

City & Borough of Juneau Docks & Harbors Department Cruise Ship Dock Uplands Operations Analysis

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As Table 2 shows, following reconstruction, the docks in Juneau will have the ability to serve cruise ships with a combined capacity of approximately 13,000 passengers in one day. This represents an increase of approximately 2,600 passengers over the combined capacity of the ships present on the day that the pedestrian volumes were measured. Therefore, in a design scenario, pedestrian traffic in downtown Juneau would be 25% higher than that observed on the count day. Note that the actual increase in potential design capacity from what is possible today (approximately 11%) is limited to the difference in passenger capacity of the 'D' and 'E' docks before and after reconstruction, where currently only one Panamax-sized vessel may be docked at one time.

For the purposes of this design analysis, all existing pedestrian volume counts were factored up by 25%. Figure 1 illustrates the projected peak hour and 12-hour total pedestrian volumes at the locations counted for the previous memo. The volumes reflect both directions of travel (e.g., eastbound and westbound crossing volumes), and have been rounded to the nearest five pedestrians.

Given that an across-the-board 25% factor is applied, no changes are expected regarding the locations experiencing the highest levels of pedestrian activity. It is assumed that pedestrian activity after reconstruction will exhibit similar peaking characteristics to those observed on the count day. Please refer to our previous August 26, 2009, memorandum titled *Field Inventory and Analysis* (Reference 1) for a discussion of when pedestrian volumes are highest during the day.

Level of Service Analysis

A pedestrian level of service (LOS) analysis was performed in our previous memo for the congested portions of the Franklin Street sidewalks under existing conditions. An updated analysis is performed here using the projected volumes. This analysis is based on the methodology described in the *Highway Capacity Manual 2000* (Reference 2) for sidewalks and walkways. The methodology uses the effective sidewalk width and the peak 15-minute pedestrian count to calculate the peak flow rate in persons per minute per foot of effective sidewalk width. (As described in our previous memo, the effective sidewalk width is the portion of the sidewalk usable for pedestrian travel, after sidewalk obstacles and shy distances from curbs and building faces are accounted for.) The peak flow rate determines the volume-to capacity (v/c) ratio, using an assumed capacity of 23 p/min/ft, which in turn determines the LOS letter grade ("A" through "F") that is assigned to the sidewalk. Table 3 summarizes the results of this analysis for both sides of Franklin Street.

Table 3 LOS Analysis of Critical Sections of Sidewalk During Peak Periods Along Franklin Street

Location	Peak 15-Minute Count (p)	Effective Sidewalk Width (ft)	Flow Rate (p/min/ft)	v/c	LOS
East Sidewalk, between Crosswalks 5 and 6	559	0.5 ¹	75	>1.0	F
West Sidewalk, between Crosswalks 5 and 6	535	1.0 ¹	37	>1.0	F

¹See previous memo for calculation of effective sidewalk width

downtown from the ships typically travel directly to Franklin Street from the ships; the boardwalk was not observed to be heavily used.

PEDESTRIAN TRAFFIC

Pedestrian counts were conducted via videotaped observations between 7 a.m. and 7 p.m. on June 16. This time period reflects when most cruise ship passenger activity occurs. The counts included the sidewalks on both sides of Franklin Street, the area just north of the "D" dock parking lot, and crossing counts at the following locations:

- Crosswalk #2: The guard-controlled crosswalk north of the parking garage and southeast of Marine Park;
- Crosswalk #4: The crosswalk east of the parking garage and immediately south of the turnabout (including jaywalkers through the turnabout);
- Crosswalk #6: The crosswalk just north of the "D" dock parking lot (including jaywalkers to the north); and
- Crosswalk #7: The guard-controlled crosswalk across from the Alaska Shirt Company.

The weather was fairly typical for a June day, with temperatures in the 50s (Fahrenheit) and with light rain until about 2:30 p.m., when the sun broke out.

Figure 3 illustrates the peak-hour and 12-hour total pedestrian volumes at these locations. The volumes reflect both directions of travel (e.g., eastbound and westbound crossing volumes), and have been rounded to the nearest five pedestrians. Attachment "A" includes the pedestrian count data.

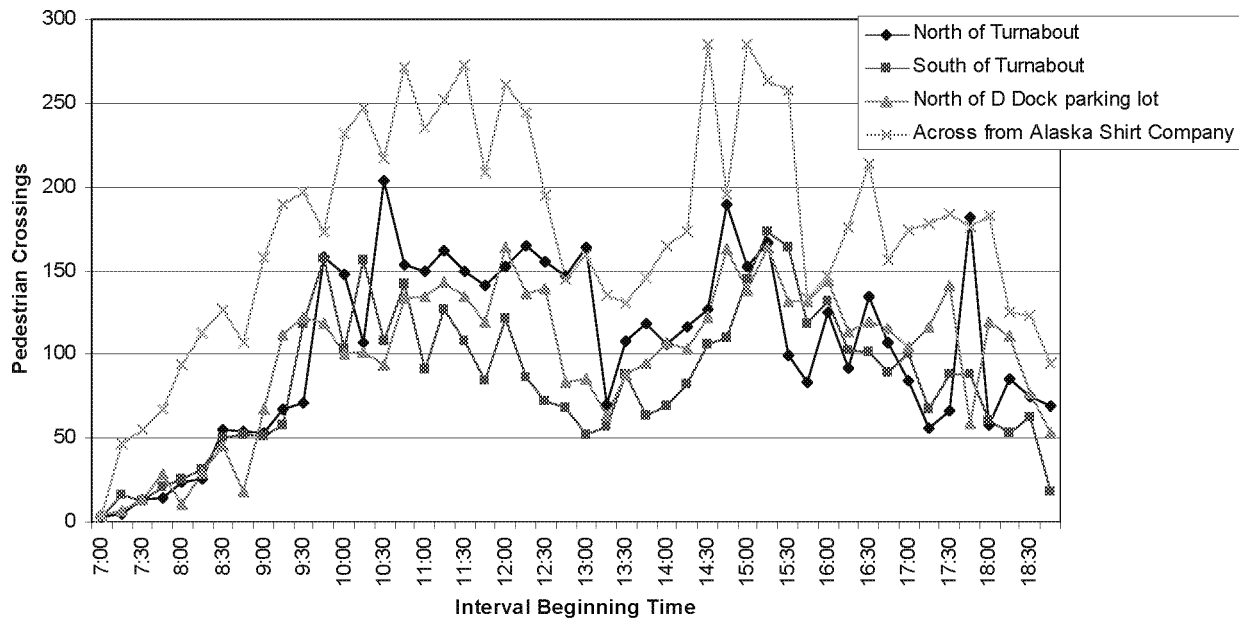
Crosswalk Counts

Many of the businesses along Franklin Street are located along the east side of the street, and the east-side sidewalk connects directly into downtown Juneau. As cruise ships dock on the west side of the street, passengers must cross Franklin Street to visit many shops or to walk downtown.

Figure 3 shows that the busiest crosswalk is Crosswalk #7, the guard-controlled crosswalk across from the Alaska Shirt Company. Approximately 8,370 pedestrians crossed here from 7 a.m. to 7 p.m., and 1,035 pedestrians crossed during the highest hour of activity. The other guard-controlled crosswalk, Crosswalk #2, had the second-highest volume, with approximately 5,010 pedestrians crossing during the 12-hour period. The third- and fourth-highest-volume crosswalks were Crosswalk #6 and Crosswalk #4, respectively.

Figure 4 profiles crossing activity at the four crosswalks, with counts summarized in 15-minute intervals.

Figure 4 – Pedestrian Crossing Volumes (15-Minute Intervals)



As Figure 4 shows, the relative intensity of activity at each crosswalk followed a similar pattern. Crossing volumes gradually increased to a peak in the mid-morning and then remained relatively stable until a significant drop-off shortly after noon. This drop-off was likely due to a combination of lunchtime and the transition time between ships at the AJ Dock (see Table 1). Activity peaked again in the mid-afternoon following the arrival of the second ship at the AJ Dock, and then gradually declined with sporadic 15-minute bursts of activity, some of which can be attributed to passengers returning to their ship (e.g., the peak around 6:00 p.m. at the crosswalk north of the turnabout).

The highest 15-minute interval at each crosswalk was closely matched several times during the day by other 15-minute intervals, meaning that “peak” conditions are seen more than once throughout the day at each crosswalk.

Jaywalking

Jaywalking, or pedestrian crossings in locations other than legal crosswalks, was frequently observed in the study area. Jaywalking is mostly concentrated at the turnabout and in the area around the Alaska-Juneau Mining Company building (see Figures 5 through 7). Figure 3 shows that from 7 a.m. to 7 p.m., 1,075 pedestrians jaywalked in front of the Alaska-Juneau Mining Company building (180 during the peak hour) and 620 jaywalked through the turnabout (110 during the peak hour). Another 535 pedestrians stepped off the sidewalk and into the street in front of the Alaska-Juneau Mining Company, including 90 during the peak hour. Most stepping-into-the-street activity occurred on the east side of Franklin Street.

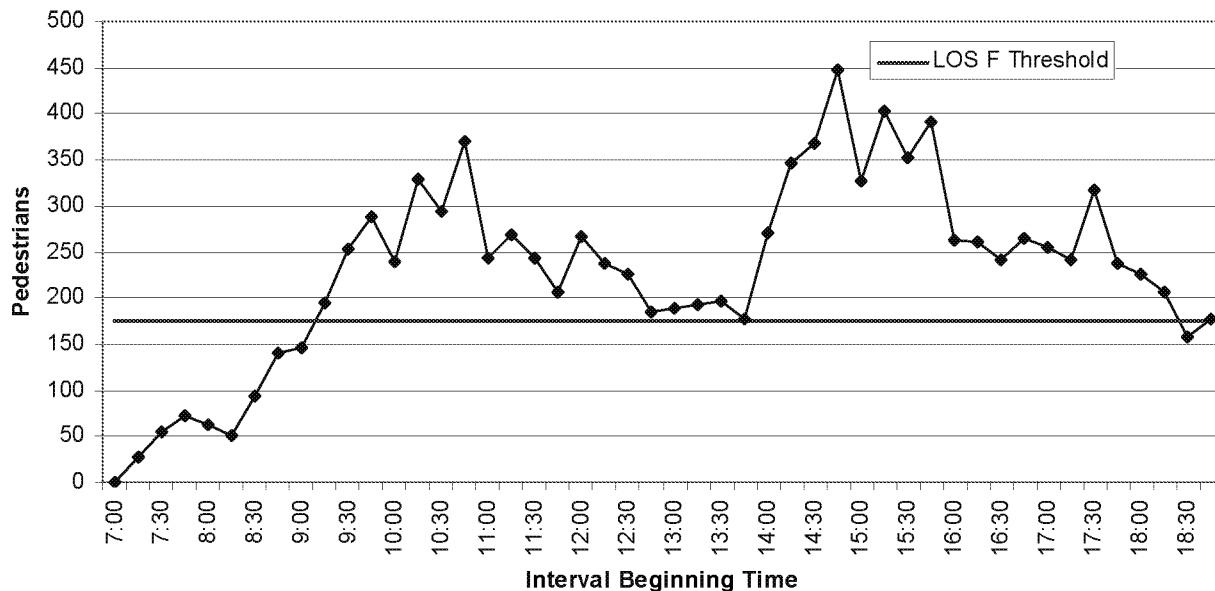
through "F") that is assigned to the sidewalk. Table 3 summarizes the results of this analysis for both sides of Franklin Street.

Table 3 LOS Analysis of Critical Sections of Sidewalk During Peak Periods Along Franklin Street

Location	Peak 15-Minute Count (p)	Effective Sidewalk Width (ft)	Flow Rate (p/min/ft)	V/C	LOS
East Sidewalk, between Crosswalks 5 and 6	447	0.5 ¹	60	>1.0	F
West Sidewalk, between Crosswalks 5 and 6	428	1.0 ²	29	>1.0	F

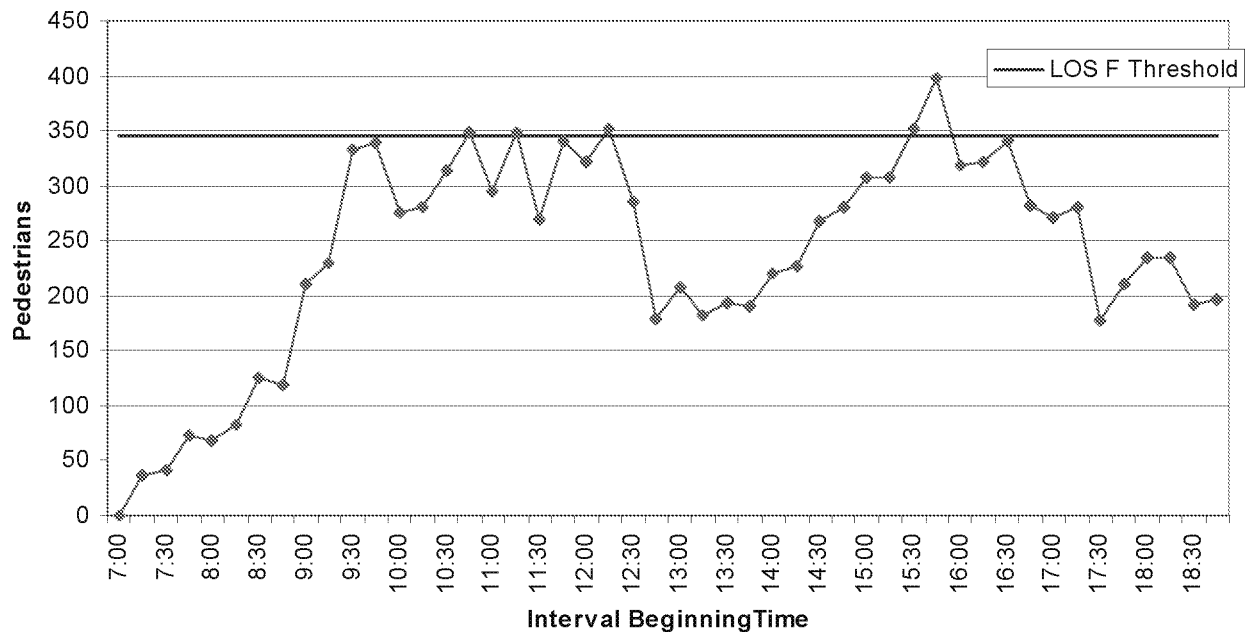
As Table 3 shows, critical sections of both sidewalks currently experience LOS F conditions during the peak 15 minutes. Based on the effective sidewalk widths shown in Table 3, the LOS is E or better when the 15-minute flow is less than 175 pedestrians on the east side and less than 345 pedestrians on the west side. On a peak day, the pedestrian flow rate on the east sidewalk exceeds 175 pedestrians per 15 minutes (700 pedestrians per hour) for most of the day (9:15 a.m. to 6:30 p.m.), as illustrated in Figure 9.

Figure 9 – Duration of LOS F on East Sidewalk (15 Minute Intervals)



Pedestrian flow rates on the west side during most of the day are less than 345 pedestrians per 15 minutes (1,380 pedestrians per hour), with only five 15 minute intervals having more than 345 pedestrians, as shown in Figure 10.

Figure 10 – Duration of LOS F on West Sidewalk (15 Minute Intervals)



KEY SITE OBSERVATIONS

In addition to the observations and counts previously described, qualitative observations were made regarding:

- Guard-controlled crossings;
- Underuse of the boardwalk; and
- Auto traffic operations.

Guard-Controlled Crossings

As Figures 1 and 2 showed, there are two crosswalks where crossing guards stop traffic to allow pedestrians to cross. The guards help ensure that pedestrians can cross safely and comfortably. They also seem to stop traffic frequently, so that queued pedestrians do not have to wait long to cross. This provides a good experience for pedestrians, but slows down vehicular traffic as it is stopped frequently. Adding to the vehicular delay is the occasional occurrence of pedestrians making a last-second dash to enter the crosswalk before the guard walks away, thereby lengthening the time that traffic is stopped.

During the peak 15 minutes of the day, the crossing guard at the crosswalk in front of the Alaska Shirt Company stopped traffic 18 times, which is one stop every 50 seconds. These stops lasted an average of 18 seconds, with a maximum length stop of 35 seconds. The crossing guard north of the turnabout stopped traffic 20 times, or one stop every 45 seconds. These stops were slightly shorter, with an average of 13 seconds per stop and a maximum stop of 32 seconds. These stop