

### 3.7 TRAFFIC

Traffic and circulation refers to the movement of vehicles and pedestrians along and adjacent to roads. Freeways and major roads are under the jurisdiction of the state through the Hawai'i Department of Transportation; other streets and roads are under the jurisdiction of the counties. Roadways consist of multilane road networks with asphalt surfaces to unpaved plantation roads. Traffic conditions in Hawai'i vary depending on location but are typically over capacity during peak hours, resulting in significant traffic delays. These traffic delays occur in urban areas with multilane roads as well as less developed areas with only two-lane roads.

The main access routes for the training areas around SBMR are via H-2 from the Ewa/Honolulu area, Kamehameha Highway and Kunia Road from the Ewa District, and Kamananui Road and Wilikina Drive from the North Shore District. Trimble Road, Kolekole Avenue, and Lyman Road are the primary circulation routes through SBMR. Access to and egress from KTA is via Drum Road or Kamehameha Highway. Saddle Road (SR 200) is a two-lane, two-way roadway that connects PTA with Māmalahoa Highway.

#### 3.7.1 Introduction/Region of Influence

This section defines traffic terms, describes the regional transportation agencies in the ROI, and provides an overview of adopted transportation goals and policies that guide transportation development in the ROI. The ROI for each component of the Proposed Action is as follows:

- SBMR—The ROI is the area within the SBMR/WAAF perimeter and Kunia Road adjacent to the proposed project;
- Dillingham Trail—The ROI is the corridor between SBMR and DMR. This corridor includes the area from central O'ahu to DMR, which is in the northwest area of the island;
- Drum Road and Helemanō Trail—The ROI is the corridor from SBMR to KTA, which consists of two trail segments, Drum Road and Helemanō Trail. This corridor originates at SBMR, which is located in central O'ahu, and ends at KTA, which is located on the windward side of O'ahu; and
- PTA Trail—The ROI is the corridor between PTA and Kawaihae Harbor. This corridor is approximately 26 miles (42 kilometers) long and is bounded by SR 190 on the east and the coastline on the west.

#### 3.7.2 Resource Overview

##### *O'ahu*

On O'ahu, the primary urban development is along the southern coastal areas. This major development extends from Ewa on the west to Hawai'i Kai on the east. The Transportation for O'ahu Plan 2025 provides an overview of traffic conditions, shown below.

“Congested operating conditions occur regularly during the morning and afternoon peak periods on the major highways and street in many parts of

the island. Traffic on freeways through the PUC typically operates stop-and-go in the peak periods, and parallel arterials carry high volumes of traffic and operate at low levels-of-service. At signalized intersection along the arterials, motorists typically stop for more than one signal cycle. Similar conditions occur during peak periods in outlying developed areas and on major corridors in and out of the PUC” (Carter-Burgess 2001, 2-7).

There are four freeways on O’ahu that provide approximately 55 miles of state roadway. These freeways and the other major roadways on O’ahu are described below.

H-1 (Lunalilo Freeway) traverses the southern portion of O’ahu. H-1 connects the Ewa areas with Hawai’i Kai. The freeway also provides service to Honolulu International Airport, Pearl Harbor, Hickam Air Force Base, and downtown Honolulu.

H-2 connects the Ewa area with central O’ahu, where SBMR Barracks is located. H-2 ties into H-1 east of Honolulu. Along with a section of H-1, H-2 connects SBMR and Pearl Harbor and Hickam Air Force Base.

H-3 is the newest freeway on O’ahu and connects the Pearl Harbor area with Marine Corps Base Kaneohe, which is on the northeast side of O’ahu.

SR 78, referred to as the Moanalua Road, provides a bypass for H-1 traffic between the Aiea/Pearl City area and downtown Honolulu.

The remaining state highways provide approximately 200 lane-miles of roadway. The City and County of Honolulu maintains approximately 1,200 lane-miles of roads (Carter-Burgess 2001, 2-4).

There are few roadways connecting the southern and northern portions of the island, which are separated by the Ko’olau Mountains. The connecting roadways are the Pali Highway, the Likelike Highway, and H-3. Kalaniana’ole Highway goes around the east coastline between Hawai’i Kai and Kailua. H-2 and Kamehameha Highway go around the western end of the Ko’olau Range, connecting Honolulu with Mililani, Wahiawa, Schofield Barracks, and Haleiwa.

The City and County of Honolulu also maintains TheBus, which is the public transportation system. TheBus operates 525 buses along 89 routes (Carter-Burgess 2001, 2-6), providing extensive coverage of the island. There are few areas of the island that do not have bus service.

Historical traffic accident data for O’ahu were not available.

### ***Hawai’i***

The major urban areas on the island of Hawai’i are Hilo and Kailua-Kona, which are on the east and west sides of the island, respectively. Air service for these centers is provided by Hilo International Airport and Kona International Airport. Generally, major roadways in

Hilo are congested, and major highway improvements are underway to address these problems. There are several congested areas in Kailua-Kona, but the periods of congestion are short.

The most direct roadway link between these population centers is Saddle Road, but most motorists use Queen Kaahumanu Highway (Highway 19) because this road has better design features. Saddle Road is not up to current design standards, and sight distances are limited. Over the years, transportation plans for the island have included recommendations for improving Saddle Road.

Major roadways on the island are under the jurisdiction of the Hawai'i Department of Transportation. Roadways under the jurisdiction of HDOT are Queen Kaahumanu Highway, Mamalahoa Highway, Hawai'i Belt Road, Volcano Highway, and Kawaihae Road. Except for limited sections, these roadways are two-lane highways. Major intersections are signalized. The remaining local roads and streets are under the jurisdiction of the County of Hawai'i Department of Public Works.

### 3.7.3 Traffic Terminology

Traffic and circulation refers to the movement of vehicles on local and regional street networks. The roadway network is a hierarchy of roads and streets classified by function. For example, arterial streets are typically four or more lanes that provide the connection from limited access highways to local collector streets, which collect traffic from local neighborhood-serving streets.

Signalized intersections. Level-of-service (LOS) denotes combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to traffic volumes. LOS is a qualitative measure of the effect of a number of factors, including space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, and convenience.

The six LOSs for signalized intersections, A through F, relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each LOS are summarized in Table 3-11. In general, LOS A represents free-flow conditions with no congestion, while LOS F represents severe congestion with stop-and-go conditions. LOS D is typically considered acceptable for peak hour conditions in urban areas.

Corresponding to each LOS shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period. The capacity of a particular roadway is dependent upon its physical characteristics, such as the number of lanes, the operational characteristics of the roadway (e.g., one-way, two-way, turn prohibitions, bus stops), the type of traffic using the roadway (e.g., trucks, buses), and turning movements.

**Table 3-11**  
**Level-of-service Definitions for Signalized Intersections**

Level-of-service	Interpretation	Volume/Capacity Ratio <sup>1</sup>	Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000 – 0.700	<10.0
C	Light congestion; occasional backups on critical approaches.	0.701 – 0.800	15.1 to 25.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801 – 0.900	25.1 to 35.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901 – 1.000	35.1 to 50.0
F	Total breakdown with stop-and-go operation.	>1.001	>50.1

Source: Transportation Research Board 2000

Note:

<sup>1</sup>When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing, which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

*Unsignalized intersections.* Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by LOS A to F. However, the method for determining LOS for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors, the distribution of gaps in the major street traffic stream, and driver judgment in selecting gaps through which to execute a desired maneuver. The criteria for LOS at an unsignalized intersection are therefore based on delay of each turning movement. Table 3-12 summarizes the definitions for LOS and the corresponding delay for unsignalized intersections.

**Table 3-12**  
**Level-of-service Definitions for Unsignalized Intersections**

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note below	>50.1

Source: Transportation Research Board 2000

Note: When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing, which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

### 3.7.4 Regional Transportation Agencies

Three transportation agencies have authority in the ROI: the Hawai'i Department of Transportation, City and County of Honolulu Department of Transportation Services, and County of Hawai'i Department of Public Works. None of these agencies have specific guidelines or criteria for traffic impact studies; rather, they defer to national standards.

Adopted transportation goals and policies that guide O'ahu's and Hawai'i's transportation development are contained in the *Transportation for O'ahu Plan 2025* and *Hawai'i Long Range Land Transportation Plan*.

#### ***Transportation for O'ahu Plan 2025 (TOP 2025)***

The O'ahu Metropolitan Planning Organization (OMPO) is responsible for carrying out the various requirements of the metropolitan transportation planning process. These requirements are mandated by the US Department of Transportation as the means for establishing the eligibility of metropolitan areas for federal funds for ground transportation systems. One of these requirements is that each major urban area develop a multi-modal long-range plan that documents ground transportation projects selected for federal funding for a minimum time horizon of 20 years (Figure 3-3).

The goals and objectives of the TOP 2025 were developed at the outset of the study and reflect the issues and concerns raised by participants in the study. The following system goals were adopted by the OMPO policy committee for the four major issues:

- Transportation Services—Develop and maintain O'ahu's island-wide transportation system to ensure efficient, safe, convenient, and economical movement of people and goods;
- Quality of Life—Develop and maintain O'ahu's transportation system in a manner that maintains environmental quality and community cohesiveness;
- Community Responsibility—Develop and maintain O'ahu's transportation system in a manner that is sensitive to community needs and desires; and
- Demand Management—Develop a travel demand management system for O'ahu that optimizes use of transportation resources.

The TOP 2025 recommendations define a transportation system for O'ahu's future that will help to achieve the four goals adopted for the plan. The projects included in the TOP 2025 achieve these goals within the fiscal constraints of funding that will be available within the 25-year time frame of the plan.

**Figure 3-3**  
Major Roadways on O‘ahu

***Hawai'i Long Range Land Transportation Plan***

The Hawai'i Long Range Land Transportation Plan (LRLTP) identifies the major land transportation improvements needed to support the island of Hawai'i's projected growth to the year 2020 (Figure 3-4). This transportation plan was developed through the Countywide Transportation Planning Process, which is a cooperative, comprehensive, and continuing transportation planning effort involving the Hawai'i DOT and the neighbor island counties. Those agencies that participated in updating the Hawai'i LRLTP include the state DOT, the Hawai'i County Department of Public Works, and the Hawai'i County Department of Planning.

The LRLTP, along with the updated transportation plans for O'ahu, Maui, and Kaua'i, is used in developing a statewide transportation plan that fulfills requirements of the Intermodal Surface Transportation Efficiency Act of 1991.

**Figure 3-4**  
Major Roadways on Hawai'i