The Corporation of the City of Stratford
Community Services Sub-committee
Open Session
AGENDA

Date:	Thursday, June 15, 2023
Time:	4:30 P.M.
Location:	Council Chamber, City Hall
Sub-committee Present:	Councillor Beatty - Chair Presiding, Councillor Henderson - Vice Chair, Councillor Briscoe, Councillor Sebben, Councillor Wordofa
Staff Present:	Tim Wolfe - Director of Community Services, Michael Mousley - Manager of Transit, Jodi Akins - Council Clerk Secretary

To watch the Sub-committee meeting live, please click the following link:
https://video.isilive.ca/stratford/live.html
A video recording of the meeting will also be available through a link on the City's website https://calendar.stratford.ca/meetings following the meeting.

Pages

1. Call to Order

The Chair to call the Meeting to Order.

Land Acknowledgment

Moment of Silent Reflection

2. Disclosure of Pecuniary Interest and the General Nature Thereof

The *Municipal Conflict of Interest Act* requires any member of Council declaring a pecuniary interest and the general nature thereof, where the interest of a member of Council has not been disclosed by reason of the member's absence from the meeting, to disclose the interest at the first open meeting attended by the member of Council and otherwise comply with the *Act.*

Name, Item and General Nature of Pecuniary Interest

3. Delegations

None scheduled.

4. Report of the Director of Community Services

4.1 Stratford Minor Girls Softball Association Agreement 2023 - 2028 (COM23-007) 4 - 6

Motion by
Staff Recommendation: THAT the agreement between The Corporation of the City of Stratford and the Stratford Minor Girls Softball Association be entered into for a five (5) year term to January 31, 2028;

AND THAT the Mayor and Clerk, or their respective delegates, be authorized to sign the agreement on behalf of the Corporation.

4.2 Stratford Urban Gym Proposal (COM23-008) 7 - 16

Motion by
Staff Recommendation: THAT the report titled, "Stratford Urban Gym" (COU23-008), be received;

THAT a public notification be given to the surrounding residents advising of the Urban Gym proposal and to obtain comments on the proposal;

AND THAT following the public notification process, and confirmation of success of the fundraising, staff be directed to issue a Request for Proposal for the design and installation of a Stratford Urban Gym for Shakespeare Park.

5. Report of the Manager of Transit

5.1 2023 Transit Bench Advertising Locations (COM23-004) 17 - 26

Motion by
Staff Recommendation: THAT the Management Report titled, "2023 Transit Bench Advertising Locations" (COM23-004), be received for information.

5.2 Community Transportation – PC Connect Fare Increase Feasibility (COM23-005) 27 - 31

Motion by
Staff Recommendation: THAT the report titled, "Community

Transportation - PC Connect Fare Increase Feasibility" (COM23-005), be received for information.

5.3 **Transit Bus Electrification Feasibility Study Results (COM23-006)** 32 - 69

Motion by
Staff Recommendation: THAT the report titled, "Transit Bus Electrification Feasibility Study Results"(COM23-006), be received for information.

6. Department Update 70 - 72

The Director/Manager to provide an update on department activities and ongoing projects

7. Advisory Committee/Outside Board Minutes 73 - 83

The following Advisory Committee/Outside Board minutes are provided for the information of Sub-committee:

- Board of Park Management minutes of April 3, 2023
- Communities in Bloom Advisory Committees minutes of April 6 and May 4, 2023

8. Next Sub-committee Meeting

The next Community Services Sub-committee meeting is July 13, 2023 at 4:30 p.m. in the Council Chamber, City Hall.

9. Adjournment

Meeting Start Time:
Meeting End Time:

Motion by
Sub-committee Decision: THAT the Community Services Sub-committee meeting adjourn.

MANAGEMENT REPORT

Date: June 15, 2023
To: Community Services Sub-committee
From: Tim Wolfe, Director of Community Services
Report #: COM23-007
Attachments: None

Title: Stratford Minor Girls Softball Association Agreement 2023 - 2028

Objective: To consider entering into an agreement with the Stratford Minor Girls Softball Association for use of the ball diamonds at Anne Hathaway Park.

Background: The Stratford Minor Girls Softball Association (SMGSA) has used the Anne Hathaway Park ball diamonds for many years, but an official agreement wasn't put into place until 2003. At that time, the SMGSA required an official agreement for their use of the diamonds as they were applying for an Ontario Trillium Foundation Grant to undertake park improvements.

The original agreement expired January 31, 2008 and was renewed for five years to January 31, 2013, for another five years to January 31, 2018 and then again for another five years to January 31, 2023.

Analysis: The Stratford Minor Girls Softball Association and Community Services Department are in favour of entering into an agreement for a further five years.

For use of the ball diamonds at Anne Hathaway Park, the Association:

- pays the City $13.00 plus HST per player as per their registration, or the amount approved by Council in the Community Services Department Fees and Charges Schedule (approximately $5,000 per season);
- is responsible for the routine cleaning and minor maintenance of the softball complex including all costs incurred;
- pays all water and sewage costs; and is
- responsible for maintaining all diamonds.

Financial Implications:

Financial impact to current year operating budget:
For 2023, SMGSA will pay $13.00 plus HST per participant (approximately $5,000) as approved by Council in the Community Services Department Fees and Charges Schedule. Yearly water and sewage charges are also recouped from SMGSA for the concession booth at the facility.

Financial impact on future year operating budget:
For future budgets, SMGSA will pay the amount per participant as approved by Council in the Community Services Department Fees and Charges Schedule. Yearly water and sewage charges will also be recouped from SMGSA for the concession booth at the facility.

Link to asset management plan and strategy:
The agreement states that the Association is responsible for all capital improvement projects proposed for the softball complex by the Association. All capital projects that are approved are to be funded entirely by the Association.

Insurance considerations:
The Association will provide commercial general liability insurance against claims for personal injury, death or property damage or loss in the amount of not less than Five Million Dollars ($5,000,000).

Alignment with Strategic Priorities:

Strengthening our Plans, Strategies and Partnerships
Partnering with the community to make plans for our collective priorities in arts, culture, heritage and more. Communicating clearly with the public around our plans and activities.

Developing our Resources
Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Alignment with One Planet Principles:

Health and Happiness
Encouraging active, social, meaningful lives to promote good health and wellbeing.

Staff Recommendation: THAT the agreement between The Corporation of the City of Stratford and the Stratford Minor Girls Softball Association be entered into for a five (5) year term to January 31, 2028;

AND THAT the Mayor and Clerk, or their respective delegates, be authorized to sign the agreement on behalf of the Corporation.

Prepared by:	Tim Wolfe, Director of Community Services
Recommended by:	Tim Wolfe, Director of Community Services
	Joan Thomson, Chief Administrative Officer

MANAGEMENT REPORT

Date: June 15, 2023
To: Community Services Sub-committee
From: Tim Wolfe, Director of Community Services
Report #: COM23-008
Attachments: Urban Gym Design

Title: Stratford Urban Gym Proposal

Objective: To provide Council with information regarding a proposal for an adult urban gym at Shakespeare Park and to seek authorization to proceed with the RFP process.

Background: In 2018 there was a large fundraising effort put together to aid in the skatepark development and relocation to Shakespeare Park, now known as the "All Wheels Park". This was a big improvement to the park and participation of the area has increased.

Recently, Community Services staff were contacted by a resident about a proposal to purchase and install an Urban Gym on the Shakespeare Street side of the park. This would have accessible pathways leading from the tennis court to the skatepark with gym components throughout. These additions to the park would be paid entirely from donations.

See attachment for the Urban Gym design.

Analysis: An Urban Gym would promote fitness and draw a different demographic to the park. By having components that adults can use, it would provide opportunities for families to be active and put a more inclusive lens to the park. Also, the components and walkway will be accessible to ensure that inclusion is available for all users.

Benefits of the park include:

1) getting people outside;
2) free to users, no gym membership required;
3) simple and effective equipment for ease of use and maintenance.

The resident has undertaken some of the preliminary research into the designs and has involved the accessibility committee in the early stages of the discussions. Furthermore, the resident would be undertaking the fundraising for the project. City staff would be

involved in the procurement to supply and install the equipment and pathway and potentially the administration of providing donation receipts.

The first step in moving this project forward, is to obtain approval from Council to accept the proposed design and authorize staff to issue an RFP through our procurement process. Before the RFP is issued, there would be a public notice sent to the surrounding neighbours to ensure the property owners have no objections and fully support the Urban Gym.

If the project proceeds, there will be an ongoing expectation that the City performs regular maintenance and ultimately has the financial resources for maintenance and repairs and ultimately replacement of some or all of the components as required. This will impact the 10-year forecasted costs and asset management planning requirements but given the expected useful life of the components and the minor nature of ongoing maintenance, this is expected to be manageable in the upcoming budget years.

Warranty on most of the equipment components is five years some components up to 10 years, therefore no additional replacement costs are anticipated in the earlier years. Lifespan is expected to be 15 or more years in speaking with other municipalities that have undertaken an Urban Gym. Each of the outdoor units can be replaced individually when needed as not every structure would need replacement at the same time.

Financial Implications:

Financial impact to current year operating budget:
Donation revenues would be collected for the project, and expenditures incurred of approximately $110,000.00. As such, there is no expected variances to the City's operating levy surplus or deficit for 2023.

Financial impact on future year operating budget:
Inspection of the equipment will be an additional item to the operations budget which would be added to the existing playground inspection list. This would be absorbed in the current operating budget and therefore have a nominal impact, if any.

Link to asset management plan and strategy:
Based on the total installation costs and expected useful life of the asset components, it is anticipated that increasing the contributions to reserves to deal with future requirements would be approximately $7,500 above the requirements identified for existing assets.

Insurance considerations:
The Urban Gym will constitute a playground structure and be assessed similarly to other playgrounds with respect to managing risks. It will not materially impact the City's risk profile and is not expected to cost additional funds to insure against liability risks or equipment failure risks.

Alignment with Strategic Priorities:

Strengthening our Plans, Strategies and Partnerships
Partnering with the community to make plans for our collective priorities in arts, culture, heritage and more. Communicating clearly with the public around our plans and activities.

Developing our Resources
Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Alignment with One Planet Principles:

Health and Happiness
Encouraging active, social, meaningful lives to promote good health and wellbeing.

Staff Recommendation: THAT the report titled, "Stratford Urban Gym" (COU23-008), be received;

THAT a public notification be given to the surrounding residents advising of the Urban Gym proposal and to obtain comments on the proposal;

AND THAT following the public notification process, and confirmation of success of the fundraising, staff be directed to issue a Request for Proposal for the design and installation of a Stratford Urban Gym for Shakespeare Park.

Prepared by:	Tim Wolfe, Director of Community Services
Recommended by:	Tim Wolfe, Director of Community Services
	Joan Thomson, Chief Administrative Officer

Stratford Urban GYM

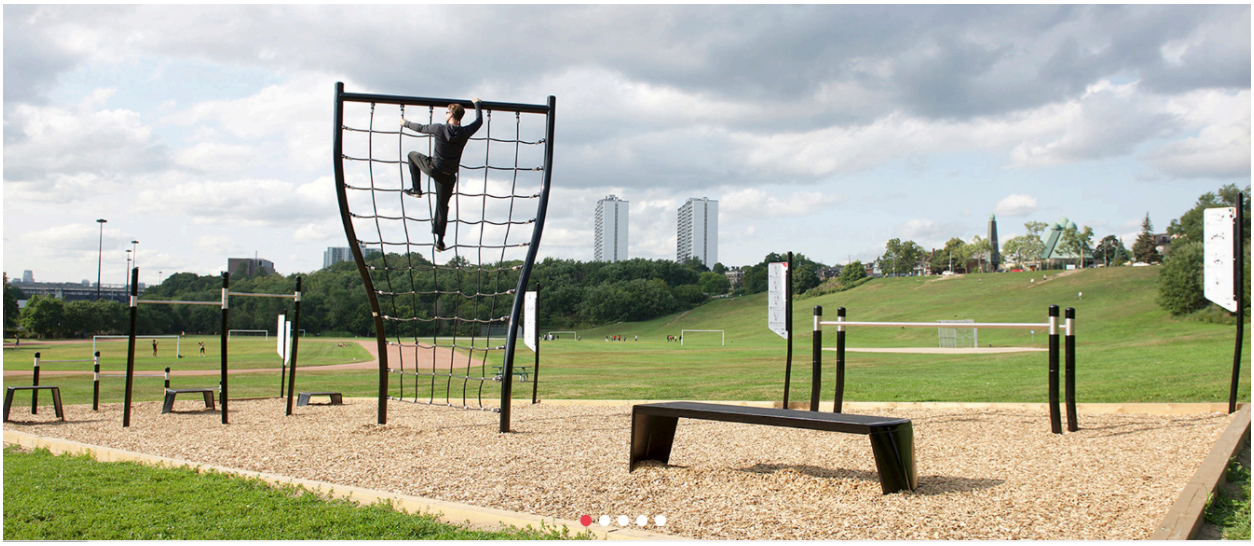
@ Downie Street & Shakespeare

Created by Bruce Whitaker, [redacted]

The Trend

The COVID-19 pandemic has radically demonstrated the importance of physical health—pulling people away from the indoor gym towards the great outdoors. A swath of research is bringing light to one change that has proven to be unexpectedly enduring: "green exercise."

In 2022, exercising outdoors was the most popular fitness trend: 59.1% of active adults chose outdoor activities like running, training, hiking, and walking as the best way to stay fit; up 14.6% from the start of 2020. 39.4% of gym members switched to running and other outdoor activities.



Even prior to the COVID-19 pandemic, exercise in fresh air was already on an upswing. According to a survey conducted by RunRepeat in 2020, 72 percent of gym members were expected to exercise outdoors in 2021. Across North America, there has been an explosion of open-air classes in everything from obstacle courses and military-inspired workouts to yoga and stationary cycling.

According to news published by the Outdoor Industry, more than half (54%) of Americans ages 6 and over participated in at least one outdoor activity in 2021, and the outdoor recreation participant base grew 2.2% in 2021 to 164.2M participants.

The outdoor fitness equipment market size was valued at $1.5 billion in 2020, and is estimated to reach $1.8 billion by 2030, growing at a CAGR of 4.3% from 2021 to 2030.

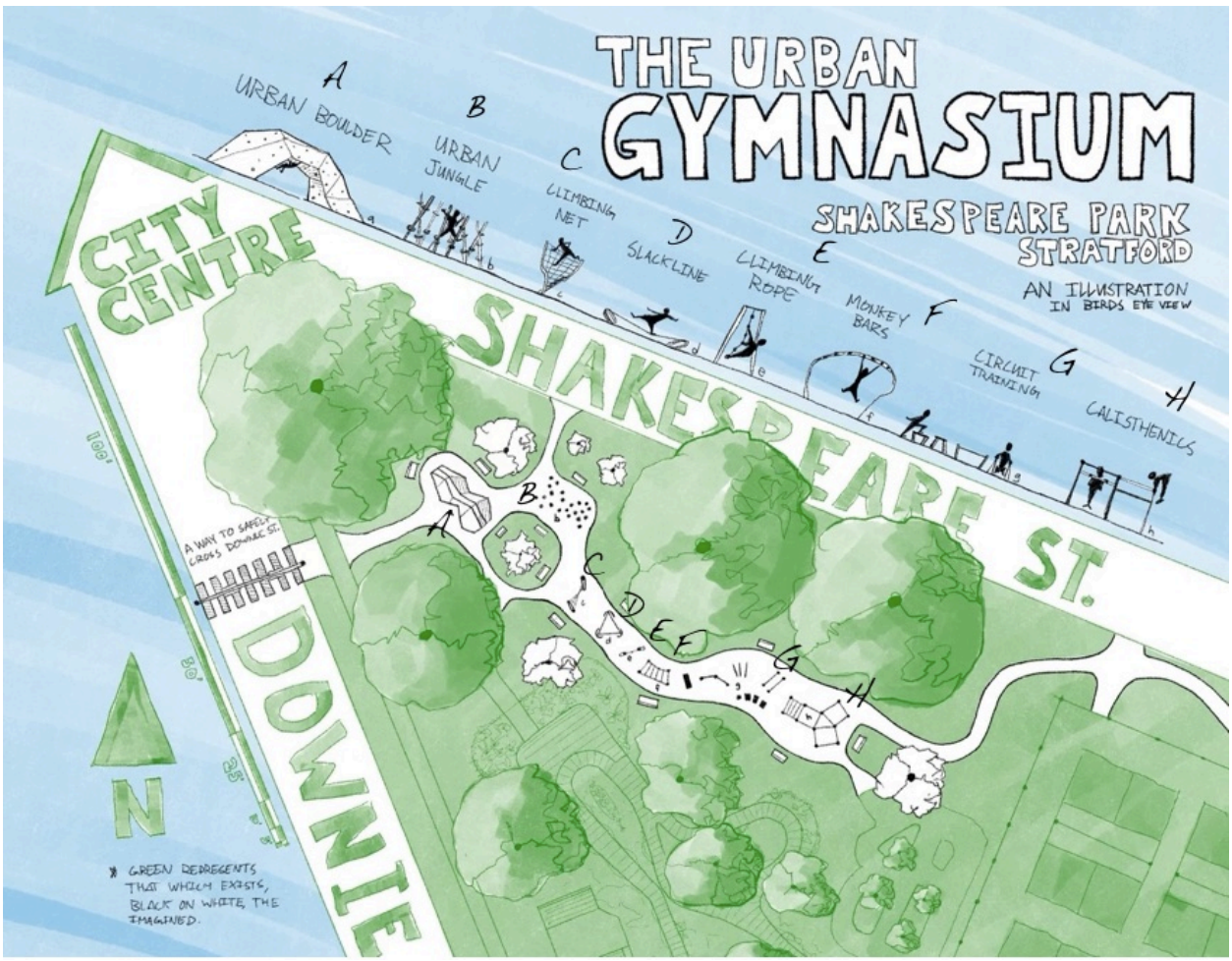
The Demographic

The success of the All-Wheels Park in downtown Shakespeare Park is further evidence that people want to be outdoors. The ages of the users of the All Wheels Park is wide from very young children (5 years old) to young adults (up to 45 years old). The average age is 15-20.

Stratford's Urban Gym will attract a different demographic though there will be some overlap. The typical age group using outdoor gyms is 25-45.

The Location

The proposed location for Stratford's Urban Gym will be in the Northwest section of Shakespeare Park.



The most livable cities in the world have activities going on at all times in *prime* locations making the activities more appealing to both participants and spectators.

The users of Stratford's All Wheels Park want to be seen by those passing by for a couple of reasons: 1. showcases their talents and 2. provides a safer environment. There is a natural vibe being located in the downtown core and it is also very accessible by residents in all four quadrants of Stratford.

Additionally, a community has been developing in the area bringing people together of similar interests. The area of Shakespeare Park used to be a "*boring*" unused area. Now it is vibrant and active being enjoyed by not only the users, but by those driving by on Downie Street.

The proposed next stage of the All Wheels Park will be a welcoming space for the whole family. Families will be inspired to visit the area together. Parents will likely use the Urban Gym and kids the skatepark.

The Benefits

The preference for exercising outdoors is attributed to numerous benefits that could be gained, such as decreased blood pressure, stress reduction, insomnia relief, and it is typically free of charge.

Simple and effective equipment
Outdoor gym equipment is designed for ease of use, with simple diagrams and instructions to get you off to a great start. Many workout stations cater to more than one exercise, some even combining strength and cardio for a complete workout.

Sunlight and fresh air
Not only is spending time outside a proven way to reduce stress, it also provides the oxygen and Vitamin D necessary for peak physical health. In workout terms, this translates into keeping you at the top of your game longer, both physically and mentally, so you can push yourself much closer to your fitness goals.

More Varied Workout
Doing the same exercises in the same way means you'll only ever work the same muscles, while neglecting a lot of other important muscle groups. The naturally

uneven surfaces of grass and hills mean your body makes use of many stabilizer muscles to cope with the complex terrain. This results in a better overall workout, hitting more muscle groups for the same effort.

Free to users
One of the best things about exercising outside is that you hardly ever have to wait for someone else to finish with the piece of equipment you want to use. To top it all off, these workouts are absolutely free!

Combines Parkour
The idea of parkour is to achieve smooth, uninterrupted movement through an area, typically in an urban environment, negotiating obstacles by running, jumping, and climbing. Although parkour is a street sport, parkour parks are gaining popularity.

The Design

The designated area is fairly wide and long - 30 meters wide by 80 meters.

The design will flow with the nature of the park. There will be 8-10 stations each with one piece of equipment affixed to the ground.

A potential vendor is Trekfit based out of Montreal. The company is a provider of outdoor gyms and has installed gyms across Canada including Kitchener, Cambridge, Hagersville, Tavistock, Hamilton, Burlington, Halton Hills, Georgetown, Caledon, and approximately 50 gyms throughout Toronto.

The Equipment

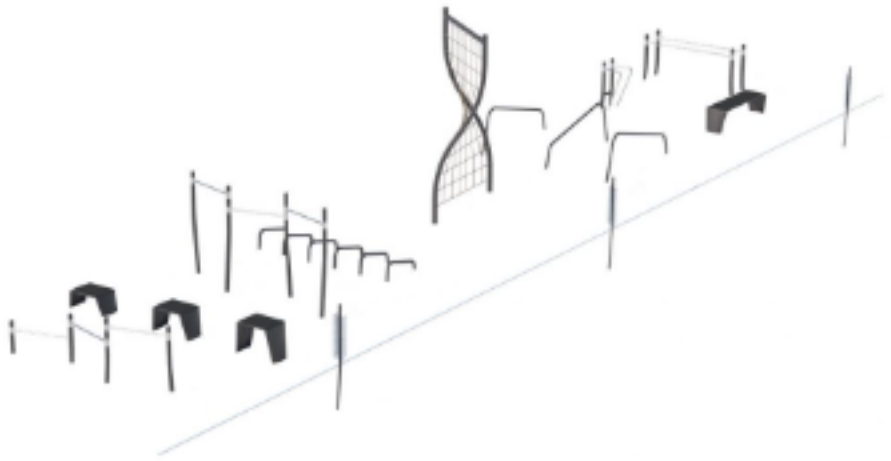
Static equipment facilitates progressive training by allowing users to do most of the exercises at various intensity levels.

This type of equipment meets the needs of both amateur athletes and people wanting to get back into shape.

You can perform a variety of exercises and solicit several muscle groups with the same piece of equipment.

Allows for several types of training such as: Circuit training, strength training, suspension training (TRX), resistance training (elastic bands), calisthenics, crossfit, parkour, etc.

Group training is fun and increases the motivation of users.



Trekfit Circuit combo 2

5	Exercise Stations	6	Information Panels
40	Exercises divided into 2 fitness programs	13	Equipments

Static equipment is ideal for group training as it allows multiple users to workout simultaneously, on the same piece of equipment.

Static equipment is comfortable for all body shapes and sizes. Participants simply need to adjust their position towards the equipment based on their height or size.

There are no moving parts or mechanisms that could break or cause accidents.

The Neighbours

There are eight house houses located on Shakespeare Street within fairly close proximity to the proposed gym. The stations will be spread along the 80 meters so that there won't be a congregation of users at any one station. The GYM will be unlike the skatepark which at any one time can have over one hundred participants. It is expected, based on other outdoor gyms, that the maximum number of users will be 25.

The Tracks and Parking

Many of the users will bike to the location as it is easily accessible by city residents. There will likely be users from outside of the city, similar to how the All-Wheels Park is used by many visitors from surrounding communities. Therefore, parking will be needed. Currently, Shakespeare Street has free parking along the street. Additionally, there is plenty of parking at the Grand Trunk site, across from the All Wheels Park.

The Partners

The approach to the Stratford Urban Gym will be to make it inclusive of all. The following groups have been contacted and are fully in support of the initiative.

- Roger Koert - Accessibility Advisory Committee
- Steve Ford - City of Stratford Fire Department
- Jay Colqohoun - Stratford Perth YMCA
- Cole Johnson - Pursuit Climbing
- Quin Malott - City of Stratford Recreation
- Chief Skinner - Stratford Police Department

The Environment

The proposed location has treed areas which will be thoughtfully incorporated in the build of the Urban Gym. No trees will be taken out as a result of the build.

The Budget

1. Equipment: $57k

COMBO 2 WITH 14' CARGO NET		**Investment: $56,950**
COMBO 2 WITH 10' CARGO NET		**Investment: $52,450**
Push-up Bars	Dip Station	
Step Benches (3)	Vault Bars (3)	
Pull-up Bars	Long Bench	
Hurdles	Parallel Bars	
Cargo Net	Information Panel (6)	

2. Ground material + ground prep + installation + shipping: $45k
3. Spectator benches and path: $10k

TOTAL BUDGET: Approximately $110k+HST.

MANAGEMENT REPORT

Date: June 15, 2023
To: Community Services Sub-committee
From: Michael Mousley, Manager of Transit
Report #: COM23-004
Attachments: Proposed Bench Locations
Management Report COU22-066

Title: 2023 Transit Bench Advertising Locations

Objective: To provide the 2023 proposed locations of the 10 no cost, revenue generating transit advertising benches.

Background: At the September 12, 2022 Regular Council meeting, Council adopted the following resolution:

THAT the report titled, "Transit Bench Advertising Program 2022" (COU22-066), be received;

AND THAT the Mayor and Clerk, or their respective delegates, be authorized to sign the agreement with Creative Outdoor Advertising for advertising on transit benches for a period of ten (10) years to 2032.

In 2022, 20 (twenty) locations were proposed, and benches were installed. Staff have noticed over the months many customers using these unique, barrier free seating options while waiting for a Transit bus. Also, all advertising spaces are currently sold on all benches located throughout the City.

Analysis: The advertising vendor, Creative Outdoor Advertising, supplies transit benches at no cost to the City, for installation at the locations noted in the attachment.

City of Stratford receives a revenue stream of 20% of advertising space sold by the vendor for the term of the agreement. There are no Capital/Operating costs to budget, as maintenance and replacement of the benches are the company's responsibility in the agreement. The program generates revenue for the Transit Division of approximately $17,000 annually.

Bench advertising examples:

Financial Implications:

Financial impact to current year operating budget: No impact as the 2023 budget reflects the planned revenues of $17,000.

Financial impact on future year operating budget: At a minimum the program revenues received are $17,000 each year and this amount is in the transit operating budget, which will overall help reduce the reliance on the tax levy. This amount increases based on 100% of advertising space being sold.

Link to asset management plan and strategy: Based on the commitment of the vendor to keep the benches in good condition, they benches will continue to have a useful life beyond the 10-year contract.

Legal considerations: None identified.

Insurance considerations: As per the agreement, the Vendor provides the City with a certificate of insurance naming the City as an additional insured for not less than $5 million. This assists in mitigating the liability risk for both parties.

Alignment with Strategic Priorities:

Mobility, Accessibility and Design Excellence
Improving ways to get around, to and from Stratford by public transit, active transportation and private vehicle.

Developing our Resources
Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Alignment with One Planet Principles:

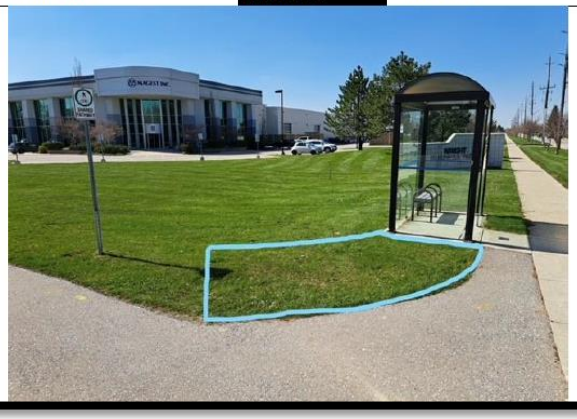
Health and Happiness
Encouraging active, social, meaningful lives to promote good health and wellbeing.

Travel and Transport
Reducing the need to travel, encouraging walking, cycling and low carbon transport.

Staff Recommendation: THAT the Management Report titled, "2023 Transit Bench Advertising Locations" (COM23-004), be received for information.

Prepared by:	Michael Mousley, Manager of Transit
Recommended by:	Tim Wolfe, Director of Community Services
	Joan Thomson, Chief Administrative Officer

COA Stop#:	144001120	**City Stop #:**	1011
On-Street:	Wright	**At-Street:**	Lorne Ave
Facing Dir:		**Municipality:**	Stratford, ON
Longitude:	-81.007523	**Latitude:**	43.359623



COA Stop#:	144003445	**City Stop #:**	
On-Street:	Douro St	**At-Street:**	Stratford Home Furniture
Facing Dir:	S	**Municipality:**	Stratford, ON
Longitude:	-80.953935	**Latitude:**	43.366899

COA Stop#:	144004010	**City Stop #:**	
On-Street:	Douro St	**At-Street:**	Romeo St S
Facing Dir:	N E	**Municipality:**	Stratford, ON
Longitude:	-80.960955	**Latitude:**	43.367081

COA Stop#:	144001210	**City Stop #:**	1020
On-Street:	Dunn Rd	**At-Street:**	Packham Rd
Facing Dir:		**Municipality:**	Stratford, ON
Longitude:	-81.007053	**Latitude:**	43.349623

COA Stop#:	144001440	**City Stop #:**	1043
On-Street:	Huron St	**At-Street:**	St Vincent
Facing Dir:	N E	**Municipality:**	Stratford, ON
Longitude:		**Latitude:**	

COA Stop#:	144001790	**City Stop #:**	1078
On-Street:	Huron St	**At-Street:**	Mornington St
Facing Dir:	S E	**Municipality:**	Stratford, ON
Longitude:	-80.98521	**Latitude:**	43.37282

COA Stop#:	144001110	**City Stop #:**	1010
On-Street:	Lorne Ave	**At-Street:**	Wright Blvd
Facing Dir:		**Municipality:**	Stratford, ON
Longitude:	-81.004803	**Latitude:**	43.359915

COA Stop#:	144003695	**City Stop #:**	
On-Street:	Ontario St	**At-Street:**	Canadian Tire Gas Bar
Facing Dir:	S	**Municipality:**	Stratford, ON
Longitude:	-80.944318	**Latitude:**	43.370741

COA Stop#:	144003585	**City Stop #:**	
On-Street:	Ontario St	**At-Street:**	Gamestop
Facing Dir:	S	**Municipality:**	Stratford, ON
Longitude:	-80.945873	**Latitude:**	43.37073

COA Stop#:	144003340	**City Stop #:**	1234
On-Street:	Romeo St	**At-Street:**	Ontario St
Facing Dir:	N W	**Municipality:**	Stratford, ON
Longitude:	-80.963231	**Latitude:**	43.371587

MANAGEMENT REPORT

Date: September 12, 2022
To: Mayor and Council
From: Michael Mousley, Manager of Transit
Report#: COU22-066
Attachments: Advertising on City Property Policy P.3.9
Location of Benches

Title: Management Report - Transit Bench Advertising Program 2022.docx

Objective: To provide information regarding the implementation of a no cost, revenue generating transit bench advertising program and to provide proposed locations of bench installations.

Background: Stratford Transit has in the past encountered many challenges to provide a comfortable, positive service experience for the customer while waiting for a bus.

With the new bus routes and stops implemented in 2019 and new stops and shelters installed in 2020 and 2021, the department finds itself in a most opportunistic position to install revenue generating benches at bus stops around the City.

At the May 11, 2020 Regular Council meeting, Council adopted the following recommendation of the Community Services Sub-committee:

THAT Council authorize staff to further pursue the opportunity of a revenue generating transit bench advertising program;

AND THAT staff work to create advertising guidelines including location and types of advertisers.

As a result, at the March 14, 2022, Regular Council meeting, Council adopted the following recommendation of the Community Services Committee:

THAT the Advertising on City Property Policy, be adopted.

Analysis: : The advertising vendor, Creative Outdoor Advertising, approached transit staff to supply transit benches at no cost to the City, for installation at the locations noted in the attachment. As the City will not own the benches, this proposal does not fall within the procurement requirements in the City's purchasing policy.

Outline of the program is as follows:

- Vendor would audit locations in Stratford and recommend the best sites. The final decision on locations will be made by the Transit Manager. General guidelines suggest approximately 1 bench for every 1000 population.

- Local small businesses will sponsor (advertise) each site by paying a monthly fee.

- Vendor would make inspections of each bench to clean, repair and maintain our units and the immediate area around them.

- The City of Stratford would receive 20% of the revenue.

- Vendor would fund all of the required capital investment.

- Vendor would visit Stratford to audit our urban and suburban areas and advise us on locations and the correct unit for each location. The City will also retain complete control over the placement or removal of all units placed under this program.

- Vendor would install each unit and implement a cleaning and maintenance program for all units.

- The City will have total control and approval over all sponsorship messages, and all installation locations as per the Municipality's Advertising Policy.

- Every bench unit is GPS coded by vendor and Transit can monitor the inspection program online. The vendor would dispatch a response team in the event of vandalism within 24 hours, and in the case of destruction or unsafe conditions, response within 4 hours, all at no cost to the City of Stratford.

- City of Stratford will be in complete control of all aspects of the program, from site selection to approval of all sponsors and sponsorship content.

- Advertising benches will not be placed at Residential bus stop locations. Any proposed bench location designated in the Heritage section of the City (Downtown) will follow the normal approvals through the Heritage Committee.

- Benches will be installed on municipal lands or private lands, with the approval of private landowners.

- Term of the agreement is ten years with an option to extend annually.
- An exit clause of 30 days does exist in the agreement.
- Upon termination of the agreement, the benches would be removed at the vendor's cost.

Bench advertising examples:

Under the Delegation of Authority By-law, Council delegated its signing authority to certain staff to enter into agreements for advertisement on City Property for a term of up to 12 months, with an option to renew for one (1) six-month period.

As this term with Creative Outdoor Advertising is for 10 years, Council approval of entering into the agreement is required.

Financial Implications:
City of Stratford will receive a revenue of 20%.

Financial impact to current year operating budget:
City of Stratford will receive a revenue stream of 20% of advertising space sold by the vendor for the duration of the agreement. There are no expected Capital/Operating costs to budget, as maintenance and replacement of the benches are the company's responsibility in the agreement. The program is expected to generate revenue for the Transit Division of $17,000 annually, but would likely be nominal in the first year. The revenue will offset operational costs of the division.

Financial impact on future year operating budget:
At a minimum the program revenues of $17,000 are expected each year. This amount may increase based on 100% of advertising space being sold. The agreement can be extended annually at the end of the term.

Legal considerations:
None identified.

Insurance considerations:

The Vendor shall provide the City with a certificate of insurance naming the City as an additional insured for not less than $ 5million. This will assist in mitigating the liability risk for both parties.
Upon termination of the agreement, the benches would be removed at the vendor's cost.

Alignment with Strategic Priorities:

Mobility, Accessibility and Design Excellence
Improving ways to get around, to and from Stratford by public transit, active transportation and private vehicle.

Developing our Resources
Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Alignment with One Planet Principles:

Health and Happiness
Encouraging active, social, meaningful lives to promote good health and wellbeing.

Travel and Transport
Reducing the need to travel, encouraging walking, cycling and low carbon transport.

Staff Recommendation: THAT the Management Report titled Management Report - Transit Bench Advertising Program 2022.docx regarding the proposed installation locations be received;

AND THAT Council authorize the Mayor and Clerk to sign the agreement with Creative Outdoor Advertising for advertising on transit benches.

Prepared by: Michael Mousley, Manager of Transit
Recommended by: David St. Louis, Director of Community Services
Joan Thomson, Chief Administrative Officer

MANAGEMENT REPORT

Date: June 15, 2023
To: Community Services Sub-committee
From: Mike Mousley, Manager of Transit
Report #: COM23-005
Attachments: None

Title: Community Transportation – PC Connect Fare Increase Feasibility

Objective: To assess the feasibility of increasing PC Connect fares to generate revenue for service sustainability.

Background: In 2018, the City of Stratford received $1.45 million in Community Transportation grant funding to launch an intercity bus service. Stratford operates three PC Connect routes, connecting North Perth with Kitchener-Waterloo on Route 1; and Stratford and St. Marys to Kitchener-Waterloo and London on Routes 2 and 3.

The service is an equal partnership with North Perth and St. Marys that provides each partner with equal service levels and shared expenses. We received an additional $611,936.91 to continue PC Connect until 31 March 2025.

The City continues to advocate for increased Community Transportation program funding but does not anticipate any further funding commitments from MTO. Therefore, substantial municipal investment will be required to extend the program until 2025 and to make the service sustainable in the long term.

Staff recently presented a project update to Council in Spring (COU23-001) and Council passed the following resolution:

THAT options for a proposed fare increase for the PC Connect Service, be referred to staff for review and preparation of a report for consideration at a future Community Services Sub-committee meeting.

Analysis: This report outlines potential PC Connect fare increases with consideration to their impact on ridership and service sustainability, in consultation with:

- City staff, including the City's Corporate Leadership Team, Manager of Diversity, Equity and Inclusion, and Accessibility Diversity and Inclusion Coordinator;

- Our service partners: Perth County's Community Transportation Coordinator, the CAOs of North Perth and St. Marys;
- Our service provider Voyago (service managers and bus drivers);
- Our Transit App provider Blaise Transit.

Current Fare Structure

The current PC Connect fare structure is as follows:

Route	Adult	Student	Senior (60+)	Veteran	Child (Under 5)	Support Persons
1, 2, 3	$12	$10	$10	Free	Free	Free
A&B	$6	$5	$5	Free	Free	Free

The City's three PC Connect routes in 2022 saw an annual fare paying ridership total of 22,105 in 2022 (after subtracting 114 no charge rides for children under five, veterans and support persons) with total annual revenues for 2022 at $56,976 for all three routes.

Potential Fare Increases

Based on a projected future operating budget of $760,000, fares would need to be increased to $35.00 per ride, to make the service a full cost recovery without requiring support from the tax levy, at current ridership levels.

Please note that a fare increase of this magnitude would make the service cost prohibitive for most riders and therefore the City would expect a substantial decrease in ridership.

One alternative, an increase to $20.00 per adult ride, would produce an additional $445,000 in revenues at current ridership levels. This still does not provide enough revenue to make the service sustainable without provincial and/or municipal support. Furthermore, Staff expect that ridership levels would decrease if the City decided to raise PC Connect fares.

Changes to fares would also impact our in-kind partners in Perth County, who operate Routes A and B and share branding, marketing, and the Blaise booking application with the City. The Blaise app does not support different fare structures for the same service area. Stratford and Perth County share routes between Stratford and St. Marys and in North Perth.

As per the terms of our Local Partnership Agreements, Stratford would need to secure the agreement of our partner municipalities in St. Marys and North Perth to change current fare structures.

Fare increases are expected to impact ridership levels due to affordability. Staff hear consistent feedback that current fares are too high, particularly on shorter distance trips (e.g., between Stratford and New Hamburg) and for students and frequent/daily riders.

At current fare levels, PC Connect provides an affordable transportation option amid the ongoing cost of living situation. More than 3,000 fare passes have been sold to local social service agencies, including Ontario Works, which is funded substantially from other levels of government and our shared services partners. PC Connect also allows affordable access to resources and services in Stratford and larger communities, including employment services, immigrant and refugee services, identity-affirming services, faith, cultural, or ethnic-based services, and/or broader social services for equity-seeking members of our communities.

Similarly, access to affordable public transportation is essential for our aging population. Many seniors depend on public transportation due to health and mobility challenges. PC Connect allows seniors to maintain their lifestyle, personal connections, and engage in activities and access services and healthcare.

Per the 2021 Census, Stratford has a higher demographic of Seniors[1] in our communities than the Provincial average of 18.5%:

- 21% Seniors in Perth County;
- 25% Seniors in Stratford;
- 26.5% Seniors in St. Marys.
- 7,485+ Perth County residents are over the age of 75

Staff expect that a fare increase would also negatively impact persons with disabilities. As per Statistics Canada (2017), 41% of the national low-income population comprises of persons with disabilities. Affordable transportation is an essential part of their lives. The American Association of People with Disabilities (AAPD), which mirrors the statistics in Ontario/Canada, states that people with disabilities are twice as likely to have inadequate transportation compared to those without disabilities. Some never leave their homes due to lack of transportation, denying them independence, employment opportunities, and community connections. The AAPD notes that rural residents with disabilities cite lack of transportation as one of the most significant barriers to accessing community resources, healthcare, and opportunities.

Go Train

The Ministry of Transportation of Ontario (MTO) extended GO Train services between Toronto, London, St. Marys, and Stratford beginning on October 18, 2021 with one daily return trip, operating Monday to Friday. Fares are structured as follows:

London - Stratford $12.50

[1] Residents over 65

St. Marys - Stratford	$7.50
Kitchener - Stratford	$12.50
Guelph	$16
Toronto - Stratford	$25

At present rates, PC Connect charges a similar fare as the GO Train services operating in our community. It is hoped that GO service will replace PC Connect for long-distance connectivity to London and Kitchener-Waterloo.

Service Sustainability

Based on local and provincial market knowledge, a PC Connect fare increase is not likely to make the service any more sustainable than it currently is, as it would only serve to make our service less affordable for the residents it serves. Regardless of fare contributions in any municipality, there are no Community Transportation grant recipients currently able to maintain current program service levels without ongoing support from the Ministry of Transportation unless the local municipalities commit a substantial level of municipal investment to the service. Continued provincial investment in connecting small Ontario communities will be necessary to realize the vision outlined in MTO's Connecting Southwest strategy. City staff continue to advocate for this on behalf of our community.

A full sensitivity analysis would require the use of an outside consultant to determine the precise impact to ridership levels of any fare increases. Fare increases would need to be significant to make a material difference in approaching a break-even scenario, so it is the position of staff that any increase at this time would have a negative impact on ridership levels and the success of the program during this period of receiving government funding.

Financial Implications:

Financial impact to current year operating budget:
There are no financial implications as a result of this report.

Financial impact on future year operating budget:
Substantial municipal contributions will be required to continue with PC Connect in 2024 and the first quarter of 2025. The extent of these is unknown until such time as discussions occur with our Municipal partners. This will be determined through further analysis of the available existing grant funds, the structure of the routes and service and pending any potential additional funding.

Alignment with Strategic Priorities:

Mobility, Accessibility and Design Excellence

Improving ways to get around, to and from Stratford by public transit, active transportation, and private vehicle.

Strengthening our Plans, Strategies and Partnerships
Partnering with the community to make plans for our collective priorities in arts, culture, heritage and more. Communicating clearly with the public around our plans and activities.

Developing our Resources
Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Widening our Economic Opportunities
Strengthening Stratford's economy by developing, attracting, and retaining a diversity of businesses and talent.

Alignment with One Planet Principle:

Health and Happiness
Encouraging active, social, meaningful lives to promote good health and wellbeing.

Equity and Local Economy
Creating safe, equitable places to live and work which support local prosperity and international fair trade.

Culture and Community
Nurturing local identity and heritage, empowering communities, and promoting a culture of sustainable living.

Travel and Transport
Reducing the need to travel, encouraging walking, cycling and low carbon transport.

Staff Recommendation: THAT the report titled, "Community Transportation - PC Connect Fare Increase Feasibility" (COM23-005), be received for information.

Prepared by:	Michael Mousley, Manager of Transit
Recommended by:	Tim Wolfe, Director of Community Services
	Joan Thomson, Chief Administrative Officer

MANAGEMENT REPORT

Date: June 15, 2023
To: Community Service Sub-committee
From: Michael Mousley, Manager of Transit
Report #: COM23-006
Attachments: HDR Feasibility Study Highlights

Title: Transit Bus Electrification Feasibility Study Results

Objective: To provide information regarding the results of the Bus Electrification Feasibility Study that was performed by the consultant HDR Inc., to transition from fossil fuel to battery electric buses.

Background: In 2021 the Federal Government announced funding opportunities for transit agencies that wanted to start the process of transitioning from fossil fuel buses to zero emission buses (ZEBs) or battery electric buses (BEBs). A $1.65 billion federal funding stream was created under the banner of Zero Emission Transit Fund (ZETF). Funding applications included allowable cost claims for transition feasibility studies, the purchase of BEBs or ZEBs, and any infrastructure required related to moving towards electrification of the fleet, including charging station infrastructure.

Analysis: In the summer of 2022, Stratford Transit applied and was accepted through ZETF to procure a consultant to perform transition studies. Metrolinx Transit Procurement Initiative (TPI), which Stratford is a member of, and 12 other smaller transit agencies were involved in tendering an RFP to secure a consultant and awarded HDR Inc. to perform the study.

Stratford's funding application included total costs for this study of $120,000 which the Federal funding covers 80% and the City of Stratford is responsible for 20%, or $24,000. Stratford's portion is funded through our annual Provincial Gas Tax allocation.

As the study outlines, Stratford Transit, based on current operations, has a few options regarding the transition over the next couple decades. It is important to note that this transition has many large and new "upfront" capital costs not previously incurred when procuring transit fleet and its infrastructure. Today's market pricing of buses is as follows:

- Standard 40' Diesel bus - $680,000

- Standard BEB 40' 525kw bus - $1,200,000
- Standard BEB 40' 675kw bus - $1,500,000

These costs for battery electric buses do not include charging infrastructure which is an additional estimated $250,000 per charging unit, plus additional costs for building upgrades and infrastructure upgrades. It is projected, at a start, two charging units would be required.

At the October 25, 2021 Stratford City Council meeting, a resolution was passed to mandate a 30% reduction in GHG's by 2030 to eventually reach an overall target of net zero emissions by 2050.

Financial Implications:

Financial impact to current year operating budget: None as this report is being provided for information only.

Financial impact on future year operating budget: If Council directs the further transition from fossil fuel to battery electric for transit fleet, gradual financial savings will be noticed over time from operating and maintenance costs, primarily in the difference between the cost of fossil fuels and the cost of electricity. However, there is still significant infrastructure investment required to install the charging infrastructure that may or may not be funded from federal or provincial funding. Substantial savings will be recognized once half the fleet is replaced, and the volume impact of the fossil fuel reduction can be determined.

Link to asset management plan and strategy: The current lifecycle of transit fleet is approximately 10 years. Electric fleet are anticipated to have a similar estimated useful life. It is expected that the transition would occur as the current fleet reaches the end of useful life, replacing at that time. Therefore, the estimated impact to the ten-year capital forecast is purchases totalling $1.1 million annually from 2024-2030, which includes the charging infrastructure.

Alignment with Strategic Priorities:

Mobility, Accessibility and Design Excellence
Improving ways to get around, to and from Stratford by public transit, active transportation and private vehicle.

Developing our Resources
Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Alignment with One Planet Principles:

Health and Happiness

Encouraging active, social, meaningful lives to promote good health and wellbeing.

Travel and Transport
Reducing the need to travel, encouraging walking, cycling and low carbon transport

Zero Waste
Reducing consumption, reusing and recycling to achieve zero waste and zero pollution.

Staff Recommendation: THAT the report titled, "Transit Bus Electrification Feasibility Study Results"(COM23-006), be received for information.

Prepared by:	Michael Mousley, Manager of Transit
Recommended by:	Tim Wolfe, Director of Community Services
	Joan Thomson, Chief Administrative Officer

City of Stratford

Energy Modelling Results

Battery Electric Bus Feasibility Study & Transition Plan

CONTENTS

INTRODUCTION

The City of Stratford is addressing climate change by collaborating with other local area municipalities in the Perth County Greenhouse Gas (GHG) Reduction Plan. The document states that a minimum reduction target 10% below the 2017 baseline year should be achieved by 2030. It also notes that the community is supportive of a 30% reduction target for 2030 and net zero by 2050.[1] There is no target for transit emissions but there is discussion of prioritizing an increase of use of the transit system by residents in the future to reduce local transportation GHG emissions. In October 2021, Stratford's council recommended that the Plan be adopted, and that the City set 2030 and 2050 targets that align with the Plan.

One way the City of Stratford is taking action is by transitioning its transit fleet to battery electric vehicles. Stratford has begun planning the transition to a zero emissions fleet by developing a Fleet Transition Plan that will act as a roadmap to guide the process. The Fleet Transition Plan will identify the feasible transition pathway(s), associated capital and operating costs, service impacts, and, ultimately, the preferred transition pathway. This Energy Modelling Results Memo will feed the larger fleet transition plan to provide a strategy for electrification of the transit fleet.

When planning for a transition to battery electric buses (BEBs), it is important for agencies to not only look at the vehicle requirements, but also the infrastructure changes and other operational changes required to operate and maintain those vehicles. For many Canadian transit agencies, current BEB technology cannot replace diesel buses at a one-to-one replacement ratio while maintaining the same service level primarily due to vehicle range limitations. To mitigate BEB range limitations, agencies may require additional vehicles, en-route charging infrastructure, or a combination of both. It may therefore also likely impact schedules for operations, peak vehicle requirements, infrastructure, capital and operating costs, training requirements for maintenance staff and vehicle operators, as well as customers. Understanding how the system will need to operate with BEBs and how those decisions will impact these variables are important in determining an optimum fleet transition pathway.

This memo documents the process and analysis involved in the development, assessment, and recommendations for a transition pathway for Stratford's fleet from diesel internal combustion engine buses to BEBs. The processes and analyses include:

- Review of current fleet composition, the existing capital replacement plan, and service operations for transit and paratransit services
- Estimation of energy consumption of the transit fleet using the Zero+ tool and the consolidation of the model results to identify feasible transition pathway(s)

[1] https://www.stratford.ca/en/live-here/resources/Climate-Change/Perth-County-and-Municipalities-Climate-Change-Plan-FINAL_cb.pdf

- Recommendation of the optimal vehicle battery size required for the BEB deployments based on the energy consumption modelling results
- Recommendation of a preferred transition pathway that will guide future analysis of Stratford's transition from diesel buses to BEBs
- Determination of charging infrastructure required to operate the vehicles based on the fleet's daily energy consumption profile

EXISTING CONDITIONS

The first step in exploring battery electric vehicles is to document existing conditions and evaluate the current routes and fleet vehicles used to provide service. Key data includes:

- Operator blocks for weekdays and weekends
- Block and bus-type assignments
- General Transit Feed Specifications (GTFS) data from pre-COVID service for transit blocks on weekdays and weekends
- Fleet Replacement Plan

Adding this data to the Zero+ model creates an accurate energy consumption profile unique to Stratford's existing service. Below is a summary of the fleet composition, fleet replacement plan, and fixed route and paratransit service operations information that feeds into the modelling effort and analysis that follows.

FLEET COMPOSITION AND REPLACEMENT PLAN

CURRENT TRANSIT FLEET COMPOSITION

Based on the existing fleet replacement plan, the current transit fleet includes a mix of full-size, 40' fixed route diesel buses and paratransit gasoline transit shuttles as shown in **Table 1**. Currently, there are a total of 15 fixed route transit buses in service. Two hybrid buses will likely be purchased within the next two years and will arrive in 2024 to replace the oldest two hybrid buses in the fleet. There are 5 paratransit buses.

Table 1: Current Fixed Route and Paratransit Fleet Composition

Fleet Count	Vehicle Type	Vehicle Make	Model Year(s)	Fuel Type	Facility Assignment
Fixed Route Transit Fleet					
15	LFS	40' Nova	1997-2022	Diesel	Stratford Transit Garage
Paratransit Fleet					
1	ETV	Chevrolet	2013	Gasoline	Stratford Transit Garage
1	G4500	Chevrolet	2015	Gasoline	Stratford Transit Garage
1	3500 CTV	Ford	2019	Gasoline	Stratford Transit Garage
1	G4500	GMC	2021	Gasoline	Stratford Transit Garage
1	G4500	GMC	2022	Gasoline	Stratford Transit Garage

Existing Fleet Replacement Plan: 2022 - 2040

Stratford's current fleet replacement plan outlines in which year(s) the current fleet will be replaced. The replacement of BEBs will follow this schedule. For fixed route transit buses, Stratford plans for 15 replacements between 2026 and 2042. The two 2024 buses are the replacements for the hybrid buses that Stratford plans to be in service in 2024. There is no service expansion planned in the near future. **Figure 1** shows the transit fleet replacement schedule. **Figure 2** shows the replacement schedule for Stratford's five paratransit buses.

For Stratford's fixed route transit fleet to transition to 100% zero emissions within an eight-to-ten-year timeframe, the agency will need to consider an accelerated replacement.

Figure 1: Fixed Route Transit Fleet Replacement Schedule

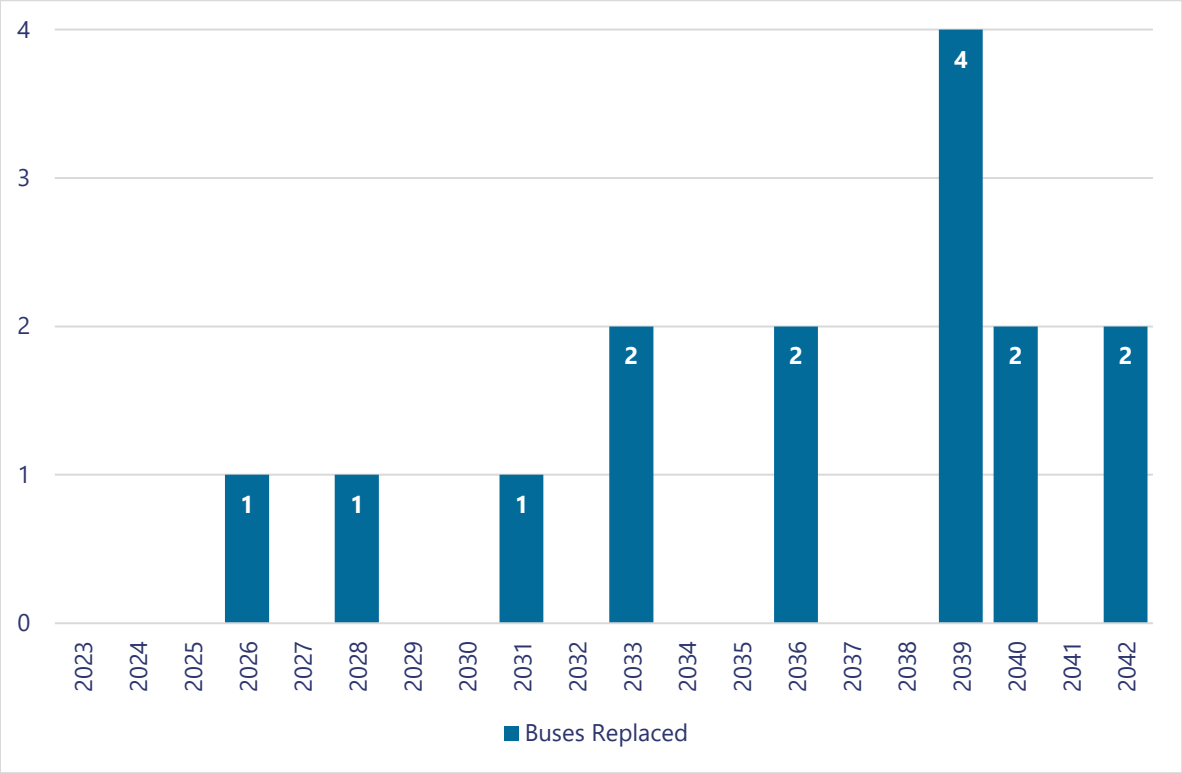
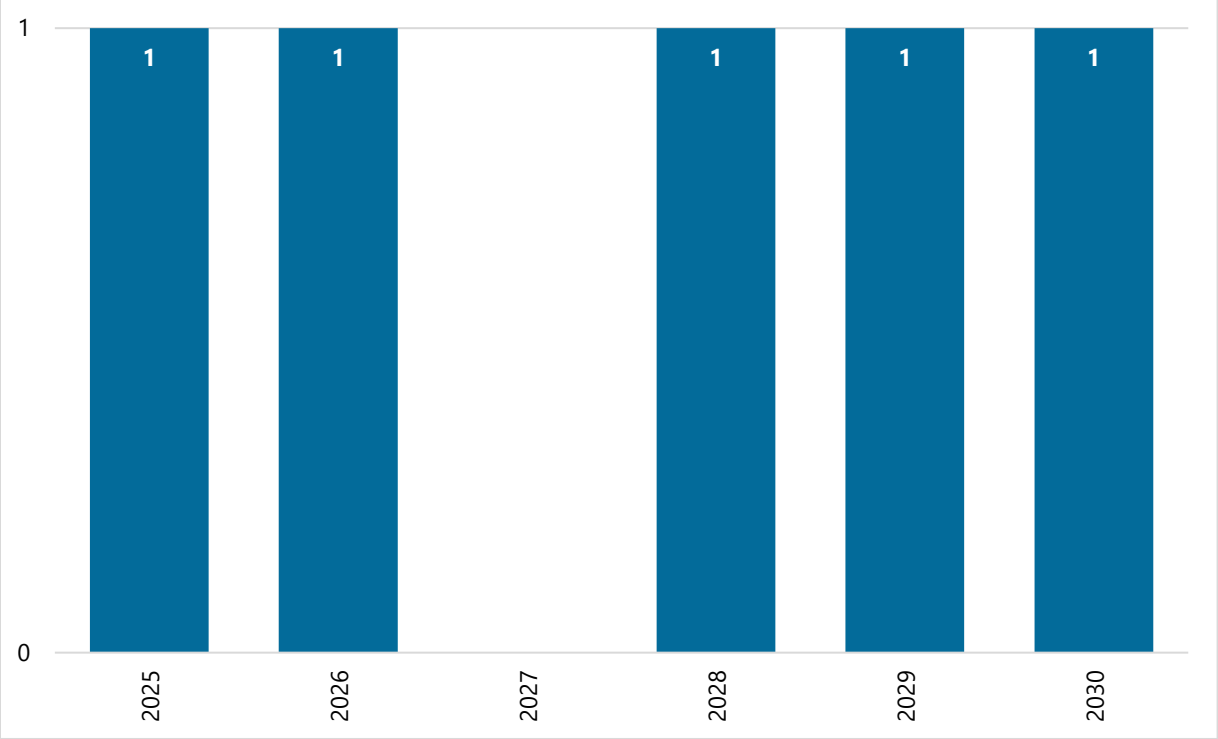


Figure 2: Paratransit Fleet Replacement Schedule



FIXED ROUTE & PARATRANSIT SERVICE OPERATIONS OPERATING SCHEDULES

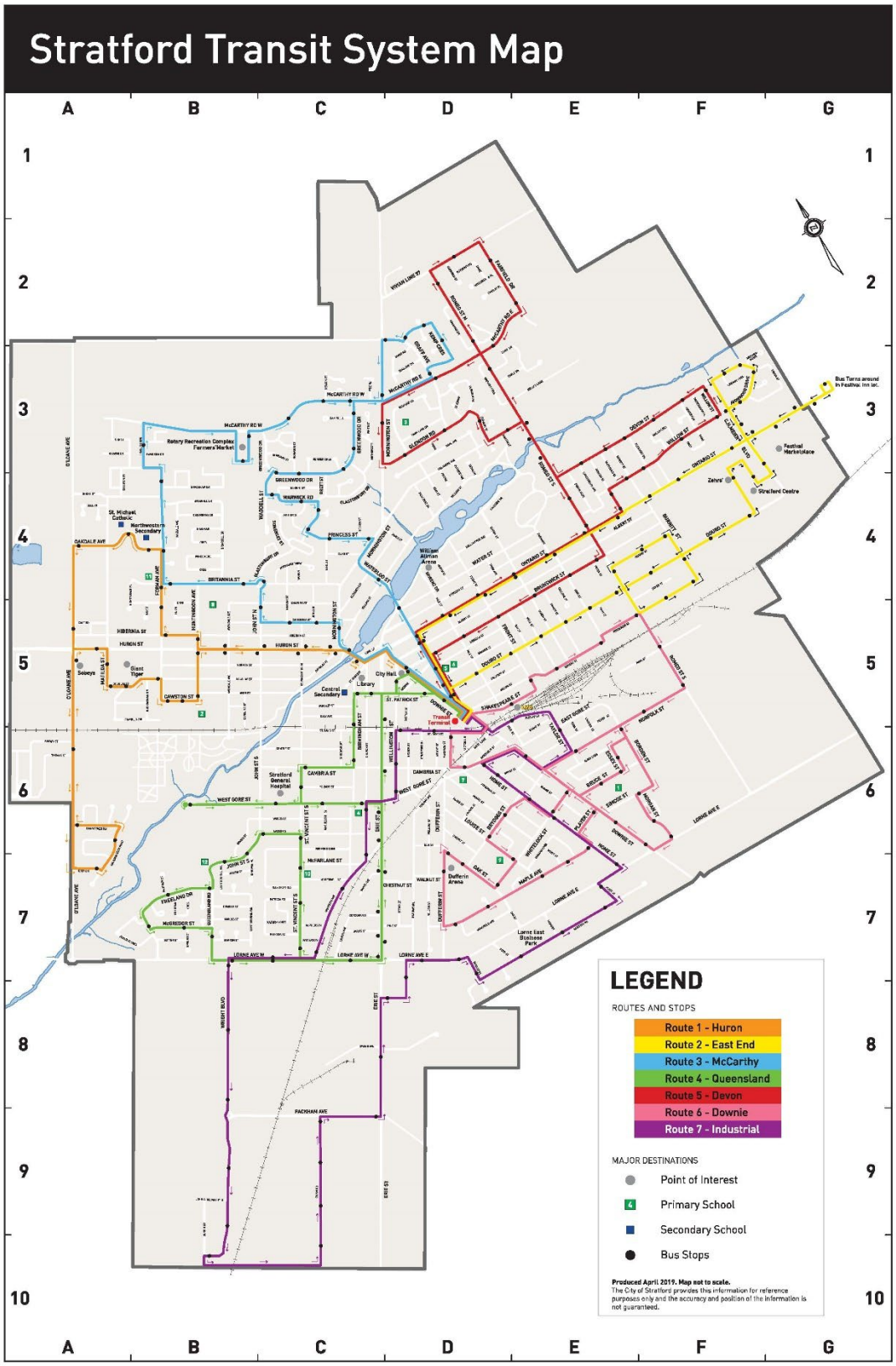
Stratford Fixed Route Transit (Weekday Only)

Stratford Transit has 7 bus routes that operate and start and end at the Transit Terminal at the centre of the City, as shown in **Figure 3**. Most routes are about half an hour end-to-end and average approximately 14km in length. There are 32 trips a day. One bus has the same route for the whole day and buses are out from 6am to 10pm.[2]

A piece of work for a transit bus is typically called a block which has information on the start/end time, routes on which it will operate and timetable of when it will be at various stops on the route. All of Stratford's blocks operate at approximately a distance of 300-400km.

[2] https://www.stratford.ca/en/live-here/transit.aspx#August-10-2022-Stratford-Transit-School-Specials-for-20222023

Figure 3: Stratford Transit System



The operation of longer blocks (over 200kms) makes it challenging to accommodate battery electric vehicles because their operation is contingent on their battery capacities. Based on GTFS data from Fall 2022, the current diesel and hybrid fleet's blocks typically last 15 hours and run for 300-400 kms for a typical weekday

By comparison, BEBs can only continuously run for about 200 km, with less running time capacity in cold winter weather. This limits block times to approximately 10 hours, which in turn requires significant adjustments to route planning and scheduling.

Weekend On-Demand Service

Stratford Transit runs on-demand services on Saturday and Sunday. Six buses run on Saturday and three are out on Sunday. All buses run for eight and a half hours and customers request the stops they want to go to at the time they need to be there. Hours of operation are 6am to 8pm on Saturdays and 10am to 5:30pm on Sundays.[3]

School Bus Service

Stratford Transit provides School Special buses on mornings and afternoons during the weekdays for Stratford Intermediate School, Stratford District Secondary School, and Street Michael Catholic Secondary School. The buses leave the Terminal and travel to the schools at 7:25am until 8:45am. The times the buses arrive at the schools in the afternoon vary between 2:40pm and 3:05pm.[4]

Parallel Transit

Parallel Transit is Stratford's paratransit service. It is a door-to-door paratransit service for people with disabilities and/or who are unable to use the fixed route transit service. Parallel Transit service is available on a first come, first served basis between 6:20am and 9:40pm Monday through Friday, from 6:20am to 7:40pm on Saturday, and between 9:00am and 4:00pm on Sunday.

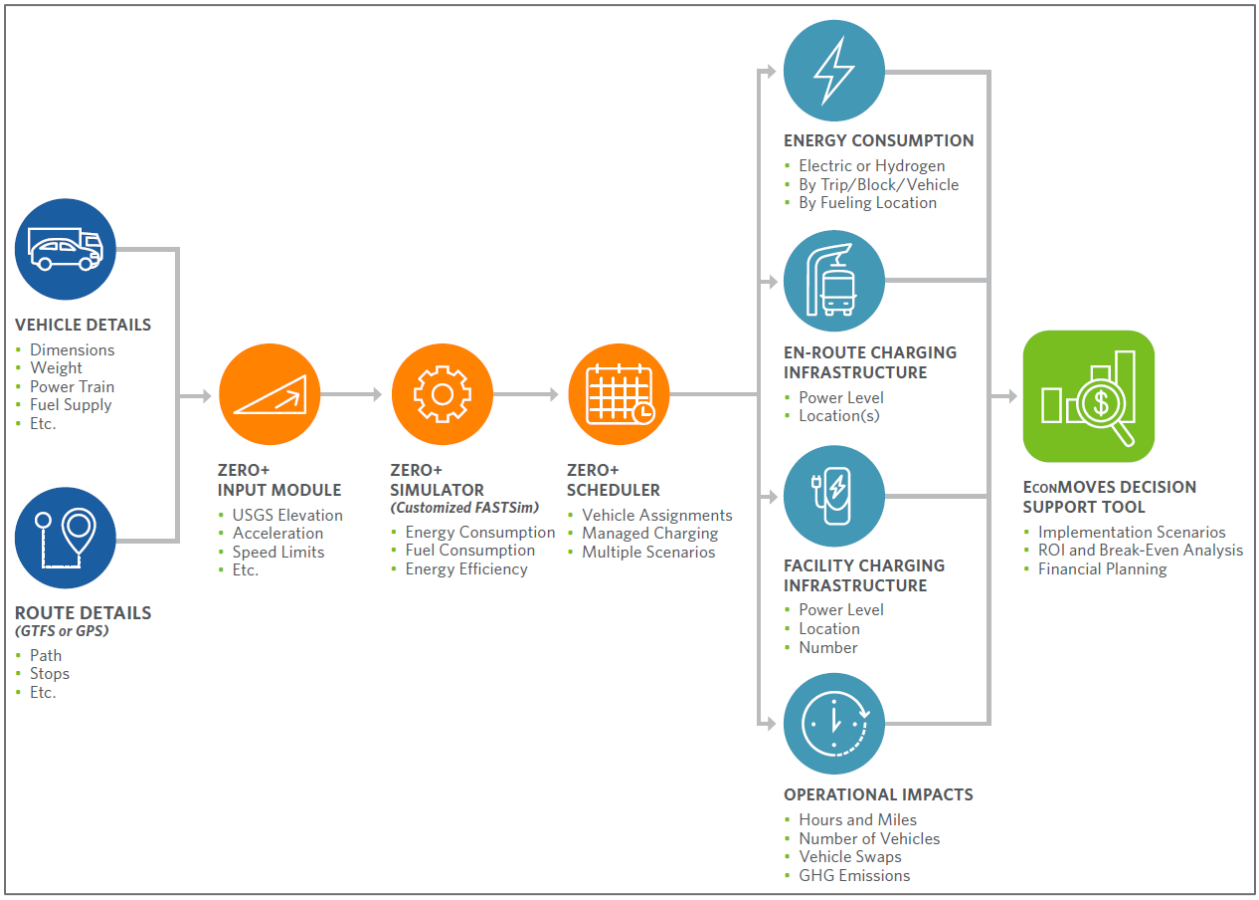
[3] https://www.stratford.ca/en/live-here/transit.aspx#August-10-2022-Stratford-Transit-School-Specials-for-20222023

[4] https://www.stratford.ca/en/live-here/transit.aspx#August-10-2022-Stratford-Transit-School-Specials-for-20222023

ENERGY CONSUMPTION ANALYSIS

The energy consumption analysis for Stratford's fixed route fleet was done using Zero+, HDR's proprietary energy consumption modelling tool to provide a comprehensive understanding of the potential impacts BEB technology may have on Stratford's existing service. Energy consumption is impacted by several factors; including slope and grade of the bus routes, number of vehicle stops, anticipated roadway traffic, terrain, and ambient temperature. Zero+ also analyzes variables known to affect lifetime vehicle performance like energy density, battery degradation, operating environment, auxiliary loads like heating and air conditioning, and lifecycle of bus batteries.

Figure 4: Zero+ Fleet Optimization Tool



The service data used was based on the service schedule on Stratford Transit's website as of October 2022[5], which notes reduced service due to COVID. Energy modelling for paratransit vehicles was conducted using a high-level mathematical modelling analysis due to less available data and the less structured nature of the services. Three BEB scenarios were modelled:

[5] https://www.stratford.ca/en/live-here/transit.aspx, October 2022

- **Baseline:** Bus reuse only with depot charging allowed all day (no modifications to the existing schedule)
- **Block Split:** Bus reuse and mid-block swaps allowed with depot charging allowed all day
- **Enroute Charging:** Bus reuse and mid-block swaps allowed with depot AND enroute charging allowed all day

During the schedule optimization process, larger battery (675 kWh) scenarios for the en-route charging option were added for sensitivity. The scenario outcomes are detailed below following discussion of key assumptions.

KEY ASSUMPTIONS

To develop a model relevant for Stratford's fleet and operations, a set of assumptions and variables was identified (**Table 2**). It is noted that the assumptions regarding vehicle Original Equipment Manufacturer (OEM) attributes represent a typical, commercially-available BEB model. Subsequent procurement of BEBs following this analysis may result in vehicle OEM specifications which differ from these assumptions, which may impact the results of this analysis. Additional energy consumption modelling based on the selected OEM should be conducted to confirm energy and infrastructure requirements.

Table 2: BEB Simulation Assumptions

Variable	Input
Service Data	October 2022
Battery Capacity	525 kWh (Larger assumed to be 675 kWh)
End-of-Life Battery State of Health	80% (max battery degradation)
Energy Reserve	20% state of charge (SOC)
Heating	Electric Heat, Diesel Heat
Ambient Temperature	-18C (Cold weather, 10th percentile)
Passenger Capacity	100%
Depot Charger Power	150 kW @ 95% Efficiency
En-route Charger Power	450 kW (Vehicle Limited) @ 95% Efficiency

As shown in the table above, this model assumes a bus with a 525 kWh nameplate battery capacity, which is typical for longer-range BEBs available on the market today. While some bus manufacturers offer BEBs with greater battery capacities, modelling service with a standard vehicle provides flexibility when selecting a vehicle manufacturer.

The depot charging scenario is modelled with 150 kW chargers with a 95% efficiency and the en-route charging scenario is modelled with 450 kW chargers with a 95% efficiency. The main vehicle modelled in the Zero+ modelling tool are the 40' New Flyer Xcelsior Charge with a 525-kWh battery. For comparison purposes in some of the scenarios, the Proterra ZX5MAX is

modelled as it currently has the largest battery capacity among manufacturers in North America with a nameplate capacity of 675 kWh.

A 20% reduction of battery capacity was applied to reflect end-of-life conditions. This is consistent with bus original equipment manufacturer (OEM) warranties which typically guarantee 80% of battery capacity for 12 years.

In addition to battery degradation, the model swaps out any vehicle that goes below the 20% state of charge (SOC) energy reserve. This is to account for both the fact that vehicles typically cannot use the last 10% SOC of a battery pack without performance reductions as well simulating the factor of safety most agencies use to reduce range anxiety for operators.

Energy consumption was modelled for the 10th percentile lowest temperature in Stratford in February (-18 °C)[6]. The initial modelling scenario assumed the use of an electric heater (which requires a loading of about 24 kW). This is a relatively conservative assumption as a heater would likely not need to be run the full day. A modelling scenario was also created that assumed a diesel auxiliary heater would be used to reduce the power requirement and increase the range of vehicles during cold weather.

It should be noted that while en-route chargers are capable of outputting 450 kW of power, the vehicle must be able to accept that level of power. In other words, as -is the case with the majority of transit buses today that can accept fast charging, the actual charge rate of a bus using a 450 kW charger is typically lower. The rate of output of the charger is determined by the vehicle and is based on a variety of factors that change based on the state of charge (SOC). The modelling factors in the charge curves (rate of charge vs SOC) are provided by manufacturers for each vehicle type. The achieved charging power in the Zero+ model is limited by both the charging curve for the vehicle and the maximum power of the charger.

BASELINE SCENARIO

The first modelled scenario assumes depot charging is allowed all day with no modifications to block schedules. Buses are reused if a vehicle has a minimum state-of-charge (SOC) of 60% or higher. In this scenario, if a short block is completed and the bus has at least 60% SOC, then the vehicle is used again to start another block that it can complete. This gives an indication of how feasible the blocks will be based on how Stratford currently operates. The main takeaway of the baseline scenario was that the vehicles were not able to complete the majority of the blocks so this option was discounted as there would be a significant increase in non-revenue hours, kilometres, and fleet

[6] https://weatherspark.com/s/19225/3/Average-Winter-Weather-in-Stratford-Canada#Figures-Temperature

DEPOT CHARGING ONLY SCENARIO

To develop a feasible alternative for Stratford, this scenario assumes that buses will be swapped out partway through the block with a fully-charged vehicle when the first vehicle reaches 20% SOC. From a scheduling perspective, this was done by swapping buses so they could run in shorter blocks that could be accommodated by BEB running time capacity.

The model assumes that when swaps occur, a bus that would normally stay in service would return to the depot, and another bus and bus operator would drive from the depot to take its place. This has impacts both on fleet size required (peak vehicle requirement) as well as operational costs due to the increased amount of deadhead (non-revenue hours and kilometres between the depot and the first/last stop).

The scheduled blocks have had swaps inserted once a vehicle falls below the parameters set in the model assumptions. This gives an idea of what a schedule would look like that is able to be completed by a full fleet of BEBs and how it impacts fleet size and operational costs.

In reality, schedulers will use their judgment when cutting blocks where it makes the most sense to do so. The 20% reserve is meant only as a guideline, but gives schedulers operational flexibility (unforeseen events, traffic, detours), improves battery life, and reduces driver range anxiety.

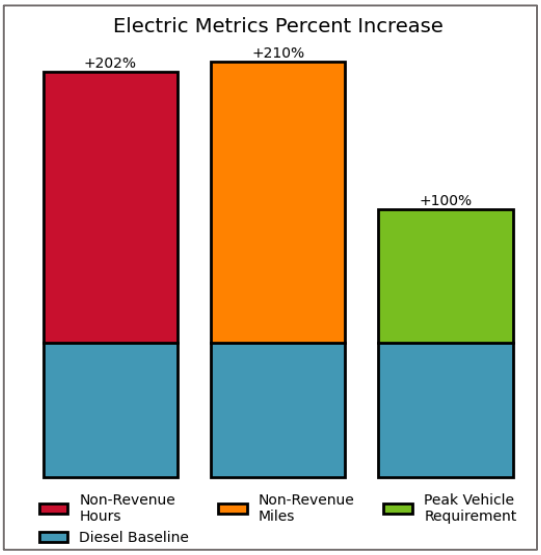
DEPOT CHARGING ONLY WITH ELECTRIC HEATERS

Model Results

Below is a review of the main components of the transit service and operations that are likely to change and should be considered when transitioning to a BEB fleet. **Figure 5** shows an estimate of the increase in non-revenue hours and kilometres as well as the estimated number of vehicles required to continue the current transit service.

Figure 5: Depot-Only Charging, Bus Swap - Electric Heating Outputs

- Revenue Hours & Kilometres remain the same
- Non-Revenue Hours: 202% increase
- Non-Revenue Kilometres: 210% increase
- Peak Vehicle Requirement: 100% increase
  Increase Fleet from 7 to 14 buses (does not include school service)
- At least 3 Depot Chargers will be required

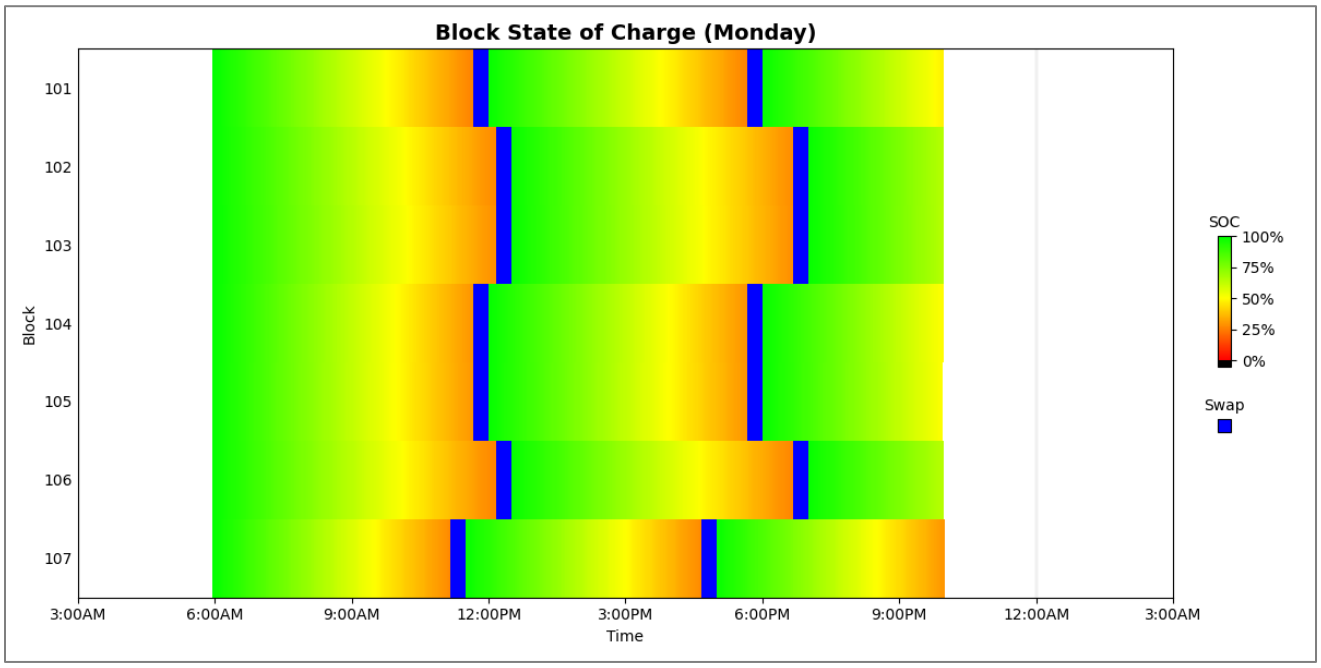


The vehicle battery state of charge on each block of typical weekday service are shown in **Figure 6**. Fleet and charging requirements are driven by weekday service.

Each block is represented by a line on the chart with the color of the line corresponding to the state of charge of the vehicle. The color changes from green to yellow to red to black as the state of charge drops from 100 to 0 percent. Bus swaps (shown in blue) are introduced only between trips to minimize service impacts.

All blocks require two swaps when we assume the buses are using electric heaters, which will be operationally challenging. Operating this service as defined would require a sizable increase in non-revenue hours, kilometres, and peak vehicles.

Figure 6: State of Charge with Electric Heating, Bus Swaps



Power Requirements

The modelling results provide estimates for both power demand and energy consumption at the Stratford Transit depot. Using these results, a preliminary assessment of the required infrastructure can be made. The baseline scenario is not shown here as it was not determined to be viable.

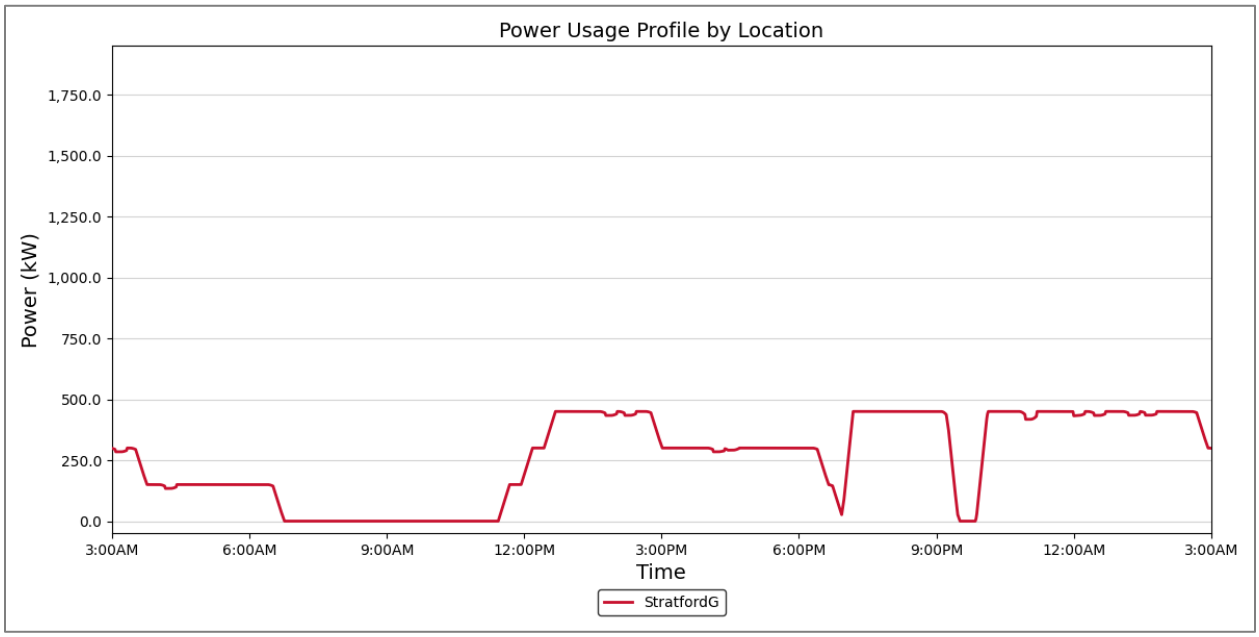
Below is the worst-case daily power demand, meaning the maximum load that would be required during weekday service with cold weather (10th percentile temperatures). Depending on the utility provider, the cost of energy depends not only on the peak power demand but also on the time of day when that peak demand occurs.

Electricity cost is typically billed based on two factors: peak power demand (kW) and amount of energy consumed (kWh). While consumption is the actual amount of energy consumed over the billing period, peak power demand is typically the maximum level seen over the billing

period. Both of these factors can be impacted by the Time-of-Use (TOU) rates where costs fluctuate throughout the day.

The simulation results provide a power profile that can be used to understand when in the day the peak load occurs and how it is affected by any TOU charges. **Figure 7** shows the managed load profile, meaning the model attempts to use the fewest chargers to have vehicles ready for service the next day. The peak power demand for the Stratford Transit garage for a BEB fleet with electric heating and block swapping is around 0.45 MW assuming. three (3) 150 kW chargers would be required.

Figure 7: Charging Profile for Electric Heating, Block Swaps

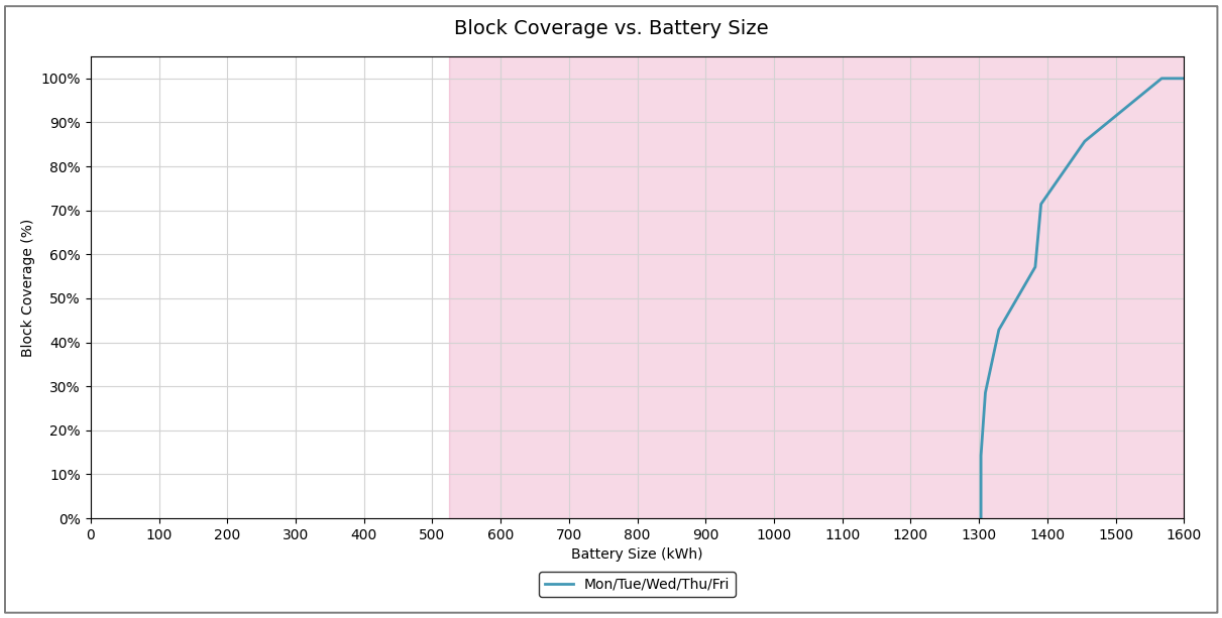


Vehicle Battery Sizes

With technological advances expected in the coming years, it may be possible to improve the performance of some scenarios by purchasing buses with larger battery sizes. There are vehicles with a battery size of (~600 kWh+) that offer more range than the 525 kWh battery that was modelled.

For the electric heating with bus swaps and depot charging only scenario, **Figure 8** illustrates that there is relatively little gain in performance when comparing a 525 kWh battery with a slightly larger batter (~600 kWh). A minimum 1,300 kWh battery would be needed to complete an entire block under present operating conditions and power usage rates. Batteries of this capacity do not yet exist.

Figure 8: Battery Size Requirement, Electric Heating, Bus Swaps



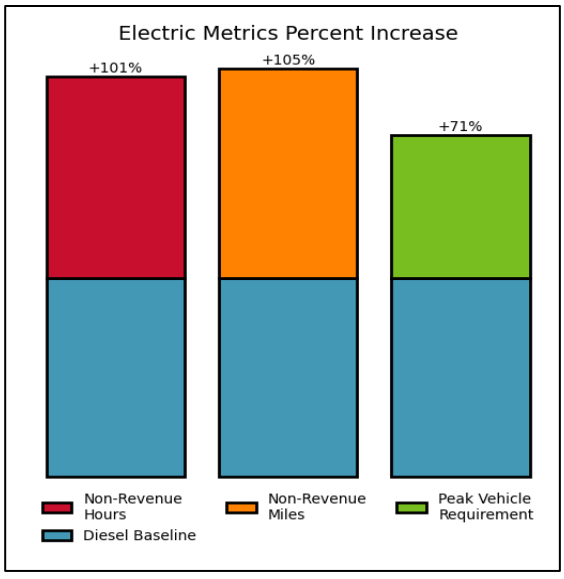
DEPOT CHARGING ONLY WITH DIESEL HEATERS

Model Results

Below is a review of the main components of the transit service and operations that are likely to change and should be considered when transitioning to a BEB fleet, particularly if onboard heaters are diesel powered. **Figure 9** shows an estimate of the increase in non-revenue hours and kilometres as well as the estimated number of vehicles required to continue the current transit service.

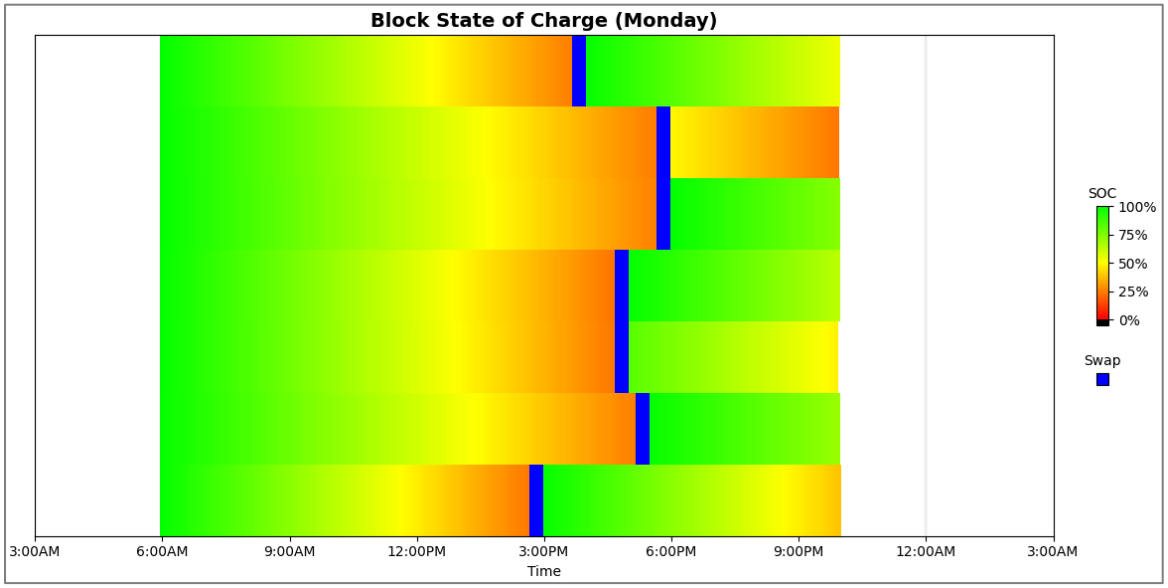
Figure 9: Depot-Only Charging, Bus Swap -- Diesel Heating Outputs

- Revenue Hours & Kilometres remain the same
- Non-Revenue Hours: 101% increase
- Non-Revenue Kilometres: 105% increase
- Peak Vehicle Requirement: 71% increase
  Increase Fleet from 7 to 12 buses (does not include school service, which would be an additional 3 buses [15 total])
- At least 2 Depot Chargers will be required



Including diesel heaters on the BEBs does offer significant operational improvements for Stratford service as all blocks are feasible with only one swap. SOC is shown in **Figure 10**. The increase in non-revenue hours, kilometres, and peak vehicle requirement is still high, although this option has lower non-revenue costs compared to electric hearing on board.

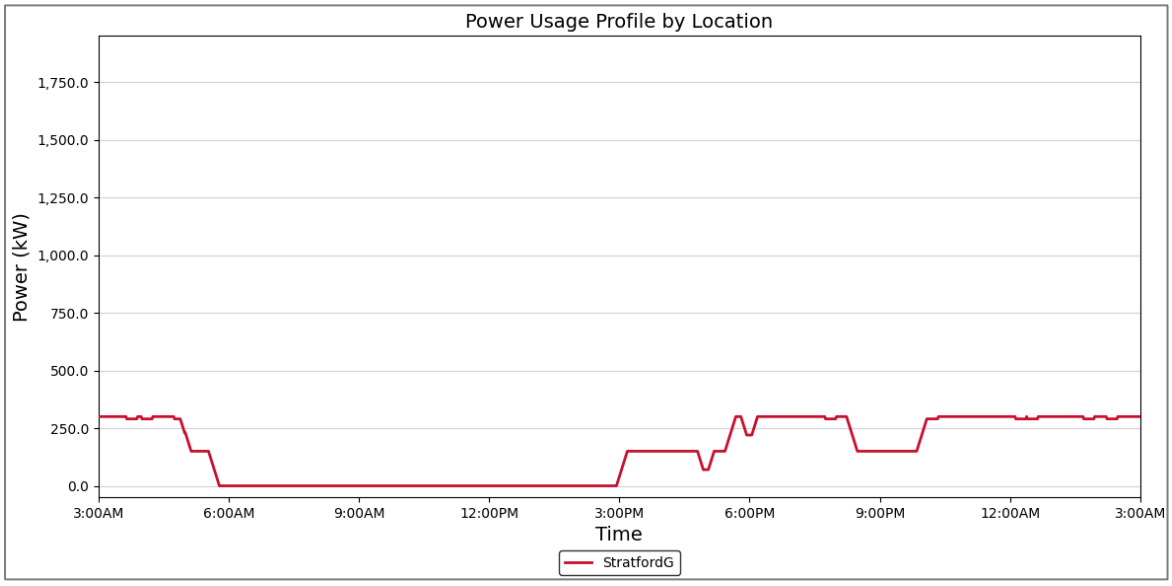
Figure 10: State of Charge with Diesel Heating, Bus Swaps



Power Requirements

The power profile for the Stratford Transit garage is shown in **Figure 11** for buses with diesel heaters. Diesel heaters bring the power requirement down to about 0.3 MW at the depot. In this scenario, only two, 150 kW chargers would be required.

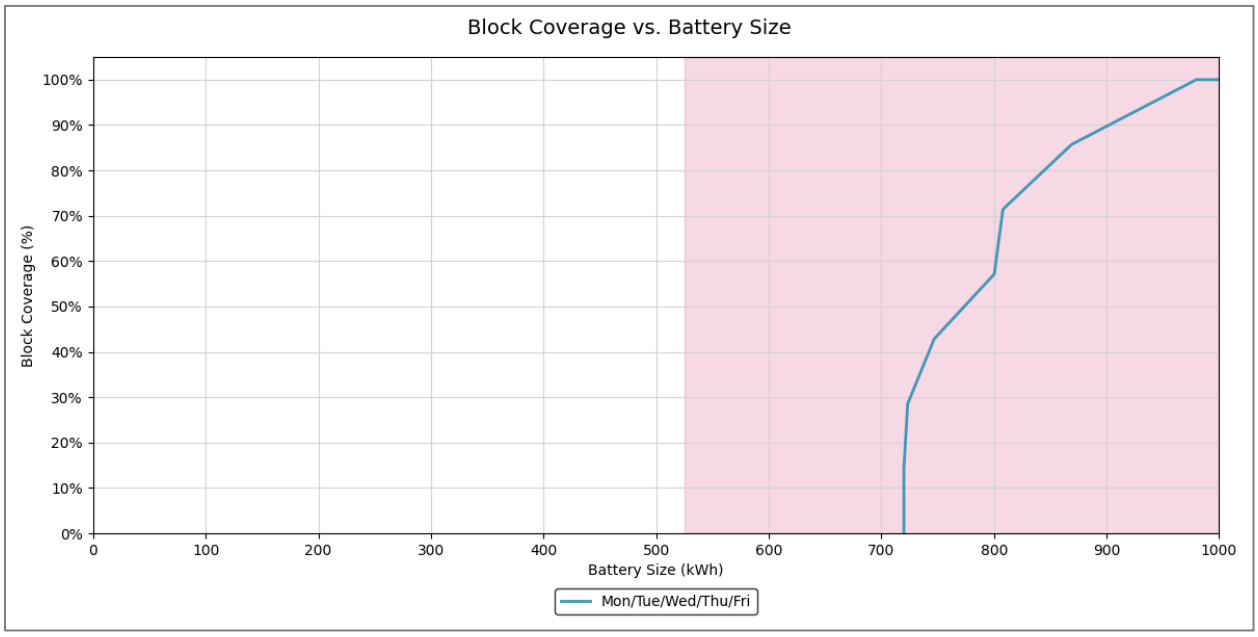
Figure 11: Charging Profile for Diesel Heating, Bus Swaps



Vehicle Battery Sizes

There is slightly more block feasibility (around 30%) for the diesel heating depot charging scenario when purchasing buses with larger battery sizes. **Figure 12** shows that no blocks can be fully covered with a 525 kWh battery.

Figure 12: Battery Size Requirement, Diesel Heating, Bus Swaps



DEPOT AND EN-ROUTE CHARGING SCENARIO

En-route (opportunity) charging is an enhancement that can greatly improve the feasibility of BEBs in many situations. This is particularly helpful with circulatory routes where the same en-route charger can be used by a vehicle multiple times throughout the day. En-route charging involves allowing a bus to charge for a short period of time using a high-powered charger (450 kW or greater) while stopped along its route while laying over. The mixture of en-route charging and charging in the bus depot greatly extends the range of a BEB and facilitates one-to-one replacement of a larger number of diesel vehicles when the routes are conducive to this charging strategy.

EN-ROUTE CHARGER LOCATION – COOPER TRANSIT TERMINAL

En-route charging infrastructure is ideally located at places such as transit centers where buses operating on multiple routes have scheduled layover time. When identifying potential en-route charging locations, property ownership and available grid capacity determine feasibility while average layover times and number of buses and riders passing through each site influence preference over other potential locations. Based on discussions with City staff on site feasibility

and reviews of the current schedule for sites that have existing layover time, the Cooper Transit Terminal was identified as the primary location for en-route chargers as all routes start and end at the location and it is the only place on the transit network with scheduled layovers. The Terminal is off Downie Street as is shown in **Figure 13.**

Figure 13: Cooper Transit Terminal Location

The modelling is meant to evaluate if opportunity charging would have significant operational and range benefits for BEBs. No modifications were made in the model to existing vehicle schedules toutilize these chargers. A more detailed evaluation of site suitability for the location would need to be conducted before implementing any infrastructure.

Chargers capable of outputting up to 450 kW using an overhead pantograph were assumed at the en-route charging location. The scenario is reviewed with electric and diesel heaters below. There are two options explored for diesel heaters with a 525 kWh battery size and a larger 675 kWh battery size. The 675 kWh battery option is used to examine the extent to which a larger battery can impact the number of blocks completed with no swaps, the number of vehicles, and non-revenue hours and kilometres.

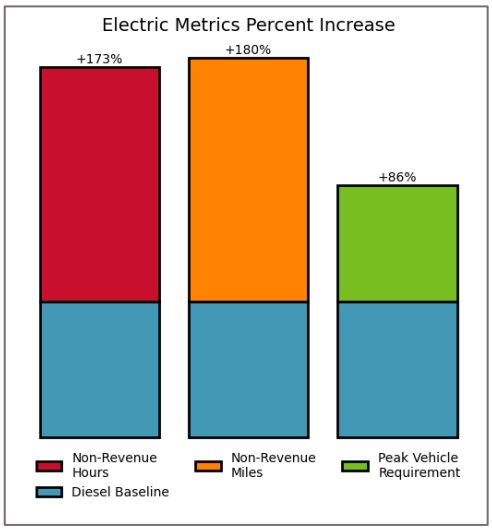
DEPOT CHARGING AND ONE EN-ROUTE CHARGER WITH ELECTRIC HEATERS

Model Results

Below is a review of the main components of the transit service and operations that are likely to change and should be considered when transitioning to a BEB fleet. **Figure 14** shows an estimate of the increase in non-revenue hours and kilometres as well as the estimated number of vehicles required to continue the current transit service.

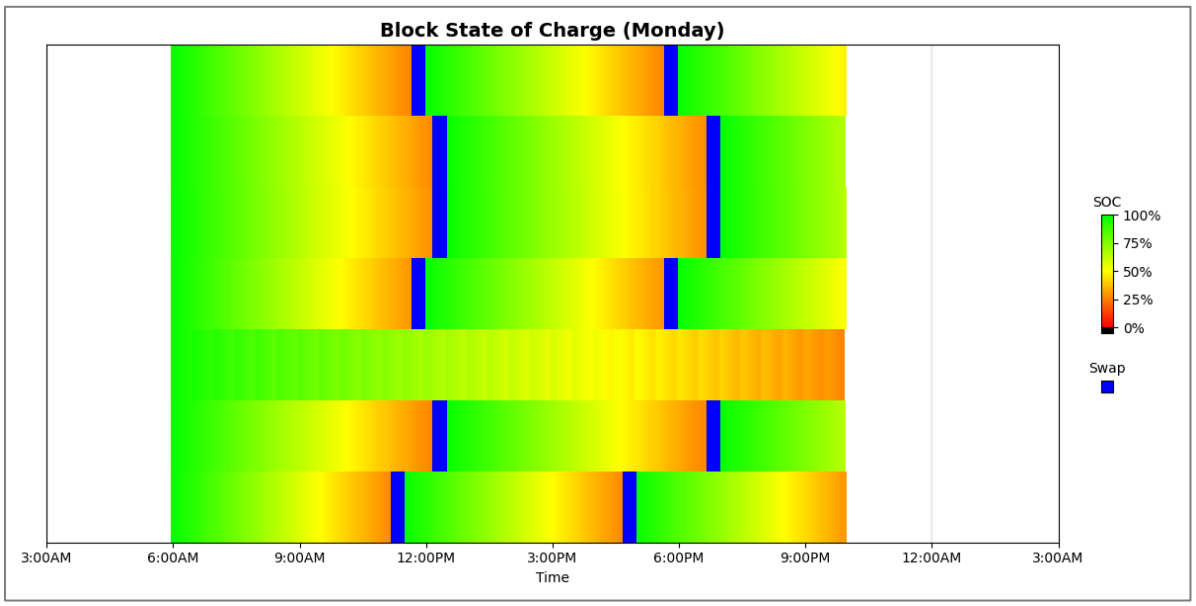
Figure 14: Electric Heating, En-Route and Depot Charging Outputs

- Revenue Hours & Kilometres remain the same
- Non-Revenue Hours: 173% increase
- Non-Revenue Kilometres: 180% increase
- Peak Vehicle Requirement: 86% increase
  Increase Fleet from 7 to 13 buses
- At least 2 Depot Chargers will be required
- 1 En-route Charger required



With an electric heater on-board, opportunity charging would not make a significant difference as all except one block still require two bus swaps, as shown in **Figure 15**.

Figure 15: State of Charge, Electric Heating, Bus Swaps, En-Route Charging

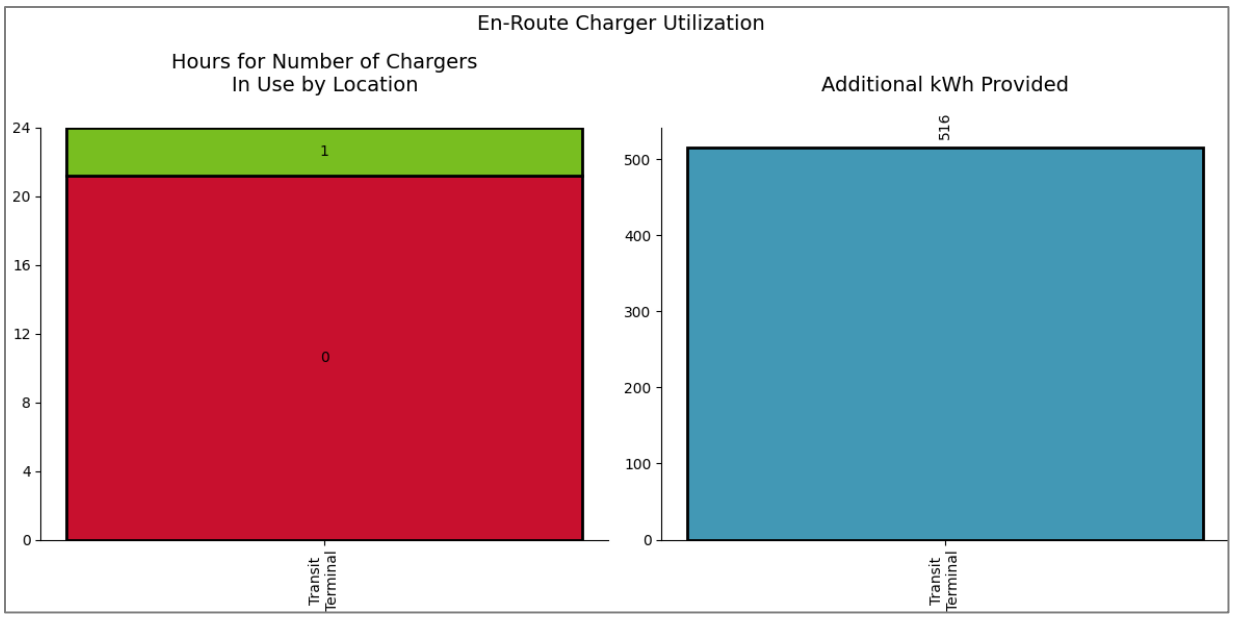


En-Route Charger Utilization

The en-route charger utilization is shown in **Figure 16**. Nine percent (9%) of total energy could be provided by en-route chargers, with the rest being supplied in depot.

In general, this gives a good indication of the quantity of equipment required at the Cooper Transit Terminal. There are operational benefits to having more than one charger at any location as it provides additional redundancy in case one charger goes out of service (or is down for maintenance), then there is at least one functioning charger at that location.

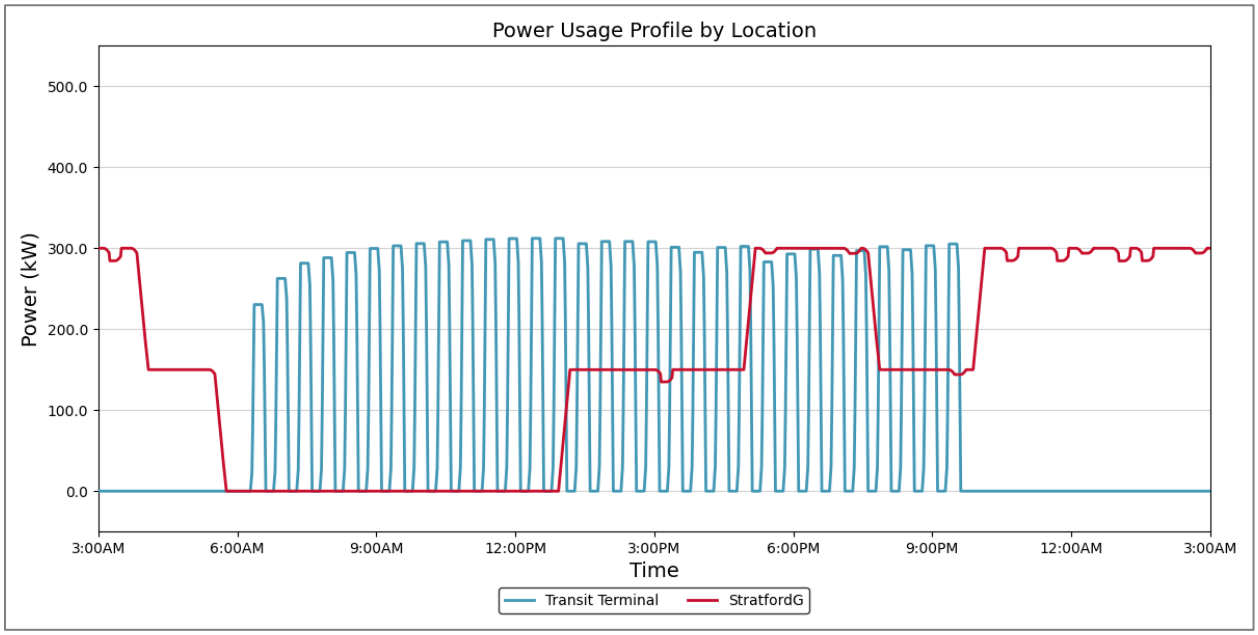
Figure 16: En-Route Charger Utilization, Electric Heating, Bus Swaps, En-Route Charging



Power Requirements

Adding en-route charging to the electric heating option reduced the peak power requirement by 0.2MW at the depot. The peak power demand would be around 0.3 MW and two, 150 kW chargers would be required at the depot. There would be a similar peak power demand of 0.3 MW for the one en-route charger. The power usage profile for the en-route charger scenario is shown in **Figure 17.**

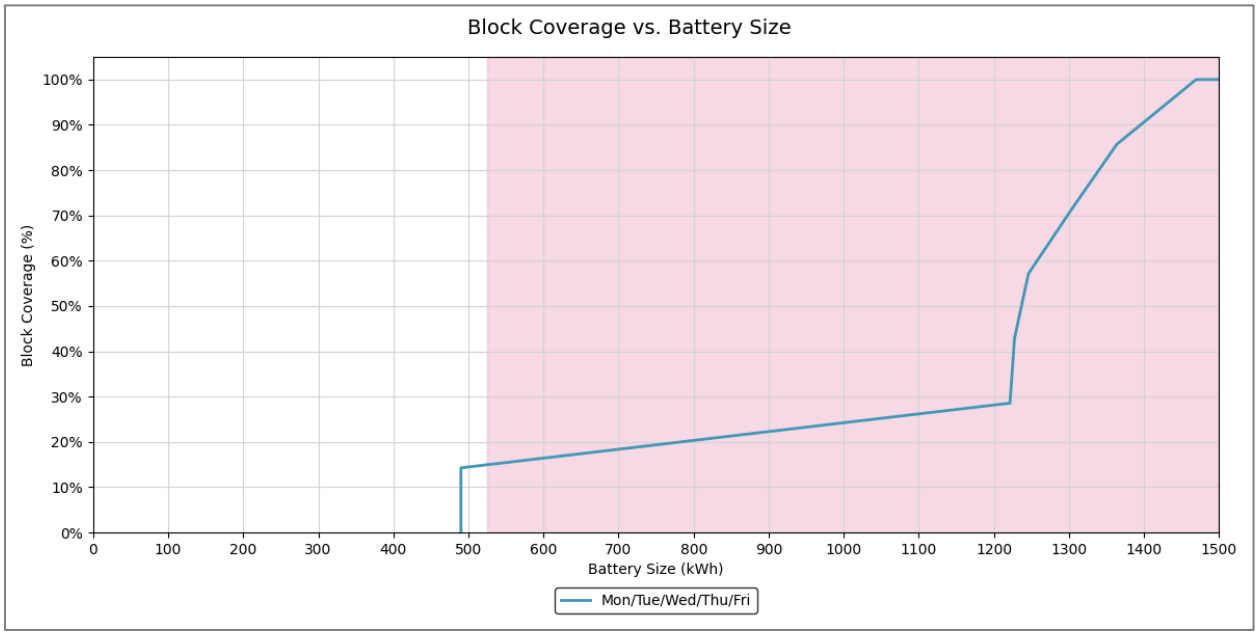
Figure 17: Charging Profile for Depot and En-Route Chargers, Electric Heating, Bus Swaps



Vehicle Battery Size

There is slight improvement in block feasibility for the electric heating, en-route charging scenario when purchasing buses with larger battery sizes. **Figure 18** shows block coverage with a 525 kWh battery is around 16% and a larger battery (~600 kWh+) kWh battery can only cover slightly more (~18%+).

Figure 18: Battery Size Requirement, Electric Heating, Bus Swaps, En-Route Charging



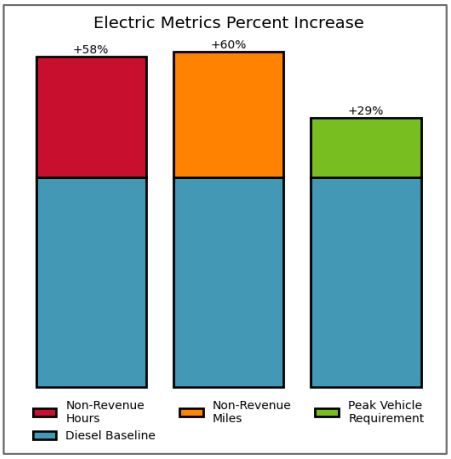
DEPOT CHARGING AND ONE EN-ROUTE CHARGER WITH DIESEL HEATERS (525 KWH BATTERY)

Model Results

Below is a review of the main components of the transit service and operations that are likely to change and should be considered when transitioning to a BEB fleet. **Figure 19** shows an estimate of the increase in non-revenue hours and kilometres as well as the estimated number of vehicles required to continue the current transit service.

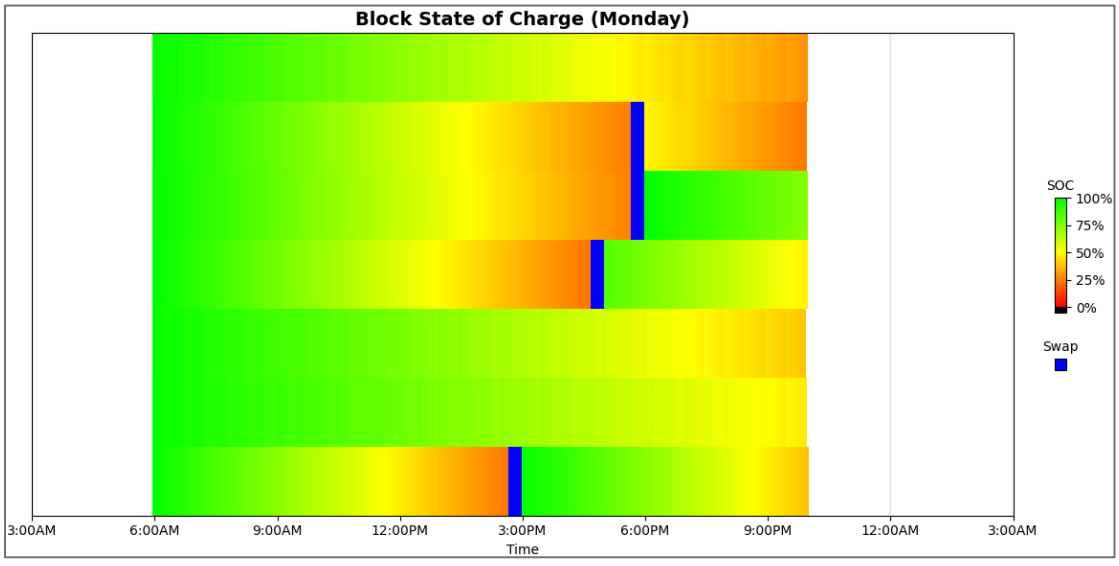
Figure 19: Diesel Heating, 525 kWh Battery, En-Route and Depot Charging Outputs

- Revenue Hours & Kilometres remain the same
- Non-Revenue Hours: 58% increase
- Non-Revenue Kilometres: 60% increase
- Peak Vehicle Requirement: 29% increase
  Increase Fleet from 7 to 9 buses
- At least 1 Depot Charger will be required
- 1 En-route Charger required



With a diesel heater onboard instead of electric heating, the number of feasible blocks without any bus swaps increases from 14% to 43%, as shown in **Figure 20**. The reduced energy requirement from the buses allows en-route charging to keep some of the buses at a relatively high level of charge for most of the day.

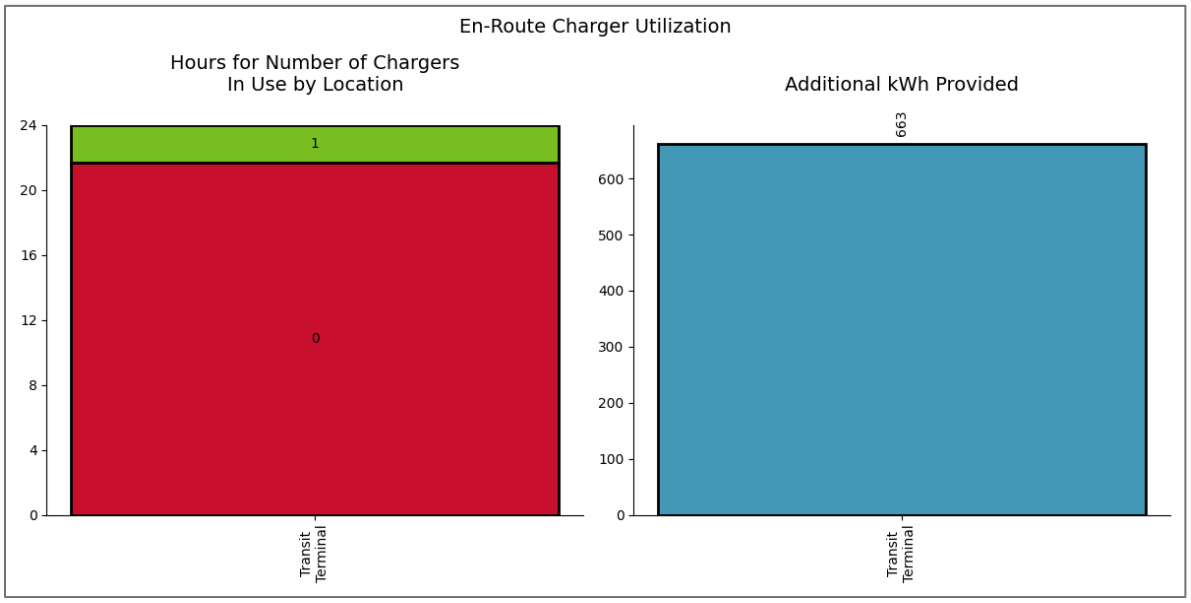
Figure 20: State of Charge with Diesel Heating, 525 kWh Battery, Bus Swaps, En-Route Charging



En-Route Charger Utilization

The en-route charger utilization is shown in **Figure 21**. 19% of total energy could be provided by the en-route charger, with the rest being supplied in depot.

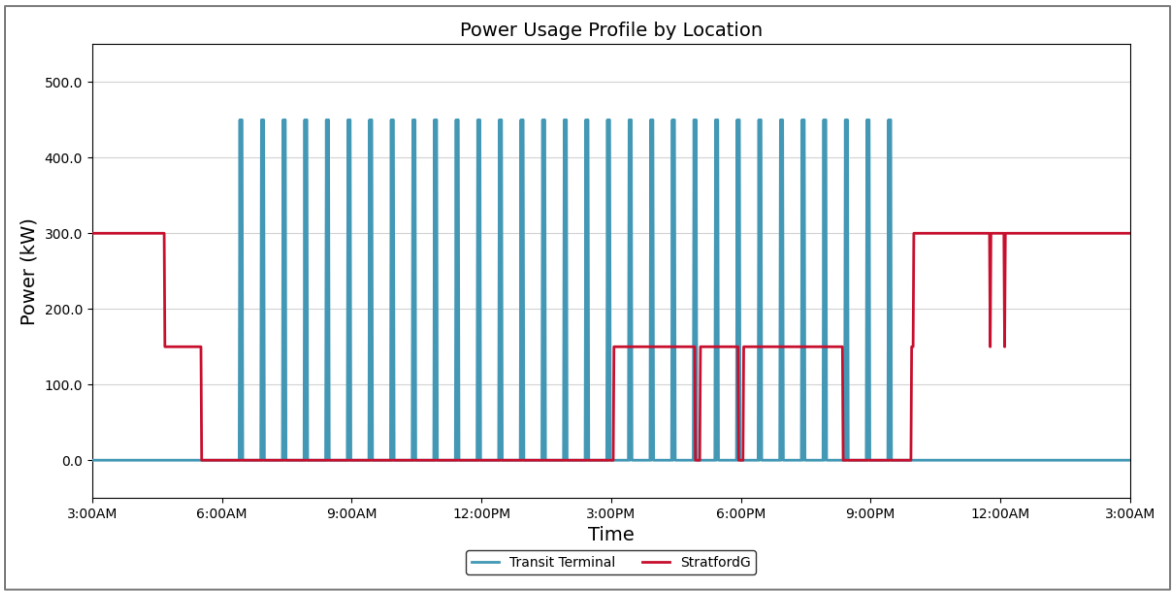
Figure 21: En-Route Charger Utilization, Diesel Heating, 525 kWh Battery



Power Requirements

With en-route charging and a diesel heater on-board, the peak power requirement in-depot is similar to the electric heating and en-route charging option, as shown in **Figure 22.** The peak power requirement would be just over 0.3 MW at the Stratford Transit garage. The charging profile for en-route chargers increases from a peak power requirement of 0.3 MW in the electric heating and en-route charging option to 0.45 MW.

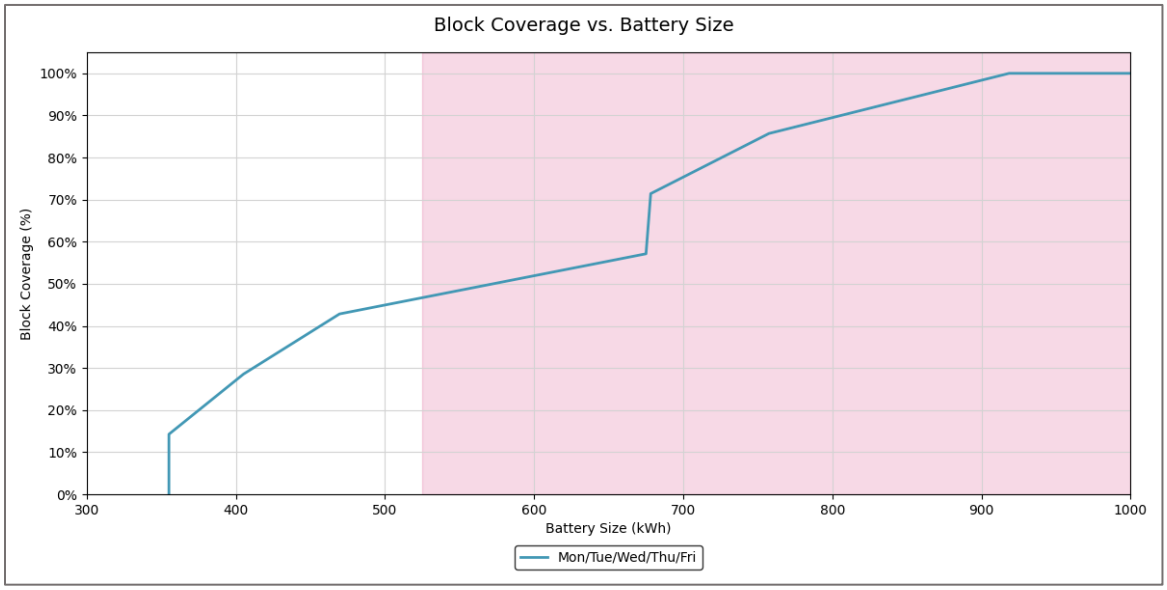
Figure 22: Charging Profile for En-Route Chargers and Depot, Diesel Heating, 525 kWh Battery



Vehicle Battery Size

The scenario with en-route charging and diesel heating has 48% block coverage at 525 kWh, as shown in **Figure 23**, and a larger battery size (~600 kWh+) would have slightly more coverage with at least 51% block coverage.

Figure 23: Battery Size Requirement, Diesel Heating, 525 kWh Battery, Bus Swaps, En-Route Charging



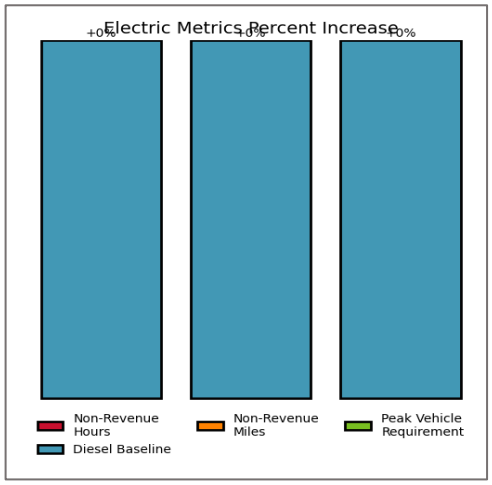
DEPOT CHARGING AND TWO EN-ROUTE CHARGERS WITH DIESEL HEATERS (675 KWH BATTERY)

Model Results

Below is a review of the main components of the transit service and operations that are likely to change and should be considered when transitioning to a BEB fleet. **Figure 24** shows an estimate of the increase in non-revenue hours and kilometres as well as the estimated number of vehicles required to continue the current transit service.

Figure 24: Diesel Heating, 675 kWh Battery, En-Route and Depot Charging Outputs

- Revenue Hours & Kilometres remain the same
- Non-Revenue Hours: 0% increase
- Non-Revenue Kilometres: 0% increase
- Peak Vehicle Requirement: 0% increase
- At least 3 Depot Charger will be required
- 2 En-route Charger required

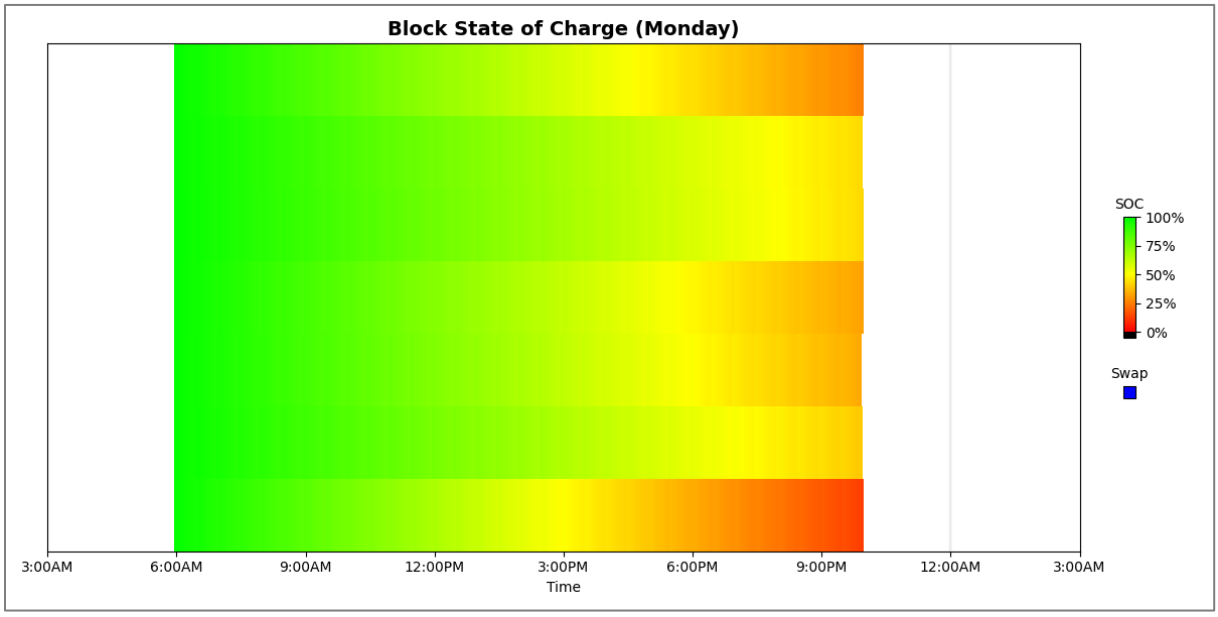


The results are not shown but increasing the battery size with one en-route charger was modeled but did not have a significant advantage. Increasing the number of en-route chargers without increasing battery size also modeled but again did not have a significant advantage in terms of operating hours or fleet size. When both battery size and number of en-route chargers we increased, there was a noticeable change which is presented here.

The diesel scenario with depot charging, two en-route chargers, and a 675 kWh battery was modelled to show the extent to which a larger battery size can decrease mid-block swaps and vehicle requirements. Although the 675 kWh battery was used in the Zero+ model, there are other battery sizes on the market so Stratford is not limited to one battery size and manufacturer. Using a larger battery size on top of including diesel heaters on the BEBs offers significant operational improvements for Stratford service. With larger batteries, 100% of blocks are feasible without swapping buses, as shown in **Figure 25**. There is no increase to fleet or non-revenue costs.

With this option, operators would get a charge every other time they arrive at the terminal; For example, buses 1-4 would be able to charge at the top of every hour and buses 5-7 would get to charge at the top of every half hour.

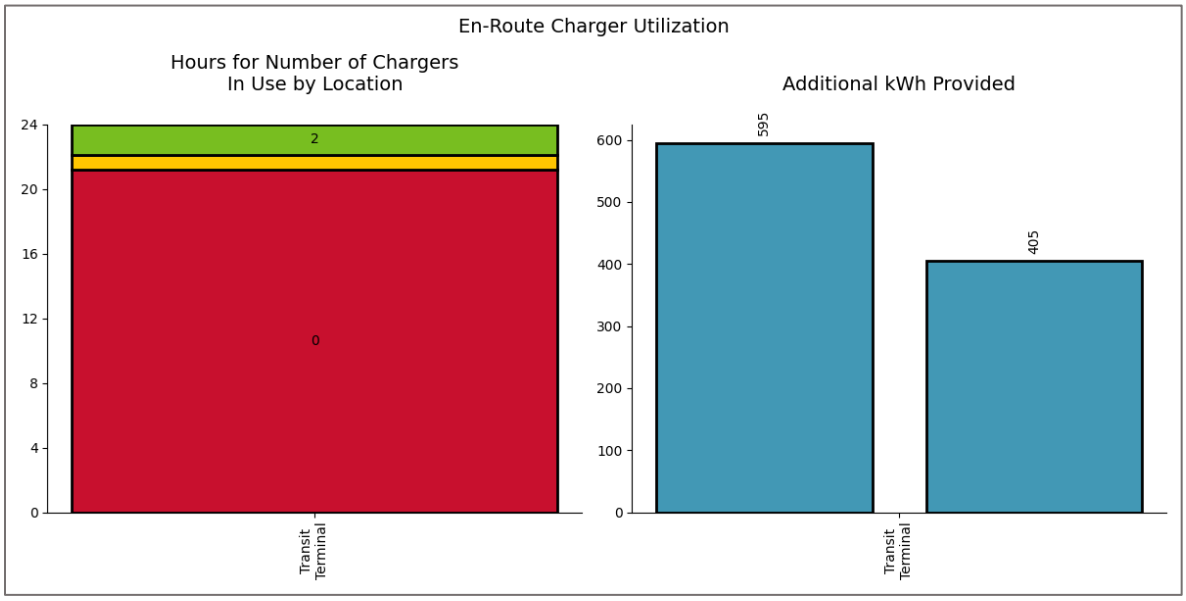
Figure 25: State of Charge with Diesel Heating, 675 kWh Battery, Bus Swaps, En-Route Charging



En-Route Charger Utilization

The en-route charger utilization is shown in **Figure 26**. 28% of total energy could be provided by the en-route charger, with the rest being supplied in depot.

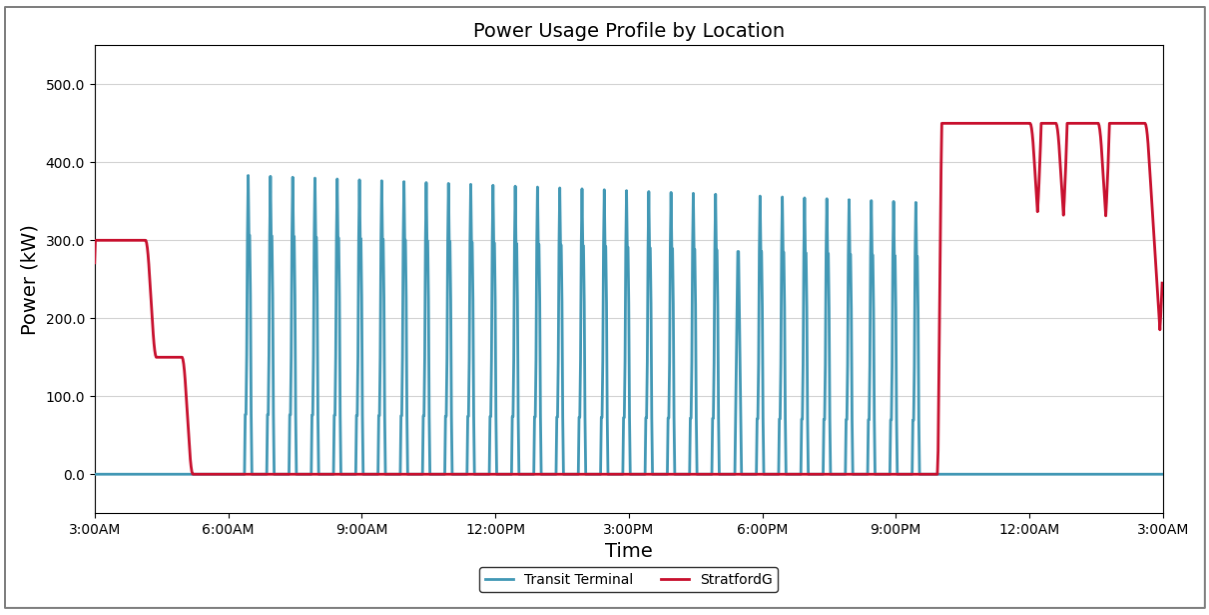
Figure 26: En-Route Charger Utilization, Diesel Heating, 675 kWh Battery, Bus Swaps, En-Route Charging



Power Requirements

With a larger battery and two chargers, the peak power requirement in-depot is higher than the other en-route charging options, as shown in **Figure 27.** The peak power requirement would be around 0.45 MW at the Stratford Transit garage. The charging profile for the two en-route chargers decreases slightly from the one en-route charger with diesel heaters (525 kWH Battery) option from 0.45 MW to just under 0.4 MW. For this option, there are no swaps which means that vehicles all go back to the garage at the end of service at similar times and complete a full charge for service back at the garage.

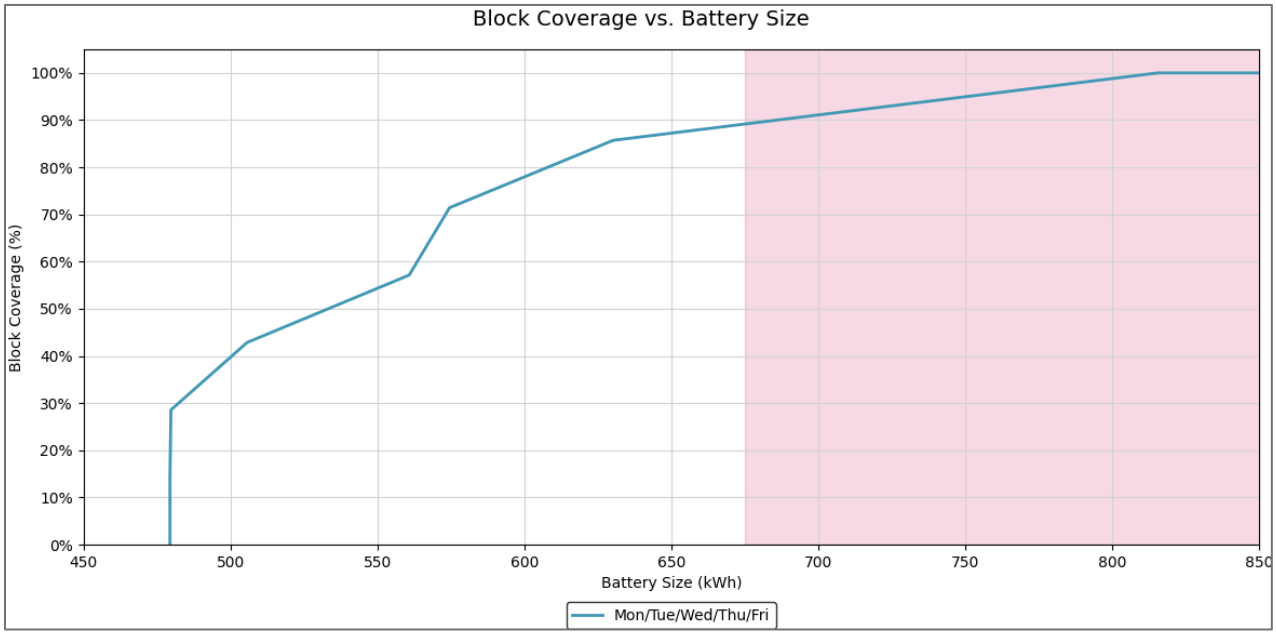
Figure 27: Charging Profile for En-Route Chargers and Depot, Diesel Heating, 675 kWh Battery



Vehicle Battery Size

En-route charging and diesel heating with a larger battery has approximately 90% block coverage at 675 kWh, as shown in **Figure 28**. With the two chargers at the Cooper Transit Terminal there is full block coverage.

Figure 28: Battery Size Requirement, Diesel Heating, 675 kWh Battery, Bus Swaps, En-Route Charging



FIXED-ROUTE TRANSIT MODELLING SUMMARY

The modelled fleet requirement column in **Table 3** is a summary of the modelling results discussed above. The table shows the peak number of buses without spares and the chargers columns show the minimum number of charges required. The block feasibility column notes the percentage of how feasible the blocks will be based on how Stratford currently operates.

The modelled fleet requirement considers feasibility for On Demand transit as the On Demand service information was an input within each of the energy modelling scenarios but does not factor in spares or AM/PM school service, which would add approximately three buses for each scenario.

Table 3: Fixed Route Modelling Summary

Scenario		Block Feasibility	Modelled Fleet Requirement	Depot Charger Quantity	En-Route Charger Quantity
Electric Heating	Depot Only	100%	14	3	0
	Depot and En-Route	100%	13	2	1
Diesel Heating	Depot Only	100%	12	2	0
	Depot and En-Route	100%	9	2	1
	En-Route (Larger Battery, 2 En-Route Chargers)	100%	7	3	2
Diesel		100%	7	-	-

PARALLEL TRANSIT MODELLING SUMMARY

An energy consumption analysis was also conducted for Parallel Transit fleet, as shown in **Table 4** and **Table 5** based on the range capabilities of the most similar EV equivalent vehicle. The range capabilities are shown as the average and maximum daily mileage based on an 8-hour shift assumption and 5% maximum mileage occurrence. The paratransit fleet can undergo a 1:1 replacement.

Table 4: Proposed Energy Consumption Plan for Paratransit

Service	Vehicle Type	Proposed EV Replacement Model	Average km	Maximum km
Non-Revenue Fleet	28' Mobility Bus	Lightning Electric E-450 129	105	115

Table 5: Chargers and Energy Demand Required for Paratransit Proposed Energy Consumption Plan

Total Charger Quantity	Total Power (kW)	Daily Energy Demand (kWh)	Required EV Fleet Size	Current Fleet Size
5	50	542	5	5

PATHWAY OPTIONS

To arrive at a final transition pathway, Stratford will select one or two scenarios that were discussed in the previous section. The number of BEBs required, costs, and GHG savings are detailed in this section based on the model outputs.

FIXED ROUTE TRANSIT

High level projections of fleet size requirements, charging equipment requirements, cost estimates, and emission reductions were produced for each option and compared to the baseline diesel "business as usual" (BAU) scenario.

The capital cost estimates include the purchase and installation cost for buses and fueling/charging infrastructure. The capital cost estimates are based on averages of best available quotes from the manufacturers or best available information from industry studies. It should be noted that the number of depot chargers is assumed to be the same for all scenarios to assure a 1:1 bus to dispenser ratio.

Operating costs includes energy and fuel cost, operating costs, and maintenance costs. These cost estimates are based on information provided by Stratford and best available information from industry studies.

Emissions reductions were estimated based on emission intensity data produced by Environmental and Climate Change Canada. **Table 6** summarizes these high-level projections.

In addition to the high-level quantitative estimates, each technology option was evaluated across a number of qualitative criteria:

- Route Flexibility – The routing and operational flexibility given the proposed fleet composition of each pathway
- Facility Constraints – The physical space requirements of supporting infrastructure and vehicle parking/storage
- Maintenance Complexity – The maintenance complexity of both the buses and the supporting equipment including chargers or hydrogen storage equipment
- Future Maintainability Risk – The expected availability of parts for maintenance in the future
- Technology Maturity – The maturity of both the technology and the supporting fuel and parts supply chain

Each pathway was graded on a scale of with the lowest number (1) being the best and highest number (3-5, depending on the category) being the worst. Some option rankings are combined, which means that they are tied. The grading of each pathway is presented in the **Table 6** below along with the quantitative estimate.

Table 6: Pathway Options High Level Summaries

Measure		Business as Usual (BAU)	Depot Only + Electric Heat (DE)	Depot Only + Diesel Heat (DH)	En-route + Electric Heat (EE)	En-route + Diesel Heat (EH)	
		Diesel	BEB Elec. Heat	BEB Hyb. Diesel Heat	BEB Elec. Heat	BEB (525 kWh) Hyb. Diesel Heat	BEB (675 kWh) Hyb. Diesel Heat
		N/A	Depot Only	Depot Only	En-Route + Depot	En-Route + Depot	En-Route + Depot
Peak Vehicle Requirement	BEB		14	12	13	9	7
	Alternative	7					
Garage Chargers			5	5	5	5	5
En-Route Chargers					1	1	2
Transformers			1	1	1	1	1
Capital Cost (Cumulative)[1]		$4,200,000	$19,400,000	$17,000,000	$19,400,000	$14,600,000	$13,400,000
Annual Operating Cost[2]		$1,545,177	$1,127,855	$1,023,016	$1,120,102	$1,018,738	$1,023,438
Annual GHGs Emissions (tCO2eq)		1,343	50	97	50	29	98
Annual GHGs Savings (%)[3]		0%	96%	93%	96%	98%	93%
Route Flexibility		1	3	2	5	4	
Facility Constraint		1	5	4	3	2	
Maintenance Complexity		1	3	2	5	4	
Future Maintainability Risk		1	2		3		
Technology Maturity		1	2		3		

[1]Total raw conversion costs. Capital Costs: Fleet, Depot Charger, En-route Charger, Transformer

[2]Operating Cost (based on current costs): Electricity Demand & Regulatory Cost, Electricity Consumption Cost, Fuel Cost, Maintenance Cost

[3]Relative to service level under diesel baseline. Includes upstream emissions and emissions from auxiliary heater.

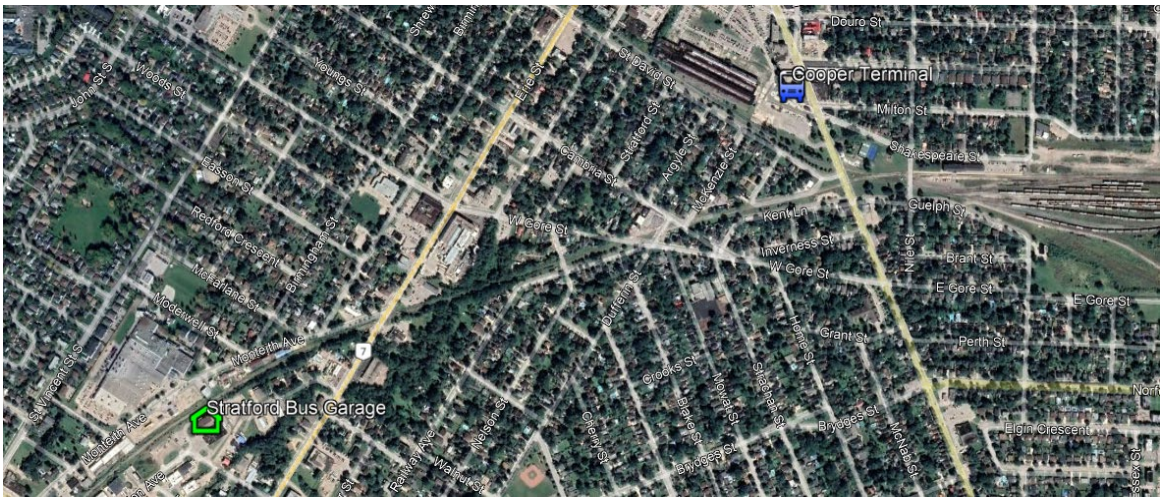
When considering options, it is important to consider both the initial capital costs of purchasing the vehicles as well as the operating costs. Typically, when transit fleets transition to BEBs, there is a significant shift from operating costs to capital costs. While the vehicles are more expensive to purchase, they are typically more cost effective to operate and maintain. One reason for this efficiency is due to electricity being typically a cheaper way to power vehicles than diesel, with more stable prices.

As can be seen in **Table 6**, all options require significant capital investment compared to the BAU scenario. However, there are savings in annual operating costs for the BEB scenarios compared to the BAU scenario. Capital and operating costs are comparable across each of the BEB options with the en-route and diesel heating scenario holding a slight advantage in both capital investment and operational cost. Although there are advantages for the en-route and diesel heating scenario, the en-route charging technology is not as mature as depot charging so there is a larger maintainability risk in the future.

It should be noted that the costs shown in **Table 6** assume that the entire fleet and facilities were converted in 2022 dollars with 2022 costs for vehicles and infrastructure. Recognizing the actual transition will occur over 10+ years, actual costs will be impacted by inflation and other factors. This will be evaluated in more detail in later phases of this study. It is also not necessary to commit to a single strategy now and a flexible plan that can adapt to technology improvements is recommended.

Cooper Terminal is where all of Stratford's transit service currently terminates and only 2.2 kms from Stratford's bus garage (see Figure 29). With the proximity of the garage being so close, the cost to swap buses is minimized. Furthermore, there is precedent with maintenance and operations for this type, as Stratford already does this type of swap when there are issues with vehicles that are in service.

Figure 29: Aerial photo of Cooper Terminal and Stratford Bus Garage which are 2.2 km apart



The vehicles that are used for school bus service also present an opportunity for service efficiencies. They use the same 40' transit buses as the fixed route service.

Based on the above evaluation and recognizing the uncertainty in future technological development for BEB technology, it is proposed that a phased approach be taken. This strategy will allow existing technology in the short term while leaving the door open for emerging technology in the future.

Recommendation:

- Implement BEBs with hybrid-diesel fired auxiliary heaters that are capable of both plug-in & en-route charging and operate them as depot charged buses prior to 2035. The vehicles procured should be longer range BEBs (~600 kWh+) that can at least complete more than a half day of service to avoid multiple bus swaps throughout the day.
- The technological maturity of plug-in charging and proximity of the bus garage make this a good low-cost strategy for Stratford that will still allow implementation of en-route charging in the future to limit increasing fleet size due to electrification. Stratford should explore a bus swapping strategy that utilizes the buses typically reserved for school bus service for transit service in the afternoon to avoid having to increase fleet size in the near term.
- Investigate adding en-route charging at Cooper Transit Terminal over the next 10 years. Become familiar with en-route charging technology risk by learning from other transit agencies and/or testing the technology. Installing a pilot pantograph charging dispenser at Stratford Bus Garage or Cooper Terminal to validate the vehicle overhead charging capability and future operating performance metrics.
- Conduct a follow-up evaluation in 3-5 years to confirm the number of buses and chargers required at each location based on actual performance in-service of the fleet selected. Increases in battery capacity or vehicle charging capabilities may reduce the number of vehicles or infrastructure required.

PARATRANSIT FLEET

The transition of the paratransit vehicle fleet is based on the analysis of the range capabilities of a similar EV equivalent. The project procurement timelines are established based on the retirement schedule provided by Stratford where vehicles are typically replaced eight years from their production.

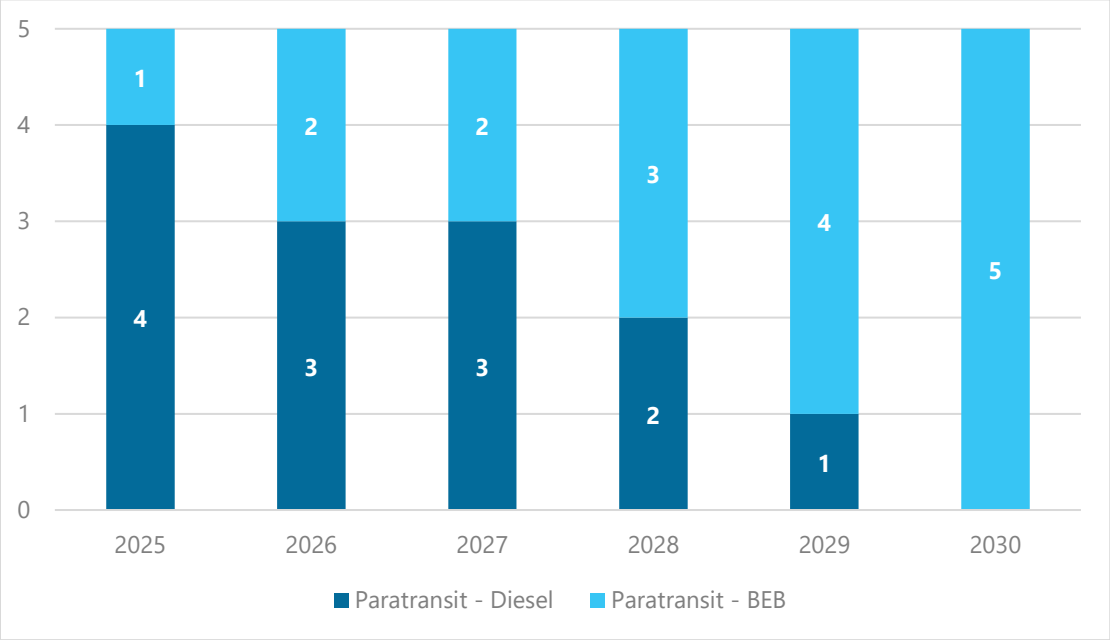
The composition forecast also considers Stratford's plans for purchase of hybrid models between 2025 and 2028 and plans to start transitioning to battery electric paratransit buses in 2028. The recommended yearly fleet composition of the paratransit fleet is shown in **Figure 30**.

The Lightning Electric E-450 129 is currently the only similar style mini-bus that has been Altoona tested and is avialable on the market. This model is recommended because it is the most similar in passenger capacity, physical dimensions, and range capability to the 4500 GMC,

3500 Ford CTV, and the Chevrolet 4500 and ETV. Although this model is currently the best option, other models might become available in the coming years.

Currently a one-to-one replacement is possible for current distances but fleet size increases will be necessary to support longer distances. Purchase of the first five vehicles would occur in 2026 and their arrival would be in 2028.

Figure 30: Paratransit Fleet Composition Forecast



Community Services Sub-committee
Department Update
MAY 2023

PARKS

- Annual planting, hanging baskets and planter installation begins May 29th
- Confederation Park Pond repairs complete, operational week of May 29th
- TJ Dolan Natural Area hog week eradication also begins May 29th

PARKS CAPITAL

- Marsh Pond Playground Equipment – four proposals received, evaluation taking place

CEMETERY

- Installation of 1000 feet of drainage begins last week of April
- Customer sales and service
- Casket and cremation interments

CEMETERY CAPITAL

- Historic monument restoration begins May 29th

TRANSIT

- All fleet disinfected nightly
- Hand sanitizer placed at front doors for customers to use when entering bus.
- Gloves/surgical masks/disinfectant still made available to Staff. Plexiglass Driver barriers will remain in place.
- **Weekly Ridership:**

2023 Monday-Friday	Ridership	Saturday ODT	2022 Monday-Friday	Ridership	Saturday ODT
Apr 23-28	12,433	244	Apr 24-29	10,071	166
Apr 30-May 5	12,132	231	May 1-6	10,199	181
May 7-12	12,375	218	May 8-13	10,354	205
May 14-19	11,476	208	May 15-20	9,806	147
May 21-26	9,728	173	May 22-29	8,094	131

TRANSIT CAPITAL

- **Approved** Projects for 2023 (ICIP)
- Accessible shelters (Project awarded and starting in June)
- Bus wash replacement (still pending approval from ICIP)
- Underground fuel tank replacement (New tank installed and removal of old tanks pending)
- Bus Storage/Facility Upgrades (still pending final approvals from ICIP)
- 40 ft. Hybrid Electric/Diesel Conventional Buses (2) (still pending final approvals from ICIP)
- Magnuscards Mobile App (still pending final approvals from ICIP)

PARALLEL TRANSIT

- All fleet disinfected nightly
- Gloves/surgical masks/disinfectant still made available to Staff.
- **Weekly Ridership**

Weekly 2023	Ridership	Weekly 2022	Ridership
Apr 23-29	386	Apr 24-30	268
Apr 30-May 6	372	May 1-7	285
May 7-13	399	May 8-14	252
May 14-20	367	May 15-21	298
May 21-27	319	May 22-28	255

- Pre-Pandemic ridership was typically 400 per week.

PARALLEL TRANSIT CAPITAL

- No update currently

RECREATION PROGRAMMING

- Recruitment for seasonal staff in Summer Day Camp and Aquatics (Lions Pool) programs is near complete. Summer Day Camps will be hosted at the Agriplex and Rotary Complex from July 3 – September 1. The Lions Pool is scheduled to open in pre-season hours from the first Friday in June, and ending the season on September 3, 2023.
- Summer Day Camp Program registration opened March 1st and is 85% sold out.
- Lions Pool Swim Lesson registration will open April 1st.
- Municipal Cultural Plan is in its final draft and is scheduled to be presented to Council in June.
- The City will host Canada Day in Market Square from 11am – 4pm. The event will include a variety of musical entertainment, activities, and food vendors.

- The Canada Day parade is scheduled from 6-8pm, with a route starting at the Tom Patterson Theatre, ending at the Stratford Rotary Complex.
- Community events for Canada Day including the parade, Market Square entertainment and fireworks at SERC will be posted in one location on the city's website.
- The City is currently delivering a community concert series in City Hall Market Square on Friday evenings from 6:30 p.m. to 7:30 p.m. Produced by Stratford's own Juno nominated Dayna Manning, each Friday evening features a new local artist. The first show was cancelled due to rain but the second show on May 26th had approximately 400 people in attendance. The concert series will continue each Friday until June 23rd. Those wishing to attend are welcome to do so free of charge and are encouraged to bring their own chairs.

RECREATION FACILITIES

- The Splash Pad and washroom facility at Anne Hathaway Park opened on Friday, May 19th. The operational hours for the Splash Pad are daily from 9:00 a.m. to 9:00 p.m.
- The target opening date for Lions Pool is scheduled for Friday, June 9th. Facility Maintenance staff have started the pool opening procedures.
- The Fieldhouse flooring at the Agriplex will be removed starting on May 30th in advance of the Ontario Pork Congress event. The flooring will be re-installed in late June for the summer day camp programs that operate out of the Fieldhouse.

RECREATION FACILITIES CAPITAL

- The sound system replacement at the William Allman Memorial Arena will be completed on June 2nd.
- The Tender for the Infill material for the artificial turf soccer field at the Packham Sports Complex was awarded to Clean Turf Canada in the amount of $79,213.00. The infill replacement project will be completed on May 31st.

BOARD OF PARK MANAGEMENT

A meeting of the Board of Park Management was held on **Monday, April 3, 2023, at 3:30 p.m.** in the **Agriplex Board Room** at the Agriplex.

PRESENT: Maureen Cocksedge, Carolyn Cuerden, Chairman Dave Hanly, Sherry Maguire, Vice Chair Kimberley Richardson, Councilor Beatty, Councilor Henderson

STAFF PRESENT: Quin Malott - Manager Parks, Forestry & Cemetery, Heather Denny – Special Events Coordinator.

MINUTES

2748. DECLARATIONS OF PECUNIARY INTEREST AND THE GENERAL NATURE THEREOF:

None declared.

Mike Bayer withdrew his presentation regarding using a deep fryer as part of his operation in the concession booth in Upper Queens Park. No further action by the Board of Park Management is required.

2749. PRESENTATION: SPECIAL EVENTS APPLICATION PROCESS:

Objective: Heather Denny, Special Events Coordinator will speak to the Board of Park Management clarifying the special events application process for member awareness.

Background and Analysis: Chairman Hanly requested at the last meeting of the Board that having the coordinator attend to explain the event application and approval process would assist in review of events that arise on the agenda for vetting.

Ms. Denny explained the process providing details in response to specific questions for clarification.

2751. MINUTES:

Objective: The minutes from the March 6, 2023 meeting provided for approval.

Resolution: That the minutes of the March 6, 2023, meeting be approved.

Mover: K. Richardson Seconder: B. Beatty Carried.

BOARD OF PARK MANAGEMENT

2752. DOCK MUSIC:

Objective: To review the event submitted by Special Events Coordinator for approval.

Background and Analysis: This event began during the pandemic as a means of providing a socially distanced opportunity for members of the community to safely enjoy some music in the park system. The response was very positive, and Ms. Thomas made another request in 2021. In response to the popularity of her performances, Ms. Thomas requested road closures as part of her application in 2022. 2023 request is same as previous year.

Staff Comments: As instructed by the Board staff ensured that road closure barricades were not left on site following performances.

Staff Recommendation: Approval of event with no concerns. Staff to ensure barricades are removed following each performance in coordination with Public Works Department.

Resolution: To approve the event as requested.

Mover: S. Maguire Seconder: B. Henderson Carried.

2753. WORLD IN A WEEKEND:

Objective: To review the request for the World in a Weekend event organized in partnership by Stratford Summer Music and Hermione Presents SpringWorks Festival to take place on August 5 & 6, 2023 in the park system.

Background and Analysis: This event offers music; puppet shows and play garden and will take place on the grass area across from the Veterans Drive bandshell between York and Waterloo Streets at no charge to attendees.

This is the second year for this event and as such will require approval from the Board to be added to the perpetual approval annual events in the park system. Organizers will continue to follow the Special Events Application process which includes informing the Board of details.

Staff Comments: Staff have no concerns.

BOARD OF PARK MANAGEMENT

Staff Recommendation: That the request to hold the World in a Weekend event in the park system on August 5 & 6, 2023 as detailed be approved and be added to the perpetual approval annual events list.

Resolution: To approve the event as requested and add to the perpetual list of events in the park.

Mover: K. Richardson Seconder: S. Maguire Carried.

2754. STRATFORD DISC GOLF CLUB EVENTS:

Objective: To review the request to hold two events at Marsh Pond Park summer of 2023. An Open House is planned for May 27, 2023 from 1 – 4pm with the goal of raising awareness and interest in the sport locally. A second event is planned on June 17, 2023 as a disc golf tournament with a shotgun style start at 9am with conclusion at 5pm. The tournament is a fundraiser for the club to support maintenance of the disc golf course at Marsh Pond. A request to post temporary sponsorship advertisement signage at each tee pad is part of the tournament request.

Background and Analysis: In 2012 the disc golf committee partnered with Community Services Department to develop a nine-hole disc golf course at Marsh Pond. Infrastructure was paid for by the disc golf club and installed and maintained by the City of Stratford Parks Department. The facility has been a popular attraction

Staff Comments: Sponsorship signage is minimal and temporary for event only.

Staff Recommendation: To support both events as requested. Further, to put both events on the perpetual approval list.

Resolution: To approve both events as requested.

Mover: M. Cocksedge Seconder: B. Beatty Carried.

The Special Events Coordinator brought forward an additional event submitted by the club scheduled for June 10th, 2023. The request includes sale of discs to participants.

Resolution: To approve the event conditional upon the Stratford Disc Golf Club obtaining business license.

Mover: K. Richardson Seconder: B. Beatty Carried.

BOARD OF PARK MANAGEMENT

2755. OTHER BUSINESS:

Swan Release Update: Brad Beatty CBEAC representative and Q. Malott discussed the success of the April 2, 2023 release. B. Beatty noted that event without advertisement there was a large volume of people in attendance. The CBEAC committee will be recommending an increase in the number of Air Cadets volunteering for crowd control in 2024.

Community Events Calendar: K. Richardson revisited M. Cocksedge's suggestion at the last meeting regarding a community calendar for events. Q. Malott explained that this may be a task for the STA to provide a calendar for community events. Councillor Henderson noted she has had similar requests regarding sporting events in Stratford. Q. Malott explained sports groups blanket book facilities for their season. Q. Malott noted that any notable sporting events could included within the context of the community events calendar or through the new sports tourism program being implement.

Food Trucks: M. Cocksedge revisited the discussion regarding food trucks being permitted in Upper Queens Park. Q. Malott noted that because of the current lease agreement with Duke's a permanent food truck would be in contravention of same. However, community events can make application to include as part of the process. K. Richardson indicated that the vision of the Orr family was not for permanent vendors to offer merchandise and food in the public park system.

Hybrid Meetings: K. Richardson revisited the possibility of offering a hybrid model of meetings. S. Maguire offered to follow-up with City Clerk Tatiana Dafoe on various options to conduct hybrid meetings for boards and committees across the municipality.

Next regularly scheduled meeting of the Board is Monday, May 1, 2023 3:30pm in the **Community Hall Lobby Meeting Room**.

Motion to adjourn by K. Richardson at 4:30pm, seconded S. Maguire.

Communities in Bloom Advisory Committee

MINUTES

A meeting of the Stratford Communities in Bloom (CIB) Advisory Committee was held on Thursday, April 6, 2023 at 12:00 p.m., City Hall Annex – 82 Erie Street, Falstaff Room.

Committee Members Present: Councillor Brad Beatty – Chair Presiding, Cindy Carlson, Kimberly Richardson, Carys Wyn Hughes

Staff Present: Casey Riehl – Recording Secretary

Absent: Mary-Anne Krutila, Barb Hacking, Councillor Bonnie Henderson

1. Call to Order
Councillor Beatty, Chair presiding, called the meeting to order at 12:22 p.m.

2. Declaration of Pecuniary Interest
None declared.

3. Adoption of the Previous Minutes – March 2, 2023

Motion by Carys Wyn Hughes
Seconded by Cindy Carlson
THAT the minutes from the Communities in Bloom Advisory Committee meetings dated March 2, 2023, be adopted as presented. Carried

4. Business Arising from Previous Minutes

4.1 Update on Ted Blowes Garden

Councillor Beatty reported that it appears the garden weathered the winter well and there has not been any visible vandalism. He stated that Barb Hacking is looking into the controllers to adjust the lights on the bridge.

Kimberly Richardson reported that she contacted the Stratford Library and they have agreed to harvest the seeds from the Ted Blowes Garden.

4.2 2023 CIB National Update – Councillor Beatty

Stratford is registered for the Circle of Excellence – Non-Evaluated Category for 2023. This year's symposium will be held in Wood Buffalo, Alberta from September 27-30, 2023.

4.3 2023 Spring Market Day – Councillor Beatty

Councillor Beatty confirmed that the CIB Committee is registered for the Stratford Market on Saturday, May 27, 2023 and he has requested an outdoor booth.

Carys Wyn Hughes will leave the CIB items at her office for members to use at the Market on the 27th.

Kimberly Richardson reported that the Stratford Library has resources available to hand out, such as colouring pages and information on how to grow plants. She has also invited representatives to join the CIB booth at the market.

Cindy Carlson will work with Barb Hacking to organize any seed packets that are available to use again this year.

4.4 CIB National Initiatives – Councillor Beatty

Councillor Beatty reviewed the Municipal World Winter Life Award that the CIB Committee could submit an entry for. The due date for submissions is August 4, 2023. Councillor Beatty will contact CIB National for clarification about the online application process. There is no information posted yet for the Live the Garden Life initiative. It was noted the CIB Committee already submitted an entry for the 2023 Best Garden Selection initiative in March.

4.5 City Gateways Project

Kimberly Richardson reported that she has contacted Zac Gribble, Executive Director of Destination Stratford. Progress on the project has slowed due to budget and the lack of funding opportunities. CIB members will research past minutes with the Stratford-Perth Archives and City of Stratford staff to inquire about possible reserves for this project.

5. New Business

5.1 Ping Pong Table (Upper Queen's Park) – Carys Wyn Hughes

Carys Wyn Hughes reported that the Winterfest Committee has funds available to purchase a concrete ping pong table that could be installed in Upper Queen's Park. The Winterfest Committee would utilize the table for their Winterfest events and it would be available for use all year around. Ms. Hughes will contact the Manager of Parks, Forestry & Cemetery to discuss.

5.2 Youth Participation in Communities in Bloom – Carys Wyn Hughes

Carys Wyn Hughes has contacted Christine Ritsma at Stratford District Secondary School to inquire about student involvement with the CIB Committee. Ms. Ritsma stated that students are very busy with Eco Club projects however, asked that CIB reach out when they have events and activities coming up to inquire if students are interested in participating and earning volunteer hours.

Councillor Beatty noted that the Stratford Cadets have always been helpful in the past at events. It was noted they could be contacted to see if they would be interested in assisting.

5.3 Community Garden Project – Cindy Carlson

Cindy Carlson reported that Christine Ritsma, SDSS, contacted her to inquire if CIB Committee would be interested in partnering with the school on a community garden located at Smith and O'Loane Street. The Eco Club and the Urban Green Club will be working together to create the vegetable garden. Ms. Carlson suggested that the CIB Committee could plant pollinators in the garden. In the fall, the students will organize a Fall Fest with all the vegetable they have grown. Ms. Carlson will inquire about more details.

6. Upcoming Events

- SLAAA Planting Workshop - Thursday, April 13, 2023 – Agriplex (1-3 p.m.)
- Spring Market Day – Saturday, May 27, 2023
- CIB National Symposium – Wood Buffalo, AB – September 27-30, 2023
- Pumpkin Parade – Wednesday, November 1, 2023

7. Date of Next Meeting

The next meeting of the CIB Advisory Committee will be held on Thursday, May 4, 2023, at 12:00 p.m., in Mansbridge Room at the Stratford Rotary Complex, 353 McCarthy Road W., Stratford.

8. Adjournment

Motion by Carys Wyn Hughes
Seconded by Kimberly Richardson
THAT the April 6, 2023, Communities in Bloom Advisory Committee meeting adjourn. Carried

Meeting Start Time: 12:22 P.M.
Meeting End Time: 1:02 P.M.

Communities in Bloom Advisory Committee

MINUTES

A meeting of the Stratford Communities in Bloom (CIB) Advisory Committee was held on Thursday, May 4, 2023 at 12:00 p.m., Rotary Complex – Mansbridge Room, Stratford.

Committee Members Present: Councillor Brad Beatty – Chair Presiding, Cindy Carlson, Kimberly Richardson, Carys Wyn Hughes, Mary-Anne Krutila

Staff Present: Casey Riehl – Recording Secretary

Absent: Barb Hacking, Councillor Bonnie Henderson

1. Call to Order

Councillor Beatty, Chair presiding, called the meeting to order at 12:05 p.m.

Land Acknowledgment

Moment of Silent Reflection

2. Declaration of Pecuniary Interest

None declared.

3. Adoption of the Previous Minutes – April 6, 2023

Motion by Kimberly Richardson
Seconded by Mary-Anne Krutila
THAT the minutes from the Communities in Bloom Advisory Committee meeting dated April 6, 2023, be adopted as presented. Carried

4. Business Arising from Previous Minutes

4.1 Update on Ted Blowes Garden

Cindy Carlson reported that clean-up of the Ted Blowes Garden will begin mid-May. Councillor Beatty will request Barb Hacking to send out a "clean up calendar" to all members to coordinate dates for volunteering.

4.2 2023 CIB National Update – Councillor Beatty

Councillor Beatty has contacted CIB National to inquire about a different document to use for the Winter Life Award submission. He has received the new form and the deadline for the submission is August 4, 2023.

Carys Wyn Hughes is now present at the meeting at 12:13 p.m.

4.3 2023 Spring Market Day – Councillor Beatty

Councillor Beatty confirmed that CIB has an outside table reserved for the May 27, 2023, Stratford Farmer's Market. He will also confirm that a tent is available to borrow in case of rain. Cindy Carlson and Barb Hacking will be making up sunflower seed envelopes to hand out again this year. Kimberly Richardson will drop off a bag of wildflower seeds that can also be handed out.

Kimberly Richardson will arrive early at the market to set up the CIB items. Items will be at the Agriculture building in Carys Wyn Hughes office that day to pick up. Barb Hacking has the tablecloth. Councillor Beatty will pick up canna lilies from Bernie VanHerk and take them to the market. He will also purchase purple pansies to hand out when the lilies run out.

Motion by Carys Wyn Hughes
Seconded by Cindy Carlson
THAT the Communities in Bloom Advisory Committee spends up to a maximum of $100.00 to purchase purple pansies to hand out at the Spring Market Day on May 27, 2023. Carried

Kimberly Richardson has kids colouring sheets from the library as well as an info-graphic regarding pollinators and planting. She will confirm if someone from the Local will be attending or sending along information to hand out.

4.4 CIB National Initiatives – Councillor Beatty

CIB Stratford is in a non-competitive category this year and will not be judged. Councillor Beatty urged members to continue to take pictures of all events taking place in the City to include in the book next year. Kimberly Richardson will set up a Google Doc for members to submit their photos.

4.5 Update on Bloom Into Spring Event – Carys Wyn Hughes

Carys Wyn Hughes provided an update on the recent Bloom Into Spring event that SLAAA hosted. It was very well attended, and CIB had a table set up. There were presentations on planting and plants. The Horticultural Society was also there. This is going to be an annual event.

4.6 Design Plan – Councillor Beatty

Councillor Beatty stated that Scott Wentworth will be doing a site visit in Stratford later in May. Scott Wentworth will provide recommendations to CIB and Community Services that can be used for design plans in the future.

4.7 City Gateways

Kimberly Richardson will contact Councillor Henderson to inquire if she has copies of the minutes prior to 2011 to research if there was a budget line for gateways. Ms. Richardson inquired if CIB could possibly partner with Destination Stratford to rent a billboard to welcome people to Stratford. She will discuss this option further with Zac Gribble and update the CIB Committee. Councillor Beatty also suggested that CIB and Destination Stratford could do a joint presentation to Council about the gateways.

5. New Business

5.1 Accessibility Training

Staff informed Committee members that City of Stratford volunteers, including members of advisory committees, are required to complete training related to accessibility in accordance with the Accessibility for Ontarians with Disabilities Act, 2005. To meet this requirement, the Clerk will be circulating training materials to review and then you will be asked to complete a form stating you completed the training.

The Clerk will be circulating materials in different formats such as reading a brochure or watching a video so that all volunteers can complete the training. This training is mandatory and there will be strict deadlines for completion.

Members were advised to contact the Clerk with any questions or if they required assistance.

6. Upcoming Events

- Rain Date for Spring Clean Up – Saturday, May 6, 2023
- Spring Market Day – Saturday, May 27, 2023
- Pumpkin Parade – Wednesday, November 1, 2023

7. Date of Next Meeting

The next meeting of the CIB Advisory Committee will be held on Thursday, June 1, 2023, at 12:00 p.m., in the Mansbridge Room at the Stratford Rotary Complex, 353 McCarthy Road W., Stratford.

8. Adjournment

Motion by Cindy Carlson
Seconded by Mary-Anne Krutila
THAT the May 4, 2023, Communities in Bloom Advisory Committee meeting adjourn. Carried

Meeting Start Time: 12:05 P.M.
Meeting End Time: 12:43 P.M.