TRANSPORT LONG ISLAND

A Train-to-Plane Connectivity Study

May 2018

ISP Long Island MacArthur Airport

Long Islanc Rail Road

NYMTC NEW YORK METROPOLITAN TRANSPORTATION COUNCIL

Appendices

Appendix A. Mode Book

Appendix B. Existing Conditions and Connection Modes Identification Memo

Appendix C. Project Screening Criteria Memo

Appendix D. High-Level Implementation Plans Memo

Appendix E. Public Information Session Materials

Appendix F. Cost Estimate Classification and General Assumptions

Appendix G. Key Reference Documents

Appendix H. Environmental Review Effort Assessment References

Appendix E.
Public Information Session Materials

STUDY PROCESS

Kick-Off Meeting 6.30.17

Existing Conditions Analysis

Long Island MacArthur Airport (accessibility, demand & catchment area, planned improvements)

Ronkonkoma LIRR Station (state of existing infrastructure, planned improvements)

Purpose and Need Statement

Defined broad purpose of the study

Identified project needs - System Linkage, Transportation Demand and Economic Growth

Identified Project Impacts

Connectivity Modes Assessment

Identified 10 modes which can be implemented as an train-to-plane linkage

High level technology assessment and feasibility context was established based on their applications at other locations

Ranking of Connectivity Modes

Developed Screening Criteria under three focus areas – Air Traveler, Community, and Delivery

Modes were scored for the existing terminal location as well a potential north-side terminal

Implementation Plans

Developed four high-level Implementation Plans: Short Term - Updated Taxi System, Mid Term - Shuttle, Long Term Option 1 - Automated Vehicle Shuttle, Long Term Option 2 - Moving Walkway to a new North-side Terminal

Cost & Environmental Review Assessments

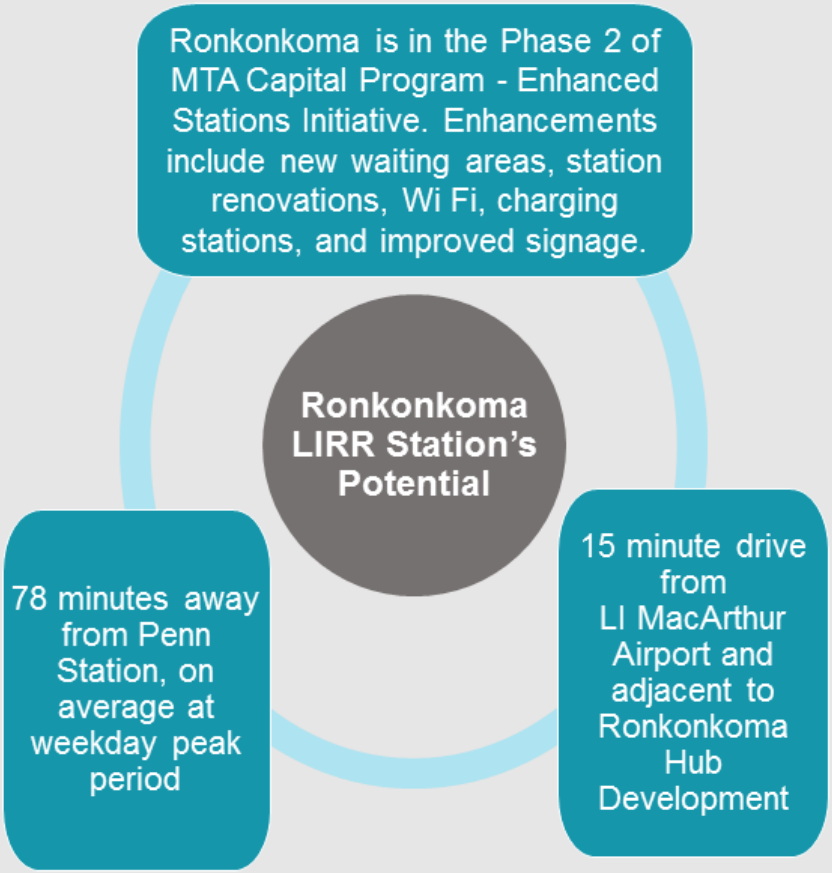
Planning level estimates of capital and operating costs for each of the four Implementation Plan options

Estimation of level of effort necessary for the required environmental reviews

Public Session 4.11.18

Final Report

OPPORTUNITY FOR A TRAIN-TO-PLANE CONNECTION



TYPE OF CONNECTION MODES EVALUATED IN THE STUDY

CATEGORY	DESCRIPTION	MODES INCLUDED
POINT TO POINT	• Pickup and drop off passengers at nearly any location • No major investment in stations, tracks, rolling stock	• Taxis • TNCs
STRUCTURED, BRANCHED TO AIRPORT	• Used as part of a regional transit network, with an extension for a train-to-plane connection • New investment in stations, transit-ways, and rolling stock	• Bus Rapid Transit • Streetcar • Light Rail Transit
STRUCTURED, CENTERED ON AIRPORT	• Mostly used for a train-to-plane connection • Focused on airport generated demand • New investment in stations, transit-ways, and rolling stock	• Shuttle • Gondola • Automated People Mover • Personal Rapid Transit • Moving Walkways

POINT-TO-POINT MODES

Upgraded Taxi System

A fleet of for-hire vehicles offering rides for individual passengers or small groups. Enhancements - New orientation signage, Upgraded vehicle fleet, Availability of e-Hailing and mobile payment, Updated LIRR ticket vending machines and app.

Transportation Network Companies (TNCs)

Customers use a GPS-enabled mobile phone to request a ride from a 3rd party driver. Enhancements- Negotiated service and fare with TNC, Designated pick-up areas

STRUCTURED, BRANCHED TO AIRPORT MODES

Bus Rapid Transit (BRT)

Branched from Nicolls Road Corridor; Enhanced buses, traveling along dedicated lanes with signal priority, offer reliable, convenient, and fast transit.

Streetcar

Electric rail vehicles operating in mixed-traffic and on tracks embedded in the pavement.

Light Rail Transit (LRT)

A light rail service operating in either mixed traffic or dedicated right-of-way; Smaller vehicles and lower operating costs than traditional subways or commuter rail services.

STRUCTURED, CENTERED ON AIRPORT MODES

Shuttle Buses

Dedicated bus service along fixed routes timed with Ronkonkoma LIRR train arrivals and with amenities catering to air travelers.

Automated People Mover (APM)

Grade-separated mass transit system with full automated, driverless operations, featuring vehicles that travel on guide ways with an exclusive right-of-way.

Personal Rapid Transit (PRT)

Small autonomous vehicles providing on-demand point-to-point service along a fixed guide way.

Moving Walkways

A covered, climate-controlled, moving walkway to connect the potential north-side terminal with Ronkonkoma LIRR Station.

Gondola

Cabins supported and propelled by overhead cables connecting the Station track overpass with the potential north-side terminal.

MODE EVALUATION - SCREENING CRITERIA

A Screening Criteria Matrix, comprised of ten screening criteria, was developed to evaluate the modes for their suitability as a potential train-to-plane connection and support in determining the four connection modes that should advance to 'Development of Implementation Plans' stage.

Air Traveler Focused

- Ease of Connection
- Reliability
- Passenger experience

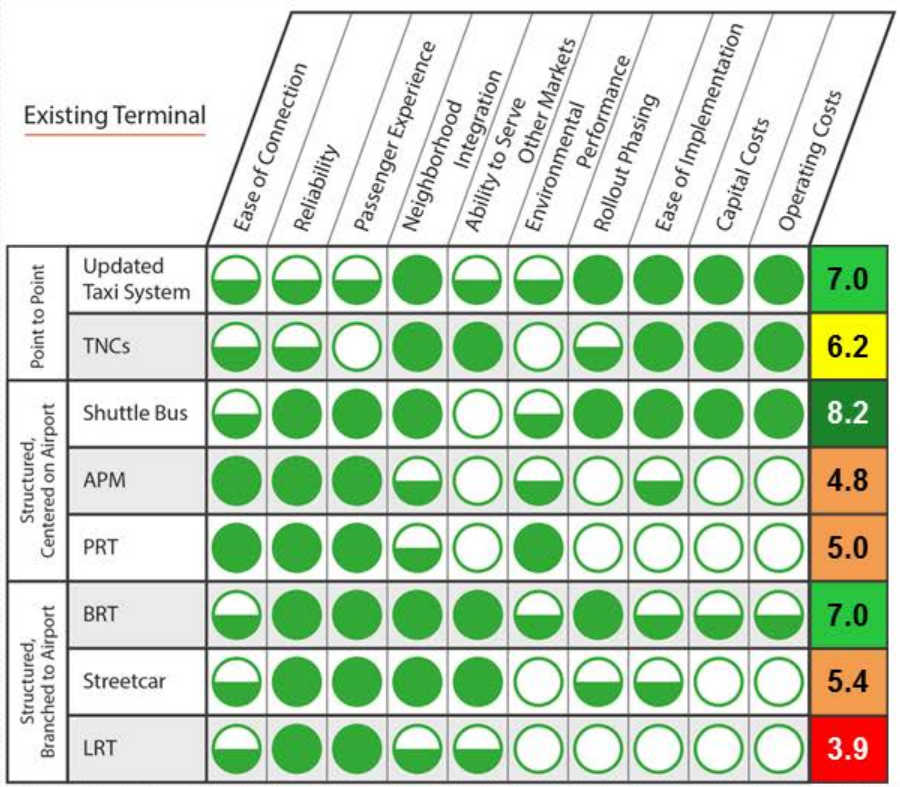
Community Focused

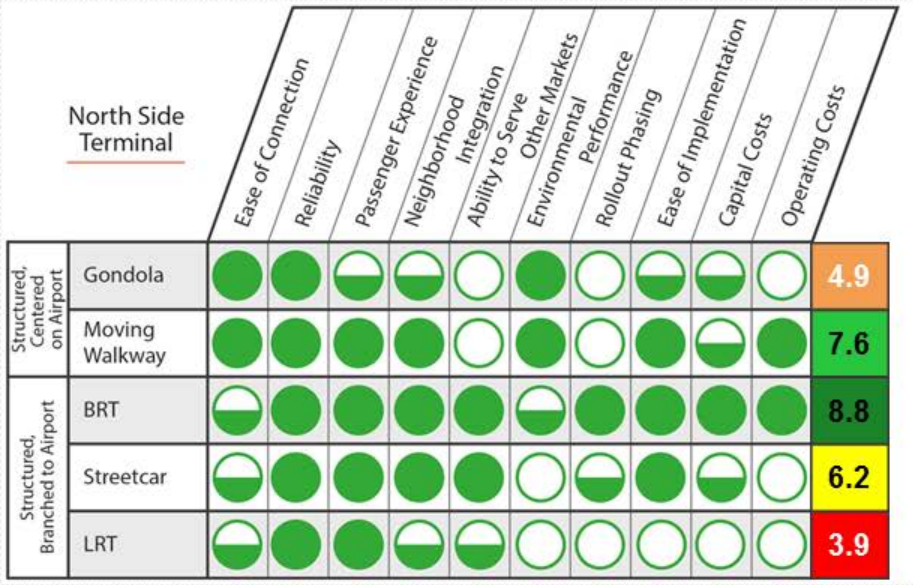
- Neighborhood Integration
- Ability to serve other markets
- Environmental performance

Delivery Focused

- Rollout Phasing
- Ease of Implementation
- Capital Costs
- Operating Costs

MODE EVALUATION - SCREENING MATRIX





Modes selected for Implementation Plans:

- Short Term (1-2 Years) - Updated Taxi System
- Mid Term (5-7 Years) - Shuttle Bus System on Public Roads
- Long Term (20+ Years) - Option 1: AV (Autonomous Vehicle) Shuttle on Airport Roads
- Long Term (20+ Years) - Option 2: Moving Walkway to the potential North Side Terminal

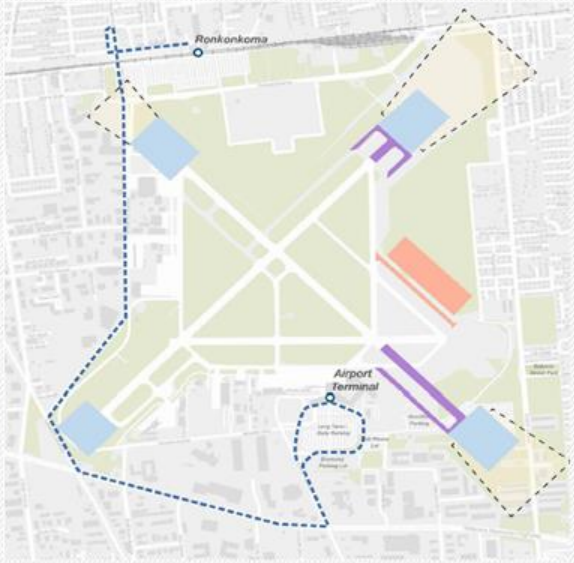
SHORT TERM - UPDATED TAXI SYSTEM (1-2 YEARS)

Salient Features

- Fleet of for-hire vehicles for point-to-point travel
- Ride hailing and payment enhanced by mobile device application
- Vehicle fleet designed for airport-bound passengers, potential features include:
  - Easy boarding
  - Larger trunks
  - Universal accessibility
  - Individualized climate control
  - Higher standard of design and comfort
- Cloud-based taxi dispatching system with performance monitoring

Example: Ford Transit Connect

Route Alignment
- Around Airport, on Public Roads



Distance - 3.6 miles

Planning Level Cost Estimates

- Capital Costs - $1.1 Million
- Operating Costs - depends on the contractual arrangement with the taxi operator and app specifications

MID TERM - SHUTTLE BUS SYSTEM (5-7 YEARS)

Salient Features

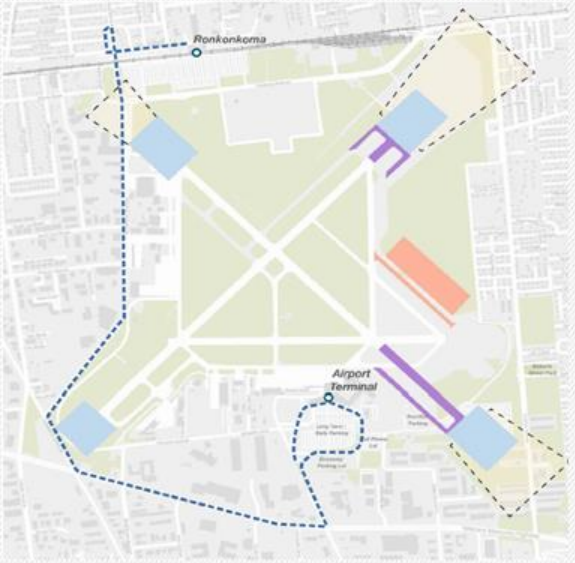
- Upgraded shuttle fleet continues to operate along public roadways- 40 foot battery electric transit buses
- Scheduled departures approximately every 20 minutes – meeting train and plane arrivals
- Regular service, improved vehicles, and real time information
- Station Locations:
  - New enclosed shelter with amenities proposed at LIRR station, with Airport Shuttle branding
  - At future transportation facility adjacent to the passenger terminal at LI MacArthur Airport
- Buses would be equipped with AVL to monitor schedule and provide real-time passenger information at the Airport and LIRR Passenger Information Displays

Planning Level Cost Estimates

- Capital Costs - $8.5 Million (3 buses + ancillary structures)
- Annual Operating Costs - $2.2 Million

Example: Proterra Catalyst Zero-Emission Bus

Route Alignment
- Around Airport, on Public Roads



Distance - 3.6 miles

LONG TERM - AV (AUTONOMOUS VEHICLE) SHUTTLE (20+ YRS)

Salient Features

- The vehicle would be an automated electric vehicle with capacity to carry 6 – 10 passengers
- Alignment through airport, on dedicated private roads, with underpasses to cross the two RPZs
- Through-airport road will have two lanes and shoulders, fences and security control on both entrance points
- Underpasses would be built with cut-and-cover, with temporary construction on the RPZs for the extended (future) runways. Construction of tunnels may take from 6 to 12 months
- Utilities need to be extended to power lighting poles and fire hydrants

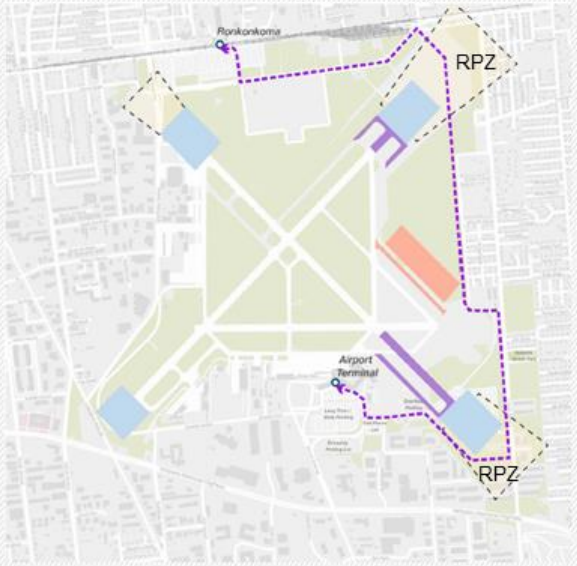
Planning Level Cost Estimates

- Capital Costs - $41 Million (for construction of roadways and tunnels)
- Annual Operating Costs – N.A.

Example: Navya Autonomous Shuttle

Example: Box Culvert Tunnel

Route Alignment - Through Airport, on dedicated right-of-way



Distance - 3.5 miles

LONG TERM - MOVING WALKWAY - NORTH TERMINAL (20+ YRS)

Salient Features

- Conditional to the development of a new passenger terminal on the north side of the existing runways
- Conveyor mechanism provides continuous service between the Ronkonkoma LIRR Station and potential North-Side Terminal
- No-step access, passengers can walk or ride at faster-than-walking speed within a climate-conditioned space
- Adjacent walking lane accommodates passenger-assist vehicles, provides redundancy
- Constructed at ground level, underground or elevated
- Travel times on the walkway would be in 3.5 – 6 minutes range, depending on design specifications.
- Walkway has two speed zones : slower speeds on the access and egress, and “cruise” speeds in the middle

Planning Level Cost Estimates

- Capital Costs - $15 Million (for moving walkway)
- Annual Operating Costs – $150,000

Example: ACCEL variable speed moving walkway

Route Alignment - Through Railroad Avenue & Airport

Distance < 0.25 miles

Appendix F.
Cost Estimate Classification and General Assumptions

The level of cost estimating performed for this study is classified as a Class 5 rough order of magnitude estimate according to Arup's estimate classification matrix (Level 5), which was developed from the Association for the Advancement of Cost Engineering (AACE) best practices.

The accuracy range of this estimate has been determined to be -25% and +50%. The accuracy range is a gauge of likely bid prices if the project was issued to tender at this current stage. These estimates are based on the measurement and pricing of quantities wherever information is provided and/or reasonable assumptions for other works not covered in the drawings and programs as stated in this document. The unit rates reflected herein have been obtained from experience of projects of this nature.

General cost assumptions:

- The values are from the fourth quarter of the year 2017
- Material costs are calculated from data bases such as RS Means, similar project costs and vendors
- Labor rates, fringes and taxes are calculated based on the Bureau of Labor Statistics from the United States Department of Labor
- A New York location factor is applied to the labor and material costs, this factor is obtained from the portal RS Means
- The Operational Cost estimate is not a Life Cycle Cost, meaning that there might be other costs involved to operate the facilities
- ARUP has no control over the cost of labor and materials, general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This opinion of probable cost of construction is made based on the experience, qualifications, and best judgment of the professional consultant familiar with the construction industry. ARUP cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent cost estimates.
- ARUP recommends that the Owner carefully review this document, including line item descriptions, unit prices, clarifications, exclusions, inclusions and assumptions, contingencies, escalation and markups. If the project is over budget, or if there are unresolved budgeting issues, alternate systems schemes should be evaluated before proceeding into the construction phase.

Some items that may affect the cost estimate:

- Modifications to the scope of work included in this estimate.
- Special phasing requirements.
- Restrictive technical specifications or excessive contract conditions.
- Any other non-competitive bid situations.
- Bids delayed beyond the projected schedule.
- Loss of labor productivity.
- Future market conditions.

The cost estimates reflect standard project conditions, and the best information available, and therefore exclude items that have substantial variation or that require design details available only at a future date. Additional cost estimate details can be found in Appendix D.

Appendix G.
Key Reference Documents

AECOM. (2017). ISP Long Island MacArthur Airport Customs Facility Location Study.

Airport Cooperative Research Program. (2013). ACRP Report 98 - Understanding Airline and Passenger Choice in Multi-Airport Regions. Washington, D.C.: Transportation Research Board.

Airport Cooperative Research Program. (2015). ACRP Report 146 - Commercial Ground Transportation at Airports: Best Practices. Washington D.C.: Transportation Research Board.

Airport Cooperative Research Program. (2017). ACRP Synthesis 84 - Transportation Network Companies: Challenges and Opportunities for Airport Operators. Washington D.C.: Transportation Research Board.

Federal Aviation Administration. (2007a). FAA Regional Air Service Demand Study, Task A - Survey of Passengers and Businesses. FAA, NYSDOT. Retrieved from https://www.faa.gov/airports/eastern/planning_capacity/media/panynj-task-a-final-may-2007.pdf

Long Island MacArthur Airport. (2017a, 04 04). Capital Improvement Program.

MTA Long Island Rail Road. (2013). Environmental Assessment, Long Island Rail Road Double Track Project, Ronkonkoma to Farmingdale.

Suffolk County. (2016). Nicolls Road Alternatives Analysis: Final Report.

Suffolk County Climate Smart Community Standing Committee. (2015). Suffolk County Climate Action Plan. New York State Climate Smart Communities.

Suffolk County Department of Economic Development and Planning. (2014a). Framework for the Future, Suffolk County Comprehensive Master Plan 2035.

Suffolk County Department of Economic Development and Planning. (2014b). Transportation, Economic Development and Housing Strategies for Suffolk County, Background Documentation, Suffolk County Comprehensive Master Plan 2035.

Town of Babylon. (2011). Connect Long Island. Town of Babylon.

Town of Brookhaven Department of Planning, Environment and Land Management. (2011). Ronkonkoma Hub Transit-Oriented Planning Study.

Town of Islip. (2017a). Airport Master Plan: Long Island MacArthur Airport.

VHB Engineering, Surveying and Landscape Architecture, P.C. (2010). Proposed Adoption of the Land Use and Implementation Plan for the Ronkonkoma Hub Transit-Oriented Development (TOD). Draft Generic Environmental Impact Statement, Town of Brookhaven.

Zupan, J. M., Barone, R. E., & Lee, H. M. (2011). Upgrading to First Class: The future of the New York Region's Airports. New York, NY: Regional Plan Association.

Appendix H.
Environmental Review Effort Assessment References

New York State Department of Environmental Conservation. (2018, Feb 05). *Environmental Resource mapper*. Retrieved from http://www.dec.ny.gov/gis/erm/

New York State Department of Environmental Conservation. (2018, Feb 05). *Maps: Google Maps and Google Earth Data.* Retrieved from https://www.dec.ny.gov/pubs/212.html

New York State Department of Environmental Conservation. (2018, Feb 05). *SEQR Regulations and Guidelines.* Retrieved from https://www.dec.ny.gov/permits/357.html

New York State Department of Parks, Recreation and Historic Preservation. (2018, Feb 05). *State Historic Preservation Office.* Retrieved from https://parks.ny.gov/shpo/

New York State Historic Preservation Office and Department of Parks, Recreation and Historic Preservation. (2018, Feb 05). *Cultural Resource Information System (CRIS)*. Retrieved from https://cris.parks.ny.gov/Default.aspx

U.S. Environmental Protection Agency. (2018, Feb 05). *National Environmental Policy Act Policies and Guidance.* Retrieved from https://www.epa.gov/nepa/national-environmental-policy-act-policies-and-guidance

U.S. Fish & Wildlife Service. (2018, Feb 05). I*nformation for Planning and Consultation.* Retrieved from Environmental Conservation Online System: https://ecos/fws.gov/ipac/location/index

U.S. Fish & Wildlife Service. (2018, Feb 05). *Wetlands Mapper.* Retrieved from National Wetlands Inventory: https://fws.gov/wetlands/Data/Mapper.html