Kansas City’s
MAX Bus Rapid Transit System
Arterial BRT Lines

- **Main Street MAX**
  - $21 million
  - 6,000+ Daily Riders
  - Opened July 2005

- **Troost Avenue MAX**
  - $30 million
  - 8,500+ Daily Riders
  - Opened January 2011
Main Street MAX
Regional Commercial Corridor

- Regional Center
  - > 150,000 Jobs
  - Civic & Cultural Centers
  - Residential Growth

- 9 Miles Connecting
  - River Market
  - Downtown CBD
  - Crown Center
  - Midtown
  - Country Club Plaza
  - UMKC
Main Street - Pre-MAX (2004)

- Six-Lane Urban Arterial
- Curb Lanes
  - Travel Lane in Peak
  - Parking in Off-Peak
- Two Local Bus Routes
- Slow Bus Service
- Too Many Stops
- Declining Ridership (3300 Daily)
Main St. MAX Objectives

- Attract New Riders
- Operate Like Rail
  - Stations Rather Than Stops
  - Unique Identity
- Reduce Travel Time 20%+
- Support Econ. Development
- Implement Quickly (3 to 4 yrs)
- No New Taxes
Why Bus Rapid Transit?

- Alternatives Analysis
  - Transit & Other Benefits
  - High LRT Expense
  - Lower Cost BRT
- Rapid Start-up (3.5 Yrs.)
-Existing funding sources
Main St. MAX - July 2005

- “Bus Only” Lanes 52% of Length
  - Peak Hour “Bus Only” Midtown
  - Full-time “Bus Only” Downtown
- New Start “Fixed Guideway”
- Signal Upgrades & TSP
- Limited / Far Side Stops
- Travel Time Savings
Infrastructure Improvements

- Partnered with City
- Repave All Six Lanes
- Concrete Pads at All Stations
- Repair Sidewalk, Inlets and Reset Manhole Covers
- Traffic Signal Upgrades
  - Fiber Interconnect
  - New Controllers
  - TSP and New Timing
MAX Station Design Goals

- Distinctive “Station”
- Enhance Transit Image
- Reflect MAX Brand
- Within Existing ROW
- Terminus Park & Rides
Main St. MAX Stations

- 4 Block Spacing
- Every ¼ to ½ Mile
- Major Cross Streets
Main Street MAX Stations
Station as Landmark

- Design for Permanence
- Station Naming = Landmarks
- Real-Time Information
- Wayfinding Maps
ITS Real-time Info & TSP

- Real-Time Information
  - Every MAX Station
  - Trapeze On-Street System
  - Radio Based
  - 2 Line Signs on Main St.
  - 3 Line Amber on Troost
MAX TSP

- Traffic Signal Priority
  - Non-CBD Intersections
    - 31 Intersections on Main St.
    - 30 on Troost Ave.
  - Schedule Reliability
  - No Operator Interaction
- On-Time Perf. <92%
# TSP System Monitoring

![TSP System Monitoring Interface](image)

## Options
- **Main Routes**: Main st
- **Intersections**: Main & 18th
- **Time**: All Day
- **Bus Number**: 502
- **Select Single Date**: 2011-11-24
- **Select Between Dates**: 2011-09-01 to 2011-09-30

## Route: Main st

<table>
<thead>
<tr>
<th>ID</th>
<th>Start_Time</th>
<th>End_Time</th>
<th>Duration</th>
<th>Chan</th>
<th>PREEMPT</th>
<th>Priority</th>
<th>Intersection</th>
</tr>
</thead>
<tbody>
<tr>
<td>527</td>
<td>08:00:30</td>
<td>08:00:37</td>
<td>7</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>510</td>
<td>22:00:53</td>
<td>22:01:10</td>
<td>17</td>
<td>N/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>531</td>
<td>13:02:34</td>
<td>13:02:41</td>
<td>7</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>529</td>
<td>18:30:55</td>
<td>18:31:01</td>
<td>5</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>532</td>
<td>07:31:12</td>
<td>07:31:19</td>
<td>7</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>508</td>
<td>21:35:26</td>
<td>21:35:26</td>
<td>0</td>
<td>N/B</td>
<td>No</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>527</td>
<td>12:31:02</td>
<td>12:31:10</td>
<td>8</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>506</td>
<td>18:01:06</td>
<td>18:01:16</td>
<td>10</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>527</td>
<td>06:30:28</td>
<td>06:30:33</td>
<td>5</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
<tr>
<td>532</td>
<td>12:03:37</td>
<td>12:03:43</td>
<td>6</td>
<td>S/B</td>
<td>Yes</td>
<td>Low</td>
<td>Main &amp; 18th</td>
</tr>
</tbody>
</table>

### Statistics
- **% Accepted**: 70%
- **% Rejected**: 29%
- **Schedule Adherence**: 99.61%
- **Behind Schedule**: 0.39%
MAX Vehicles
Main Street MAX
Capital Cost $20.9 Million (2005)

- 80% Federal Funding
- Federal $16.7 Million – Earmarked Over 5 Years
  - 5309 New Starts: $3.4 M
  - 5309 Bus Capital: $8.3 M
  - Sect. 330 (RABA): $5.0 M
- 20% + Local Funding
Main Street MAX Operations

- MAX (10 Min. Peak/15 Min. Off)
- Local (30 Minute)
- Nights and Sunday
  - 30 Min. MAX/30 Min. Local
- Enhanced Event Service
- Travel Time Savings (> 20%)
  - Plaza to Downtown <18 Minute
  - Pre-MAX 24 Minute +
  - Perception of Speed
Main Street MAX Operating Costs

- Pre-MAX: $3 Million (2 Locals)
- MAX & Local: $4 Million
- Increase Operating Cost
  - Service Levels
  - Station Cleaning & Servicing
  - ITS, Lights and Power
  - Vehicle Maintenance
Main Street MAX Success

- High Customer Satisfaction
  - Increased Ridership

- Positive Community Reaction

- Changing Demographics
  - Choice Riders
  - Visitor and Event Service

- Regional BRT System
SMART MOVES

Regional Transit Plan (BRT Based)
Troost Corridor Pre-MAX

- Population
  - Lower Income
  - High Transit Dependency
  - Very Diverse Population
- Economic Need
- Pockets of Growth
  - Universities
  - Hospital Hill
- Neglected Infrastructure
Troost Corridor Pre-MAX

• Local Service Only
• 13+ Miles, 62 Min.
• Frequent, Closely Spaced Stops
• Very Slow Service in Core
• 10 to 12 Min. Headways

Pre-MAX 25 Troost Local Bus Service
Troost Corridor

- **High Ridership**
  - 7500 Daily Boardings
  - Connecting Routes

- **Major Activity Nodes**
  - Downtown
  - Hospital Hill
  - Universities
  - Federal Complex
  - Green Impact Zone
Troost MAX
Very Small Starts

- Substantial Branded Stations
  - 44 Stations/2 per Intersection
  - 3 Park-and-Rides
- Signal Priority at 30 Intersections
- 14 Low-Floor Vehicles
- Artwork at 3 Locations
  - Planning: Start in 2006
- Operation: Jan. 2011
Troost MAX Stations

- Every 4 Blocks (¼ to ½ Mile)
- 92% of Existing Ridership
- Troost MAX Unique Design
- Multi-Directional Protection
- Park and Rides
  - South Termini (2)
  - Midtown
Troost MAX Station
Troost MAX - 75th Street Transit Center
Troost MAX Station
Green Initiatives

- Solar Lighting
- All Electric Service Truck
- Hybrid Electric Buses
- Solar Trash Compactor
- Waste Recycling
- 43 Rain Gardens
- Pervious Concrete
Hybrid MAX Buses
Troost Artwork
Troost MAX ITS

- Traffic Signal Priority
  - 30 Non-CBD Intersections
  - Controller Upgrades
  - Wired & Wireless Interconnect

- Schedule Reliability
  - On-Time Perf. <91%

- TransitMaster
  - TSP, Vehicle Headsigns, On-Street Signs
Troost MAX (Green Line) Operations

- **Troost MAX**
  - Every 10 Minutes All Day
  - > 20% Travel Time Saving

- **Troost Local**
  - 30 Minutes All Day
  - Uses MAX Station

- **Corridor Operating Costs**
  - Pre-MAX $4.5 Million
  - MAX & Local $4.9 Million
Troost MAX $30.7 M  Capital Costs

- $3.5  Planning, Design & Engineering
- $5.9  15 Vehicles (5 Hybrid-Electric)
- $3.5  Pavement, Streetscape, Sidewalk
- $2.4  Signals, Signs, TVMs
- $14.1  Stations & Park-and-Rides
- $1.3  Administration, Easements, Utility, & Legal
Sustained Success

- Customer Satisfaction
- Ridership Growth
- First University Pass Program
  - August 2011
- Development Opportunities
- Riders Shifting to MAX
- Demand for More MAX Line
Lessons Learned

- Bus Lane Enforcement
- Signal Priority Challenges
- Boarding Delays
  - On-Board Fare Collection
- Station Spacing (Too Tight)
- Branding / Marketing
- Increase Operating Cost
  - Vehicle Operations & Maint.
  - Stations, Signs & Electrical
  - Staff Resources
Contact Info

Dick Jarrold
Senior Director
Kansas City Area Transportation Authority
816-346-0356
djarrold@kcata.org

Danny O’Connor
Director of Planning
Kansas City Area Transportation Authority
816-346-0353
doconnor@kcata.org
Land Use Developments Related to MAX

- Main Street Corridor Improvements
  - Community Improvement Districts
  - Streetscape to Match MAX Design Elements

- Troost Avenue TOD
  - Medical Center and University Expansion
  - Green Impact Zone – Neighborhood Reinvestment
  - Senior Housing Development
  - Satellite KCMO Public Health Clinics
  - Potential New Federal Office and Downtown Housing

- Pedestrian Improvements & Trail Connections
  - Connected to 3 Regional Trails