MPO Autonomous Transit Feasibility Study for USF Campus

MPO Committees

October 2018
USF Quick Facts

- 43,500 students and 14,000 faculty and staff
- 3 square mile campus
- Existing mobility options include
  - Bull Runner bus
  - Share-a-Bull Bike Share
  - Walk
- Campus wide 25 mph speed limit
  - ideal for testing autonomous shuttles
Autonomous Shuttles in (or close to) operation
Gainesville Driverless Shuttle Testing

https://www.youtube.com/watch?v=90YhyP_iNJc
Three Study Purposes

1. Identify the areas of campus that would best be served by an autonomous shuttle.

- Marshall Center
- Rec Center
- Library
- Sun Dome
Three Study Purposes

2. Identify any legal and insurance restrictions to operating an autonomous shuttle on campus.
Three Study Purposes

3. Identify 2 to 3 potential service options for autonomous shuttles.
Student Outreach Results
Summary of Outreach to Students

- 3 student surveys conducted
  - Paper surveys distributed to classes taught by CUTR faculty
  - Online survey distributed by USF Student Government
  - Online survey distributed by USF Students with Disabilities Services
  - 374 surveys total completed
- Presentation made to Student Government New Initiatives Council
- Met with USF Director of Students with Disabilities Services
What were the survey highlights?
Highlight No. 1

Students are tech savvy and willing to ride in automated vehicles even if they don’t know a lot about them.
When it comes to new technology, what best describes you?

**USF SG Survey**

<table>
<thead>
<tr>
<th>Perception</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I love new technologies and am among the first to experiment and use them</td>
<td>16%</td>
</tr>
<tr>
<td>I like new technologies and use them before most people I know</td>
<td>30%</td>
</tr>
<tr>
<td>I use new technologies when most of the people I know use them</td>
<td>40%</td>
</tr>
<tr>
<td>I am usually one of the last people I know to use new technologies</td>
<td>9%</td>
</tr>
<tr>
<td>I am skeptical of new technologies and use them only when I have to</td>
<td>4%</td>
</tr>
</tbody>
</table>

46% said they use new technology before their peers.
How likely do you see yourself using driverless vehicles when they become available?

- USF SG
  - Extremely likely, 29%
  - Likely, 32%
  - Don't know/can't say, 22%
  - Unlikely, 8%
  - Extremely unlikely, 9%

- Disabled Survey
  - Extremely likely, 42%
  - Likely, 28%
  - Don't know/can't say, 17%
  - Unlikely, 6%
  - Extremely unlikely, 8%

Over 60 percent of students said they were likely or extremely likely to use driverless vehicles.
Highlight No. 2

A third of the students say it is hard to get to class from where they park.

I knew I should have arrived earlier!
Highlight No. 3

There is a demand for night time bus service combined with a sense that the campus is not safe to walk on at night.
I wish the Bull Runner ran at night

More than 60% of respondents wished the Bull Runner ran at night.
Almost 50% of the female respondents do not feel safe walking on campus at night.
Highlight No. 4

Students do not want to pay extra fees for autonomous shuttle service.
If necessary, I would be willing to pay a nominal fee to use the driverless shuttle

Only 16% to 21% said they would be willing to pay a nominal fee.
Highlight No. 5

Across all three surveys, there is general agreement in how students would like to see autonomous shuttles used on campus.
Shuttle Services Requested by Students

<table>
<thead>
<tr>
<th>Service</th>
<th>Student Government Survey</th>
<th>Students with Disabilities Survey</th>
<th>Paper Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>After hours /nighttime shuttle</td>
<td>148</td>
<td>70</td>
<td>31</td>
</tr>
<tr>
<td>Remote parking lot shuttle</td>
<td>90</td>
<td>62</td>
<td>21</td>
</tr>
<tr>
<td>Campus circulator</td>
<td>84</td>
<td>41</td>
<td>22</td>
</tr>
<tr>
<td>Transportation for students with disabilities</td>
<td>79</td>
<td>54</td>
<td>16</td>
</tr>
<tr>
<td>Shuttle from HART bus stop on edge of campus to nearest Bull Runner stop or to center of campus</td>
<td>66</td>
<td>29</td>
<td>n/a</td>
</tr>
<tr>
<td>A shuttle operating between the soon to be constructed campus Publix and student housing</td>
<td>54</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>A short distance connector between campus buildings and Bull Runner bus stops</td>
<td>52</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Special event service</td>
<td>37</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Campus tours for prospective students</td>
<td>24</td>
<td>11</td>
<td>5</td>
</tr>
</tbody>
</table>

Yellow boxes represent Top 3 choices selected by students
Transportation Data
Used Existing Data Sources

- Bull Runner Passenger On-Off Data
- SAFE Team Trip Log Data
- Share-A-Bull (Coast Bike Share) Data
Bike Share Top Activity Hubs
Recommended Service and Routes

Transportation Data

Survey Data
Remote Parking Shuttle
Remote Parking Shuttle

Lot 18 North
(start point)

Lot 18 South
Remote Parking Shuttle

Library
Juniper-Poplar Hall to Campus Rec Shuttle
Juniper-Poplar Hall to Campus Rec Shuttle

Juniper-Poplar Hall

Campus Rec
Night Time Shuttles

The Hub to Juniper-Poplar
Library to Juniper-Poplar

Sources: Esri, HERE, Garmin, USGS, Intermap, BLM, U.S. GS, NRCan, Esri Japan, METI, Esri China (Shangahi) Co., Ltd., Esri (Thailand), NGCC, © OpenStreetMap contributors, and the USF Alumni, D7 GRU Her Community
Night Time Shuttles

Library

The Hub
Legal and Insurance Issues
State Legal and Insurance Issues

- No permit required in Florida to test or operate AVs.
- $5 Million insurance requirement eliminated in 2016.
- Florida treats registration and insurance for AVs the same as other vehicles.
- F.S. 320.01 limits low speed vehicles (>20 mph but <25 mph) to roads with posted speed limits 35 mph or less.
  - Head/tail lights, turn signals, stop lamps, reflex reflectors
USF Legal and Insurance Issues

- USF’s participation in AV initiative would be covered under the state’s general liability insurance.
- USF General Counsel Office would require any transportation service provider to provide commercial liability insurance.
  - Similar to any contracted transportation service.
- Recommended considering signage at campus entrances alerting drivers to presence of autonomous shuttles
- **NHTSA approval needed for any on-street testing**
Operational Considerations
Characteristics of a Good AV Route

- Less than 2 miles
- Paved roadway
- Traffic lights capable of Vehicle to Infrastructure (V2I) communication
- Minimal obstructions that could block line of sight to southern sky
- Roadways with posted speed limits 25 mph or below
- Right turns preferred over left

1 Source: NAVYA
Finances
Estimated Costs & Potential Funding Sources
Gainesville Autonomous Transit Shuttle

- 3-year project
- $2.5 Million FDOT Service Development Funds
- 15 minute service between Downtown and UF in mixed traffic
- 3 autonomous shuttles
- RTS contracted 3-year service lease with Transdev
Estimated Cost for USF Shuttle Project

- $700,000 for 12 month pilot
- 2 shuttles
- 10 hours of daytime service
  - 8:00 a.m. – 6:00 p.m.
- 6 hours of night time service
  - 8:00 p.m. – 2:00 a.m.
- No summer service
Potential Funding Sources

- USF Student Green Energy Fund
- FTA Strategic Transit Automation Research (STAR) Program
- Grants from Foundations
- FDOT Service Development Funds
- Advertising Revenue
  - Interior Bus Cards
  - Route Sponsors
Next Steps

- Conduct 2-week demo Fall 2018
- Secure funding for 12-month demo
- Prepare and issue Request for Proposals (RFP)
Contact Information

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