

TO: Kirk Miller, PE; Paul Voelckers, AIA

FROM: Randy Kinney, PE, PTOE

DATE: October 10, 2017

SUBJECT: **Report to Ketchikan Gateway Borough Assembly Meeting**
Ketchikan Revilla New Ferry Berth & Uplands Improvements Project
SFHWY-00085
Discussion of Traffic Issues

This memorandum discusses traffic and safety issues used in the development of alternatives for the Ketchikan Revilla New Ferry Berth & Uplands Improvements Project. The project area is presented in Figure 1.



Figure 1- Project Area (Uplands Improvement)

While the project's main overall objectives are to provide a new ferry berth and to improve passenger staging/waiting facilities, there are several objectives that pertain specifically to traffic and safety elements including:

- Adding Parking
- Improving access on and off North Tongass Highway (minimize delay, minimize potential crashes)
- Providing Improved Internal Pedestrian and Vehicular Circulation.
- Accommodating travel modal trip chains using the ferry including:
 - Pedestrian → Ferry, and, Ferry → Pedestrian
 - Transit → Site Pedestrian → Ferry, and, Ferry → Site Pedestrian → Transit
 - Parked Vehicle → Site Pedestrian → Ferry, and, Ferry → Site Pedestrian → Parked Vehicle
 - Curbside Private Vehicle drop-off → Ferry, and, Ferry → Curbside Private Vehicle pick-up
 - Curbside Taxi and Shuttle Van drop-off → Ferry, and, Ferry → Curbside Taxi and Shuttle Van pick-up

Street System and Site Traffic

North Tongass Highway fronts the project area, and is functional classified as minor arterial. As an arterial, the primary purpose of the roadway is mobility, that is to efficiently convey traffic through connecting parts of

Ketchikan. However, as a minor arterial, North Tongass Highway also provides access to intersecting streets and driveways. Ideally, the access function for minor arterials should not degrade the mobility function.

The 2015 average annual daily traffic (AADT) for North Tongass was about 9,300 vehicles daily. There is a wide seasonal variation of traffic, with daily volumes of about 7,900 vehicles per day in January, and 10,700 vehicles daily in June. Traffic growth for the area is forecasted to be low (about 0.25% per year), resulting in a background 2039 AADT of about 10,000 vehicles daily. Note that this AADT may not include additional traffic that is generated by improved airport and ferry market opportunities and facilities.

The airport/ferry terminal as a site generator is expected to generate traffic for 2017 and 2039 as presented in the following tables.

Table 1-2017 Site Traffic

<u>2017</u>	Vehicles Directly Boarding/Alighting Ferry	Private Vehicles to/from Parking	Private Vehicles drop-off and pickup to/from curbside	Taxi and Shuttle drop-off and pickup to/from curbside	Pedestrian and Transit trips
Daily Traffic	262	334	76	38	45
Peak Hour	50	58	13	7	8

Table 2- 2039 Site Traffic

<u>2039</u>	Vehicles Directly Boarding/Alighting Ferry	Private Vehicles to/from Parking	Private Vehicles drop-off and pickup to/from curbside	Taxi and Shuttle drop-off and pickup to/from curbside	Pedestrian and Transit trips
Daily Traffic	975	1520	430	115	100
Peak Hour	170	265	75	20	20

Alternative Development

In the early stages of developing alternatives as well as during evaluation and refinement, the team decided that the site access and circulation should achieve these objectives and actions:

1. Maintain the mobility function of North Tongass and minimize safety and operational impacts of the driveways on North Tongass.
 - o Expand North Tongass to include a center-two-way left-turn lane (CTWLTL). This will remove left-turning traffic from the through lane, minimizing delay of through traffic and thereby decreasing the likelihood of rear-end crashes.
 - o Locate driveway connections so that a through-way driver on North Tongass only has to process one conflict point at a time. Minimum separation distance between driveways is stopping sight distance. To that end, the speed limit on North Tongass should be reduced to 25 mph, corresponding to a SSD of 150 feet.
2. Provide enough access capacity to meet design year ingress and egress demand, and minimize delay for site-generated traffic.
 - o Provide egress left-turn and right-turn lanes.
 - o CTWLTL provides refuge for left turns from site for two-stage left-turns during higher traffic periods. By dividing the left-turn movement into two stages (driveway → CTWLTL → through lane), driver only needs to evaluate one direction of gaps and conflicts at a time. Overall delay for two-stage left-turn is typically much less than a single-stage turn.

3. Separate direct ferry traffic, passenger curbside traffic, parking traffic, and taxi/shuttle traffic.
 - o Mixing these traffic types create safety, congestion, and operation issues.
 - o Upon entering the site, the traffic types are segregated and assigned aisle ways.
 - o Circulation aisles should be configured to collect and distribute egress vehicles to nearby driveways, to minimize cross-site travel distances to keep speeds in check.

4. Provide ticketing kiosk on the Revilla side of the island to replace/augment Gravina side ticketing.
 - o About 180 feet (about 9 vehicles) of queuing length upstream is required upstream of a ticketing kiosk to eliminate spill-back conflicts for 90% of the time.
 - o Provide adequate on-site storage after the ticketing kiosk (24+vehicles per ferry load)

5. Provide direct, continuous, distinct pedestrian ways to connect parking, external pedestrian and transit facilities, and ferry facilities.
 - o Provide a connection to the transit stop with a median refuge that facilitates pedestrian two-stage crossing of North Tongass
 - o Delineate and designate pedestrian way within the site.
 - o Crossing traffic ways may require additional treatments; signage, raised colored/textured walkways (define crossing point, calm/slow conflicting traffic)

6. Maximize Parking
 - o Employee, business, travel parking
 - o Varies per alternative layout.
 - o Controlled by site configuration

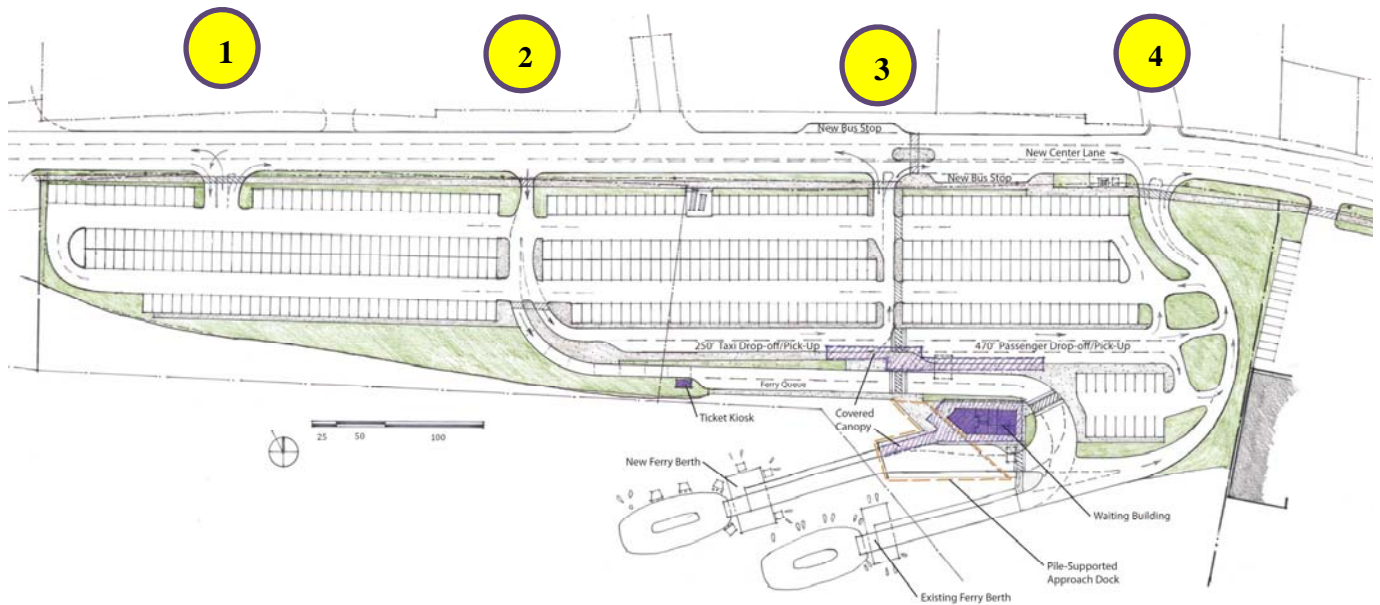
Three options: A (Figure 3 on page 5), B (Figure 4 on page 6), and C (Figure 4 on page 6) were developed in the early stages of the project concept phase. These have been systematically refined by the project team (DOT&PF, KTN Airport staff, and Consultants) with additional options (Option D) and multiple variations.

Preferred Alternative

Option C has been improved and modified to the extent that the project team has advanced this as the preferred alternative (renamed Option C-2). This presented below in large scale in Figure 6 on page 8.

Option C-2 satisfies the objectives presented above.

The four driveway connections labeled in Figure 2 on page 4, and operational performance measures (2039 Peak Hour) are presented in Table 3 on page 4. The driveways will have acceptable operations (level of service C or better) and minimum queues through the design life of the project.



35 Vehicle Ferry Queue
394 Parking Stalls

Option C-2
October 10, 2017

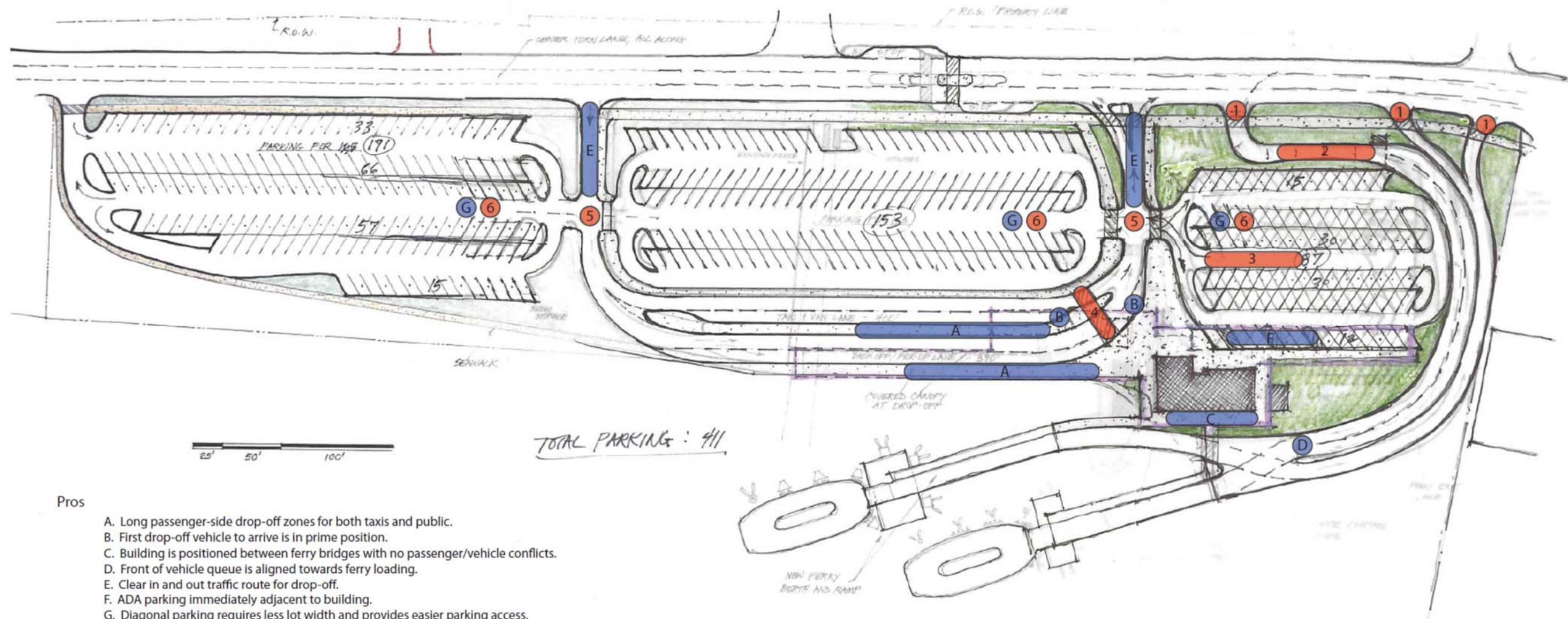
Revilla & Gravina Airport Ferry Terminal Improvements
Revilla Uplands Site Plan

Alaska DOT/PF
MRV ARCHITECTS

Figure 2- Option C-2 Driveways

Table 3- Option C-2 Driveway Performance measures for 2039 Peak Hour Traffic.

Driveway →	1			2			3		4		
	TM →	NBL	EBL	EBR	NBL	EBL	EBR	EBL	EBR	EBL	EBR
95% Queue Length		<1	<1	<1	<1	<1	<1	<1	1	<1	1
Control Delay (s/veh)		10	17	16	9	22	12	20	15	24	16
LOS		A	C	C	A	C	B	C	B	C	C
Approach Delay			16			14		16		18	
Approach LOS			C			B		C		C	



Pros

- A. Long passenger-side drop-off zones for both taxis and public.
- B. First drop-off vehicle to arrive is in prime position.
- C. Building is positioned between ferry bridges with no passenger/vehicle conflicts.
- D. Front of vehicle queue is aligned towards ferry loading.
- E. Clear in and out traffic route for drop-off.
- F. ADA parking immediately adjacent to building.
- G. Diagonal parking requires less lot width and provides easier parking access.

Cons

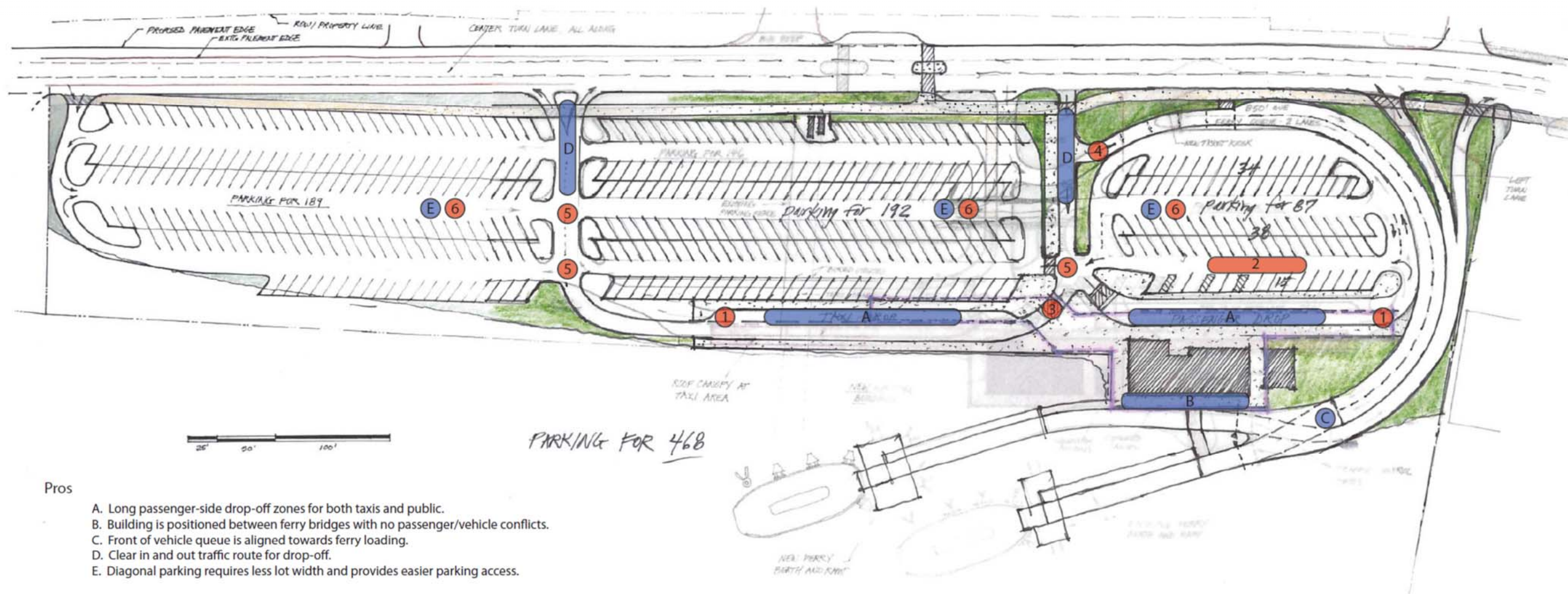
- 1. Ferry on-off vehicle lanes close together along Tongass.
- 2. Short ferry queue lane before kiosk if located on Revilla side.
- 3. One parking lot isolated outside main traffic route.
- 4. Pedestrian routes from bus and taxis crosses drive lanes.
- 5. Cross-traffic conflicts at parking lot entrances.
- 6. Diagonal parking relies on arrows or signage to control traffic flow.

OPTION - A
date, May 2017

SITE PLAN - REVILLA UPLAND FERRY TERMINAL

ALASKA DOT/PF - MRV ARCHITECTS

Figure 3- Initial Option A

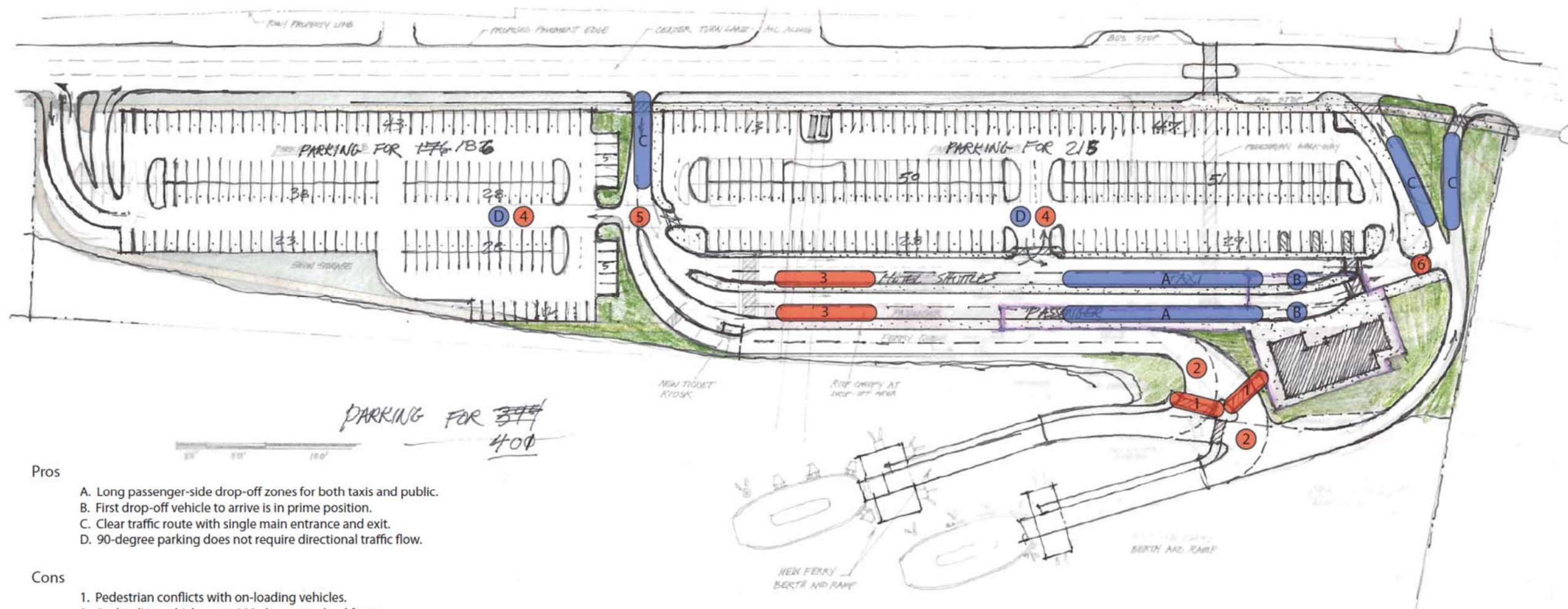


OPTION - B
date, May 2017

SITE PLAN - REVILLA UPLAND FERRY TERMINAL

ALASKA DOT/PF - MRV ARCHITECTS

Figure 4- Initial Option B



Pros

- A. Long passenger-side drop-off zones for both taxis and public.
- B. First drop-off vehicle to arrive is in prime position.
- C. Clear traffic route with single main entrance and exit.
- D. 90-degree parking does not require directional traffic flow.

Cons

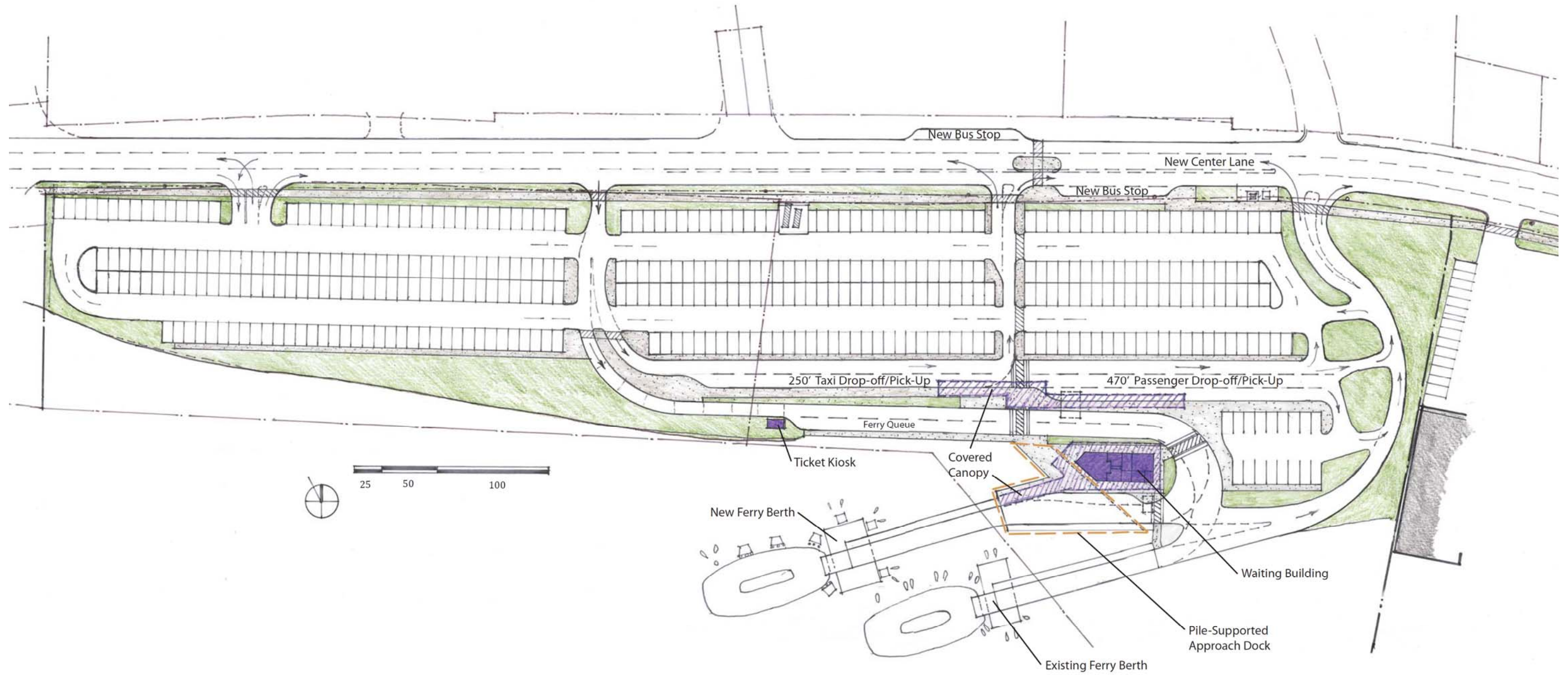
- 1. Pedestrian conflicts with on-loading vehicles.
- 2. On-loading vehicles turn 180-degrees to load ferry.
- 3. Drop-off lanes longer than programmed, resulting in reduced parking.
- 4. 90-degree parking requires wider lots and has 2-way traffic.
- 5. Cross-traffic conflicts at parking lot entrances.
- 6. Exit traffic yields to ferry off-loading traffic.

OPTION - C
date, May 2017

SITE PLAN - REVILLA UPLAND FERRY TERMINAL

ALASKA DOT/PF - MRV ARCHITECTS

Figure 5- Initial Option C



35 Vehicle Ferry Queue
394 Parking Stalls

Option C-2
October 10, 2017

Revilla & Gravina Airport Ferry Terminal Improvements Revilla Uplands Site Plan

Figure 6- Preferred Alternative Option C

Alaska DOT/PF
MRV ARCHITECTS