Real Time and On-Line
Transit Information for a Connected Region

The New York Academy of Sciences
May 4, 2010

Clair Fiet
Chief Technology Officer
Utah Transit Authority
cfiet@rideuta.com
Transit Competing with the Automobile in Utah
What Our Customers Expect

- Generally 65-70% of individuals using UTA service indicate they had other alternatives for their travel.
- In deciding whether to take UTA our customer care about
  - the availability and clarity of service information,
  - service alignment,
  - frequency,
  - travel time, and
  - fare.
What Our Customers Expect

- While traveling our customers care about
  - accuracy of service information,
  - availability of real-time service status information,
  - on-time reliability,
  - amenities at stops,
  - fare payment system reliability and accuracy,
  - seat availability,
  - vehicle type,
  - vehicle age,
  - convenience of transfer between services,
  - facility cleanliness,
  - vehicle cleanliness,
  - security while waiting for and traveling on the transit system, and
  - customer friendliness/ professionalism of the vehicle operators.
UTA Approach to Information Technology Development

- Open systems; adaptive use of commercial products
- Internal integration
- Modular, incremental evolution
- Collaboration/partnerships
- Competition
UTA ITS Systems

• **Bus**
  – Mobile Data Computer/Radio – voice and data
  – Ethernet
  – Electronic Fare Collection (EFC) validators
  – Onboard Mobile Gateway (WIFI and 3G)

• **Facility WIFI**

• **Fiber-optic network to all platforms**

• **EFC hosted back office**

• **WIMAX – commuter rail line**
UTA ITS Applications

• Current
  – Computer Aided Dispatch (CAD)
  – Mobile Data Computer/Radio – bus voice and data communications, routes, schedules, detours
  – Reliability – schedule keeping
  – ADA stop annunciation
  – Patron WIFI on commuter rail and express bus
  – Electronic fare collection
  – Google transit

• Being developed
  – AVL
  – Predictive arrival info for bus and train
  – Remote malfunction detection and diagnostics
Mobile Data Computer (MDC)
UTA Smart Bus Components
Future Bus Architecture

Front Door

- Tri Combo Antenna
- WiFi
- GPS
- Radio 900 MHz
- Mobile Gateway
- Mobile Computer Device

Rear Door

- Card Validator
- Ethernet Switch
- Card Validator

Subsystems:
- APC
- Signage
- Video

KEY:
- ETHERNET
- COAXIAL
- POWER / CONTROL
- POWER OVER ETHERNET
08:23:17
Tuesday Apr 27 2010

07:52 3WHWY89 (STATE ST @ 480 W) 5:49
08:08 123SSSTAT (FACTORY OUTLET RD @ 12... 7:32
08:21 SNDYCCTR (SEGO LILY DR @ 115 E) 2:12
08:35 SNDYCCTR (SEGO LILY DR @ 115 E) -11:38
*** 10600 SOUTH STATE ST
08:44 123SSSTAT (FACTORY OUTLET RD @ 12...
08:58 3WHWY89 (STATE ST @ 465 W)
08:23:19
### Schedule Reliability Reporter

#### System Summary

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#### Overview

- **Date Range:** Yesterday
- **Time Range:** All Day
Patron Wi-Fi Internet
Heavy Rail Cab Car Architecture

“A” end

“B” end

Key:
- Ethernet
- Coaxial
- Power / Control
- Power over Ethernet

Existing cubicle behind drivers cab
Existing terminals for cab radio / PA
Existing cubicle, air conditioning control, No 2 end

1 - WiMAX 1
2 - GPS / UMTS
3 - WiMAX 2
New Mexico Rail Runner train gets lit with WiMAX, sets a good example

By Darren Murph posted Apr 14th 2010 12:05PM

Oh sure, we've seen the occasional big city train get their own WiFi / WiMAX installation, but when a state like New Mexico steps up and does it, we take notice. The New Mexico Rail Runner, which travels some 95 miles between Santa Fe and Albuquerque, is now lit with WiMAX along the entire route, and the service is being provided gratis for all who ride. Better still, the New Mexico Mid-Region Council of Governments has no intentions of ever charging patrons in order to recoup the $2.4 million investment. We're told that users can expect download rates of up to 6Mbps and upload speeds nearing 4Mbps, and we're desperately hopeful that other states will take notice and attempt to get with the program. America's already way behind most every European nation when it comes to rail travel, but toss a "free WiMAX!" sign on the door and you just might coax these car-lovin' Yanks into going mass transit.
Commuter Rail Ridership: General Patrons vs. Wi-Fi Users
Why Electronic Fare Collection?

- Customer convenience
- Collection efficiency and effectiveness
- Data, data, data
Electronic Fare Collection

- **Infrastructure Deployment**
  - Readers at all doors of 520 fixed route buses
  - 170 validators installed on 35 TRAX and FrontRunner platforms

- **Communications**
  - Wireless gateways on buses that support WIFI in four depots and 3G continuous mobile throughout service area
  - Fiber communication to all platforms
  - Link to hosted back office operated by ERG in Sacramento California via internet
Initial Products

- Third party paid passes – ECO, Ed, Ski

- Contactless credit acceptance for full single adult fares
The Greatest Benefit of Real-time Information Comes from Regional Transportation Integration.

- Information to customers is what makes it all work
- Typical transit approach is to operate within four walls
- Share information among ALL players in the region
- Integrated Corridor Management
Real Time Information

- On platforms
- On board
- Internet access
- Trip planner
- Real time bus predictions
- Open access to third parties
Thank you.
Schedule Reliability Reporter

System Overview

- Last Week (05/27/07 - 06/02/07)
  - On Time: 70.22%
  - Early 9.05%
  - Critical 2.83%
  - Late 18.31%

- Week To Date (05/03/07 - 06/05/07)
  - On Time: 72.43%
  - Early 9.37%
  - Critical 1.52%
  - Late 16.68%

- Last Month (05/01/07 - 05/31/07)
  - On Time: 71.35%
  - Early 9.76%
  - Critical 2.06%
  - Late 18.01%

- Month To Date (05/01/07 - 06/05/07)
  - On Time: 70.52%
  - Early 8.74%
  - Critical 2.02%
  - Late 17.12%

- Last Year (01/01/06 - 12/31/06)
- This Year (01/01/07 - 06/05/07)

- Year To Date Reliability
  - On Time
  - Early
  - Late
  - Critical

- Month To Date Reliability
  - On Time
  - Early
  - Late
  - Critical
Custom Overview Reports - System

The graph you generate and the corresponding one on the main System Overview page may differ slightly since the main page's graphs are updated every 20 minutes.
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Reliability – Schedule Keeping

TransDat V Mobile Data Computer

09:25:28
Friday Jan 05, 2007

09:26 MILLCREK 3300 S @ 210 W 0:52

***MILLCREEK TRAX STATION

09:27 MILLCREK 3300 S @ 210 W 0.03
09:35 36-S9-W 900 W @ 3600 S
09:39 35-SRDWD 3500 S @ 1720 W
09:45 VALYFAIR 3650 S @ 2754 W

Logout