Date: November 3, 2016

To: Bill Cowern, City of Boulder Public Works and Transportation
Susan Connelly, City of Boulder Community Vitality
Deryn Wagner, Open Space and Mountain Parks

From: Carlos Hernandez, Fox Tuttle Hernandez Transportation Group
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RE: Updated Chautauqua Access Management Plan Summer 2016 Data Summary

A. Executive Summary

The Fox Tuttle Hernandez Transportation Group collaborated with multiple City of Boulder departments and the Colorado Chautauqua Association (CCA) to monitor and collect transportation data in and around the Colorado Chautauqua National Historic Landmark, including the surrounding neighborhoods, in the summer of 2016. In advance of collecting data, a data collection plan was prepared based on the vision established in the Transportation Master Plan and prior CCA parking and transportation studies. This vision is to explore ways to manage demand for access to Chautauqua in ways that minimize impacts to surrounding neighbors, visitors, and the area's natural and cultural resources. The proposed summer 2016 data collection methods and timelines were previewed during the first community workshop in March 2016 presented to city boards, and discussed at city council.

This memorandum provides a high level summary of over 650,000 data points collected during summer 2016. The information will be used to determine the feasibility of pilot projects in and around CCA and the surrounding neighborhoods during the summer of 2017. The key findings from the summer 2016 data collection include:

- Open Space and Mountain Parks (OSMP) visitation at Chautauqua more than doubled between 2005 and 2015.
- Visitors to Chautauqua (historic district, park, open space) from out of state and outside of Boulder mostly drive.
- Boulder residents also mostly drive, and do so a few times a week.
- Peak parking and OSMP visits both occur between 10 a.m. and 1 p.m.
- Most visitors are arriving from the direction of US36 and Baseline Road.
- Each of the arrival routes to access Chautauqua have public parking opportunities along the way.
- Traffic in and near Chautauqua is higher on weekends than on weekdays.
- Most people are driving near the posted speed limits.
- Visitors park within 1,200' or a 5-minute walk of their specific destinations.
- Parking is dynamic; many factors influence demand.
- Typical parking duration is between 2 and 3 hours.

- 75% utilization of on-street parking spaces is occurring on certain blocks.
- Some people are riding bicycles to Chautauqua despite the climb.
- Ridesharing has arrived.
- Hop 2 Chautauqua is reducing on-site parking demands on Chautauqua Auditorium event evenings.
- Most people walking and driving are courteous/accommodating on shared streets within the historic district.

The 11 days of detailed parking data collected is available on this external website:

https://public.tableau.com/profile/chautauquaaccessmanagementplan#!/

B. Summer 2016 Data Collection Overview

Transportation data was collected within the Chautauqua boundaries, Gregory Canyon, and in the adjacent neighborhoods. The study area included new parking observation areas that have not been studied in previous field studies, new observations of bicycle demand, new travel pattern data beyond the Chautauqua area, and a shared street safety analysis within Chautauqua. Figure 1 shows the complete study area. The following provides a summary of the data that was collected during summer 2016. Additional details will be provided on October 27 at the CAMP Working Group meeting.

1. **Acyclica and Survey Data**

   Acyclica readers detect a portion of the WiFi or Bluetooth signal that emit from a mobile device or vehicle. The City of Boulder has Acyclica readers at several locations across the city to understand travel patterns. Data was retrieved at four locations external to Chautauqua and two additional readers were deployed within Chautauqua. The data was retrieved for a concert day and a non-concert day. The data represents 8 a.m. to 8 p.m. at each reader on two different days. Approximately 5,000 unique signals were detected at all the readers over two days between 8 a.m. and 8 a.m.. Approximately 780 signals were matched between external stations citywide and the ones located within Chautauqua. This data was used to understand possible arrival direction patterns of Chautauqua area visitors.

   In conjunction with the Acyclica data, the City of Boulder worked with independent research firm RRC Associates to conduct an intercept survey of visitors within CCA. This included many questions about the arrival experience and trip origination. The full survey and results are available on the project website. The key findings for purposes of parking and transportation are noted in the next section.

2. **Vehicle Traffic and Speed Data**

   The City of Boulder deployed traffic count and speed data equipment on roadways in and around Chautauqua. This included new counts on streets in the adjacent neighborhoods that were requested during the initial community engagement process. Counts were collected for three days at each location for 24 hours per

day. 10 locations within the study area were counted and monitored for vehicle speeds.

3. **Vehicle Parking Data**

Hourly parking demand for motor vehicles was collected at locations within Chautauqua and the adjacent neighborhoods. Approximately 3,000 on- and off-street parking spaces in the study area were studied for parking utilization and duration. The study area includes neighborhood streets north of Baseline Road, and within Chautauqua. Data was collected on 11 different days between June and September 2016. Data was collected for eight hours (9 a.m. to 5 p.m.) on most days[2]. Fox Tuttle Hernandez staff collected data within Chautauqua by walking designated routes every hour, counting cars to gather utilization data, and conducting a photo inventory to study the duration of parked vehicles. The electric vehicle (EV) parking space near the Ranger Lot was also photo documented. Figure 2 shows the parking zones studied within Chautauqua.

A total of 11 days of parking data collection was conducted. The summer 2016 data collection days, months, and concerts are summarized in Figure 3[3]. The data collection details are noted on the following pages.

City of Boulder staff also collected parking utilization and duration data. City staff collected this data on neighborhood streets north of Baseline Road using License Plate Recognition (LPR) technology. A city vehicle equipped with LPR technology was driven on a designated route once each hour for eight hours on each data collection day. Figure 4 shows the blocks studied in the adjacent neighborhood.

Parking data was collected on a variety of days based on the dynamic nature of activities that occur in the CAMP study area. Parking data was collected on six weekdays, four Saturdays and one Sunday. Data was collected on days when there were concerts in the CCA Auditorium. On these days, starting at approximately 5 p.m., parking south of Clematis Drive was managed by CCA staff. The management plan limits access to CCA residents, resident guests and those with an accessible parking pass for the concert south of Clematis Drive after 5 p.m.. Data was also collected on days where there was not a concert in the CCA Auditorium.

4. **People on Bicycles**

People riding bicycles to and from CCA were observed for two days. This included observations of arrivals along existing routes and within Chautauqua. Nine days of bicycle parking within Chautauqua was also studied. During this time approximately 460 parked bicycles were observed on two bikes racks near the Ranger Parking Lot.

5. **Rideshare Use**

[2] On June 11th and June 15th data was collected for less than 8 hours
[3] Data was not collected on Saturday June 11th at 2pm and on Wednesday June 15th at 9am or 5pm. On all other days and hours data was collected

Rideshare is a form of transportation that has not previously been studied at CCA. This emerging service matches drivers and travelers using mobile applications. This includes popular ridesharing applications such as Uber and Lyft. Field observations over 11 days occurred while walking the parking study routes. Specific use was observed within the CCA Leasehold, around the Green, in the Ranger Lot and outside the Academic Hall. Additionally, on two concert nights rideshare demand was studied at the beginning and the end of the concert. At those times, surge pricing (when rates exceed twice the typical rate) was documented.

6. **Shared Street Interactions**
   Video cameras were deployed on Kinnikinic Road to study interactions between people driving motor vehicles and people walking on this shared street. The videos were collected over four hours on two different days. Staff from FTH watched the videos and processed the results to understand yielding movements between people driving cars and walking. A total of 86 people walking in the shared street were observed.

7. **Additional Data**
   Additional observations of Park-n-Ride lot availability along the arrival corridors was completed. This data was completed over a few hours on single days. A separate transit analysis will be conducted later this year by city staff and an independent consultant.

C. Key Data Findings

1. **Acyclica and Survey Data**

Acyclica Data

- 12% to 36% arrive from the north via 9th Street and other northern streets
- 64% to 88% arrive from the east via Baseline Road

Arrival Mode Share Data from Survey

- 85% of all respondents visiting Chautauqua arrived by means of a private automobile (In 2011 the total was 86%)
- 2% of all respondents utilized ridesharing (In 2011 the total was 0%)
- 2% of respondents arrived by bicycle (In 2011 the total was 4%)

Survey Arrival Data from RRC Intercept Survey

- 81% of respondents utilized the Grant Place entrance
- 8% of respondents utilized the King's Gate entrance at Lincoln Place
- 8% of respondents utilized the entrance from 12th Street
- 2% of respondents arrived from other directions
- 1% of respondents arrived from the south from the Mesa Trail

Boulder Resident Data from RRC Intercept Survey

- Boulder respondents drive up a few times a week
- 70% of "nearby neighborhood residents" respondents drive up

- 89% of “citywide residents” respondents drive up
- 57% of “CU/Naropa students" respondents drive up

2. **Vehicle Traffic and Speed Data**

Figure 5 shows the block numbers assigned to streets in the adjacent neighborhood

Vehicle Traffic Data

- Weekend daily traffic volumes on Baseline Road are 64% higher than a typical weekday
- Weekend daily traffic volumes on 9th Street are 15% lower than a typical weekday
- Daily traffic volumes on 6th, 7th, 8th, 12th, Kinnikinic Road, and Grant Place are less than 1,000 vehicles and have varying day of week peaks

85th Percentile Vehicle Speed Data

- Baseline Road between 8th and Lincoln Place at or below 30 MPH limit
- 9th Street near Baseline Road 4 MPH above the 25 MPH limit
- 6th, 7th, 8th, and Grant near Baseline Road and Kinnikinic Road at or below the 25 MPH limit

3. **Vehicle Parking Data**

Parking Utilization Data

- 71% of the blocks studied (63 blocks) experience less than 50% utilization
- 15% of the blocks studied (13 blocks) experience 51% to 75% utilization
- 14% of blocks studied (11 blocks) exceed 75% utilization at least four hours in a day for more than two days studied

Parking Duration Data

- North neighborhood parking duration ranges from 2 to 3 hours
- Baseline Road parking duration ranges from 1 to 2 hours
- Ranger Lot parking duration ranges from 2 to 3 hours
- Green parking ranges from 2 to 3 hours
- CCA Cottages ranges from 3 to 4 hours

4. **People on Bikes**

Bicycle Arrival Data from RRC Intercept Survey

- 13% of CU/Naropa students surveyed arrive by bicycle
- 3% of Boulder residents surveyed arrive by bicycle

Surrounding Area Bicycle Routes and Lanes

- The CAMP study area has an existing on-street bicycle network that follows mostly residential streets, except for Baseline Road which has a climbing lane
- 6th St, Lincoln Pl, Cascade Ave, and Columbine Ave are designated bicycle routes that are marked with periodic Boulder Bikeways Wayfinding Signs, usually where bike routes intersect

Intersection of 9th Street & College Avenue

- 9th Street & College Avenue is a gateway intersection for many people on bicycles heading to and coming from downtown to the CAMP study area
- This intersection also connects bicycle routes that access Downtown, University of Colorado, and the Boulder Creek Path to Naropa
- This intersection has signage that links the bicycle routes and lanes in the area

Intersection of Lincoln Place & Baseline Road

- Lincoln Place & Baseline Road is one of the arrival intersections for people riding bicycle to and from Chautauqua
- This intersection does not have signage that directs people on bicycles to and from CCA to secure bicycle parking

Bicycle Parking Conditions

- There are four bicycle parking locations near and within CCA
- Two racks are located near the Ranger Lot and two near the CCA Auditorium
- The racks near the Ranger Lot were fully occupied for most of the day during the 11 days of observation
- People are also parking bicycles in non-designated locations; attaching to trees and other vertical elements
- The wave racks are inefficient for the current demand and can be difficult to park at and wooden “wheel benders” or head-in racks are not effective with modern bicycle locks

5. <u>Shared Street Interactions</u>

Kinnikinic Video Observations

- 56% of time people driving cars do not interact with people walking
- 35% of time people walking do not interact with a moving vehicle
- 9% of the time people driving and walking interact
- People driving vehicles appear to brake or slow when they approach people walking
- 85% of people driving motor vehicles are operating them at 16 MPH
- Two people were typically walking together

Figure 1: CAMP Study Area Map

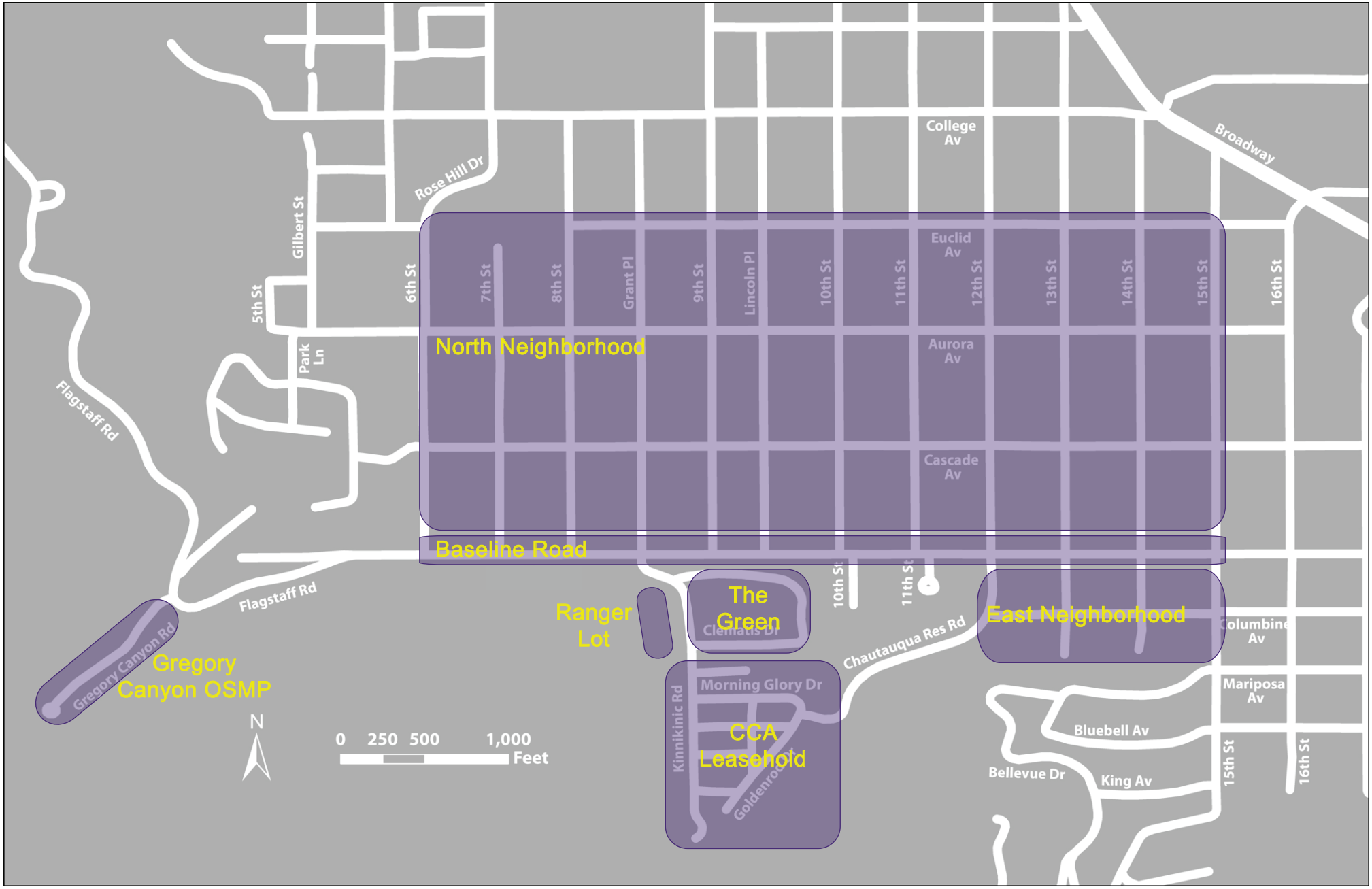

Figure 2: Chautauqua Parking Map

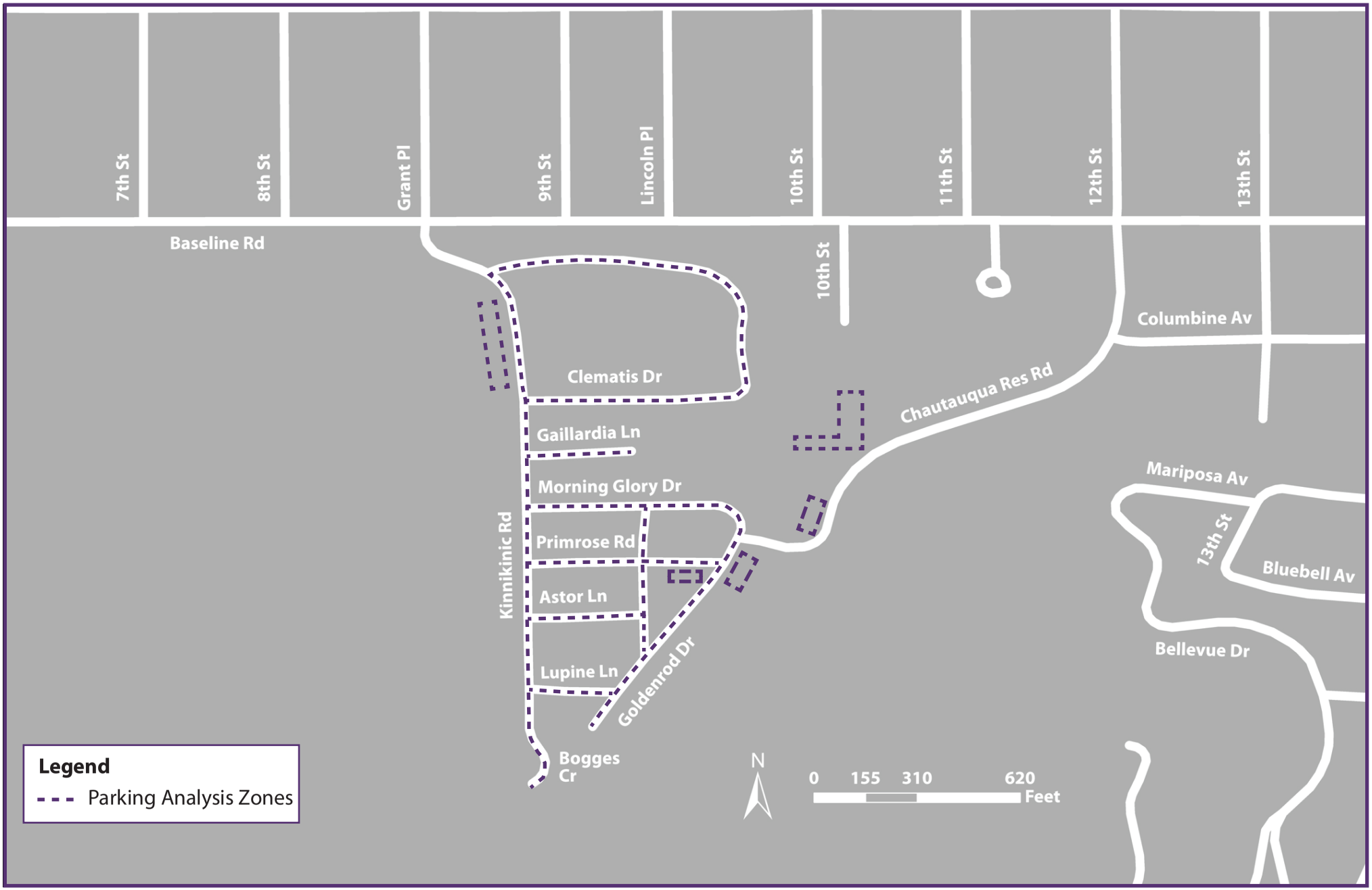

Figure 3: Summer 2016 CAMP Data Collection Schedule

Collection Date	Weekday	Weekend	No Concert	Concert	Performer
Wednesday June 8	x		x		
Saturday June 11		x	x		
Wednesday June 15	x			x	Bela Fleck
Sunday July 10		x		x	CMF
Wednesday July 13	x		x		
Saturday July 23		x		x	CMF
Friday July 29	x			x	Indigo Girls
Saturday August 13		x	x		
Wed. August 10	x			x	Keb Mo
Thursday August 18	x		x		
Saturday September 17		x	x		

Figure 4: Neighborhood Parking Map

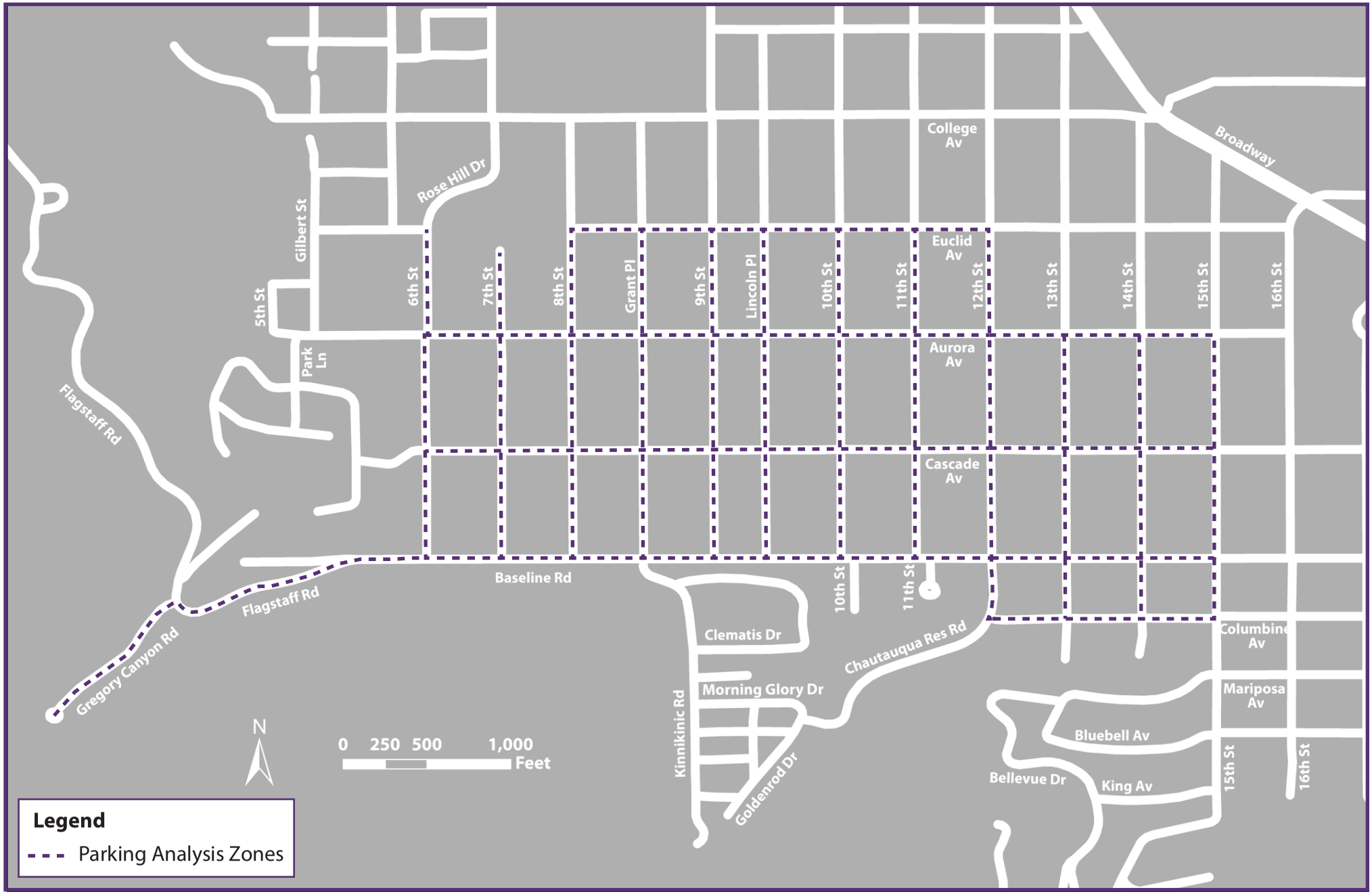

Figure 5: Block Number Map