Transportation and Maintenance Operations Plan - Phase 2 South

For the

Central Florida Commuter Rail Transit Project

In preparation for





Florida Department of Transportation District 5

Revision Log

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1 INTRODUCTION

The Federal Transit Administration (FTA) serves as the lead federal agency for the Central Florida Commuter Rail Transit (CFCRT) Project. Florida Department of Transportation (FDOT), in cooperation with the Central Florida Regional Transportation Authority (LYNX), MetroPlan Orlando (MPO), the City of Orlando, and Volusia, Seminole, Orange, and Osceola Counties is proposing to extend regional commuter rail service south from the CFCRT Phase 1 Sand Lake Road Station to an additional station in Orange County and three stations in Osceola County.

The CFCRT Phase 2 South Project uses 17.2 miles of active Class IV mixed freight and passenger railroad right of way (ROW) acquired by FDOT from CSXT in November 2011 for passenger rail operations. Phase 2 South SunRail service will extend along the railroad ROW south of Orlando through Kissimmee to unincorporated Osceola County and will utilize property adjacent to the rail corridor for station site parking, kiss-and-ride and bus circulation. Specifically, the CFCRT Phase 2 South Project would be a southern extension of the completed 32-mile CFCRT Phase 1 Initial Operating Segment (IOS). The FDOT-owned corridor has received the Federal Railroad Administration (FRA) alpha designation Central Florida Rail Corridor or CFRC. Additionally, through a branding exercise, FDOT selected SunRail as the name for the passenger rail service that currently operates on the IOS alignment. The SunRail service will operate entirely at grade, sharing tracks owned by FDOT with freight service provided by CSXT and Florida Central Railroad (FCEN) and Amtrak intercity passenger rail service.

1.1 Phase 1 Initial Operating Segment (IOS)

The first phase is the Initial Operating Segment (IOS), which is a 32-mile long north corridor extending from Fort Florida Road (DeBary) in Volusia County to Sand Lake Road in Orange County. The CFCRT Phase 1 (IOS) project received a Full Funding Grant Agreement (FFGA) in July 2011. SunRail revenue operations commenced in May 2014.

Twelve stations were constructed in the Phase 1 IOS between DeBary Station in Volusia County and the Sand Lake Road Station in Orange County and approximately 18 miles of additional 2nd track and a new railway operations signal system were added to the existing eleven miles of double track. Additional improvements included grade crossing enhancements, station platforms, canopies and park and ride lots. The CFRC Vehicle Storage and Maintenance Facility (VSMF) that includes the CFRC Operations Control Center (OCC) and Service and Inspection (S&I) Shop were constructed as part of the Phase 1 IOS Project. The VSMF is located at Rand Yard in Sanford, Florida.

1.2 Phase 2 South

The Central Florida Commuter Rail Transit Phase 2 South Project, shown in Figure 1, consists of a new, 17.2-mile extension to the existing 32-mile SunRail commuter rail transit line that provides service from Volusia County through Seminole County, to

Orange County and downtown Orlando. Phase 2 South SunRail service will extend along the railroad ROW south of Orlando through Kissimmee to unincorporated Osceola County. The Project includes four new commuter rail stations and the construction of a Vehicle Storage and Light Maintenance Facility (VSLMF).

The Project would operate along the existing Central Florida Rail Corridor (CFRC) acquired by the Florida Department of Transportation (FDOT) from CSXT in November 2011 for passenger rail operations. The Project would operate entirely at-grade, sharing track owned by FDOT with freight service, provided by CSXT and Florida Central Railroad, and Amtrak intercity passenger rail service. The Project alignment generally parallels Interstate 4 and US 17/92.

The Project scope includes two locomotives, three cab passenger cars and one coach passenger car, approximately 11.81 miles of additional second track that will be added to the existing 2.87 miles of double track, a new railway wayside signal and communication system, grade crossing upgrades, station platforms and canopies at all four stations, park and ride lots at four stations, and other elements necessary to achieve Project implementation. A proposed Vehicle Storage and Light Maintenance Facility (VSLMF) adjacent to the proposed Poinciana Station will serve as an end of the line fueling and layover facility for up to four train sets. Train wash services and heavy vehicle maintenance will continue to be provided at the existing Amtrak Auto Train Yard in Sanford.

Service headways in the Horizon Year (2030) would be 15 minutes in the weekday peak period, 30 minutes in the weekday off-peak, 60 minutes in the weekday evenings, and 120 minutes on weekends. In the Opening Year, service headways would be 30 minutes in the weekday peak period and 120 to 150-minute headway service in the midday and evening periods. There is no planned weekend service or service on designated holidays in the opening year. The FFGA Revenue Service Date (RSD) for the Project is September 2019. However, it is FDOT's intent to open Phase 2 South in advance of the FFGA RSD by December 23, 2017.

The Phase 2 South Project scope includes:

- The installation of 11.81 miles of second mainline track positioned within the existing right-of-way and realignment of approximately 2.87 miles of existing track.
- Track upgrades have been identified for approximately 3.65 miles of existing siding tracks; construction of approximately 150' of retaining wall at one location to support track construction.
- Replacement of the entire existing wayside signal system, plus 8 new interlockings (control points) and modifications to 3 existing control points and communications system for control points and highway-rail grade crossing warning systems, including integration with the existing Computer Aided Dispatch (CAD) system at the OCC.
- Extension of the Fiber Optic system to Poinciana and integration of the new systems with the existing communications system.
- Design and construction of four new stations with parking lots. A standard station includes two 300' x 14' concrete platforms with canopies and amenities.

Stations will include bus bay parking and circulation, kiss-and-ride drop off areas, and entrance/egress, all which vary by station site.

- Upgrades to the existing highway-rail grade crossings at potentially 24 locations. Approximately 14 had been identified as impacted by the addition of the 2nd track. Two of these crossing will be closed and one crossing is being relocated approximately 1200' north of its current location. The 2014 Value Engineering Report reduced the number of double track crossings to nine by single-tracking through Donegan St, Vine St, Magnolia St, Pine St. and Park St. in Kissimmee.
- A proposed Vehicle Storage and Light Maintenance Facility (VSLMF) adjacent to the proposed Poinciana Station will serve as an end of the line fueling and layover facility for up to four train sets. The VSLMF will also include a 1,760 sq. ft. pre-engineered building for train crews, mechanical office and storage and utility space.
- There are five existing bridge locations in the Phase 2 alignment requiring construction work (new 2nd track bridge/culvert and replacement of existing bridge) This includes approximately 830' of new trestle bridge and 133' of new culverts. Two bridges at MP A810.8 and MP A810.9 were replaced with culverts in 2013.
- Approximately 455' of concrete deflection/crash walls at existing overhead bridge piers.
- Two additional locomotives, one coach and three cab cars, were procured through the exercise of options negotiated during the Phase 1 vehicle procurement with MPI (locomotive vendor) and Bombardier (coaches and cab cars vendor).

1.3 Phase 2 North

At the request of Volusia County, the commuter rail system would be extended from the DeBary Station (Fort Florida Road) of the Phase 1 Project to the DeLand Amtrak Station, approximately twelve miles ("Phase 2 North").¹ This TMOP assumes that construction on Phase 2 North begins in 2016 with a target revenue service date of December 2017.

A 12-mile extension of the LPA further north to DeLand including one new commuter rail station at DeLand Amtrak, defines the Full Build Alternative, which was evaluated under the federal NEPA process in the Environmental Assessment, as shown in Figure 2.

¹ The addition of Phase 2 South to the Initial Operating Segment comprises the Locally Preferred Alternative (LPA). The addition of Phase 2 North to the LPA completes the Full Build Alternative. In earlier Project-related documents, the LPA was, on occasion, referred to as Phase 2 while the Full Build was, on occasion, referred to as Phase 3. The TMOP submitted in support of the Full Funding Grant Agreement for Phase 1 combined Phase 2 South and Phase 2 North into a single "Phase 2". This TMOP recognizes Phase 2 South and Phase 2 North as two distinct projects.







Figure 2 - CFCRT Project (Full Build) System Map

1.4 Purpose of the Plan

The Transportation and Maintenance Operations Plan (TMOP) documents the operations and maintenance practices necessary to deliver transit services for the Project in a safe, dependable, and efficient manner, and to provide quality transit service to the riders. This version of the TMOP has been prepared in advance of the Phase 2 South Project application for a Full Funding Grant Agreement (FFGA). The intent of the TMOP is to:

- Guide system design to assure conformance to the operating intent
- Define the Project's service and operating characteristics
- Define the Project's operating and maintenance objectives
- Define the staff's responsibilities and organizational relationships required to operate and maintain the Project
- Define the system and operating requirements for assuring service dependability and system availability
- Serve as a frame of reference for future design refinements
- Provide a basis for detailed definition of operations and maintenance methods, practices, and estimates of these costs.

As the Phase 2 South (LPA) Project progresses through construction and implementation of revenue service, this document should be continually reviewed and updated as necessary.

1.5 Relationship to Overall Transportation Network

The CFCRT Project, when complete, will provide a key north-south transit spine for the metropolitan Orlando area and a viable commuting option to the I-4 corridor. Enhanced local and commuter bus operations will complement the system by providing transfer opportunities to the LYNX and VOTRAN networks, ultimately increasing connectivity throughout the region. The CFCRT Project will establish a regional rail network that can be expanded elsewhere throughout the state.

1.6 Organization of the TMOP

The remaining sections of the TMOP are organized as follows:

<u>Chapter 2 – Project Description:</u> Provides an overview of the CFCRT Project and describes the facilities, track, stations vehicle storage and maintenance facilities, and grade crossings associated with the Phase 1, Phase 2 South and Phase 2 North Projects.

<u>Chapter 3 – Systems:</u> Provides an overview of the revenue vehicles, signals and communications, and fare collection systems for the CFCRT Project.

<u>Chapter 4 – Interface with Other Transportation Modes:</u> Describes how the CFCRT Project interfaces with other transportation modes including CSX and Amtrak operations, LYNX and Votran feeder bus services, general traffic and station parking.

<u>Chapter 5 – Operating Plans:</u> Provides a detailed description of the projected operating

plans for each phase of the CFCRT Project.

<u>Chapter 6 – Transportation Operations:</u> Describes the activities required to provide revenue service, including descriptions of normal operations, special event operations and abnormal operations.

<u>Chapter 7 – Maintenance Operations:</u> Identifies requirements for maintenance of vehicles, facilities and equipment.

<u>Chapter 8 – Organizational Responsibilities:</u> Identifies each organization involved with the CFCRT Project and their respective roles in designing, constructing, maintaining and operating the system.

2 PROJECT DESCRIPTION

This chapter presents a description of the Full Build CFCRT Project and the various phases; and describes the facilities, infrastructure and systems that will comprise the completed Full Build Project.

2.1 Phase 1 - Initial Operating Segment

The Phase 1 Initial Operating Segment (IOS), which commenced service in May 2014, extends from the DeBary Station to the Sand Lake Road Station, a distance of approximately 32 miles. The twelve (12) IOS stations are located at DeBary, Sanford, Lake Mary, Longwood, Altamonte Springs, Maitland, Winter Park Amtrak, Florida Hospital Health Village, LYNX Central Station, Church Street, Orlando Amtrak, and Sand Lake Road. Park-and-ride facilities are provided at all stations except Winter Park Amtrak, Florida Hospital Health Village, LYNX Central Station, Church Street and Orlando Amtrak.

2.2 Phase 2 South - Locally Preferred Alternative

The Phase 2 South Locally Preferred Alternative (LPA) is similar to the IOS except the southern terminus of the line will extend to the Poinciana Station. The total Phase 1 and Phase 2 South route length will be approximately 49 miles and will include four additional stations: Meadow Woods, Osceola Parkway, Kissimmee Amtrak, and Poinciana. The LPA's Target RSD is December 2017.

2.3 Phase 2 North - Full Build Alternative

The Phase 2 North Full Build Alternative, also with a planned Target RSD in December 2017, adds to the IOS and LPA a 12-mile, one-station extension from DeBary Station to DeLand Amtrak Station in Volusia County to the north. At full build-out, the SunRail commuter service will operate on a 17-station, 61-mile alignment from DeLand in the north (Volusia County) to Poinciana in the south (Osceola County).

2.4 Facilities

This section presents a description of the CFRC track, SunRail stations and the Vehicle Storage and Maintenance Facilities.

2.4.1 Track

At Full Build, 35 miles of new 2nd track will increase the total amount of double-tracked alignment to approximately 54 miles of the 61-mile corridor. Approximately two (2) miles of existing single track across the St. Johns River and through the City of Maitland from the Control Point north of Sybelia Avenue to the Control Point north of Denning Drive will remain single track. There will also be approximately 3 miles of single track centered at MP A754.82, the French Avenue overhead bridge, and 1.6 miles of single track between the Osceola Parkway and Kissimmee Intermodal stations (MP 806.1 to MP 807.7).

The Phase 2 South project includes the following track improvements:

- Construction of 11.81 miles of new track adjacent to existing single mainline track at the following locations: MP 797.34 to MP 797.46, MP 797.40 to 797.82, MP 797.57 to MP 798.24, MP 799.11 to MP 806.1, MP 807.7 to MP 809.1, and MP 810.72 to 813.76.
- Realign 2.87 miles of existing track.
- Upgrade 3.65 miles of existing siding track.
- Construction of approximately 455 LF of crashwall.
- Construction of approximately 150 LF of retaining wall within the VSMLF to support track construction.
- Six (6) new #10 turnouts will be used for replacement of existing industry sidetrack turnouts being upgraded or relocated due to the addition of the second track. At MP 813.5, a #20 crossover will be installed to facilitate the transition for Amtrak operations from the CSXT single track to the CFRC double track at Poinciana.

2.4.2 Stations

The CFCRT Full Build Project will include 17 stations. All stations will be designed to comply with requirements of the American with Disabilities Act (ADA) of 1990 in accordance with 49 CFR Part 37.42, as well as DOT's recently amended regulations ADA's Final Rule (76 FR 57924). All stations will be at-grade. All SunRail station platforms will be 8" ATR and 5'1" from the centerline of the track. Platforms will be a minimum of 14' wide and 300' long and capable of berthing three coaches. All passenger coaches and cab cars include two ADA-compliant car-borne lifts. In addition, FDOT will construct a ramp to a mini-high platform at an elevation of 22-inches ATR at the south end of each platform. This configuration of the mini-high is currently provided for Phase 1 stations. The construction of the ramp to a mini-high platform is in addition to the car-borne lifts on each coach and cab car.

In general, station amenities will be standardized, including shelters, platform features and structural elements, with a canopy over a portion of each platform. The extent of canopy will vary for each station and will depend on expected patronage and platform type. Platform amenities include:

- Platform topping to include decorative pavers and tactile warning strip
- Bench seating on each platform
- Painted steel map kiosks with lighting and system map
- Trash receptacles

- Inter-track fencing between the platforms •
- Platform and canopy lighting •
- Informational, directional and regulatory signage •
- ADA bi-level water fountain and drain
- Pedestrian crosswalks with warning signals •
- Emergency Call Boxes and Passenger Assist Telephones
- Public Address System
- Variable Message Signs
- CCTV Security System with Static and Pan/Tilt/Zoom cameras •

At Full Build, the CFRCT will include 17 stations at the following locations:

- DeLand Amtrak (Phase 2 North)
- LYNX Central Station (Phase 1)

- DeBary (Phase 1) •
- Sanford (Phase 1) •
- Lake Mary (Phase 1)
- Longwood (Phase 1)
- Altamonte Springs (Phase 1)
- Maitland (Phase 1) •
- Winter Park Amtrak (Phase 1)
- Florida Hospital (Phase 1) •

- Church Street (Phase 1)
- Orlando Amtrak (Phase 1)
- Sand Lake Road (Phase 1) •
- Meadow Woods (Phase 2 South) •
- Osceola Parkway (Phase 2 South)
- Kissimmee Amtrak (Phase 2 South) •
- Poinciana (Phase 2 South) •

2.4.3 Vehicle Storage and Maintenance Facilities

Rand Yard VSMF

A secured Vehicle Storage and Maintenance Facility (VSMF), located at Rand Yard, provides for overnight storage of revenue vehicles; routine cleaning, fueling, maintenance and inspection of revenue vehicles; staging and support areas for Maintenance of Way (MOW); Signals and Communications (S&C), Track and Roadway (T&R); an Operations Control Center (OCC); security monitoring of the station CCTV, audio broadcast and text messaging to station public address and variable messaging systems, and administrative offices. The VSMF provides for the following functions:

- Seven (7) for the 10 SunRail trainsets (21 vehicles) required to operate the • Phase 2 South and Phase 2 North Opening Year operating plans will be stored at the Sanford VSMF; (9 vehicles, 3 trainsets, will be stored at the Poinciana VSLMF).
- Fueling of locomotives
- Periodic maintenance and repairs of not more than two (2) hours for locomotives and coaches and cab cars at VSMF only.
- Routine interior car cleaning
- Support facilities, including staff offices, locker rooms and restrooms •
- Rolling stock maintenance administration at VSMF only.
- Dispatching and control of mainline and yard operations at VSMF.
- Support facilities for track, signals and other infrastructure maintenance for the entire system at VSMF only.

- Parking for all CFRC operating and maintenance personnel
- Service and Inspection (S&I) Shop at VSMF only.

The following inspection and maintenance activities on diesel locomotives, coach cars, and cab cars occur at the CFRC Rand Yard VSMF:

- Daily FRA mandated inspections
- Daily checking of any systems, as required by vehicle manufacturer/supplier
- Corrective maintenance of not more than two (2) hours, including but not limited to:
 - Replace brake shoes
 - Replace seat cushions
 - Replace light bulbs/ballasts
 - Replace headlamps
- Inspection of radios, public address user interface, PA Amp, etc. Troubleshoot minor electrical and mechanical malfunctions, and replace easily handled and easily replaced defective components, when required and providing total time does not exceed two (2) hours
- Routine interior cleaning
- Weekly inspections or checking of any systems, if required by vehicle manufacturer/supplier
- Routine lubrication, primarily for diesel locomotives
- Troubleshoot and perform corrective maintenance on specific items that generally require less than two (2) hours of labor, and not requiring cranes, special tools, jacking equipment, etc. An example would be changing a defective component in a HVAC unit, and subsequent testing of the heating and cooling system.

Above-ground fueling of diesel locomotives is performed in the CFRC VSMF yard by a local fueling contractor.

Rand Yard will continue to be used for the CFRC VSMF for Phases 1 and 2.

Poinciana VSLMF

A Vehicle Storage and Light Maintenance Facility (VSLMF) will be constructed adjacent to the Poinciana Station during construction of the Phase 2 South project. The VSLMF facility will function as a midday and overnight train storage facility, in order to reduce deadhead costs and provide more operational flexibility, and will have the capability to perform light maintenance as well. The VSLMF will have the following capabilities:

- Midday and overnight storage tracks (for up to four train sets).
- Two wayside power stations for connection to locomotive head end power (HEP).
- Yard air compressor.
- Fueling facility.
- Pre-engineered building (1,760 sq. ft.) for train crews, mechanical office and storage and utility space.

Amtrak Sanford Auto Train Facility

The Amtrak Sanford Auto Train Facility is currently used on a daily basis to perform maintenance on the Amtrak Auto Train. The facility has the capabilities and capacity, primarily during the evening and night shifts, to perform equipment maintenance, and servicing activities on the SunRail fleet. FDOT has contracted with Amtrak to provide heavy vehicle maintenance and exterior car washing of the SunRail fleet at this facility.

Amtrak performs the following activities for the SunRail fleet at the Auto Train Facility:

- Periodic Maintenance
 - For Coaches: 184 Day, annual, Four Year Airbrake
 - For Cab Cars: 92 Day, annual, bi-annual and Four Year Airbrake
 - For Locomotives: 45 Day, 92 Day, annual, bi-annual and Airbrake
- Corrective Maintenance
 - Wheel change-outs
 - Truck change-outs / repairs
 - HVAC Unit change-outs
 - Check, test, and replace propulsion and braking equipment components that may require extra time on pits and/or jacking of cars
 - Replace Door Operators
 - Replace Windows
 - Replace seats and perform other interior repairs
 - Repair/Replace Propulsion/Braking Control
 - Check condition and replace car and locomotive batteries
 - Perform minor exterior and interior damage repairs
- Exterior Car Cleaning
- Storage of Components

Fueling and sanding are service items usually performed by the O&M Contractor at the CFRC/SunRail VSMF. Amtrak, however, inspects and tops off fluids, sand and fuel before dispatching back to the VSMF. Washing the train exterior, and re-stocking the train are also functions performed by Amtrak.

Amtrak will from time to time be requested to change out components such as power assemblies, wheels and axles and traction motors. Repairs that may be anticipated at this time are shock absorber replacement, wear liner replacement, pin and bushing replacement, air brake cylinder overhaul, bushing and pin replacement – all on an as needed basis.

Material handling for loading/packaging, handling and shipping of major components, such as wheel axle assemblies, traction motors and HVAC units are also included.

2.5 Grade Crossings

There are 126 total at-grade crossings within the 61-mile corridor, 24 in Phase 2 South and 6 in the North alignment. In order to mitigate crossing delay while preserving safety, new Constant Warning Time (CWT) crossing technology will replace the existing "Fixed Start" crossing warning system. This technology reduces intersection delay by initiating crossing warning based on a train's speed rather than its fixed location. FDOT established a policy on November 14, 2012 prohibiting the establishment of any new at-grade rail crossing to include, but not limited to, vehicular, pedestrian, bicycle, horse, golf cart, etc. The only exemption to this policy restriction is the installation of pedestrian crossings at CFRC passenger stations. For conversion of highway-rail grade crossings from private to public on the CFRC, the applicant must meet the criteria established in Rule 14-57.012(2)(a), Florida Administrative Code. Upon the Department's authorization of the conversion, the applicant will adhere to the installation of the crossing surface and safety signalization criteria pursuant to Rule 14-57.012(3) Florida Administrative Code; Florida Statutes; Manual of Uniform Traffic Control Devices (MUTCD); American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets; Manual of Uniform Minimum Standards for Design, Construction, Maintenance for Streets and Highways (Florida's Green Book); and the Department's Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System.

Phase 2 South

Within Phase 2 South, there are 24 highway-rail grade crossings, 14 of which are in the new second track construction sections. Two of these crossings have been identified for closure and one crossing is being relocated approximately 1200' north of its current location. The 2014 Phase 2 South Value Engineering (VE) Report reduced the number of double track crossings to nine (9) by single-tracking through Donegan St, Vine St, Magnolia St, Pine St. and Park St. in Kissimmee.

In addition, there will be one grade crossing modification in the Phase 2 South alignment. FDOT and the City of Kissimmee have agreed to close a public highway-rail grade crossing, located at MP A808.76, Lakeshore Boulevard/Penfield Street and relocate the public highway-rail grade crossing to Beaumont Avenue, City of Kissimmee, FL. The relocation of the Lakeshore Boulevard/Penfield Street crossing to Beaumont Avenue will eliminate a complex bidirectional intersection with S. Clyde Avenue, less than 25' from the CFRC track. The City of Kissimmee has agreed to close a pedestrian crossing at Memorial Walkway (MP 808.22) and agreement has been reached to provide alternate access for a residence and close a private crossing at Vernon Rd. (MP 808.61)

3 SYSTEMS

This section presents a description of the various systems associated with the CFCRT Project. The revenue vehicles proposed to be used for service are described along with the signals and communications and fare collection system.

3.1 Revenue Vehicles

The SunRail commuter service is operated using a fleet of push-pull diesel locomotives and ADA-compliant coaches and cab cars. Push-pull trains provide the ability to serve the corridor without electrification and provide flexibility in matching train capacity to passenger demand. Push-pull locomotives, coaches and cab cars train consists comply with Federal Railway Administration (FRA) guidelines (49 CFR Part 238). When using a push-pull formation, the locomotive operates at the front or rear of the train, pushing or pulling the train. The cab car is located at the other end of the train, allowing the train driver to operate the train from either end. The SunRail service plans require a fleet of bi-level commuter coaches and cab cars. The commuter coaches seat approximately 147 passengers and 132 passengers for cab cars. The SunRail service required seven locomotives, five coaches and nine cab cars for Phase 1 revenue service; nine locomotives, six coaches and twelve cab cars are required for Phase 2 South service; and ten locomotives, seven coaches and thirteen cab cars for Phase 2 North service.

The Vehicles for Phase 2 South were procured under options in the Phase 1 contracts and are on site at the Vehicle Storage and Maintenance Facility. FDOT exercised the option with Motive Power, Inc. (MPI) to purchase the two additional locomotives required for Phase 2 South on May 1, 2012. The Coaches and Cab Cars for Phase 1 were provided by Bombardier. FDOT exercised the option with Bombardier to purchase the one additional coach and three cab cars required for Phase 2 South on August 14, 2012.

Modifications to the vehicles (Locomotives/Cab Cars) will be required for the addition of the onboard equipment for PTC operations.

3.2 Signals and Communications

Signal and communications equipment and systems for Phase 2 South and Phase 2 North will include the following:

- New or modifications to existing crossing warning signals at all at-grade intersections and associated train detection technology
- Replacement of the existing wayside signal system, with new Control Points (CP) or modifications to existing CPs
- Extension of the Fiber Optic system to Poinciana and integration of the new systems with the existing communications system.

The wayside signal system is a Traffic Control System consisting of bi-directional signaling and is configured as a "three-block, four-aspect" system. Block layout supports a maximum 79 mph passenger train operation and a maximum 60 mph freight train operation (except where a lower Maximum Authorized Speed is designated). The signal system is designed to support a practical CFRC following move headway of 7.5 minutes to support Amtrak running between consecutive same-direction SunRail trains. Solid-State microprocessor-based systems are used for new control points and intermediate signals. Control points shall use fiber optic for communication between the control points and the OCC. ATCS radio base stations connected via the fiber optic network will provide backup communications between the control points and the Operations Control Center. PTC is no longer included as part of the federal scope of the Phase 2 South Project.

The grade crossing warning system includes an upgrade of the existing system consisting of the individual warning devices located at highway and pedestrian crossings. Upgrades to the crossing warning systems include new houses and crossing warning devices as well as relocating existing warning devices and wiring new equipment into existing houses. The grade crossing signal system incorporates

microprocessor-based constant warning time devices.

Control points shall use the fiber optic backbone for normal Centralized Train Control (CTC) communications; wayside signals will be connected to the fiber optic network VHF and ATCS communications. The ATCS radio will provide redundant communication between the CPs and OCC for CTC communications.

3.3 Fare Collection

The SunRail fare collection system features an account-based contactless "smart" card system and has been coordinated with the LYNX and VOTRAN's current bus fare collection system in order to accommodate transfers to and from SunRail. The fare collection system is comprised of the following features:

- Two types of ticket vending machines (TVMs) have been installed: a full-service TVM (FSTVM) that accepts both cash and credit/debit cards for payment and issue change and a cashless TVM (CTVM) that accepts only credit/debit cards but not cash. TVMs provide 14" color display units with touch screen and soft key interface for selection of products for fare payment, loading/reloading and distribution of smart cards. Four TVMs are located at each SunRail station (two on each platform), including 1 FSTVM and 3 CTVMs.
- Station Platform Ticket Validators (SPTV) to validate smart cards. Typically, four SPTVs are located at each SunRail station (two on each platform).
- Handheld ticket validators (HHTV) for fare payment inspection and validation by Train Conductors and/or Fare Inspectors. The HHTVs are accompanied by a separate thermal printer module capable of issuing receipts, reports and citations.
- Contactless Smart cards (standard and limited use disposable).
- A central data collection and information system (CDCIS) application that handles credit/debit card processing, transaction and maintenance data processing and reporting, as well as TVM and TV configuration.

FDOT and LYNX participated in a joint procurement of fare collection equipment. LYNX and Votran purchased TVMs and On-Board Smart Media Processors (OSMP) that will be installed on fixed route buses, enabling seamless integration of SunRail, LYNX and Votran fares.

4 INTERFACE WITH OTHER TRANSPORTATION MODES

SunRail is designed to interface with other transportation modes. SunRail operations have been coordinated with LYNX and VOTRAN local and express bus operations in order to maximize transfer opportunities. Potential conflicts with vehicular and pedestrian traffic, as well as other freight and passenger rail traffic, have also been identified.

4.1 CSX and Amtrak Operations

FDOT entered into an agreement with CSX Transportation to purchase approximately 61 miles of the CSXT A-Line from DeLand to Poinciana and took possession in November

2011. FDOT is required to perform all maintenance and dispatch duties, including freight, along the 61-mile CFRC corridor for the first seven years of operation. As part of the purchase agreement, passenger rail traffic will be allowed access for 19 hours per day with exclusive passenger rail access for 12 hours per day. Freight rail traffic consists of a combination of CSXT through-freight service including tri-level auto trains, merchandise train, coal and rock unit trains, and intermodal unit trains plus CSXT local switching operations and freight transfers from Florida Central Railroad entering at Robinson St. in Orlando and traveling to CSXT Taft Yard. The current CFRC General Freight Service Plan, effective April 2, 2014 reflects operations within the CFRC Orlando Subdivision during Phase 1 commuter operations. The freight service plan consists of 4 different classes of service which are Local, Through Freight, Work and Unit trains. Operating Windows provided as reference below. Operating plans are subject to change under provisions of Central Florida Operating and Management Agreement (CFOMA) between the State of Florida and CSX Transportation, Inc.

- 0500 to 1000 Commuter Operation Only (Morning Commute)
- 1000 to 1500 Commuter and Freight Operation Only (Mid-Day Window)
- 1500 to 2200 Commuter Operation Only (Evening Commute)
- 2200 to 0001 Commuter and Freight Operation Only (Night Window)
- 0001 to 0500 Exclusive Freight Operation Only / No passenger or CFRC Track work allowed (Night Window)
- Amtrak Use 6 Amtrak per day between 0530 and 1600 weekdays

Amtrak continues to operate throughout the corridor. Amtrak currently operates two roundtrip passenger trains, the Silver Meteor and the Silver Star, through the CFRC corridor daily, serving passenger stations in DeLand, Winter Park, Orlando, and Kissimmee. Amtrak also operates a daily roundtrip Auto Train from north of the CFRC corridor to the Auto Train facility in Sanford at MP A766.00. There are no known plans for increased Amtrak service.

4.2 LYNX and VOTRAN Local Buses

Several LYNX and VOTRAN-operated local and regional bus routes will be modified to maximize transfer opportunities with nearby commuter rail stations. In most cases this involves minor route deviations or short route extensions to serve the proposed stations.

Station/Stop	Bus Routes	
DeBary	30,31,32,33	
Sanford	34,46E,46W,651	
Lake Mary	45	
Longwood	434,505	
Altamonte Springs	436N	
Maitland	102	
Winter Park/Amtrak	1,9,14,23,102,443	
Florida Hospital Health Village	102,125	
LYNX Central Station	All LYNX routes serving LCS	

Table 1 – Feeder Bus Routes for Phase 1 and Phase 2 South

Station/Stop	Bus Routes	
Church Street	Lymmo Orange, Lymmo Grapefruit	
Orlando Amtrak	40	
Sand Lake Rd.	11,18,42,111,208 ² ,418	
Meadow Woods	18,418	
Osceola Pkwy	631, 632	
Kissimmee Intermodal Terminal	10,18,26,55,56,57,108,208 ² ,441,632	
Poinciana	604	

4.3 General Traffic

All highway-rail grade crossings will have automatic warning systems to alert vehicles to the approach of a train.

4.4 Station Parking

The Phase 1 stations in Winter Park and the City of Orlando are considered primarily destination stations and as such do not have parking. The Phase 2 South and North stations will have parking with the number of spaces estimated to accommodate the expected opening day parking demand (see Table 2).

Station Name	Phase	Station Type	Opening Day Parking Spaces
DeLand	Phase 2 North	Park & Ride	90
DeBary	IOS	Park & Ride	275
Sanford	IOS	Park & Ride	232
Lake Mary	IOS	Park & Ride	325
Longwood	IOS	Park & Ride	260
Altamonte Springs	IOS	Park & Ride	326
Maitland	IOS	Park & Ride	125
Winter Park/Amtrak	IOS	Destination	0
Florida Hospital Health Village	IOS	Destination	0
LYNX Central Station	IOS	Destination/ Intermodal	0
Church Street	IOS	Destination	0
Orlando Amtrak	IOS	Destination	0
Sand Lake Road	IOS	Intermodal	429
Meadow Woods	Phase 2 South	Park & Ride	195
Osceola Parkway	Phase 2 South	Park & Ride	100
Kissimmee Amtrak	Phase 2 South	Intermodal	195
Poinciana	Phase 2 South	Park & Ride	125

Table 2 – Station Type and Opening Day Parking

² LYNX 208- Downtown Kissimmee Express (limited stop service from Kissimmee to Sand Lake Road Station) will be discontinued when Phase 2 South service begins revenue service

5 OPENING YEAR AND DESIGN YEAR OPERATING PLANS

This section presents operating plans for the Phase 1 IOS, Phase 2 South Project, and the Phase 2 North Project.

5.1 Hours of Operation

Table 3, below, summarized the assumed span of service for SunRail Phase 1 and Phase 2 South and Phase 2 North Opening Year service. The span of service for the Opening Year operating scenarios included three hour AM and PM peak periods. In the 2030 scenario, when peak period service is increased to 15 minutes, the AM and PM peak periods will be approximately two hours long.

DAY OF WEEK	TIME PERIOD	HOURS
Weekdays	Early Morning	5:00 a.m 6:00 a.m.
	AM Peak Period ¹	6:00 a.m 9:00 a.m.
	Midday	9:00 a.m 3:30 p.m.
	PM Peak Period ¹	3:30 p.m 6:30 p.m.
	Evening	6:30 p.m 10:30 p.m.

Table 3 – Span of Service for Opening Year Scenarios

 AM and PM Peak Periods represent entire time in which the peak frequency is operated at some location(s) along the route. At any individual station, the AM and PM Peak Periods will be less than 3 hours.

For the IOS, SunRail service is currently provided on weekdays with revenue service beginning at approximately 5:00 a.m. and continuing until about 10:30 p.m. (17.5 hours). Please refer to Table 14 and 15 for the current Phase 1 SunRail schedule. Scheduled service may be augmented for special events.

5.2 Loading Standards

Vehicle capacity and passenger loading standards have been established in order to determine the service frequency and fleet requirements. Table 4 summarizes the vehicle capacity (seats) and passenger loading standards for coaches and cab cars. Vehicle capacities are based on the seat configurations for the SunRail vehicles.

VEHICLE FLEET	NUMBER OF	LOAD STANDARD	
	SEATS	PEAK HOUR	OFF-PEAK
Bi-Level Coaches	147	125% of seats	100% of seats
Bi-Level Cab Cars	132	125% of seats	100% of seats

The load standards shown above were used to determine the appropriate peak hour service frequency and train consist for the Project alternatives. The projected AM or PM peak hour, peak direction (PHPD) maximum line loads were divided by the load standard to determine the peak hour throughput required for that route. A peak hour load standard of 125% (Load Factor = 1.25) has been assumed due to the higher demand in projected ridership and loads for the stations approaching downtown Orlando

and the shorter travel distance between those stations for potential standees. During offpeak hours, the load standard is 100% (Load Factor = 1.00) of the seated load (i.e., no standees).

Since the start of Phase 1 revenue operations in May 2014, the observed peak hour load factor has typically been less than the seated capacity. On selected trips, however, SunRail trains have exceeded the 125% design factor, reaching a maximum load factor of 1.8 (Train 317; Friday, January 2, 2015). In response to high loads, FDOT has increased the train consist on selected trips (1 coach car, 2 cab cars). FDOT will continue to monitor passenger loads and will adjust operating plans (e.g., adding trains or increasing train consist) or modify its design load standard, as necessary.

5.3 Travel Times

Travel times were recently simulated by HNTB for Phase 1, Phase 2 South and Phase 2 North operations. The CFRC track alignment has a maximum authorized speed of 79 mph. However, sections of the alignment will have speed restrictions due to track curves, street crossings, the operating environment, and station spacing. Station-tostation run time estimates have been developed based on these criteria, vehicle performance characteristics and applied to the Project's rail alignment drawings.

Cycle times are important for determining the operating requirements for each rail scenario. Cycle times consist of in-vehicle running time, station dwells, intersection and grade crossing delays, and layover and schedule recovery time. The cycle time is calculated by multiplying the one-way run time by two (round-trip) and adding a minimum 10 minutes layover / schedule recovery time at each terminal. When developing preliminary schedules, the layover / schedule recovery time at each terminal was adjusted until the cycle time was an integer multiple of the service frequency (i.e., SunRail can't operate fractions of trains).

5.4 Vehicle Performance Characteristics

Commuter rail trains accelerate at a maximum rate of about 2.0 miles per hour per second (mphps). Normal service braking is a constant 2.0 mphps from 65 mph to 0 mph. Station-to-station run times also include station dwell times (30 to 60 seconds per station) and a 5% to 10% allowance for schedule margin (e.g., wheelchair boardings and alightings, dispatching delays and other unscheduled delays).

5.5 Station-to-Station Travel Times

Table 5 presents simulated station-to-station run times for the Full Build, from DeLand to Poinciana, with one locomotive, one coach and one cab car. Actual run times are currently 63 minutes, as shown in the SunRail weekday schedules (Tables 14 and 15). The Phase 2 South run time from Sand Lake Road to Poinciana is estimated to 25 minutes. The Phase 2 North run time from DeBary to DeLand is estimated to be 14 minutes. Scheduled run times are subject to change as SunRail train operators acquire more real-time experience.

	[Distance (miles	5)	Run Time	(hour:min)
Station	Milepost	Increment	Cumulative	Increment	Cumulative
DeLand	750.0				
DeBary	761.8	11.8	11.8	0:14	0:14
Sanford	765.8	4.0	15.8	0:06	0:20
Lake Mary	773.2	4.3	20.1	0:07	0:27
Longwood	777.7	4.5	24.5	0:06	0:33
Altamonte Springs	780.5	2.8	27.3	0:04	0:37
Maitland	783.3	2.8	30.1	0:06	0:43
Winter Park	785.6	2.3	32.4	0:07	0:50
Florida Hospital	787.9	2.3	34.8	0:07	0:57
Central Station	789.8	1.9	36.7	0:05	1:02
Church Street	790.5	0.7	37.4	0:03	1:05
Orlando Health/Amtrak	791.4	0.9	38.3	0:03	1:08
Sand Lake Road	796.5	5.1	43.4	0:09	1:17
Meadow Woods	801.1	4.5	47.9	0:06	1:23
Osceola Parkway	804.5	3.5	51.4	0:05	1:28
Kissimmee	808.0	3.5	54.9	0:06	1:34
Poinciana	813.6	5.6	60.5	0:08	1:42

Table 5 – "Full" Build Estimated Station-to-Station Run Times

Source: Simulated station-to-station run times, HNTB, January 2015.

5.6 Ridership Projections

Development of a feasible and efficient operating plan involves an iterative process where potential ridership markets are projected, an operating plan is sized to meet the projected demand, and design standards are defined. Ridership projections, an integral part of this iterative process, establish fleet vehicle requirements, equipment quantities (e.g., number of ticket vending machines), station circulation requirements, operating plans, and staffing and operating cost estimates.

SunRail ridership was projected using regional travel demand models developed as part of the Florida State Urban Transportation Modeling System (FSUTMS) modeling system, developed by FDOT and used throughout the state. The following ridership projections have been developed: Opening Year IOS, Opening Year Phase 2 South, and Opening Year Phase 2 North (Full Build) Horizon Year. Ridership for the 2030 Full Build scenario was extrapolated based on Opening Year, Full Build and 2030 LPA projections. Daily and annual boardings and line loads, shown below, have been interpolated for the start-up scenarios. Table 6 summarizes actual Phase 1 ridership (January, 2015) and projected daily ridership for the Phase 2 CFCRT scenarios.

A comparison of actual and projected Phase 1 ridership, below, indicates that actual ridership (January 2015) is about 8.6% less than the projected Opening Year ridership. However, average daily ridership has increased by almost 19% from November 2014 to January 2015, indicating that new riders are still being attracted to the SunRail system.³

³ SunRail currently has two methods of reporting ridership data: (a) counts reported by the automated fare collection system, and (b) manual counts prepared by Train Conductors. Because the fare collection system has had software and hardware failures, SunRail is using the Train Conductor counts to report ridership.

PERIOD	ACTUAL PHASE 1 JANUARY 2015 ¹	PROJECTED PHASE 1 2014 ²	PHASE 2 SOUTH OPENING YEAR ³	PHASE 2 NORTH OPENING YEAR ⁴	PHASE 2 NORTH 2030⁵
Daily Boardings	3,788	4,144	6,535	6,798	15,108
Peak Hour Boardings	683	1,039	1,632	1,695	3,328
PHPD Maximum Line Load	387	558	657	703	1,100
PHPD Maximum Train Load	194	279	328	352	275

Table 6 – Projected Daily and Peak Hour Ridership

1. SunRail Conductor Delay Reports, Jan. 2 -30, 2015.

2. Phase 1 Opening Year projections, AECOM, July, 2007.

3. Phase 2 South Opening Year projections, AECOM, December, 2011.

4. Extrapolated for DeLand Station Boardings from Opening Year Phase 2 South projections, AECOM, December, 2011.

5. Extrapolated for DeLand Station Boardings from 2030 Phase 2 South projections, AECOM, December, 2011.

Table 7 presents current Phase 1 boardings and alightings by station and line loads for the southbound AM peak hour and northbound PM peak hour. The current ridership data profile indicates that midday and early evening ridership is exceeding ridership projections, but AM and PM peak hour ridership is below projections.

Phase 1 Line	Loads	- Southbo	und, AM F	eak Hour	Phase 1 Line Loads	s - Northbo	und, PM P	eak Hour
Station		Ons	Offs	Line Load	Station	Ons	Offs	Line Load
DeBary		103	0	103	Sand Lake	66	0	66
Sanford		35	2	136	Orl. Health	33	2	97
Lake Mary		77	2	211	Church St.	133	7	223
Longwood		39	3	247	LCS	92	10	305
Alt. Springs		36	14	269	FL Hospital	45	7	343
Maitland		39	14	294	Winter Pk	70	26	387
Winter Pk		9	19	284	Maitland	13	41	359
FL Hospital		5	30	259	Alt. Springs	21	55	325
LCS		9	67	201	Longwood	13	56	282
Church St.		1	93	109	Lake Mary	9	90	201
Orl. Health		0	25	84	Sanford	3	71	133
Sand Lake		<u>0</u>	<u>85</u>		DeBary	<u>0</u>	<u>135</u>	
Total		353	354		Total	498	500	

 Table 7 – Phase 1 IOS Actual Line Loads

1. SunRail Conductor Delay Reports, Jan. 5, 9, 21, 2015. Station boarding and alightings were factored for average monthly ridership.

2. AM peak hour is 7:00 to 7:59 AM.; PM peak hour is 4:00 to 4:59 PM.

Tables 8, 9 and 10 present projected AM peak hour boardings and alightings by station, and line loads for the Phase 2 South Opening Year, Phase 2 North Opening Year, and Phase 2 North Full Build 2030 scenarios, respectively.

		Southbound		Northbound			
Station	On	Off	Load	On	Off	Load	
Fort Florida	98	0	98	0	16	0	
Sanford	82	8	172	3	63	16	
Lake Mary	161	5	328	5	58	76	
Longwood	108	23	413	13	83	129	
Altamonte	127	38	502	39	78	199	
Maitland North	94	6	590	25	7	238	
Winter Park	91	24	657	20	43	220	
Florida Hospital	27	64	620	20	57	243	
Central Station	23	202	441	70	124	280	
Church Street	190	267	24	125	334		
ORMC/Amtrak	7	88	186	17	55	435	
Sand Lake	14	95	105	133	31	473	
Meadowwoods	5	18	92	89	9	371	
Osceola Pkwy	5	11	86	98	7	291	
Kissimmee	0	85	1	121	16	200	
Poinciana	<u>0</u>	0	1	95	0	95	
Total	858	857		772	772		
Notes:							
1. Opening Year proje	cted ridership (A	ECOM, tassmo	a4s_16n.xls & t	assmoa4s_16s.	xls, Dec. 3, 201	1)	
2. Sum of Ons and Of	fs may not be eq	ual due to assig	gnment of produ	uctions and attra	actions.		
3. Peak hour, peak dire	ection maximum l	ine load is shov	vn in bold, ita	lics.			

Table 8 – Phase 2 South Opening Year Projected Line Loads

4. Phase 1 Ons and Offs are based on travel demand model projections, not actual ridership patterns.

Table 9 – Phase 2 North Full Build Opening Year Projected Line Loads

		Southbound			Northbound		
Station	On	Off	Load	On	Off	Load	
DeLand	50	0	50	0	16	-1	
Fort Florida	98	0	148	0	16	15	
Sanford	82	8	222	3	63	31	
Lake Mary	161	5	378	5	58	91	
Longwood	108	24	462	13	83	144	
Altamonte	127	40	549	40	78	214	
Maitland North	94	6	637	26	7	252	
Winter Park	91	25	703	20	43	233	
Florida Hospital	27	68	662	20	57	256	
Central Station	471	71	124	293			
Church Street 16 201			286	24	125	346	
ORMC/Amtrak	MC/Amtrak 7 93			17	55	447	
Sand Lake	14	101	113	136	31	485	
Meadowwoods	5	19	99	91	9	380	
Osceola Pkwy	5	12	92	100	7	298	
Kissimmee	0	90	2	124	16	205	
Poinciana	<u>0</u>	<u>0</u>	2	<u>97</u>	<u>0</u>	97	
Total	908	906		787	788		
Notes:							
1. Based on Phase 2 S	South projected i	ridership (AECC	M, tassmoa4s_	16n.xls & tassm	noa4s_16s.xls,	Dec. 3, 2011)	
and estimated DeLa	nd boardings an	d alightings.					
2. Sum of Ons and Off	s may not be ed	ual due to assi	gnment of produ	uctions and attra	actions.		
3. Peak hour, peak dire	ection maximum	line load is shov	vn in bold, ita l	lics.			

4. Phase 1 Ons and Offs are based on travel demand model projections, not actual ridership patterns.

	ę	Southbound	1	l	Northbound	ł
Station	On	Off	Load	On	Off	Load
DeLand	137	0	137	0	66	
Fort Florida	191	0	328	0	50	66
Sanford	187	27	488	10	158	116
Lake Mary	252	11	729	7	111	264
Longwood	127	33	823	18	113	367
Altamonte	185	73	935	77	127	463
Maitland North	111	51	994	49	56	513
Winter Park	139	33	1,100	32	66	520
Florida Hospital	61	95	1,066	20	203	554
LYNX Central Sta	92	284	875	221	256	737
Church Street	42	333	584	45	275	772
ORMC/Amtrak	18	177	424	57	131	1,003
Sand Lake	20	233	211	296	62	1,077
Meadow Woods	12	58	165	279	19	843
Osceola Pkwy	14	20	160	188	11	583
Kissimmee	7	145	22	247	29	406
Poinciana	0	22		188	<u>0</u>	188
Total	1,595	1,595		1,733	1733	
Notes:						

Table 10 – Phase 2 North Full Build 2030 Projected Line Loads

1. Based on 2030 Phase 2 South projected ridership (AECOM, tassmoa4s_30d.xls & tassmoa4n_30d.xls, Dec. 3, and estimated DeLand boardings and alightings.

2. Sum of Ons and Offs may not be equal due to assignment of productions and attractions.

3. Peak hour, peak direction maximum line load is show n in *bold, italics*.

4. Phase 1 Ons and Offs are based on travel demand model projections, not actual ridership patterns.

5.7 Passenger Fares

The base commuter rail fare is \$2.00 for trips made within one county. A surcharge of \$1.00 is added for trips made between two counties (total \$3.00); a surcharge of \$2.00 is added for trips spanning three counties (total \$4.00); and a surcharge of \$3.00 is added for trips encompassing all four counties (total \$5.00). The maximum one-way fare is \$5.00. Travelers can transfer without additional cost between the commuter rail system and either the LYNX or VOTRAN local bus system. LYNX or VOTRAN bus riders may have to pay a fare upgrade for travel on the commuter rail system, depending on how many counties are traversed.

Table 11 – Base Passenger Fares

Distance	Fare
Base Fare (One County)	\$2.00
Two Counties	\$3.00
Three Counties	\$4.00
Four Counties	\$5.00

5.8 **Operating Plans**

Three CFCRT Project operating scenarios are described in the following sections: (1)

Phase 1 IOS, a 32-mile commuter rail line from the DeBary Station to Sand Lake Road Station (2014); (2) Phase 2 South LPA, a 49-mile commuter rail line between DeBary Station and Poinciana Station (Opening Year); and (3) Phase 2 North Full Build, a 61-mile commuter rail line between DeLand Station and Poinciana (Opening Year and 2030). The development of these service plans are described below.

5.9 Cycle Times

Cycle times are important for determining the operating requirements for each individual rail line. Cycle times consist of in-vehicle running time, station dwells, intersection and grade crossing delays, and layover and schedule recovery time.

Parameter	Phase 1 IOS ¹	Phase 2 South LPA ²	Phase 2 North Full-Build ²
One-Way Run Time (minutes)	63	88	102
Layover Time	12	17	18
Round-Trip Cycle Time	150	210	240

Table 12 – Round-Trip Cycle Times

1. Phase 1 times are based on current schedule (Table 14 and 15).

2. Phase 2 times are based on actual Phase 1 times and simulated run times for extensions (HNTB).

5.10 Peak and Fleet Vehicle Requirements

The Peak Vehicles Required includes the total number of SunRail locomotives, coach and cab cars required during weekday peak period revenue operations. The Total Fleet requirement includes the total number of vehicles required for operations and maintenance of the rail system. The Total Fleet Demand is equal to the sum of the Peak Vehicles Required and the Maintenance Fleet Demand.

5.11 Summary of Operating Requirements

Phase 1 (IOS) Service Plan (2014)

SunRail service commenced in May 2014 on the 32-mile IOS between the DeBary SunRail Station and the Sand Lake Road SunRail Station. Twelve (12) stations are located on this alignment: DeBary, Sanford, Lake Mary, Longwood, Altamonte Springs, Maitland, Winter Park/Amtrak, Florida Hospital Health Village, LYNX Central, Church Street (downtown Orlando), Orlando Amtrak, and Sand Lake Road.

Trains run every 30 minutes in the peak period and every 120 to 150 minutes during the midday and evening hours (32-36 daily trips, depending on actual ridership demand). For the Opening Year service plan, no service is operated on Saturdays, Sundays, or designated holidays. The current scheduled terminal-to-terminal run time is 63 minutes (average commercial speed = 30.5 mph). Trains layover about 12 minutes at each terminal.

The estimated maximum peak hour line load for the Opening Year IOS scenario is 387 passengers (refer to Table 6). With 30-minute peak period service, two trains per hour in each direction, this demand can be met with one (1) bi-level coach and one (1) bi-level cab car on each train (2 trains per hour * (132 + 147) seats per train = 558 seats per hour). The peak period operating schedules require five (5) trainsets (not including one

stand-by train). Operating requirements for Phase 1 are summarized in Table 13. Current Phase 1 schedules are shown in Tables 14 and 15.

One stand-by train is provided during peak periods, subject to availability. The stand-by train is used to replace scheduled trains that must be removed from service for corrective maintenance or scheduled trains that have been delayed beyond 30 minutes.

Phase 2 South (LPA) Service Plan (Opening Year)

The Phase 2 South scenario will extend from the DeBary Station to Poinciana Station, a distance of approximately 49 miles, via the CFRC corridor. Sixteen (16) stations will include the existing twelve (12) Phase 1 stations and four new stations at Meadow Woods, Osceola Parkway, Kissimmee Intermodal, and Poinciana.

Trains will run every 30 minutes in the peak period and every 120 to 150 minutes during the midday and evening hours (32-36 daily trips, depending on actual ridership demand). No service will be operated on Saturdays, Sundays, or designated holidays. The estimated terminal-to-terminal run time is 88 minutes. The average commercial speed for Phase 1 and Phase 2 combined is 33.4 mph. Trains will layover about 17 minutes at each terminal.

The projected maximum peak hour line load for the LPA scenario is 657 passengers (refer to Table 6). With a 1.25 Load Factor, a minimum of 526 seats must be provided in each direction during the peak hour. With 30-minute peak period service, two trains per hour in each direction, this demand could be met with one (1) bi-level coach and one (1) bi-level cab car on each train (2 trains per hour * (132 + 147) seats per train = 558 seats per hour). The operating schedules will require a total of seven (7) trainsets to operate the 30-minute, peak period service (not including one stand-by train). Operating requirements for the LPA Alternative are summarized in Table 13. Preliminary LPA schedules are shown in Tables 16 and 17.

It is anticipated that one stand-by train will be provided during peak periods, subject to availability. The stand-by train will be used to replace scheduled trains that must be removed from service for corrective maintenance or scheduled trains that have been delayed beyond 30 minutes.

Phase 2 North (Full-Build) Service Plan (Opening Year)

The Phase 2 North system will extend from the DeLand Amtrak Station to Poinciana Station, a distance of approximately 61 miles. Seventeen (17) stations will be located at: DeLand Amtrak, DeBary, Sanford, Lake Mary, Longwood, Altamonte Springs, Maitland, Winter Park Amtrak, Florida Hospital Health Village, LYNX Central Station, Church Street, Orlando Amtrak, Sand Lake, Meadow Woods, Osceola Parkway, Kissimmee Amtrak, and Poinciana.

Trains will run every 30 minutes in the peak period and every 120 to 150 minutes during the midday and evening hours (32-36 daily trips, depending on actual ridership demand). No service will be operated on Saturdays, Sundays, or designated holidays. The estimated terminal-to-terminal run time is 102 minutes. The average commercial speed is 35.9 mph. Trains will layover about 18 minutes at each terminal.

The projected maximum peak hour line load for the Full Build scenario is 703 passengers (refer to Table 6). With a 1.25 Load Factor, a minimum of 563 seats must be provided in each direction during the peak hour. With 30-minute peak period service, this demand could be met with one (1) bi-level coach and one (1) bi-level cab car on each train (2 trains per hour * (132 + 147) seats per train = 558 seats per hour). Because the projected supply and demand for this scenario are so closely matched, SunRail will closely monitor ridership for potential overcrowding. If regular overcrowding results due to higher than projected ridership and/or occasional use of two cab cars, SunRail will develop operating strategies to alleviate the overcrowding. These strategies may include: (a) adding a third passenger car (cab or coach) on selected train trips and/or (b) increasing the peak hour service frequency by inserting the ready train into train schedules.

The operating schedules will require a total of eight (8) trains to operate the 30-minute, peak period service (not including one stand-by train). Operating requirements for the Opening Year Full Build Alternative are summarized in Table 13. Preliminary Full Build schedules for Opening Year service are shown in Table 18 and 19.

It is anticipated that one stand-by train will be provided during peak periods, subject to availability. The stand-by train will be used to replace scheduled trains that must be removed from service for corrective maintenance or scheduled trains that have been delayed beyond 30 minutes.

Phase 2 North Full Build Service Plan (2030)

The Full Build system will extend from the DeLand Amtrak Station to Poinciana Station, a distance of 61 miles. Trains will run every 15 minutes in the peak period and every 60 minutes during the midday and evening hours (56 daily trips). No service will be operated on Saturdays, Sundays or designated holidays. The estimated terminal-to-terminal run time is 102 minutes. The average commercial speed is 35.9 mph. Most trains will layover about 18 minutes at each terminal.

The projected maximum peak hour line load for the Full Build scenario is 1,100 passengers (refer to Table 6). With a 1.25 Load Factor, a minimum of 880 seats must be provided in each direction during the peak hour. With 15-minute peak period service, four trains per hour in each direction, this demand can be met with one (1) coach and one (1) cab car on each train (4 trains per hour * (132 + 147) seats per train = 1,116 seats per hour). The operating schedules will require a total of fourteen (14) trains to operate the 15-minute, peak period service (not including one stand-by train). Operating requirements for the 2030 "Full" Build Alternative are summarized in Table 13. Preliminary Full Build schedules for 2030 service are shown in Table 20 and 21.

For vehicle planning purposes, it is assumed that the 2030 Full Build service plan will be implemented in 2025.

It is anticipated that one stand-by train will be provided during peak periods, subject to availability. The stand-by train will be used to replace scheduled trains that must be removed from service for corrective maintenance or scheduled trains that have been delayed beyond 15 minutes.

PARAMETER	PHASE 1 IOS 2014 ¹	PHASE 2 SOUTH OPENING YEAR	PHASE 2 NORTH OPENING YEAR	PHASE 2 NORTH 2030 ²
One-Way Run Time (min:sec)	63	88	102	102
Layover Time	12	17	18	18
Round-Trip Cycle Time (Peak)	150	210	240	240
Frequency (peak/off- peak)	30/120-150	30/120-150	30/120-150	15/60/60
Peak Locomotives	5	7	8	14
Standby Locomotives	1	1	1	1
Fleet Locomotives	7	9	10	17
Peak Coach & Cab Cars	10	14	16	28
Standby Coach & Cab Cars	2	2	2	2
Fleet Coach & Cab Cars	14	18	20	34
Annual Revenue Train- Hours	11,500	16,100	18,400	29,100
Annual Revenue Car- Miles	579,000	893,000	1,110,000	1,761,000
Route Miles	31.6	48.6	60.8	60.8
Stations	12	16	17	17
Daily Revenue Train Trips	(32-36) ³	(32-36) ³	(32-36) ³	56

Table 13 –	Operating	Requirements	for Commuter	Rail Scenarios
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1. Phase 1 operating requirements are estimated for the first full year of operations.

2. Phase 2 North service plan is assumed to be implemented in 2025 for vehicle planning purposes.

3. A range of 32-36 daily trips is assumed and may vary due to actual ridership demand

5.12 Planned Revenue Operations Schedule

Current and planned daily revenue operations schedules for the SunRail service are shown on the following pages. The current Phase 1 IOS weekday schedule is presented in Tables 14 and 15. Planned daily revenue operations schedules for the Phase 2 South (LPA) Opening Year are presented in Tables 16 and 17. Planned daily revenue operations schedules for the Phase 2 North (Full Build) Opening Year are presented in Tables 18 and 19.

EPA	EPARTURE TIMES SUNRAIL TRAINS RUN MONDAY - FRIDAY ON MORNING SERVICE											
DeBary	Sanford	Laka Mary	Longwood	Altamonte Springe	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Streat	Orlando Health/ Amtrak	Sand Lak Road	
	5:06 AM	5:13 AM	519 AM	5:23 AM	5:29 AM	5:36 AM	5:43 AM	5:48 AM	5:51 AM	5:54 AM	6:03 AM	
5:30 AM	5:36 AM	MA EAR	5.49 AM	5.53 AM	5.57 AM	6:06 AM	6:13 AM	6:18 AM	6:21 AM	6:26 AM	6-33 AM	
6:00 AM	6:06 AM	6:13 AM	6:19 AM	6:23 AM	6:29 AM	6:36 AM	6:43 AM	6:48 AM	6:51 AM	6.54 AM	7:03 AM	
6:30 AM	6:36 AM	6.43 AM	MA PLB	653 AM	6.59 AM	7.06 AM	7:13 AM	7.18 AM	7.21 AM	7.24 AM	7.33 AM	
7:00 AM	7:06 AM	7:13 AM	7:19 AM	7:23 AM	7:29 AM	7:36 AM	7:43 AM	7:48 AM	7:51 AM	7.54 AM	8:03 AM	
7.30 AM	7:36 AM	7:43 AM	7:19 AM	7:53 AM	7:59.AM	ED6 AM	8:13 AM	8.18 AM	EZI AM	8-24 AM	11:33 AM	
MA 00.8	8-06 AM	B13 AM	8:19 AM	8-23 AM	8:29 AM	8-36 AM	8:43 AM	MA BLB	8:51 AM	8-54 AM	9:03 AM	
10:00 AM	10-05 AM	10-13 AM	10-19 AM	10-23 AM	10:29 AM	10:36 AM	MA ELOI	IO. 48 AM	10-51 AM	10-54 AM	11:03 AM	

Table 14 – 2014-2015 Phase 1 Current Weekday Schedule – Southbound

	ALC: 10		 	-
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the second second			-	-

DeBory	Sanford	Laka Mary	Longwood	Altansante Springe	Maitland	Winter Park	FL Harpital Health Village	CYNX Central Station	Church Street	Orlando Health/ Anstrak	Sand Lake Road
12:30 PM	12:36 PM	12:43 PM	12:49 PM	12-53 PM	12:59 PM	1:06 PM	1:13 PM	1:18 PM	1:21 PM	1:24 PM	1:33 PM
3-00 PM	2-06 PM	3.13 PM	3-19 PM	3:23 PM	3-29 PM	3:36 PM	3:43 PM	3.48 PM	3.51 PM	1-54 PM	#03 PM

Dellary Surfard Loks Longwood Alexanite Springs Mairland Winter Park FL Haspited Headth LYNX Cantral Station Church Streat Orlanda Hasbl/ Anstral San Surfare 3:30 PM 3:43 PM 3:49 PM 3:53 PM 3:59 PM 4:06 PM 4:18 PM 4:21 PM 4:24 PM 4: 4:00 PM 4:18 PM 4:21 PM 4:24 PM 4: 4:30 PM 4:38 PM 4:38 PM 4:35 PM 4:36 PM 4:38 PM 4:35 PM 4:36 PM 4:38 PM 4:51 PM 4:24 PM 4: 5:30 PM 4:36 PM 4:38 PM 4:51 PM 4:54 PM 5: 5:00 PM 5:06 PM 5:18 PM 5:18 PM 5:21 PM 5:24 PM 5: 5:30 PM 5:36 PM 5:36 PM 5:38 PM 5:36 PM 5:32 PM 5:36 PM 5:31 PM 5:21 PM 5:24 PM 5: 5:30 PM 5:36 PM 5:36 PM 5:31 PM 5:21 PM 6:24 PM 6: 5:30 PM 6:36 PM 6:13 PM 6:13 PM 6:21 PM 6:24 PM 6: 5:30 PM 6:36 PM 6:13 PM 6:35 PM 6:36 PM 6:35 PM 6:36 PM 6:35 PM											
Dellary	Sanford	Lake Mary	Longwood	Abamantu Springa	Mairland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlanda Haabh/ Ambrak	Sand Lake Road
3-30 PM	3:36 PM	3:43 PM	3:49 PM	3:53 PM	3:59 PM	4:06 FM	£13 PM	4:18 PM	#21 PM	4:24 FM	#33 PM
4.00 FM	406 PM	#13 PM	.£19 PM	4:23 FM	#29 PM	4:36 FM	#43 PM	ALAS PM	AST PM	4.54 PM	5:00 PM
#:30 PM	£36 PM	4:43 PM	4:49 PM	4:53 PM	4.59 PM	5:06 PM	5:13 PM	5:18 PM	5:21 PM	5:24 PM	5-33 PM
5-00 PM	5:06 PM	513 PM	5-19 PM	5:23 PM	5:29 PM	5-36 PM	5.43 PM	5.48 PM	5.51 PM	5.54 PM	6-03 FM
5:30 PM	5:36 PM	.5:43 PM	5:49 PM	5:53 PM	5:59 PM	6:06 PM	&13 PM	6:18 PM	6-21 PM	6:24 PM	6:33 PM
6:00 PM	6-06 PM	613 PM	619 PM	6-23 PM	6-29 PM	6:36 PM	6.43 PM	6:48 PM	6.51 PM	6:54 PM	7:03 PM
8:00 PM	B-06 PM	8:13 PM	8-19 PM	8:23 PM	8:29 PM	8:36 PM	8:43 PM	8:48 PM	8.51 PM	8:54 PM	9:03 PM
9-05 PM	9-11 PM	9:15 PM	9.24 PM	9:28 PM	9-34 PM	9-41 PM	F-4E PM	9.53 FM	9-56 PM	9.59 PM	10-08 PM

CLOSED ON THE FOLLOWING HOLIDAYS New Year's Day, Martin Luther King, Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day



Table 15 – 2014-2015 Phase 1 Current Weekday Schedule – Northbound

DEPARTURE TIMES | SUNRAIL TRAINS RUN MONDAY - FRIDAY ONLY

MORNING SERVICE

Sand Lake Road	Orlando Health/ Amtrak	Church Street	LYNX Central Station	FL Hospital Health Village	Winter Park	Maitland	Altomonte Springe	Longwood	Lake Mary	Sanford	DeBary
6:15 AM	6:22 AM	6:25 AM	6:28 AM	6:34 AM	6:41 AM	6:48 AM	6:53 AM	6:57 AM	7:03 AM	7:10 AM	7:18 AM
6:45 AM	6:52 AM	6:55 AM	6:58 AM	7:04 AM	7:11 AM	7:18 AM	7:23 AM	7:27 AM	7:33 AM	7:40 AM	7:48 AM
7:15 AM	7:22 AM	7:25 AM	7:28 AM	7:34 AM	7:41 AM	7:48 AM	7:53 AM	7:57 AM	8:03 AM	8:10 AM	8:18 AM
7:45 AM	7:52 AM	7:55 AM	7:58 AM	MA 1:0:8	8:11 AM	8:18 AM	8:23 AM	8:27 AM	8:33 AM	8:40 AM	8-48 AM
8:15 AM	8:22 AM	8:25 AM	8:28 AM	8:34 AM	8:41 AM	8:48 AM	8:53 AM	8:57 AM	9:03 AM	9:10 AM	9:18 AM
8:45 AM	8:52 AM	8:55 AM	8:58 AM	9:04 AM	9:11 AM	9:18 AM	9:23 AM	9:27 AM	9:33 AM	9:40 AM	9:48 AM
9:15 AM	9:22 AM	9:25 AM	9:28 AM	9:34 AM	9:41 AM	9:48 AM	9:53 AM	9:57 AM	10:03 AM	10:10 AM	10:18 AM

MID-DAY SERVICE

Sand Lake Road	Orlando Health/ Amtrak	Church Street	LYNX Central Station	FL Hospital Health Village	Winter Park	Maitland	Altomonte Springe	Longwood	Laka Mary	Sanford	DeBary
11:15 AM	11:22 AM	11:25 AM	11:28 AM	11:34 AM	11:41 AM	11:48 AM	11:53 AM	11:57 AM	12:03 PM	12:10 PM	12:18 PM
1:45 PM	1:52 PM	1:55 PM	1:58 PM	2:04 PM	2:11 PM	2:18 PM	2:23 PM	2:27 PM	2:33 PM	2:40 PM	2:48 PM

EVENING SERVICE Chur LYN nanda DeBary Sanford Maitlan Lake Mary . nure Park Poord &15 PM 4:22 PM 4:25 PM 4:28 PM 4-34 PM 4:41 PM 4:48 PM 4:53 PM 4:57 PM 5:03 PM 5:10 PM 5:18 PM 4-45 PM 4:52 PM 5:11 PM 5:18 PM 5:23 PM 5-27 PM 5:33 PM 5:40 PM 5:48 PM 4:55 PM 4:58 PM 5:04 PM 5:15 PM 5:22 PM 5:25 PM 5:28 PM 5:34 PM 5:41 PM 5:48 PM 5:53 PM 5:57 PM 6:03 PM 6:10 PM 6:18 PM 5:58 PM 5:45 PM 5:52 PM 5:55 PM 6:04 PM 6:11 PM 6:18 PM 6:23 PM 6:27 PM 6:33 PM 6:40 PM 6:48 PM 6:15 PM 6:22 PM 6:25 PM 6:28 PM 6:34 PM 6:41 PM 6:48 PM 6:53 PM 6:57 PM 7:03 PM 7:10 PM 7:18 PM 6:52 PM 7:48 PM 6:45 PM 6:55 PM 6:58 PM 7:04 PM 7:11 PM 7:18 PM 7:23 PM 7:27 PM 7:33 PM 7:40 PM 7:30 PM 7:37 PM 7:43 PM 7:49 PM 7:56 PM 8:03 PM 8:08 PM 8:12 PM 8:18 PM 8:33 PM 7:40 PM 8:25 PM 9:15 PM 9:22 PM 9:25 PM 9:28 PM 9:34 PM 9:41 PM 9:48 PM 9:53 PM 9:57 PM 10:03 PM 10:10 PM 10:18 PM 10:20 PM 10:27 PM 10:30 PM 10:33 PM 10:39 PM 10:46 PM 10:53 PM 10:58 PM 11:02 PM 11:08 PM 11:15 PM 11:23 PM

CLOSED ON THE FOLLOWING HOLIDAYS New Year's Day, Martin Luther King, Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day



Train No.	DeBary	Sanford	Lake Mary	Longwood	Altamonte Springs	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlando Health / Amtrak	Sand Lake Road	Meadow Woods	Osceola Parkway	Kissimmee Intermodal	Poinciana	Layover
1 - Yard S		5:06 AM	5:13 AM	5:19 AM	5:23 AM	5:29 AM	5:36 AM	5:43 AM	5:48 AM	5:51 AM	5:54 AM	6:03 AM	6:09 AM	6:14 AM	6:20 AM	6:28 AM	0:17
2 - Yard S	5:30 AM	5:36 AM	5:43 AM	5:49 AM	5:53 AM	5:59 AM	6:06 AM	6:13 AM	6:18 AM	6:21 AM	6:24 AM	6:33 AM	6:39 AM	6:44 AM	6:50 AM	6:58 AM	0:17
3 - Yard S	6:00 AM	6:06 AM	6:13 AM	6:19 AM	6:23 AM	6:29 AM	6:36 AM	6:43 AM	6:48 AM	6:51 AM	6:54 AM	7:03 AM	7:09 AM	7:14 AM	7:20 AM	7:28 AM	0:17
4 - Yard S	6:30 AM	6:36 AM	6:43 AM	6:49 AM	6:53 AM	6:59 AM	7:06 AM	7:13 AM	7:18 AM	7:21 AM	7:24 AM	7:33 AM	7:39 AM	7:44 AM	7:50 AM	7:58 AM	0:17
5 - Yard S	7:00 AM	7:06 AM	7:13 AM	7:19 AM	7:23 AM	7:29 AM	7:36 AM	7:43 AM	7:48 AM	7:51 AM	7:54 AM	8:03 AM	8:09 AM	8:14 AM	8:20 AM	8:28 AM	0:17
6	7:30 AM	7:36 AM	7:43 AM	7:49 AM	7:53 AM	7:59 AM	8:06 AM	8:13 AM	8:18 AM	8:21 AM	8:24 AM	8:33 AM	8:39 AM	8:44 AM	8:50 AM	8:58 AM	Yard P
7	8:00 AM	8:06 AM	8:13 AM	8:19 AM	8:23 AM	8:29 AM	8:36 AM	8:43 AM	8:48 AM	8:51 AM	8:54 AM	9:03 AM	9:09 AM	9:14 AM	9:20 AM	9:28 AM	0:32
								MID-DAY	SERVICE								
Train No.	DeBary	Sanford	Lake Mary	Longwood	Altamonte Springs	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlando Health / Amtrak	Sand Lake Road	Meadow Woods	Osceola Parkway	Kissimmee Intermodal	Poinciana	Layover
4	10:00 AM	10:06 AM	10:13 AM	10:19 AM	10:23 AM	10:29 AM	10:36 AM	10:43 AM	10:48 AM	10:51 AM	10:54 AM	11:03 AM	11:09 AM	11:14 AM	11:20 AM	11:28 AM	0:32
7	12:00 PM	12:06 PM	12:13 PM	12:19 PM	12:23 PM	12:29 PM	12:36 PM	12:43 PM	12:48 PM	12:51 PM	12:54 PM	1:03 PM	1:09 PM	1:14 PM	1:20 PM	1:28 PM	0:32
4	2:00 PM	2:06 PM	2:13 PM	2:19 PM	2:23 PM	2:29 PM	2:36 PM	2:43 PM	2:48 PM	2:51 PM	2:54 PM	3:03 PM	3:09 PM	3:14 PM	3:20 PM	3:28 PM	0:32
								EVENING	SERVICE								
Train No.	DeBary	Sanford	Lake Mary	Longwood	Altamonte Springs	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlando Health / Amtrak	Sand Lake Road	Meadow Woods	Osceola Parkway	Kissimmee Intermodal	Poinciana	Layover
1 - Yard S	3:15 PM	3:21 PM	3:28 PM	3:34 PM	3:38 PM	3:44 PM	3:51 PM	3:58 PM	4:03 PM	4:06 PM	4:09 PM	4:18 PM	4:24 PM	4:29 PM	4:35 PM	4:43 PM	0:17
7	3:45 PM	3:51 PM	3:58 PM	4:04 PM	4:08 PM	4:14 PM	4:21 PM	4:28 PM	4:33 PM	4:36 PM	4:39 PM	4:48 PM	4:54 PM	4:59 PM	5:05 PM	5:13 PM	0:17
2 - Yard S	4:15 PM	4:21 PM	4:28 PM	4:34 PM	4:38 PM	4:44 PM	4:51 PM	4:58 PM	5:03 PM	5:06 PM	5:09 PM	5:18 PM	5:24 PM	5:29 PM	5:35 PM	5:43 PM	0:17
3 - Yard S	4:45 PM	4:51 PM	4:58 PM	5:04 PM	5:08 PM	5:14 PM	5:21 PM	5:28 PM	5:33 PM	5:36 PM	5:39 PM	5:48 PM	5:54 PM	5:59 PM	6:05 PM	6:13 PM	0:17
5 - Yard S	5:15 PM	5:21 PM	5:28 PM	5:34 PM	5:38 PM	5:44 PM	5:51 PM	5:58 PM	6:03 PM	6:06 PM	6:09 PM	6:18 PM	6:24 PM	6:29 PM	6:35 PM	6:43 PM	Yard P
4	5:45 PM	5:51 PM	5:58 PM	6:04 PM	6:08 PM	6:14 PM	6:21 PM	6:28 PM	6:33 PM	6:36 PM	6:39 PM	6:48 PM	6:54 PM	6:59 PM	7:05 PM	7:13 PM	0:47
7	7:15 PM	7:21 PM	7:28 PM	7:34 PM	7:38 PM	7:44 PM	7:51 PM	7:58 PM	8:03 PM	8:06 PM	8:09 PM	8:18 PM	8:24 PM	8:29 PM	8:35 PM	8:43 PM	1:17
4	9:45 PM	9:51 PM	9:58 PM	10:04 PM	10:08 PM	10:14 PM	10:21 PM	10:28 PM	10:33 PM	10:36 PM	10:39 PM	10:48 PM	10:54 PM	10:59 PM	11:05 PM	11:13 PM	Yard P

Table 16 – Phase 2 South Opening Year Preliminary Weekday Schedule – Southbound

Train No.	Poinciana	Kissimmee Intermodal	Osceola Parkway	Meadow	Sand Lake	Orlando Health /	Church	LYNX Central	FL Hospital Health	Winter Park	Maitland	Altamonte	Longwood	Lake Mary	Sanford	DeBary	Layover
		internouur	Tankway	110003	nouu	Amtrak	50000	Station	Village	T CITK		3bim93					
6 - Yard P	5:45 AM	5:53 AM	5:59 AM	6:04 AM	6:10 AM	6:17 AM	6:20 AM	6:23 AM	6:29 AM	6:36 AM	6:43 AM	6:48 AM	6:52 AM	6:58 AM	7:05 AM	7:13 AM	0:17
7 - Yard P	6:15 AM	6:23 AM	6:29 AM	6:34 AM	6:40 AM	6:47 AM	6:50 AM	6:53 AM	6:59 AM	7:06 AM	7:13 AM	7:18 AM	7:22 AM	7:28 AM	7:35 AM	7:43 AM	0:17
1	6:45 AM	6:53 AM	6:59 AM	7:04 AM	7:10 AM	7:17 AM	7:20 AM	7:23 AM	7:29 AM	7:36 AM	7:43 AM	7:48 AM	7:52 AM	7:58 AM	8:05 AM	8:13 AM	Yard S
2	7:15 AM	7:23 AM	7:29 AM	7:34 AM	7:40 AM	7:47 AM	7:50 AM	7:53 AM	7:59 AM	8:06 AM	8:13 AM	8:18 AM	8:22 AM	8:28 AM	8:35 AM	8:43 AM	Yard S
3	7:45 AM	7:53 AM	7:59 AM	8:04 AM	8:10 AM	8:17 AM	8:20 AM	8:23 AM	8:29 AM	8:36 AM	8:43 AM	8:48 AM	8:52 AM	8:58 AM	9:05 AM	9:13 AM	Yard S
4	8:15 AM	8:23 AM	8:29 AM	8:34 AM	8:40 AM	8:47 AM	8:50 AM	8:53 AM	8:59 AM	9:06 AM	9:13 AM	9:18 AM	9:22 AM	9:28 AM	9:35 AM	9:43 AM	0:17
5	8:45 AM	8:53 AM	8:59 AM	9:04 AM	9:10 AM	9:17 AM	9:20 AM	9:23 AM	9:29 AM	9:36 AM	9:43 AM	9:48 AM	9:52 AM	9:58 AM	10:05 AM	10:13 AM	Yard S
								MID-DAY	SERVICE								
		Viccimmoo	Occordo	Maadow	Sand Lako	Orlando	Church	LYNX	FL Hospital	Winter		Altomonto					
Train No.	Poinciana	Intermedal	Dorkway	Woods	Dood	Health /	Church	Central	Health	Dork	Maitland	Caringo	Longwood	Lake Mary	Sanford	DeBary	Layover
		Internioual	Falkway	woous	NUdu	Amtrak	Sueer	Station	Village	FdIK		springs					
7	10:00 AM	10:08 AM	10:14 AM	10:19 AM	10:25 AM	10:32 AM	10:35 AM	10:38 AM	10:44 AM	10:51 AM	10:58 AM	11:03 AM	11:07 AM	11:13 AM	11:20 AM	11:28 AM	0:17
4	12:00 PM	12:08 PM	12:14 PM	12:19 PM	12:25 PM	12:32 PM	12:35 PM	12:38 PM	12:44 PM	12:51 PM	12:58 PM	1:03 PM	1:07 PM	1:13 PM	1:20 PM	1:28 PM	0:32
7	2:00 PM	2:08 PM	2:14 PM	2:19 PM	2:25 PM	2:32 PM	2:35 PM	2:38 PM	2:44 PM	2:51 PM	2:58 PM	3:03 PM	3:07 PM	3:13 PM	3:20 PM	3:28 PM	0:17
								EVENING	SERVICE								
		Vissimmee	Ossaala	Maadau	Cond Laka	Orlando	Church	LYNX	FL Hospital	Mintor		Altomonto					
Train No.	Poinciana	Intermedal	Dorkway	Woods	Dood	Health /	Church	Central	Health	Dork	Maitland	Caringo	Longwood	Lake Mary	Sanford	DeBary	Layover
		Intermodal	Parkway	woods	KUdu	Amtrak	Street	Station	Village	PdIK		springs					
4	4:00 PM	4:08 PM	4:14 PM	4:19 PM	4:25 PM	4:32 PM	4:35 PM	4:38 PM	4:44 PM	4:51 PM	4:58 PM	5:03 PM	5:07 PM	5:13 PM	5:20 PM	5:28 PM	0:17
6 - Yard P	4:30 PM	4:38 PM	4:44 PM	4:49 PM	4:55 PM	5:02 PM	5:05 PM	5:08 PM	5:14 PM	5:21 PM	5:28 PM	5:33 PM	5:37 PM	5:43 PM	5:50 PM	5:58 PM	Yard S
1	5:00 PM	5:08 PM	5:14 PM	5:19 PM	5:25 PM	5:32 PM	5:35 PM	5:38 PM	5:44 PM	5:51 PM	5:58 PM	6:03 PM	6:07 PM	6:13 PM	6:20 PM	6:28 PM	Yard S
7	5:30 PM	5:38 PM	5:44 PM	5:49 PM	5:55 PM	6:02 PM	6:05 PM	6:08 PM	6:14 PM	6:21 PM	6:28 PM	6:33 PM	6:37 PM	6:43 PM	6:50 PM	6:58 PM	0:17
2	6:00 PM	6:08 PM	6:14 PM	6:19 PM	6:25 PM	6:32 PM	6:35 PM	6:38 PM	6:44 PM	6:51 PM	6:58 PM	7:03 PM	7:07 PM	7:13 PM	7:20 PM	7:28 PM	Yard S
3	6:30 PM	6:38 PM	6:44 PM	6:49 PM	6:55 PM	7:02 PM	7:05 PM	7:08 PM	7:14 PM	7:21 PM	7:28 PM	7:33 PM	7:37 PM	7:43 PM	7:50 PM	7:58 PM	Yard S
4	8:00 PM	8:08 PM	8:14 PM	8:19 PM	8:25 PM	8:32 PM	8:35 PM	8:38 PM	8:44 PM	8:51 PM	8:58 PM	9:03 PM	9:07 PM	9:13 PM	9:20 PM	9:28 PM	0:17
7	10:00 PM	10:08 PM	10:14 PM	10:19 PM	10:25 PM	10:32 PM	10:35 PM	10:38 PM	10:44 PM	10:51 PM	10:58 PM	11:03 PM	11:07 PM	11:13 PM	11:20 PM	11:28 PM	Yard S

 Table 17 – Phase 2 South Opening Year Preliminary Weekday Schedule – Northbound

								мо	RNING SER	/ICE								
Train No.	DeLand	DeBary	Sanford	Lake Mary	Longwood	Altamonte Springs	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlando Health / Amtrak	Sand Lake Road	Meadow Woods	Osceola Parkway	Kissimmee Intermodal	Poinciana	Layover
1 - Yard S			5:05 AM	5:12 AM	5:18 AM	5:22 AM	5:28 AM	5:35 AM	5:42 AM	5:47 AM	5:50 AM	5:53 AM	6:02 AM	6:08 AM	6:13 AM	6:19 AM	6:27 AM	0:18
2 - Yard S	5:15 AM	5:29 AM	5:35 AM	5:42 AM	5:48 AM	5:52 AM	5:58 AM	6:05 AM	6:12 AM	6:17 AM	6:20 AM	6:23 AM	6:32 AM	6:38 AM	6:43 AM	6:49 AM	6:57 AM	0:18
3 - Yard S	5:45 AM	5:59 AM	6:05 AM	6:12 AM	6:18 AM	6:22 AM	6:28 AM	6:35 AM	6:42 AM	6:47 AM	6:50 AM	6:53 AM	7:02 AM	7:08 AM	7:13 AM	7:19 AM	7:27 AM	0:18
4 - Yard S	6:15 AM	6:29 AM	6:35 AM	6:42 AM	6:48 AM	6:52 AM	6:58 AM	7:05 AM	7:12 AM	7:17 AM	7:20 AM	7:23 AM	7:32 AM	7:38 AM	7:43 AM	7:49 AM	7:57 AM	0:18
5 - Yard S	6:45 AM	6:59 AM	7:05 AM	7:12 AM	7:18 AM	7:22 AM	7:28 AM	7:35 AM	7:42 AM	7:47 AM	7:50 AM	7:53 AM	8:02 AM	8:08 AM	8:13 AM	8:19 AM	8:27 AM	0:18
6 - Yard S	7:15 AM	7:29 AM	7:35 AM	7:42 AM	7:48 AM	7:52 AM	7:58 AM	8:05 AM	8:12 AM	8:17 AM	8:20 AM	8:23 AM	8:32 AM	8:38 AM	8:43 AM	8:49 AM	8:57 AM	Yard P
7	7:45 AM	7:59 AM	8:05 AM	8:12 AM	8:18 AM	8:22 AM	8:28 AM	8:35 AM	8:42 AM	8:47 AM	8:50 AM	8:53 AM	9:02 AM	9:08 AM	9:13 AM	9:19 AM	9:27 AM	0:33
								MI	D-DAY SERV	ICE								
Train No.	DeLand	DeBary	Sanford	Lake Mary	Longwood	Altamonte Springs	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlando Health / Amtrak	Sand Lake Road	Meadow Woods	Osceola Parkway	Kissimmee Intermodal	Poinciana	Layover
3	10:00 AM	10:14 AM	10:20 AM	10:27 AM	10:33 AM	10:37 AM	10:43 AM	10:50 AM	10:57 AM	11:02 AM	11:05 AM	11:08 AM	11:17 AM	11:23 AM	11:28 AM	11:34 AM	11:42 AM	0:18
7	12:00 PM	12:14 PM	12:20 PM	12:27 PM	12:33 PM	12:37 PM	12:43 PM	12:50 PM	12:57 PM	1:02 PM	1:05 PM	1:08 PM	1:17 PM	1:23 PM	1:28 PM	1:34 PM	1:42 PM	0:18
3	2:00 PM	2:14 PM	2:20 PM	2:27 PM	2:33 PM	2:37 PM	2:43 PM	2:50 PM	2:57 PM	3:02 PM	3:05 PM	3:08 PM	3:17 PM	3:23 PM	3:28 PM	3:34 PM	3:42 PM	0:33
								EV	ENING SERV	ICE								
Train No.	DeLand	DeBary	Sanford	Lake Mary	Longwood	Altamonte Springs	Maitland	Winter Park	FL Hospital Health Village	LYNX Central Station	Church Street	Orlando Health / Amtrak	Sand Lake Road	Meadow Woods	Osceola Parkway	Kissimmee Intermodal	Poinciana	Layover
1 - Yard S	3:15 PM	3:29 PM	3:35 PM	3:42 PM	3:48 PM	3:52 PM	3:58 PM	4:05 PM	4:12 PM	4:17 PM	4:20 PM	4:23 PM	4:32 PM	4:38 PM	4:43 PM	4:49 PM	4:57 PM	0:18
2 - Yard S	3:45 PM	3:59 PM	4:05 PM	4:12 PM	4:18 PM	4:22 PM	4:28 PM	4:35 PM	4:42 PM	4:47 PM	4:50 PM	4:53 PM	5:02 PM	5:08 PM	5:13 PM	5:19 PM	5:27 PM	0:18
7	4:15 PM	4:29 PM	4:35 PM	4:42 PM	4:48 PM	4:52 PM	4:58 PM	5:05 PM	5:12 PM	5:17 PM	5:20 PM	5:23 PM	5:32 PM	5:38 PM	5:43 PM	5:49 PM	5:57 PM	0:18
4 - Yard S	4:45 PM	4:59 PM	5:05 PM	5:12 PM	5:18 PM	5:22 PM	5:28 PM	5:35 PM	5:42 PM	5:47 PM	5:50 PM	5:53 PM	6:02 PM	6:08 PM	6:13 PM	6:19 PM	6:27 PM	0:18
5 - Yard S	5:15 PM	5:29 PM	5:35 PM	5:42 PM	5:48 PM	5:52 PM	5:58 PM	6:05 PM	6:12 PM	6:17 PM	6:20 PM	6:23 PM	6:32 PM	6:38 PM	6:43 PM	6:49 PM	6:57 PM	Yard P
8 - Yard S	5:45 PM	5:59 PM	6:05 PM	6:12 PM	6:18 PM	6:22 PM	6:28 PM	6:35 PM	6:42 PM	6:47 PM	6:50 PM	6:53 PM	7:02 PM	7:08 PM	7:13 PM	7:19 PM	7:27 PM	0:33
1	7:15 PM	7:29 PM	7:35 PM	7:42 PM	7:48 PM	7:52 PM	7:58 PM	8:05 PM	8:12 PM	8:17 PM	8:20 PM	8:23 PM	8:32 PM	8:38 PM	8:43 PM	8:49 PM	8:57 PM	1:03
8	10:00 PM	10:14 PM	10:20 PM	10:27 PM	10:33 PM	10:37 PM	10:43 PM	10:50 PM	10:57 PM	11:02 PM	11:05 PM	11:08 PM	11:17 PM	11:23 PM	11:28 PM	11:34 PM	11:42 PM	Yard P

Table 18 – Phase 2 North Opening Year Preliminary Weekday Schedule – Southbound

								MO	RNING SERV	/ICE								
Train No.	Poinciana	Kissimmee Intermodal	Osceola Parkway	Meadow Woods	Sand Lake Road	Orlando Health / Amtrak	Church Street	LYNX Central Station	FL Hospital Health Village	Winter Park	Maitland	Altamonte Springs	Longwood	Lake Mary	Sanford	DeBary	DeLand	Layover
7 - Yard P	5:45 AM	5:53 AM	5:59 AM	6:04 AM	6:10 AM	6:17 AM	6:20 AM	6:23 AM	6:29 AM	6:36 AM	6:43 AM	6:48 AM	6:52 AM	6:58 AM	7:05 AM	7:13 AM	7:27 AM	0:18
8 - Yard P	6:15 AM	6:23 AM	6:29 AM	6:34 AM	6:40 AM	6:47 AM	6:50 AM	6:53 AM	6:59 AM	7:06 AM	7:13 AM	7:18 AM	7:22 AM	7:28 AM	7:35 AM	7:43 AM	7:57 AM	Yard S
1	6:45 AM	6:53 AM	6:59 AM	7:04 AM	7:10 AM	7:17 AM	7:20 AM	7:23 AM	7:29 AM	7:36 AM	7:43 AM	7:48 AM	7:52 AM	7:58 AM	8:05 AM	8:13 AM	8:27 AM	Yard S
2	7:15 AM	7:23 AM	7:29 AM	7:34 AM	7:40 AM	7:47 AM	7:50 AM	7:53 AM	7:59 AM	8:06 AM	8:13 AM	8:18 AM	8:22 AM	8:28 AM	8:35 AM	8:43 AM	8:57 AM	Yard S
3	7:45 AM	7:53 AM	7:59 AM	8:04 AM	8:10 AM	8:17 AM	8:20 AM	8:23 AM	8:29 A M	8:36 AM	8:43 AM	8:48 AM	8:52 AM	8:58 AM	9:05 AM	9:13 AM	9:27 AM	0:33
4	8:15 AM	8:23 AM	8:29 AM	8:34 AM	8:40 AM	8:47 AM	8:50 AM	8:53 AM	8:59 AM	9:06 AM	9:13 AM	9:18 AM	9:22 AM	9:28 AM	9:35 AM	9:43 AM	9:57 AM	Yard S
5	8:45 AM	8:53 AM	8:59 AM	9:04 AM	9:10 AM	9:17 AM	9:20 AM	9:23 AM	9:29 AM	9:36 AM	9:43 AM	9:48 AM	9:52 AM	9:58 AM	10:05 AM	10:13 AM	10:27 AM	Yard S
								MI	D-DAY SERV	ICE								
Train No.	Poinciana	Kissimmee Intermodal	Osceola Parkway	Meadow Woods	Sand Lake Road	Orlando Health / Amtrak	Church Street	LYNX Central Station	FL Hospital Health Village	Winter Park	Maitland	Altamonte Springs	Longwood	Lake Mary	Sanford	DeBary	DeLand	Layover
7	10:00 AM	10:08 AM	10:14 AM	10:19 AM	10:25 AM	10:32 AM	10:35 AM	10:38 AM	10:44 AM	10:51 AM	10:58 AM	11:03 AM	11:07 AM	11:13 AM	11:20 AM	11:28 AM	11:42 AM	0:18
3	12:00 PM	12:08 PM	12:14 PM	12:19 PM	12:25 PM	12:32 PM	12:35 PM	12:38 PM	12:44 PM	12:51 PM	12:58 PM	1:03 PM	1:07 PM	1:13 PM	1:20 PM	1:28 PM	1:42 PM	0:18
7	2:00 PM	2:08 PM	2:14 PM	2:19 PM	2:25 PM	2:32 PM	2:35 PM	2:38 PM	2:44 PM	2:51 PM	2:58 PM	3:03 PM	3:07 PM	3:13 PM	3:20 PM	3:28 PM	3:42 PM	0:33
								EV	NING SERV	ICE								
Train No.	Poinciana	Kissimmee Intermodal	Osceola Parkway	Meadow Woods	Sand Lake Road	Orlando Health / Amtrak	Church Street	LYNX Central Station	FL Hospital Health Village	Winter Park	Maitland	Altamonte Springs	Longwood	Lake Mary	Sanford	DeBary	DeLand	Layover
3	4:15 PM	4:23 PM	4:29 PM	4:34 PM	4:40 PM	4:47 PM	4:50 PM	4:53 PM	4:59 PM	5:06 PM	5:13 PM	5:18 PM	5:22 PM	5:28 PM	5:35 PM	5:43 PM	5:57 PM	Yard S
6 - Yard P	4:45 PM	4:53 PM	4:59 PM	5:04 PM	5:10 PM	5:17 PM	5:20 PM	5:23 PM	5:29 PM	5:36 PM	5:43 PM	5:48 PM	5:52 PM	5:58 PM	6:05 PM	6:13 PM	6:27 PM	Yard S
1	5:15 PM	5:23 PM	5:29 PM	5:34 PM	5:40 PM	5:47 PM	5:50 PM	5:53 PM	5:59 PM	6:06 PM	6:13 PM	6:18 PM	6:22 PM	6:28 PM	6:35 PM	6:43 PM	6:57 PM	0:18
2	5:45 PM	5:53 PM	5:59 PM	6:04 PM	6:10 PM	6:17 PM	6:20 PM	6:23 PM	6:29 PM	6:36 PM	6:43 PM	6:48 PM	6:52 PM	6:58 PM	7:05 PM	7:13 PM	7:27 PM	Yard S
7	6:15 PM	6:23 PM	6:29 PM	6:34 PM	6:40 PM	6:47 PM	6:50 PM	6:53 PM	6:59 PM	7:06 PM	7:13 PM	7:18 PM	7:22 PM	7:28 PM	7:35 PM	7:43 PM	7:57 PM	Yard S
4	6:45 PM	6:53 PM	6:59 PM	7:04 PM	7:10 PM	7:17 PM	7:20 PM	7:23 PM	7:29 PM	7:36 PM	7:43 PM	7:48 PM	7:52 PM	7:58 PM	8:05 PM	8:13 PM	8:27 PM	Yard S
8	8:00 PM	8:08 PM	8:14 PM	8:19 PM	8:25 PM	8:32 PM	8:35 PM	8:38 PM	8:44 PM	8:51 PM	8:58 PM	9:03 PM	9:07 PM	9:13 PM	9:20 PM	9:28 PM	9:42 PM	0:18
1	10:00 PM	10:08 PM	10:14 PM	10:19 PM	10:25 PM	10:32 PM	10:35 PM	10:38 PM	10:44 PM	10:51 PM	10:58 PM	11:03 PM	11:07 PM	11:13 PM	11:20 PM	11:28 PM	11:42 PM	Yard S

Table 19 – Phase 2 North Opening Year Preliminary Weekday Schedule – Northbound

Train No.		DeLand	DeBerry	Conford	Laka Manu	Languaged	Altamonte	Maisland	Minter Derk	Florida	Olende I CC	Church	Orl Health/	Sand Lake	Meadow	Osceola	Kissimmee	Poinciana	1
	To From	Amtrak	Debary	Sanioro	Lake wary	Longwood	Springs	wartand	winter Park	Hospital	Olando LCS	Street	Amtrak	Road	Woods	Pkwy.	Amtrak	Blvd.	Layover
1	From Yard	5:30	5:44	5:50	5:58	6:04	6:09	6:14	6:20	6:27	6:33	6:35	6:38	6:47	6:53	6:58	7:04	7:12	0:18
2	From Yard	6:05	6:19	6:25	6:33	6:39	6:44	6:49	6:55	7:02	7:08	7:10	7:13	7:22	7:28	7:33	7:39	7:47	0:13
3	From Yard	6:30	6:44	6:50	6:58	7:04	7:09	7:14	7:20	7:27	7:33	7:35	7:38	7:47	7:53	7:58	8:04	8:12	To Yard
4	From Yard	6:45	6:59	7:05	7:13	7:19	7:24	7:29	7:35	7:42	7:48	7:50	7:53	8:02	8:08	8:13	8:19	8:27	To Yard
5	From Yard	7:00	7:14	7:20	7:28	7:34	7:39	7:44	7:50	7:57	8:03	8:05	8:08	8:17	8:23	8:28	8:34	8:42	0:18
6	From Yard	7:15	7:29	7:35	7:43	7:49	7:54	7:59	8:05	8:12	8:18	8:20	8:23	8:32	8:38	8:43	8:49	8:57	To Yard
8	-	7:30	7:44	7:50	7:58	8:04	8:09	8:14	8:20	8:27	8:33	8:35	8:38	8:47	8:53	8:58	9:04	9:12	To Yard
7	From Yard	7:45	7:59	8:05	8:13	8:19	8:24	8:29	8:35	8:42	8:48	8:50	8:53	9:02	9:08	9:13	9:19	9:27	To Yard
9	-	8:00	8:14	8:20	8:28	8:34	8:39	8:44	8:50	8:57	9:03	9:05	9:08	9:17	9:23	9:28	9:34	9:42	0:18
12	-	9:00	9:14	9:20	9:28	9:34	9:39	9:44	9:50	9:57	10:03	10:05	10:08	10:17	10:23	10:28	10:34	10:42	0:18
2	-	10:00	10:14	10:20	10:28	10:34	10:39	10:44	10:50	10:57	11:03	11:05	11:08	11:17	11:23	11:28	11:54	11:42	0:18
5	-	11:00	11:14	11:20	11:28	11:34	11:39	11:44	11:50	11:57	12:03	12:05	12:08	12:17	12:23	12:28	12:34	12:42	0:18
9	-	12:00	12:14	12:20	12:28	12:34	12:39	12:44	12:50	12:57	13:03	13:05	13:08	13:17	13:23	13:28	13:34	13:42	0:18
12	-	13:00	13:14	13:20	13:28	13:34	13:39	13:44	13:50	13:57	14:03	14:05	14:08	14:17	14:23	14:28	14:34	14:42	0:18
2	-	14.00	14.14	14.20	14.20	14.34	14.39	14.44	14.30	14.37	15.03	15.05	15.08	15.17	15.25	15.20	15.54	15.42	0.18
1	From Yard	15.00	15.14	14.50	15.28	15.24	15.09	15.14	15.50	15.57	16:02	16.05	15.58	16.17	16.22	16.78	16.24	16.12	0.18
5	- Erom Vard	15:20	15:34	15:40	15:48	15:54	15:59	16:04	16:10	16:17	16:23	16:25	16:28	16:37	16:43	16:48	16:54	17:02	0:13
10	From Vard	15:45	15:59	16:05	16:13	16:19	16:24	16:29	16:35	16:42	16:48	16:50	16:53	17:02	17:08	17:13	17:19	17:27	To Yard
9	-	16:00	16:14	16:20	16:28	16:34	16:39	16:44	16:50	16:57	17:03	17:05	17:08	17:17	17:23	17:28	17:34	17:42	0:18
13	From Yard	16:15	16:29	16:35	16:43	16:49	16:54	16:59	17:05	17:12	17:18	17:20	17:23	17:32	17:38	17:43	17:49	17:57	To Yard
8	-	16:30	16:44	16:50	16:58	17:04	17:09	17:14	17:20	17:27	17:33	17:35	17:38	17:47	17:53	17:58	18:04	18:12	To Yard
14	From Yard	16:45	16:59	17:05	17:13	17:19	17:24	17:29	17:35	17:42	17:48	17:50	17:53	18:02	18:08	18:13	18:19	18:27	To Yard
12	-	17:00	17:14	17:20	17:28	17:34	17:39	17:44	17:50	17:57	18:03	18:05	18:08	18:17	18:23	18:28	18:34	18:42	0:18
3	-	17:15	17:29	17:35	17:43	17:49	17:54	17:59	18:05	18:12	18:18	18:20	18:23	18:32	18:38	18:43	18:49	18:57	To Yard
2	-	18:00	18:14	18:20	18:28	18:34	18:39	18:44	18:50	18:57	19:03	19:05	19:08	19:17	19:23	19:28	19:34	19:42	0:18
5	-	19:00	19:14	19:20	19:28	19:34	19:39	19:44	19:50	19:57	20:03	20:05	20:08	20:17	20:23	20:28	20:34	20:42	To Yard
9	-	20:00	20:14	20:20	20:28	20:34	20:39	20:44	20:50	20:57	21:03	21:05	21:08	21:17	21:23	21:28	21:34	21:42	To Yard

Table 20 – Phase 2 North Design Year Preliminary W	Weekday Schedule – Southbound
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Source: HNTB Train Simulations, Jan. 2015.

Train No.	To From	Poinciana Blvd.	Kissimmee Amtrak	Osceola Pkwy.	Meadow Woods	Sand Lake Road	Orl Health/ Amtrak	Church Street	Olando LCS	Florida Hospital	Winter Park	Maitland	Altamonte Springs	Longwood	Lake Mary	Sanford	DeBary	DeLand Amtrak	Layover
8	From Yard	5:30	5:38	5:44	5:49	5:55	6:04	6:07	6:09	6:15	6:22	6:28	6:33	6:38	6:44	6:52	6:58	7:12	0:18
9	From Yard	6:05	6:13	6:19	6:24	6:30	6:39	6:42	6:44	6:50	6:57	7:03	7:08	7:13	7:19	7:27	7:33	7:47	0:13
10	From Yard	6:30	6:38	6:44	6:49	6:55	7:04	7:07	7:09	7:15	7:22	7:28	7:33	7:38	7:44	7:52	7:58	8:12	To Yard
11	From Yard	6:45	6:53	6:59	7:04	7:10	7:19	7:22	7:24	7:30	7:37	7:43	7:48	7:53	7:59	8:07	8:13	8:27	To Yard
12	From Yard	7:00	7:08	7:14	7:19	7:25	7:34	7:37	7:39	7:45	7:52	7:58	8:03	8:08	8:14	8:22	8:28	8:42	0:18
13	From Yard	7:15	7:23	7:29	7:34	7:40	7:49	7:52	7:54	8:00	8:07	8:13	8:18	8:23	8:29	8:37	8:43	8:57	To Yard
1	-	7:30	7:38	7:44	7:49	7:55	8:04	8:07	8:09	8:15	8:22	8:28	8:33	8:38	8:44	8:52	8:58	9:12	To Yard
14	From Yard	7:45	7:53	7:59	8:04	8:10	8:19	8:22	8:24	8:30	8:37	8:43	8:48	8:53	8:59	9:07	9:13	9:27	To Yard
2	-	8:00	8:08	8:14	8:19	8:25	8:34	8:37	8:39	8:45	8:52	8:58	9:03	9:08	9:14	9:22	9:28	9:42	0:18
5	-	9:00	9:08	9:14	9:19	9:25	9:34	9:37	9:39	9:45	9:52	9:58	10:03	10:08	10:14	10:22	10:28	10:42	0:18
9	-	10:00	10:08	10:14	10:19	10:25	10:34	10:37	10:39	10:45	10:52	10:58	11:03	11:08	11:14	11:22	11:28	11:42	0:18
12	-	11:00	11:08	11:14	11:19	11:25	11:34	11:37	11:39	11:45	11:52	11:58	12:03	12:08	12:14	12:22	12:28	12:42	0:18
2	-	12:00	12:08	12:14	12:19	12:25	12:34	12:37	12:39	12:45	12:52	12:58	13:03	13:08	13:14	13:22	13:28	13:42	0:18
5	-	13:00	13:08	13:14	13:19	13:25	13:34	13:37	13:39	13:45	13:52	13:58	14:03	14:08	14:14	14:22	14:28	14:42	0:18
9	-	14:00	14:08	14:14	14:19	14:25	14:34	14:37	14:39	14:45	14:52	14:58	15:03	15:08	15:14	15:22	15:28	15:42	0:18
8	From Yard	14:30	14:38	14:44	14:49	14:55	15:04	15:07	15:09	15:15	15:22	15:28	15:33	15:38	15:44	15:52	15:58	16:12	0:18
12	-	15:00	15:08	15:14	15:19	15:25	15:34	15:37	15:39	15:45	15:52	15:58	16:03	16:08	16:14	16:22	16:28	16:42	0:18
3	From Yard	15:20	15:28	15:34	15:39	15:45	15:54	15:57	15:59	16:05	16:12	16:18	16:23	16:28	16:34	16:42	16:48	17:02	0:13
4	From Yard	15:45	15:53	15:59	16:04	16:10	16:19	16:22	16:24	16:30	16:37	16:43	16:48	16:53	16:59	17:07	17:13	17:27	To Yard
2	-	16:00	16:08	16:14	16:19	16:25	16:34	16:37	16:39	16:45	16:52	16:58	17:03	17:08	17:14	17:22	17:28	17:42	0:18
6	From Yard	16:15	16:23	16:29	16:34	16:40	16:49	16:52	16:54	17:00	17:07	17:13	17:18	17:23	17:29	17:37	17:43	17:57	To Yard
1	-	16:30	16:38	16:44	16:49	16:55	17:04	17:07	17:09	17:15	17:22	17:28	17:33	17:38	17:44	17:52	17:58	18:12	To Yard
7	From Yard	16:45	16:53	16:59	17:04	17:10	17:19	17:22	17:24	17:30	17:37	17:43	17:48	17:53	17:59	18:07	18:13	18:27	To Yard
5	-	17:00	17:08	17:14	17:19	17:25	17:34	17:37	17:39	17:45	17:52	17:58	18:03	18:08	18:14	18:22	18:28	18:42	0:18
10	-	17:15	17:23	17:29	17:34	17:40	17:49	17:52	17:54	18:00	18:07	18:13	18:18	18:23	18:29	18:37	18:43	18:57	To Yard
9	-	18:00	18:08	18:14	18:19	18:25	18:34	18:37	18:39	18:45	18:52	18:58	19:03	19:08	19:14	19:22	19:28	19:42	0:18
12	-	19:00	19:08	19:14	19:19	19:25	19:34	19:37	19:39	19:45	19:52	19:58	20:03	20:08	20:14	20:22	20:28	20:42	To Yard
2	-	20:00	20:08	20:14	20:19	20:25	20:34	20:37	20:39	20:45	20:52	20:58	21:03	21:08	21:14	21:22	21:28	21:42	To Yard

 Table 21 – Phase 2 North Design Year Preliminary Weekday Schedule – Northbound

Source: HNTB Train Simulations, Jan. 2015.

6 TRANSPORTATION OPERATIONS

This chapter presents a description of commuter rail operations (system opening, revenue service, and closing procedures) and abnormal operations procedures necessary to provide revenue service for the Phase 2 South Project.

6.1 Normal Operations

This section describes normal vehicle operations, encompassing system opening, revenue operations, and system closing procedures.

System Opening

Prior to the start of revenue service, several activities must be accomplished: (1) operating staff must report for duty; (2) vehicles must be prepared for service; and (3) vehicles are moved from the Vehicle Storage and Maintenance Facility (VSMF) into revenue service.

<u>Staff Reporting</u> – Prior to the start of service and/or their individual shift assignments, operations staff will report to the operations sign-up area. Personnel will then be informed of pertinent notices and bulletins and be briefed on any problems or special needs. The Supervisor will inform Locomotive Engineers and Conductors of their vehicle number and its location in the yard, and will arrange transportation for train crews from the yard. Each train crew will consist of an FRA qualified Locomotive Engineer and a Conductor. The Supervisor, with access to crew schedules, vehicle availability, and maintenance data will record the arrival times of personnel.

<u>Vehicle Preparation</u> – Vehicles will be prepared and assigned to runs by the Supervisor based on data supplied by the Mechanical department. In advance of staff report time, the Supervisor will direct qualified Engineering personnel to prepare, fuel, make up, and position the required number of vehicles for revenue service. Upon reporting for duty and receiving assignment, each SunRail crew will board the train; walk through it to inspect for cleanliness, vandalism, or defects; and correct and report any noted deficiencies. Locomotive Engineers and Conductors also will perform pre-departure inspections and tests.

<u>Introduction of Trains into Revenue Service</u> – Following their preparation for revenue service, Locomotive Engineers will move the trains through the yard and onto the mainline according to instructions from the Operations Control Center (OCC). The OCC Train Dispatcher will be responsible for dispatching trains according to scheduled departure times. Revenue service will be provided whenever feasible to minimize deadheading.

Revenue Service

SunRail service will be provided according to established operating timetables. The normal direction of traffic will be on the right-hand track in the direction of travel, and all trains will stop at all stations along their scheduled routes.

Relief procedures will be established for shift changes and to provide a rest period for train crews at intervals set according to schedule.

Typical daily train operations for the Phase 2 South Project are described below:

<u>Early Morning and AM Peak Period</u> – Early morning service will begin at about 5:00 AM with the dispatching of trains from the VSMF. During the AM peak period trains will run every 30 minutes. Southbound peak trains will depart the VSMF between 4:30 AM and 6:45 AM. Northbound trains will enter revenue service from the Poinciana VSLMF. Southbound trains will deadhead from the VSMF to the DeBary Station, where they will begin revenue service. At the end of the AM peak period (about 9:00 AM), five trains will be removed from service and will layover at the Rand Yard VSMF and Poinciana VSLMF, leaving two trains in revenue service.

<u>Base Periods</u> - Base service levels are assumed to be operated during the midday, between 9:00 AM and 3:30 PM. Base period service will be operated at 120 to 150 minute headways. Two trains will remain in revenue service during the base period.

<u>PM Peak Period</u> - PM peak service (3:30 PM to 6:30 PM) will be operated at 30 minute headways. Five trains will be added to revenue service at the beginning of this period. Southbound trains will enter revenue service at DeBary station after deadheading from the VSMF. Northbound trains will enter revenue service from the Poinciana VSLMF. At the end of the PM peak period, trains will return to the VSMF and Poinciana VSLMF for cleaning and servicing, leaving one train in revenue service.

<u>Evening Period</u> - Evening service (6:30 PM to 10:30 PM) will be operated at 120 to 150 minute headways. One train will remain in revenue service during the early evening period. This train will return to the storage yard at the conclusion of revenue service at about 11:45 PM. Trains removed from service will proceed to the VSMF where they will be serviced, inspected, maintained (as required), and stored.

<u>Saturdays, Sundays and Holidays</u> - No revenue service is planned for Saturdays, Sundays or designated holidays as part of the IOS start-up phase or Phase 2 South. Weekend service will be operated at 60-minute frequencies in the Horizon Year (2030) phase.

System Closing

At the close of revenue operations, several activities will need to be accomplished: (1) passengers must be informed of end-of-service; (2) vehicles must be removed from service and stored in the VSMF; (3) staff must check out.

<u>End-of-Service Announcements</u> – At a reasonable time before system closing, Conductors will use the PA system to alert patrons to the scheduled end of operations. Announcements will be made periodically on each train.

<u>Vehicle Removal</u> – At the end of their revenue service runs, trains will be taken to the VSMF and the Poinciana VSLMF to be made ready for service the next morning. Train Engineers will move and locate their trains according to instructions from OCC. After shutting down the locomotive, each Train Engineer will walk through to ensure that no passengers remain aboard and identify any defects in the passenger coaches. Engineers and Conductors will fill out defect cards noting any problems or defects experienced with the trains and return them to the operations sign-in office. Engineers and Conductors will lock and leave their trains in accordance with established CFRC and

SunRail procedures.

<u>Staff Checkout</u> – At the end of their shifts, all operating personnel will report back to the location from which they received their shift assignment.

6.2 Operations Control Center

All mainline and yard operations will be performed under the authority and direction of the Central Florida Rail Corridor (CFRC) Operations Control Center (OCC) in accordance with established rules, procedures, and operating timetables. The Train Dispatcher will direct all operations from the OCC using the communications links and equipment described in Chapter 2.

The OCC, located at the Sanford VSMF, will be staffed 24-hours a day, seven days a week. The CFRC Train Dispatcher will have responsibility for mainline operations. Other O&M personnel will have responsibility for operations within the yard and yard leads; coordination with Transportation, Engineering and Mechanical Department personnel; and monitoring of security/fire alarms; communications with outside agencies (i.e., Police, Fire, and FDOT). O&M Supervisors along the mainline and in the yard will support the OCC during all shifts.

OCC will respond to emergencies as reported by the radio, telephone, alarm monitoring system, or other sources by directing transportation, engineering, safety personnel and field personnel. When there is a disruption to the service, O&M personnel will be responsible for implementing emergency procedures depending on the nature of the problem as defined by the applicable policy or procedure.

6.3 Failure Management

This section describes the types of equipment or system failures that may cause schedule delays or service disruptions and specifies actions necessary to minimize service disruptions and restore full service. All failure recovery actions will be conducted by CFRC OCC and overseen by the Manager of Train Operations or designated supervisor on duty.

Causes of Failures

Several types of failures or incidents could delay or disrupt scheduled service. These include failures of vehicles or vehicle equipment, track or wayside equipment; conflicts with automotive traffic or pedestrians, and passenger activities. Most failures occur infrequently, such as wayside and track failures. Various types of failures are described generally below.

<u>Vehicle Failures</u> – Vehicle failures can occur for a number of reasons. Depending on the nature of these failures, trains may be unable to move under their own power; may operate only at reduced speeds or in one direction; or may result in extended station dwell times.

The type of failure and location/direction of the train will determine whether the vehicle can continue in revenue service or whether it should be removed from service. If removal from service is necessary, passengers will alight at the nearest station and the train will be moved to the maintenance shop or nearest unoccupied storage track where it can be repaired or stored until such time as it can be safely moved to the shop.

If the disabled train cannot be moved from revenue tracks within 15 minutes of failure, then alternative operating strategies will be implemented so that service can be restored to the affected section. OCC will direct the operating strategies and determine whether to dispatch a replacement train.

<u>Wayside Problems</u> – Wayside equipment failures may include malfunctioning signals or locked track switches. These failures may require running at reduced speeds through the affected track section or bypassing the track section through the second main-line track.

Other wayside problems include physical damage to the rails or supporting track bed, flooding, obstruction of tracks (i.e., stalled vehicles), and train derailments.

Emergency situations involving utilities that occur during SunRail operations may require the utility company and/or emergency response personnel and equipment to enter or be located on or adjacent to corridor rights-of-way, causing service delays or disruptions. To minimize the effects of these emergency situations on SunRail operations and to ensure proper coordination and response among all involved organizations, procedures defining organization responsibilities will be developed.

<u>Accidents, Incidents, and Other Emergencies</u> – A number of events may interfere with normal train service, even when their cause is external to SunRail operations. Potential conflicts with general traffic and pedestrians can occur because the train will be crossing at-grade intersections at some locations along the alignment. When these conflicts result in accidents involving injury or property damage, scheduled operations are usually delayed. Depending on the accident, delays may range from a few minutes to an hour or more if police, ambulance, or other outside assistance is rendered.

Actions by passengers can extend station stops or disrupt operations. In the simplest case, extended boarding or alighting times may result due to excessive crowds or a physical disability. However, there also is potential for medical emergencies, attempted suicides, and felonious activities (i.e., assault on passengers or operator, vandalism, etc.) which could disrupt service. Depending on the nature of the incident, delays may be significant.

In an effort to prepare its passengers for the unlikely event of an emergency, SunRail shall take specific measures to properly and effectively communicate emergency information using all practical means available. All on-board personnel will be provided initial training on the requirements of the CFRC/SunRail Passenger Train Emergency Preparedness Plan (PTEPP), as required by the FRA, so they are prepared to respond in the event of an emergency situation. Refresher training will be provided every two years as required by regulation. The level and nature of the training provided shall be dependent upon individual employee duties and responsibilities, as required by their assigned position. SunRail will also employ techniques on passenger trains to help ensure passenger awareness of emergency preparedness and response actions, such as:

• Legible, clear, and simple emergency instructions conspicuously posted

throughout every passenger car. Methods include, but are not limited to the use of bulkhead signs, set back decals, seat cards, or other distinct posted materials.

- More detailed printed emergency instructions may be provided as an insert to onboard magazines and other informative publications that are normally available free of charge to passengers.
- Frequent, brief, on-board announcements made so new and existing passengers are consistently informed of the actions required should an emergency situation occur, such as the procedure to follow when making an emergency exit from a stalled train.
- Printed timetables shall have emergency information printed in clear, legible, and simple-to-read language.

SunRail will employ the use of regularly scheduled, automated public service announcements at stations as well as signs and automated variable message boards to consistently keep the traveling public informed and aware of safety and security procedures.

6.4 Service Recovery Strategies

Service recovery is a two-step process; first resolving an equipment or system failure, and then restoring scheduled service. This section describes various failure recovery and service restoration strategies the Dispatchers and O&M Personnel may use to deal with service disruptions. Details on these strategies will be provided within the standard operating procedure for many specific situations and governed by CFRC policies and procedures. However, for those situations not covered precisely, and for any that are not now foreseen, it is recognized that Dispatchers, Manager of Train Operations and other personnel must use their common sense and best judgment in responding.

<u>Failure Resolution</u> - OCC will monitor the status of SunRail operations using available displays and communications equipment. Depending on the nature of the failure, one or more of the following actions may be appropriate:

<u>Troubleshooting</u> – Rail vehicle malfunctions may be overcome by troubleshooting, making minor repairs, or using bypass switches, cut-out switches, or circuit breakers. This mainline repair may be directed by the OCC Supervisor. Mainline troubleshooting will always be followed up with a defect report, which notes the problem and corrective action and forwarded to the Mechanical Department.

<u>Equipment Bypass</u> – If an equipment failure can be controlled through temporarily bypassing malfunctioning equipment, the Dispatcher or Supervisor will direct the Train Engineer to take appropriate actions. After the problem has been bypassed, the Dispatcher or Supervisor will determine whether the train can continue revenue operations, or be removed to the VSMF or temporary storage location and replaced by another train.

<u>Single-track Operations</u> – When a section of track is blocked by a disabled train or other failure, OCC could direct single-track operations around the section of blocked track. Crossovers located before and after the blocked track will be used to switch trains from the blocked track to the clear track. No train will enter the single-track section without

direction from OCC or an on-site Supervisor. Trains will proceed through the single track section at the speed authorized by the Dispatcher.

<u>Replacement of Disabled Train</u> – Disabled trains will be removed from service and may be replaced by another vehicle, depending on equipment availability. The disabled train will be moved to the maintenance facility or other storage tracks until it can be repaired or safely moved without affecting revenue operations. The Dispatcher will dispatch the replacement train from the yard to the appropriate location where the train will begin revenue service. However, depending on the location of the disabled train, the replacement train may not enter revenue service until the next scheduled route cycle.

<u>Removal of Disabled Train</u>– When a disabled train cannot move under its own power, it can be towed or pushed by another train to the nearest station where all passengers will alight the disabled vehicle. OCC will determine the safest route and method for removing the disabled trains and will direct all train movements. A Supervisor, if available, will be directed to the scene to supervise the operation. Operating procedures for pushing/towing a disabled train will be prescribed in the Transportation Standard Operating Procedures.

<u>Reduce Frequency</u> – OCC may reduce the frequency of service on a line segment until the failure is resolved. CFRC may be required to operate additional bus service in order to provide adequate capacity at the lower frequency.

<u>Temporary Suspension of Service</u> – If an unusual operating condition is expected to interrupt SunRail service for an extended period of time, the Transportation Manager may suspend service on the affected segment and replace it with alternative service (i.e., buses). When alighting and boarding occurs away from a station platform, passengers may require assistance. Transportation Supervisors would be directed to the scene to supervise the operations and provide assistance to passengers.

<u>Bus Bridge Operations</u> – In the event that all train operations are suspended, a bus bridge may be implemented to serve passengers between stations along the entire alignment.

6.5 Restoration of Scheduled Service

After the equipment or system failure has been resolved, non-revenue equipment and staff will return to their normal base and revenue trains must adopt strategies to return to scheduled operations. The appropriate strategy (or strategies) will depend on the deviation of actual operations from scheduled service. For deviations of less than the length of one service headway, late trains can be advanced by reducing the scheduled station dwell times and end-of-line layover times and early trains can be retarded by increasing dwell and layover times. For deviations longer than one service headway, it may be necessary to temporarily reassign train crew runs or dispatch standby trains. These strategies are described below:

<u>Changing Scheduled Station Dwell Times</u> - Average station dwell times have been estimated at 30 seconds. The average dwell time will vary by station and time of day. Late trains could be advanced by reducing station dwell times to correspond to the actual time required for passenger boarding and alighting. Similarly, early trains could be retarded by increasing station dwell times. Station dwell times would be adjusted by the Train Engineer and Conductor at the direction of the Dispatcher or Supervisor.

<u>Changing Scheduled Layover Times</u> – The preliminary weekday schedules include scheduled layover times that vary from 17 to 60 minutes, depending on the time of day. Late trains could be advanced by reducing the scheduled layover, and early trains could be retarded by increasing layovers. Layover times would be adjusted at the direction of OCC or Supervisors.

<u>Changing Scheduled Run Assignments</u> – If system or equipment failures result in delays that exceed the service headway, then the Dispatcher can temporarily reassign operator runs. This will result in at least one missed trip and the subsequent reassignment of succeeding trains and crews.

<u>Dispatch Stand-by Trains</u> – Stand-by trains, if available, could be inserted into revenue service, replacing late or disabled trains. Standby-trains would be dispatched by OCC.

<u>Segment Recovery Strategies</u> – A service recovery strategy will depend on the location and nature of the condition which necessitates unusual operations. It is not possible to identify all possible incidents that would require emergency operations, let alone develop specific emergency operating strategies for all likely events. The track plan should be flexible to allow the OCC to select an appropriate emergency operating strategy for each unique incident. The following goals will be used to guide the definition of emergency operating strategies.

- Ensure safe operations for SunRail passengers, personnel and equipment
- Provide access to/from yard at all times
- Maintain revenue service to all stations
- Minimize passenger inconvenience (e.g., induce transfers, walk to adjacent stations, etc.)
- All emergency operations should be directly supervised by authorized CFRC personnel unless otherwise subverted to law enforcement or emergency agencies

6.6 Foul Weather Operations

It is the goal of SunRail to provide passenger service during all but the most severe weather conditions. An Emergency Operations Plan will provide detailed directions when weather conditions affect regular service. Some basic operating strategies are described below for inclement weather.

<u>Flooding</u> – Whenever there are unusually heavy rains or opportunities for standing water along the alignment, the track will be patrolled by maintenance personnel at frequent intervals. Whenever water is above the head of the rails, supervisory personnel will be available to direct the trains through the area with extreme caution. Signal cases and other electrical boxes will be inspected frequently to ensure that they are not subject to water intrusion.

<u>High Winds</u> – Operations will be suspended when sustained wind speeds are in excess of 70 mph (112 kph). In the event that there are problems associated with high winds (i.e., wires or objects blocking the trackway), OCC will assess the problems and

operational response to insure continued scheduled service.

<u>Power Failures</u> – All signal equipment is provided with backup batteries that will provide for normal operation for a minimum of 8 hours from the time of a power failure. During extended power failures, signal houses are equipped with generator inputs on the outside of the house for connection of external power sources. The Operations and Maintenance Contractor will determine the necessity and the priority for generator distribution during extended power outages.

7 MAINTENANCE OPERATIONS

This section presents maintenance operations of the Phase 2 South (LPA) Project.

7.1 Revenue Equipment Maintenance

The Operations and Maintenance Contractor is directly responsible for all maintenance and servicing of revenue vehicles including: preventive maintenance, corrective maintenance, cleaning and servicing, and major campaigns. The Operations and Maintenance Contractor has developed an Equipment Maintenance Plan that specifies the responsibilities, maintenance activities and maintenance schedules. The Equipment Maintenance Plan is comprised of a Preventive Maintenance Plan, Corrective Maintenance Plan, and Cleaning and Servicing Plan. FDOT's Chief Operating Officer is responsible for overseeing the Operations and Maintenance Contract and performing on-site inspections and reviews.

The primary objectives of the vehicle maintenance program is to:

- Maximize the safety, comfort, and convenience of passengers and employees
- Preserve CFRC assets
- Protect property and equipment
- Minimize system downtime
- Minimize operating costs

7.2 Railcar Maintenance Program

Elements of the vehicle maintenance program include preventive (scheduled) maintenance, corrective (unscheduled) maintenance, routine cleaning and servicing, and major campaigns to correct component failures. Train failures that require maintenance include break-downs of locomotives, cab cars and coaches due to engine failure, pneumatic system failure, other mechanical failure, electrical rotating machine failure, other electrical apparatus failure, and other failures that prevent operation.

Vehicle maintenance program elements are described below.

7.3 Preventive/Scheduled Maintenance

The objective of preventive maintenance is to detect and correct potential problems

before they cause a vehicle to fail in service. Preventive maintenance practices also enable servicing tasks that require lubrication, measurement, or adjustment at regular intervals. Preventive maintenance is a program of progressive, scheduled inspections and servicing.

The Operations and Maintenance Contractor is required to submit a Preventive Maintenance Plan (PMP) that specifies responsibilities, activities and schedules for scheduled maintenance. The PMP is consistent with the maintenance guidelines provided by the Original Equipment Manufacturer (OEM).

The Preventive Maintenance Plan complies with all requirements of 49 CFR, Part 229, *Railroad Locomotive Safety Standards*. The Operations and Maintenance Contractor is required to conduct daily inspections, 92-day inspections, semi-annual inspections (184 days), annual inspections (368 days), and biennial inspections (736 days).

7.4 Corrective/Unscheduled Maintenance

The Operations and Maintenance Contractor is required to submit a Corrective Maintenance Plan that specifies the responsibilities and performance of corrective actions and establishes guidelines for removing trains from service. Corrective maintenance restores a revenue vehicle to service following a failure to a system or component. Corrective maintenance consists of troubleshooting, repairing failed equipment, and returning the equipment to service as quickly as possible.

Corrective maintenance is addressed as a result of defects noted by Train Engineers and Conductors, defects found during inspection, vehicle failure in service, and accidents. In all cases, risk is assessed and a decision made to repair immediately or log for repair during the next scheduled maintenance activity. All such occurrences are logged on the computerized vehicle history record.

7.5 Cleaning and Servicing

The Operations and Maintenance Contractor is required to submit a Cleaning and Servicing Plan that specifies regular cleaning and servicing responsibilities, activities and intervals. The following is an overview of the expected cleaning and servicing program.

Daily light servicing will be performed in the VSMF and the Poinciana VSLMF following return from PM revenue service. This level of servicing is comprised of litter and trash removal as well as graffiti inspection. Graffiti is brought to the attention of the supervisor on duty for corrective action. Cleaners sweep floors, remove graffiti, remove light stains or spills, replace torn or defaced upholstery, inspect safety seals, perform a general interior and exterior inspection, and replenish passenger literature racks. Defects beyond the scope of the servicing staff are brought to the attention of the supervisor on duty for corrective action.

Comprehensive interior cleaning is performed at periods not to exceed 30 service days. All interior wash activity is recorded on a work order and entered into a maintenance management information system (MMIS). Additionally, the supervisor on duty is responsible for a follow up quality check prior to the vehicle's return to service.

Exterior washes are performed at least twice a month at the Amtrak Sanford Facility

following return from PM revenue service (weather permitting). Hand scrubs are performed at least bi-annually to address areas of the vehicle that are not cleaned by the automated car wash.

Locomotives will be fueled at the VSMF and the Poinciana VSLMF by a contract supplier. The fueling is accomplished at the VSMF yard and on the storage track at the VSLMF. These stations are accessible by adjacent roadway for fueling locomotives from tanker trucks. Locomotives are fueled at regular intervals to be determined by usage data gathered by the Operations and Maintenance Contractor during startup testing.

7.6 Major Campaigns to Renew/Enhance Revenue Vehicle Fleet

Fleet campaigns and modifications generally take the form of sending the entire fleet through the shop for changes to performance characteristics or original equipment configuration. Major campaigns will be conducted, based on cumulative mileage and manufacturer specifications, to resolve recurring repair problems with components, keep the revenue vehicle fleet in sound condition, and enhance performance of the revenue vehicles with improved components and/or technologies. Locomotives, coaches and cab cars will be monitored for overhaul beginning 5 years from the start of revenue service depending on the actual fleet mileage and the manufacturer's recommended overhaul schedule. It is expected that each vehicle will remain in overhaul for approximately 2-3 months. Anticipated overhaul will commence in CY 2022 for coach and cab cars and in CY 2025 for locomotives.

7.7 Balance of Vehicle Demand and Supply

Tables 22 and 23 summarize existing and forecasted demand for rail cars through 2030, as well as the anticipated fleet size for the same period. Demand encompasses the vehicles needed to provide passenger service and the cars required for equipment maintenance purposes. The demand for the number of cab cars would be greater than coaches, requiring one cab car for each trainset. While the cab cars have less seating capacity, they offer more flexibility in operations and can cover for coaches out of service for unscheduled repairs and accidents.

FDOT recognizes that the projected vehicle requirements shown in Tables 22 and 23 may need to be adjusted to reflect actual ridership demand. FDOT's policy is to closely monitor ridership and develop service improvement strategies and/or vehicle procurements as they become necessary.

Vehicle Demand & Supply at																		
End of Calander Year (Dec. 31)	CY 13	CY 14	CY 15	CY 16	CY 17	CY 18	CY 19	CY 20	CY 21	CY 22	CY 23	CY 24	CY 25	CY 26	CY 27	CY 28	CY 29	CY 30
Vahiele Demand																		
Service Operation:																		
1 Peak Locomotives	0	5	5	5	5	8	8	8	8	8	8	8	14	14	14	14	14	14
2 Standby Locomotives	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Peak Locomotive Requirement	Š	- 6	<u>-</u>	<u>-</u>	<u>-</u> 6	<u>,</u>	à	à	<u>-</u>	<u>,</u>	<u>-</u>	<u>,</u>	15	15	15	15	15	15
Maintenance:	v	Ũ	Ũ	Ũ	Ũ	Ŭ	Ŭ	Ŭ	Ũ	Ŭ	Ũ	Ŭ		10	10			10
4 Preventive & Corrective Maintenance	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5a Major Overhaul (total vehicles during year)	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	1	2
5b Major Overhaul (vehicles at same time)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
6 Total Maintenance	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
7 Total Vehicle Demand	0	7	7	7	7	10	10	10	10	10	10	10	17	17	17	17	17	17
Vehicle Supply																		
Vehicles Owned/Purchased																		
8 Locomotives Owned (beginning of year)	0	7	10	10	10	10	10	10	10	10	10	10	17	17	17	17	17	17
9 Procurement of New Locomotives	7	3	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	7	<u>0</u>	<u>0</u>	<u>0</u>	0	<u>0</u>	0
10 Total Vehicles Owned (end of year)	7	10	10	10	10	10	10	10	10	10	10	17	17	17	17	17	17	17
11 Total Vehicle Supply	7	10	10	10	10	10	10	10	10	10	10	17	17	17	17	17	17	17
Balance of Vehicle Demand & Supply																		
12 Excess (Deficit) Vehicles	7	3	3	3	3	0	0	0	0	0	0	7	0	0	0	0	0	0
13 Operating Spares Ratio	n/a	67%	67%	67%	67%	11%	11%	11%	11%	11%	11%	89%	13%	13%	13%	13%	13%	13%
14 Maintenance Spares Ratio	n/a	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	6%	12%	12%	12%	12%	12%	12%

Table 22 – Locomotive Vehicle Demand/Supply Balance

Vehicle Demand & Supply at																		
End of Calander Year (Dec. 31)	CY 13	CY 14	CY 15	CY 16	CY 17	CY 18	CY 19	CY 20	CY 21	CY 22	CY 23	CY 24	CY 25	CY 26	CY 27	CY 28	CY 29	CY 30
Vehicle Demand																		
Service Operation:																		
1a Peak Trainsets	0	5	5	5	5	8	8	8	8	8	8	8	14	14	14	14	14	14
1b Scheduled Coach Cars	0	5	5	5	5	6	6	6	6	6	6	6	12	12	12	12	12	12
1c Scheduled Cab Cars	0	5	5	5	5	10	10	10	10	10	10	10	16	16	16	16	16	16
2a Standby Coach Cars	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	1	1
2b Standby Cab Cars	<u>0</u>	2	2	2	2	1	1	1	1	2	2	2	1	<u>1</u>	<u>1</u>	1	1	1
3 Peak Vehicle Requirement	0	12	12	12	12	18	18	18	18	18	18	18	30	30	30	30	30	30
Maintenance:																		
4 Preventive & Corrective Maintenance	0	2	2	2	2	2	2	2	2	1	1	1	3	3	3	3	3	4
5a Major Overhaul (total vehicles during year)	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	2	0
5b Major Overhaul (vehicles at same time)	0	0	0	0	0	0	0	0	0	1	1	1	1	<u>1</u>	<u>1</u>	1	<u>1</u>	0
6 Total Maintenance	0	2	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4
7 Total Vehicle Demand	0	14	14	14	14	20	20	20	20	20	20	20	34	34	34	34	34	34
Vehicle Supply																		
Vehicles Owned/Purchased																		
8a Coach Cars Owned (beginning of year)	0	5	7	7	7	7	7	7	7	7	7	7	14	14	14	14	14	14
8b Cab Cars Owned (beginning of year)	0	9	13	13	13	13	13	13	13	13	13	13	20	20	20	20	20	20
9a Procurement of New Coach Cars	5	2	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0
9b Procurement of New Cab Cars	9	4	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0
10 Total Vehicles Owned (end of year)	14	20	20	20	20	20	20	20	20	20	20	34	34	34	34	34	34	34
11 Total Vehicle Supply	14	20	20	20	20	20	20	20	20	20	20	34	34	34	34	34	34	34
Balance of Vehicle Demand & Supply																		
12 Excess (Deficit) Vehicles	14	6	6	6	6	0	0	0	0	0	0	14	0	0	0	0	0	0
13 Operating Spares Ratio	n/a	67%	67%	67%	67%	11%	11%	11%	11%	11%	11%	89%	13%	13%	13%	13%	13%	13%
14 Maintenance Spares Ratio	n/a	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	6%	12%	12%	12%	12%	12%	12%

Table 23 – Passenger Vehicle Demand/Supply Balance

7.8 Operating and Maintenance Spare Ratios

The Operating Spares Ratio (OSR) is the percentage of extra vehicles in a fleet, over and above the number actually required by the PVR. It is also a primary measure of how efficiently a fleet is being used. The OSR needs to accommodate the normal preventive and corrective maintenance demand as defined by the Maintenance Spare Ratio (MSR), which can vary from day to day, as well as provide sufficient spare vehicles in the event that a damaged vehicle is out of service for an extended period of time due to accident repair or other unplanned outages. Rail transit systems typically maintain an OSR of 10% to 30%, depending on the age and condition of the vehicles, the vehicle fleet size, and the effectiveness of the maintenance program.

Since the Phase 2 South and Phase 2 North vehicle options were exercised in 2012 and vehicles were delivered in 2014, the SunRail OSR for both locomotives and passenger cars is anticipated be about 67% through 2017 prior to the start of revenue service on Phase 2 South and Phase 2 North. From 2018 to 2023, the CFCRT OSR will decrease to 11% for both locomotives and passenger cars, which is acceptable for a small fleet of newly acquired vehicles. In CY 2024, when new locomotives and passenger cars are procured in anticipation of the 2025 service expansion, the OSR temporarily increases to 89% for both locomotives and passenger cars. Once service is expanded in 2025, the OSR is 13% for both locomotives and passenger cars.

MSR relates to the number of cars that are typically held for preventive and corrective maintenance and overhauls. Based on the maintenance program described above, it is expected that, on average, one locomotive will be held for preventive or corrective maintenance from 2014 through 2024. In 2025, when the locomotive overhaul program begins, two locomotives will be held for preventive and corrective maintenance and overhauls. Similarly, it is expected that two passenger cars will be held for preventive or corrective maintenance from 2014 through 2021. In 2022, when the passenger car overhaul program begins, one passenger car will be held for preventive and corrective maintenance and one will be held for overhauls. In 2025 through 2030, three to four passenger cars will be held for maintenance.

Following implementation of the CFCRT Project, FDOT will closely monitor the maintenance program of the Operations and Maintenance Contractor to ensure that the revenue vehicles remain in good condition and the planned OSR and MSR can be maintained.

7.9 Infrastructure and Facilities Maintenance

FDOT has two contractors responsible for maintenance of infrastructure and facilities. The O&M Contractor, Bombardier Mass Transit Corporation, is responsible for Infrastructure Maintenance which includes routine preventive and corrective track, structures and communications maintenance functions and emergency repairs; and major and specialized maintenance and replacement work such as rail grinding, major rail replacement, major construction projects, bridge inspection and replacement. The Signal Maintenance Contractor, Herzog Technologies, Inc. is responsible for maintenance of the existing signal system and maintenance of new signal systems as they are cutover during construction activities.

The Operations and Maintenance Contractor and the Signal Maintenance Contractor have developed Maintenance Standard Operating Procedures based on industry typical and best practices as a part of their Scope of Work.

The O&M Contractor, the Signal Maintenance Contractor and FDOT have developed a Maintenance Standard Operating Procedures (SOP) manual containing detailed instructions for performing all aspects of revenue vehicle maintenance, facilities and systems maintenance. Maintenance SOPs have been prepared and updated by technical and training staff, and cover the following maintenance topics: administration, shop, vehicles, parts, facilities, contract services, and safety. Each different aspect of the Maintenance SOP Manual applies to the specific topic of maintenance, as listed above, and is compiled into a complete Maintenance SOP Manual separated into functional categories. Function specific SOPs have been provided to each craft for their individual tasks. SOPs for contracted services have been created to define the particular tasks required of the contract personnel.

7.10 Track Maintenance

Maintenance of track and right-of-way require a skilled workforce. Authorization from OCC is required before any work can be conducted on the track and right-of-way. All maintenance personnel are required to be familiar with CFCRT safety rules and procedures, and are required to wear appropriate safety clothing (e.g., hard hat, work shoes, safety vest, and safety glasses).

Locomotive Engineers are notified of any required speed restrictions through bulletins, notices and flagging procedures. Flagging is required for maintenance work other than inspections being performed in the right-of-way during revenue service hours. Any maintenance work affecting vehicular traffic is coordinated with the appropriate governmental agency (e.g., City of Orlando, Orange County, Seminole County, Volusia County, Osceola County, Florida Department of Transportation).

Maintenance personnel perform track inspections and routine maintenance. Track inspections identify any defects such as worn rail, gauge deviation, elevation or alignment change, loose or damaged ties or fastenings or other defects. Track inspectors routinely inspect the track. Track inspections and maintenance complies with all requirements of 49 CFR, Part 213 – Track Safety Standards.

Track maintenance staff consists of a Chief Engineer, Roadmaster, Section Foremen, Track Maintainers, Track Inspectors, Machine Operators and Track Welders. The Chief Engineer, Roadmaster, Track Inspectors, and the Section Foremen are required to be FRA qualified to inspect track as defined in the CFR Title 49, Part 213 - Track Safety Standards. Track maintenance tasks consist of inspections (twice per week) usually done by the Track Inspector(s), basic maintenance (5-7 days per week) and emergency response (24/7). Additional information for the O&M Contractor organization can be found in the Phase 2 South Project Management Plan, Section 9.

Basic Maintenance includes routine preventive and corrective track maintenance functions and emergency repairs. Routine repairs include repair of broken rails; spot repairs of defective welds, repair of insulated joints, spot tie replacement and minor repairs of turnouts. Major and specialized maintenance and replacement work performed on an irregular basis may be contracted, such as rail grinding, major rail replacement, turnout repairs, correction of surface line and gauge over large sections of track, and major welding repairs. Typical rail maintenance equipment is used and provided by the O&M Contractor as part of the Scope of Work. (O&M Scope of Services, February 2013)

7.11 Signal and Communications Maintenance

<u>Signal and Highway-Rail Grade Crossing Systems</u> - Maintenance requirements for the signal system include a Rail Management Information System (RMIS) which has been implemented to ensure reliable and safe operations.

Signal Maintenance is divided into three general functions – Preventative Maintenance, Regulatory Testing and Emergency Response. Each function has different skills required to perform the tasks but all are required for a qualified signal maintainer. While there are no certification or qualification requirements for signal maintainers, specialized training normally provided by Class 1 railroads to its employees is commercially available and is required as a qualification for signal maintainers.

- Preventative Maintenance includes inspections, repairs, and replacement of equipment as required by normal use for preventative maintenance. This function would be performed 5-7 days per week and will be performed between train movements.
- Regulatory Testing is required by the FRA to comply with standards for wayside signal and highway-rail grade crossing operation and safety. The FRA regulations are divided into separate rules for wayside signals and highway-rail grade crossing systems: CFR Title 49, Parts 234 and 236, respectively.
- Emergency Response is required on a 24 hr/day 7 days/wk basis to react to wayside signal failures, highway-rail grade crossing failures and accidents, broken highway-rail grade crossing gates, gate knock-downs, storm damage, vandalism and, and any other conditions adversely affecting the wayside signal and highway-rail grade crossing systems.

Maintenance of the wayside signal and the highway-rail grade crossing warning systems is required to comply with the applicable CFR Title 49 requirements.

Signal system maintenance functions include:

- Control Points
- Track Circuits
- Signals
- Electric Switch Machines
- Handthrow Switches
- Grade Crossing Warning Systems

Communications maintenance functions include:

- Voice communications units in the rail cars and locomotives
- Portable radios
- Public address amplifiers and speakers, intercoms and security alarm systems

- Telephones and various communication cables
- Fiber Optic Network maintenance
- Inter-office communications systems
- OCC consoles
- Other computers

The Signal Maintenance Contractor provides all signal staff including a Manager of Signals, Field Operations Manager, Signal Inspectors and Signal Maintainers. Additional information for the Signal Maintenance Contractor organization can be found in the Phase 2 South Project Management Plan, Section 9.

7.12 Structures, Facilities, and Bridge Maintenance

The goal of the CFRC and the SunRail service is to provide a clean, reliable and safe environment for passengers, employees and the general public. The objective is to maintain these assets in optimum operating condition to ensure safety, reliability and cost-effectiveness. This is achieved through keeping the assets operating optimally and in clean and attractive condition to reduce unnecessary and unbudgeted capital and operating costs. The result is a high level of customer satisfaction, a cost-effective operation and improved quality of service.

A maintenance management system with appropriate staffing levels for related disciplines and clear definitions for in-house or contracted functions has been developed as part of the overall maintenance strategy. A periodic review of contracted and in-house functions has been undertaken to ascertain cost efficiency, cycle time, customer inconvenience and future expansion. In addition, a facilities and systems maintenance plan establishes a preventive maintenance system, personnel training requirements, and a plan for a capital cost replacement program for equipment nearing life expectancy. CFRC's DBM and O&M contractors are responsible for the development of the maintenance management system, and that system's policies and procedures are subject to FDOT oversight and approval.

Stations

Local jurisdictions are responsible for station maintenance services listed below, including:

- Pick-up and disposal of garbage
- Clean and re-lamp light fixtures
- Remove graffiti
- Replace broken glass
- Clean platforms, benches, canopies, parking areas and station amenities
- Replace/repair transit information boards, as required
- Repair/replace canopies, waste receptacles
- Maintain landscaping
- Ensure platform vertical edge markings are painted on an established schedule

<u>Bridges</u>

The approximate 61-mile corridor currently has eleven bridges (two steel/concrete combinations, one steel, two timber trestles and six concrete span/arch bridges). The two timber trestle bridges will be replaced with concrete box culverts as part of the Phase 2 upgrades prior to the FFGA Phase 2 South RSD in September, 2019. Culverts in need of repair will also be upgraded as part of the IOS and Phase 2 South capital investment. This will greatly reduce the bridge MOW requirements in the initial years.

Periodic bridge inspections are necessary to determine a structure's safe load carrying capacity. All bridges will receive a visual inspection annually and a detailed measured fracture inspection (Lake Monroe Draw Bridge and Maitland Overpass) once every five years. The Lake Monroe Draw Bridge will have a bridge pier scour inspection every five years or less depending on whether a flood event occurs. Inspections of bridges will include measuring and recording the condition of substructure support at locations subject to erosion from moving water. A series of records of those readings will provide the best information in the event unexpected changes suddenly occur. Where such indirect measurements do not provide the necessary assurance of foundation integrity, diving inspections will be performed as prescribed by the Railroad Bridge Engineer.

Bridge work is generally considered in three broad segments:

- Basic maintenance: Bridge Inspection annual visual inspection of all bridges; and measured inspection every 5 years; basic maintenance (annual) and emergency response (24/7)
- Programmed maintenance: often annual
- Programmed capital renewal and major rehabilitation: often annual or longer intervals which may include new construction, modifications and bridge strengthening. Contractors will be hired for major capital/rehabilitation work.

There is one O&M Contractor Bridge and Building Supervisor on staff reporting to the Chief Engineer that is responsible for managing the bridge work using consultants and contractors.

8 ORGANIZATIONAL RESPONSIBILITIES

This section presents organizational responsibilities as they relate to the operations and maintenance of the CFRC system. Staffing and operations and maintenance (O&M) cost estimates for the Phase 2 South Project are provided in a separate report, "O&M Cost Methodology and Results Report".

FDOT and CSX Transportation, Inc. (CSXT) executed a Contract of Sale dated November 9, 2011, through which FDOT acquired the railroad corridor on the CSXT A-Line between Milepost A749.61 near DeLand, Florida and Milepost A813.82 near Poinciana, Florida, a distance of approximately 61 miles.

At that time, FDOT became the railroad owner with the alpha designation "Central Florida Rail Corridor" (CFRC) for this railroad corridor and accepted responsibility for maintenance and operations of the corridor. Operations on the corridor consist of SunRail passenger service, freight service provided by CSXT and Florida Central Railroad (FCEN) and Amtrak intercity passenger rail service. The CFRC is subject to review by the Federal Railroad Administration (FRA) and is required to comply with the Title 49 CFR regulations governing railroad transportation systems.

Dispatching services for the CFRC were contracted to Bombardier Transportation.

8.1 Florida Department of Transportation

The day-to-day operations of the SunRail commuter service and the maintenance of the CFRC railroad system have been contracted to Bombardier Mass Transit Corporation, as the O&M Contractor, and Herzog Technologies, Inc., as the Signal Maintenance Contractor. The O&M Contractor received NTP for Mobilization April 12, 2013 and NTP for Maintenance Services on December 9, 2013. Signal Maintenance NTP for mobilization was given in September, 2013 with NTP for Signal Maintenance Services occurring on December 9, 2013. The CFRC/SunRail Operations organization, which includes FDOT, CFRC Operations Officers, O&M Contractor and the Signal Maintenance Contractor, is responsible for implementing all rail policy and procedures for the CFRC, capital planning, customer service, regulatory compliance, and financial management.

Although FDOT retains consultants to oversee the day-to-day management of the Project, there are program requirements and responsibilities that cannot be delegated by contract or agreement to entities beyond FDOT itself. FDOT will transfer these oversight responsibilities to a local entity after 7 years of operation.

These include:

- Adopting the Long-Range System Plan for service and facilities;
- Adopting a Project Financial Plan;
- Submitting the environmental documentation to the FTA;
- Oversight of consultants;
- Approval and control of consultants' work;

- Preparing various senior staff-level policies and procedures in furtherance of FDOT policies;
- Applying for, receiving, and administering state and Federal funds for Project implementation;
- Establishing and staffing an organizational structure supportive of the design and construction of the Project;
- Ensuring control over the Project;
- Establishing the bases of design and construction including the goals and standards for operations, maintenance, reliability, safety, security, dependability and quality of the finished works;
- Quality Assurance and Quality Control oversight;
- Entering into agreements with other agencies and third-parties which permit changes to their facilities and operations necessary for implementation of the Project;
- Entering into agreements with other carriers of the region by which coordinated transportation services will be effected;
- Establishing risk management programs and related insurance coverage;
- Preparing and adopting annual budgets for operations and capital expenditures;
- Ensuring quality of system development;
- Certifying safety and security of the system;
- Grantee responsibility for other Segments of the Program;
- Training of employees during start-up; and
- Setting of fares, fees, tariffs, and user rates.

8.2 Chief Executive Officer (FDOT)

The position of CEO of the CFRC and SunRail may be either an employee or contractor of the FDOT, and shall report directly to the District Secretary of FDOT. During the current phase of the Project and until such time as FDOT determines, the CEO position will be filled by the District 5 Secretary.

8.3 CFRC Chief Operating Officer/Passenger Rail Operations Manager (FDOT)

This position reports directly to the SunRail CEO. The Passenger Rail Operations Manager/COO serves as FDOT's primary representative for the CFRC and SunRail and provides oversight of day-to-day operations of the CFRC and SunRail commuter rail operations and service provided by the O&M and Signal Maintenance Contractors to ensure compliance with service standards and budgets, including oversight of all contracted services and providing guidance with special events trains, operating sequencing and train dispatching. The Passenger Rail Operations Manager/COO coordinates with the FDOT Central Office's Rail Manager on SunRail Operations, holding bi-weekly meeting to discuss Sunrail operations with FDOT Central Office; establishes and maintains communication links between FDOT, FRA, the O&M

Contractor, Signal Maintenance Contractor and the CFRC's tenant railroads (Amtrak, CSXT and FCEN); coordinates corridor management/operational/design, procurement and construction issues with the Program Management Team (PMT) and Program Management Consultants (PMCs) and leads the PTC efforts on behalf of the FDOT for interoperability issues within the FDOT corridors. The Passenger Rail Operations Manager/COO provides timely coordination with the appropriate staff of the individual Signatory Member Agencies, LYNX, VOTRAN, CSXT, FCEN, and Amtrak in the event of an emergency (such as the need for bus bridges, public service announcements, security, or railroad property issues); provides timely and comprehensive operational input to and coordination with the individual Signatory Member Agencies and the O&M Contractor in order to enable FDOT to effectively respond to the needs and requirements of the individual Signatory Member Agencies and to enhance SunRail service for the IOS and future expansions; ensures the maintenance of a high standard of customer relations with all users of the CFRC and SunRail; provides guidance and monitors CFRC oversight day-to-day activities, compliance, work load, oversight audits, trouble tickets, accident and incident reporting; engages with APTA Passenger Rail Committee and performs such other duties and responsibilities pertaining to the CFRC as may be assigned from time to time by FDOT. Additional information is provided in the Phase 2 South PMP.

8.4 Operations and Maintenance Contractors

For the first seven years after the Revenue Operation Date, FDOT has assigned the management, maintenance, dispatch, and operation of CFRC to Bombardier Mass Transit Corporation. The O&M Contractor is directly responsible for all maintenance and servicing of revenue vehicles including: preventive maintenance, corrective maintenance, cleaning and servicing, and major campaigns. FDOT has also contracted with Herzog Technologies, Inc. to maintain the existing signal system and new signal systems as they are cutover during construction.

Detailed estimated annual O&M costs for commuter rail operations for the Phase 1 IOS 2014, Phase 2 South LPA Opening Year, Phase 2 North Full Build Opening Year and Phase 2 North 2025 Full Build service are included in Appendix A.

8.5 Local Jurisdictions

FDOT has entered into multi-year Inter-local Agreements with Volusia, Seminole, Orange, and Osceola Counties and the City of Orlando for capital and operating funds and other assistance.

The local governments have agreed with FDOT regarding an appropriate methodology to allocate capital, as well as future operating costs. The financial analysis assumes that capital costs are allocated to the governments based on each county's and city's share of the total station construction costs and of the length of the CFRC within each county's borders. Volusia, Seminole, Orange, and Osceola Counties and the City of Orlando have signed agreements to financially commit to the Project.

FDOT and the appropriate local governmental agency with jurisdiction over a station shall enter into a joint use agreement for each station. This agreement delineates the responsibilities of each party, and as a minimum, includes the following:

- Maintenance and operation standards for the station.
- Control over the platform and any structure or device or system located on the platform.
- Provision of adequate pedestrian access to the platform and stations.
- Requirements for housekeeping and appearance of the platform, the stations, parking lots, and ancillary facilities.
- Security and law enforcement for the station and parking areas.
- Access for vehicular or pedestrian traffic to stations and parking areas.
- Provision of adequate lighting and parking.
- Disposition of station revenues in accordance with the Joint Use Agreement.
- FDOT's commitment to support local growth management and permitting decisions to encourage transit oriented land uses in the vicinity of the station.
- Local government's rights to development ancillary facilities located near or on the station site, consistent with their Inter-local Agreements.

8.6 Federal Railroad Administration and Federal Transit Administration

The Federal Transit Administration (FTA) is the agency that provides the directives, guidelines and funding for commuter rail projects. FTA directives govern planning, environmental, revenues adequacy and funding required to be addressed by start-up commuter services. As the Project construction progresses, reporting schedule, budget, construction, and risk status and issues to the FTA will be accomplished through monthly progress reports.

The Central Florida Rail Corridor (CFRC) is the name granted by the Federal Railroad Administration (FRA) for the 61-mile rail corridor being purchased by FDOT from CSXT Transportation, Inc. The FRA has regulatory authority for the safety, operations, and maintenance of all track and systems on the corridor and all trains that operate over the corridor, regardless of the railroad operating entity. CFRC has developed operating and safety rules and inspection and maintenance procedures that are consistent with FRA CFR Title 49 regulations that govern CFRC and other railroads operating over the CFRC trackage. The SunRail commuter service operates over the CFRC track and all aspects of safety, operation and maintenance practices are governed and comply with applicable FRA regulations.

The FDOT Passenger Rail Operations Manager, the O&M Contractor and Signal Maintenance Contractor will be directly responsible for all reporting requirements of both the FTA and the FRA including but not limited to:

- Monthly Progress Reporting
- Quarterly Status Reporting
- CFR Title 49 Testing and Inspection compliance

APPENDIX A - COMMUTER RAIL O&M COST ESTIMATES

Appendix A-1 - Commuter Rail Annual O&M Costs – Phase 1 System

CONTRACT	VENDOR	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	
Operations	Bombardier	\$ 6,503,845	\$ 6,698,960	\$ 6,899,929	\$ 7,106,927	\$ 7,320,135	\$ 7,539,739	\$ 7,765,931	
Maintenance	Bombardier	\$13,187,338	\$ 13,582,958	\$ 13,990,447	\$14,410,160	\$ 14,842,465	\$ 15,287,739	\$ 15,865,920	
Incentive/Disincentive	Bombardier	\$ 1,000,000	\$ 1,030,000	\$ 1,060,900	\$ 1,092,727	\$ 1,125,509	\$ 1,159,274	\$ 1,194,052	
Emergency Work Order	Bombardier	\$ 2,077,168	\$ 1,545,000	\$ 1,591,350	\$ 1,639,091	\$ 1,688,263	\$ 1,738,911	\$ 1,791,078	(2)
Capital Maintenance	Bombardier	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	(2)
Signal Maintenance of Way, Operations Expenses	Herzog	\$ 2,562,508	\$ 2,639,383	\$ 2,718,565	\$ 2,800,122	\$ 2,884,125	\$ 2,970,649	\$ 3,059,769	
Signal Maintenance of Way, Capital Expenses	Herzog	\$ 2,570,019	\$ 1,030,000	\$ 1,060,900	\$ 1,092,727	\$ 1,125,509	\$ 1,159,274	\$ 1,194,052	(2)
Heavy Vehicle Maintenance	Amtrak	\$ 1,400,637	\$ 1,477,406	\$ 1,558,595	\$ 1,644,464	\$ 1,735,292	\$ 1,831,371	\$ 1,933,013	
Corrective Maintenance	Amtrak	\$ 500,000	\$ 515,000	\$ 530,450	\$ 546,364	\$ 562,754	\$ 579,637	\$ 597,026	(2)
Fuel	Greens Energy	\$ 2,700,000	\$ 2,781,000	\$ 2,864,430	\$ 2,950,363	\$ 3,038,874	\$ 3,130,040	\$ 3,223,941	
Back-of-the-House Hosting	ACS-Xerox	\$ 593,500	\$ 652,848	\$ 757,764	\$ 1,093,516	\$ 1,321,343	\$ 945,720	\$ 974,092	
Fare Equipment Maintenance	ACS-Xerox	\$ 1,191,118	\$ 1,226,852	\$ 1,263,657	\$ 1,301,567	\$ 1,340,614	\$ 1,380,832	\$ 1,422,257	
Fare Media Smart Card	ACS-Xerox	\$ 35,000	\$ 36,050	\$ 37,132	\$ 38,245	\$ 39,393	\$ 40,575	\$ 41,792	(2)
Limited Use Smart Card	ACS-Xerox	\$ 194,000	\$ 199,820	\$ 205,815	\$ 211,989	\$ 218,349	\$ 224,899	\$ 231,646	(2)
Card Distribution & Packaging	inComm	\$ 100,000	\$ 103,000	\$ 106,090	\$ 109,273	\$ 112,551	\$ 115,927	\$ 119,405	(3)
Banking Services	Wells Fargo, BOA	\$ 115,000	\$ 115,000	\$ 115,000	\$ 115,000	\$ 115,000	\$ 115,000	\$ 115,000	
Armored Car Service	Mid-Florida	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	
Insurance	Gallagher	\$ 1,506,770	\$ 1,551,973	\$ 1,598,532	\$ 1,646,488	\$ 1,695,883	\$ 1,746,759	\$ 1,799,162	
SunRail Management & Administration	CH, URS, HNTB, AECOM	\$ 7,920,564	\$ 5,525,264	\$ 5,525,264	\$ 5,525,264	\$ 5,525,264	\$ 5,525,264	\$ 5,525,264	(3), (5)
PIO	Cunningham Group	\$ 500,000	\$ 515,000	\$ 530,450	\$ 546,364	\$ 562,754	\$ 579,637	\$ 597,026	(3)
Marketing & Ambassadors	DTS	\$ 1,074,000	\$ 1,030,000	\$ 1,060,900	\$ 1,092,727	\$ 1,125,509	\$ 1,159,274	\$ 1,194,052	(3)
Wi-Fi Service	AT&T, Verizon	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	(3)
SUNRAIL TOTAL O&M COST ESTIMATE		\$47,821,467	\$44,345,514	\$ 45,566,169	\$47,053,377	\$48,469,586	\$ 49,320,522	\$ 50,734,480	
SUNRAIL TOTAL (EXCLUDES CAPITAL AND PROGRAM MAI	NAGEMENT COSTS)	\$ 30,790,716	\$ 31,786,380	\$ 32,857,819	\$ 34, 191, 334	\$ 35,449,240	\$ 36,137,124	\$ 37,383,137	
10777									
NOTES:									
1. SOURCE: Phase 1 annual costs by vend or prepared by FDOT (Joanne Glider, Feb. 4, 2015).									
2. Capital costs not included in Adjusted Total Annual O&M Cost	s.								
3. Program Management Costs not included in Adjusted Total Annual O&M Costs.									
4. Costs escalated by a nnual inflation:	3%								
5. Per FDOT, SunRail Management & Administration Costs includ	e management of Phase 1 o	operations and s	upport for Phase	2 extensions (pl	anning, design a	and implementa	tion support}.		
6. FY 2015 cost excludes Contingency and allowance for State of (Sood Repair.								
Costs are in year of expenditure dollars.									

Appendix A-2 - Commuter Rail Incremental Annual O&M Costs - Phase 2 South Project

				PHASE 1		PHASE 2 S	- 1	PHASE 2 S	
CONTRACT	VENDOR	VARIABLE		FY 2018		FY 2018	IN	CREMENT	
Operations	Bombardier	Tr-Hours	\$	7,106,927	\$	9, 479, 607	\$	2,372,680	
Maintenance	Bombardier	Car-Miles	\$	14,410,160	\$	17,670,871	\$	3,260,710	
Incentive/Disincentive	Bombardier	5% of O&M	\$	1,092,727	\$	1,357,524	\$	264,797	
Emergency Work Order	Bombardie r	Route-Miles	\$	1,639,091	\$	2,002,636	\$	363,545	(2)
Capital Maintenance	Bombardie r	Route-Miles	\$	2,000,000	\$	2, 443, 594	\$	443,594	(2)
Signal Maintenance of Way, Operations Expenses	Herzog	Route-Miles	\$	2,800,122	\$	3, 421, 180	\$	621,058	
Signal Maintenance of Way, Capital Expenses	Herzog	Route-Miles	Ş	1,092,727	\$	1,092,727	\$	-	(2)
Heavy Vehicle Maintenance	Amtrak	Car-Miles	\$	1,644,464	\$	2,016,571	\$	372,107	
Corrective Maintenance	Amtrak	Car-Miles	Ş	546, 364	Ş	669,994	\$	123,630	(2)
Fuel	GreensEnergy	Tr-Hours	\$	2,950,363	\$	4, 129, 994	\$	1,179,631	
Back-of-the-House Hosting	ACS-Xerox	Stations	\$	1,093,516	\$	1,458,021	\$	364,505	
Fare Equipment Maintenance	ACS-Xerox	Stations	\$	1,301,567	\$	1,735,422	\$	433,856	
Fare Media Smart Card	ACS-Xerox	Stations	\$	38,245	\$	50, 994	\$	12,748	(2)
Limited Use Smart Card	ACS-Xerox	Stations	Ş	211,989	Ş	282,652	\$	70,663	(3)
Card Distribution & Packaging	inComm	Negotiated	\$	109,273	\$	109,273	\$	-	(3)
Banking Services	Wells Fargo, BOA	Stations	\$	115,000	\$	153, 333	\$	38,333	
Armored Car Service	Mid-Florida	Stations	\$	30,000	\$	40,000	\$	10,000	
Insurance	Gallagher	N e got iate d	\$	1,646,488	\$	1,646,488	\$		
SunRail Management & Administration	CH, URS, HNTB, AECOM	Negotiated	\$	5,525,264	\$	5, 525, 264	\$	-	(3), (5)
PIO	Cunningham Group	Negotiated	\$	546,364	\$	546, 364	\$	-	(3)
Marketing & Ambassadors	DTS	Negotiated	\$	1,092,727	\$	1,092,727	\$		(3)
Wi-Fi Service	AT&T, Verizon	Negotiated	\$	60,000	\$	60,000	\$	-	(3)
SUNRAIL TOTAL O&M COST ESTIMATE			\$	47,053,377	\$	56, 985, 235	\$	9,931,858	
SUNRAIL TOTAL (EXCLUDES CAPITAL AND PROGRAM MAI	VAGEMENT COSTS)		\$	34,191,334	\$	43, 109, 012	\$	8,917,678	
NOTES:									
1. SOURCE: Phase 1 annual costs by vendor prepared by FDOT [Jo: 2. Capital costs not included in Adjusted Total Annual O&M Cost	anne Glider, Feb. 4, 2015). 5.								
3. Program Management Costs not included in Adjusted Total An									
4. Costs escalated byannual inflation:	3%								
5. SunRail Management & Administration Costs include manage	ment of Phase 1 operations	and support for	Pha	se 2 extension	s (p	lanning, desig	nan	d implementa	tion).
 Phase 2 South FY 2018 costs are shown for full year (12 months 7. Costs are in 2018 dollars unless otherwise noted.) of operations.								

Appendix A-3 - Commuter Rail Incremental Annual O&M Costs - Phase 2 North Project

TBD