

## City of Bremerton Data Collection Plan (Round One)

As part of the development of the Bremerton Parking Study, parking data will be collected in the identified study area, shown on the following page. The data collection process will be conducted in two rounds, the first being conducted in October, and the second in early 2017. Data collected during Round One will focus on on-street and off-street parking occupancy and turnover in the Downtown Subarea Planning Boundary (DSAP) area. Round two of data collection will focus on residential neighborhoods and other commercial areas as necessary.

The parking data will be developed into an ArcGIS parking database and analyzed to determine the parking behavioral characteristics that exist within the study area. The data collection and analysis processes for each of these components are discussed in greater detail in this document.

The purpose of the data collection effort is to identify parking behavioral characteristics within the study area, which will be used as the basis for analyzing future conditions and developing the Bremerton Parking Study. The project team intends to use License Plate Recognition (LPR) data collection technology to improve efficiency of data collection, as well as collect information that can be utilized to define parking occupancy and turnover.

### **Data Collection**

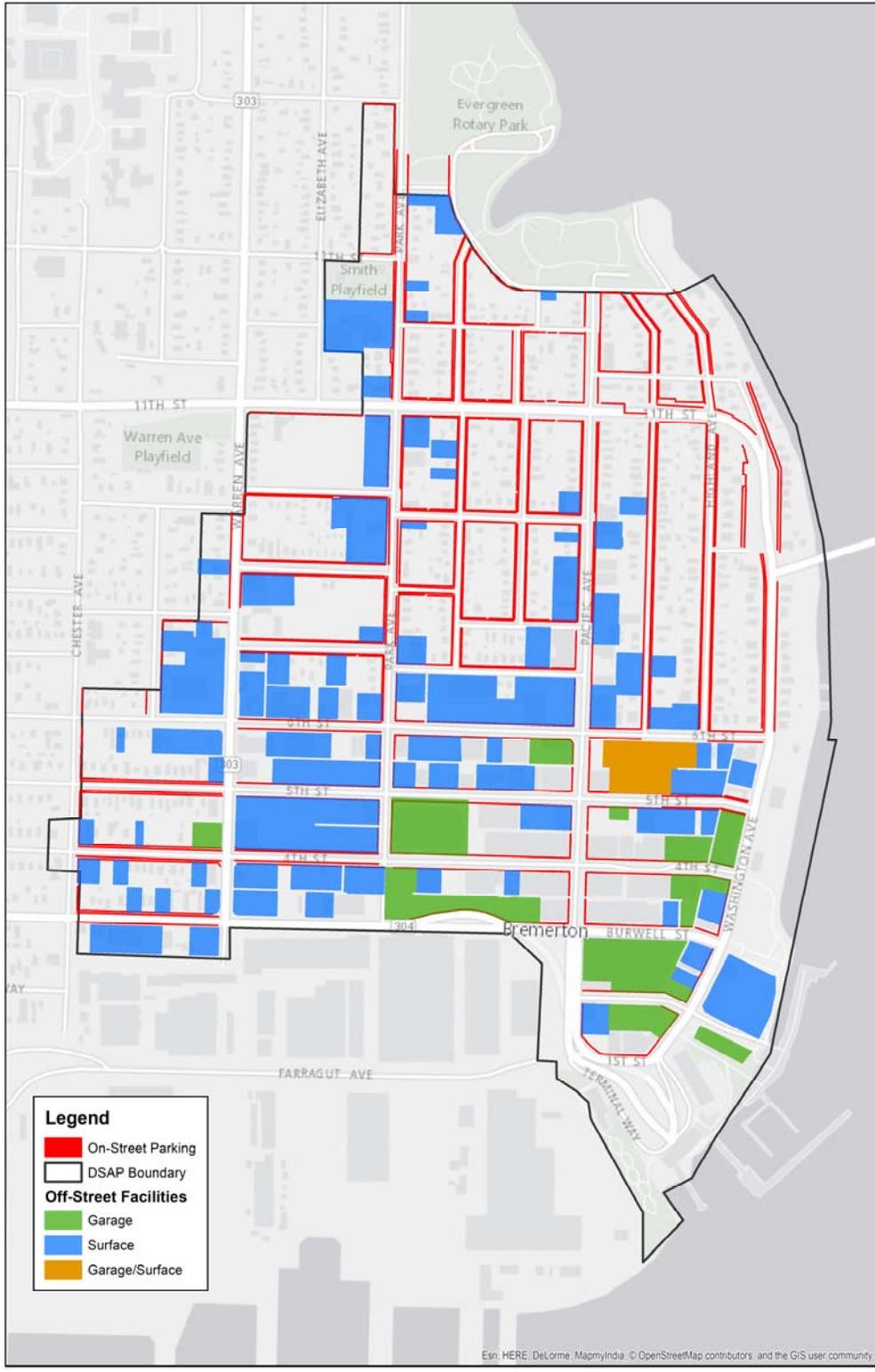
The occupancy and turnover data collection will be conducted in the downtown area, as well as in selected residential districts. The downtown area data collection will occur on Tuesday, October 11<sup>th</sup> and Wednesday, October 12<sup>th</sup>, 2016. Using the LPR equipment, weekday data will be collected throughout the day during a 12-hour period. On the first day, on-street parking data will be collected in the downtown area, while off-street facilities will be collected on the second day.

**On-Street Facilities** – The on-street data will be collected for the DSAP area hourly to obtain consistent occupancy and turnover behaviors. The collection will start at 7am and will continue until 7pm on Tuesday, October 11<sup>th</sup>. One staff member will be needed to complete the on-street component.

**Off-Street Facilities** – The off-street facilities will be collected on Wednesday, October 12<sup>th</sup> and will require the use of two staff members to complete. The data will be collected over 3 hour periods to obtain morning, mid-day, and evening occupancy counts and turnover. The data collection will take place between 7am and 7pm.

The mobile LPR equipment uses a dual camera configuration, placed on the roof of the data collection vehicle. The cameras are connected to a laptop within the vehicle, which collects and maintains the read data. The cameras use reflectivity technology to capture images of each license plate that appears within the camera(s) window. With each read, the cameras collect read time, location (latitude and longitude), and license plate number.

# Study Area



## Basic Data Analysis

The data gathered from the LPR equipment will be analyzed using both an Excel database and ArcGIS (using geospatial coordinates collected from each read) to identify the occupancy and turnover of collected parking assets (i.e. a block face or parking facility). In the field, collected data is stored to a local database on the laptop within the vehicle. At the end of each day of data collection, an Excel-based database is generated from the stored data. For each image taken, the report includes license plate numbering, time of when the picture was taken, time when the image was offloaded, and the latitude/ longitude of where the image was taken. A unique identifier will be assigned to each LPR read and used to replace the license plate number. During analysis, this unique identifier will be used to determine occupancy and turnover and the actual license plate number will be deleted from the database.

The project team will use the parking inventory data, described previously, to determine the occupancy on an hourly basis by parking facility and/or block face using the stored data from LPR and excel based databases. This excel database equates one row of data to one vehicle, using the unique identifier, and relates this to the hour the image was taken and capacity of the facility. For turnover, each read will be plotted into ArcGIS, where misreads and/or an incorrect text conversion of license plate are cleaned up. Following cleaning up the data, the frequency and duration of stay for each license plate is calculated using geospatial tools within ArcGIS, equating average duration and turnover at the space, block face, or facility level.

## Reporting and Analysis

The collected data will be used to develop the Park+ database. A Park+ model will be built and calibrated to analyze the existing and future parking behaviors. The results of the analysis will be included in the summary technical memorandum. The data will be presented in both tabular and mapping formats.