MARTA Mobility: Proof of Concept

MARTA Mobility offers door-to-door paratransit pick-up that must be scheduled the previous day during office hours. Riders call in and queue for an operator to prepare arrangements. As we all know, general Atlanta traffic, construction sites, and unpredictable accidents can drastically change our commute time. Meanwhile, the riders wait at the allotted time and are unaware of arrival delays.

Providing SMS notifications can improve the experience for the rider. Currently, the driver has a 30 minutes ready window and 5 minutes to board upon ride arrival. The rider has possibly waited 35 minutes. There are studies that show how this waiting & boarding time may be optimized. The research paper, *Smart Arrival Notification System for ADA Passenger Paratransit Service Using Consumer Mobile Device*, was presented last month to the Journal of Transportation Research Board that showed the benefits of using GPS and smart notification to provide an estimated arrival time.

In the research team's field tests, the data considered included the passenger's expected arrival time against the vehicle's actual arrival time. The results returned a range of 16 to 23 minutes waiting time at an average of 20.3 minutes. Testing the smart notification lead to a range of 3 to 6 minutes waiting time at an average of 4.3 minutes. That is a difference of 16 minutes in average time saved. Out of MARTA Mobility's 1443 data sets from a singular day, the appointment time was measured against the actual arrival time. The results returned a range from 1 to 164 minutes arrival after appointment time with an average of 20.8 minutes delay. Comparing these results against the potential of smart notification is an average 16.4 minutes saved. This may not seem very much but consider 1443 rides times 16.4 minutes. That is possibly 23,665.2 minutes, or 394.4 hours, of resources and productivity per day. That is 164 minutes of productivity in 5 days of round-trips for an individual rider.

Paratransit riders are provided a 30 minutes window of expected ride arrival at exact address location. Offering riders a notification system via SMS text will reduce the perception of wait times and allow passengers to seek reprieve from the extreme weather conditions. Drivers and customer care representatives, in return, will optimize their operation time.

Table 1

Qty of Data Sets	**Timeframe**	**Time Average (mins)**
1443	1 to 164 minutes late	20.8
1553	0 to 164 minutes late	19.4
110	0 minutes (on time)	0 (on time)
346	-74 to -1 minutes (early)	-8.2

Table 2

Field test results for the base case (without notification system)

Passenger	Scheduled Pick-up Time	Actual Vehicle Arrival Time	Time Difference (Scheduled-Actual)	Passenger Arrival Time at the Pick-up Location	Passenger Waiting Time (Min)
1	11:50 AM	11:53 AM	+3 min	11:30 AM	23
2	12:05 PM	12:08 AM	+ 3min	11:45 AM	23
3	12:35 PM	12:34 PM	-1 min	12:15 PM	19
4	12:55 PM	12:51 PM	-4 min	12:35 PM	16
Mean					20.3

Table 3

Advanced passenger notification field test results

Passenger	Call Placed Time	Estimated Pick-up Time	Actual Pick-up Time	Time Difference (Estimated-Actual)	Passenger Arrival Time at the Pick-up Location	Passenger Waiting Time (Min)
1	11:44 AM	11:55 PM	11:53 AM	-2 min	11:49 AM	4
2	12:00 PM	12:10 PM	12:08 AM	-2 min	12:05 PM	3
3	12:23 PM	12:33 PM	12:34 PM	+1 min	12:28 PM	6
4	12:42 PM	12:52 PM	12:51 PM	-1 min	12:47 PM	4
Mean						4.3