Tariff for Public-Facing Electric Vehicle Charging Stations

Overview

Public-Facing Electric Vehicle (EV) Charging Stations were an initiative of Keep Winter Park Beautiful and Sustainable (KWPB&S). Since first installed around the City, no fee has been charged for the associated energy consumption or use of the charger. The EV Charging Stations are a source of increasing complaints concerning user behaviors attributable to the free nature of the resource. For example, frequent complaints indicate that EV users park at a station for many hours—essentially using the Charging Station as a free parking spot; some users park overnight. It appears that such users are not technically violating any rules or laws.

In 2023, KWPB&S initiated an effort to address this issue by imposing a rate for charging. However, KWPB&S is not empowered to set electric rates; electric rate setting is the domain of the Winter Park City Council in consult with the Electric Department. The issue was, therefore, referred to the Utilities Advisory Board (UAB). The UAB directed Electric Department Staff to recommend a course of action.

Background

Winter Park first installed six public-facing EV Charging Stations in 2011. Currently, the City has 13 primary stations shown on the map at right.

Although station energy consumption has increased more than four-fold over the past four years, the amount of energy actually consumed at EV Stations has comprised a small portion of overall City load. The table below provides calendar year totals from 2020 to 2023. In 2023, EV usage represented approximately 0.036% of total City sales.

| YEAR	USAGE (kWh)	YEAR	USAGE (kWh)
2020	35,319	2022	107,857
2021	52,441	2023	151,656

Assessment

To evaluate how EV stations are being used and to what extent users are parked at chargers for extended
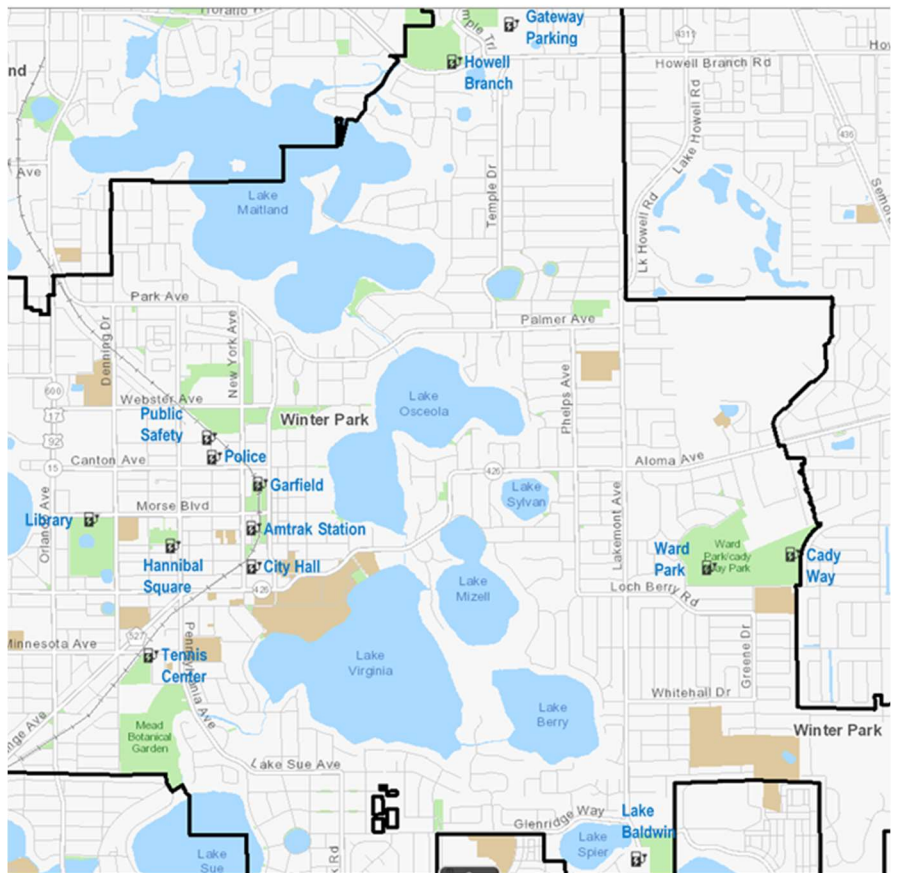
periods, station data for calendar year 2023 was analyzed. Of the total consumption of 151,656 kWh, only 144,742 kWh was associated with a defined user. Figure 1 summarizes connected events by station and port for 2023. Total energy consumed is also provided. The EV stations at the Library, Ward Park, and City Hall had the most connected events and energy consumption. Figure 2 shows the energy consumption by length of event and charging station. As can be seen in this figure, each charger had events lasting more than three hours.

Figure 1 2023 Total Connected Events & Energy Usage by Charging Station
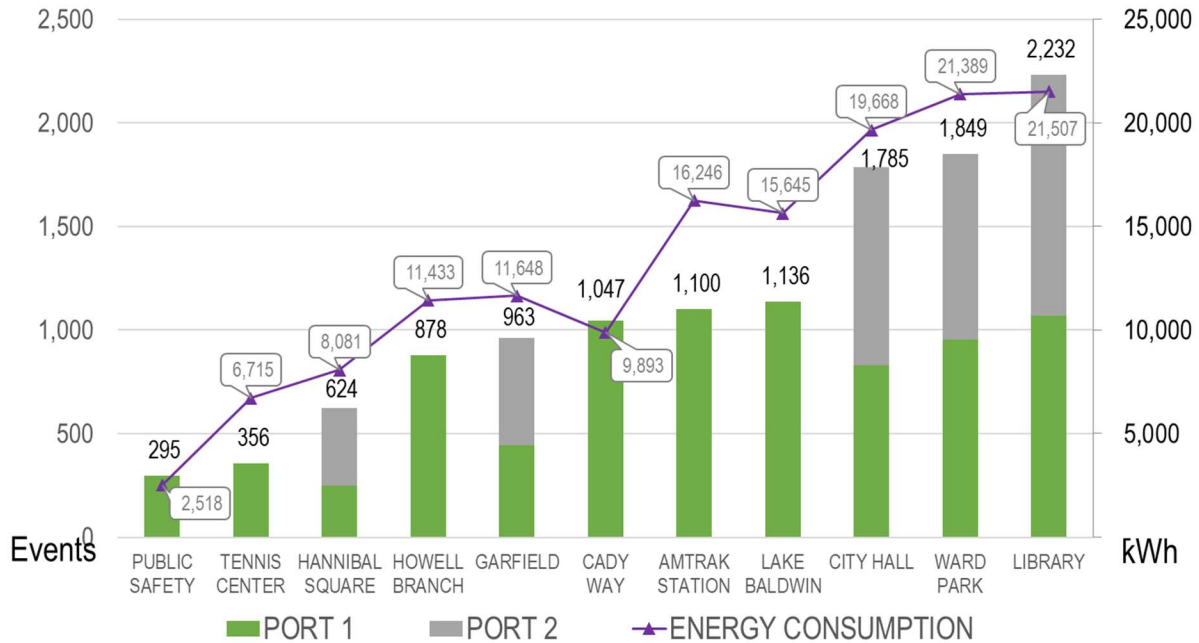
A total of 340 days appear in the data.
Consumption totaled 144,742 kWh.

Figure 2 Total Energy Consumption by Length of Event and Charging Station 2023
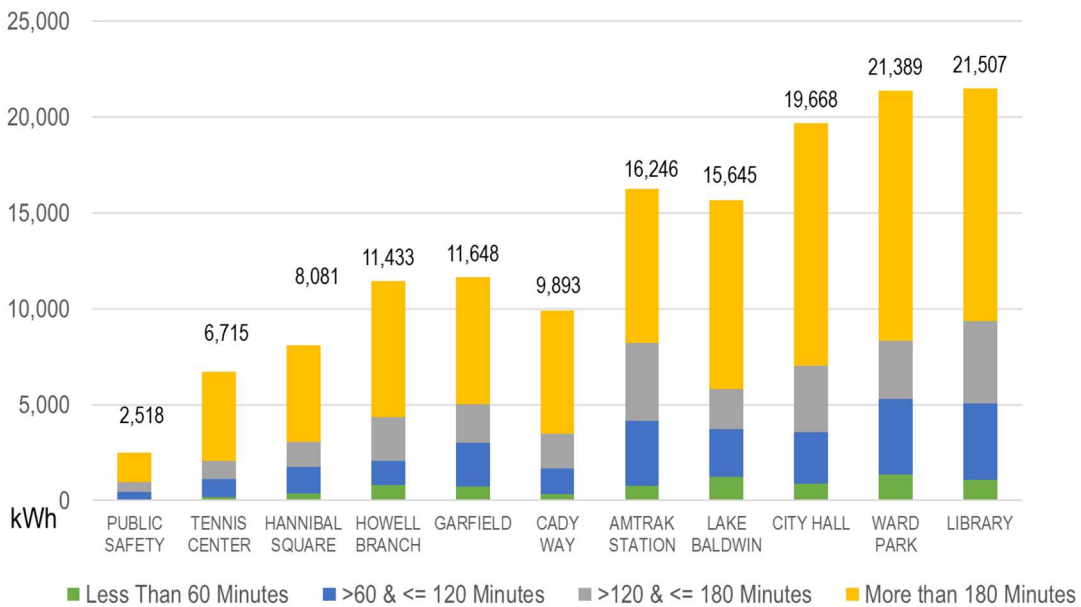
A total of 340 days appear in the data.
144,742 kWh energy consumed; 60% in events lasting over 180 Minutes.

Figure 3 shows the total connected events for 2023 and the total number of unique users by station. Just under 30% of events lasted for more than three hours. Figure 4 provides the frequency of connected events lasting more than 3 hours by unique user. Of the 1,724 unique users in the data set, 57 had more than ten such connected events. These users epitomize the issue of over use and are referred to here as "Super Users."

Figure 3 Total Connected Event by Length of Event and Station in 2023
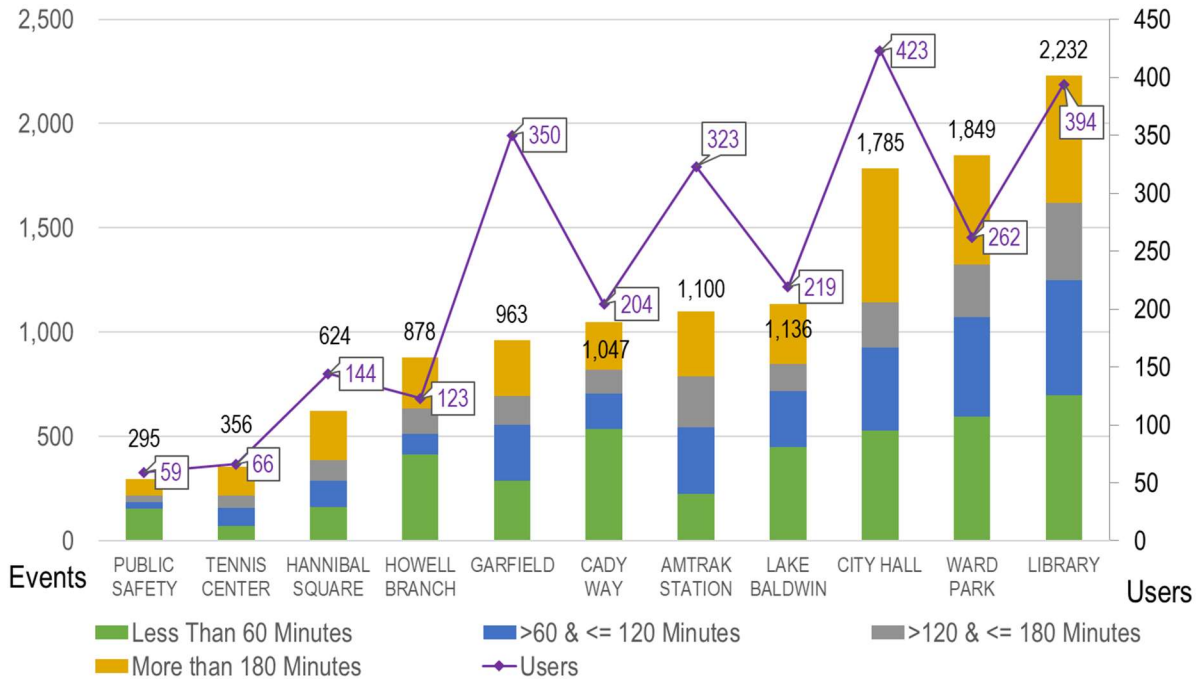
A total of 340 days appear in the data.
12,265 total events; 3,576 events over 180 minutes, 29% of total.

Figure 4 Unique Users with Connected Events Over 3 Hours by Frequency of Event in 2023
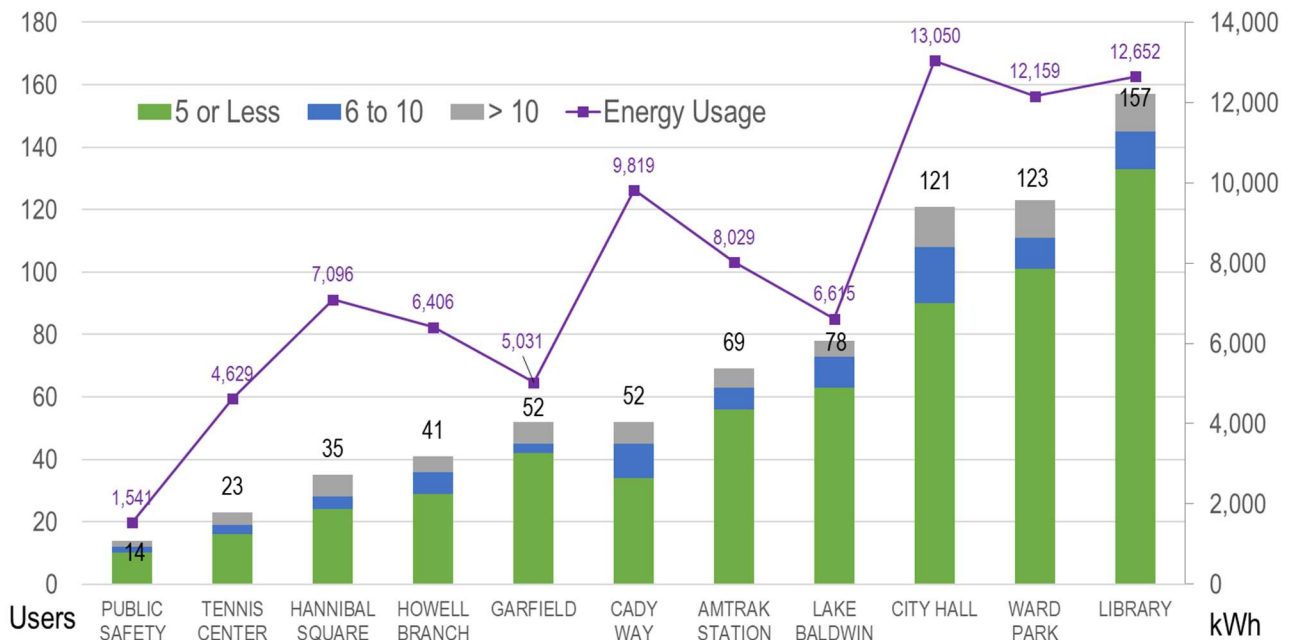
Users that have events at both ports of a station appear twice in the totals. 87,027 kWh total energy used.
1,724 unique users, of which 57, or 3%, are unique Super Users. Super Users have more than 10 events greater than 180 minutes.

Figure 5 illustrates that connected events in excess of three hours generally average between 240 and 400 minutes, indicating that a per-hour fee for use in excess of 180 minutes would have an impact on behavior.

Figure 5 2023 Average Activity for Event Duration of More than 3 Hours

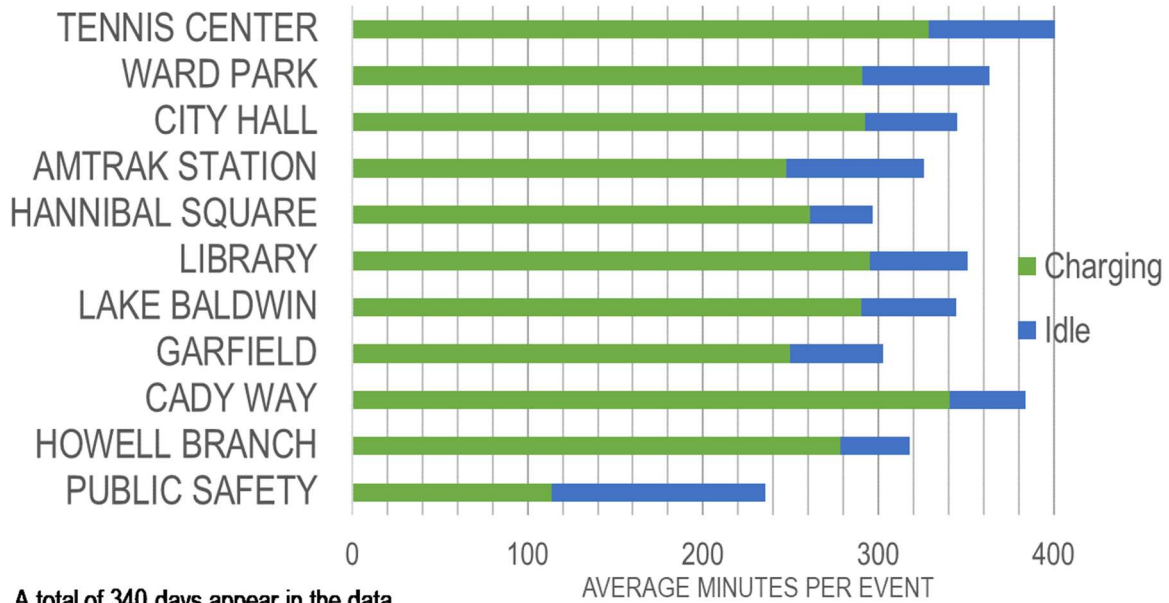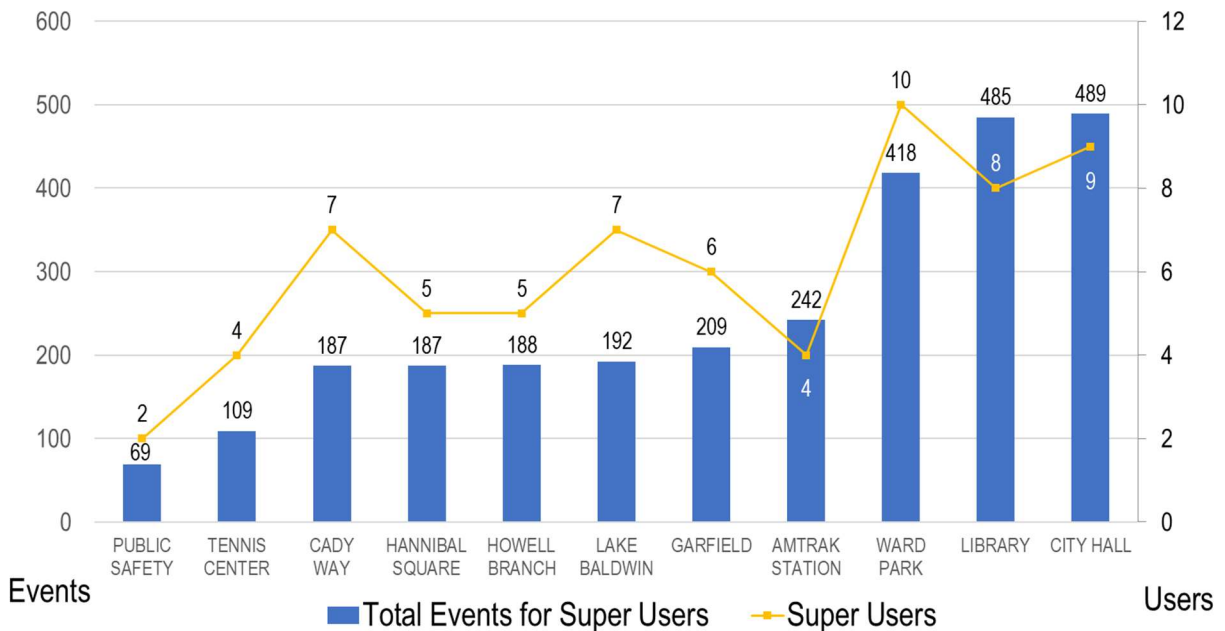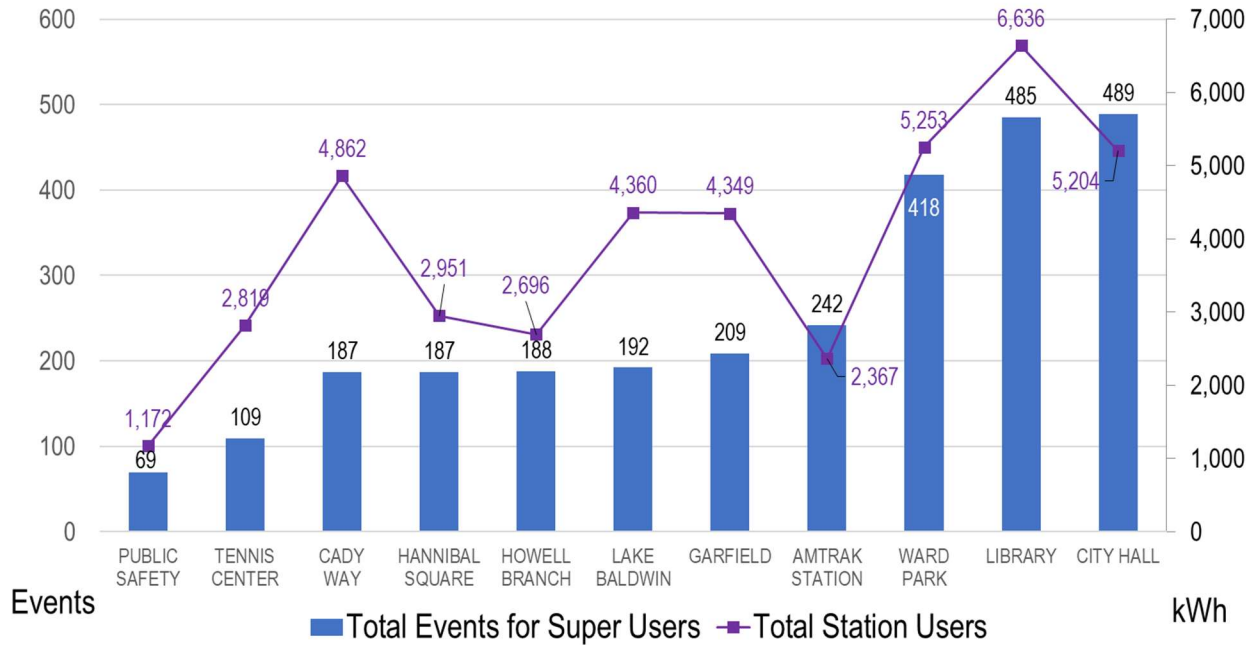**A total of 340 days appear in the data.**

Figure 6 shows the activities of Super Users by station in 2023. At City Hall, for example, nine Super Users had a total of 489 connected events exceeding three hours in 2023. Similar activity occurred at the Library, and Ward Park. All charging stations in the data set were used by Super Users. Of the 57 unique Super Users, 8 use two separate charging stations and one uses four separate stations. Figure 7 provides the energy consumed by Super Users during these events.

Figure 6 Number of Connected Events Exceeding 3 hours by Super Users in 2023

A total of 340 Days are in the data set.
Of the 57 unique Super Users: 8 use multiple stations and one 4 stations. A Super User has more than 10 events of greater than 180 minutes.

Figure 7 Energy Consumption by Number of Connected Events Exceeding 3 hours by Super Users in 2023


A total of 340 Days are in the data set. 42,668 kWh Used.
Of the 57 unique Super Users: 8 use multiple stations and one 4 stations. A Super User has more than 10 events of greater than180 minutes.

To understand the impact of Super Users versus other users that charge over 3 hours, Figure 8 provides a breakdown of events exceeding 3 hours by user type. As can be seen in this figure, although Super Users represent a small fraction of users that charge for more than 3 hours, they account for 78% of all events. Figure 9 provides a breakdown of energy consumption by user type for these events. Again, Super Users account for nearly half of all energy consumed despite being a relatively small portion of users.

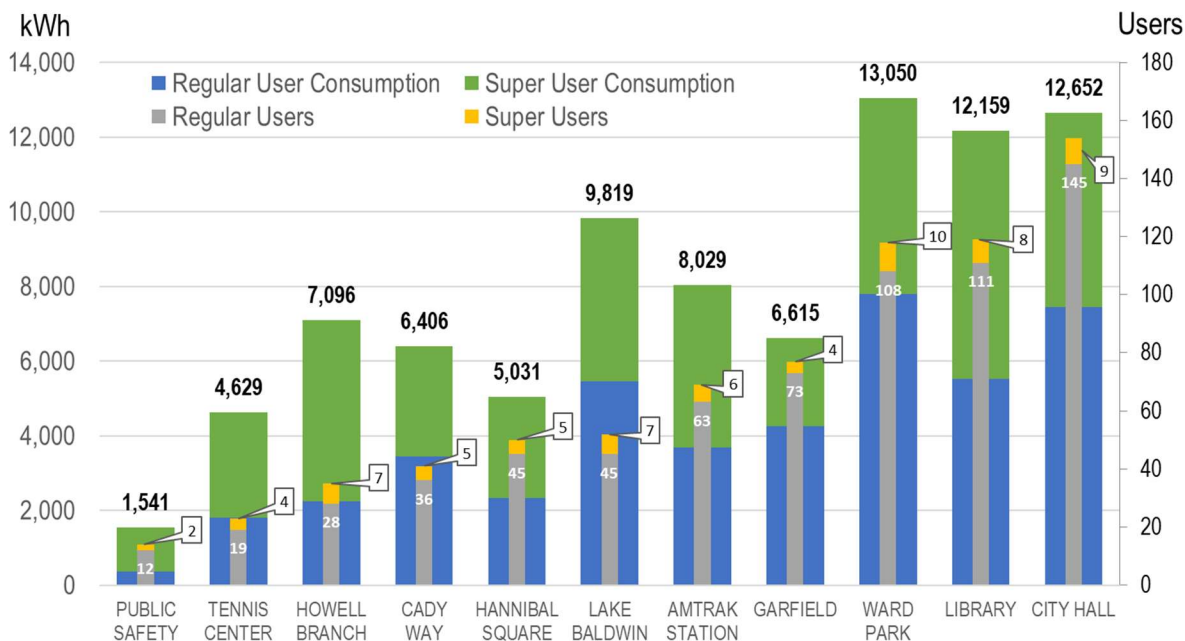*Figure 8 2023 Events of More than 3 Hours by User Type*
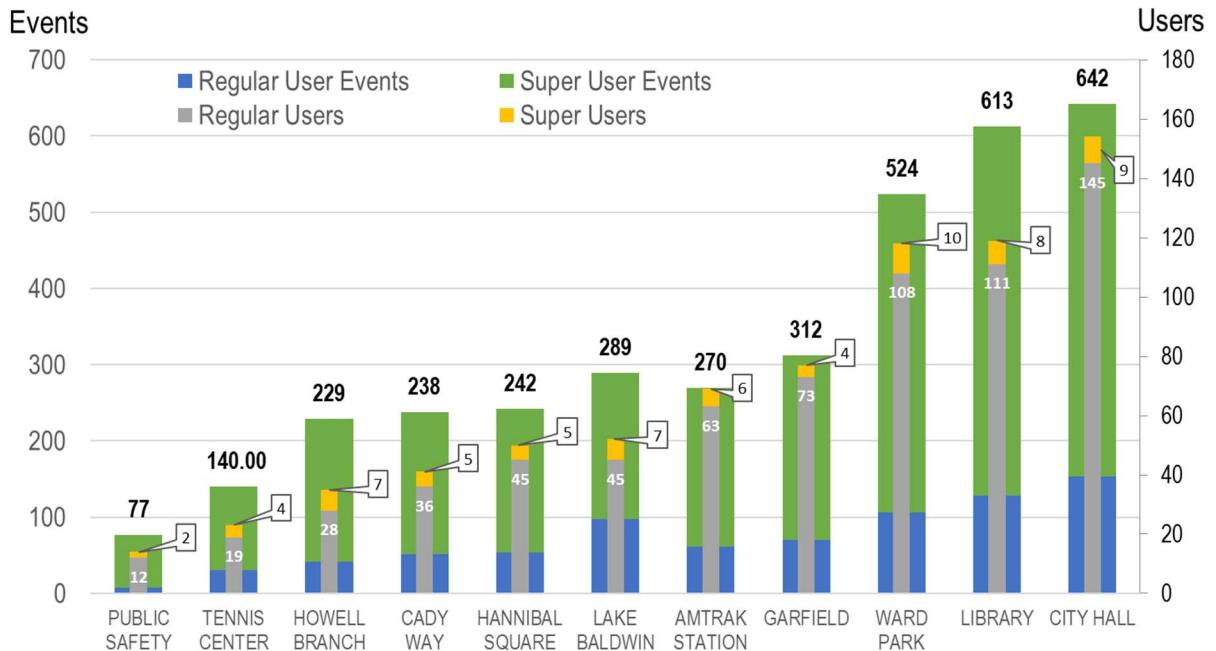
A total of 340 days appear in the data.
A total of 3,576 events over 3 hours of which 2,775 were by Super Users. Super Users represented 78% of all events.

Figure 9 Energy Consumption by User Type in Events Greater than 3 Hours in 2023

A total of 340 days appear in the data.
87,027 kWh energy consumed; 49% by Super Users. Super Users consumed 29% of all energy.

Additional information on station usage and use patterns by charging station appear in Appendix A.

Additional Considerations

A unique aspect of EV Charging Stations is that they provide two services to customers: charging and parking. In researching the issue of station over use, additional problematic behaviors were identified. The following are recent complaints logged at the stations:

- Just adding fuel to the grey Tesla hate train right now, it's been plugged in for 8 hours so I haven't been able to plug in :(

- I'm going to start disconnecting the Tesla which hogs the station if the park management does nothing about it. Hoping for confrontation because people like this need to be checked.

- Agree! The grey Tesla is hogging as a personal spot and then she is walking home and leaves it more than 24 hours! If you see her maybe someone can politely mention that this is for everyone and not just for her personal parking spot!

- Station works, but is hogged by a grey Tesla whose owner lives in the neighborhood and uses the park as his free private spot. It's 1:47pm and he's been there since 7:53 in the morning, doing it on a regular basis now.

- Unavailable to charge, there is a regular gas black Mercedes Benz parking in the ev parking spot

- Station works, but a silver ford focus uses it as their personal charger even when charging is complete.

- Open charger blocked by a white Lexus RX350L this morning at 9:30 am.

Although many complaints address over use, other behaviors were noted that would not be resolved through implementation of a rate for charging. In particular, a rate would not resolve the problem of non-EVs and/or unconnected EVs parked at a station or blocking EVs from accessing a station. Additional solutions are needed.

Public-Facing Electric Vehicle (EV) Charging Stations straddle several areas of City services as follows:
- Electric Utility—provides power, designs Tariffs, and sets rates
- City Council—sets policy
- Utility Billing/EV Station Vendor—maintains stations, meters, and collects revenue
- Sustainability—oversees vendor(s), tracks outcomes, seeks funding
- Parking Enforcement—enforces ordinances, issues fines

An effective solution will require interdepartmental coordination. Parking enforcement will play an integral role.

For reference, current City parking fines include:
- Prohibited by sign: $25
- Over posted time: $25
- Re-Park within 500 feet within 4 hours: $55

Appropriate signage at the Charging Stations along with aggressive enforcement should assist in curtailing behaviors by unconnected users.

Recommendation

Based on the evaluation conducted as summarized above, Staff recommends implementing a two-part solution consisting of: (1) a rate design for charging; and (2) parking signage and enforcement.

Rate Design

After researching usage patterns as well as the underlying costs associated with the EV Charging Stations, a two-part rate design consisting of a consumption charge per kWh and an hourly connection charge was identified as the optimal solution to mitigate over use. Each component of the proposed rate design is discussed below.

- **Consumption Charge**
  Based on a cost of service analysis, a consumption charge of $0.35/kWh is recommended. Options for rate design could include: waiving the consumption charge for the first three hours or charging a reduced consumption charge for the first three hours.
- **Connection Fee**
  Under the proposed rate design, and to provide parking accommodation comparable to high traffic areas such as Park Avenue, the connection fee for the first 3 hours of charging would be waived. After 3 hours, the recommended connection fee of $10.00 per hour would apply. Options could include use of a $5.00 charge assessed every 30 minutes of connected time after three hours.

Parking Signage and Enforcement

Staff recommends implementing appropriate signage and stepped-up enforcement to address behaviors that would not be impacted by charging fees, such as unconnected vehicles. It is hoped that current ordinances in combination with clear signage and enforcement would be sufficient to resolve over use issues. However, Staff recommends monitoring the situation and exploring additional remedies if needed.
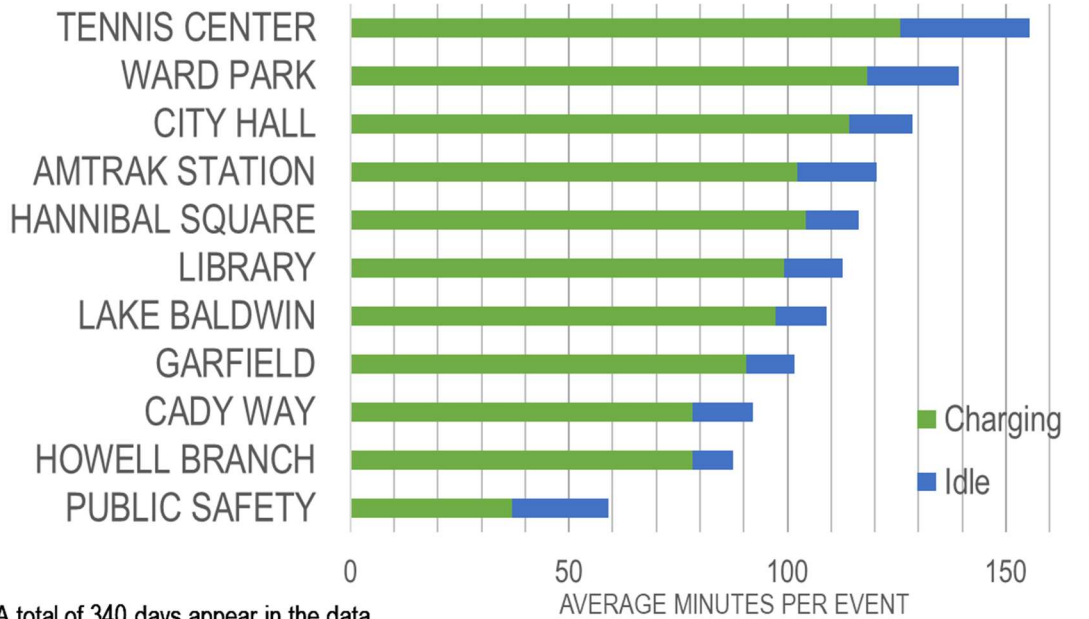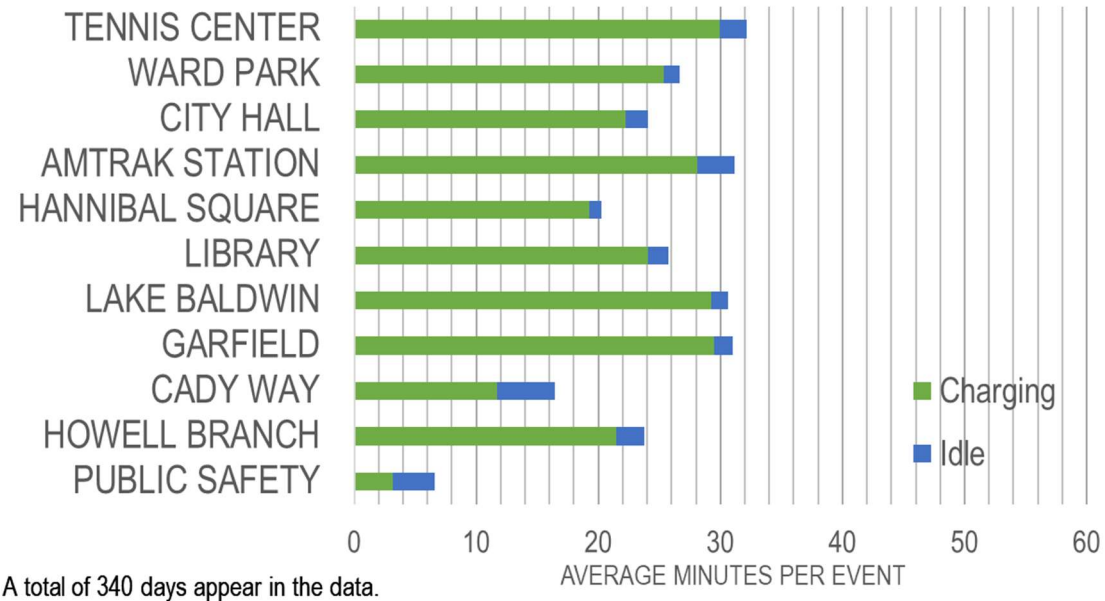
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Summary of 2023 activity duration by length of connected event by EV Charging Station.

AVERAGE 2023 ACTIVITY DURATION FOR ALL EVENTS
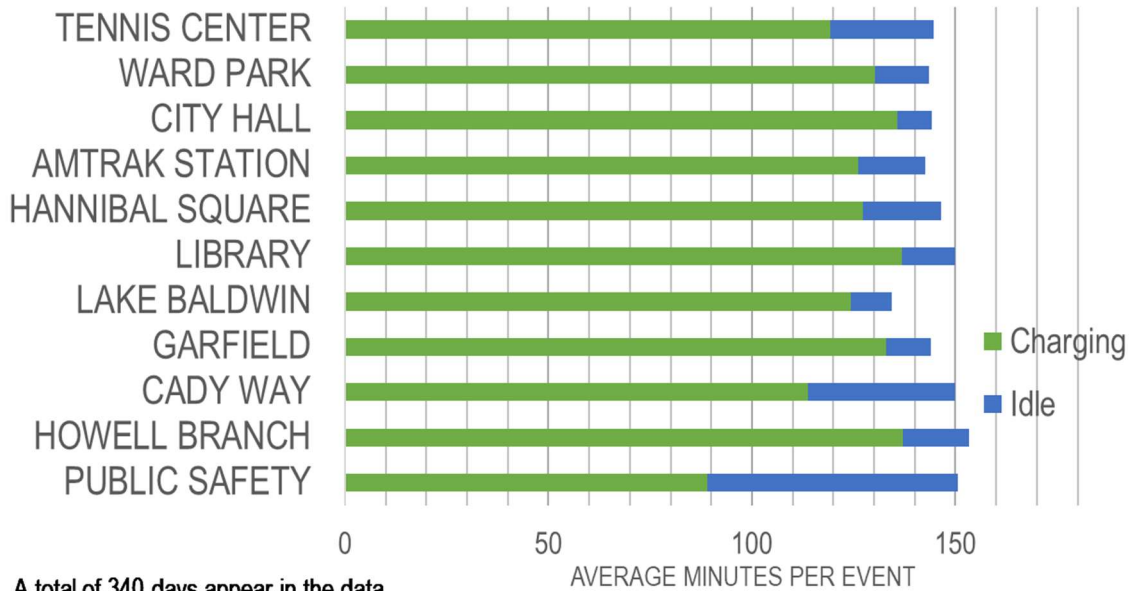
A total of 340 days appear in the data.

AVERAGE 2023 ACTIVITY FOR EVENT DURATION OF 60 MINUTES OR LESS

A total of 340 days appear in the data.

AVERAGE 2023 ACTIVITY
FOR EVENT DURATION OF 60 TO 120 MINUTES
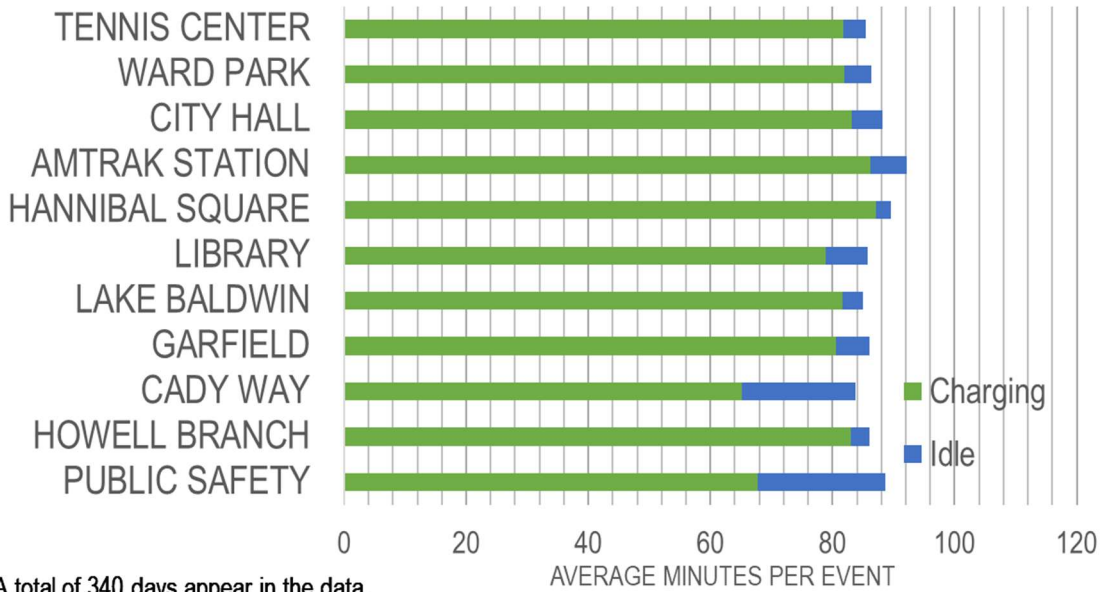
A total of 340 days appear in the data.

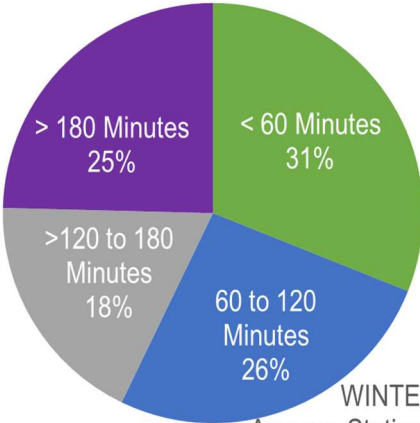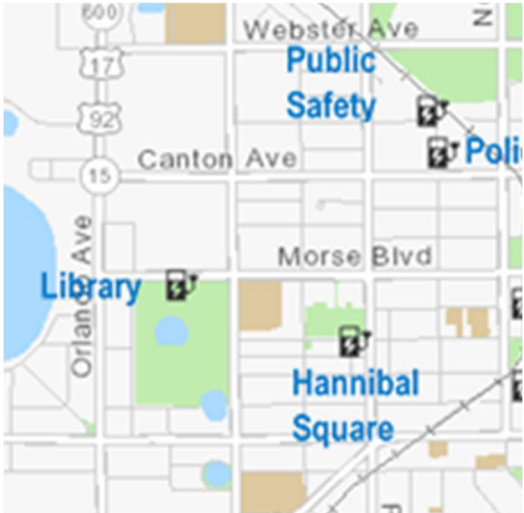## AVERAGE 2023 ACTIVITY
FOR EVENT DURATION OF 120 TO 180 MINUTES

A total of 340 days appear in the data.

AVERAGE 2023 ACTIVITY
FOR EVENT DURATION OF > 180 MINUTES

A total of 340 days appear in the data.
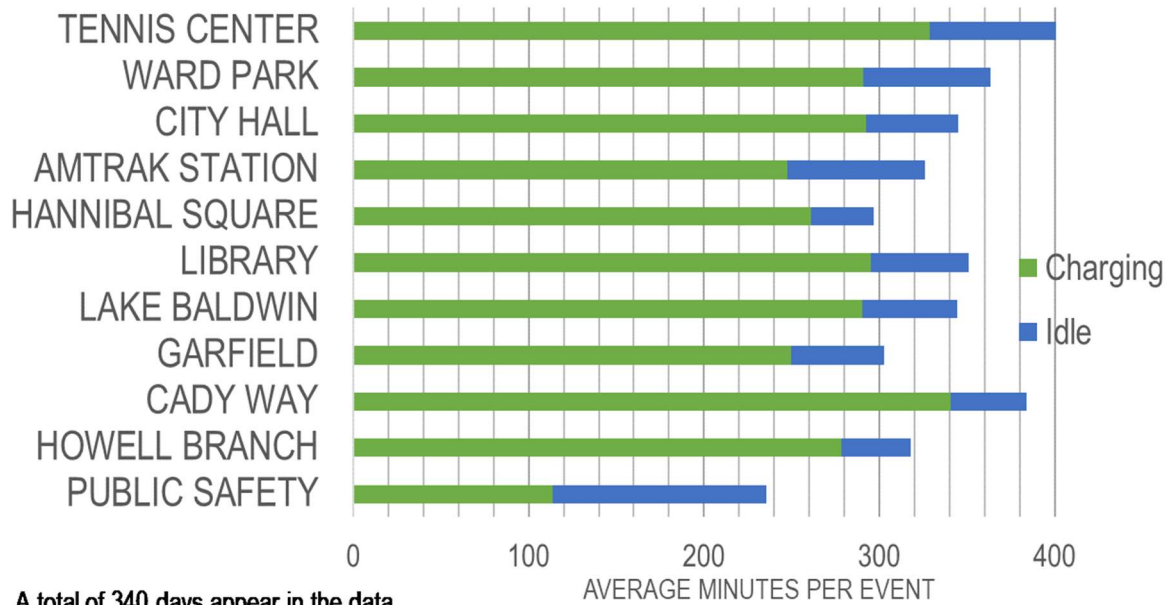
Winter Park Library

WINTER PARK LIBRARY
Average Station Activity Per Event
January to December 2023

■ Charging ■ Idle — Events

PORT 1 WINTER PARK LIBRARY
Average Station Activity Per Event
January to December 2023

- < 60 Minutes 31%
- 60 to 120 Minutes 26%
- >120 to 180 Minutes 18%
- > 180 Minutes 25%
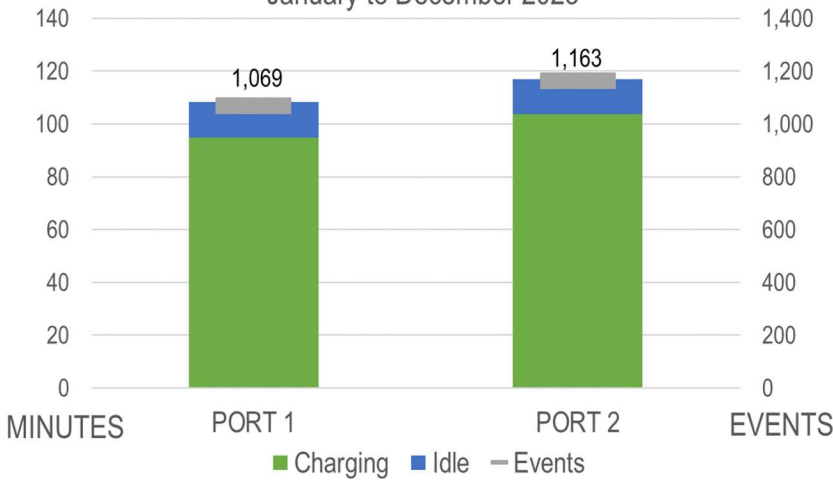
1,069 Total Connected Events 10,014 kWh

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 WINTER PARK LIBRARY
January to December 2023

Event Duration

	Charging	Idle
All	95	14
> 180 Minutes	285	65
120 to 180 Minutes	139	11
60 to 120 Minutes	81	6
60 or Less Minutes	23	2

AVERAGE MINUTES

ACTIVITY BREAKDOWN BY USER
PORT 1 WINTER PARK LIBRARY
January to December 2023

Event Duration

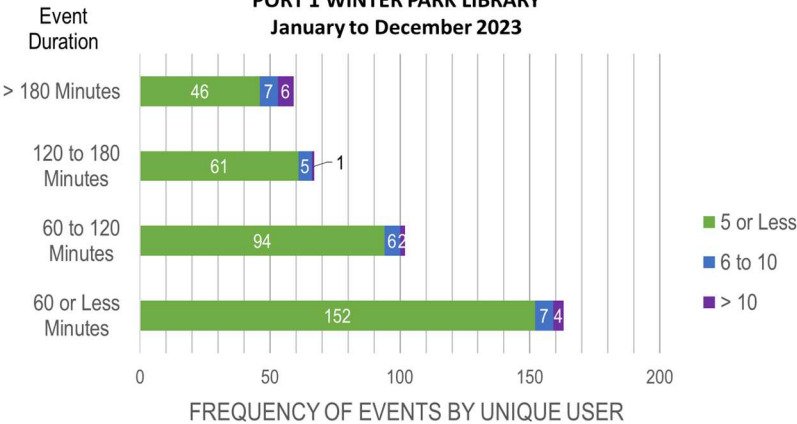|	5 or Less	6 to 10	> 10
> 180 Minutes	46	7	6
120 to 180 Minutes	61	5	1
60 to 120 Minutes	94	62	
60 or Less Minutes	152	7	4

FREQUENCY OF EVENTS BY UNIQUE USER

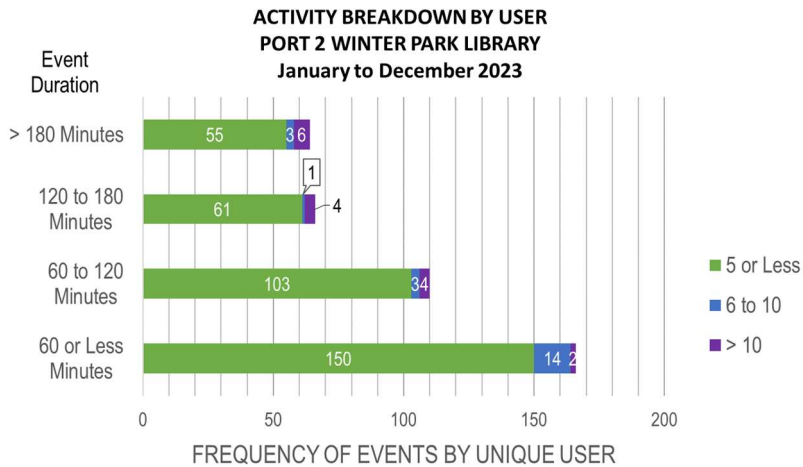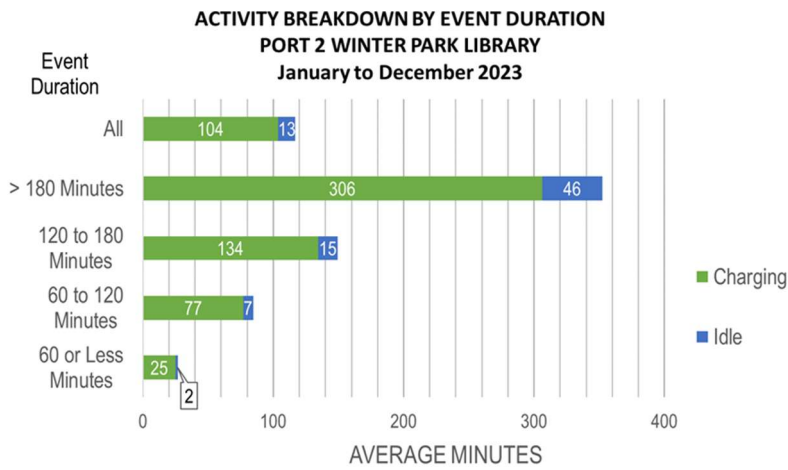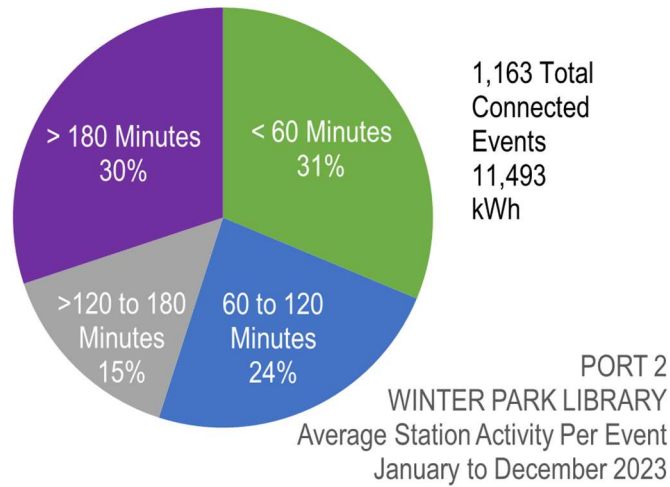1,163 Total Connected Events
11,493 kWh

PORT 2
WINTER PARK LIBRARY
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
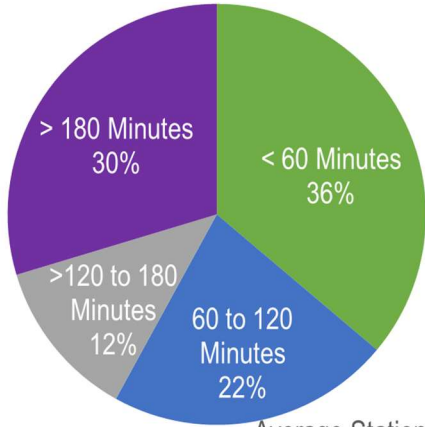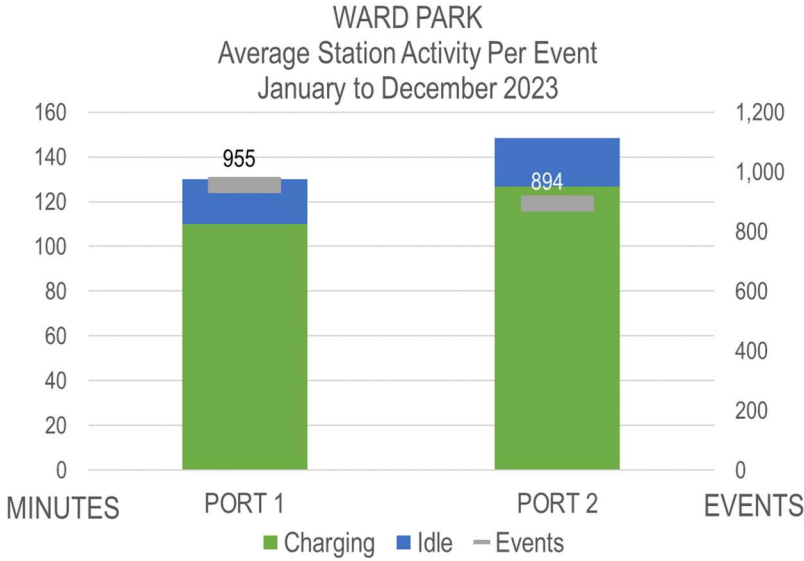**PORT 2 WINTER PARK LIBRARY**
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 2 WINTER PARK LIBRARY
January to December 2023

Ward Park

WARD PARK
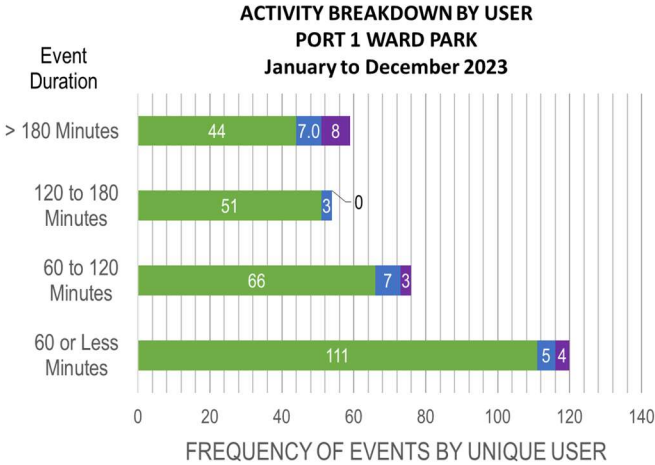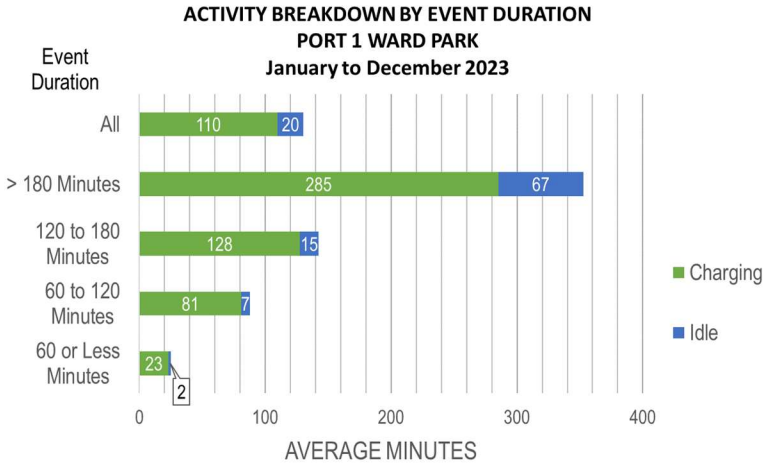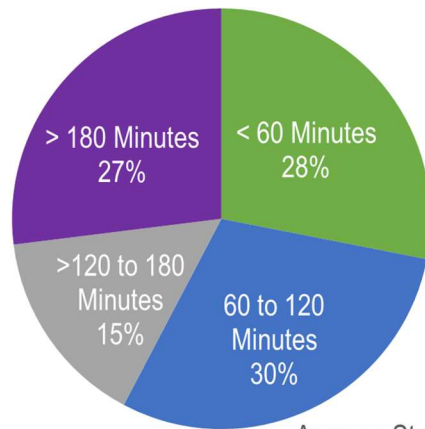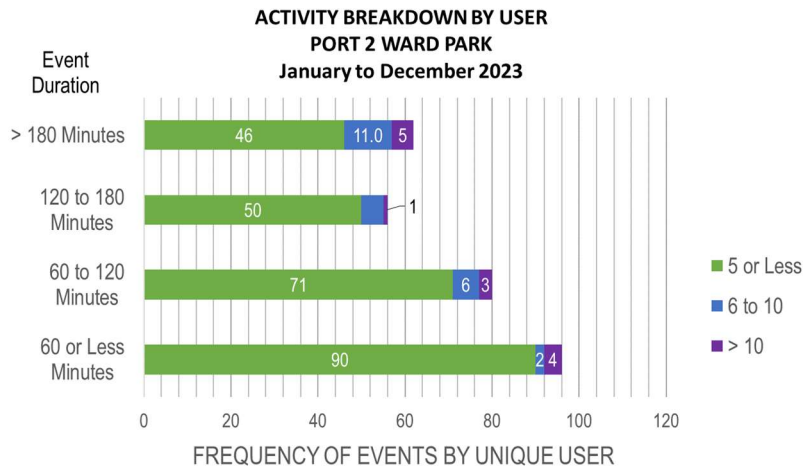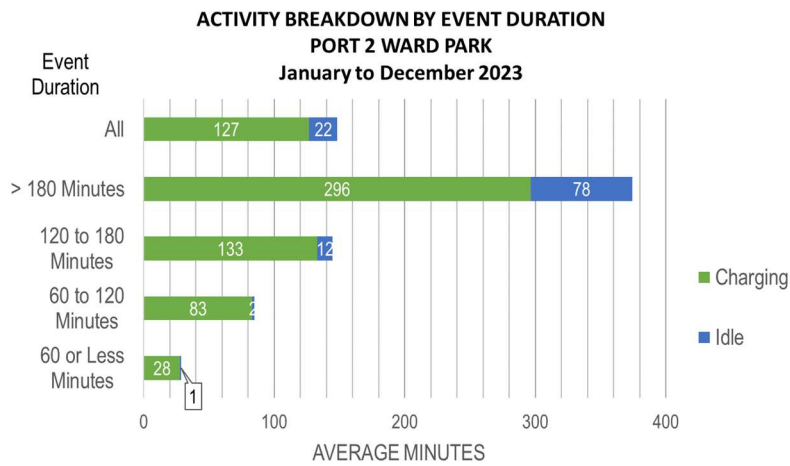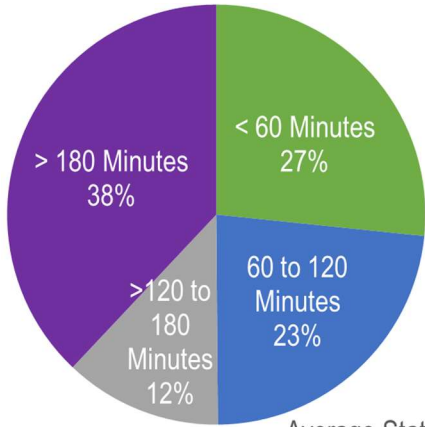### Average Station Activity Per Event
January to December 2023

955 Total Connected Events 11,470 kWh

PORT 1 WARD PARK
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 WARD PARK
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 1 WARD PARK
January to December 2023

894 Total Connected Events 9,919 kWh

Pie chart:
- < 60 Minutes 28%
- 60 to 120 Minutes 30%
- >120 to 180 Minutes 15%
- > 180 Minutes 27%

PORT 2
WARD PARK
Average Station Activity Per Event
January to December 2023

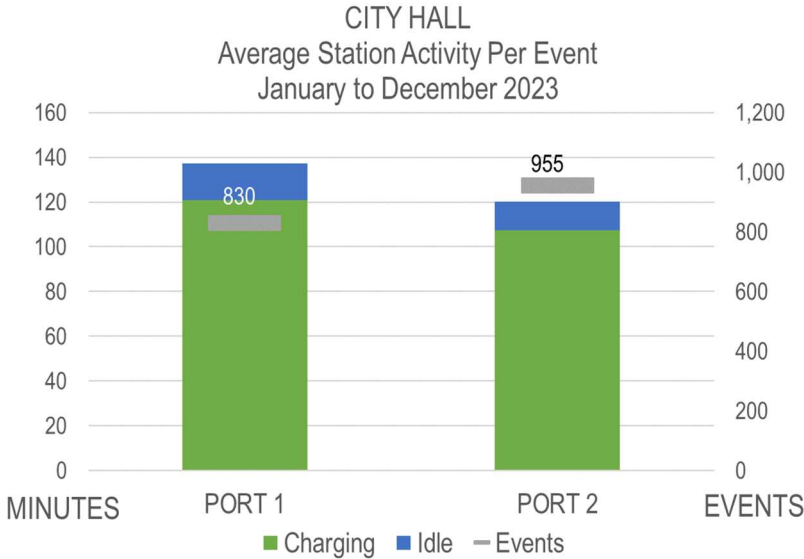**ACTIVITY BREAKDOWN BY EVENT DURATION**
PORT 2 WARD PARK
January to December 2023

Event Duration (Average Minutes), Charging / Idle:
- All: 127 / 22
- > 180 Minutes: 296 / 78
- 120 to 180 Minutes: 133 / 12
- 60 to 120 Minutes: 83 / 2
- 60 or Less Minutes: 28 / 1

Legend: Charging, Idle

AVERAGE MINUTES

ACTIVITY BREAKDOWN BY USER
PORT 2 WARD PARK
January to December 2023

Event Duration (Frequency of Events by Unique User), 5 or Less / 6 to 10 / > 10:
- > 180 Minutes: 46 / 11.0 / 5
- 120 to 180 Minutes: 50 / / 1
- 60 to 120 Minutes: 71 / 6 / 3
- 60 or Less Minutes: 90 / 2 / 4

Legend: 5 or Less, 6 to 10, > 10

FREQUENCY OF EVENTS BY UNIQUE USER

City Hall

CITY HALL
Average Station Activity Per Event
January to December 2023

MINUTES

830

955

EVENTS

■ Charging ■ Idle — Events

> 180 Minutes
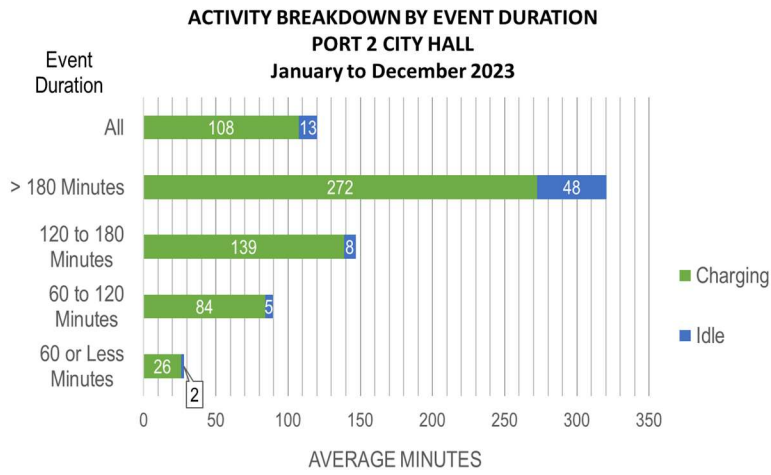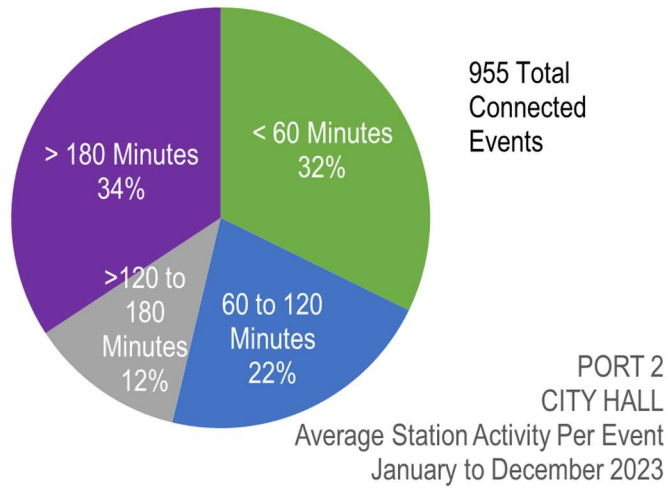38%

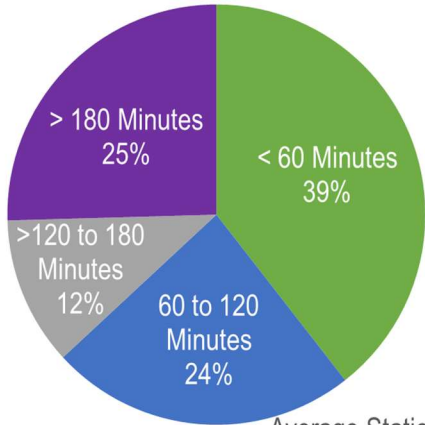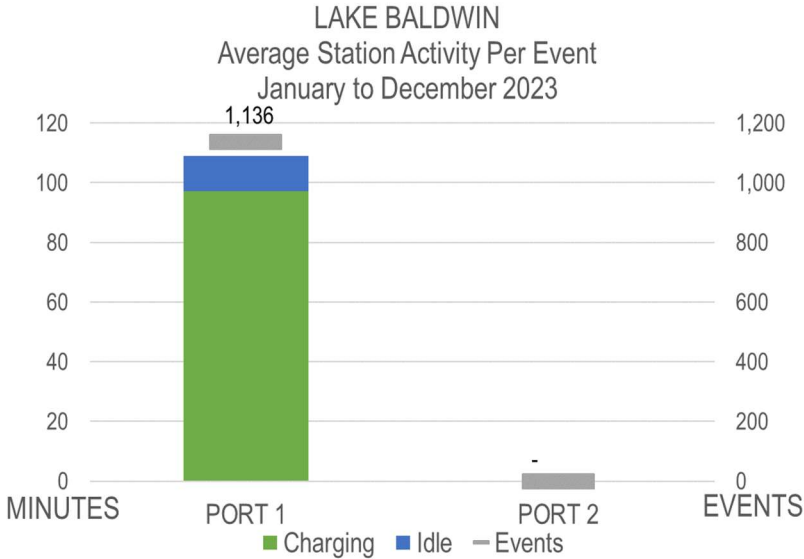< 60 Minutes
27%

>120 to 180 Minutes
12%

60 to 120 Minutes
23%

830 Total Connected Events

PORT 1 CITY HALL
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 CITY HALL
January to December 2023

Event Duration

All — 121 | 16
> 180 Minutes — 312 | 58
120 to 180 Minutes — 133 | 9
60 to 120 Minutes — 82 | 5
60 or Less Minutes — 19 | 2

■ Charging
■ Idle

AVERAGE MINUTES

ACTIVITY BREAKDOWN BY USER
PORT 1 CITY HALL
January to December 2023

Event Duration

> 180 Minutes — 63 | 6 | 7
120 to 180 Minutes — 71 | 0
60 to 120 Minutes — 88 | 22
60 or Less Minutes — 133 | 3 | 0

■ 5 or Less
■ 6 to 10
■ > 10

FREQUENCY OF EVENTS BY UNIQUE USER

955 Total
Connected
Events

PORT 2
CITY HALL
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 2 CITY HALL
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 2 CITY HALL
January to December 2023

Lake Baldwin

LAKE BALDWIN
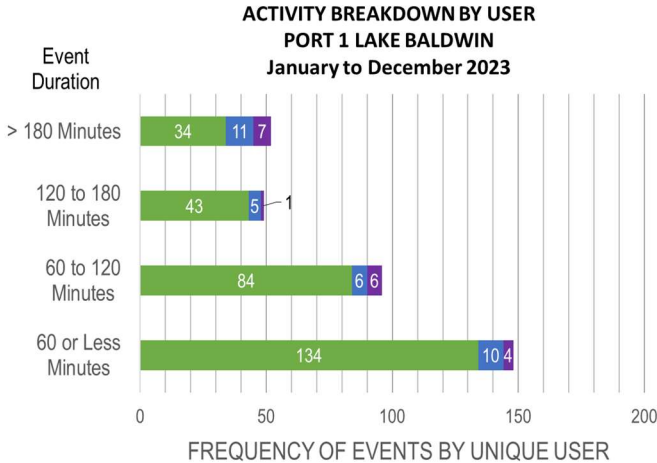**Average Station Activity Per Event**
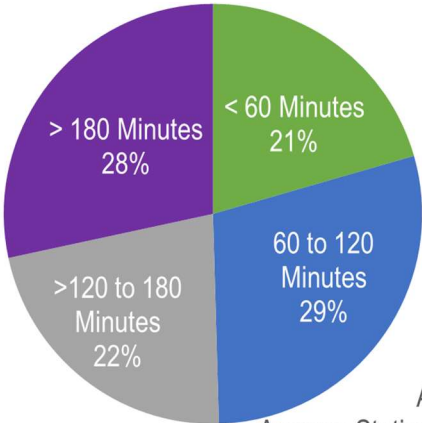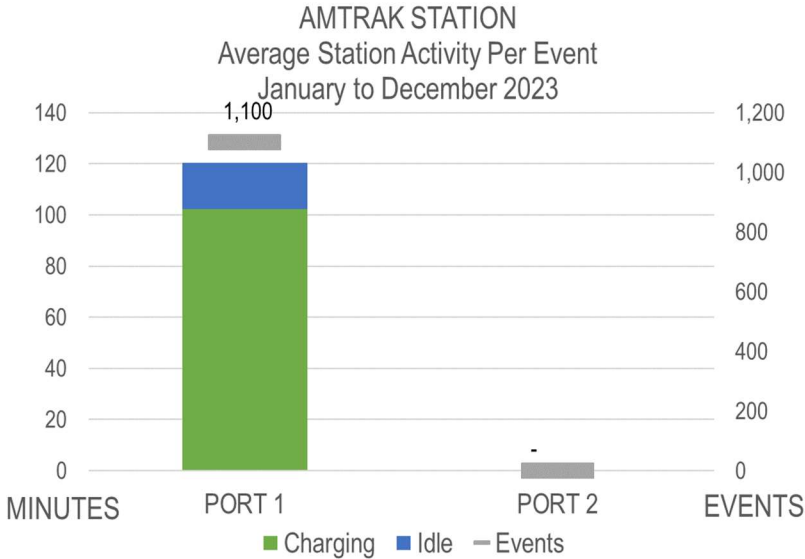**January to December 2023**

1,136 Total
Connected
Events
15,645
kWh

PORT 1
LAKE BALDWIN
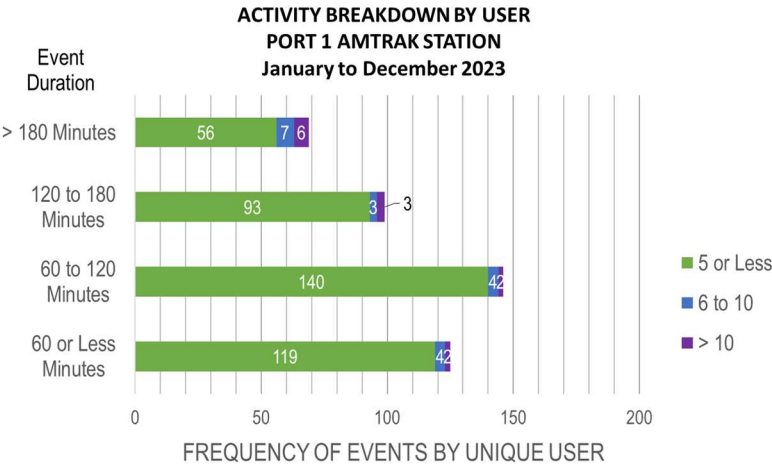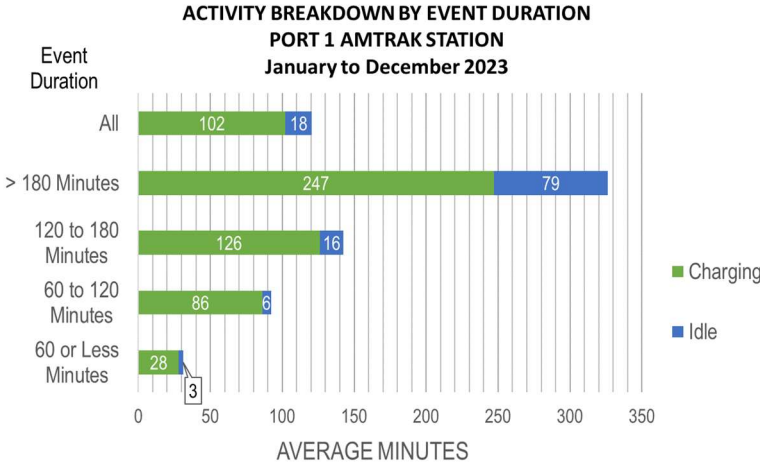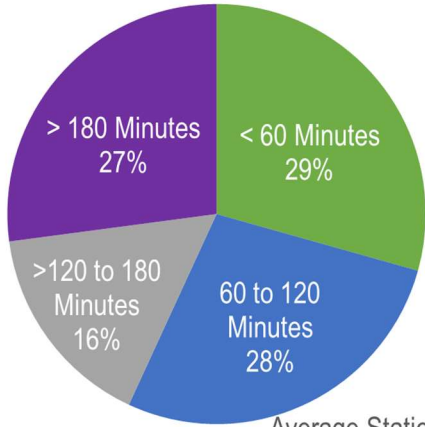**Average Station Activity Per Event**
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 LAKE BALDWIN
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 1 LAKE BALDWIN
January to December 2023

Amtrak Station

AMTRAK STATION
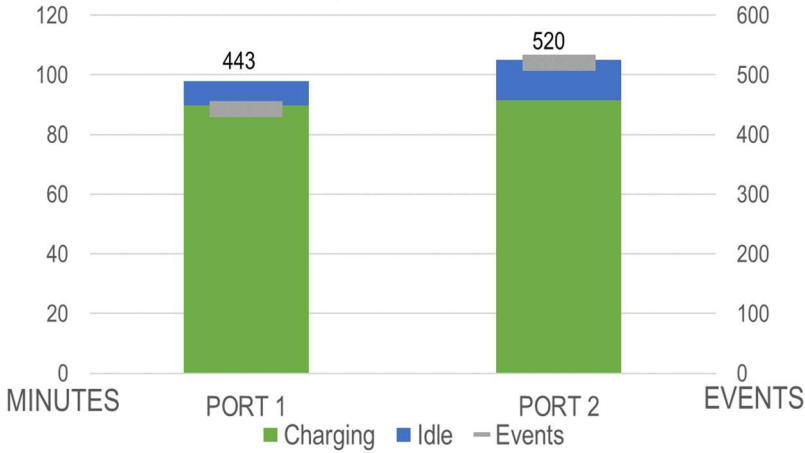Average Station Activity Per Event
January to December 2023
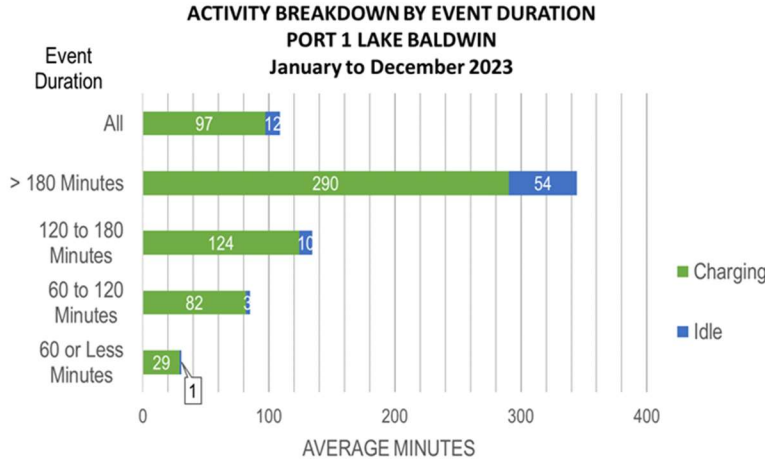
1,100 Total Connected Events 16,246 kWh

Pie chart:
- < 60 Minutes 21%
- 60 to 120 Minutes 29%
- >120 to 180 Minutes 22%
- > 180 Minutes 28%

PORT 1
AMTRAK STATION
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 AMTRAK STATION
January to December 2023

Event Duration

Event Duration	Charging	Idle
All	102	18
> 180 Minutes	247	79
120 to 180 Minutes	126	16
60 to 120 Minutes	86	6
60 or Less Minutes	28	3

AVERAGE MINUTES

ACTIVITY BREAKDOWN BY USER
PORT 1 AMTRAK STATION
January to December 2023

Event Duration

Event Duration	5 or Less	6 to 10	> 10
> 180 Minutes	56	7	6
120 to 180 Minutes	93	3	3
60 to 120 Minutes	140	42	
60 or Less Minutes	119	42	

FREQUENCY OF EVENTS BY UNIQUE USER

Garfield Avenue

GARFIELD AVE
Average Station Activity Per Event
January to December 2023

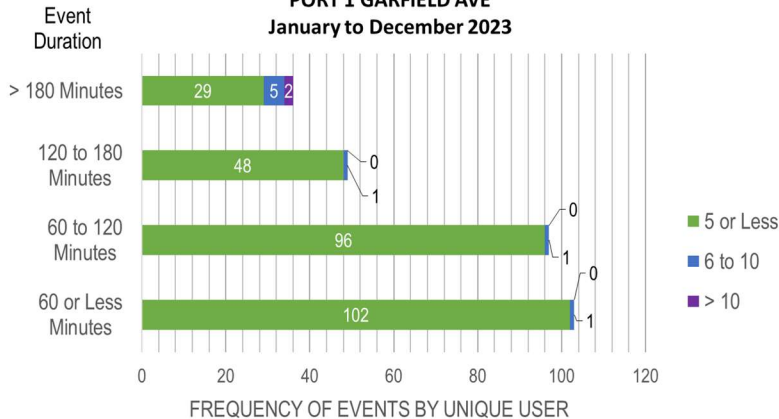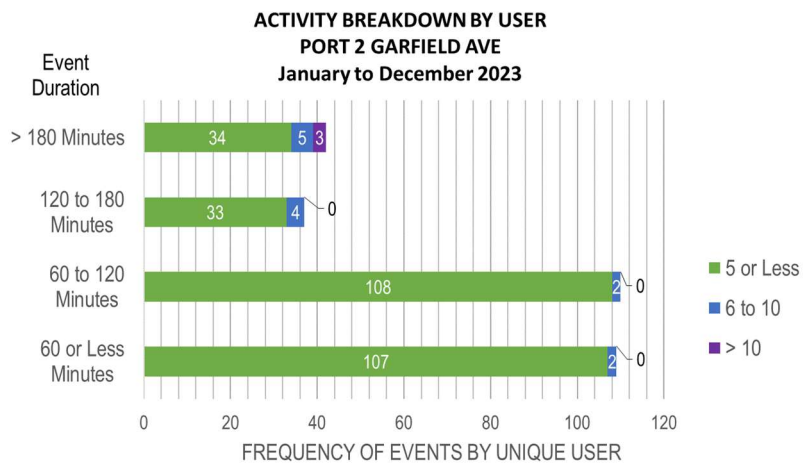MINUTES — Charging ■ Idle — Events — EVENTS

443 Total
Connected
Events
5,364 kWh

PORT 1
GARFIELD AVE
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 GARFIELD AVE
January to December 2023

AVERAGE MINUTES

■ Charging ■ Idle
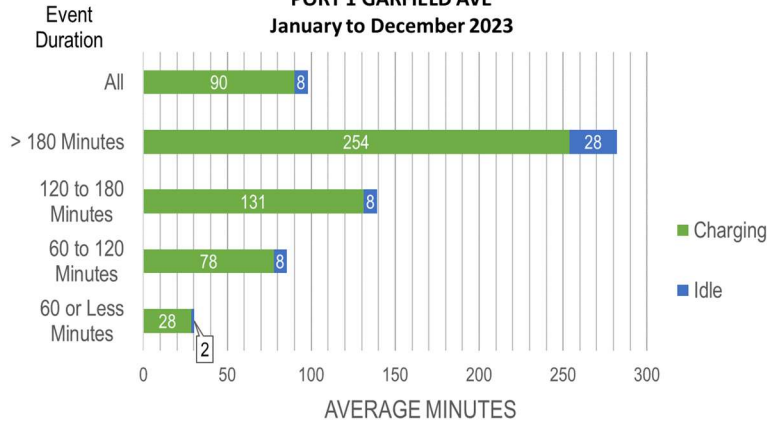
ACTIVITY BREAKDOWN BY USER
PORT 1 GARFIELD AVE
January to December 2023

FREQUENCY OF EVENTS BY UNIQUE USER

■ 5 or Less ■ 6 to 10 ■ > 10

520 Total
Connected
Events
6,284 kWh

PORT 2
GARFIELD AVE
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 2 GARFIELD AVE
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 2 GARFIELD AVE
January to December 2023

Cady Way

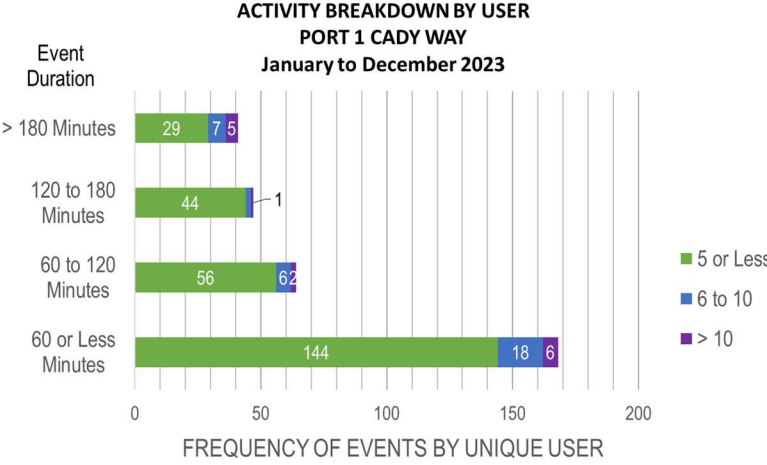
CADY WAY
Average Station Activity Per Event
January to December 2023
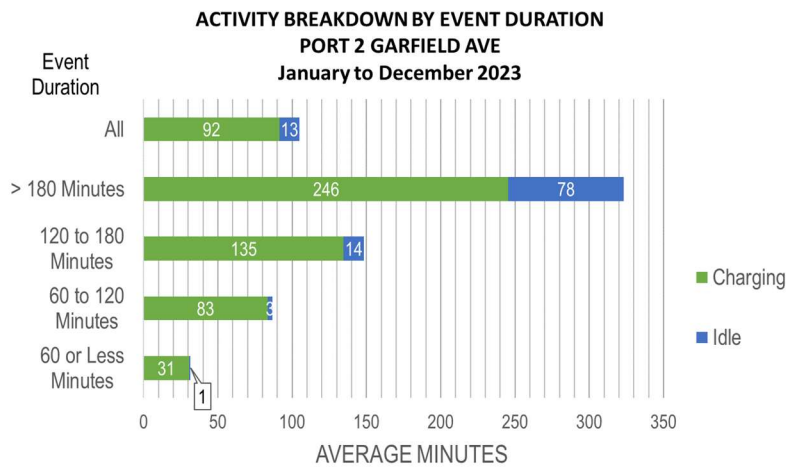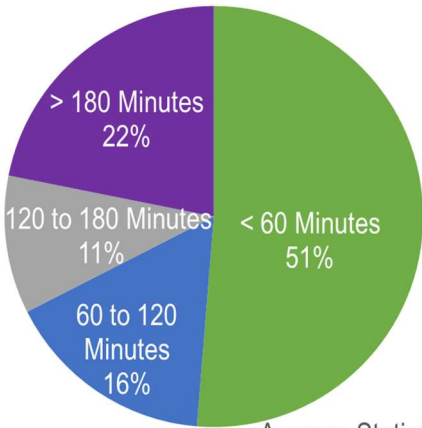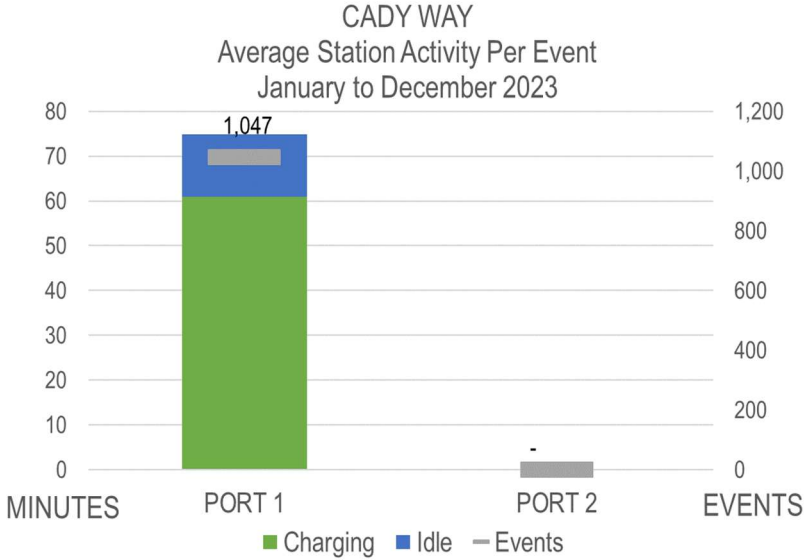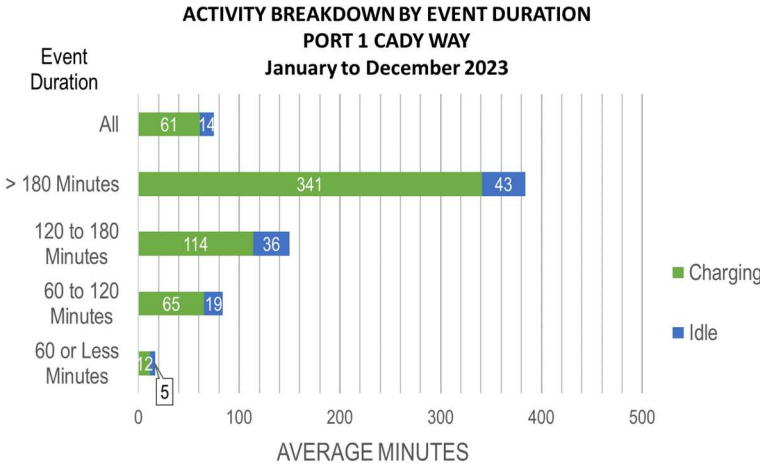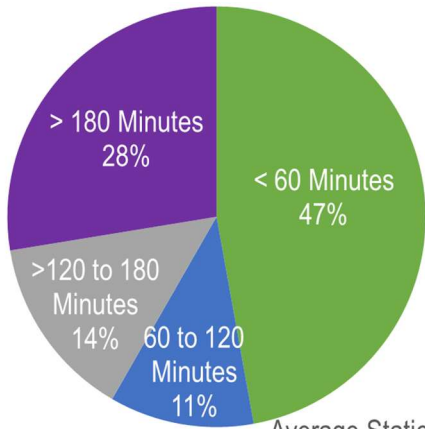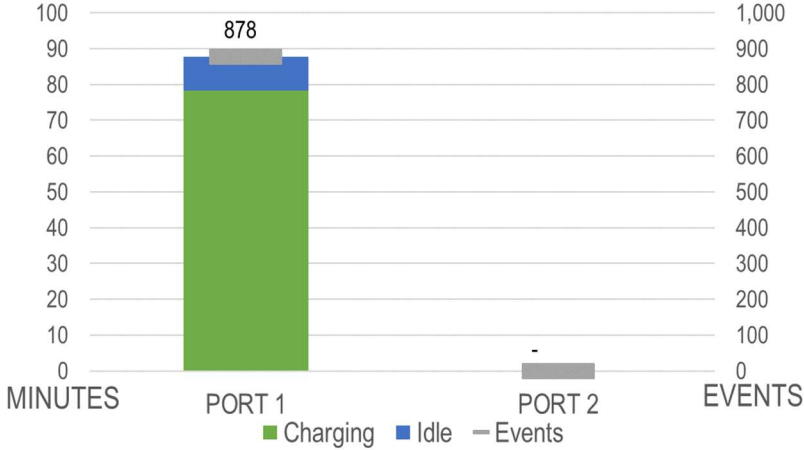

1,047 Total
Connected
Events
9,893 kWh

PORT 1
CADY WAY
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 CADY WAY
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 1 CADY WAY
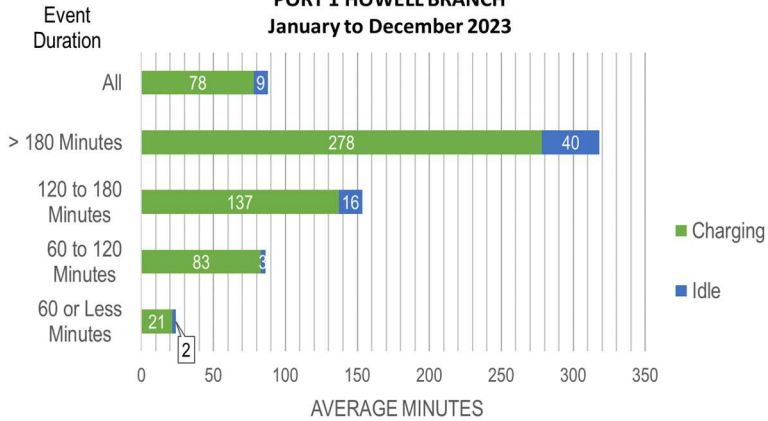**January to December 2023**

Howell Branch

HOWELL BRANCH
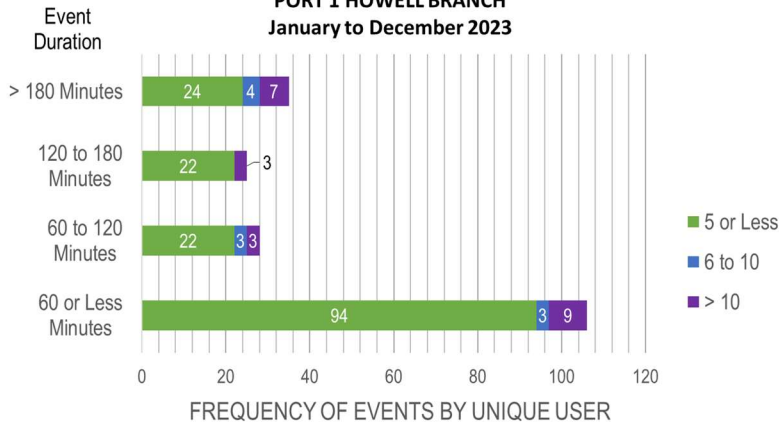### Average Station Activity Per Event
January to December 2023

878 Total
Connected
Events
11,433
kWh

PORT 1
HOWELL BRANCH
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
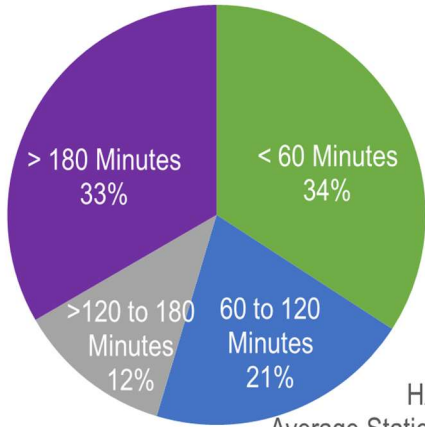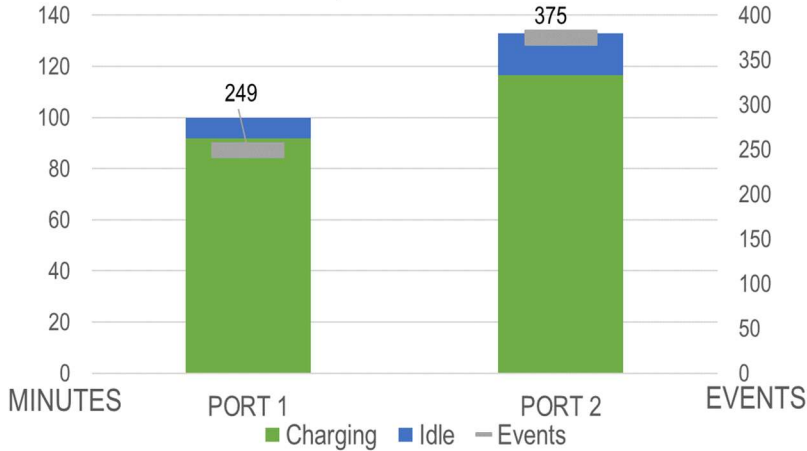**PORT 1 HOWELL BRANCH**
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 1 HOWELL BRANCH
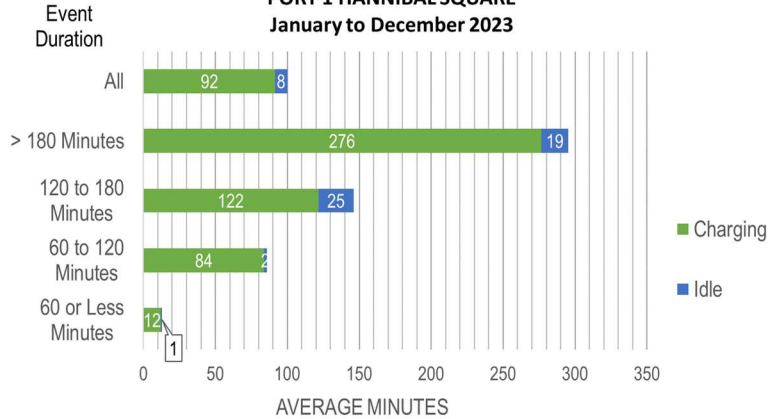**January to December 2023**

Hannibal Square

HANNIBAL SQUARE
Average Station Activity Per Event
January to December 2023

MINUTES / EVENTS

Legend: ■ Charging ■ Idle — Events

PORT 1 values: 249, 375

Pie chart:
- < 60 Minutes 34%
- 60 to 120 Minutes 21%
- >120 to 180 Minutes 12%
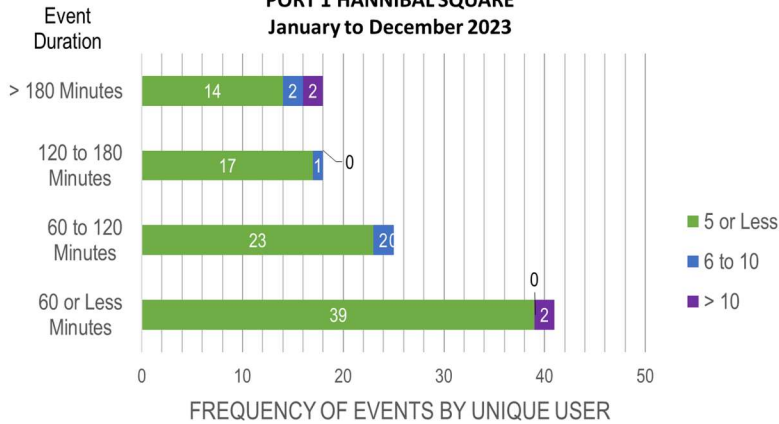- > 180 Minutes 33%

249 Total Connected Events 2,534 kWh

PORT 1
HANNIBAL SQUARE
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 HANNIBAL SQUARE
January to December 2023

Event Duration	Charging	Idle
All	92	8
> 180 Minutes	276	19
120 to 180 Minutes	122	25
60 to 120 Minutes	84	2
60 or Less Minutes	12	1

AVERAGE MINUTES

ACTIVITY BREAKDOWN BY USER
PORT 1 HANNIBAL SQUARE
January to December 2023

Event Duration	5 or Less	6 to 10	> 10
> 180 Minutes	14	2	2
120 to 180 Minutes	17	1	0
60 to 120 Minutes	23	20	
60 or Less Minutes	39	0	2

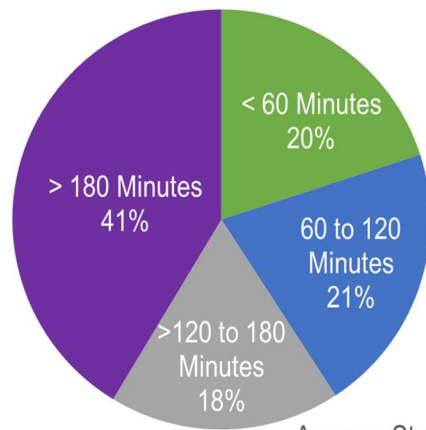FREQUENCY OF EVENTS BY UNIQUE USER

375 Total
Connected
Events
5,547 kWh

PORT 2
HANNIBAL SQUARE
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
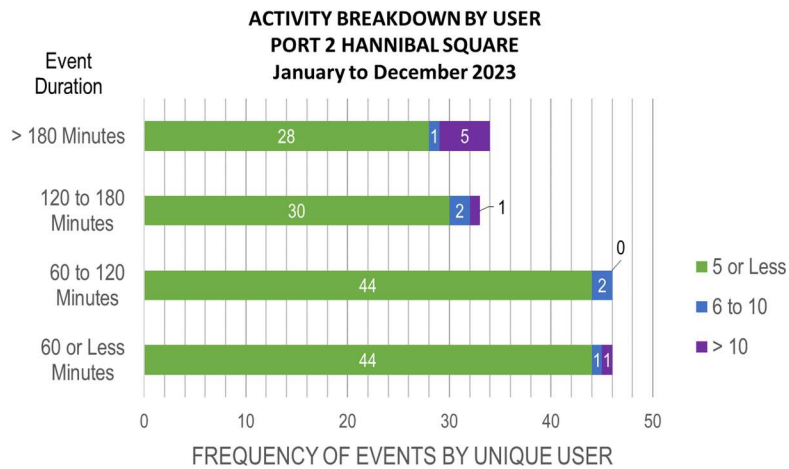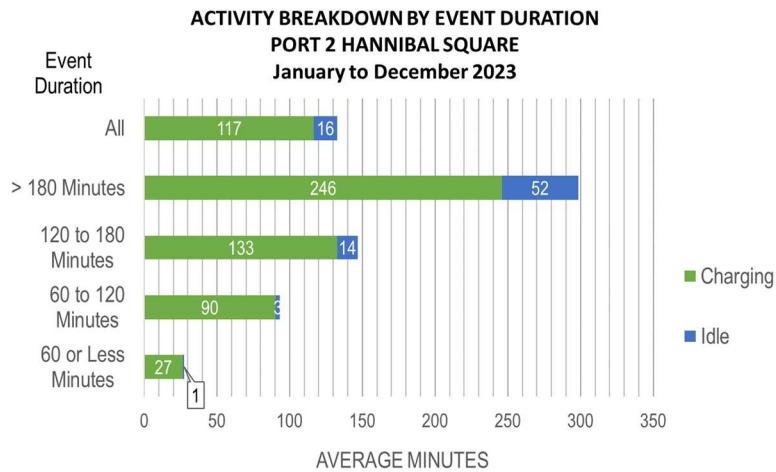**PORT 2 HANNIBAL SQUARE**
January to December 2023

**ACTIVITY BREAKDOWN BY USER**
PORT 2 HANNIBAL SQUARE
January to December 2023

Tennis Center

TENNIS CENTER
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 TENNIS CENTER
January to December 2023

356 Total
Connected
Events

PORT 1
TENNIS CENTER
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 1 TENNIS CENTER
January to December 2023
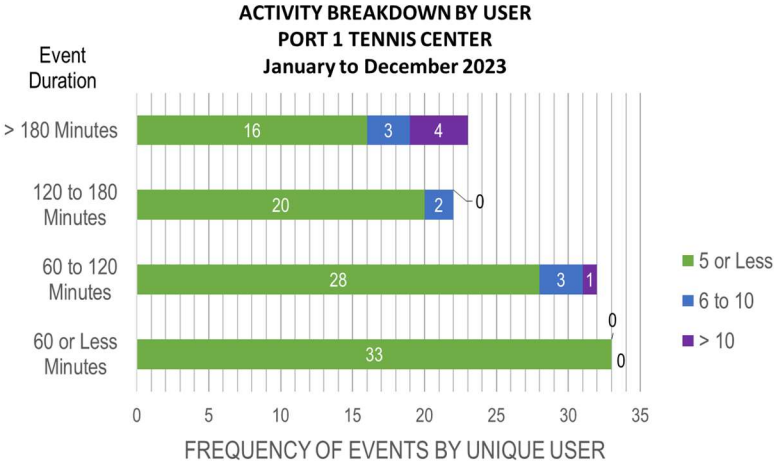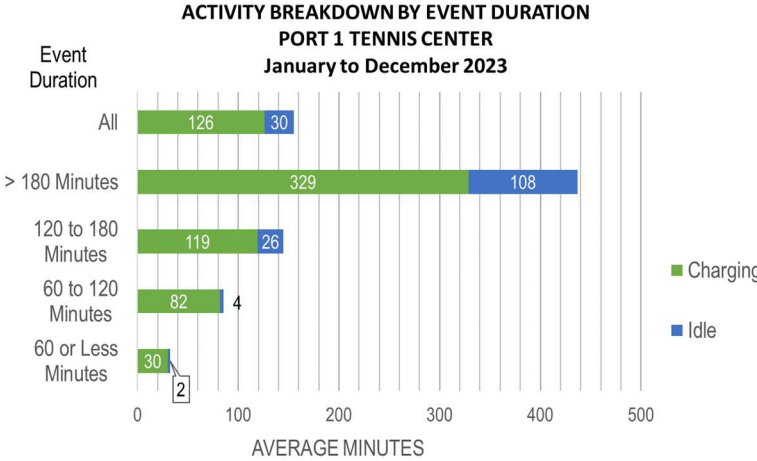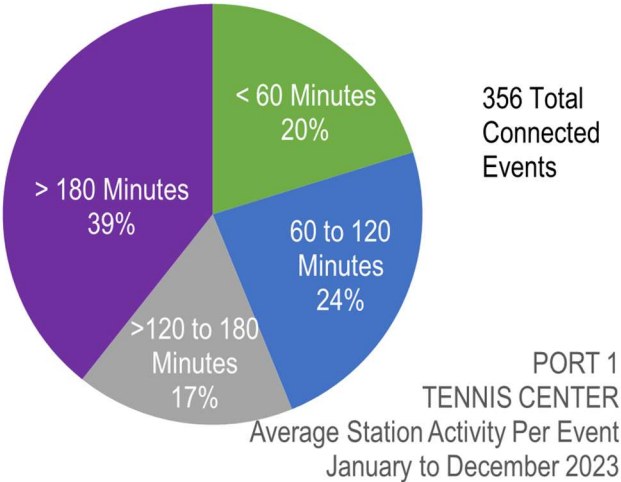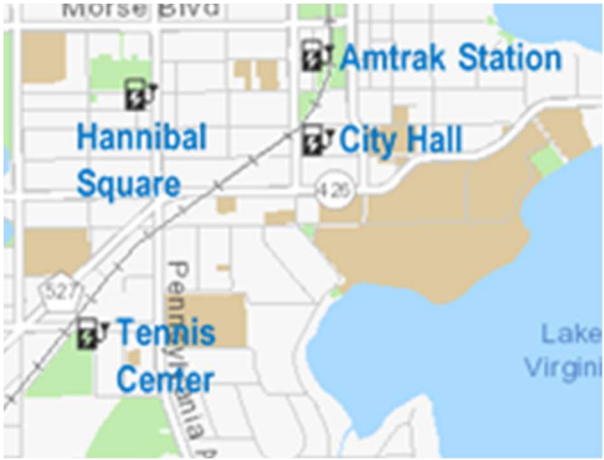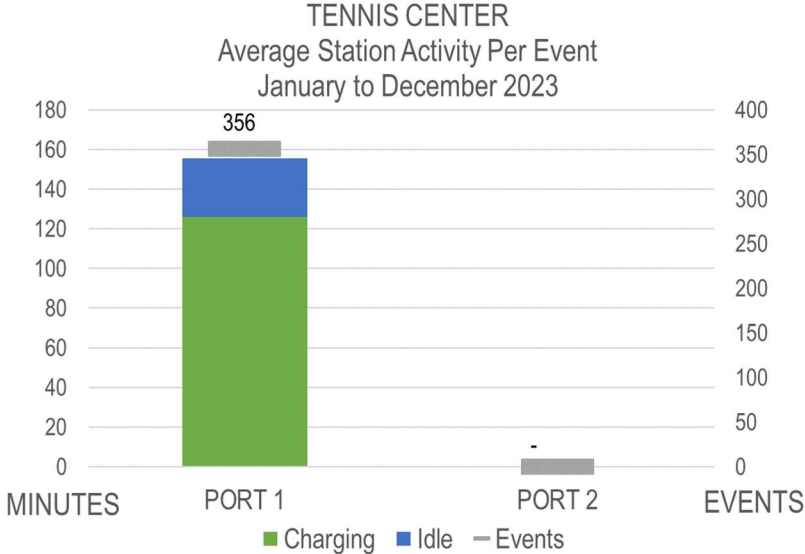
Public Safety

PUBLIC SAFETY
Average Station Activity Per Event
January to December 2023

295 Total
Connected
Events
2,518 kWh

PORT 1
PUBLIC SAFETY
Average Station Activity Per Event
January to December 2023

ACTIVITY BREAKDOWN BY EVENT DURATION
PORT 1 PUBLIC SAFETY
January to December 2023

ACTIVITY BREAKDOWN BY USER
PORT 1 PUBLIC SAFETY
January to December 2023