Trippin’ on MTA wit

Transit App

A discussion in real-time about real-time information

Michael Helta
Chief Innovation Officer, MDOT MTA

Boring Overview Slide

- MDOT MTA 101
- Real-Time Basics
- Our Approach
- What we did
- What we found out
- How else we use the info
- What does the future hold

MDOT MTA 101

Services:

- Local Bus
- Metro
- Light Rail
- MARC
- Commuter Bus
- Mobility (Paratransit)

- ~380k rides per day (70% bus)
- ~112 Million riders per year
- $1b+ annual budget
- 750 buses, 100 metro cars, 55 light rail vehicles, 125 MARC vehicles, 500 paratransit vehicles,
- 3,500 employees

Real-Time Info is more than simply knowing when the next bus is arriving

- Allows for Trip Planning
- Informs your decision making
- Saves wasted time
- Keeps you dryer, cooler, hotter, etc.

It lets you live your life on your time…not on ours.

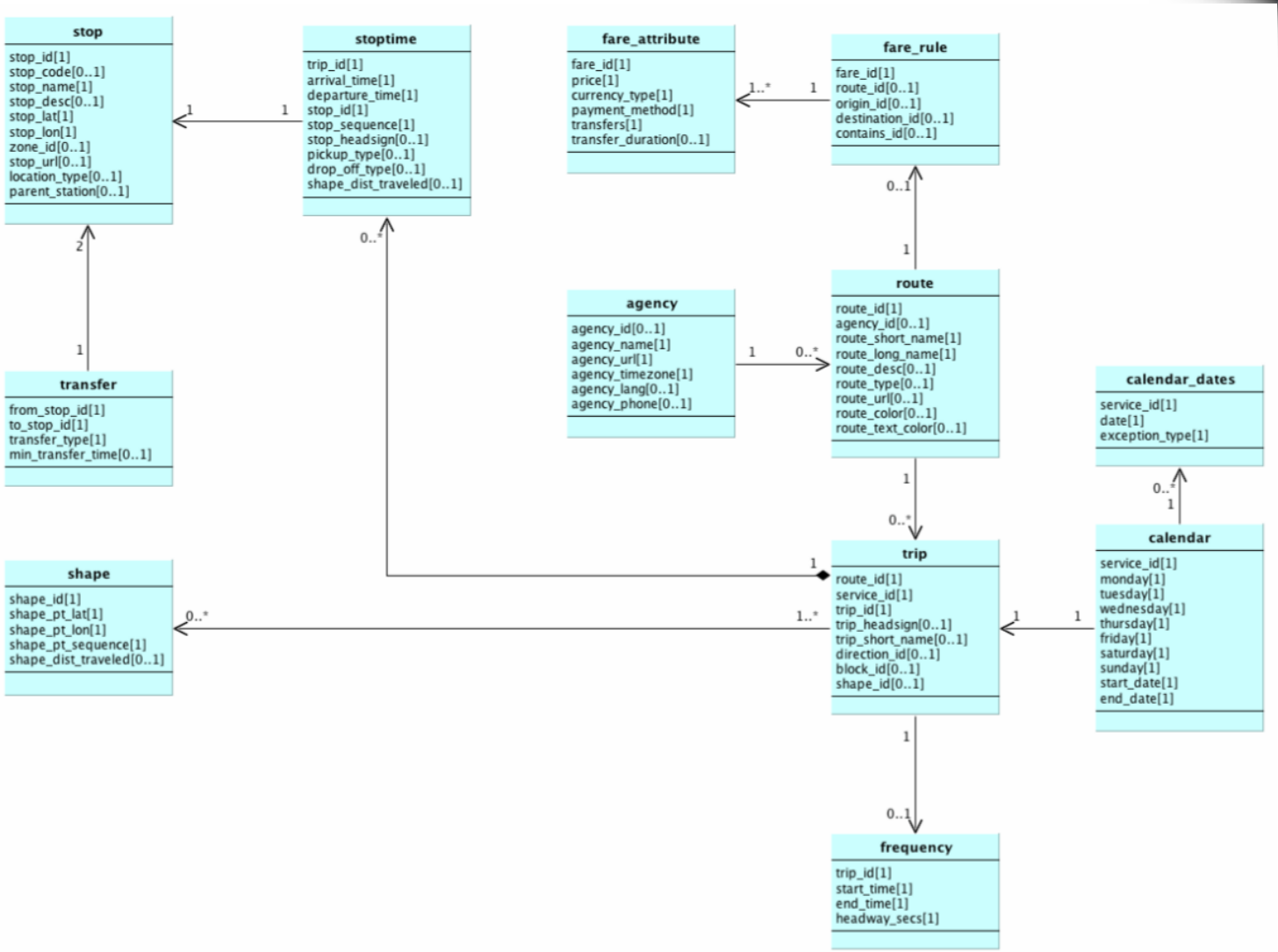
“Getting around on transit in other cities shouldn’t be this hard”

+

- Google and Tri-Met collaborate
- Circa 2006-2009
- Create a standard format for transit schedules called:

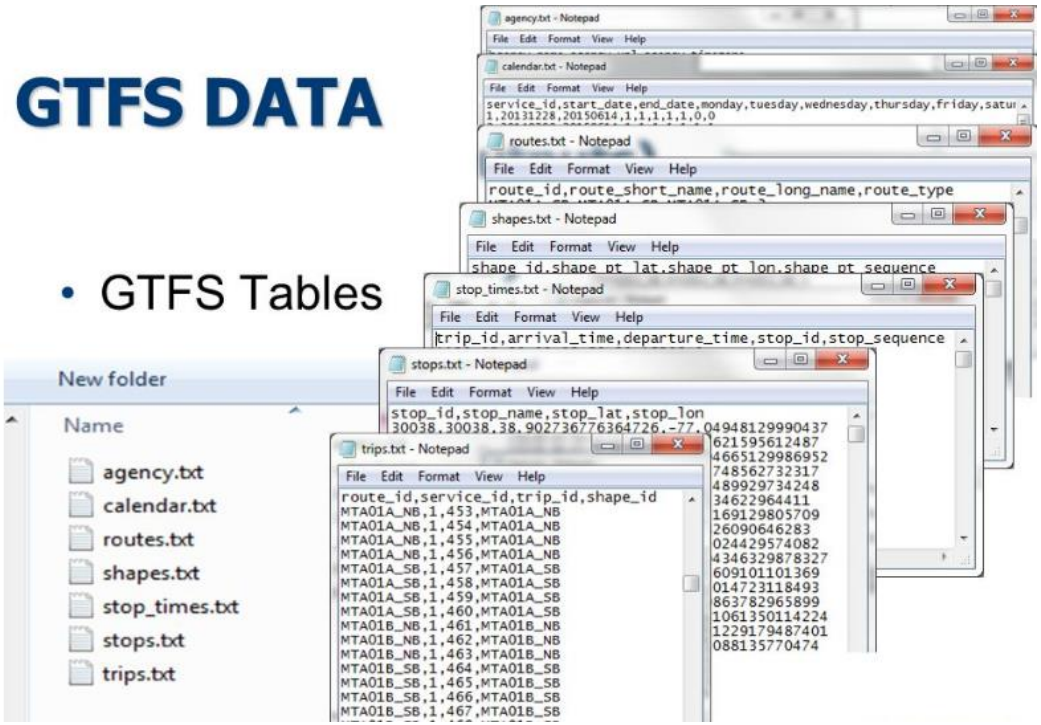
- **General Transit Feed Specification (GTFS)**

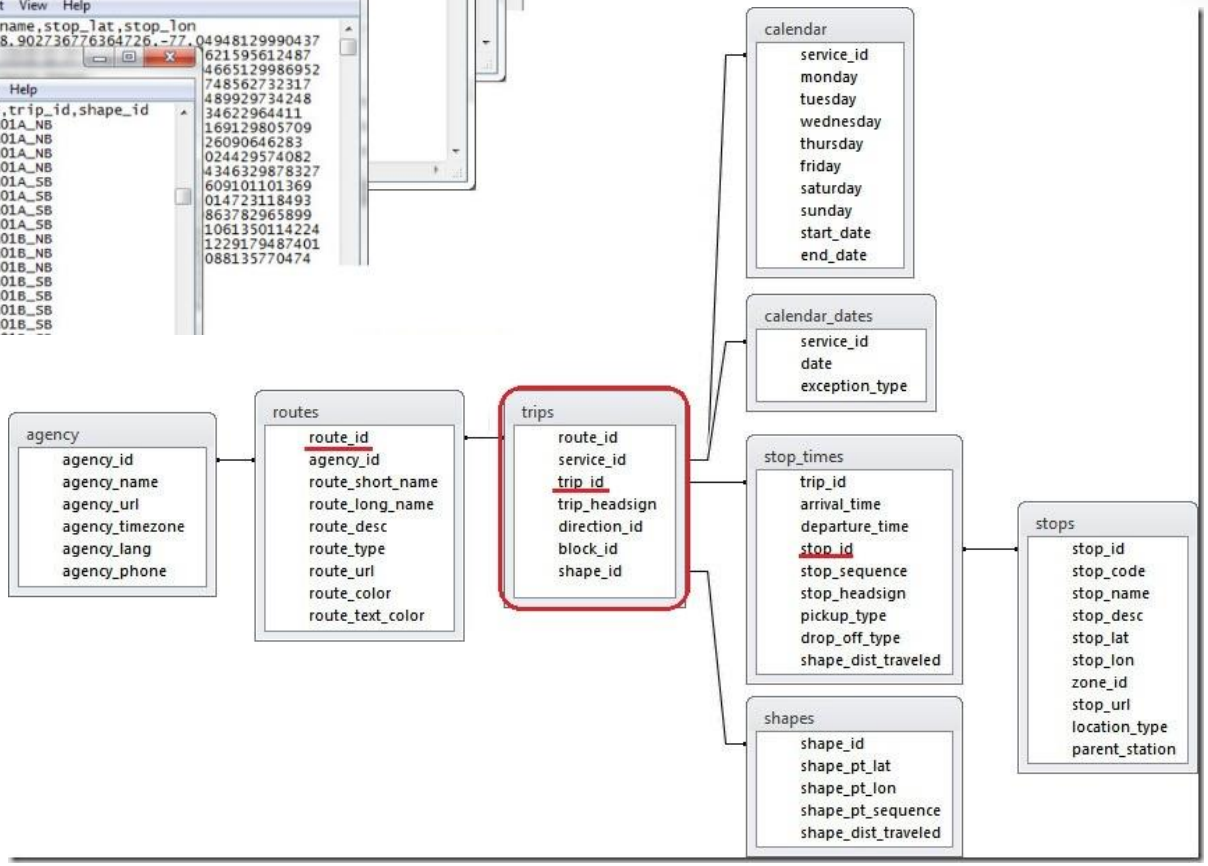
GTFS is pretty simple…



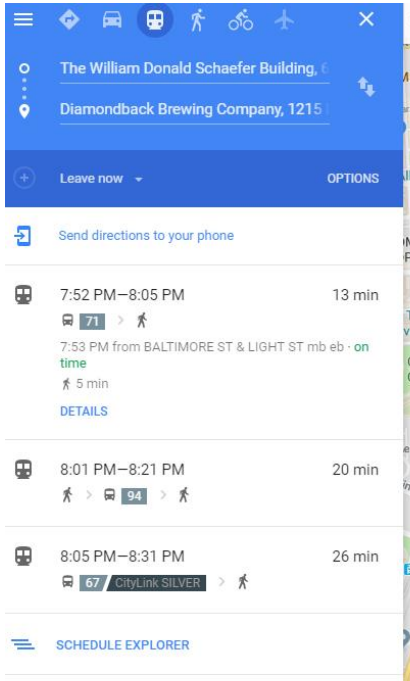
GTFS DATA

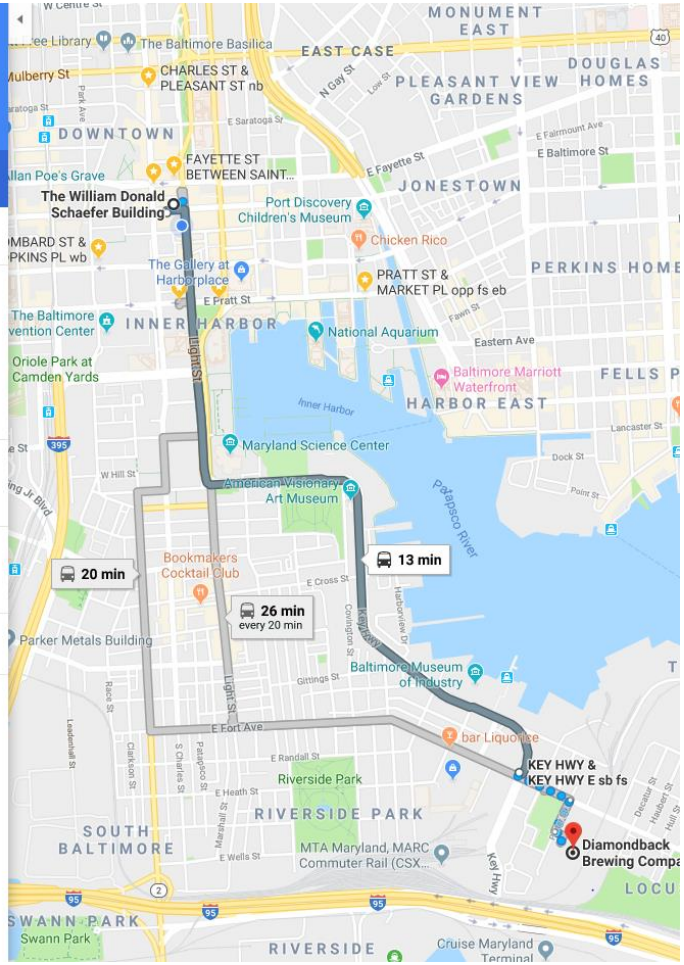
- GTFS Tables

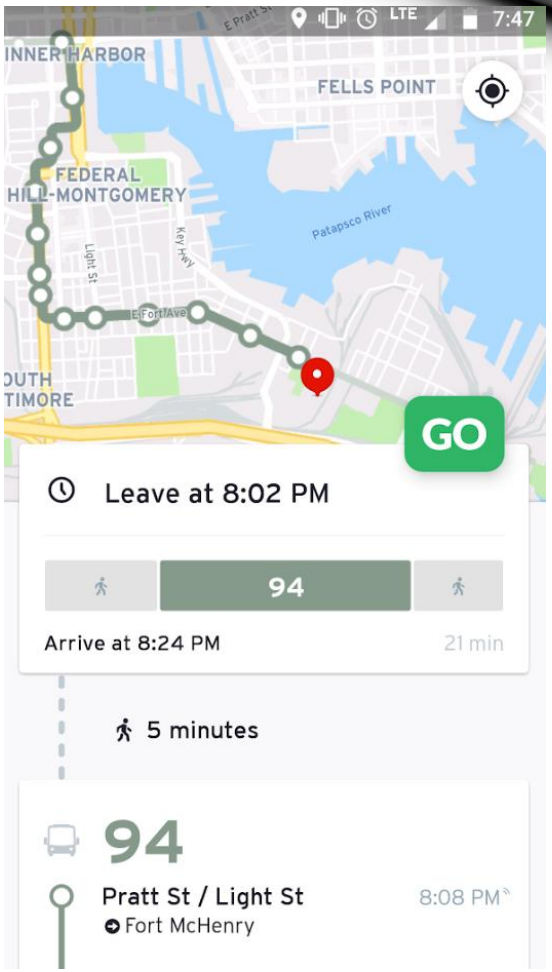




GTFS Allows for this:







GTFS-RT

Going from Static to Real-Time

- RT stands for Real-Time
- Allows for predictions
- Requires:
  - A working GTFS
  - Actual Vehicle Locations

Schedule	3:49P	3:53P	3:56P	3:59P
Actual (*prediction*)	**3:52P**	*3:56P*	*3:59P*	*4:02P*
	+3 min	+3 min	+3 min	+3 min

The way we were….

MDOT MTA had Real-Time…but it wasn't very good

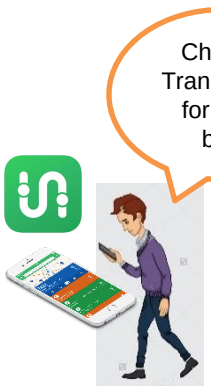
- 50-75% of our buses could be seen
- 2-4 minutes between location updates
- Radio tech often dropped out near tall buildings

1. How could we improve location information without taking apart intricate bus operating systems?
1. How can we make sure riders can use the info?

Solution:

- Put GPS Trackers on all buses
- Create an improved real-time feed
- Work with a 3rd party provider to promote the capability!

Putting it all together



Checks Transit app for next bus

Transit reads the GTFS-RT feed

GTFS-RT

Swiftly Creates a public GTFS-RT Feed

Swiftly

Swiftly pulls bus location, schedule info, and vehicle assignment data to create a GTFS-RT

Equipped with Swiftly GPS tracker, bus pings back location every 10 seconds

MARYLAND DEPARTMENT OF TRANSPORTATION

MARYLAND TRANSIT ADMINISTRATION

MTA provides GTFS and Vehicle Assignment information

Connecting buses to their routes

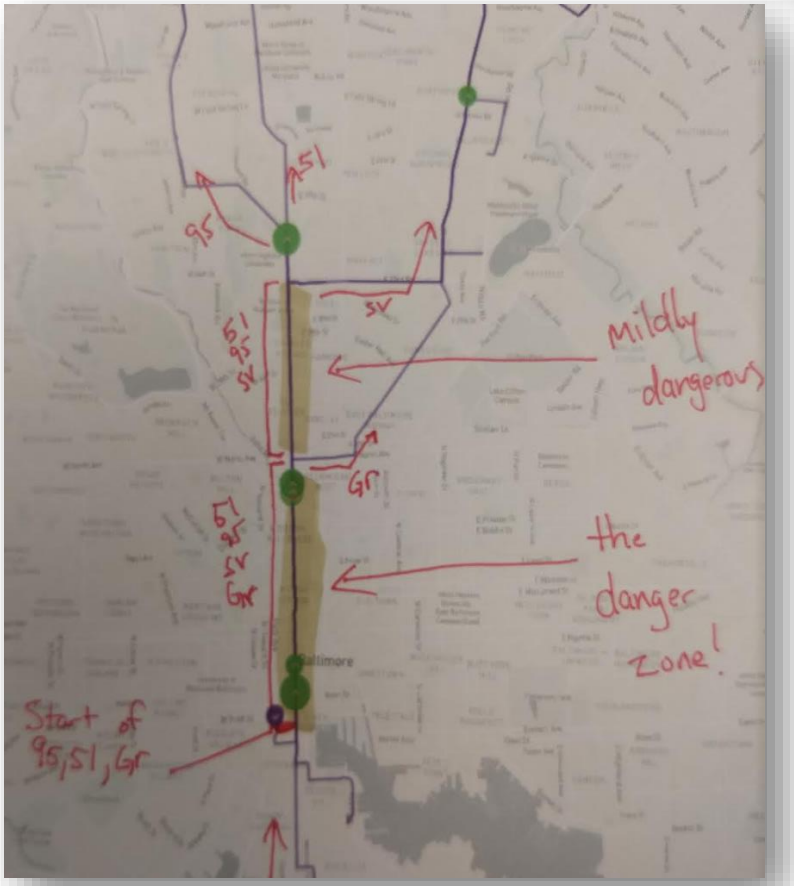
"I know where Bus 1 is but how do I know what route it is actually on?"

Overly simplified data flow

1. Bus is assigned to a block (Block is a set of trips the bus will make)
2. Operator is assigned to a Block
3. Service hits the street at prescribed time

Feed this to Swiftly every minute

4. Swiftly attaches the bus to a trip via a translation table we've provided and now it can apply location to a scheduled route/time



Auto Assignment…Not here

Getting to Predictions

“Ok, I know what route bus A is on, when will it get places?

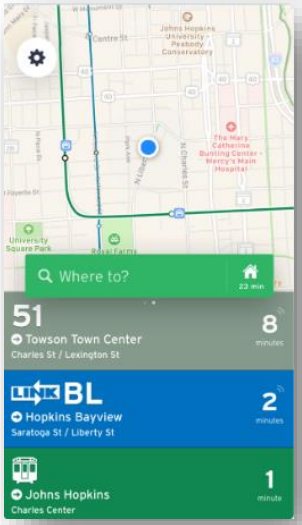
Every Minute Swiftly gets an assignment feed

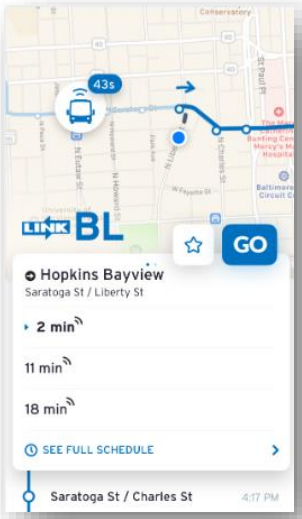
1. Uses a translation table to convert Block to TripID (GTFS)
2. Location of bus vs Schedule (GTFS)
3. Creates prediction for arrivals for every stop down the route (GTFS-RT)
    1. Every 10 seconds
    2. For up to 550+ buses
4. Provides that information to 3rd party arrival apps (Transit, Google, etc)

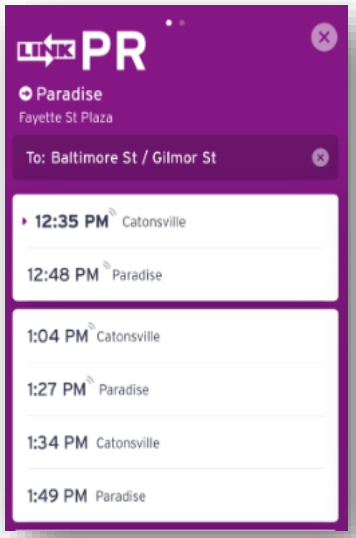
End User opens Transit:

- It GPS locates you
- Locates routes near you
- Calls to Swiftly to tell it arrival data for every bus on those routes

Why Transit (app)?

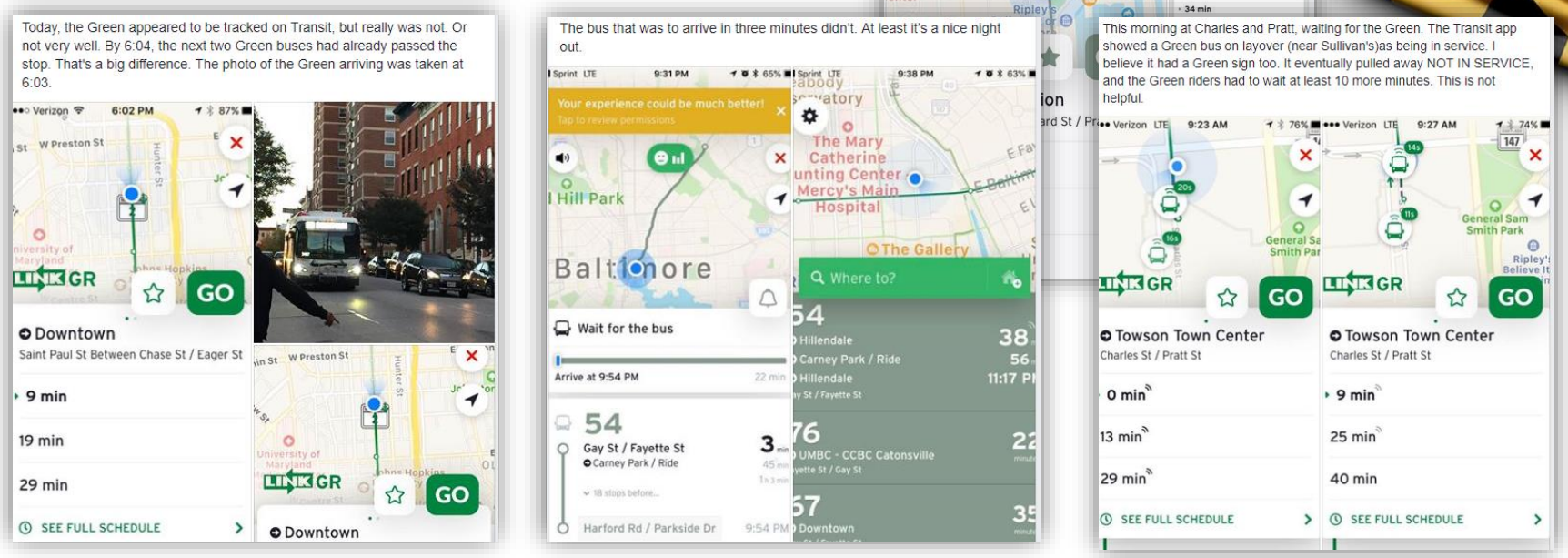






- We are not Software Designers
- Wanted to provide a robust user experience
- Consolidated training and support
- Limited User Data
- It’s Free

Nothing is Perfect



Things that can impact predictions:

- Lack of assignment at division level
- Reassignment while on street
- Diversions
- Cut Service
- Proximity to Termini
- Versioning of Apps (and how they display data)
- Factors we haven't even discovered yet

Real-Time: Not just for Riders

Fine Grain data allows for improved internal processes:

- Call Center
- Issue/Incident Triage
- Improved management of vehicles in service
  - Operator oversight
  - Vehicle location for maintenance crews
- Archived data becomes a planning tool for:
  - Schedule analysis
  - Bottleneck identification
  - Run time adjustment
  - Corridor Analysis
- Police Investigations

What's Next?!

Utilize GTFS-RT Service Alerts – improved Real-time event and delay communications

Real-Time feeds for all modes!

- Light Rail
  - Harnessing GPS locations
  - Coordination with platform arrival displays
- MARC
  - Harnessing GPS locations
  - Coordinating with contract operators
  - Coordination with platform arrival displays
- Commuter Bus
  - Managing 5-6 contract operators to coordinate location and schedule information
- Metro
  - It's underground…

Q & A time!