Traffic Patterns/ Temporal Traffic Changes/ Pedestrian Activities

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1. Summary

This part describes and analyzes current traffic conditions of the project site in addition to the surrounding area, including traffic patterns, temporal traffic changes and pedestrian activities, based on the available data from the City of Seattle, site observations and traffic count surveys (See Appendix for the details about the traffic count surveys).

The overall key findings are summarized as below.

- The King Street is assumed to be served as the lowest capacity street in terms of the hierarchy, but is affected by major surrounding streets, such as Jackson St., Dearborn St. 5th Ave. and 12th Ave. that have larger traffic flows.
- Pedestrians have been observed with more or constant movements in the west side of the I-5 while the Little Saigon area had less pedestrian activities except a market store.
- The section between 8th and 10th Ave. has higher car traffic volume.
- Car traffic flow around noon on weekend tremendously exceeded other day or time.
- Smaller number of parking cars was observed in the sections to the west of the I-5.
- Car flows are more affected by the traffic from avenues than the one within the street.
- Some negative factors were seen, such as frequent and short parking by customers, large parking and loading spaces on the streets, and congested intersections.
- Various activities were observed on weekend's noon, such as walking, shopping, chatting and sitting, though sitting were only seen at the park.
- Attractive storefront spaces beckoned people more.
- Some undesirable activities were observed around the Chinatown gate.

Photo 1: An Intersection with Congestion

Photo 2: People and Cars on Saturday Afternoon

2. Traffic Patterns

This section is divided into three major parts:

1) Traffic Patterns of Surrounding Area, to examine the larger traffic contexts including street hierarchies and traffic volumes in the surrounding area;
2) Traffic Patterns in King St. including pedestrian and vehicular volumes and movement trends based on the count survey, and;
3) Traffic Issues in King Street, to clarify the current major issues faced on the site based on the observations.

2.1. Traffic Patterns of Surrounding Area

Based on the data provided by the Seattle's Department of Transportation (SDOT), the following facts are found regarding the street hierarchy and traffic flows.

- The King Street in the project site is classified as "Access Street" (the lowest classification in terms of the capacity).
- Jackson St., Dearborn St. 4th Ave. 5th Ave. and 12th Ave serve as "Principal" or "Minor Arterials" that assume relatively higher capacity.
- Those surrounding streets have higher traffic flows, especially in Dearborn St. and 12th Ave., which connects relatively directly to the project site. Jackson St. and 5th Ave. that are directly connected to the site also have relatively higher traffic.

[Street Classifications (For References)]

SDOT classifies the streets described as below. The "Interstate Freeways" provide the highest capacity. Then "Principal Arterials," "Minor Arterials," "Collector Arterials," and "Access Streets" follow it in turn in terms of capacity.

Interstate Freeways: "provide the highest capacity and least impeded traffic flow for the movement of longer distance vehicle trips (5 miles or more). "

Principal Arterials: "Serve as the principal route for the movement of traffic through the City. Connects Interstate Freeways to major activity centers, to minor and collector arterial streets and directly to traffic destinations. "

Minor Arterials: "To distribute traffic from Principal Arterials to Collector Arterials and Access streets, directly to secondary traffic generators such as community shopping areas, high schools, community centers and athletic fields, and to serve trips between neighborhoods within a community."

Collector Arterials: To collect and distribute traffic from Principal and Minor Arterials to Access Streets or directly to local destinations."

Access Streets (both residential and commercial): "Access streets are not part of the arterial network. They provide direct access from the arterial network to local land uses."

Source: Seattle Department of Transportation, "Planned Arterials Map Legend Definitions," http://www.seattle.gov/transportation/streetclassmaps/arterialslegend.pdf.

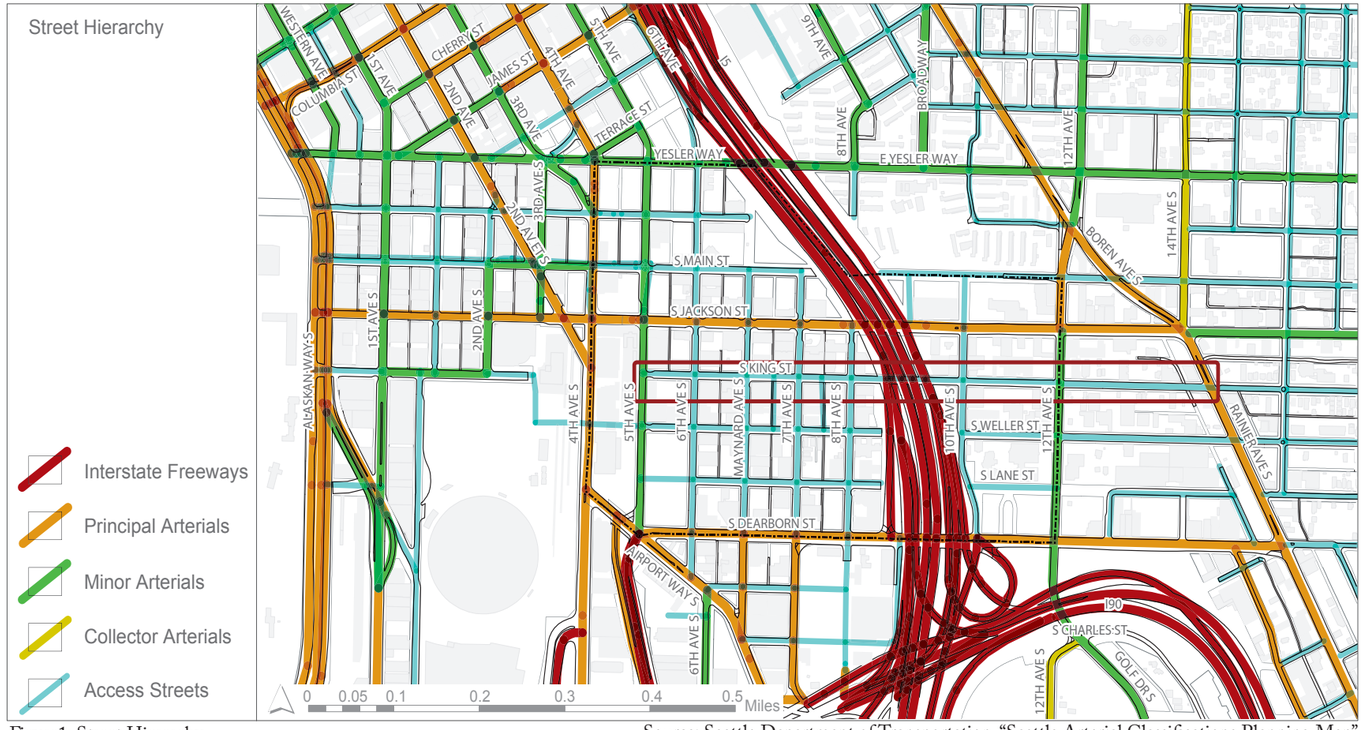


Figure1: Street Hierarchy

Source: Seattle Department of Transportation, "Seattle Arterial Classifications Planning Map"

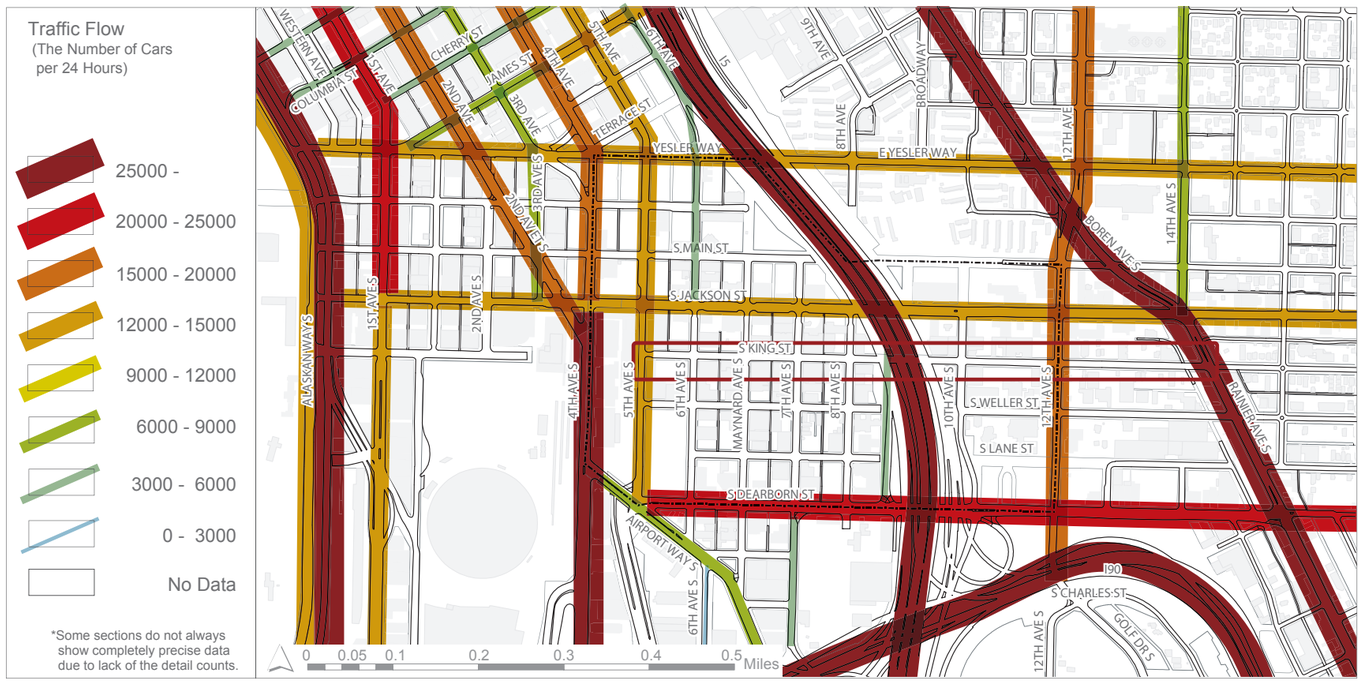


Figure2: Traffic Flow

Source: Seattle Department of Transportation, "2006 Traffic Flow Map"

2.2. Traffic Patterns in King St.

Based on the count survey, the following traffic trends or patterns were observed.

- Pedestrians have been observed with more or constant movements in the west side of the I-5 while the east side (A Little Saigon area) has less pedestrian activities in the morning both on the weekday and weekend.
- With regards to the vehicular traffic, the section between 8th and 10th Ave. has higher traffic volume and the weekend's noon's traffic exceeded other day or time's traffic flows.
- The smaller number of parking cars was observed in the sections to the west of the I-5.
- The street's car flows are more affected by the traffic from avenues than the one within the street.

2.2.1. Pedestrian Patterns

Figure 3 and Graph 1 show the number of pedestrians by sections both on the weekday and weekend observed by the traffic count survey. Based on the survey, the section between 7th and 8th Ave. has higher pedestrian volumes and the section beyond the east of the I-5 has less traffic both on weekday and weekend. On the weekday, larger pedestrian movements were observed around the 5th Ave. while the number of pedestrians gradually increases by approaching to the section between 7th and 8th on the weekend. In sum, in the morning time, the west side of the I-5 has been observed more or constant pedestrian movements while the east side has less.

Photo 3: Sidewalk between 6th and Maynard Ave. on Saturday Afternoon

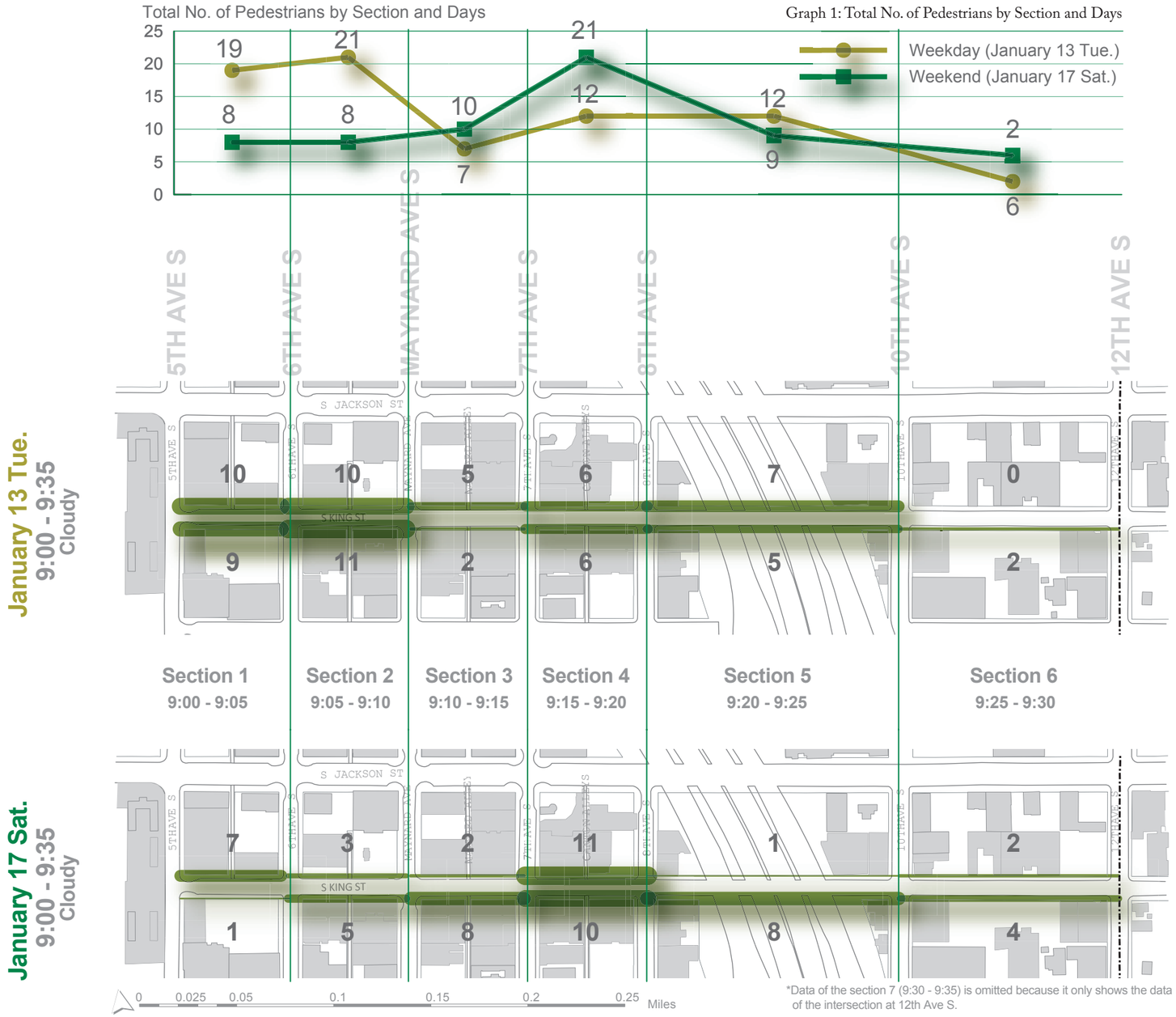


Figure3 : Volume and Pattern of Pedestrian Movements

2.2.2. Vehicular Patterns

Figure 4 and Graph 2 and 3 show the number of passage and parking cars, and in-and-outflow by sections or intersections both on the weekday and weekend observed by the traffic count survey.

Regarding the passage cars through the King Street, the number of cars tended to increase as approaching to the section 5 (the area between 8th and 10th Ave.) on all observed days. And the number of traffic and its tendency in the morning time both on the weekday and weekend are not so different, while the noon's traffic volume has approximately double as the morning's one if compared between the weekend's outcomes.

In every day and time of the survey, the number of the parking cars on the streets show same tendency: the section 5 and 6 (the area between 8th and 12th Ave.) have the larger number of parking, while the western sections to those areas have relatively smaller counts.

As for the traffic flows that go into or out of the King Street, inflow and outflow basically set off each other except both ends of the street as shown in the inflow ratio to outflow (the ratios are around 1.0 at almost all intersections). In addition, 6th, 7th and 8th Ave. show relatively larger traffic activities in terms of going in and out of the street. Furthermore, the highest flow was observed at the intersection of 8th Ave. from the direction of the Dearborn Street where the rump of the I-5 is located on the weekday's morning. In sum, the traffic that goes in and out may be more affected by the vertical traffic flows as shown in the imbalance traffic movements within the site.

Photo 4: Car Traffic Flow under I-5 on Saturday Afternoon

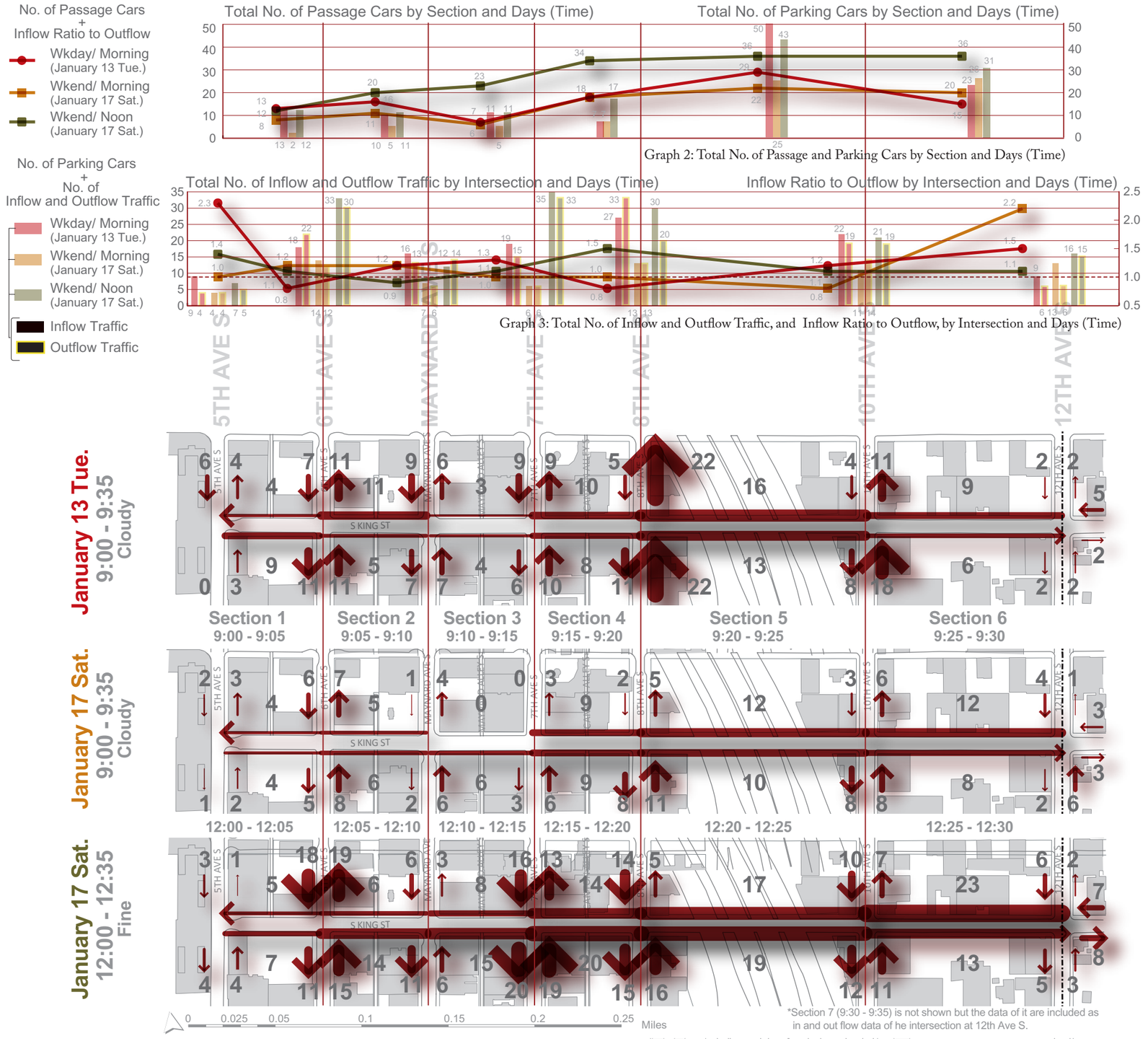


Figure4: Volume and Pattern of Vehicular Movements

2.3. Traffic Issues in King St.

From the observations, some negative factors, such as frequent and short parking by customers, large parking and loading spaces faced on the streets, and congested intersections, may cause undesirable effects on the traffic on the street. Major issues as plotted in the Figure 5 are summarized as follows.

- **Frequent and short parking:** customers of shops or restaurants made on-street parking with relatively short time intervals, which may prevent the smooth flow of the traffic.
- **Congested intersections without traffic signals:** all intersections except the both ends of the project site have no traffic signals, and have large amount of car flows from all directions in addition to pedestrian's crossing, especially in the peak times such as weekend's noon.
- **Large parking and loading spaces faced on the streets:** there are several big sites used for parking on the street in addition to the loading spaces in front of the Post Office and in the Little Saigon area. The movements of vehicles that go into or out of the street prevent smooth flows of the traffic through the street. In addition, the loading spaces may tend to disconnect the movement of pedestrians on the sidewalks.
- **Excessive parking around a market in the Little Saigon:** in front of the market that does not have its own parking lots was occupied with a lot of parking cars owned by the customers on Saturday's noon. And frequent and short car stops caused the congestion around it.

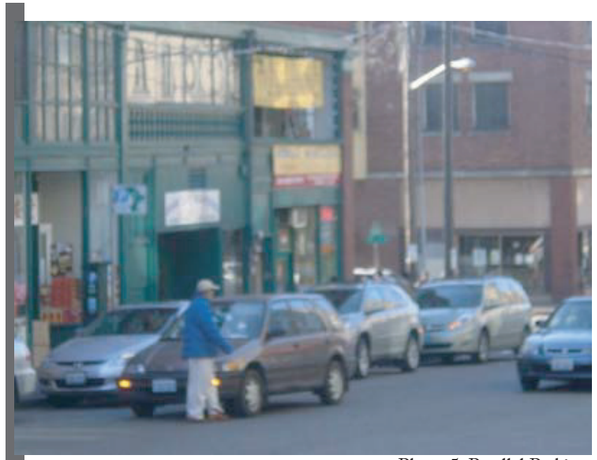


Photo 5: Parallel Parking

Photo 6: Customers using Parking Lane

Parking by Shop Customers: sometimes causes congestions, especially at the traffic peak time. The above picture shows parallel parking that might prevent from smooth traffic flows.

Large Parking Spaces and Vacant Lots: are located on the important sites, such as the entrance of the King Street and street corners. Vacant lots are temporarily used as parking spaces, which may cause additional traffic.

Photo 7: Large Parking Lot

Photo 8: Restaurants' Parking Space on the Corner

Photo 9: Vacant Lot used for Parking

Photo 10: Loading Zone on Post Office

Loading Spaces Faced on the King Street: may cut off the connectivitiy of the sidewalks due to the passage of loading vehicls. The coming and going of such kinds of traffic may also generate additional traffic.

Photo 11: Loading Facility in Little Saigon

Relatively High Volume in Car Traffic around the Little Saigon on Weekends: A market on the King Street contributes to forming the lively atmosphere on the weekends. However, since many customers uses their cars and there are no parking spaces for the market, the front street spaces of it is occupied with a lot of cars, and that affects the congestion of the street as shown in the above picture that depict a car's clogged situation.

Photo 12: Entangled Cars by Congestion

Photo 13: A Market Store in Little Saigon with Parking Cars

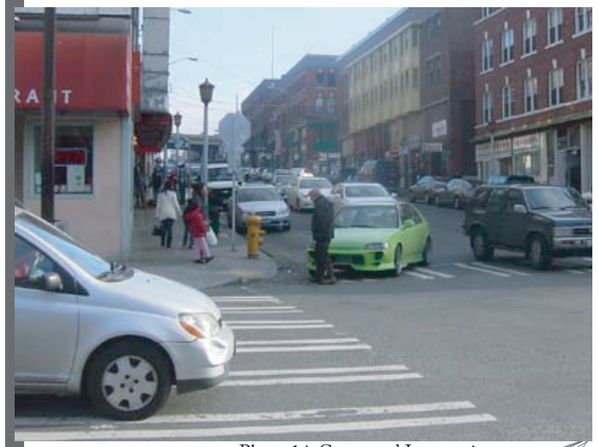


Photo 14: Congested Intersection

Intersections with High Vehicular Traffic having No Traffic Signals: each intersection has high volume car traffics from all directions, in especially peak times (e.g. weekend days' noon). From each direction, cars wait for the other directions' traffic, and this causes congestions. This situation also worsens the mobility of pedestrians, especially elderly persons because they have to carefully pay attention to the cars when they cross the intersections.

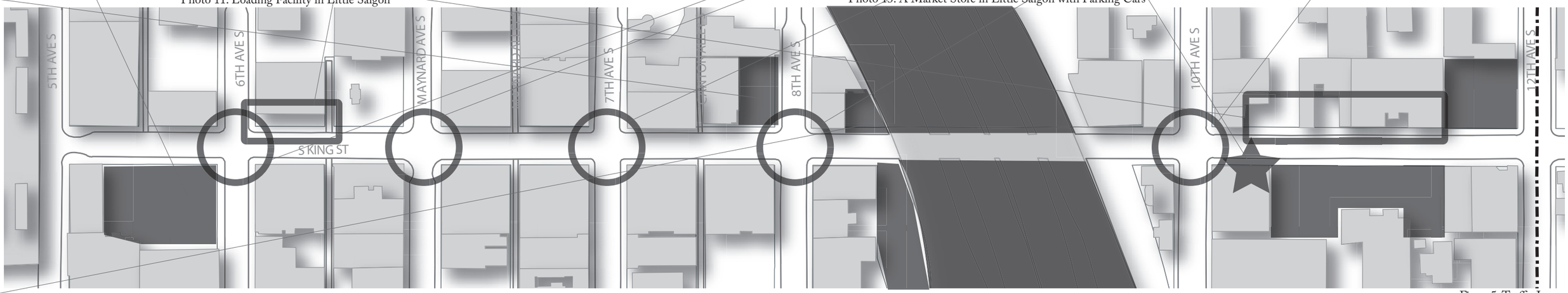
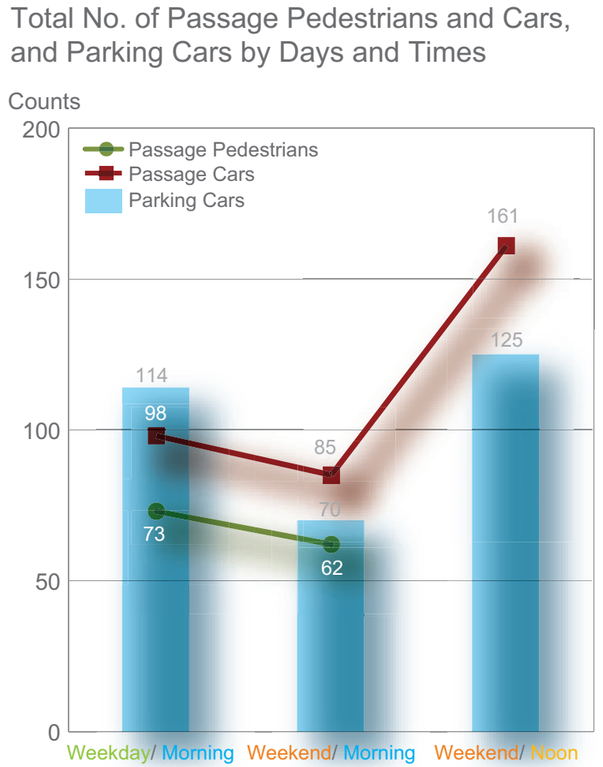


Figure5: Traffic Issues

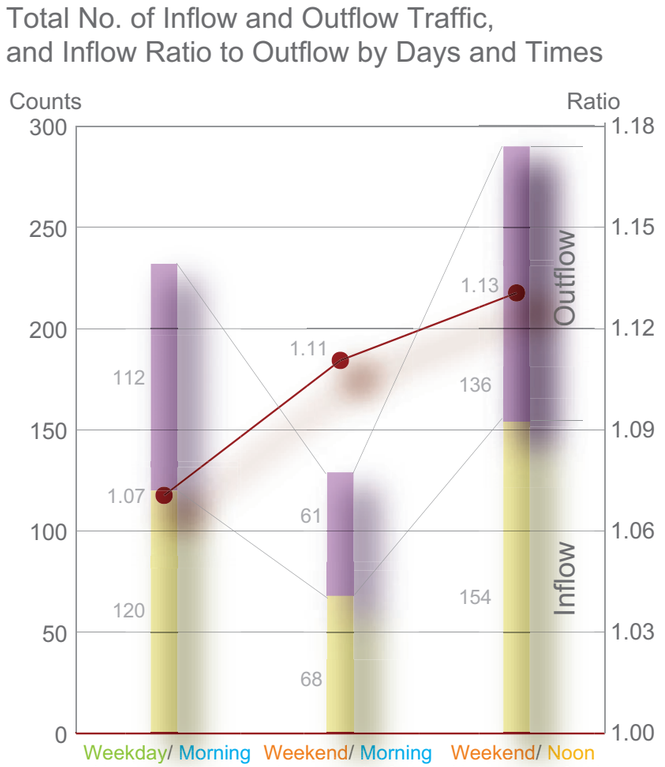
3. Temporal Traffic Changes

Differences between weekday and weekend and between morning and noon in terms of the traffic patterns are summarized as follows.

- The number of cars through the street is much higher around noon than morning (on weekend) as shown in the Graph 4.
- The number of the on-street parking cars is not so different between weekday's morning and weekend's noon. One of the causes of this outcome may be explained by the fact that the on-street parking spaces are limited.
- The pedestrian movement between weekday and weekend is not so different. One of the reasons may be explained by the fact that the data were gathered in the morning.
- The number of pedestrians slightly increased (this means that it did not dramatically increase) around the noon compared with the morning on Saturday.
- In the Little Saigon area, the pedestrian activities around the market store are more activated around noon on Saturday than weekday.



Graph 4: Total No. of Passage Pedestrians and Cars, and Parking Cars by Days and Times



Graph 5: Total No. of Inflow and Outflow Traffic, and Inflow Ratio to Outflow by Days and Times

Photo 15: Little Saigon on Weekday's Morning

Photo 16: Little Saigon on Weekend's Noon

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4. Pedestrian Activities

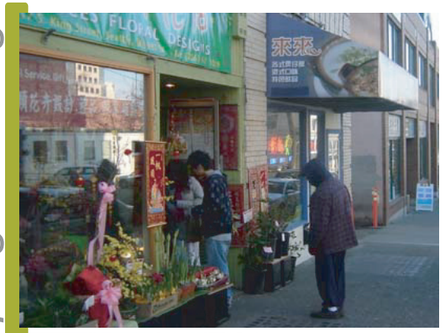
Both positive and negative activities were seen through observations, and they are summarized as follows. The following summaries are basically description of Saturday's noon if there are no specifications.

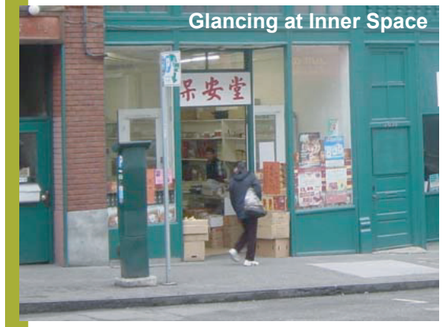
- Some sidewalks, especially at the south side between the 6th and Maynard Ave. and between 7th and 8th Ave. in addition to a Little Saigon's market store gathered people because along them have more open façade to the streets (e.g. spilling over commodities on the street or having attractive restaurants).
- People formed waiting lines in front of, at least, two restaurants (one is at the corner of the 7th Ave. and another is located on the south side between 7th and 8th Ave., though there were no seating spaces for them.
- Various kinds of chatting activities were seen (see photos); however, people talked with standing or leaning due to lack of sitting spaces.
- Sitting activities were only observed at Hing Hay Park, even though few people used this site.
- Unrespectable activities, such as hanging around places or smoking, were seen, especially around Chinatown gate.
- Some sidewalks were devastated, especially in the Little Saigon area.

Walking

Photo 17 - 18 from top to bottom: Walking

Shopping & Eating





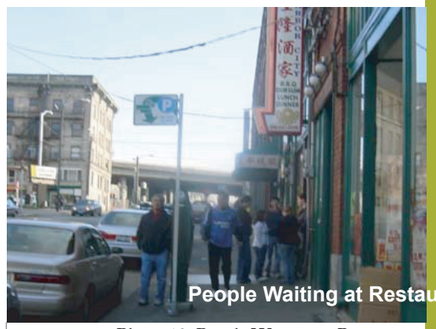
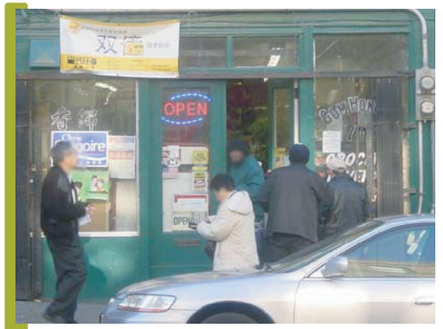
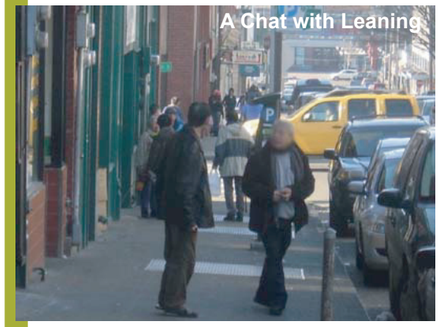


Photo 19: People Waiting at Restaurant

Photo 20 - 23 from top to bottom: Shopping & Eating

Chatting





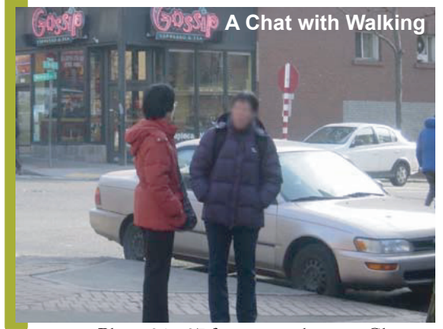
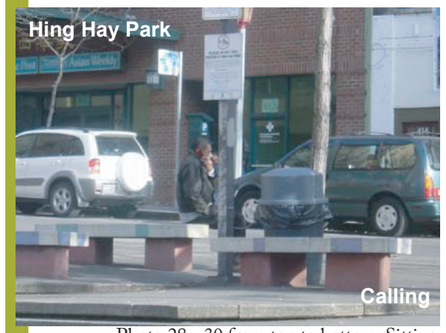


Photo 24 - 27 from top to bottom: Chatting

Sitting



Others

Photo 28 - 30 from top to bottom: Sitting

Photo 31 - 33 from top to bottom: Others

Hanging-around

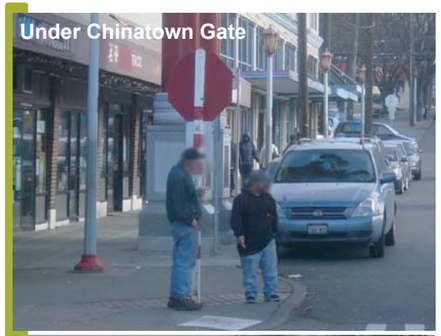


Photo 34 - 36 from top to bottom: Hanging-around

Negative Factors on Spaces

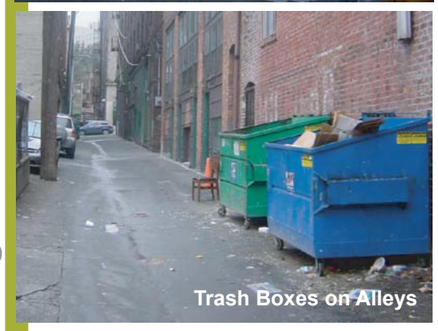


Photo 37 - 39 from top to bottom: Negative Factors

Photo 40 - 42 from top to bottom: Negative Factors

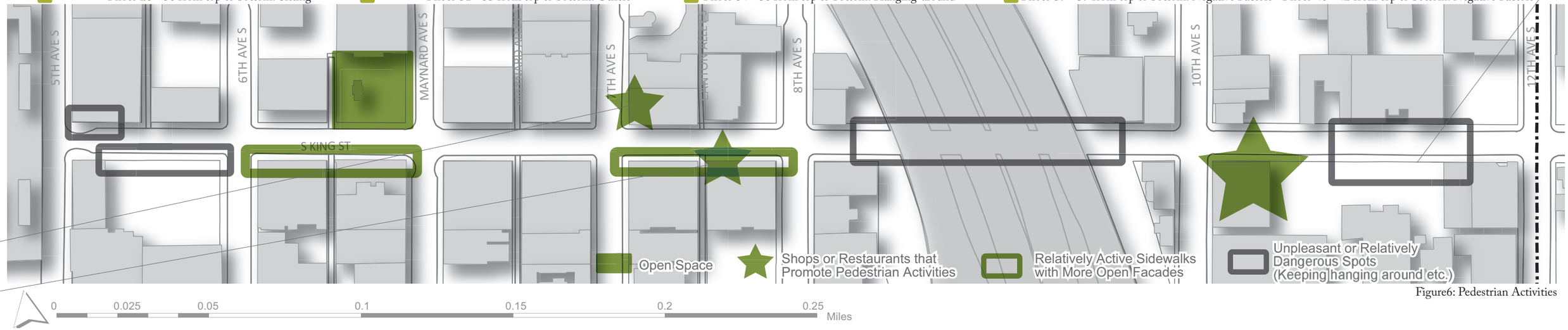


Figure6: Pedestrian Activities

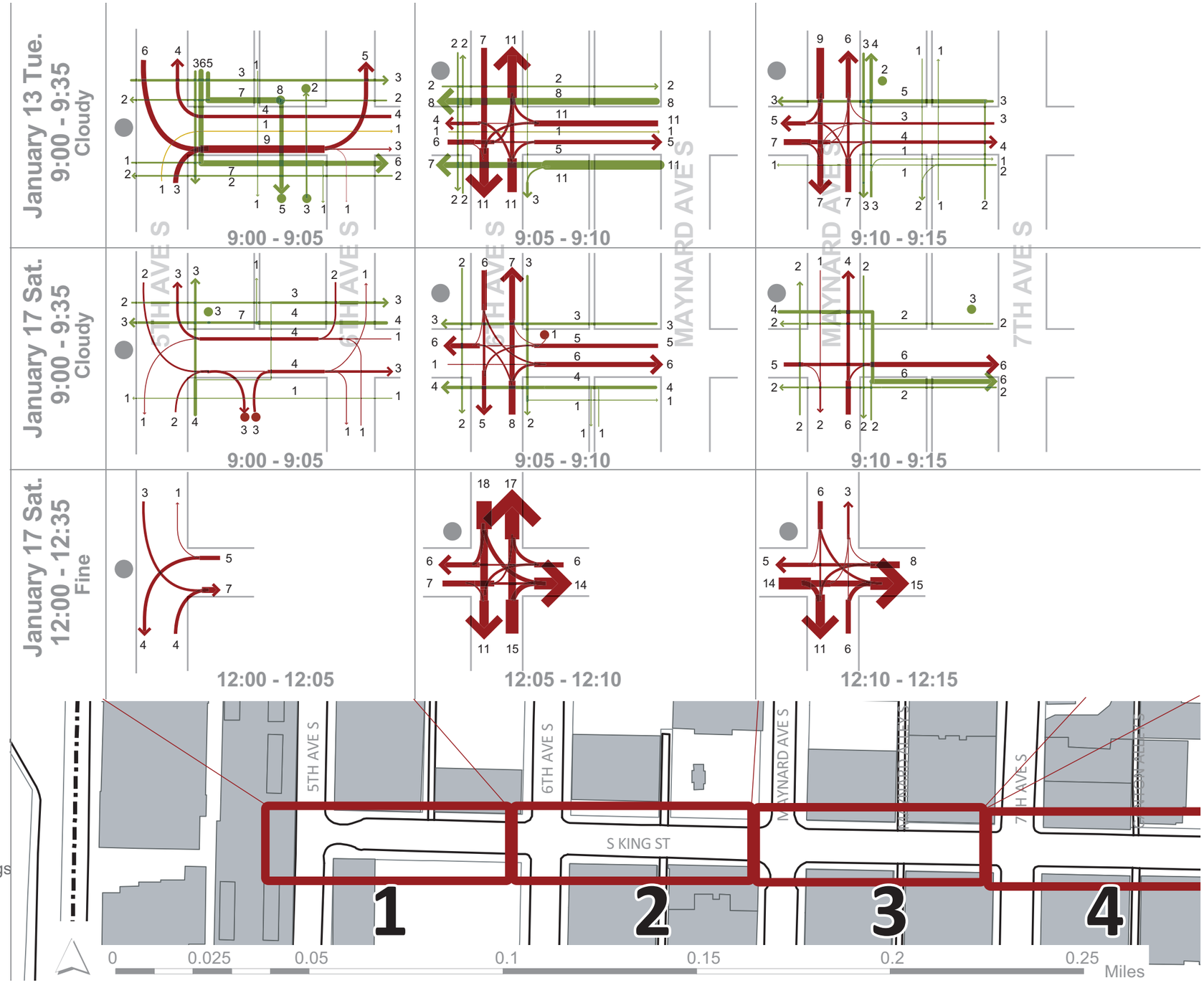
Appendix: Outcome of Traffic Count Survey

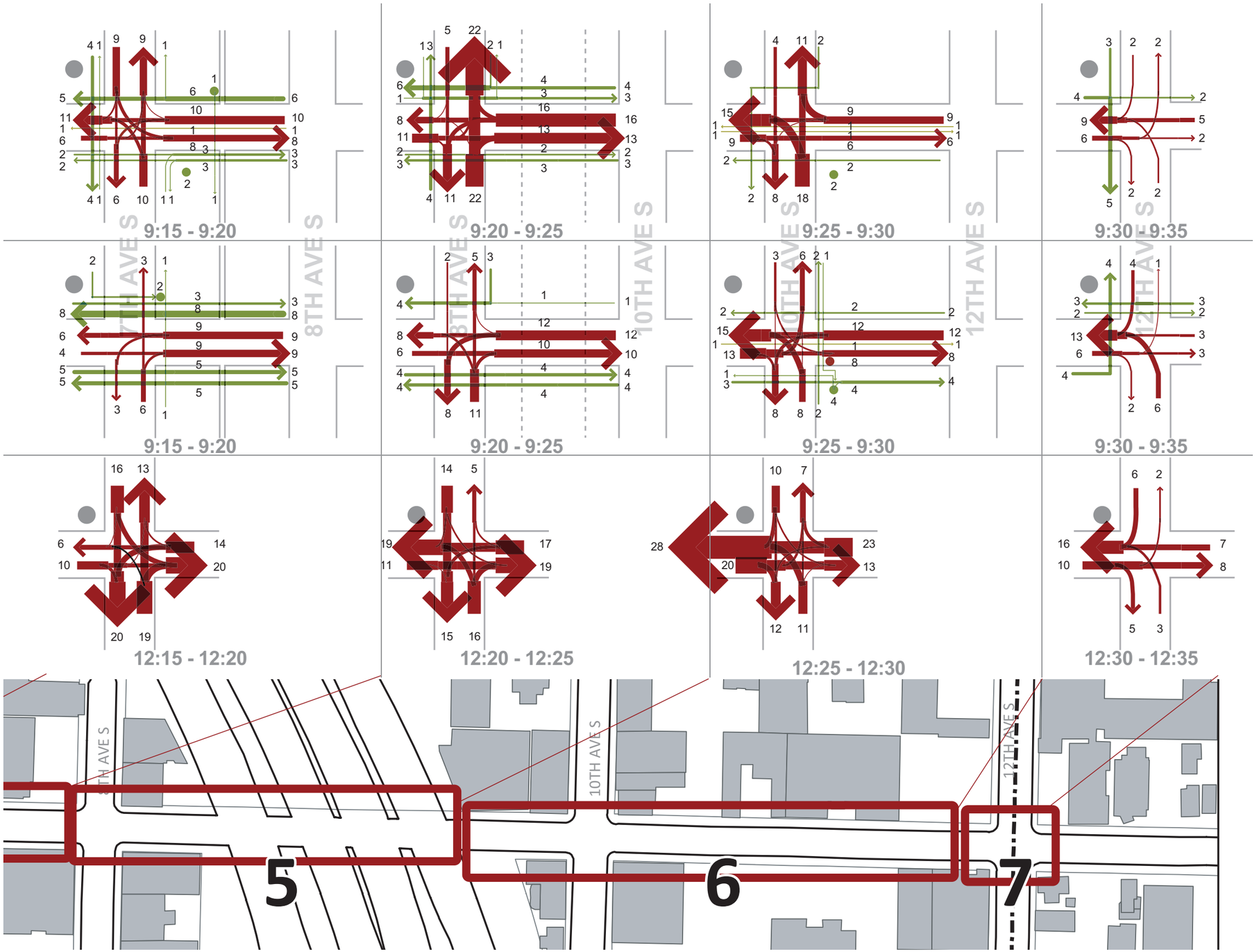
A traffic count surveys have been conducted to see traffic patterns in King St. The number and movement patterns of pedestrian, bike and vehicles at each section of King Street both on weekday and weekend were counted or plotted (Regarding the section, please see the right map).

The count dates were as follows.

- January 13 Tue (Weekday)
- January 17 Sat (Weekend)

The count time was between 9:00 - 9:35 am on both days (five minutes observation per each section). In addition to those, an additional count only for car traffic at each intersection was conducted at noon of January17 because large car traffic was observed. The diagrams described to the right were summarized and simplified into the data used in this analysis.





References

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Seattle Department of Transportation. *Seattle Arterial Classifications Planning Map*. Seattle: City of Seattle, 2003.

Seattle Department of Transportation. *2006 Traffic Flow Map*. Seattle: City of Seattle, 2006.