What's new in Bus Rapid Transit

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Agenda

- What is Bus Rapid Transit?
- FTA Demonstration Project Evaluations
- CDTA (Albany, NY) peer agencies
Bus Rapid Transit combines the **Permanence** of a rail system with the **Flexibility** of buses.

**Components of BRT**

- Running Ways
- Stations
- Vehicles
- Service
- ITS
- Route Structure
- Fare Collection
Running Ways

- Exclusive Transitways
- HOV Lanes
- Dedicated Transit Lanes with Mixed Traffic
  - With traffic
  - Contra flow
- Traffic Signal Priority
- Transit Streets or Malls
- Queue jumpers
- Share roadway with mixed traffic

Stations

- Enhanced Shelters
- Large Transit Centers
- Amenities
  - Park & Ride
  - Passenger Information
  - Signage/Graphics
  - Public Art
  - Coffee Shops/ATMS/Phones
- Clean, safe, well-lit & protected from elements
- Facilitate fast efficient service
Vehicles

- Existing Bus Fleet
- Varying Size
- Low Floor
- Alternative Fuels
- Multiple & Left Door
- Distinctive Design
- On-Board Information
- Precision Docking

Service

Shuttle

Express

Local

Feeder
ITS Applications

- Signal Priority
- Real Time Info
  - At Station
  - On-Board
- Security
- Headway Maintenance
- Precision Docking
- Fare Collection

FTA BRT Demonstration Sites
Las Vegas MAX - **Background**

- **Line:** MAX Las Vegas Boulevard North  
  DTC to Nellis Air Force Base
- **Start Date:**  
  June 30, 2004
- **Capital Cost:**  
  $20,162,430
- **Operating Cost:**  
  $93 per hour

Las Vegas MAX - **Components**

- **Running Way:**  
  7.5 miles (4.5 mi bus lanes)
- **Stations:**  
  23 (shelters, TVM, vending, lit)
- **Vehicles:**  
  10 articulated CIVIS 60’  
  (low-floor, multi-door, optical-guided)
- **Service Plan:**  
  - 5 AM to 7 PM  
    (12-min headways)  
  - 7 pm to 10 pm  
    (15-min headways)
Las Vegas MAX - **Components**

- **Fare Collection:**
  Off-board random proof of fare

- **ITS:**
  - Signal Priority, Queue Jump
  - Automatic Passenger Counters
  - CAD/AVL
  - On-board passenger information display

- **Branding/Marketing:**
  - Naming contest
  - "Meet MAX" campaign

Las Vegas MAX - **Results**

- **Peak Travel Time:**
  32 min on MAX (vs. 44 min on Rte 113)

- **Ridership:**
  10,000 per day (vs. 7,000 per day pre-MAX)

- **New Riders:**
  30% new to transit
  10% previously drove alone

- **Customer Satisfaction:**
  ~95% rated MAX as excellent or good
Las Vegas MAX - Lessons

- **Branding takes time**
  - In Resident Surveys, only 41% had heard of MAX
  - 48% gave no preference for MAX or CAT

- **Optical Guidance may not yield**
- **Transit Signal Priority may not improve travel time**

- **Highly skilled drivers pay off**
  17 months with no preventable accidents

Silver Line Waterfront - Background

- **Line:**
  - SL1 – South Station to Airport
  - SL2 & SL3 – South Station to South Boston

- **Start Date:**
  - December 2004

- **Capital Cost:**
  - $625 million
Silver Line Waterfront - Components

○ Running Way:
  ● 1.5 mi exclusive tunnel
  ● on-street

○ Stations:
  ● 3 underground & 1 surface
  ● multiple bus stops

○ Vehicles:
  Neoplan dual mode (electric/diesel) articulated

○ Service Plan:
  5 min headways in peak

Silver Line Waterfront - Results

○ Peak Travel Time:
  24 min to airport

○ Ridership:
  11,000 per day

○ New Riders:
  ~10% previously drove alone
  ~60% have auto available

○ Customer Satisfaction:
  ● + to ++ : Cleanliness, Personal Safety, Announcements and Travel Time
  ● 0 to + : Reliability, Courtesy, Frequency, Station
  ● 0 : Parking
Silver Line Waterfront - Lessons

- Customer Relations: Takes time to overcome pre-opening bad press
- CAD / AVL: Tracking vehicles difficult and real time info costly
- High Capital Cost: Necessary?
- Transit investment: 8.9 million sf new development

CDTA Route 5 BRT

- Albany to Poughkeepsie On-street BRT
- Peer Agencies
  - Sacramento
  - Kansas City
  - Eugene
  - Orlando
  - Tacoma
Sacramento, California

- **System name:** EBus (Enhanced Bus)
- **Service Began:** January 5, 2004
- **Capital Cost:** $6.1 million
- **Ridership:** 8000 daily boardings out of 90,000 systemwide

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Sacramento, California

- **Runningway:** 7.7 mi using signal priority / queue jump lanes
- **Stations:** 28 stops (0.5 to 1 mile spacing)
  sidewalk improvements, shelters, real-time info
- **Buses:** 8 low-floor branded buses with CNG propulsion
- **Service:** 15 minute headways
Kansas City, Missouri

- **System name:** MAX (Metro Area Express)
- **Service Began:** July 24, 2005
- **Capital Cost:** $21 million
- **Ridership:**
  - 4450 daily ridership
  - up 30% from 3400 riders before MAX
  - 23% of MAX riders are new to transit

Kansas City, Missouri

- **Running Way:**
  - 9 miles - exclusive lanes in peak direction for 3.5 miles,
  - mixed traffic and extended green signal priority
- **Stations:**
  - 22 stations in each direction
  - 17 foot marker signs, real-time info
- **Buses:**
  - 12 standard branded buses powered by clean diesel fuel
- **Service:**
  - 9 min headways peak
  - 15-30 min off-peak
  - travel time cut from 24 to 18 minutes
**Eugene, Oregon**

- **System name:** EmX (Emerald Express)
- **Service Began:** January 14, 2007
- **Capital Cost:** $17 million for runningway and stations, $6 million for vehicles
- **Ridership:** Before EmX daily boardings were 2800, projected ridership with EmX is 4200

### Runningway:
- 4 mile transitway
- 60% exclusive bus lanes, 40% TSP and queue jump

### Stations:
- 8 stops level-boarding, real-time info, lighting, furniture and bike storage

### Buses:
- 60-foot articulated New Flyer branded buses with hybrid-electric propulsion

### Service:
- 10 min daytime, 20 min evenings, weekend
Orlando, Florida

- **System name:** Lymmo
- **Service Began:** 1997
- **Capital Cost:** $21 million for runningway and stations
- **Ridership:** 91,000 boardings per month, up 33% from the previous service

Orlando, Florida

- **Runningway:** 3 mile loop transitway with signal priority
- **Stations:** 11 stations include lighting and computer links, 8 stations are traditional bus stops
- **Buses:** 10 low-floor, wide-door CNG collision warning, lane assist and precision docking
- **Service:** 5 min day, 10-15 min other
Tacoma, Washington

- **System name:** Trunk routes (not called BRT)
- **Ridership:** Route 1 saw a 40% increase
- **Runningway:** 246 buses & 95 intersections with TSP
- **Stations:** shelters with lighting, benches, garbage cans and customer information
- **Buses:** standard 40’ CNG

**Conclusions**

- Evaluations proving that BRT can be an inexpensive option
- Much more data and research is needed