Innovative Transit Technologies
Statement of Work

BACKGROUND

Hyperloop, air taxis, and aerial gondolas in an urban setting are three forms of innovative transportation that have the potential to change the way people move between and within cities.

- **Hyperloop** is an experimental form of transportation involving a floating pod that travels inside a low-pressure tube. Because almost all the air is removed from the tube, friction is greatly reduced, and in theory, the pods can reach speeds over 700 miles per hour.
- **Air taxis** are an on-demand, point-to-point travel system between small regional and general aviation airports. The concept was initially tested by NASA in 2001 as part of the Small Aircraft Transportation Systems (SATS) Initiative. In the last several years, multiple start-up companies including Uber have been working on the development of electric vertical take-off and landing (eVTOL) aircraft.
- **Aerial gondolas** in an urban setting are used internationally, but currently, there are only two operational aerial gondolas in the U.S. that are in an urban setting: the Roosevelt Island Tramway in New York, and the Portland Aerial Tram in Oregon.

PROJECT DESCRIPTION

The Tampa Bay Area Regional Transit Authority (TBARTA) wishes to conduct a high-level research and feasibility study that examines the technical, financial, and regulatory feasibility of implementing hyperloop, air taxi, and urban aerial gondolas. The feasibility study will cover route types, corridor profiles and connections, travel demand, environmental considerations, safety considerations, regulatory considerations, an overview of the technologies alongside comparable technologies and innovations, costs, and sector financing opportunities.

The portion of the study related to hyperloop will focus on its applicability to the State of Florida. The portion of the study related to air taxis and aerial gondolas will focus on Tampa Bay opportunities.

PROJECT TASKS

The following tasks and associated deliverables will be performed for the project.

Task 1. Project Management

The Consultant will be responsible for managing the project with assistance from the TBARTA project manager. This task provides for the overall project's management and coordination. Included in this effort are:

- An initial kickoff meeting
- An abbreviated project management plan (PMP) showing the project team organizational structure and consultant team roles and responsibilities.
- Maintenance of a project schedule and budget
- Project progress reporting to TBARTA via twice a month meetings (e.g., conference calls, in-person briefings) and monthly progress reports

Deliverables:

- Kickoff meeting, including meeting materials (e.g., presentation)
- Kickoff meeting notes
- Abbreviated PMP and schedule (updated as needed)
- Monthly progress reports

Task 2. Technology Literature Review and Analysis

The Consultant will conduct a literature review of the current state of each technology, the locations where they are in operation or testing, their strengths and weaknesses, and as much as possible, the unit costs, maintenance considerations and infrastructure requirements for each technology. The literature review will include a scan of a variety of sources such as professional journals, conference presentations and reports, published project reports, and websites.

The literature review should take into consideration the projects and manufacturers including, but not limited to:

- **Hyperloop**: The Great Lakes Hyperloop Feasibility Study funded by the Northeast Ohio Areawide Coordinating Agency (NOACA); Virgin Hyperloop One; Hyperloop Transportation Technologies; TransPod.

- **Air Taxis**: NASA Small Aircraft Transportation System (SATS) Initiative; Uber Air, Bell Helicopter, Volocoptor, Lilium

- **Aerial Gondolas**: the Portland Aerial Tram; the Roosevelt Island Tramway, the London Emirates Air Line; Doppelmayr (manufacturer of the Portland Aerial Tram and the London Emirates Air Line); Poma (manufacturer of the Roosevelt Island Tramway)

Deliverables:

- Draft Tech Memo 1: Literature Review
- Final Tech Memo 1: Literature Review

Task 3. Manufacturer Interviews

Information gathered in the literature review will be supplemented by interviews with manufacturers of these three technologies. Recognizing that this type of information has the potential to be biased, the purpose of these interviews will be to supplement information and data that could not easily be gleaned from the literature review (e.g. vehicle specifications, unit costs, system capacity).

Deliverables:

- Draft Tech Memo 2: Summary of Manufacturer Interviews
- Final Tech Memo 2: Summary of Manufacturer Interviews

Task 4. Government and Regulatory Review

The Consultant will conduct a review and federal, state, and local laws and regulations that could impact the implementation of any of these technologies. For example, the Federal Railroad Administration regards 0.1 g as the accepted acceleration/deceleration for high speed rail and maglev systems. How does this regulation impact hyperloop? For air taxi, what Federal Aviation Administration rules would apply? Title 14 C.F.R. Part 135 governs air taxi and air charter operations. However, these rules apply to manually piloted aircraft. How would these rules apply to unmanned drones ferrying passengers to and from destinations that could include building rooftops? At the state level, the role that the Florida Legislature has played in making it easier to test and operate autonomous vehicles may serve as a guide to promoting air taxis and hyperloop.

Deliverables:

- Draft Tech Memo 3: Government and Regulatory Review
- Final Tech Memo 3: Government and Regulatory Review

Task 5. Preliminary Corridor Analysis

Based on the information gathered in Tasks 2 through 4, the consultant will develop a high-level preliminary analysis that shows where each of these technologies could make sense as a transportation solution. This will consider market analyses, service type, and connection opportunities. For the hyperloop, the analysis will look at potential connections within the State of Florida. For air taxi and aerial gondolas, the analysis will be restricted to the 5-county TBARTA area. To the extent that it is possible, the analysis will include general magnitudes of costs for right-of-way acquisition, construction, and operation.

Deliverables:

- Draft Tech Memo 4: Preliminary Corridor Analysis
- Final Tech Memo 4: Preliminary Corridor Analysis

Task 6. Draft and Final Report

The Consultant will consolidate Tech Memos 1 to 4 into a Final Report with an executive summary and recommendations. The Final Report shall be tabbed into three parts, one for each of the technologies. Each tab will include an assessment of the challenges and opportunities of the particular technology; recommended next steps for a private sector led vs. public sector led effort; the potential timing for project development; and potential funding sources. A brief fact sheet will be developed to relay quick facts about the study. A PowerPoint presentation of the study will be developed for TBARTA and the contractor to use as needed. The contractor will provide up to two presentations to the Citizens Advisory Committee (CAC), up to two presentations to the Transit Management Committee (TMC), and up to two presentations to the TBARTA Board of Directors.

Deliverables:

- Draft Final Report
- Final Report
- Fact Sheet
- PowerPoint Presentation

Task 6. Miscellaneous Support Effort

It is anticipated that the study effort may require attending some coordination meetings with outside agencies (e.g. FDOT, MPO, transit agencies) and making presentations to these agencies. The contractor will attend up to 10 meetings on an as-needed basis. During the course of the study, there may arise a need to conduct cursory research of other emerging transportation technologies. The contractor will provide this additional research and include it in the study effort as requested by TBARTA.

COST ESTIMATE

Below is the budget for the project.

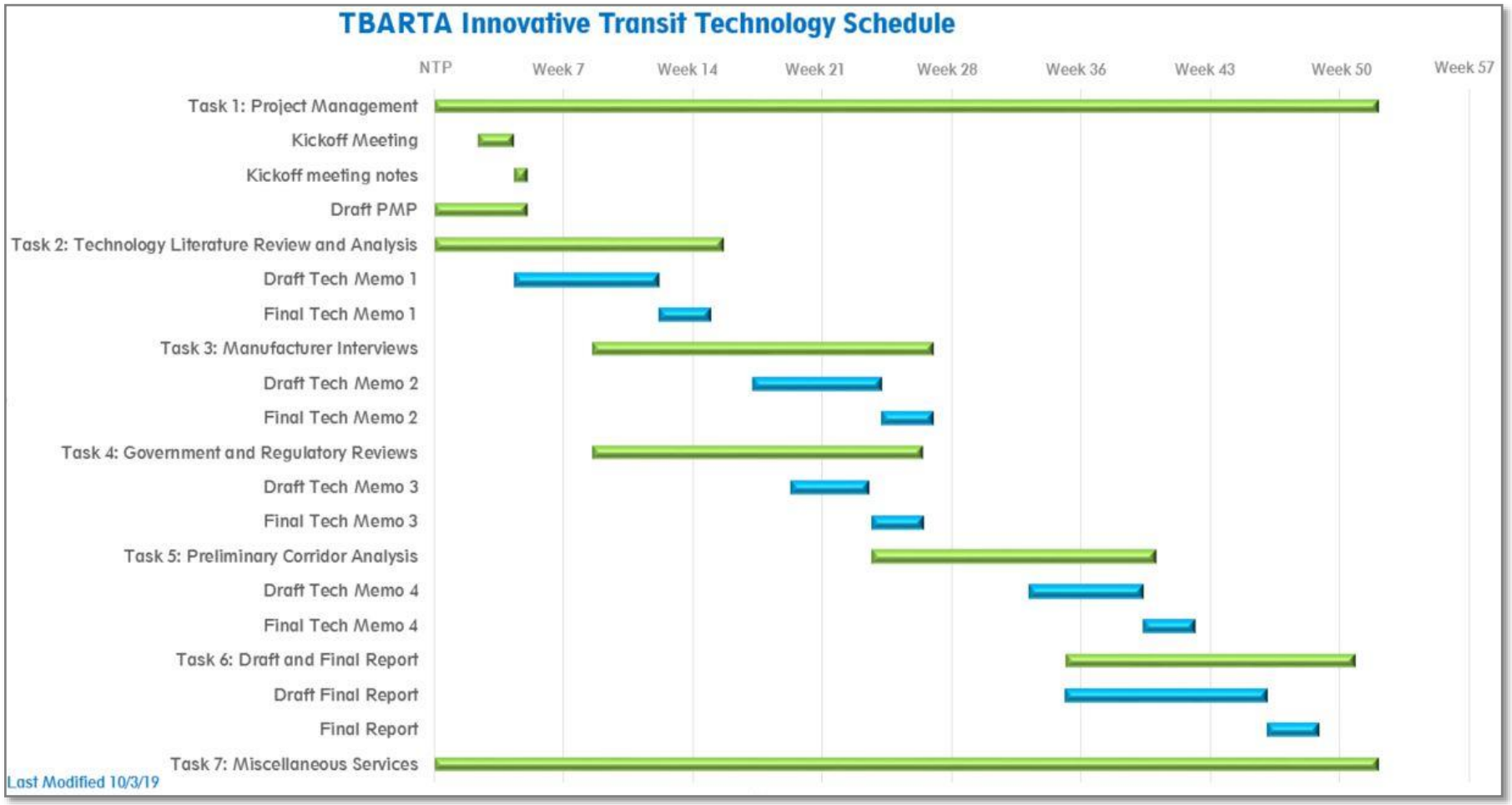
Tasks and Other Activities	Cost ($)
Task 1: Project Management	$22,623.64
Task 2: Technology Literature Review and Analysis	$20,403.89
Task 3: Manufacturer Interviews	$23,751.09
Task 4: Government and Regulatory Review	$23,559.76
Task 5: Preliminary Corridor Route Analysis	$52,841.33
Task 6: Draft and Final Report	$49,220.15
Task 7: Miscellaneous Services	$28,516.98
Total	**$220,916.84**

SCHEDULE

The timeline for completing the project is shown in the table below. The estimated duration of the project from notice to proceed (NTP) is 12 months. Some tasks may overlap (i.e., project duration may not equal to the sum of the durations of the individual tasks).

Task	Duration (months)
Task 1: Project Management	12
Task 2: Technology Literature Review and Analysis	3.7
Task 3: Manufacturer Interviews	4.4
Task 4: Government and Regulatory Review	4.3
Task 5: Preliminary Corridor Route Analysis	3.7
Task 6: Draft and Final Report	3.7
Task 7: Miscellaneous Services	12

The schedule (Gantt chart) is provided below.


TBARTA Innovative Transit Technology Schedule
NTP
Week 7
Week 14
Week 21
Week 28
Week 36
Week 43
Week 50
Week 57
Task 1: Project Management
Kickoff Meeting
Kickoff meeting notes
Draft PMP
Task 2: Technology Literature Review and Analysis
Draft Tech Memo 1
Final Tech Memo 1
Task 3: Manufacturer Interviews
Draft Tech Memo 2
Final Tech Memo 2
Task 4: Government and Regulatory Reviews
Draft Tech Memo 3
Final Tech Memo 3
Task 5: Preliminary Corridor Analysis
Draft Tech Memo 4
Final Tech Memo 4
Task 6: Draft and Final Report
Draft Final Report
Final Report
Task 7: Miscellaneous Services
Last Modified 10/3/19

A deliverables schedule is shown below. Deliverable dates will be identified in the PMP once the project begins and may be updated based on further coordination (based on 12-month schedule).

Task No.	Task	Duration (months)	Deliverable(s)	Submittal (days from NTP)
1	Project Management	12	kickoff meeting and materials	15
			kickoff meeting notes	25
			Abbreviated PMP	30
			monthly progress reports	n/a
2	Technology Literature Review and Analysis	3.7	Draft Tech Memo 1	87
			Final Tech Memo 1	107
3	Manufacturer Interviews	4.4	Draft Tech Memo 2	173
			Final Tech Memo 2	193
4	Government and Regulatory Review	4.3	Draft Tech Memo 3	168
			Final Tech Memo 3	189
5	Preliminary Corridor Route Analysis	3.7	Draft Tech Memo 4	274
			Final Tech Memo 4	294
6	Draft and Final Report	3.7	Draft Report	332
			Final Report	342