

WHAT IS BRT?

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Elements of a BRT System

- BRT is tailored to each unique corridor
- BRT can be implemented incrementally

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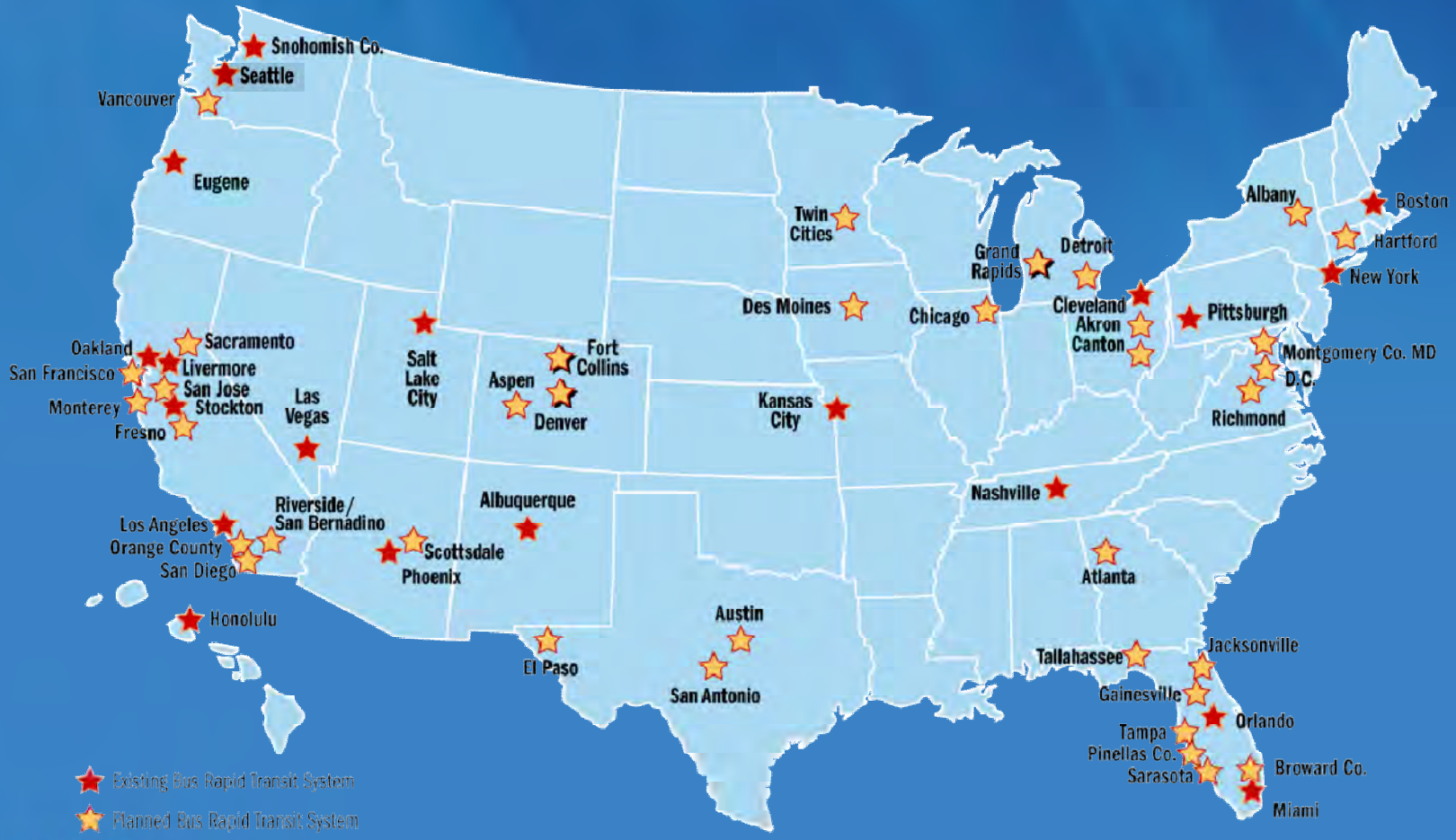
What is Bus Rapid Transit (BRT)?

A flexible, high performance rapid transit mode that combines a variety of physical, operating, and system elements into a permanently integrated system with a quality image and unique identity.

- ✓ Flexible design
- ✓ Flexible cost
- ✓ Fewer operating constraints than LRT
- ✓ Scalable
- ✓ Reliability
- ✓ Serves primary or secondary corridors

Existing/Planned U.S. BRT Systems



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Based on NBRTI Survey (as of March 2011)

Stylish Vehicles

- Easy to board
- Customer friendly
- Environmentally compatible

BRT Stations

- Attractive and Safe
- Lighting
- Customer information
- ITS
- Off bus fare collection
- Level boarding
- Artwork

What is BRT?

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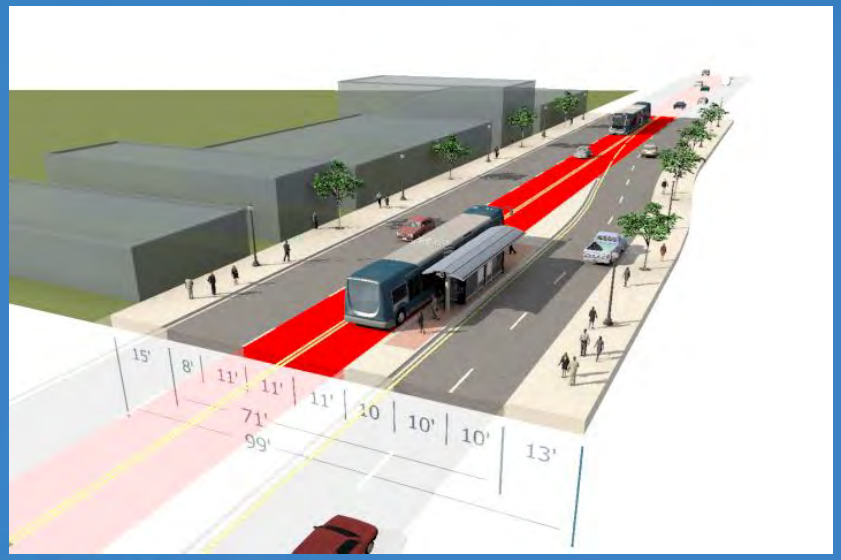
Running Ways



- BRT can operate in a wide variety of physical environments
  - On street
  - Bus lane
  - Busway
- Median, Offset lane or Curb lane
- Exclusive lane or Mixed traffic
- Parallel side running with freeway
- Guided or non-guided
- Contra-flow and reversible lanes (special safety with headlight glare and ped crossing)

Benefits

- Standard construction methods/costs
- Local contractors familiar with work

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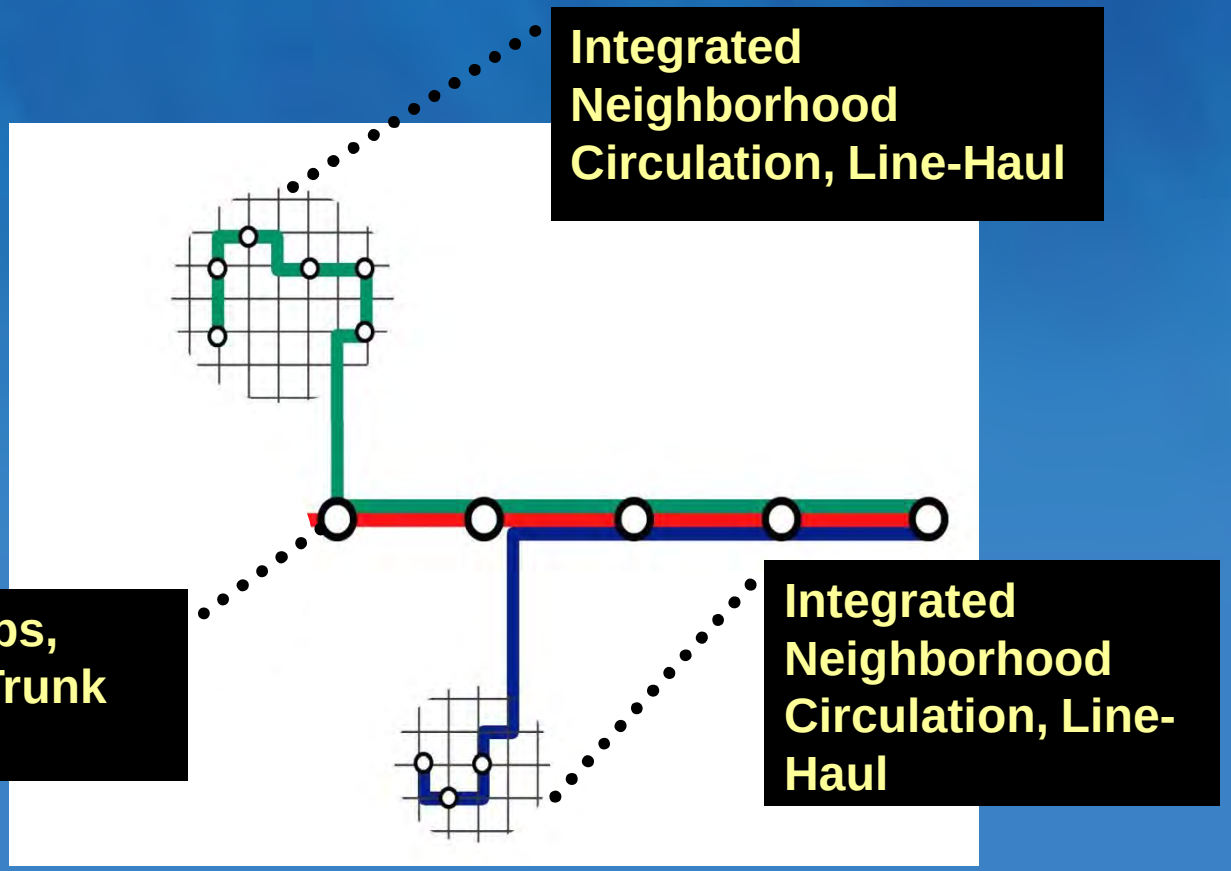
Bi-Directional Lane - Eugene, Oregon

BRT Service Plans

- Base: all-day, local all-stop trunk line
- Peak-only or all-day integrated services
- All-day, frequent service
  - Service every 10 minutes
  - No schedule needed
- Simple route structure
  - Direct
  - Easy to understand



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Branding

- "Branding" is conveying a recognizable, consistent, and unique system identity and image
- Vehicles - branded using design, color, graphics, and signage
- Stations - branded using design, colors, graphics, signage, and materials
- Running ways - branded using barriers, pavement markings/materials/colors, graphics, signage, and landscaping

BRT Spectrum

BRT – Lite
Swift BRT - Everett

$3-8 M per mile

Hybrid BRT
Eugene EmX

$8-15M per mile

Full BRT
Orange Line - LA

$20-45 M per mile

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Los Angeles Orange Line

- Began October 2005
- $350M, $25M per mile
- 14 mile busway
- 13 stations
- Branded as part of the rail network
- Transit signal priority
- Real-time passenger info
- 4-5 minute headways
- Ridership: 23,900 per day (projected ridership was 7,500 per day)

LA Orange Line Exceeded Expectations

- Exceeds Ridership Projections
  - 21,828 daily trips in May 2006
  - Exceeds milestone set for 2020
  - Currently 26,000+
  - Initial rash of motorist collisions at crossings declined with operational adjustments, public information
  - NABI 60-BRT CNG vehicles performing well – looking at larger ones to accommodate growth
  - Leadership hails line's success
- Extensions to Burbank Airport considered, if funding available

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LA Orange Line

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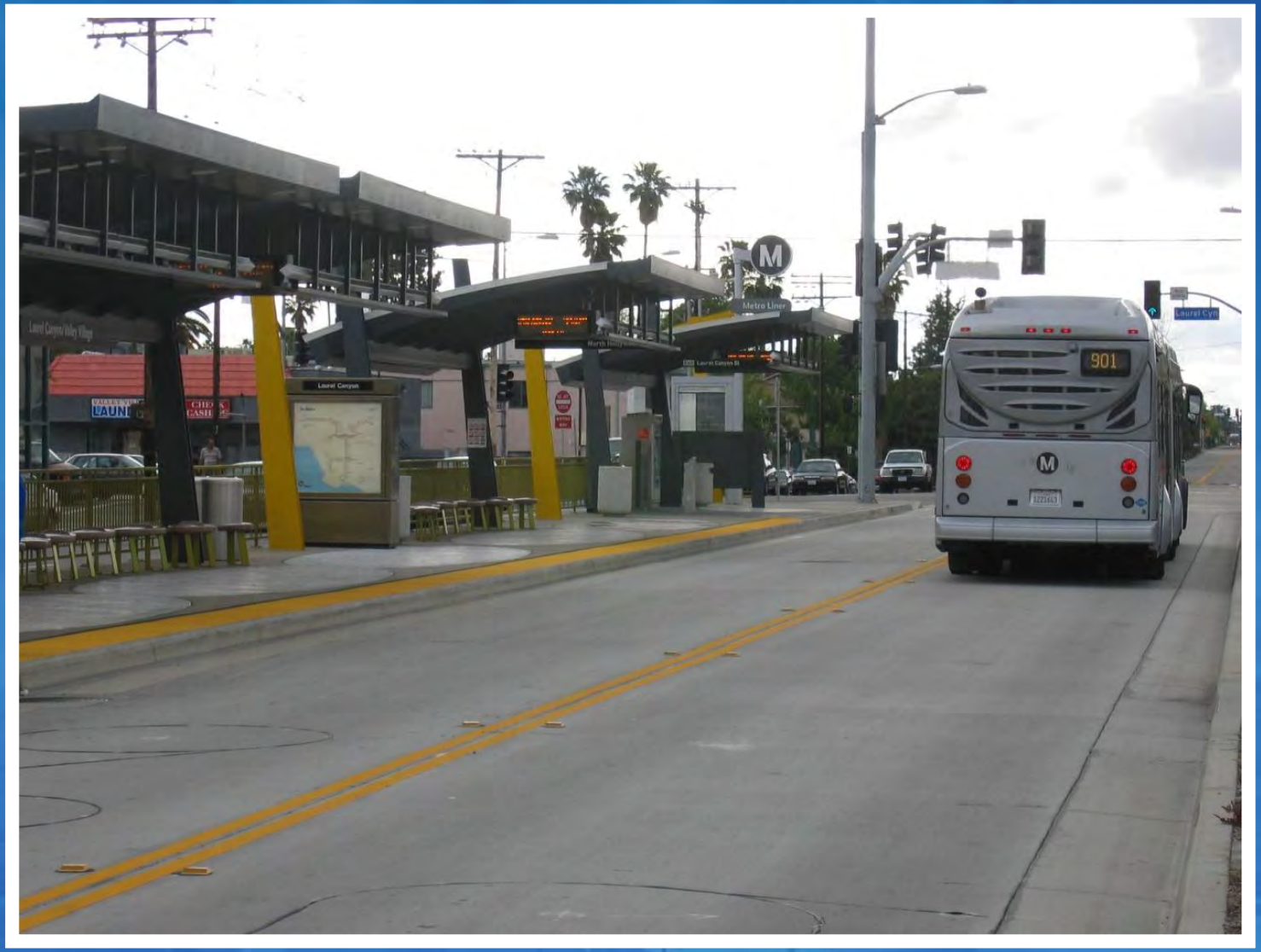

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"Full" BRT: LA Orange Line-2005

Challenges/Goals:

- San Fernando Valley – Reduce congestion on parallel Highway 101
- Connect to Red Line Metro subway (N Hollywood)
- At-grade corridor with many street crossings (against signal progression)
- Improve quality of service (travel time, frequency, comfort)
- Create sleek, modern image of transit – shift rider travel patterns

Solutions:

- Used abandoned railway corridor – created two fully dedicated BRT lanes
- Four- to six-minute frequency at peak hour; 10 minute mid-day
- Very high level finish of stations and distinct branding
- Off-board fare collection, real-time passenger information, signal priority
- Rubberized asphalt roadway for sound mitigation

Results:

- Exceeded ridership goals in first year – 21,000 weekday riders, comparable to LRT
- Mode shift: 17 percent new riders new to BRT
- Improved adjacent freeway traffic flow 6–7 percent

North Hollywood Development Near Orange Line

- Near terminus of both Orange BRT and Red (metro) Lines
- Connects Red Line (HRT) with Warner Center (50,000 jobs)
- NoHo Commons Mixed Use $200 million
- 438 apartments
- 200+ loft condos
- 60,000 sq ft. retail space
- Redeveloped master plan, Improved ped access

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Cleveland Health Line

- Began August 2008
- Total reconstruction of Euclid Ave.
- $200M, $28.5M per mile
- 6.8 miles (4.4 miles of exclusive center median bus lanes)
- Near level boarding
- Off-board fare collection
- Real-time passenger info
- 5 minute headways
- Ridership: 12,300 per day
- 60% increase over old Route 6
- $4B in development: retail, residential, office, health

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Cleveland Health Line "Hybrid" BRT Example:

- 6.8 mile line on Euclid Ave; cost $200 M
- Features
  - Includes signal priority; off-board fare collection; high platforms; branding; unique vehicles
  - Replaced existing service
  - Combination of exclusive lanes and mixed traffic
- Results
  - Ridership increased 60 percent
  - Travel time reduced 34 percent

Cleveland Health Line

Cleveland Health Line

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Cleveland Health Line: Who Says BRT Can't Generate Development?

REBIRTH ON EUCLID AVENUE

STEVEN LITT | THE PLAIN DEALER

Over the past century, Euclid Avenue has gone from being Cleveland's most prestigious address to a Main Street riddled by blight. Now, thanks in part to the Greater Cleveland Regional Transit Authority's Euclid Corridor bus rapid transit project, the avenue is rebounding as the backbone of the city's new economy. But while a transformation is in the works, nothing is guaranteed. The national economy, the location of the much-discussed Medical Mart and disruptive highway work by the Ohio Department of Transportation could blunt the multibillion-dollar reinvestment now gathering momentum. Shown below is an overview — by no means exhaustive — of construction projects in the Euclid Corridor zone.

What's driving the development?

Observers say Euclid Avenue and adjacent blocks are benefiting from a "perfect storm" of positive factors including:

- The rising price of gasoline, which is encouraging dense, pedestrian-oriented development around the RTA bus line.
- Federal and state historic-preservation tax credits have made it viable for developers to renovate dozens of early 20th-century buildings downtown.
- Continued growth at the city's big medical centers and at Cleveland State and Case Western Reserve universities.
- The bottoming-out of local real estate prices, now viewed by lenders and developers as a bargain in comparison with prices in more expensive cities.
- Demand for new, in-town housing, driven by the steady influx of hospital employees and spin-off industries, plus the growing back-to-the-city movement among retirees and empty-nesters.

What are the possible roadblocks?

Despite the proven investments under way, the rebirth of Euclid Avenue could be hampered by other factors:

- A looming recession and tightening of credit among lenders could slow the recovery along Euclid, but won't stop it, developers say. Housing developers say they're optimistic they will find the capital they need.
- The Ohio Department of Transportation's $1.5 billion reconstruction of the downtown Inner Belt could impose a 15-year tourniquet on the city's main traffic artery and strangle property values. Developers say there's a critical need to maintain the flow of traffic. "Our politicians have to be all over this," said Doug Price III, chief executive of the K&D Group.
- The proposed Medical Mart and new convention center could damage the city for decades if located in Midtown near the Cleveland Clinic. The projects would bleed energy from the existing business district and undercut decades of investment there, developers and planners say.

$4.3 billion announced

Public Square to Inner belt ($1.3 billion)

		Cost of project
1	Arcade/Hyatt Regency hotel	$60 million
2	515 Euclid Ave. garage	$22 million
3	East 4th Street	$110 million
4	Colonial Arcade Renovation	$30 million
5	668 Euclid Avenue	$65 million
6	Ameritrust complex	$200 million
7	Cleveland Athletic Building, 1001-1021 and 1101 Euclid Avenue	$70 million
8	Avenue District	$300 million
9	Carter Manor	$27.8 million
10	Idea Center	$42 million
11	Hanna Theatre	$19.2million
12	CSU law school renovation	$8.8 million
13	CSU arts complex	$50 million
14	Collegetown development	$18 million
15	CSU student center	$50 million
16	CSU garage and RTA transit center	$19 million
17	CSU main classroom building	$27 million
18	Trinity Cathedral annex	$9.8 million
19	CSU administrative complex	$16 million
20	CSU recreation center	$29.5 million
21	CSU Fenn Tower renovation	$30 million
22	CSU new student housing	$45 million
23	CSU College of Education building	$36 million

Midtown ($87.3 million)

		Cost of project
24	Myers University Club	$10 million
25	Northeast Ohio Regional Sewer District headquarters	$22.1 million
26	Centers for Families and Children	$1.7 million
27	Cleveland Midtown Innovation Center	$5 million
28	4600 Euclid Avenue	$5 million
29	Victory Lofts building	$10 million
30	Baker Motor Car building	$7 million
31	Aldi supermarket	$1.5 million
32	Erie Square apartments	$3.8 million
33	Church of Latter day Saints	$1.2 million
34	Woodhaven townhouses	$20 million

University Circle ($3 billion)

		Cost of project
35	Cleveland Clinic, various projects	$419 million
36	Cleveland Clinic, various projects	$868 million
37	Global Cardiovascular Innovation Center	$28 million
38	Park Lane apartments	$30 million
39	Stokes VA hospital	$183 million
40	John Jay High School	$36.7 million
41	Cleveland Museum of Art	$258 million
42	Cleveland Museum of Natural History	30 to $50 million
43	Shafran Planetarium	$6.9 million
44	Hawken School	$3.5 million
45	Cleveland Botanical Garden	$47 million
46	Mandel Center for Nonprofit Organizations	$11 million
47	Peter B. Lewis Building	$61.7 million
48	Cleveland Institute of Music	$32 million
49	Cleveland Hearing and Speech Center	$11.8 million
50	University Hospitals	$326 million
51	Museum of Contemporary Art Cleveland	No cost or date set
52	Cleveland Institute of Art	$53 million
53	University Arts and Retail District	$300 million
54	Village at 115	$126 million
55	Wolstein Research Center	$110 million

SOURCES: Historic Gateway Neighborhood; Cleveland State University; Midtown Cleveland Inc.; Cleveland Clinic; University Circle Institutions

MAP BY REED BROWN | THE PLAIN DEALER

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Cleveland Health Line Economic Impact:

By 2025:

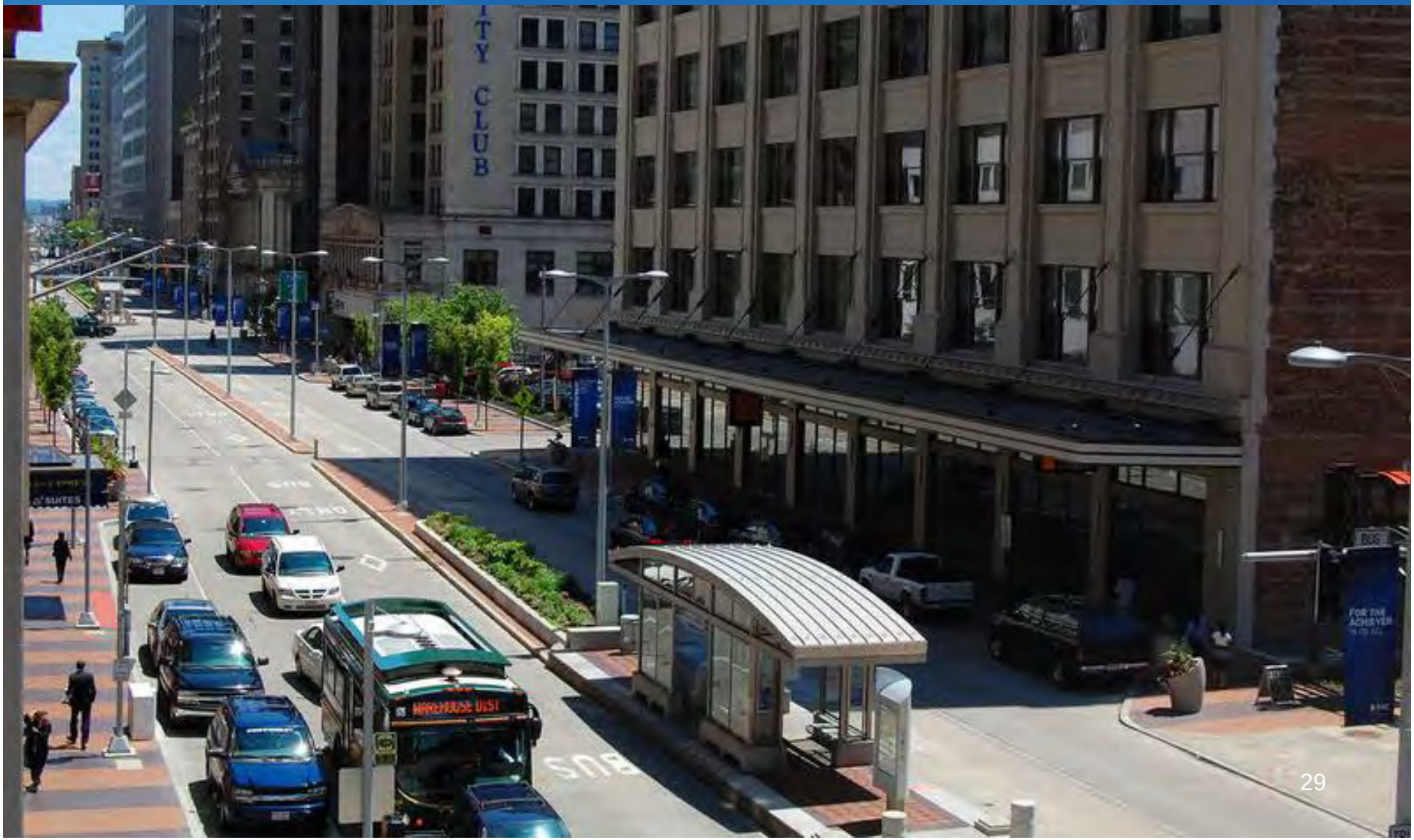
- 7.9 million sq. ft. in commercial development
- 5400+ new or renovated residential units
- $1.3 billion in capital investments
- $62.1 million in annual local taxes
- $1.98 million in annual GCRTA sales tax revenues
- 13,000 new jobs

Source: Greater Cleveland RTA

Cleveland Health Line
Euclid Avenue Before BRT

Cleveland Health Line
Euclid Avenue Before BRT

Cleveland Health Line
Euclid Avenue After BRT



Cleveland Health Line
Euclid Avenue After BRT

Cleveland Health Line Economic Development

University Loft Apartments

Cleveland Health Line Economic Development

Cleveland Clinic

Pittsburgh Busways

- South Busway opened in 1977
  - Oldest busway in the U.S.
  - 4.3 miles, shares dual-use tunnel with subway
- East Busway opened in 1983
  - 6.8 miles, built on active rail ROW
  - Extended in 2003, incorporating a bike trail and park
  - $500M in development: retail, residential, office
- West Busway opened in 2000
  - Built on abandoned rail ROW
  - Allows crosstown travel w/o transfers

What is BRT?

Pittsburgh

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Closing Thoughts

Lessons Learned

- Take advantage of BRT flexibility.
- Visualizations are critical.
- Need both sizzle and substance.
- Sum is greater than the individual parts.
- If can get exclusive right-of-way, grab it.
- “Plagiarism” is good
- Capital costing – early and often
- Do not oversell BRT
- Ridership only mildly affected by Station consolidations



QUESTIONS?

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