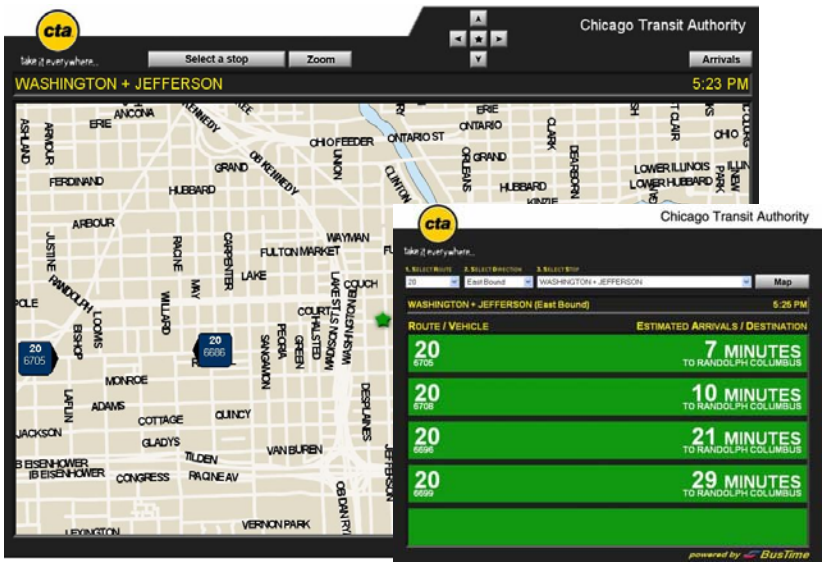
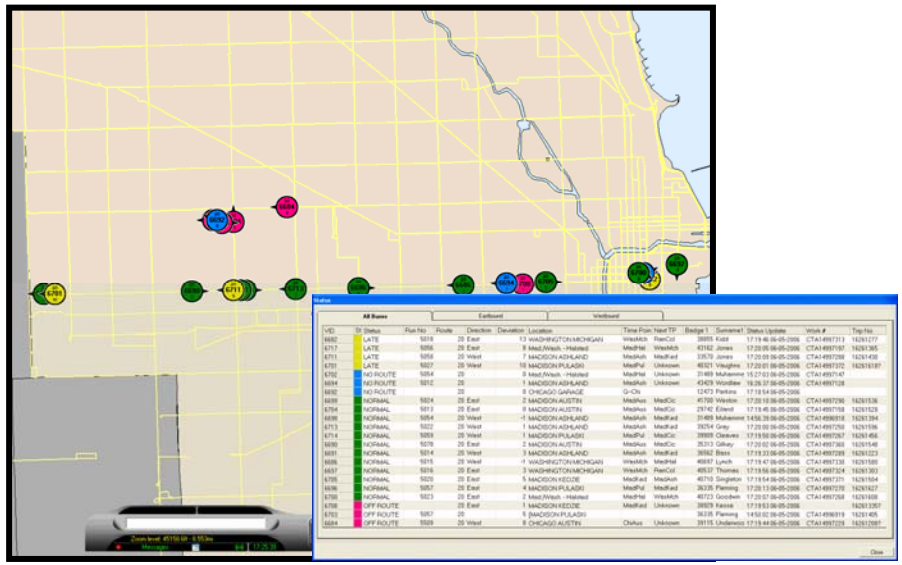
CTA
Transit Operations & Technology Management Divisions

AVL - Bus Tracker Planning Update and Business Case

February 14, 2007

Pilot Project Background





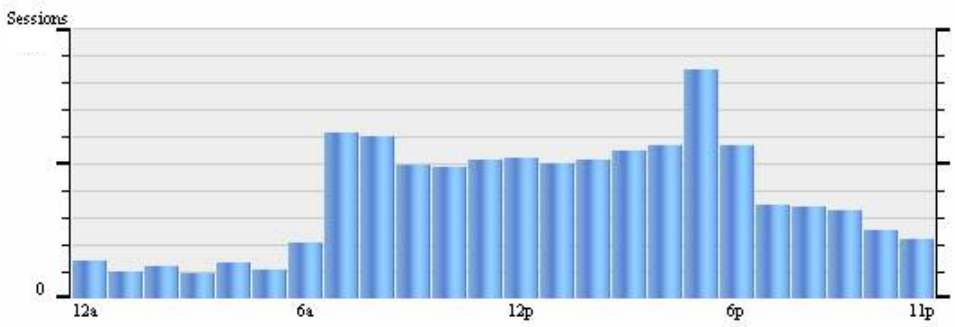
- Key System Components:
  1. **Data Communication Methods**
     - Cellular data communications
     - WiFi / Cellular / Digital Radio Switching (Mobile Access Router)
  2. **Customer Information Application (Bus Tracker)**
     - Website providing stop specific arrival predictions and a city map
     - Scrolling sign at one bus shelter displaying next two bus arrival times for that stop
  3. **Control Center Software Application (CAD/AVL)**
     - Displays real time bus location information, route incidents, and other reports

The CTA has a refined set of requirements for the customer information application as well as the data communication methods, while a transitional approach is recommended for CAD/AVL

Pilot Project Findings

Bus Tracker released to public August 5th, 2006

Typical Weekday Visits by Hour*



Example of Customer Feedback

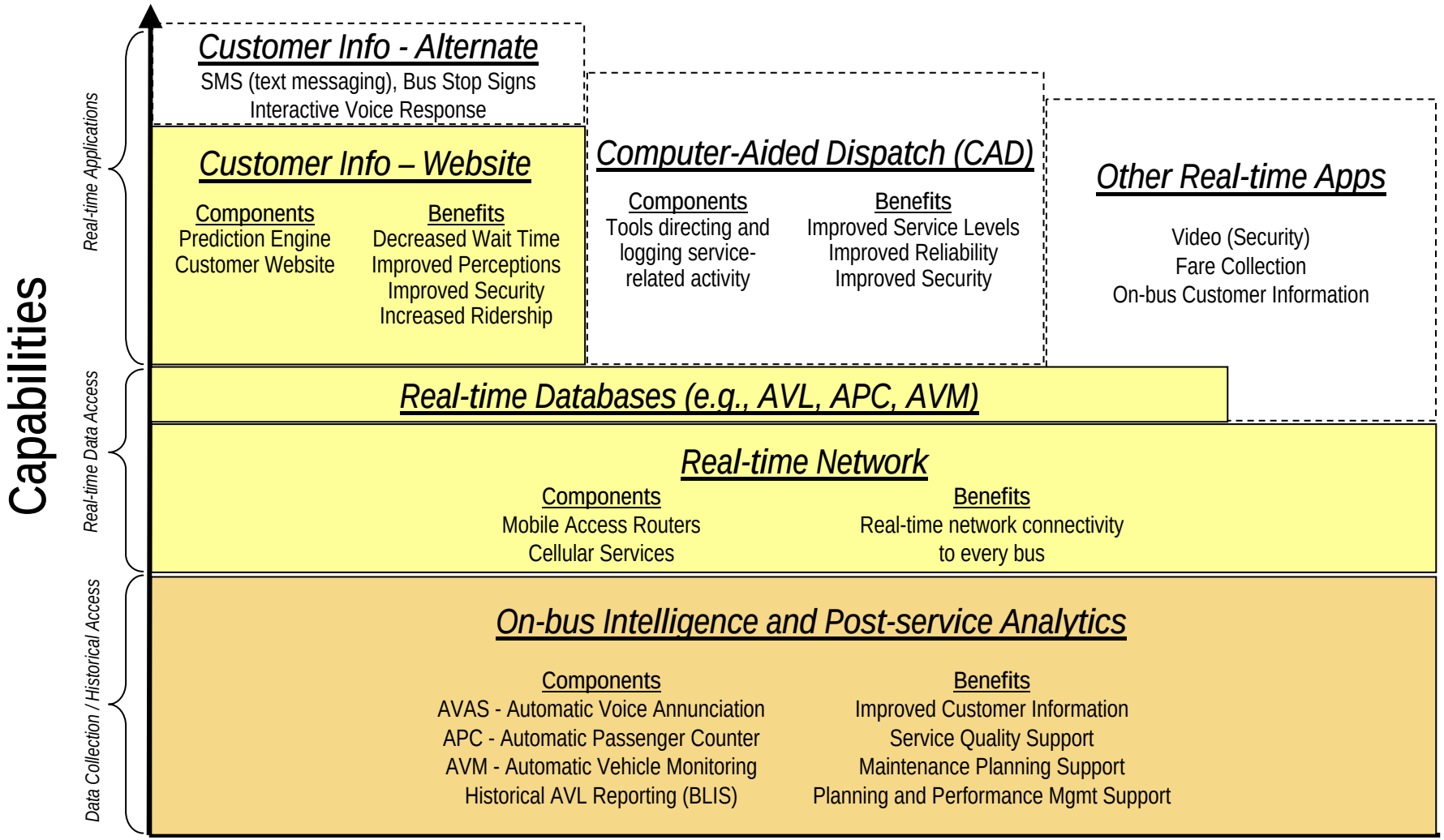
"I just wanted to let the CTA know how much I like the bus tracking system on Route 20. I ride the Route 20 bus between Michigan Ave and Peoria St …I can now plan my return trip using the tracking system in the afternoon. I check the bus tracker online from my office and leave when the bus is approaching Peoria St. I now never have to stand in the rain, snow, or cold waiting for a bus. This is a great feature! Thanks."
-- Pamela G

- Public use of website reached a steady state around 500 visits/weekday (~2.5% of #20 rides)
  - Variable message sign has been in continuous operation at the Madison & Jefferson stop
  - A slight increase in web traffic from November 2006 to December 2006 may be due to the colder weather.
- Insight into customer patterns of website usage
  - Users seem to prefer the predictions page
  - Most viewed stops: #1 – Madison/Throop; #2 – Madison/Laflin; #3 – Madison/Peoria
- Positive results in post-release customer survey of the #20 route
  - Perceived wait time at the Madison-Jefferson stop fell by a statistically significant 3.5 minutes to an average of 9.5 minutes. Since research has shown that customers value waiting time twice as much as travel time, this reduction in perceived wait time should increase customer satisfaction
  - Bus Tracker also positively impacted the customer ratings of knowing next bus arrival, reliability, wait-time satisfaction, and willingness to recommend CTA service.

* Data taken from the week 1/22-1/26

Leveraging Previous Investments & Future Opportunities

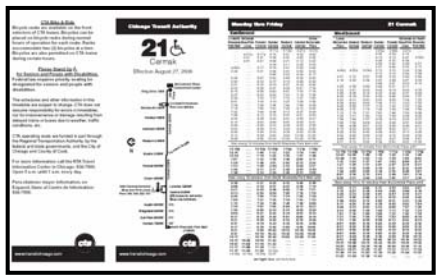
- Procurement of the customer web information, BusTime, will provide the communications to complete the on-board platform as well as increases the level of service to bus customers with real-time arrival information



Changing Customer Behavior

Without Bus Tracker

Schedule-Based Relationship



With Bus Tracker

Prediction-Based Relationship

Expectations will now be set by fundamentally different information -- perceptions of CTA service will be measured against a different standard

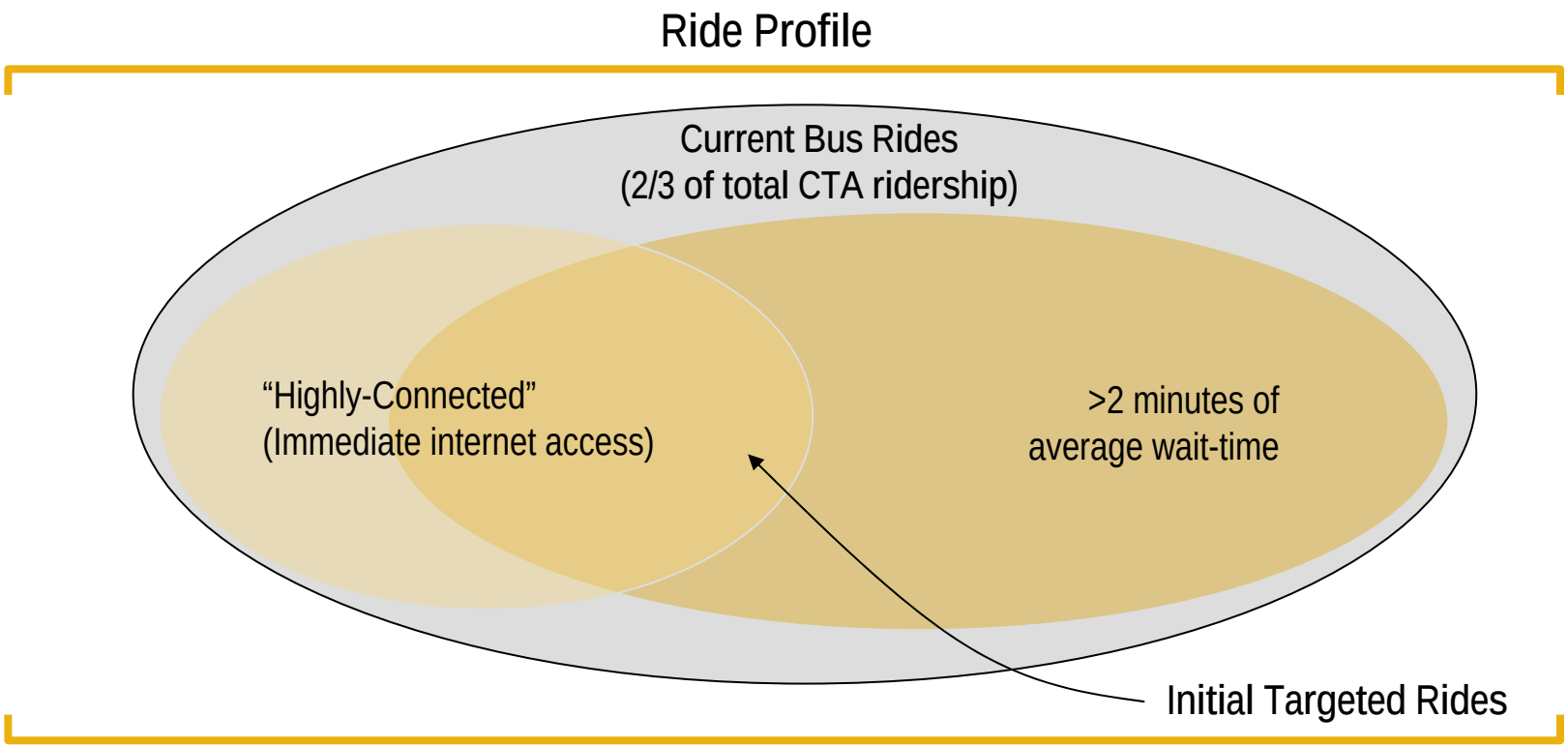
Implications

<u>Wait time at the bus stop is reduced</u>: Informed customers will not go to a bus stop until a bus is actually going to be there

<u>Denominator for service reliability is changed</u>: The static schedule was the best information available, now it will be a real-time prediction engine

<u>Frustration with service variability will be reduced</u>: Customers will spend less time waiting outside (inclement weather, safety, etc.), and not become agitated with CTA service if other routes run by a stop regularly

Initial Market Segment



The portion of rides (and potential rides) for which the rider has access to a PC or PDA just prior to their departure the bus stop

The portion of rides for which the rider currently waits longer than 2 minutes at the stop

Our market segment for the Bus Tracker application is the set of highly connected riders that find themselves waiting longer than two minutes at a bus stop

Justification – Benefits Classification

Benefits to Customers

Benefits created by a real-time arrival prediction system experienced by customers.

- Shorter Actual Wait Times
- Shorter Perceived Wait Times
- Increased Information
- Higher Perceived Reliability
- Reduced Wait-Time Anxiety
- Net Societal Benefits of Increased Mass Transit Usage (public benefit)

Direct CTA Benefits

CTA may see some revenue enhancements from the deployment of a web-based real-time arrival prediction system.

- Improved Customer Satisfaction
- Increased Ridership
- Improved CTA Image

CTA will be providing the same real-time location information to the Control Center and street supervision for the improvement of service

Future CTA Benefits

The entire real-time network investment has several benefits that are difficult to quantify and creates future options.

- CAD/AVL & Communications Platform
- Remote Video Surveillance
- Advanced Networking Capabilities
- Fare Collection Alternatives
- Potential Web-Based Advertising Revenue

If we achieve a 3.8% adoption rate, the monetized customer benefit of reduced actual wait time will equal the CTA's investment in the entire system

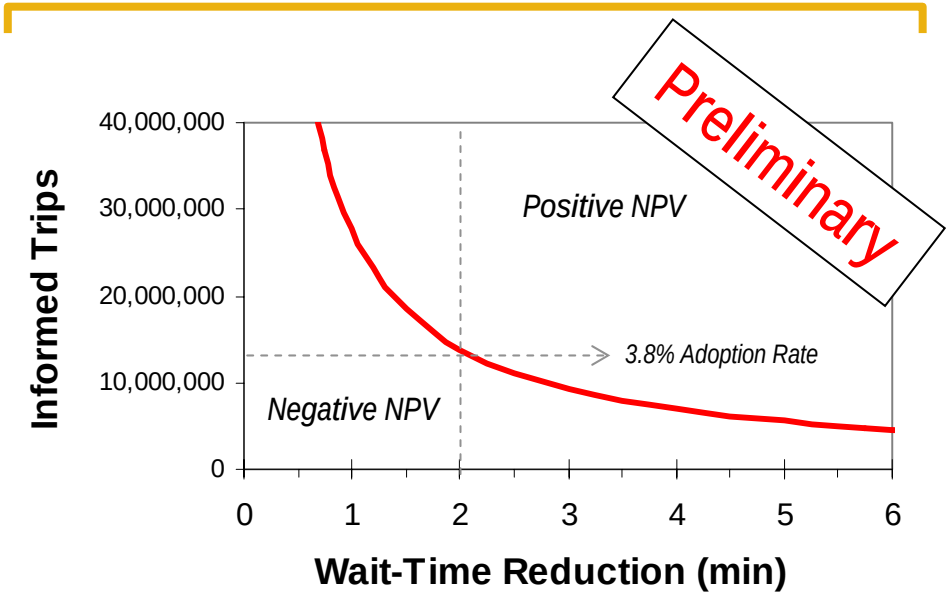
Justification – Breakeven Analysis

August 2006 FTA study

"Real-time Bus Arrival Information Systems Return-on-Investment Study"

Supports the concept of justifying the purchase of a real-time arrival prediction system by measuring the wait-time benefits for customers

Wait-Time Reduction Break-even Analysis*



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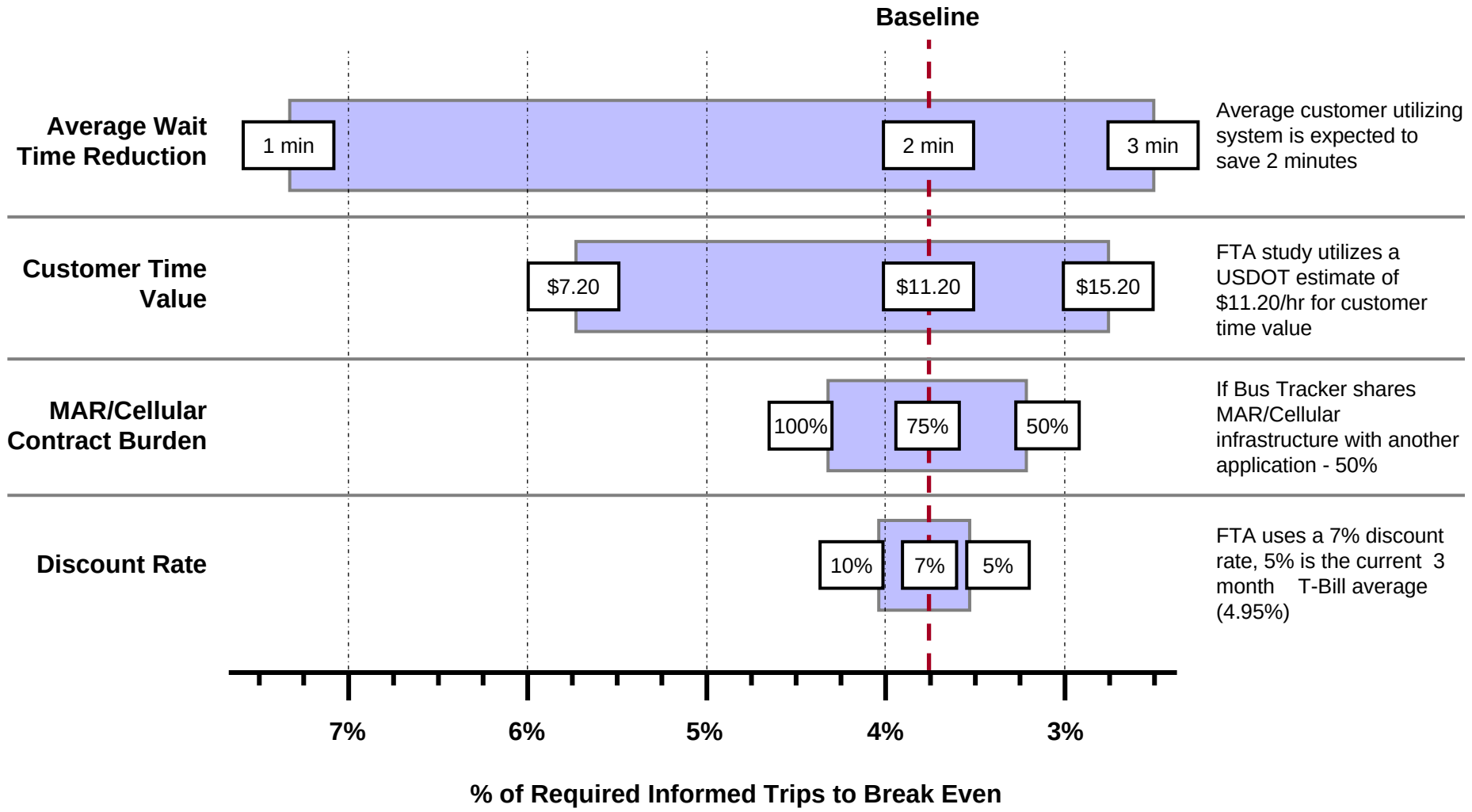
* Assumptions

- Benefits modeled after FTA study
  - 7% discount rate
  - $11.20/hour USDOT time value estimate
- 10 yr useful life of field equipment and software
- 5 yr useful life of servers
- Re-investment in software in year 7
- Customer benefits vary by scheduled interval
- 75% cellular and MAR contract burden
- NPV based on 10 yrs of operation

Justification – Sensitivity Analysis



Customer Demand – Feedback from Pilot

"Any chance that you will roll this out to the rest of your buses? As a new user of public transportation, I suspect this will increase the number of riders because of the convenience of checking arrival times."
-- Michelle F

"Having spent many cold/wet/rainy moments waiting outdoors for buses, I always thought this would be great idea for the riders. I'm glad to see this is being tested out in the city. Keep up the good work!"
-- Matthew L

"I've lived in Chicago all my life and think this is a great idea. I would use it VERY often. I look forward to these trackers being put on other routes such as the 124, 157."
-- Derek J

"I just wanted to let you know that I really like this system, and hope it will soon be able to be expanded to other bus routes and/or EL lines."
-- Jared L

"I loved tracking the #20 but have moved... when will more bus routes be in the system? I would like the #60 to get tracked."
-- Nathan M

"I often drive instead of taking the CTA on nights & weekends, because the inbound bus times are so unpredictable. This will allow me to use the bus and be on-time when going to meet people."
-- John I