</td>
<td>$47.0</td>
</tr>
</tbody>
</table>

### Ridership

<table>
<thead>
<tr>
<th></th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>13,400</td>
<td>8,800</td>
<td>9,000</td>
</tr>
<tr>
<td>Annual (000)</td>
<td>4,020</td>
<td>2,640</td>
<td>2,700</td>
</tr>
</tbody>
</table>

### Cost Effectiveness (Annualized Cost per Trip)

<table>
<thead>
<tr>
<th></th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per Trip</td>
<td>$9.41</td>
<td>$17.83</td>
<td>$17.64</td>
</tr>
</tbody>
</table>

### Notes

- HRT: Hybrid Rapid Transit
- DMU: Diesel Multi-Unit
- BRT Lite: BRT Light
- BRT: Bus Rapid Transit

*Image of a bus in the bottom right corner.*
### Mobility Improvements

Total Number of Linked Trips using the proposed project, with a weight of two given to trips by transit dependent people. Reductions in daily automobile miles traveled.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are we measuring?</td>
<td>Total “project boardings” with weighting of transit dependent trips. Reductions in daily automobile miles traveled (VMT)</td>
</tr>
<tr>
<td>What are the sources?</td>
<td>Local transit model or STOPS</td>
</tr>
<tr>
<td>Reporting methods</td>
<td>Travel forecast template; mobility template</td>
</tr>
</tbody>
</table>
## Reduced Automobile Vehicle Miles Traveled

<table>
<thead>
<tr>
<th></th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HRT</td>
<td>DMU</td>
<td>Rapid+</td>
</tr>
<tr>
<td><strong>Route Miles</strong></td>
<td>6.5</td>
<td>6.5</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>Average Daily Riders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily trips on project</td>
<td>13,400</td>
<td>8,200</td>
<td>8,800</td>
</tr>
<tr>
<td>New transit trips</td>
<td>11,100</td>
<td>5,600</td>
<td>3,300</td>
</tr>
<tr>
<td><strong>Average Daily Reductions in Automobile Miles Traveled (VMT)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily auto VMT</td>
<td>(75,200)</td>
<td>(45,900)</td>
<td>(23,100)</td>
</tr>
</tbody>
</table>
## Mobility Improvements

<table>
<thead>
<tr>
<th></th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Route Miles</strong></td>
<td>HRT: 6.5</td>
<td>Rapid+: 7.4</td>
<td>Rapid+: 7.3</td>
</tr>
<tr>
<td></td>
<td>DMU: 6.5</td>
<td>BRT: 10.4</td>
<td>BRT: 10.3</td>
</tr>
<tr>
<td><strong>Zero Car Households</strong></td>
<td>525</td>
<td>904</td>
<td>862</td>
</tr>
<tr>
<td></td>
<td>525</td>
<td>924</td>
<td>882</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility Improvements</th>
<th>Alternative B</th>
<th>Alternative E</th>
<th>Alternative G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily trips on project</strong></td>
<td>13,400</td>
<td>8,200</td>
<td>9,000</td>
</tr>
<tr>
<td><strong>% trips from zero car households</strong></td>
<td>33%</td>
<td>41%</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Transit dependent trips</strong></td>
<td>4,422</td>
<td>3,608</td>
<td>3,400</td>
</tr>
<tr>
<td><strong>Weighted trips</strong></td>
<td>8,844</td>
<td>7,216</td>
<td>6,800</td>
</tr>
<tr>
<td><strong>Non-transit dependent trips</strong></td>
<td>8,978</td>
<td>5,192</td>
<td>5,100</td>
</tr>
<tr>
<td><strong>Total Daily Weighted trips</strong></td>
<td>17,822</td>
<td>12,408</td>
<td>11,900</td>
</tr>
<tr>
<td><strong>Annualized mobility improvements (000)</strong></td>
<td><strong>5,346,600</strong></td>
<td>3,722,400</td>
<td>3,570,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4,200,000</td>
<td>4,336,800</td>
</tr>
</tbody>
</table>
Examination of the existing corridor and station area development, character, and affordability housing.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are we measuring?</td>
<td>Number of legally binding affordable housing units. Density of population and employment within ½-mile of stations.</td>
</tr>
<tr>
<td>What are the sources?</td>
<td>Census data; affordable housing policies</td>
</tr>
<tr>
<td>Reporting methods</td>
<td>• Land Use Template (Quantitative)</td>
</tr>
<tr>
<td></td>
<td>• Table of quantitative data on land use characteristics</td>
</tr>
<tr>
<td></td>
<td>• Supporting documentation to substantiate statements made in the template.</td>
</tr>
</tbody>
</table>
Benefits of Investments in Public Transit

**Direct Benefits**
- Mobility improvements
- Travel time savings
- Cost savings
- Transportation system efficiency
- Accident reduction
- Energy savings
- Environmental quality improves

**Indirect Benefits**
- Increased economic activity
- Increased competitiveness
- Productivity improvements
- Land-use patterns change
- Property values increase
- Residual impacts
- Residual community amenity
Summary Evaluation

- **Alternative B**
  - DMU option is not cost-effective.
  - HRT option provides significant mobility benefits
  - HRT option *medium* rating for cost-effectiveness without right-of-way costs.
  - HRT costs twice as much as the BRT options and is less cost effective.

- **Alternative E**
  - Rapid+ option is not cost effective.
  - BRT option has fewer mobility benefits than Alternative B.
  - BRT option would qualify for a *medium* rating for cost-effectiveness.
  - Satisfies statutory requirement for dedicated transit lanes.
  - Future "transit village" development.

- **Alternative G**
  - Rapid+ option is not cost effective.
  - BRT option has fewer mobility benefits than Alternative B.
  - BRT option would qualify for a *medium* rating for cost-effectiveness.
  - Does NOT currently satisfy statutory requirement for dedicated transit lanes.
  - Future "transit village" development.
Thank you!