International and USA BRT TOD Comparisons

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Rail-Volution October 2013

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Agenda

- BRT basic concepts
- International examples
- Principles of Good TOD and BRT
- Integrating BRT, TOD and value capture

In USA, BRT = broad menu of high-performance transit options

- **Fast, reliable, convenient, affordable and distinct from "regular" bus services**
- **MAP-21: System of "Systems" or "Elements", but:**
  - **Fixed Guideway-based: System of elements + >50% in dedicated lane**
  - **Corridor-based: System of elements + <50% in dedicated lane**

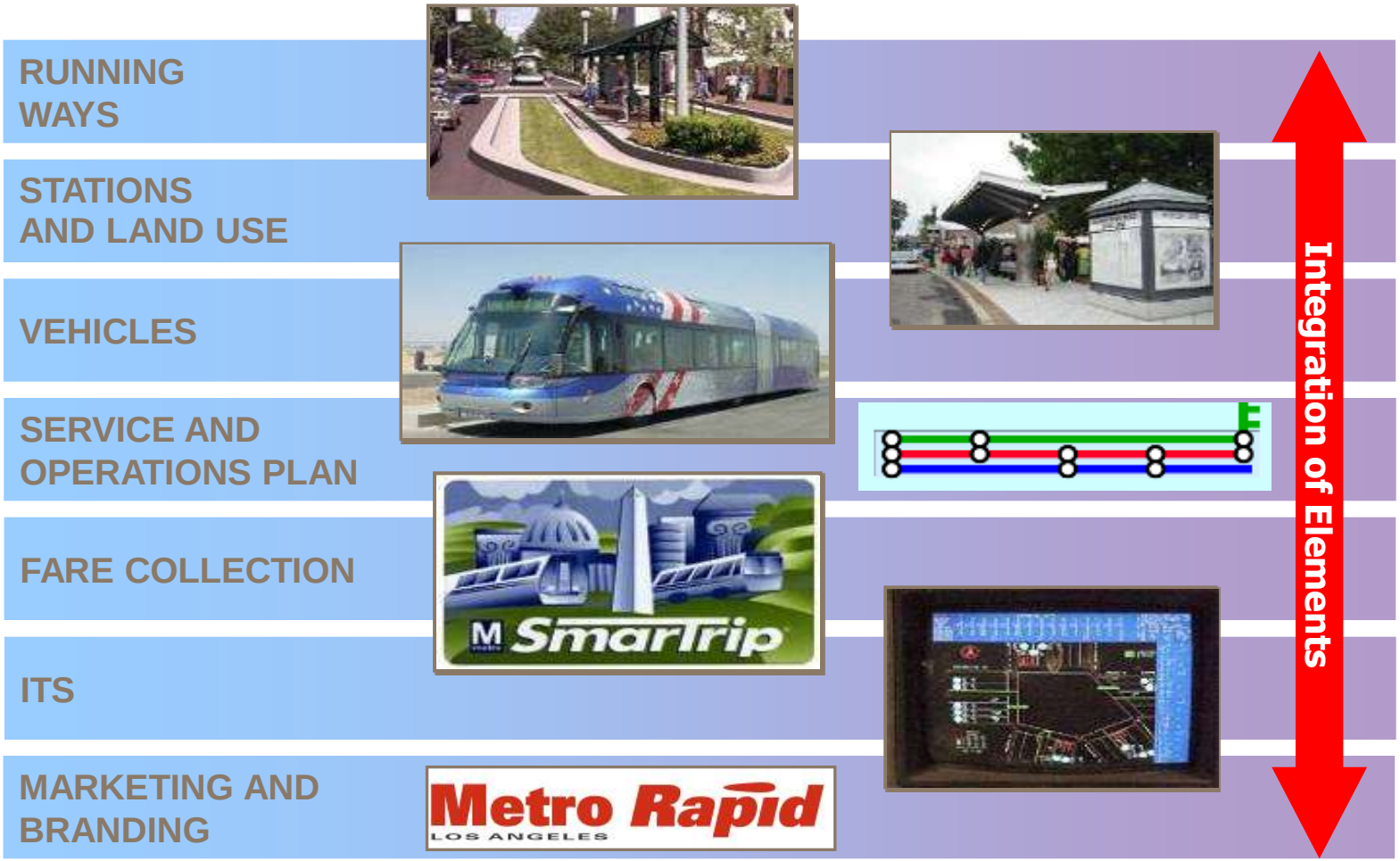
USA vs. International Basic Differences

- International approaches to BRT planning: Network-based
  - Europe/Australia/Canada: LRT-like, cost effectiveness
  - Latin America: high-capacity “metro on wheels” concept developed out of necessity
- USA approach to BRT planning: Raise corridor bus performance

  (1) Wide array of incremental bus improvements
  - Boston Silver Line: Marketing and branding of BRT
  - Los Angeles Metro Rapid: Low-cost, urban arterial BRT strategies with measurable impact on performance

  (2) Corridor-based projects
  - Los Angeles Orange Line: Full-fledged BRT carrying more passengers and at a lower cost than LRT
  - Eugene, Oregon EmX: Context-sensitive design for smaller city spine

7 elements of BRT planning, each with a spectrum of options



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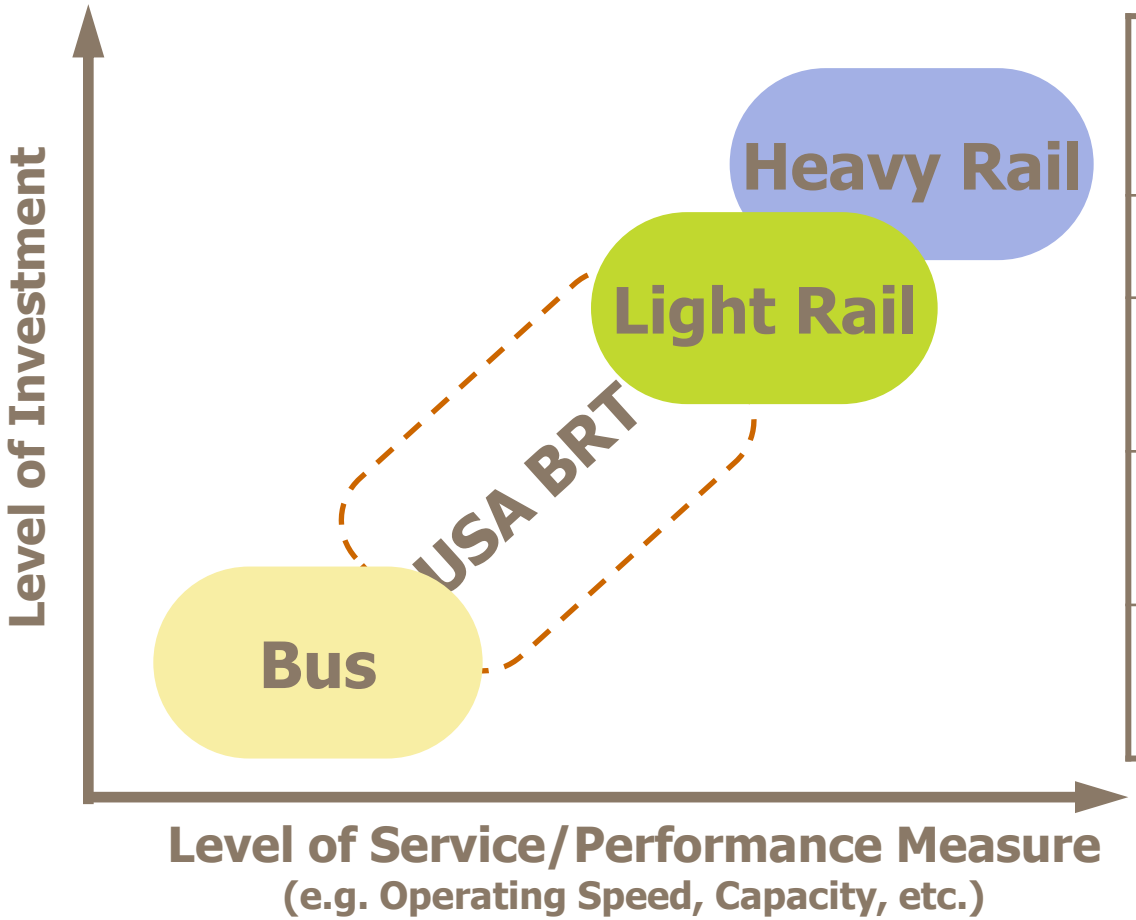
BRT can achieve the performance of more expensive modes using the flexibility of buses



BRT by Type of Running Way	Typical Capital Cost per Mile	Typical Operating Speed
Mixed flow BRT	$0.5-2 million	12-20 mph
Arterial BRT (designated lane)	$2-15 million	20-30 mph
At-grade transitway BRT	$15-20 million	25-30 mph
Fully grade-separated BRT	$20+ million	25-40 mph

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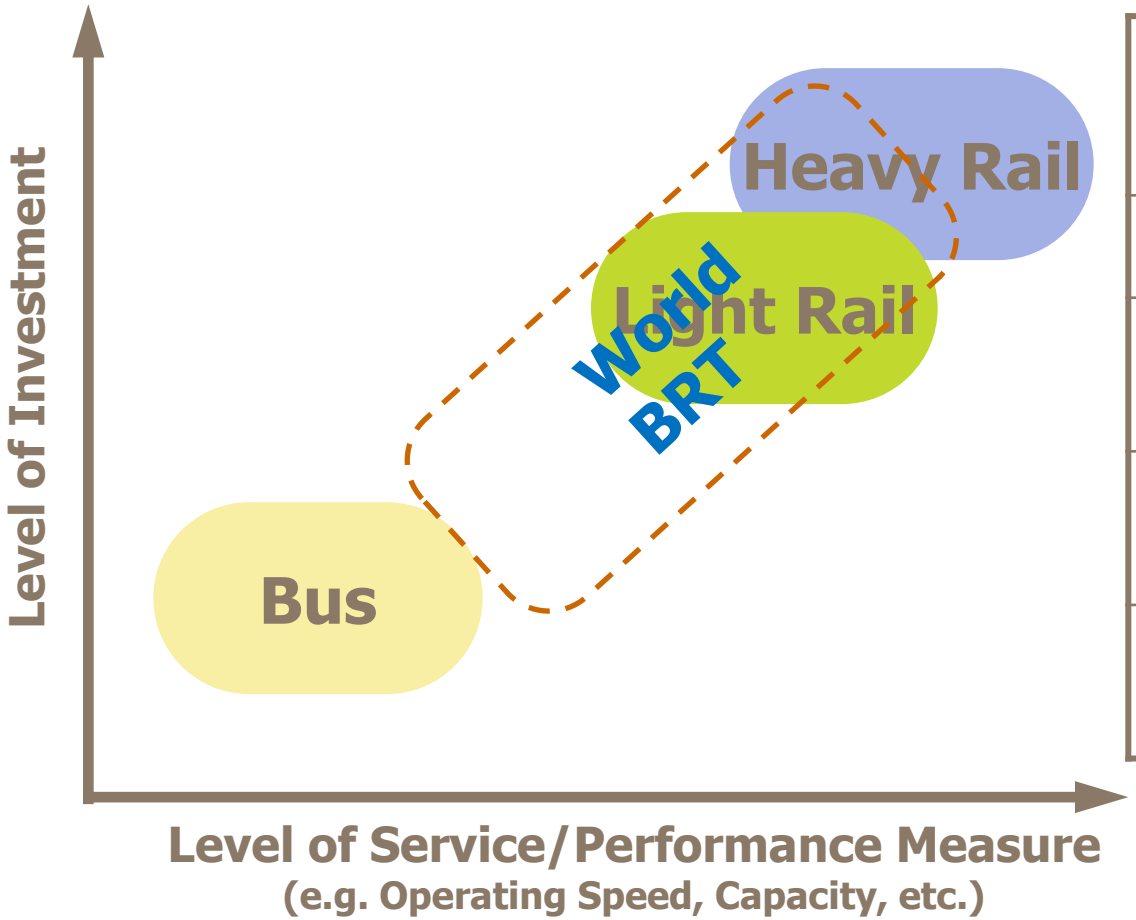

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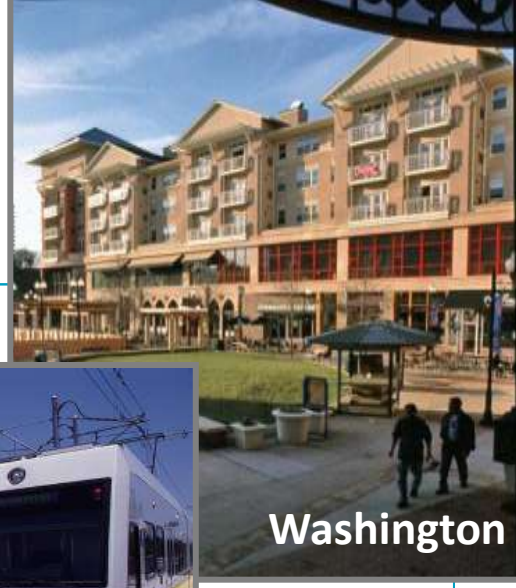
CW: Only Rail TOD = Property Values

- Washington, DC (Heavy Rail)
  + $2 to $4 per sq foot for commercial (PB)
- San Jose (LRT)
  + 23% for commercial
- Portland (LRT & Streetcar)
  + 10% rent premiums
- Dallas (LRT)
  + 39% for residential
  +53% for office

Sources: Center for Transit Oriented Development and Parsons Brinckerhoff



BRT Is Also Attractive to Developers and Retailers

- Significant examples of TOD generated around BRT:
  - Ottawa, Ontario Transitway
  - York, Ontario Viva
  - Cleveland Health Line
  - Boston Silver Line
  - Pittsburgh East Busway
  - Denver 16th Street Mall
  - L.A. Orange Line
  - Curitiba, Brazil Surface Metro
  - Bogota, Colombia TransMilenio
- Several new studies on BRT and TOD
  - GAO, NBRTI, TCRP, EMBARQ, ITDP

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Selected BRT TOD Experience

City (BRT Service)	TOD Policies?	Economic Value	Influencing Factors
Boston (Silverline)	Yes	$700 mil now, 3.7 bil + announ.	Pent-up demand, redevelopment policies
Bogota (Transmilenio)	Weak station area planning, strong bicycle amenities, ped access mixed	$2.5 bil. + overall density increased by >8%, FAR density by 7%	Development, pedestrian, bicycle policies; By 2015, 80% of residents will live <500 m of a station.
Cleveland (Silverline)	Yes	$5 bil + est.	Major redevelopment policies, planning
Curitiba (Linghinero)	Strong master planning + auto use curbs	$1.6 bil est.	Strict land use policies + CBD car use restrictions
Denver (16th St. Mall)	Yes	$1 bil + est.	Pedestrian mall + links with regional transit
Las Vegas (MAX)	No	Few $100K	Joint development of one added station
Ottawa (Transitway)	Some	$700mil +	Ped access and redevelopment policies
York (Viva)	Yes in select areas	$3 bil in phases	Master plans in Phase 2
Los Angeles (Orange)	Yes in select areas + bicycle amenities	$500 mil (w/ Red Line	Major redevelopment policies, rail links

Phase 2 York, Ontario ‘Vivanext’ Rapidways

- $1.2 billion investment, 23 miles of center lanes
- Economic situation forcing revised opening (2019)

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Brisbane Southeast Busway: Exploiting Activity Centers and Nodes

- Brisbane, Australia Translink/Busway
- 15,000 pax/hour
  - 3 to 4 buses per minute
  - Mix of dedicated and feeder routes
    - Dedicated 20%
    - Feeder express services 80%
- Freeway location limits land use integration & development
- Mater Hospital good exeception

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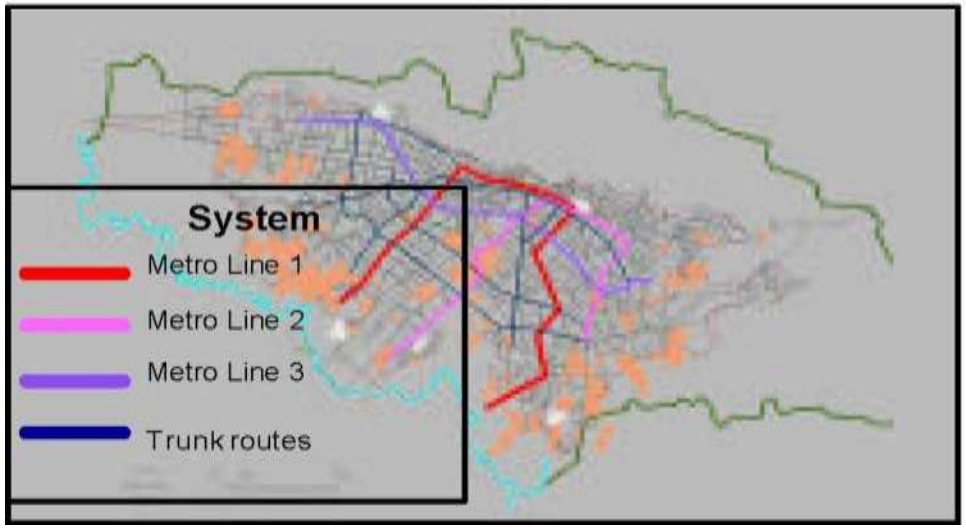
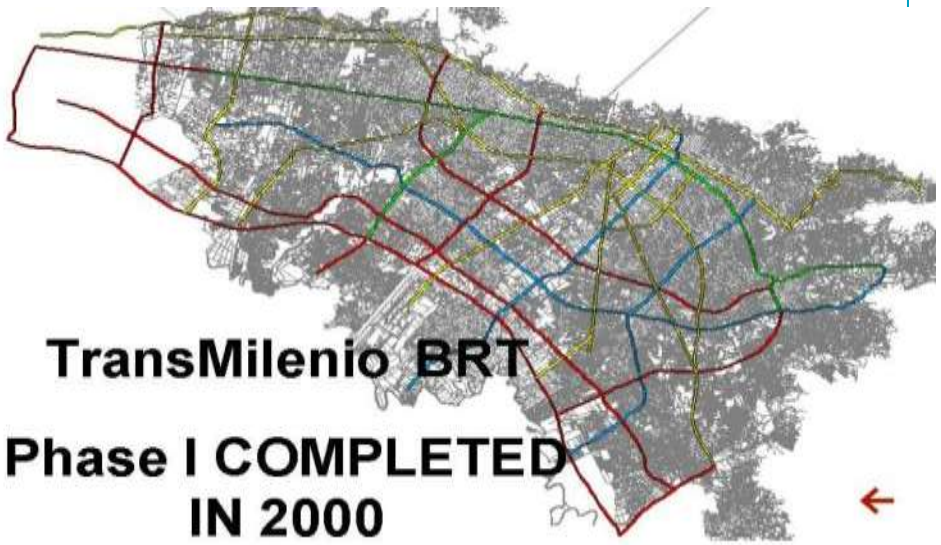
Land Values Increased Near Brisbane SE Busway

Bogotá's Choice of TransMilenio

	Heavy Rail (1997 Proposal)	TransMilenio Phase 1	TransMilenio Phase II	TransMilenio Master Plan
				
Weekday Ridership	795,000**	792,000	468,000	5,000,000
Coverage of City's Total Transit Trips	**16 percent**	**16 percent**	**10 percent**	**85 percent**

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Bogotá Urban Renewal / Mobility Program

Before

After

Rents increased by 1.3% for every minute closer to BRT station

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Cambridgeshire Guided Busway

- Cambridge-Huntingdon, 15.5 mi (25 km), 10 stations
- World's longest busway
- 11,500 trips per weekday
- Ped access and P&R lots for Northstowe housing project (9,500 houses, largest new town since Milton Keynes)

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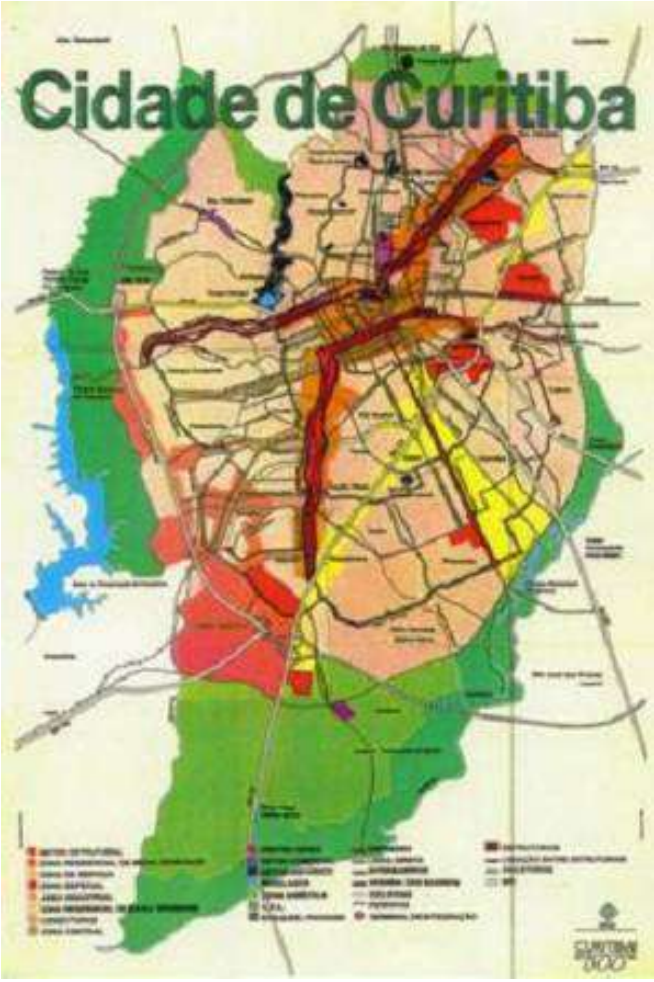
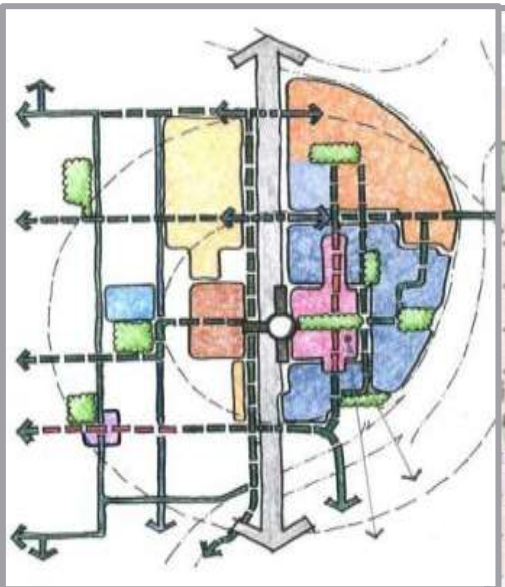
Curitiba – 35 years with a coordinated land use and transport plan with a BRT backbone

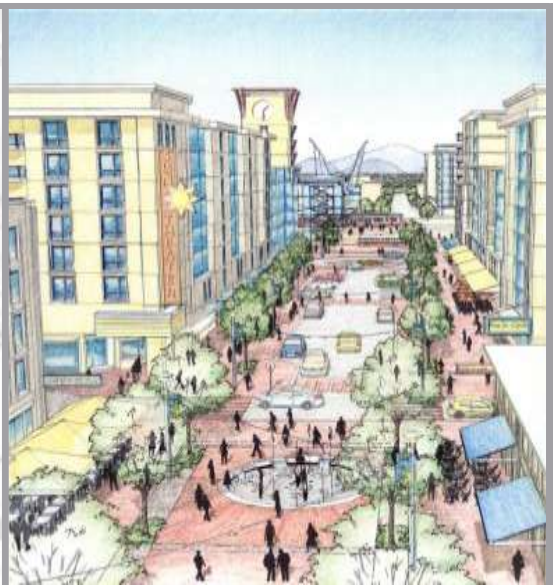


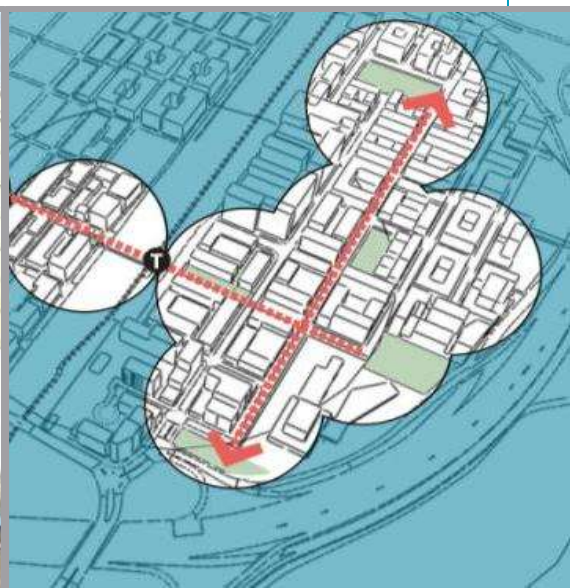
Fuente: Arq. Antonio Juarez Nakamura, Presentación en IV Seminario Internacional de Arquitectura – Universidad Piloto de Colombia, Bogotá, Agosto de 2002

Keys To TOD Success

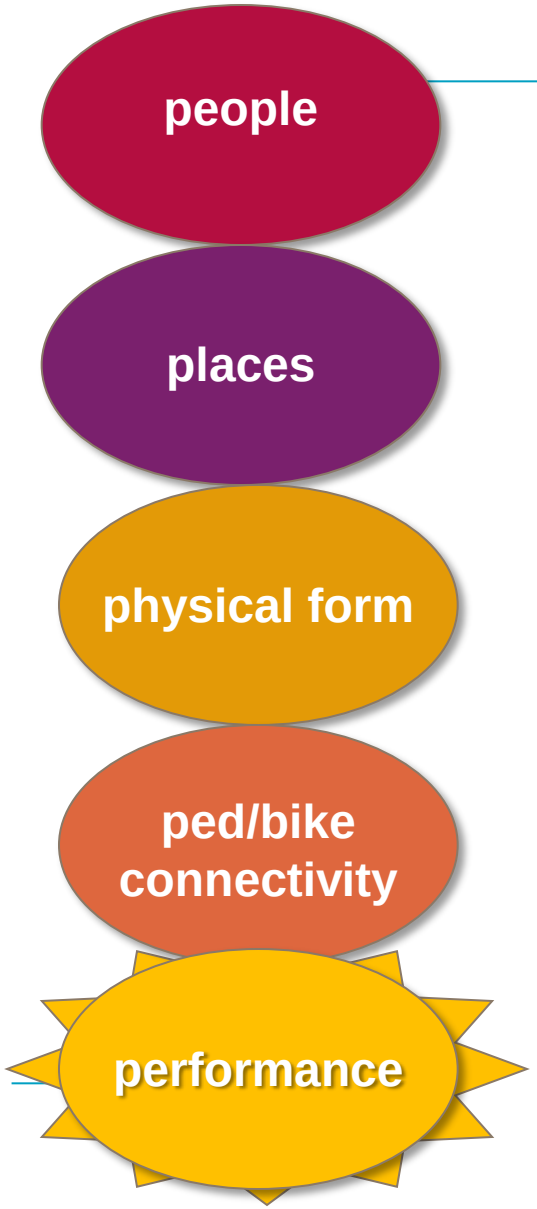
- Get the planning right
- Apply the power of partnerships
- Design for the pedestrian
- Market driven, not transit driven TOD







Transit Orientation (5 “P’s”)



People – Density

Places – Diversity of land uses

Physical Form – Street patterns

Pedestrian/Bike

Performance – Quality of transit service

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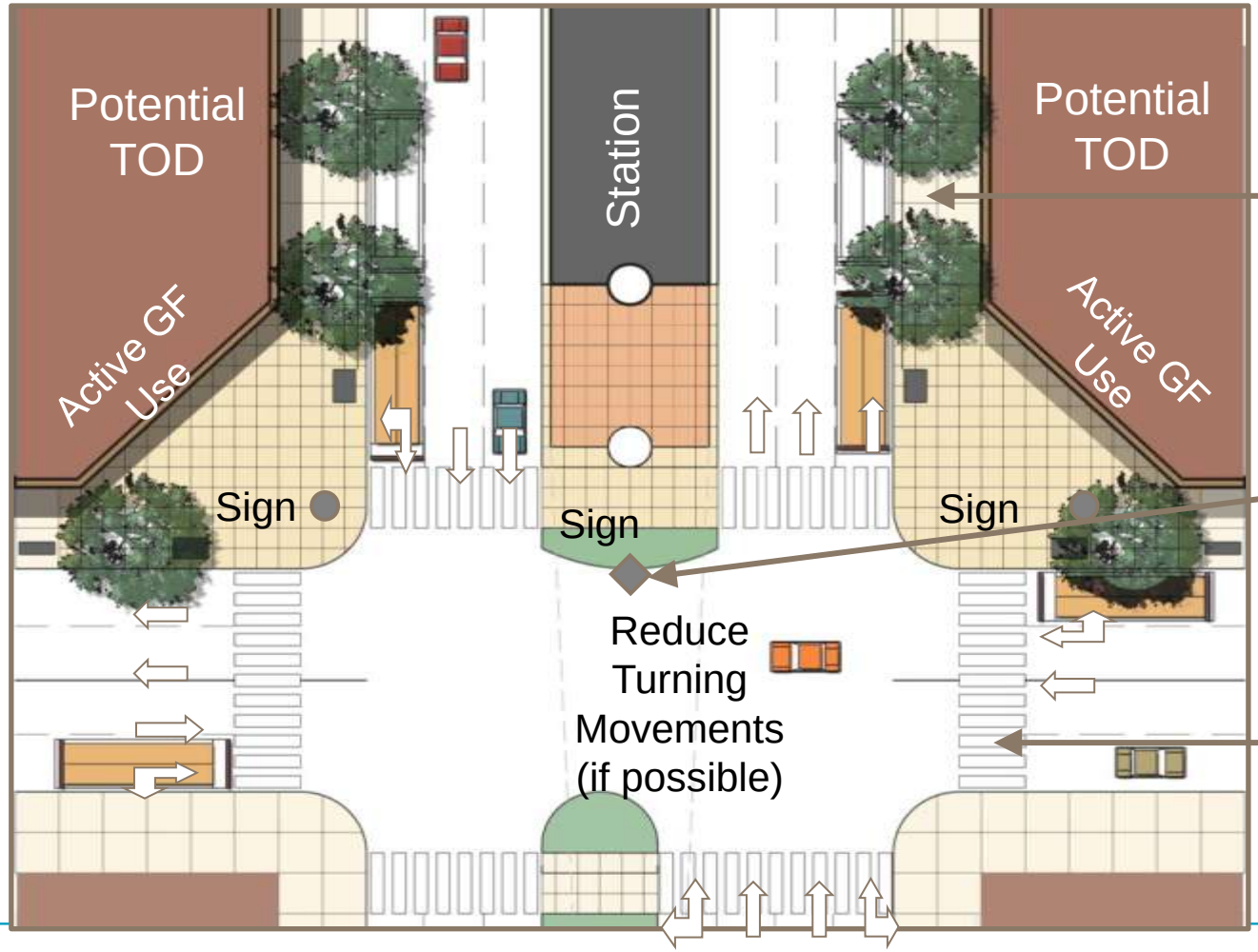
Pedestrian priorities



Wide Sidewalks & Attractive Streetscaping

Wayfinding

Clearly Marked Pedestrian Crossings

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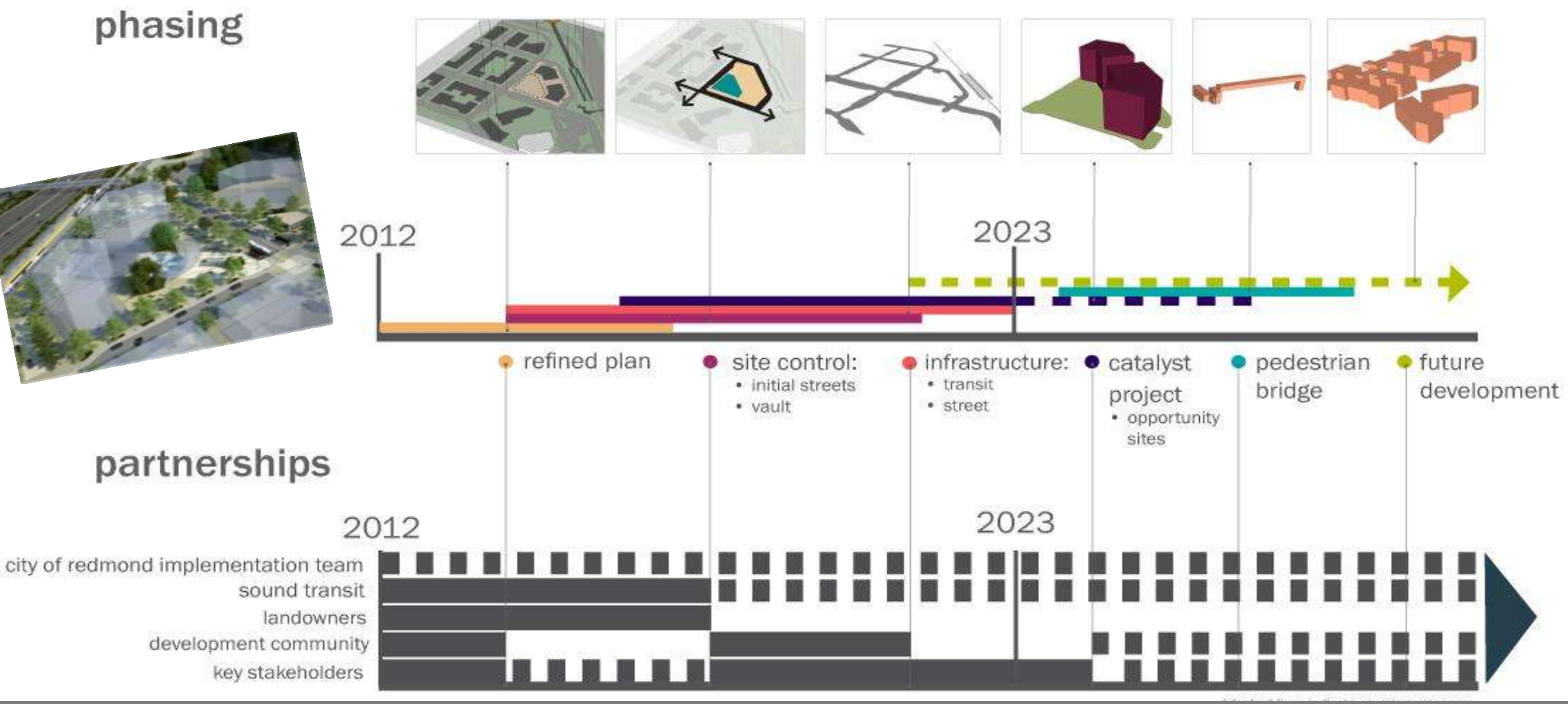
Clear path & roles to get there



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Match Market Strength to TOD Strength

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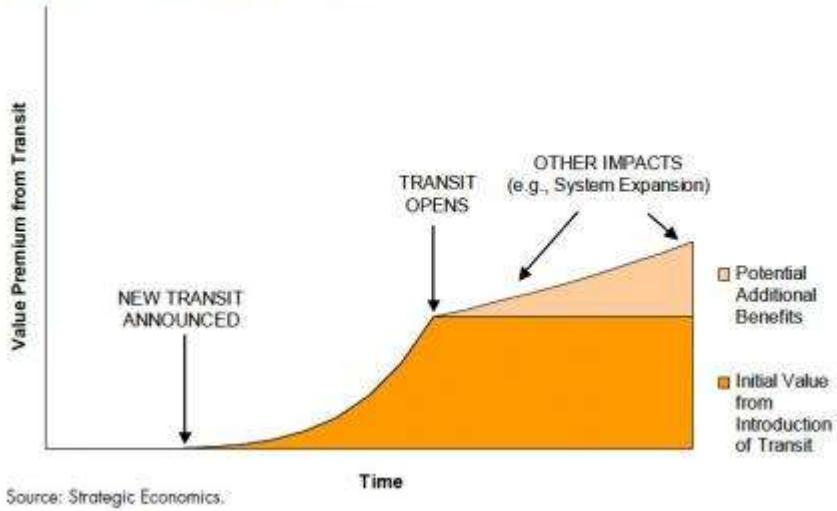
Good TOD Enhances Value Capture

- Value capture techniques:
  - Tax increment financing
  - Impact fees
  - Joint development agreements
  - Leases
- Talk the developers' language:
  - Transit improves marketability
  - Show the track record – get "comps"
  - Help them with policy changes
- Get a good financial analysis/plan
  - Reserves to hedge market timing etc.

FIGURE 3-1: THE VALUE CURVE IN THEORY



Source: Strategic Economics.

International does this about as often as U.S. does

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Lessons: Same for All Modes

- Same TOD Strategies as LRT, CR, HR - *Think "sense of place"*
- Establish planning vision and policies early
- Coordinate with all stakeholders early and often
- Location, location, location
- Station Plans: design for the pedestrian
- Ridership might not help development

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Other Slides for Q&A

Rail and Bus Modal Applications

Mode (Examples)	Circulator	Local/ Linehaul	Feeder to RT Network	Interurban	Commuter/ Regional	Intercity
Rail	Streetcars (Portland, San Diego)	Heavy Rail, LRT (New York, BART, St. Louis)	LRT, APMs (Baltimore, Hudson-Bergen LRT, Miami's Metromover	LRT L.A. Blue Line, Salt Lake City)	Commuter rail, Heavy rail Chicago Metra, New York MNRR	Amtrak CA HSR TGV
Bus/BRT	Denver 16th St. Mall, Orlando's LYMMO	Eugene, EmX San Bernardino SBx Fresno Q	L.A. Metro Rapid, Oakland Rapid Chicago Jeffrey Jump	Albany-Schenectady Chicago Pace Aspen Veloci	Phoenix Rapid, San Diego I-15, LA Silver Line, Denver US-36	Greyhound Peter Pan SwissPost

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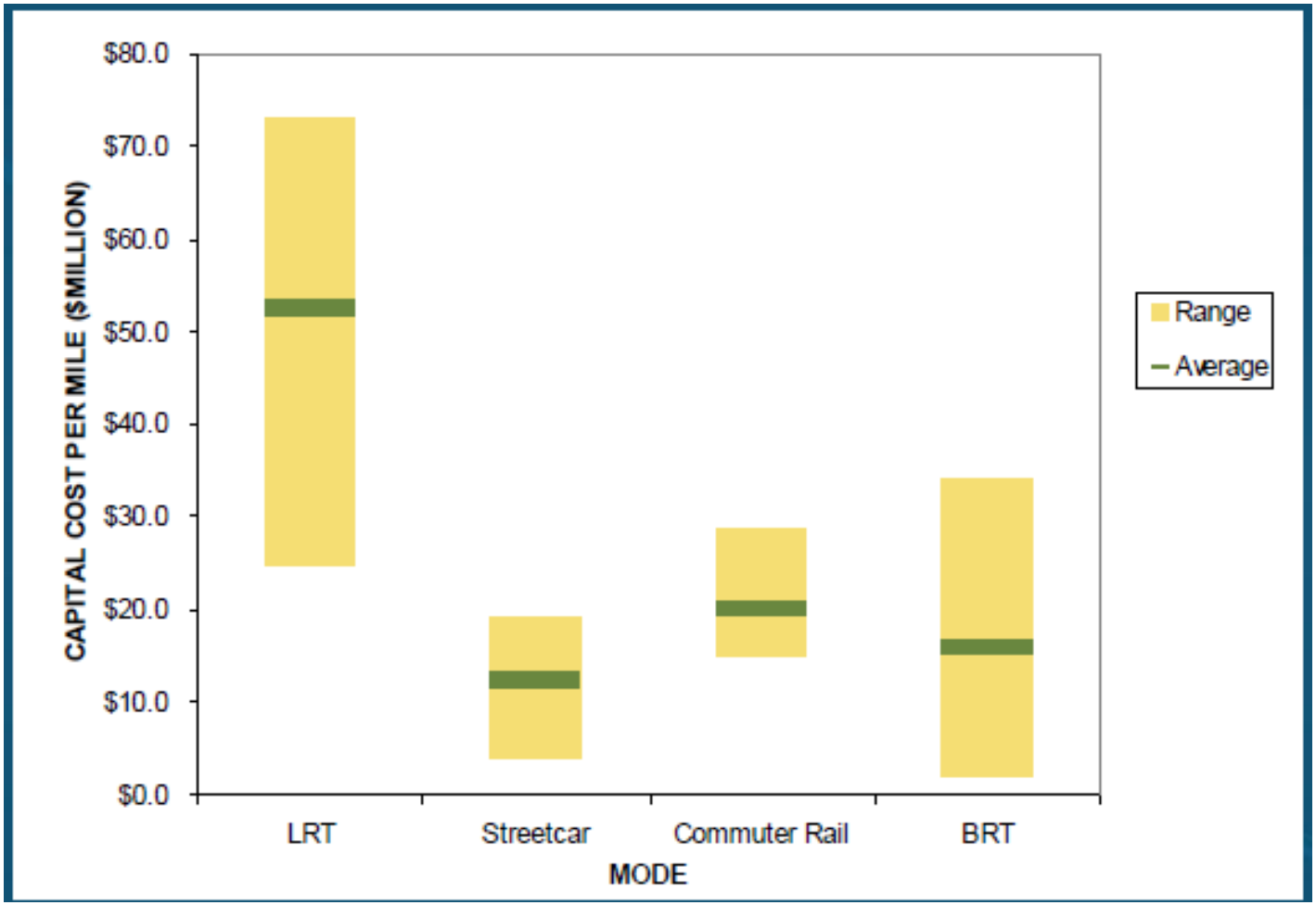
Capital Cost Per Mile



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Implementation Challenges

Challenge	LRT/ Heavy Rail	Commuter Rail	Streetcar	BRT
Time to Implement	7-10 years+	3-7 years	4-7 years	1-7 years
Political Difficulty	High and increasing	Moderate but increasing	Moderate	Lower
Flexibility to shifting commute patterns	None to very low	None to very low	Low	High

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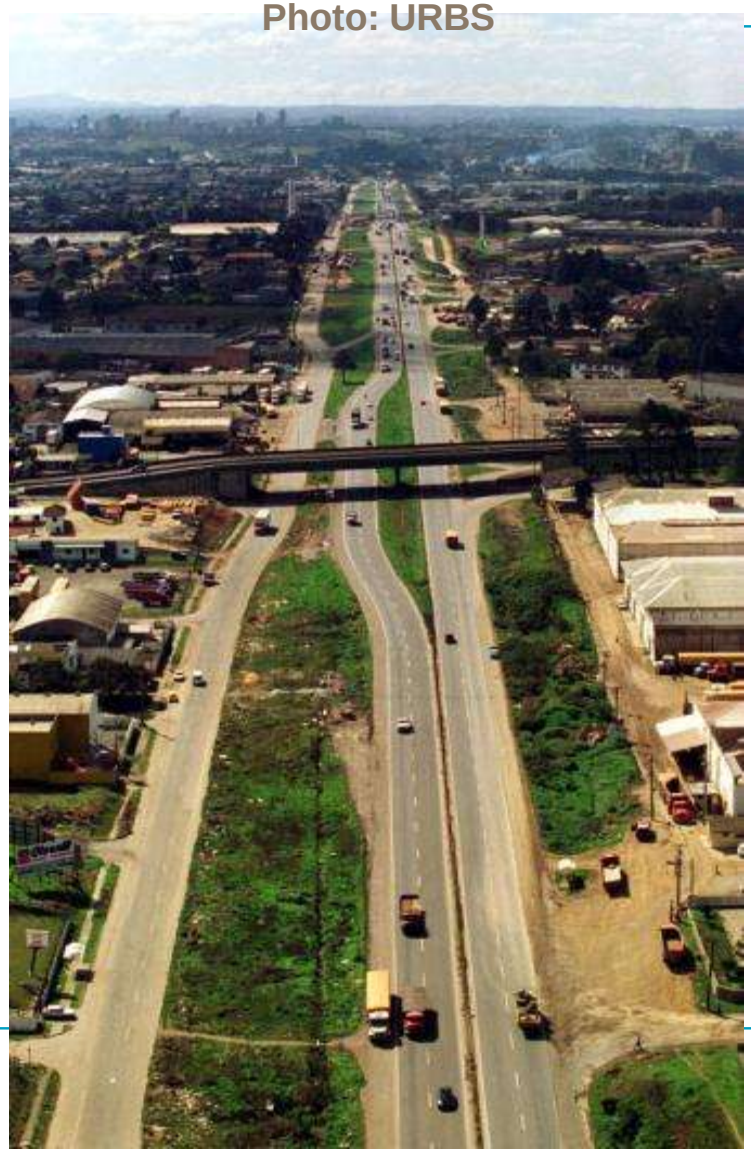
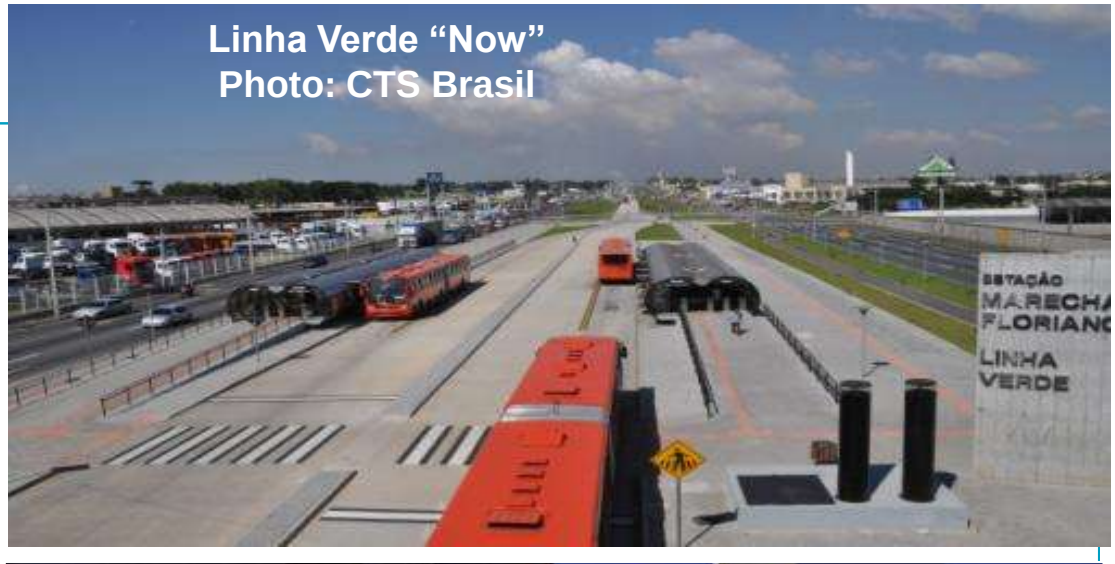
Curitiba new BRT Corridor (2009-2010)

Rodovia BR116 "Before"
Photo: URBS

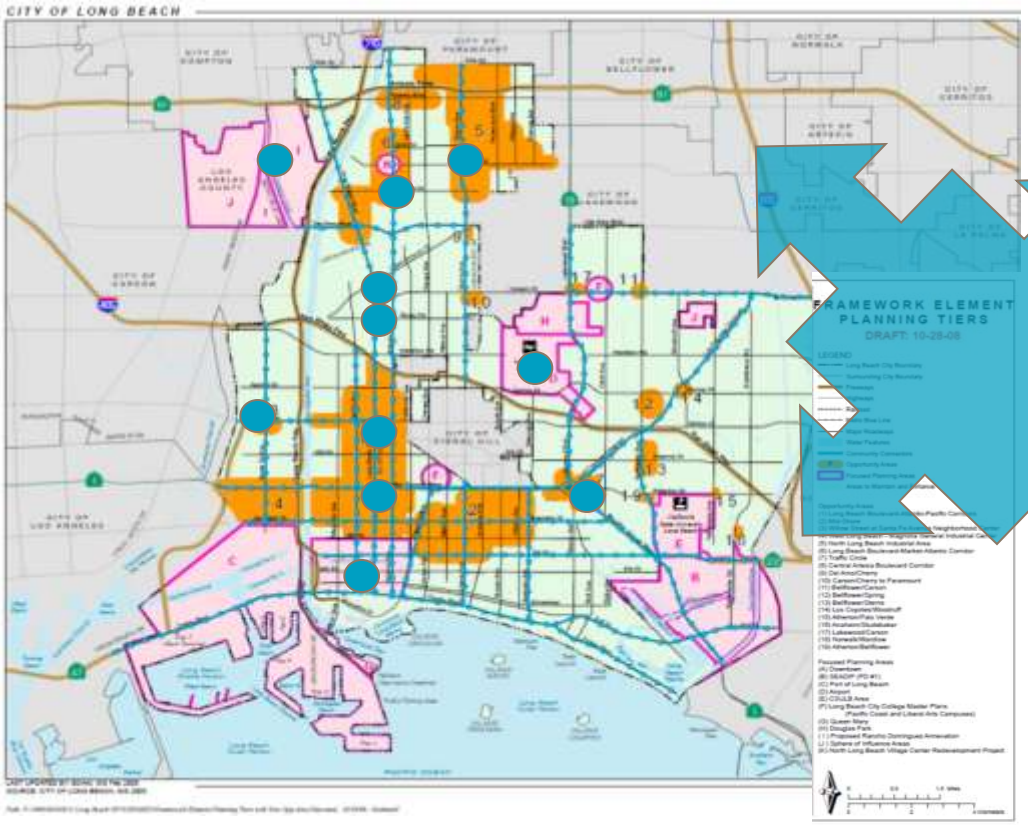


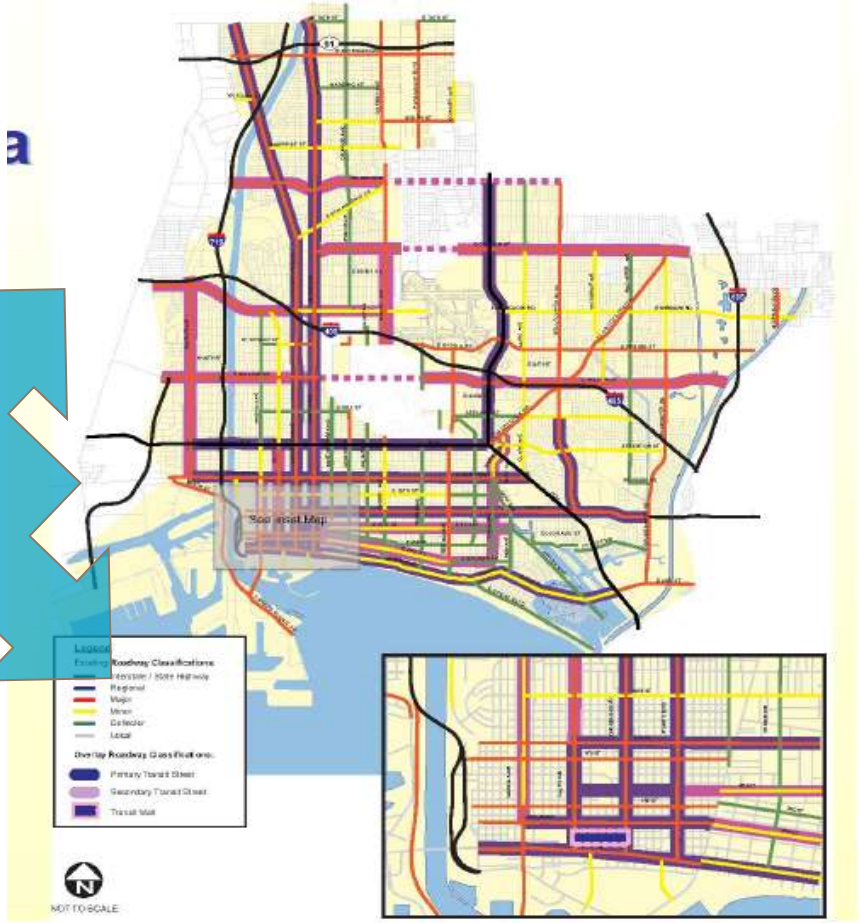


Linha Verde "Now"
Photo: CTS Brasil

Linha Verde "Future"
Image: URBS

Aligning Transit Policy and Market Areas





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