Connect Transit

Fleet Management Plan

Revised July 2018

FY2019 –FY2029

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Purpose

The purpose of this plan is to provide information, analysis and recommendations on the Connect Transit current and projected fleet requirements for paratransit and fixed-route service.

The following sections will document peak vehicle requirements, vehicle failures, system and service expansions, vehicle procurements and spare ratio justification.

One of the objectives of the fleet management plan is to properly plan for and carry out the overall management of Connect Transit's vehicle fleet. Demand continues to grow while Connect Transit's resources are scarce, therefore the importance of having a plan cannot be overstated.

The intent is to update the plan on a regular basis as the plan will have input into the transit's capital and operating budget preparation.

Section One: Introduction

Connect Transit has completed and moved into a new facility allowing room for expansion and improvement in services provided to the community. There are two distinct transportation programs that Connect Transit provides fixed route and paratransit.

Total ridership increased from 2,301,075 in FY2017 to 2,329,266 in FY2018.

Paratransit

The paratransit service has continued to grow over the last several years and Connect Transit has had a ridership increase of 7.4% in FY2018 over FY2017.

Data provided in **Table 1.1** is from the Federal Transit Administration's National Transit Database regarding the annual passenger miles and vehicle revenue hours for paratransit service for Connect Transit. In comparing FY2013 to FY2017 the passenger miles increased 162,097 miles or 32,419 miles per year and revenue hours increased 7,213 hours or 1,443 hours per year.

In 2010 Connect Transit operated eight paratransit buses and has now grown to fifteen buses during peak service to keep up with demand. If paratransit ridership continues at its current pace of growing 31.17% over the next five years the ridership will be 127,743 in fiscal year 2023. We are still partnered with Life Center for Independent Living; however, this has not seemed to curb our paratransit growth as predicted.

Table 1.1

FY2013 Paratransit Service	Total	FY2017 Pararansit Service	Total	Difference	Percentage Increase	Ave. % Increase over 5 yrs.
Passenger Miles	324,772	Passenger Miles	486,869	162,097	49.91%	12.48%
Revenue Hours	20,540	Revenue Hours	27,753	7,213	35.12%	8.78%
Operating Expense Per Passenger Mile	$5.36	Operating Expense Per Passenger Mile	$5.32	-$0.04	-0.75%	-0.19%
Annual Trips	58,003	Annual Trips	83,366	25,363	43.73%	10.93%

Fixed Route

The fixed route ridership increased 22,603 passengers to 2,240,244 in FY2018 over FY2017. The service has also grown in the last five years as shown in the data in **Table 1.2.** The ridership has increased 10.37% and revenue hours have increased 17.35% from FY2013 to FY2017.

Table 1.2

FY2013 Fixed Route Service	Total	FY2017 Fixed Route Service	Total	Difference	Percentage Increase	Ave. % Increase over 5 yrs.
Passenger Miles	6,228,647	Passenger Miles	6,737,597	508,950	8.17%	2.04%
Revenue Hours	96,566	Revenue Hours	113,325	16,759	17.35%	4.34%
Operating Expense Per Passenger Mile	$1.21	Operating Expense Per Passenger Mile	$1.37	$0.16	13.22%	3.31%
Annual Trips	2,009,241	Annual Trips	2,217,641	208,400	10.37%	2.59%

Staff believes that ridership can increase 3-5% a year for the next five years. With the new route-restructure it was estimated that ridership would grow 19% during weekdays. Staff at the time estimated an increase of 3% each year over the next five years as a more realistic increase in ridership due to the route restructure. As it turned out the route restructure caused an initial decrease on average of 6.38%. The initial decrease was drastic in the first 4 months averaging 17.25% but began to level out as fiscal year 2017 came to an end.

We can attribute this decrease to a number of factors including but not limited to the fact that ridership was already on the decline within our system. It was also declining both regionally and nationally before the route restructure occurred. There may also have been a period of time where riders needed to get used to the new route changes. Prior to the restructure there had been no major route changes for well over 10-year.

We have now seen in fiscal year 2018 that ridership is beginning to increase once again while our peer agencies are still declining. If ridership increases at the low-end estimate of 3% a year, then by fiscal year 2023 ridership will increase to 2,597,056 rides, a 15.9% increase over FY2018 ridership.

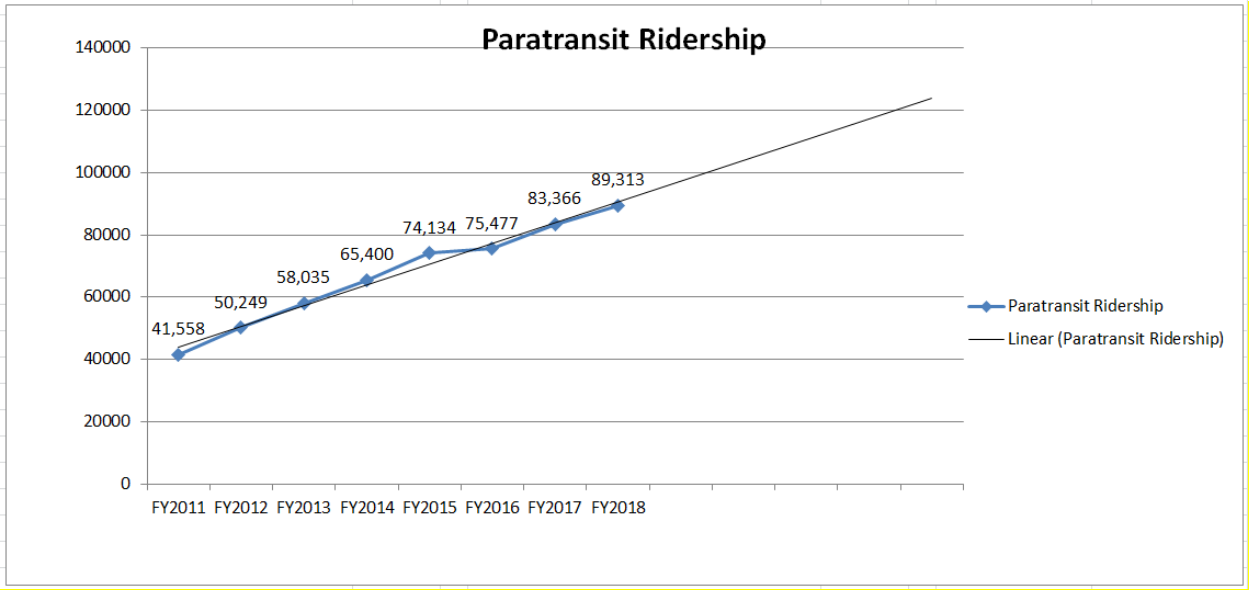
Growing Interest

Connect has had a long-standing partnership with Illinois State University that has increased student ridership. Heartland College has also been a partner with Connect through the universal access cards for students to ride the buses. Country Companies has been added as a universal access partner as well as YouthBuild. Connect continues to explore additional businesses and agencies for the universal access program.

The paratransit service has continued to foster relationships with local organizations like MARC Center, Center for Independent Living and hospitals and nursing homes. This service provides many people the opportunity to travel throughout the community to such places like grocery stores, hospitals, and local events. According to the 2010 Census 10,295 people between ages of 21 to 64 and 13,950 people over the age of 65 had a disability living in Bloomington-Normal. Between the two groups 24,245 people living in Bloomington-Normal have a disability and this provides a pool of potential paratransit customers.

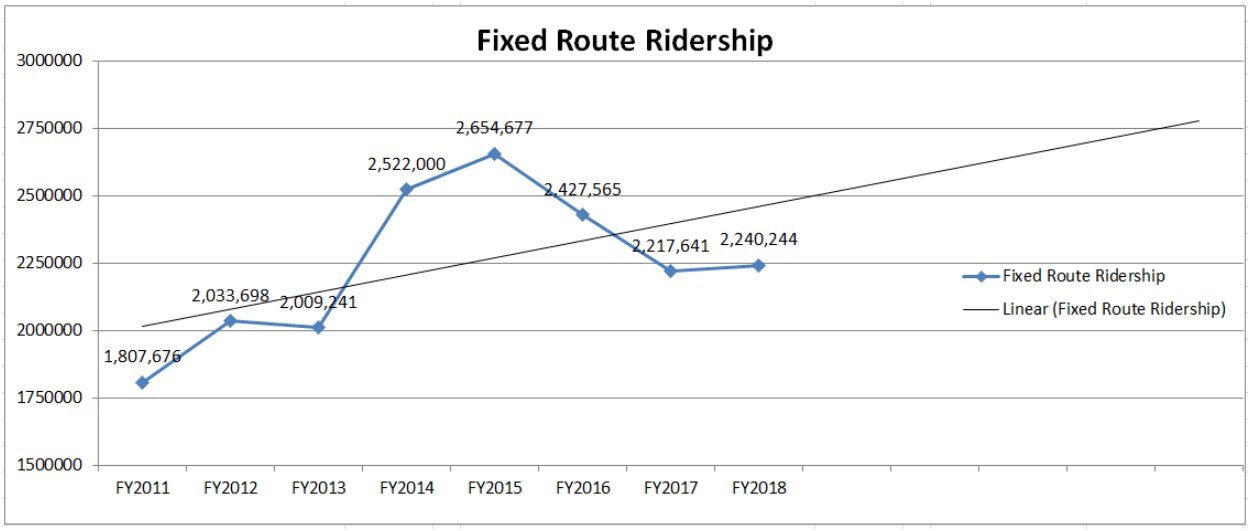
The Chart 1.1 and 1.2 demonstrate the growing trend in ridership for fixed route and paratransit service. The data was provided by FTA's National Transit Database for years 2011 through 2018.

Chart 1.1



As referenced above a large number of disabled citizens are living in Bloomington-Normal and this has had an impact on demand. However, the demand for paratransit has also grown through existing customers telling others about the service.

Chart 1.2



The data provided in **Chart 1.2** demonstrates ridership has fluctuated over the years and most recently in 2013 thru 2017. This increase and decrease in ridership can be explained by external factors outside of transits control with the fluctuation in fuel prices, unemployment, on-demand transportation, and consumers making more purchases online. Connect has also made capital investments in technology such as adding a real-time bus tracking mobile app, automatic

passenger counters on all fixed route buses, and rebranding the entire system. Internal factors are discussed below in factors affecting demand.

Factors Affecting Demand

The “Elements Needed to Create High Ridership Transit Systems” by the Transit Cooperative Research Program, Report 111 sponsored by the FTA, has outlined two internal modes that generate higher ridership. Those modes are price/availability and service, the factors are as follows.

Price/availability factors

- Fare levels;
- Nature of subsidy programs (e.g., with employers, social service agencies, and education institutions) and;
- Amount (including service hours/days) and types of service available.

Service quality factors:

- Route design;
- Service schedules and frequency of service;
- Service reliability (perceived and actual);
- Accessibility features (for persons with disability);
- Parking availability (park and ride lots)
- Availability, ease of obtaining, and usefulness of information and customer assistance;
- Nature of passenger amenities (i.e., related to cleanliness, ascetics, and comfort of vehicles and stations/bus stops/shelters);
- Ease of fare payment (e.g., purchase of prepaid options and type and technology payment);
- Nature of integration (e.g., service/schedule and fare policies and payment) with other agencies in the region;
- Perception of agency safety and security;
- Public image of agency.

In 2015, Connect Transit contracted with Nelson\Nygaard to conduct a comprehensive operational analysis on the fixed route service. The goals of the analysis were to identify strengths and weaknesses of the existing system and make recommendations to improve service and explore opportunities to improve and expand service options. Nelson\Nygaard identified gaps and deficiencies in existing service as well as unmet needs and potential markets in Bloomington-Normal with the help of stakeholder input. Connect implemented a new fixed route structure starting in August of 2016. The first six months of implementing the new routes ridership decreased but ridership has been steadily increasing over the last year.

Section Two: Demand for Revenue Vehicles

Quality of Service

Delivering a high standard of service is the utmost importance to Connect Transit. This shapes a positive image of Connect Transit's services in the community. Operators and dispatchers are relied on heavily to provide excellent customer service as they have direct contact with the customers on a daily basis.

A major element in providing service depends heavily on the quality of vehicles and bus equipment. To provide the quality of service that meets the demand of passengers, a sufficient number of vehicles will be needed and maintained in a state of good repair. Vehicles will have to be replaced once they reach the end of their useful life. This plan incorporates the following elements into providing sufficient vehicles that are reliable and imperative to providing quality service:

- **Fixed Route**
  The goal is to replace vehicles once they reach the end of their useful life, in order to ensure the fleets reliable and does not exceed the state of good repair life expectancy projections. However, capital budget constraints have forced Connect Transit to extend the life of buses three to four years beyond their recommended useful life. This practice also puts a strain on the operating budget as bus parts become obsolete and repairs more expensive as the bus ages. Our strategy is to gradually replace our aging fleet with new and more energy efficient buses. We have already replaced a portion of our fleet with five buses delivered in FY15, seven in FY16 and ten in FY18. We will continue to implement this plan by replacing more of our fleet in FY20 through FY22 with zero emission, battery-electric buses.

- **Paratransit**
  The strategy for paratransit service was to replace thirteen buses in fiscal year 2019 through fiscal year 2021. Staff will try to replace light duty buses with low floor ramps instead of wheel chair lift vehicles. Connect has already started this process with the purchase and delivery of four propane vehicles in early fiscal year 2018. The majority of capital funding for paratransit vehicles is provided by the Illinois Department of Transportation through the Consolidate Vehicle Procurement (CVP) Program. The current CVP Program only allows agencies to purchase wheel chair lift equipped vehicles. There is currently a pilot program being sponsored by Illinois Department of Transportation to test low floor light duty buses. However, the CVP Program does not allow agencies to purchase low-floor vehicles nor propane powered vehicles. Connect will apply for buses next year with the idea of replacing current vehicles with low floor medium duty buses. Staff completed a light-duty bus procurement for a maximum of twenty low-floor propane vehicles through fiscal year 2021, but Connect has limited federal funding to purchase both fixed route and paratransit vehicles.

A sustained maintenance program for preventative maintenance and vehicle mechanical failures will maintain vehicles in a state of good repair. Maintaining an ongoing maintenance program requires sufficient spare vehicles to ensure the daily pull-out (vehicles needed) requirements. The plan is developed around a 30% spare ratio for fixed route buses due to the age and high-miles of vehicles and 20% spare ratio for paratransit service.

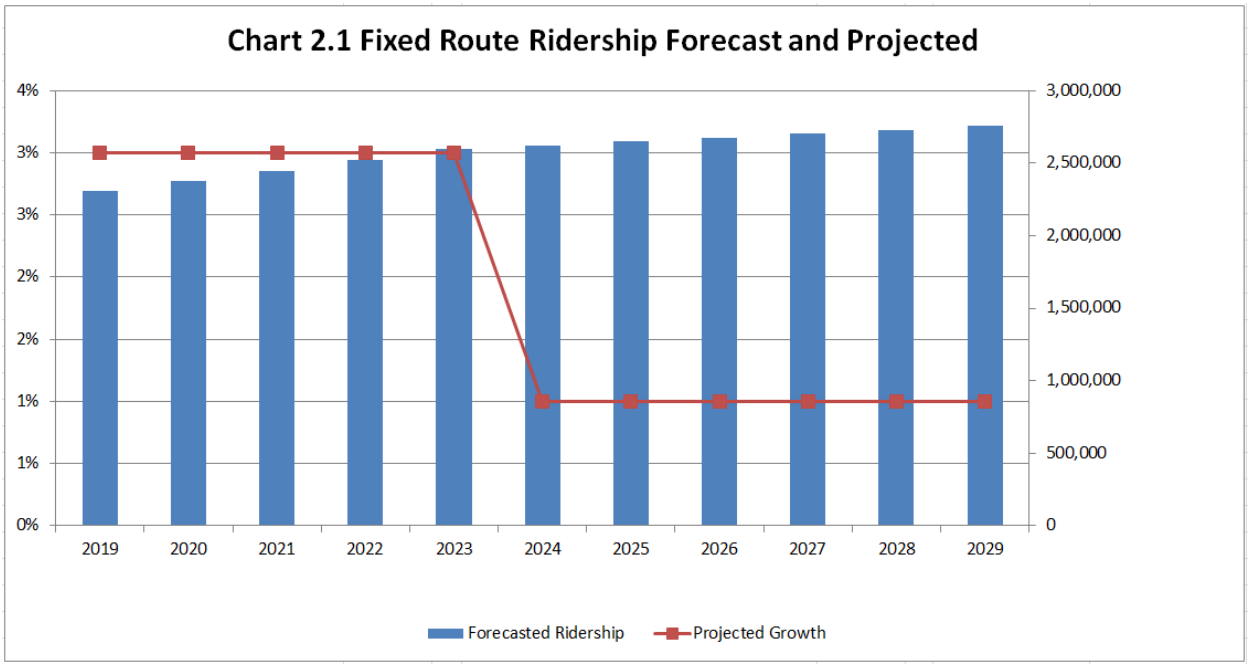
Planning Process

The following describes the task of the planning process that determines fleet size:

- Estimate Passenger Growth: Service planning process is accomplished from ridership data coupled with estimates of future demand. For the purpose of this fleet management plan passenger demand is projected 12 years into the future.
- Establish Productivity Standards, Hours per Vehicle Year, Rides per Vehicle Year and the Resulting Vehicles Required. The productivity standards will be reevaluated by staff yearly.
- Determine Spare Vehicles: on average, fixed route vehicles traveled 33,368 miles and paratransit vehicles traveled 25,751 miles. It's recommended the Connect maintain a 30% spare ratio for fixed route and 20% ratio for paratransit.
- Determine Total Vehicles Needed: The sum of vehicles required in maintaining current productivity standards and those required to respond to observed and projected demand.
- Determine Scheduled Procurement and Resulting Fleet Needs: The number of vehicles at the beginning of the year and the required expansion based on the forecasted ridership and the required replacement vehicles.

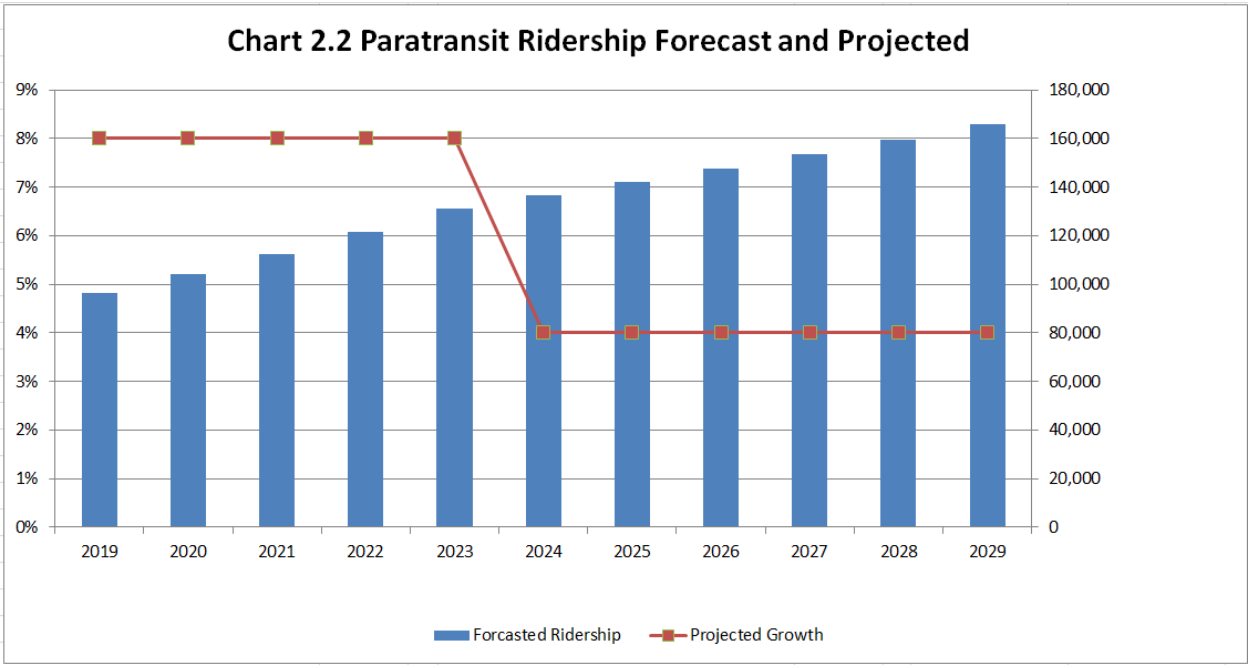
Determining Demand

As was mentioned in the previous section, staff is estimating ridership for fixed route will increase 15% in five years or 3% per year. Staff is estimating Paratransit service to increase 40% over five years or 8% per year. Chart **2.1 and 2.2** displays the projected ridership and growth rate for Connect through FY2029.



The projected growth for fixed route ridership in **Chart 2.1** includes 3% increase for FY2019 through FY2023. The growth rate will slow to 1% for FY2024 through FY2029. External factors

such as fuel prices and unemployment rates will influence the increase or decrease in ridership over the long periods of time such as twelve years.



Increases in paratransit ridership stems from the five-year rate of growth and the Census Bureau data regarding people with disabilities and Bloomington-Normal's population growth. As the elderly population ages, they will begin to qualify for ADA paratransit service. Over a ten-year period Connect Mobility service has increased over 8% a year and it is expected to increase 8% a year from FY2019 thru FY2023. With increased service and frequency to the fixed routes a decrease in the projected growth to 4% will occur in 2024 through 2029. It's important to keep a higher spare ratio for paratransit buses because the service is driven entirely by demand.

Peak Vehicle Requirements

Peak vehicle requirement is the total number of vehicles needed in the peak periods to satisfy passenger demand while maintaining productivity standards.

Fixed Route

The peak vehicle is 29 vehicles in fixed weekday service.

Paratransit

The peak vehicle requirement is 15 vehicles in paratransit weekday service.

Section Three: Supply of Revenue Vehicles

Supply and the Useful Life of Revenue Vehicles

In Federal Transit Administration Circular 5010.1D, FTA issued useful life policy for transit buses. The purpose and the goal of the policy was to establish a minimum on the number of

years (and/or miles) that transit vehicles must remain in service to ensure a sufficient return on the resources invested in capital purchases. The requirement recognizes five different service life categories based on the length, weight, and capacity.

Connect Transit fixed route fleet has 30, 35, and 40 foot buses. The 30 foot buses have a 10 year or 350,000 mile minimum service life expectancy and the 35 and 40 buses have a 12 year or 500,000 mile minimum service life expectancy. All of the paratransit buses have a 5 year or 150,000 mile minimum service life expectancy.

The remainder of this revenue fleet management plan reflects the status of Connect Transit current fleet beyond FY2017.

Vehicle Age

It is the goal of this plan to replace buses at the minimum service life expectancy of miles or years. Unless replaced on a timely basis the reliability of Connect Transit's vehicle fleet will be affected by vehicle breakdown and unscheduled vehicle repairs. Connect has purchased twelve fixed route buses throughout 2015 and 2016 as well as ten in 2018. Even with these new buses Connect still has a backlog of twelve vehicles that are past their useful life and will grow to seventeen buses in 2023.

There are thirteen paratransit vehicles that need to be replaced in 2019 through 2021 and there is a need to add paratransit vehicles to maintain a 20% spare ratio. In FY19 all but four of Connect Transit's paratransit vehicles will meet or exceed the FTA's five year minimum service life expectancy, unless replaced in a timely basis.

Vehicle Miles

The fixed route fleet travels on average 33,368 miles a year. The thirty-five foot vehicles travel on average 43,292 miles per year and eclipsed the minimum service life requirement of 500,000 miles in 11.55 years. Paratransit vehicles travel 25,751 miles per year on average and eclipse the service life requirement of 150,000 miles in 5.82 years.

Fixed Route

There are 12 buses that currently meet the minimum mileage service life requirements. At the current rate one additional bus will exceed the minimum life and mileage requirements in 2022 and four more in 2023.

Paratransit

Connect has purchased four vehicles in 2017 to have as spare buses for Connect Mobility service. The demand for paratransit service has increased the need for additional light duty buses. Connect will need to purchase and replace a total thirteen vehicles that are beyond their useful life in fiscal year 2019 through 2021.

Fleet

The vehicle inventory included the vehicles used for revenue service, maintenance required spare vehicles. Table 3.1 and 3.2 summarizes the vehicle inventories for each service.

Table 3.1 FY2019 Fixed Route Fleet

Fixed Route Revenue Fleet	Spare Vehicles	Spare Ratio	Total Fleet
29	10	26%*	39

Table 3.2 FY 2019 Paratransit Fleet

Paratransit Revenue Fleet	Spare Vehicles	Spare Ratio	Total Fleet
15	2	12%	17

Spare Ratio

The spare ratio ensures system reliability and therefore an adequate number of spare vehicles are required. The number of spare vehicles is the difference between the total fleet and peak demand. The spare ratio for fixed route is nearly adequate for now as long as we are able to replace buses over the next few years.

The goal is to grow the fleet to the correct size and reach an operating spare ratio of 20% for paratransit and 30% for fixed route.

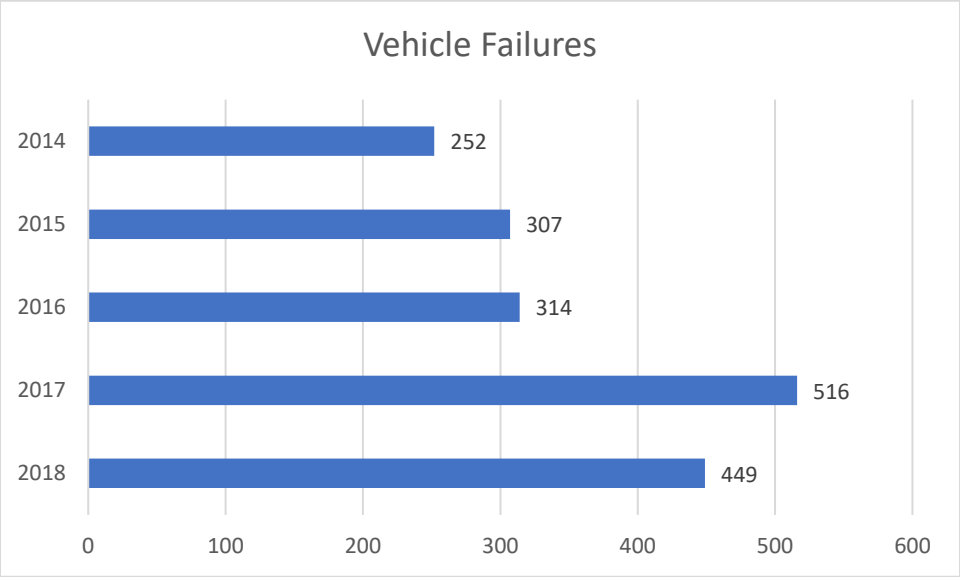
Connect Transit maintains a spare ratio of higher than 20% on fixed route due to the age and miles of the fleet.

Vehicle Failure Definitions

Safety is a priority for Connect Transit. When notified of a problem with safety-related equipment, the vehicle is removed from service. Removing the vehicle from service eliminates risks to passengers. Loose lug nuts, brake failures, engine overheat conditions, and wheel chair lift failure are examples of safety-related failures that require a vehicle to be removed from service.

Chart 3.1 indicates the number of vehicle failures that Connect has experienced in the past and the data is provided by National Transit Database.

Chart 3.1 Vehicle Failures



Since 2014 the number of vehicle failures has increased due to the age and miles of the fixed route fleet.

Section Four: Summary of Vehicle Demand

Planned Vehicle Procurement and Replacement

Connect Transit procurement cycle is designed to help ensure reliable and improving transportation services to the Bloomington-Normal community. Three factors influence the vehicle procurement cycle:

1. System Growth: Changes in passenger demand, service area, and route coverage.
2. Age replacement: Retirement of vehicles meeting service life expectancy.
3. Availability of Funds: Capital has competing requirements and has financial constraints.

Anticipated Growth

The life cycle of paratransit vehicle is seven years and fixed route bus is twelve years. Paratransit service is required by ADA law to respond to demand making it much more dynamic than fixed route service. The demand for paratransit is figured using the growth rate of the last five years and the known number of people with disabilities in Bloomington-Normal. Fixed route demand is estimated using previous five years growth rate.

This section represents both the short term and long-term growth of fleet and ridership for FY19 through FY2029.

Short Term Growth

Fixed Route

The need for the procurement of 12 buses through 2020 is as follows:

- FY19 - 4 buses
- FY20 - 4 buses
- FY21 - 4 buses

If all 12 buses are replaced the average age of the fleet will be 3.95 years old in FY21. The Transportation Improvement Plan is financially constrained due to the lack of formula grant funds that Connect Transit has for replacement vehicles and therefore Connect does not have the capital funding to replace all these vehicles. Connect plans to replace 10 diesel buses with battery-electric buses in FY19 and FY20. Over the next ten years Connect will replace diesel buses with battery-electric buses, because the operational cost is lower and environmentally friendly.

Paratransit

The need for the procurement of 13 vehicles through 2020 is as follows:

- FY19 - 5 vehicles
- FY20 - 5 vehicle
- FY21 - 3 vehicles

All 13 of these buses are for replacement vehicles. Connect plans to replace light-duty diesel buses with propane buses over the next three years. These buses will be funded thru Illinois Department of Transportation Central Vehicle Procurement Program. The average age of the fleet will be 1.82 years old in FY2021.

Long Range Horizon

In applying the growth rates from the last five years into a long-range plan, Connect Transit will experience moderate growth. As noted in section one under factors affecting demand, the TCRP Report 111 identified large increase in ridership for agencies that modified route design, service schedules, frequency, and service reliability. The consultants for the route restructure have estimated a 19% increase in ridership over an 18 to 24-month period. Over the first six months ridership decreased and in the last 3 months has increased 20%. The paratransit ridership will have significant increases in ridership due to the demand for the service.

Attachment 1 and Attachment 2 depict the long-term ridership growth and anticipated procurement of vehicles for fixed route and paratransit. The fleet requirements will increase dramatically over the next five and ten years. In order to efficiently and effectively meet the demand and grow ridership the total fleet will need to increase 25% by 2027.

Attachment 1
Fixed Route Long Term Growth

Fiscal Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Forecasted Ridership	2,307,451	2,376,675	2,447,975	2,521,414	2,597,056	2,623,027	2,649,257	2,675,750	2,702,507	2,729,532	2,756,828
Ridership Growth rate	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Required Pull-Outs (fleet nee	27	28	29	30	30	31	31	31	32	32	32
Maintenance Spare 20%	5	6	6	6	6	6	6	6	6	6	6
Total Vehicles Needed	32	33	34	35	36	37	37	38	38	38	39
Fleet (beginning of year)	41	43	43	44	44	44	46	46	48	50	50
Expansion	2	0	1	0	0	2	0	2	2	0	0
Replacement	6	5	5	1	4	0	0	0	5	7	10
Scheduled Procurement	8	5	6	1	4	2	0	2	7	7	10
Fleet (end of year)	43	43	44	44	44	46	46	48	50	50	50
Annual Fleet Growth	4.88%	0.00%	2.33%	0.00%	0.00%	4.55%	0.00%	4.35%	4.17%	0.00%	0.00%

Attachment 2

Paratransit Long Term Growth

Fiscal Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Forecasted Ridership	96,458	104,175	112,509	121,509	131,230	136,479	141,938	147,616	153,521	159,661	166,048
Ridership Growth rate	8%	8%	8%	8%	8%	4%	4%	4%	4%	4%	4%
Required Pull-Outs (fleet nee	14	14	15	15	16	16	16	17	17	17	17
Maintenance Spare 20%	3	3	3	3	3	3	3	3	3	3	3
Total Vehicles Needed	17	17	18	18	19	19	19	20	20	20	20
Fleet (beginning of year)	17	17	18	18	19	19	19	20	20	20	20
Expansion	1	0	1	0	1	0	0	1	0	0	0
Replacement	8	0	0	4	5	9	0	0	4	6	9
Scheduled Procurement	9	0	1	4	6	9	0	1	4	6	9
Fleet (end of year)	18	17	19	18	20	19	19	21	20	20	20
Annual Fleet Growth	5.88%	0.00%	5.56%	0.00%	5.26%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%