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Product Name: **C-TRAN BUS FLEET MANAGEMENT PLAN (BFMP)**

PMP Appendix: APPENDIX K

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ABSTRACT: This deliverable articulates the C-TRAN bus operating environment, fleet characteristics, and maintenance plans, as well procedures for safety, security, bus assignments and road calls.

C-TRAN

COLUMBIA RIVER CROSSING PROJECT

C-TRAN Bus Fleet Management Plan

FFGA Roadmap
April 12, 2013 Submittal
Revision #4



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Introduction

This Bus Fleet Management Plan developed by the Clark County Public Transportation Benefit Area (dba C-TRAN), fulfills a requirement of the Federal Transit Administration's New Starts Process, and has been prepared in association with the Columbia River Crossing (CRC) Project. The plan articulates the operating environment, fleet characteristics, and maintenance plans, as well procedures for safety, security, bus assignments and road calls. C-VAN paratransit service mandated by the Americans with Disabilities Act (ADA) is included along with deviated fixed-route connector service that serves three of the smaller communities in the C-TRAN service area. Where appropriate, connector service is listed separately, but does utilize the same vehicle type as C-VAN and is budgeted as fixed route. C-TRAN also operates a commuter vanpool program designed to offer an option for commuters who cannot reasonably access traditional transit. An expanded vanpool program will serve as a major component of the congestion mitigation plans surrounding the CRC Project. Also included is C-TRAN's Fourth Plain Bus Rapid Transit (BRT) Project.

All data in this plan falls into the range of 2008 through 2021. Projected data is based on C-TRAN's 20-Year Transit Development Plan (TDP), High Capacity Transit System and Finance Plan and BRT Small Starts Application Submittal. It should be noted that the Fourth Plain BRT project assumes the completion of the CRC project, with light rail transit (LRT) extended from Portland into downtown Vancouver, in 2019 as part of that project. The BRT service is being designed to utilize the LRT guideway in downtown Vancouver, though that will not occur until at least 3 years after the BRT service is in operation.

Unless noted otherwise, fleet and system information contained in this Plan are stated as of December 31, 2011, corresponding with C-TRAN's most recent Comprehensive Annual Financial Report (CAFR).

Chapter 1- Background

1.1 Agency Overview

C-TRAN was formed by a public vote in 1980 and is officially classified as a Public Transportation Benefit Area (PTBA). C-TRAN is funded by 0.7% local sales tax and governed by a nine member board of directors selected from elected officials representing the various jurisdictions served by C-TRAN, plus a non-voting labor representative. C-TRAN's service area is 137.14 square miles and has a service area population of over 350,000. C-TRAN's service boundary includes the city of Vancouver and the Vancouver Urban Growth Area (as delineated in 2005); and the current city limits only of Battle Ground, Camas, La Center, Ridgefield, and Washougal; and the Town of Yacolt.

C-TRAN operates 108 buses to provide fixed route service on 19 local, 7 express commuter and 4 limited routes, in addition to dial-a-ride Connector service in Camas, Ridgefield and La Center. Where appropriate, Connector has been listed separately. The Connector service has some dedicated vehicles and also uses some fixed route coaches on an as needed basis. The dedicated vehicles are listed in Chapter 2.

C-TRAN operates 52 paratransit vehicles to provide ADA complementary service (C-VAN) for persons who, due to a qualifying disability, are unable to use regular C-TRAN buses. In 2009, C-TRAN began operating a vanpool program that, as of December 31, 2012, had grown to a fleet size of 29 vehicles.

C-TRAN operates three transit centers located at:

- 99th Street Transit Center at Stockford Village
- Fisher's Landing Transit Center
- Vancouver Mall Transit Center

In addition, C-TRAN manages six park-and-ride facilities providing over 1,600 parking spaces with direct access to express commuter services and local routes. From these facilities, C-TRAN's express routes provide direct service into TriMet's downtown Portland transit mall and connecting service to the MAX light rail system at the Parkrose/Sumner Transit Center on I-205, and to the Delta Park/Vanport Light Rail Station on I-5. These access points allow C-TRAN passengers to reach destinations throughout the Portland metropolitan area including Portland International Airport. In 2012, C-TRAN provided nearly 6.9 million passenger trips covering over 37 million passenger miles. All C-TRAN routes meet Americans with Disabilities Act (ADA) accessibility requirements.

Clark County is a suburb of Portland. As a result, thousands of Clark County residents commute to work in Portland every day. Traffic congestion and freight movement crossing the Columbia River is a major regional and even national transportation issue. The Southwest Washington Regional Transportation Council (RTC) serves as the Metropolitan Planning Organization for the area and oversees the Transportation Improvement Plan (TIP) process.

All of C-TRAN's vehicles, except Vanpool, are maintained at a central facility located at 2425 NE 65th Avenue in Vancouver, Washington. C-TRAN's vanpool fleet is maintained under contract with an outside vendor.

1.2 Ridership

C-TRAN has experienced a steady increase in ridership across all modes in recent years. A redesigned system plan (implemented November 2007) combined with higher gasoline prices resulted in a transit friendly environment that peaked in 2008 and was followed by a ridership decline in 2009.

Figure 1: System Ridership 2008 through CRC Project Completion

| Year | Annual Ridership | Data Type |
|-------|------------------|-----------|
| 2008 | 7,230,617 | Actual |
| 2009 | 6,430,633 | Actual |
| 2010 | 6,552,570 | Actual |
| 2011 | 6,958,604 | Actual |
| 2012 | 6,888,950 | Actual |
| 2013 | 7,526,997 | Projected |
| 2014 | 7,627,248 | Projected |
| 2015+ | 9,012,610 | Projected |
| 2016 | 9,167,953 | Projected |
| 2017 | 9,390,035 | Projected |
| 2018 | 9,982,097 | Projected |
| 2019* | 10,323,718 | Projected |
| 2020 | 10,453,004 | Projected |
| 2021 | 10,580,700 | Projected |

+ Includes projected new ridership from Fourth Plain BRT project 2015-2021

* Includes projected new ridership from Columbia River Crossing Light Rail into Vancouver 2019-2021

Chapter 2- Operational Summary

2.1 Bus Fleet Overview

Figure 2-1: C-TRAN Fixed Route Fleet (as of December 31, 2012)

| Manufacturer-Model | Length | Seats-Standees | Year | # in Fleet |
|-------------------------------------|--------|----------------|------|------------|
| Optima Low Floor | 29' | 23-10 | 2004 | 10 |
| Gillig Low Floor | 29' | 26-16 | 2008 | 5 |
| Gillig Phantom | 35' | 37-18 | 1995 | 4 |
| Gillig Low Floor | 35' | 32-22 | 2008 | 5 |
| Gillig Low Floor | 35' | 32-22 | 2009 | 7 |
| Gillig Low Floor | 35' | 32-22 | 2010 | 4 |
| Gillig Phantom | 40' | 45-15 | 1995 | 3 |
| Gillig Phantom | 40' | 45-15 | 1999 | 14 |
| Gillig Phantom | 40' | 45-15 | 2002 | 1 |
| Gillig Phantom | 40' | 45-15 | 2003 | 36 |
| Gillig Hybrids Diesel-Electric (LF) | 40' | 36-28 | 2010 | 4 |
| Gillig Hybrid Diesel-Electric (LF) | 40' | 36-28 | 2008 | 12 |
| Ford Eldorado | 25' | 13-0 | 1997 | 1 |
| Ford Eldorado | 25' | 13-0 | 1999 | 1 |
| Ford Eldorado | 25' | 15-0 | 2008 | 1 |
| Total Fleet Size | | | | 108 |
| Average Age of Bus in Fleet | | | | 8.3 |

C-TRAN maintains a contingency fleet of ten 30, 35 and 40 foot buses that are not included in the table above. C-TRAN does not anticipate the ratio of smaller to larger buses changing significantly. However, the realization of a BRT project could result in the purchase and operation of articulated BRT-style buses.

Figure 2-2: C-TRAN Paratransit Fleet (as of December 31, 2012)

| Manufacturer-Model | Length | Seats-Standees | Year | # in Bus Fleet |
|-----------------------------|---------|----------------|------|----------------|
| Ford Eldorado | 25' | 16-0 | 2004 | 11 |
| Ford Eldorado | 25' | 14-0 | 2006 | 7 |
| Ford Eldorado | 25' | 14-0 | 2007 | 13 |
| Ford Eldorado | 25' | 15-0 | 2008 | 5 |
| Ford Eldorado | 25' | 15-0 | 2010 | 9 |
| Toyota Sienna | Minivan | 7-0 | 2010 | 7 |
| Total Fleet Size | | | | 52 |
| Average Age of Bus in Fleet | | | | 4.5 |

The C-VAN fleet is used for shared ride, curb-to-curb service for individuals unable to use fixed route buses due to disability or a disabling health condition. C-VAN does provide limited door-to-door service for riders with special circumstances. All high floor 25-foot vehicles in operation are wheelchair accessible and fully compliant with ADA standards. C-TRAN also deploys Toyota Sienna Mini-vans to transport groups of ambulatory ADA riders in an effort to increase the program's cost effectiveness.

Figure 2-3: C-TRAN Contingency Fleet (as of December 31, 2012)

| Manufacturer-Model | Length | Seats-Standees | Year | # in Bus Fleet |
|-----------------------------|--------|----------------|------|----------------|
| Gillig Phantom | 30' | 30-150 | 1995 | 2 |
| Gillig Phantom | 35' | 37-18 | 1995 | 1 |
| Gillig Phantom | 40' | 45-15 | 1995 | 5 |
| Gillig Phantom | 40' | 40-13 | 1998 | 2 |
| Total Fleet Size | | | | 10 |
| Average Age of Bus in Fleet | | | | 16.3 |

Figure 2-4: C-TRAN Vanpool Fleet (as of December 31, 2012)

| Manufacturer-Model | Length | Seats | Year | # in Van Fleet |
|------------------------------|---------------|-------|------|----------------|
| Chevrolet Uplander | Mini Van | 7 | 2008 | 12 |
| Toyota Sienna | Mini Van | 7 | 2010 | 5 |
| Dodge Caravan | Mini Van | 7 | 2012 | 2 |
| Chevrolet Express | Full Size Van | 12 | 2009 | 8 |
| Chevrolet Express | Full Size Van | 12 | 2012 | 2 |
| Total Fleet Size | | | | 29 |
| Average Age of Vans in Fleet | | | | 1.8 |

Figure 2-5: Total Fleet Units by Mode

| | 2008 Actual | 2009 Actual | 2010 Actual | 2011 Actual | 2012 Actual | 2013 Project | 2014 Project | 2015 Project | 2016 Project | 2017 Project | 2018 Project | 2019 Project | 2020 Project | 2021 Project |
|-------------------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Fixed Route | 123 | 113 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 |
| F/R Peak Fleet/Spares* | 100/ 23 | 83/ 30 | 88/ 20 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 | 91/ 17 |
| C-VAN | 53 | 68 | 61 | 58 | 52 | 52 | 52 | 58 | 58 | 58 | 60 | 62 | 64 | 67 |
| C-VAN Peak Fleet/Spares | 47/ 6 | 47/ 21 | 39/ 22 | 39/ 19 | 44/ 8 | 44/ 8 | 44/ 8 | 49/ 9 | 49/ 9 | 49/ 9 | 51/ 9 | 53/ 9 | 55/ 9 | 58/ 9 |
| Vanpool | 0 | 30 | 22 | 20 | 29 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| VP Spares* | 0 | 21 | 13 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

It should be noted that actual vehicle counts may not reflect the arrival of new vehicles or the anticipated removal of older vehicles during each calendar year.

2.2 Service Overview

C-TRAN operates a number of service classes including Express Commuter routes from several park and ride facilities in Clark County to Portland, Oregon; Limited Express routes serving MAX Light Rail on Interstates 5 and 205; local fixed routes providing service throughout the C-TRAN service area in Clark County; Connector deviated fixed routes in smaller communities; ADA complimentary paratransit; and Vanpool for commuters whose trip is at least 10 miles one-way, and begins, ends, or passes through the C-TRAN service area.

Figure 2-6: C-TRAN Operating Characteristics

| | Weekday Span of Service | Weekday Peak/Base Fleet | Saturday Span of Service | Saturday Peak/Base Fleet | Sunday Span of Service | Sunday Peak/Base Fleet |
|--|-------------------------------|-------------------------------|--------------------------------|--------------------------------|---------------------------|------------------------------|
| Fixed Route | 4:47 am- 12:39 am | 87/59 | 6:20 am- 12:33 am | 36/36 | 6:19 am- 12:32 am | 26/26 |
| ADA Paratransit (C-VAN) | 4:45 am- 12:00 am | 39 | 6:15 am- 12:00 am | 19 | 6:15 am- 12:00 am | 20 |

C-TRAN Dispatch is operational prior to, during and after all hours of revenue service seven days a week. Dispatch Supervisors are responsible for the day-to-day assignment of vehicles including deployment of replacement vehicles as needed for maintenance.

Hours of Operation

Fixed Route Dispatch

Monday-Friday 3:30 a.m.– 1:00 a.m.

Saturday 5:00 a.m.– 1:00 a.m.

Sunday 5:30 a.m.– 1:00 a.m.

C-VAN Dispatch

Monday-Friday 4:00 a.m.– 12:00 a.m.

Saturday 5:30 a.m.– 12:00 a.m.

Sunday 6:00 a.m.– 12:00 a.m.

2.3 Service Standards

The C-TRAN Service Performance and Design Standards provide a framework to monitor existing and future transit service performance, guide service improvement strategies, and build upon the existing ridership base.

For the purposes of this report, the following service standards apply for the various C-TRAN service types:

Fixed Route (Local, Limited):

Service performance is measured against a variety of goals including, but not limited to:

- 27.1 Passengers/Revenue Hour
- \$3.40 Subsidy per Passenger
- 80% On-Time Performance at all Time Points

Fixed Route (Express):

Service performance measured against a variety of goals including, but not limited to:

- 64% Capacity Utilization
- \$2.17 Subsidy per Passenger
- 75% On-Time Performance at all Time Points

C-VAN Service:

Service performance measured against a variety of goals including, but not limited to:

- 3.0 Passengers/Revenue Hour
- \$37.62 Subsidy per Passenger
- 100% On-Time Performance

Vanpool Service:

Deployment and performance measured on a case by case basis depending on demand, geography, utilization, fleet availability, and operating costs. Standards and requirements include but are not limited to:

- Minimum 5 people per van
- Minimum 10 mile one-way trip distance
- Recover 100% of the operating costs in passenger fares
- Van must travel from, to, or through the C-TRAN service area

2.4 C-TRAN Vanpool Overview

Initiated in 2009, the C-TRAN Vanpool Program offers an option for commuters who cannot easily access traditional fixed route transit. Qualified vanpools travel at least 10 miles one-way, have 5 to 12 riders per van, and begin, end, or pass through the C-TRAN service area. As of December 31, 2012, the number of in-service vanpools had grown to 26 and an additional 12 groups were listed as “waiting” for an available van. To begin meeting this demand, 9 new vans will be added to the C-TRAN program within the first 6 months of 2013. Vanpool has been identified as an integral component of the Columbia River Crossing Project’s Transit Demand Management Plan.

Figure 2-7 Local Service Fixed Route Frequency

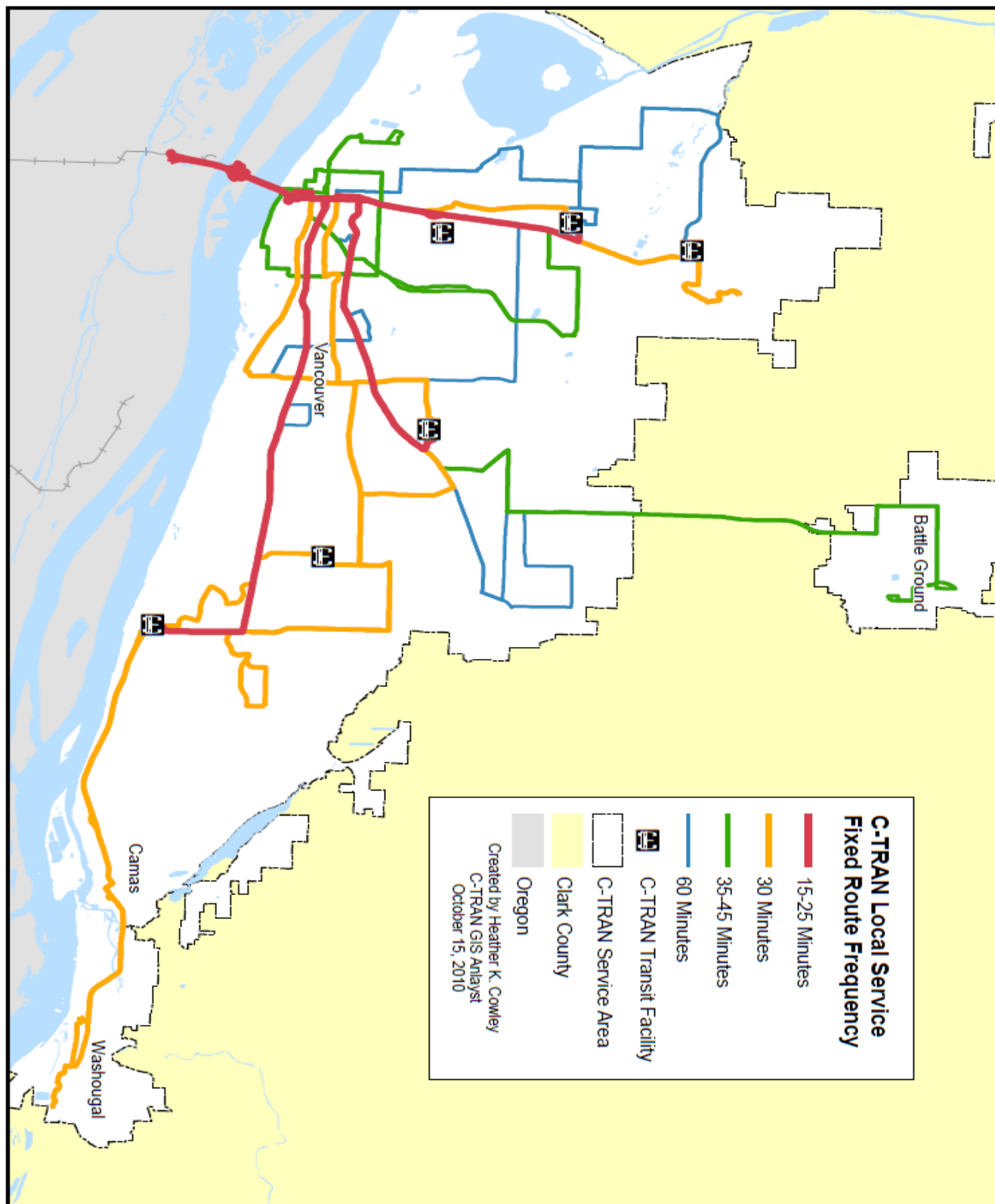
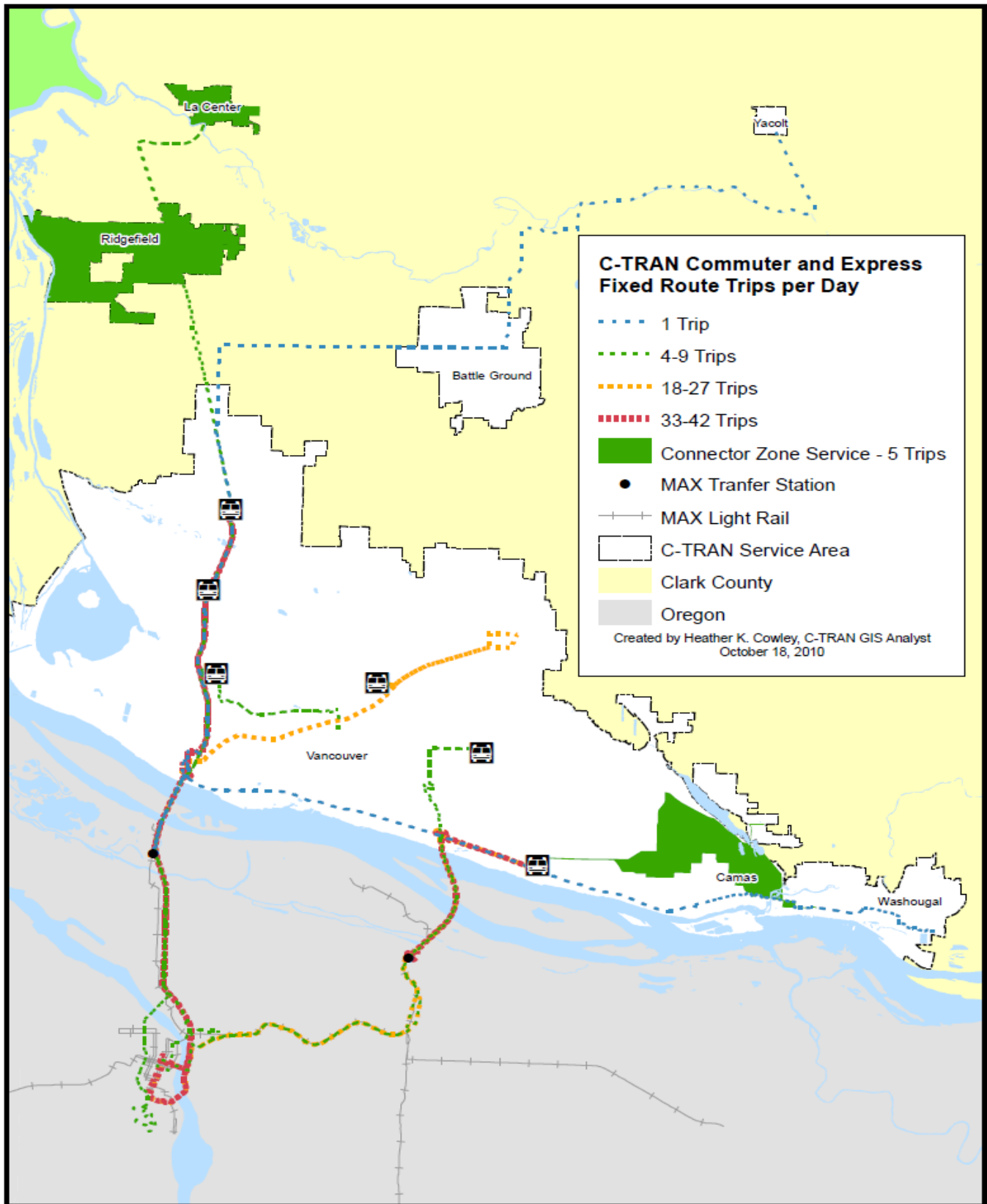


Figure 2-8 Commuter & Express Fixed Route Service



2.5 C-VAN Service Overview

C-TRAN's ADA complementary paratransit service, C-VAN, is a curb-to-curb, shared-ride service for individuals with disabilities who are unable to use C-TRAN's regular buses. Passengers must meet the Americans with Disabilities Act (ADA) of 1990 eligibility standards to utilize the service, and ride reservations must be made one day in advance. C-VAN operates during the same hours as fixed route and serves qualified individuals within $\frac{3}{4}$ of a mile of a C-TRAN fixed route.

2.6 Contingency Fleet Plan

C-TRAN's Contingency Fleet Plan provides spare capacity for use in accordance with Federal Transit Administration (FTA) policy. The FTA permits transit agencies to place buses in an inactive contingency fleet for future emergency use in lieu of disposition.

Buses held in contingency can be used in cases of local or regional evacuations, natural disasters and other emergencies. Buses that qualify for contingency will have reached the end of their useful life as defined by the FTA. These thresholds include:

- A standard-sized, heavy-duty bus (35-60 feet) must be in service twelve (12) years or have traveled more than 500,000 miles.
- A medium-sized, heavy-duty bus (30 feet) must be in service ten (10) years or have traveled more than 350,000 miles.
- A small, medium-duty bus (under 30 feet) must be in service seven (7) years or have traveled at least 200,000 miles.
- Other vehicles such as regular and specialized vans must be at least four (4) years old or have traveled more than 100,000 miles.
- In the case of a rehabilitated bus, it will have been in revenue service in excess of five (5) years from the date of rehabilitation.

As of December 31, 2012, C-TRAN had 10 standard-sized buses in its fixed route contingency fleet for use in case of emergency.

Storage, Maintenance, and Funding

The contingency fleet will be stored on site for security and to allow ready access. On-site availability also facilitates routine preventative maintenance including periodic start-ups, inspections and recordkeeping. Funds required for ongoing operational and maintenance costs are included in C-TRAN's operating budget.

2.7 Support Vehicles

C-TRAN utilizes and maintains 33 vehicles and trailers to support operations, maintenance, and staff. Support vehicles vary in size, shape and purpose including 16 automobiles and minivans for road supervision, security and staff transport; and 17 light and heavy duty trucks for vehicle and facilities maintenance staff. These vehicles are stored and maintained on site and budgeted for replacement on an as needed basis. Given the utilitarian nature of support vehicles, no further fleet description is provided.

Chapter 3- Maintenance

3.1 Current Maintenance Staffing

C-TRAN's Maintenance Department functions 24-hours a day, seven days a week providing routine preventive maintenance and repair for the fixed route, paratransit and support vehicle fleet. The following table lists C-TRAN maintenance staff by position.

Figure 3-1 Budgeted Maintenance Staff

| Position Title | # in position |
|--|---------------|
| Director of Maintenance | 1 |
| Fleet Maintenance Manager | 1 |
| Fleet Maintenance Supervisor | 3 |
| Janitor/Hostler – Full time | 1 |
| Janitor/Hostler – Part time | 4 |
| Vehicle Service Worker | 9 |
| Preventative Maintenance Worker – Tire | 1 |
| Preventative Maintenance Worker - Lube | 4 |
| Lead Mechanic | 3 |
| Mechanic | 13 |
| Coach Technician | 3 |
| Maintenance Training Supervisor | 1 |
| Facility Maintenance Manager | 1 |
| Lead Facility Maintenance Worker | 1 |
| Facility Maintenance Mechanic Apprentice | 1 |
| Facility Maintenance Worker | 2 |
| Facility Service Worker | 4 |
| Facility Helper | 1 |
| Inventory Supervisor | 1 |
| Inventory Analyst | 1 |
| Inventory Technician | 4 |
| Total Maintenance Positions | 60 |

C-TRAN's Supported Work Program employs disabled workers in part-time, Janitor/Hostler positions to clean bus interiors and exteriors. These individuals earn a competitive wage, work a regular daily schedule, and are supervised by senior maintenance staff.

3.2 Scheduled Preventative Maintenance

The preventative maintenance program effectively reduces overall maintenance costs by decreasing

the number of road calls and the high cost of unpredictable maintenance activity. Preventive maintenance inspections and service are scheduled at routine mileage intervals with the level of service increasing over time. Preventive maintenance activities follow the requirements and recommendations of the vehicle manufacturer. The program accommodates a variety of vehicle types and uses, with each sub-fleet category having its own preventative maintenance schedule as outlined below.

Fixed Route Coaches

Inspected/serviced every three months/6,000 miles, based on manufacturer's recommendations and oil sampling results.

- A Service (6,000 miles): Safety inspection, proper operation and functions, steam clean, brake adjustment, lubrication, interior/exterior inspection, operating controls, batteries/charging system, air systems, undercarriage, engine/engine compartment, transmission, motor guard system, lube, oil and filter, road test.
- B Service (12,000 miles): A Service in addition to transmission, fuel and coolant filters, plus minor extras.

C Service (18,000 miles): A Service

- D Service (24,000 miles): A Service in addition to transmission, fuel, coolant, hydraulic, and air filters, wheelchair lift/ramp, plus minor extras.
- E Service (30,000 miles): A Service
- F Service (36,000 miles): A Service in addition to major transmission service, fuel and coolant filters, plus minor extras.
- G Service (42,000 miles): A Service
- H Service (48,000 miles): A Service in addition to engine, transmission, and differential oil samples, transmission and differential, replace fuel, coolant, hydraulic, and air filters, plus minor extras.
- 50,000 Miles: Major inspection and service for engine, air suspension, and chassis systems.
- Annual: air-conditioning, farebox, and emissions testing and service.

Demand Response and Fixed Route Cutaways

These vehicles are inspected/serviced every three months/5,000 miles, based on the manufacturers' recommendations and the results of long term oil sample analysis.

- A Service (5,000 miles): Safety inspection, proper operation and functions, steam clean, brake adjustment, lubrication, interior/exterior inspection, operating controls, batteries/charging system, air systems, undercarriage, engine/engine compartment, transmission, motor guard system, wheelchair lift, lube, oil and filter, road test.
- B Service (10,000 miles): A Service in addition to replacing secondary fuel filter.
- C Service (15,000 miles): A Service
- D Service (20,000 miles): A Service in addition to transmission, fuel, coolant, engine and differential fluids, flush hydraulics, air filters, plus minor extras.
- E Service (25,000 miles): A Service in addition to major wheelchair inspection.
- F Service (30,000 miles): A Service in addition to replacing secondary fuel filter.
- G Service (35,000 miles): A Service
- H Service (40,000 miles): A Service in addition to engine, transmission, and differential oil samples, transmission and differential, replace fuel, coolant, hydraulics, and fuel and air

filters, plus minor extras.

- Annual: air-conditioning, and emissions testing and service.

In addition to routine preventative maintenance, C-TRAN Coach Operators conduct a pre-trip inspection prior to departing on their route. The pre-trip inspection includes:

- Start-up and all systems check
- Exterior walk around inspection
- Interior inspection
- Operator’s compartment set up and checks
- Air pressure and brakes check
- Wheelchair lift operation and inspection
- Wheelchair Strap Check
- Radio check upon exiting yard

Defects found upon completion of the pre-trip inspection are reported to dispatch and maintenance via two-way radio. If needed, the vehicle is removed from service and a spare is assigned. If the vehicle can be used, the Operator records the defect on a Vehicle Condition Report that is used by Maintenance to follow-up with the necessary repair.

Staff/Support Vehicles

Staff and support vehicles are inspected/serviced every three months/3,000 miles based on manufacturers’ recommendations and results of routine oil analysis. Shop equipment service inspections are based on hours of operation and are scheduled on hours/months which can vary depending on equipment.

- 3,000 miles/three months: Service inspection of all safety items, major functions, oil changes, and lubrication.
- Annual service includes air conditioning, emissions and emissions control systems.

The effectiveness of preventative maintenance is measured by indicators such as number of road calls and miles between road calls. The table below details the main indicators used to monitor program effectiveness.

Figure 3-2 On-Time Pull Outs & Road Calls

| YEAR | % of On-Time Pull Outs | Miles between Road Calls | | YEAR | % of On-Time Pull Outs | Miles between Road Calls |
|-------------|------------------------|--------------------------|--|------|------------------------|--------------------------|
| 2008 Actual | 97.6 | 11,054 | | 2015 | 0 | n/a |
| 2009 Actual | 98.5 | 11,105 | | 2016 | 0 | n/a |
| 2010 Actual | n/a | 21,285 | | 2017 | 0 | n/a |
| 2011 Actual | 99.7 | 12,707 | | 2018 | 0 | n/a |
| 2012 Actual | 99.8 | 9,140 | | 2019 | 0 | n/a |
| 2013 | 0 | n/a | | 2020 | 0 | n/a |
| 2014 | 0 | n/a | | 2021 | 0 | n/a |

3.3 Preventative Maintenance on ADA Components

Preventative Maintenance has always been, and will continue to be, the focal point of the Maintenance Department's philosophy in assuring that equipment and accessories, both for fixed route and paratransit service, are in proper working condition. This is especially true for the ADA components.

Fleet Maintenance Supervisors oversee mechanic and service workers' daily workloads and monitor equipment performance to assure proper scheduling of preventative maintenance and repairs to optimize efficiency. Basic maintenance criteria are initially based on manufacturers' recommendations and industry experience. Adjustments to techniques, procedures and time intervals between services are made as needed to compensate for wear rates on equipment based on cycling intervals, usage, and commitment to service needs.

Mobility Device Lifts/Ramps – fixed route

- **Minor Service (6,000 miles):** Pressure wash slide rails, inspect and lubricate critical wear points, operate and test safety devices to assure proper operation.
- **Major Service (24,000 miles):** Pressure wash slide rails, inspect and lubricate critical wear points, adjust chains and proximity\limiting switches, replace damaged sensitive pressure mats and edges, test fluid pressures and replace oil filter.

Mobility Device Lifts – cutaways

- **Minor Service (6,000 miles):** Inspect, lubricate and perform operational test to confirm proper operation.
- **Major Service (24,000 miles):** Clean, inspect, lubricate, adjust, and repair broken loose parts. Perform test on all safety systems and repair as needed.

Kneeling Systems

- **Minor Service (6,000 miles):** Inspect front suspension components including air springs, radius rods and skinner valves, warning alarms (when applicable) and electric controls. Lubricate components and test for proper operation of kneeling system and brake interlock.
- **Major Service (50,000 miles):** Inspect for and repair worn suspension components, adjust ride height and kneel height, adjust\repair cycle rates, adjust\repair kneel operation lock-out and brake interlock safety feature, adjust front suspension alignment to manufacturer's specifications.

Mobility Device Restraints

- **Every 6,000 Miles:** Inspect wheelchair tie-down mounting and lock strips for proper securement, inspect tie down straps and belts for proper operation, free of sharp edges, fraying and ease of operation. Inspect accessible seating for proper securement, latching and operation.

Public Address System

- **Every 6,000 Miles:** Inspect and operate system to assure proper performance.

“Stop Requested” Indicators

- **Every 6,000 Miles:** Inspect and operate system to assure proper performance.

3.4 Unscheduled Maintenance

Unscheduled maintenance is classified into four categories: Road Calls, Pullout Repairs, Operator Reported Defects and Unit Repairs & Rebuilds.

- **Road Calls:** Maintenance staff responds in the field to repair and/or replace a disabled or unsafe vehicle.
- **Pullout Repairs:** Usually a minor defect identified by the operator when conducting a pre-trip inspection that maintenance staff can repair prior to the vehicle leaving the property.
- **Operator Reported Defects:** Usually a minor defect captured by the operator on a Vehicle Condition Report that can wait for repair once the vehicle returns to the property.
- **Unit Repairs & Rebuilds:** Extensive repair, replacement or re-build of essential components including engines, transmissions, alternators, starters, AC compressors, rear end differentials, and steering boxes.

C-TRAN's full service body shop provides body and fender work including frame straightening, painting and decal installation.

3.5 Cleaning & Fueling Program

C-TRAN's Vehicle Service Workers ensure that all fleet vehicles are fueled, cleaned and ready for revenue service. All defects found during this cycle are recorded on a Vehicle Condition Report and/or reported to the maintenance supervisor on duty.

3.6 Maintenance Facilities

All fleet and facility maintenance functions are based at C-TRAN's Administration, Operations and Maintenance facility located at 2425 NE 65th Avenue in Vancouver, WA. Built in 1983, the maintenance facility no longer has the space needed for a fleet of today's size. To accommodate the potential for adding articulated buses to the C-TRAN fleet, a facility expansion is being considered and would be funded as part of C-TRAN's Fourth Plain BRT Project. In 2010, C-TRAN made the following maintenance facility improvements:

- Replaced 3 hydraulic bus lifts
- Modified 1 hydraulic bus lift to accommodate buses up to 60 foot in length
- Installed 2 large canopies to expand covered workspace
- Installed a fall protection system
- Installed new hardware and software for time management, work order tracking, maintenance records management and inventory.

3.7 Vanpool Contracted Maintenance

C-TRAN's 29 vanpool vehicles are maintained under contract with a local automotive shop.

Chapter 4- Bus Fleet Management

4.1 Safety Policy

New employees, rehires, part-time employees and those transferred from other departments within the organization, begin a safety orientation on or around their first day on the job. This program provides an introduction to company/department policies, a thorough safety briefing and a facilities tour.

On-going safety education programs are provided to all employees in an effort to increase awareness of accident-causing factors and behaviors and to promote acceptance of safety rules by presenting accident prevention as a positive, desirable and integral part of all work activities. In addition to training required by specific positions and job classifications, basic first aid and CPR training and certification is required for all supervisors and lead positions to ensure that all employees can be afforded first-responder care in the event of sudden illness or injury.

First aid kits are placed and maintained in each employee break room on C-TRAN property and in every fleet vehicle. Safety messages, policies and procedures are posted on designated bulletin boards in an effort to increase employee awareness and to meet legal requirements.

Required postings include:

1. WISHA Poster, LI-416081
2. Industrial Insurance Poster, LI-210-191

3. Citation and Notice (as appropriate)
4. OSHA 200 Summary (specifically during the month of February)

The following programs are examples of major safety programs currently being implemented at C-TRAN:

- Personal Protection Equipment
- Hearing Conservation
- Respirator Awareness
- Lock Out/Tag Out
- Hazardous Communications Program/Employee Right to Know
- Blood Borne Pathogens Exposure Control Plan
- Quarterly Facility Safety Inspections
- On-The-Job Injury Reporting

4.2 Safety Performance Data

Accident frequency data is based on what regulatory agencies define as a government-reportable accident. For C-TRAN, the standard follows reporting rules for the annual National Transit Database (NTD). Reports are also made for minor safety/security incidents following the NTD guidelines.

Figure 4-1 NTD Reportable Statistics

| Reporting Year | # of Incidents Reported to NTD | Miles Between Accidents |
|----------------|--------------------------------|-------------------------|
| 2008 Actual | 7 | 639,529 |
| 2009 Actual | 5 | 857,872 |
| 2010 Actual | 6 | 744,984 |
| 2011 Actual | 5 | 787,891 |
| 2012 Actual | 4 | 978,388 |
| 2013 | 0 | 0 |
| 2014 | 0 | 0 |
| 2015 | 0 | 0 |
| 2016 | 0 | 0 |
| 2017 | 0 | 0 |
| 2018 | 0 | 0 |
| 2019 | 0 | 0 |
| 2020 | 0 | 0 |
| 2021 | 0 | 0 |

Figure 4-2 Minor Safety/Security Incidents

| Reporting Year | # of Minor Incidents Reported to NTD | Reporting Year | # of Minor Incidents Reported to NTD |
|----------------|--------------------------------------|----------------|--------------------------------------|
| 2008 Actual | 60 | 2015 | 0 |
| 2009 Actual | 90 | 2016 | 0 |
| 2010 Actual | 68 | 2017 | 0 |
| 2011 Actual | 21 | 2018 | 0 |
| 2012 Actual | 27 | 2019 | 0 |
| 2013 | 0 | 2020 | 0 |
| 2014 | 0 | 2021 | 0 |

4.3 Security Policy

Security of the C-TRAN system relies on employee, rider and citizen awareness and notification. C-TRAN encourages customers to look for and report unusual items and behaviors along with any observed incidents, hazards and criminal activity while on transit vehicles or properties. Contracted security and C-TRAN field supervision staff are poised with mobile communication for a rapid response to reported emergencies and security alerts. C-TRAN’s Dispatch Center works closely with local law enforcement and EMS via 9-1-1 dispatchers to facilitate the most immediate and appropriate response.

All C-TRAN buses are equipped with on-board security cameras that document activities on and around buses and at transit facilities. Public telephones are also installed at transit center platforms for use in cases of emergency.

4.4 Quality of Service/Performance Monitoring

Accurate schedules, efficient boarding and fare collection systems, proper training and supervision of drivers, and restoring service promptly when disrupted, all encourage transit usage, increasing ridership and system utility.

4.5 Vehicle Deployment Standards

Figure 4-3 Coach Assignment Table

| Route # | Route | Coach Assigned |
|---------|------------------------|----------------|
| 2 | Lincoln | 29’ |
| 3 | City Center | 29’ |
| 4 | Fourth Plain | 40’ |
| 7 | Battle Ground | 35’ |
| 9 | Felida | 29’ |
| 19 | Salmon Creek | 29’ |
| 25 | Fruit Valley/St. Johns | 35’ |

| Route # | Route | Coach Assigned |
|---------|--|----------------|
| 30 | Burton | 40' |
| 32 | Evergreen-Andresen/Hazel Dell Avenue | 35' |
| 37 | Mill Plain/Highway 99 | 40' |
| 39 | Clark College/Medical Center | 29' |
| 41 | Camas/Washougal Limited | 35' |
| 44 | Fourth Plain Limited | 40' |
| 47 | Battle Ground Limited | 29' |
| 65 | Parkrose Limited | 40' |
| 72 | Orchards | 35' |
| 78 | 78th Street | 35' |
| 80 | Van Mall/Fisher's | 35' |
| 92 | Camas/Washougal | 35' |
| 105 | I-5 Express | 40' |
| 134 | Salmon Creek Express | 40' |
| 157 | Lloyd District Express | 40' |
| 164 | Fisher's Landing Express | 40' |
| 177 | Evergreen Express | 40' |
| 190 | Marquam Hill Express | 40' |
| 199 | 99th Street Express | 40' |
| n/a | Connector (Camas, Ridgefield, La Center) | 25'-29' |

4.6 In-Service Repairs/Road Calls

In the event that a revenue vehicle in operation has a maintenance failure, operators will use a dedicated radio channel for reporting the issue. Maintenance personnel will troubleshoot and provide suggested steps in an effort to correct the situation in the field. In some cases, the bus may remain in service and the repair completed at a later time. If a bus can no longer operate or is considered to be in an unsafe condition, maintenance will arrange a replacement.

4.7 Technology Upgrades

In 2005, C-TRAN began installing Intelligent Transportation Systems (ITS) applications in an effort to improve on-time performance, reduce operating costs, and improve customer service. Technology upgrades currently in use include:

- Computer Aided Dispatch & Automated Vehicle Locator
- Automated Passenger Counter
- Mobile Display Terminals
- On-Board Surveillance Cameras

- Scheduling & Run-Cutting
- Automated Stop Announcements
- Demand Response Interactive Voice Response
- Fleet & Fuel Maintenance Management
- Trip Planner

Over the next several years, C-TRAN's technology efforts will continue to build on this foundation. Some future applications may include:

- Transit Signal Priority
- Real Time Information (phone, web, mobile, text)
- Regional Electronic Fare System
- Automated Fare Box
- Yard Management
- Fixed Route Commercial Wireless Data Communications
- Incident Management
- Multi-Modal Advance Transportation Information System

There are also a number of regional initiatives which should be pursued with the cooperation of multiple transit and transportation stakeholders. These include participation in the statewide 511 program, provision of real time traveler information at key activity centers and on priority corridors, and the creation of low cost vehicle tracking and customer information solutions. There are also opportunities for common wireless communications systems and open data access.

4.8 Fleet Retirement and Purchase Plan

C-TRAN's 2030 plan includes capital for purchasing expansion and replacement vehicles over the next 20 years. In addition, the eventual construction of the Fourth Plain BRT and Columbia River Crossing projects will require an additional transit capacity to mitigate construction congestion and shifts in local and regional traffic patterns.

Chapter 5- Future Growth

5.1 Fourth Plain Bus Rapid Transit

The Fourth Plain corridor, currently served primarily by routes 4 and 44, is C-TRAN's highest ridership corridor, accounting for nearly one-third of all boardings on the C-TRAN system. The service has problems associated with poor reliability, increasing travel times, and concerns regarding safety and security. The Fourth Plain BRT Project proposes to replace the current routes 4 and 44 and reduce transit travel time, improve service frequency, improve service reliability, increase transit capacity, and create a different image for transit.

The primary elements of the BRT service include:

- Transit signal priority
- Selected queue jump bypass lanes
- Operation of the transit-exclusive LRT guideway in downtown Vancouver

- Raised platforms for easier access
- Off-board fare collection
- Attractive stations with real-time passenger information and other amenities
- Consolidation of stops
- Uniquely-styled 60-foot hybrid articulated coaches with multiple doors on both sides of the vehicle, door ramps, and the ability to carry bikes on board

The Fourth Plain BRT project proposes to operate between downtown Vancouver and the Westfield-Vancouver Mall. The service would require seven buses for peak operation, with an additional three buses as spares.

The relatively high percentage of spare buses is needed due to the fact that the BRT fleet has unique characteristics (such as doors on both sides of the vehicle) that do not allow for the replacement of BRT buses with conventional buses. Thus, the BRT fleet serves as an independent fleet and, given its limited size, requires a higher spare ratio.

5.2 Columbia River Crossing

The CRC is a bridge, transit and highway improvement project that covers five miles of Interstate 5 from State Route 500 in Vancouver, Washington, to approximately Columbia Boulevard in Portland, Oregon. In 2008, local and regional jurisdictions adopted a Locally Preferred Alternative to include a replacement bridge on I-5 over the Columbia River, and Light Rail transit from the current terminus at the ExpoCenter in Portland through Downtown Vancouver to Clark College. The project proposes to address growing travel demand and congestion; public transportation connectivity and reliability; freight mobility; safety and vulnerability to collisions; pedestrian and bicycle facilities; and seismic vulnerability.

5.3 Light Rail Fleet Management Plan

Light Rail transit operating into Vancouver, WA as part of the CRC project, would be operated by TriMet as an extension of their existing MAX Light Rail network. In that case, C-TRAN would enter into an inter-governmental agreement with TriMet who would be responsible for the operation and maintenance of the Light Rail Fleet necessary for service.

Figure 5-1 C-TRAN Service Map (Effective April 30, 2013)

