

**Appendix H**  
Traffic Impact Evaluation  
Memorandum

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## MEMORANDUM

To: Ms. Kimberly Hughes, P.E.  
HNTB Corporation

From: Mr. Jacob Bowers, AICP  
Kimley-Horn and Associates, Inc.

Date: February 24, 2017

RE: ***Traffic Impact Evaluation for PHX SkyTrain Extension Air Quality Analysis***

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### INTRODUCTION

This memorandum describes a vehicular traffic impact evaluation as a component of an air quality analysis being performed for the proposed action. The proposed action in this case is the extension of the Phoenix Sky Train (PHX Sky Train) from its current terminus at Terminal 3 to the existing Rental Car Center (RCC), with the addition of an intermediate stop at a proposed ground transportation center.

### METHODOLOGY

Kimley-Horn and Associates, Inc. (KHA) has employed the use of its proprietary multi-modal simulation platform, Advanced Land Transportation Performance Simulation (ALPS™), at Phoenix Sky Harbor International Airport (PSHIA) for various existing conditions and future alternatives analyses over the past ten years. These analyses have involved modeling the existing conditions of the roadway system, terminal curbsfronts, parking facilities, RCC, and the PHX SkyTrain, as well as proposed future configurations and demand scenarios.

Fundamental to the ALPS™ modeling concept is the ability to generate passenger and vehicular demands based on a flight schedule. Passenger characteristics, such as visitor characteristics and trip timing, are applied to the flight activity to generate the passenger and vehicular demands throughout a 24-hour period. Vehicular characteristics, such as mode splits and vehicle occupancies, are applied to the passenger demands to generate the vehicular activity. The individual vehicles are routed through the roadway network and stop at their respective curbsfronts. Through the simulation capabilities of ALPS™, the curbsfront and roadway operations can be visualized to observe the congestion, and quantitative results, such as travel times and modeled vehicular volumes, are also captured.

In 2016, the ALPS model for PSHIA was updated to current roadway geometric conditions and a 2016 flight schedule input for analysis of future impacts to the roadway and terminal curbsfronts, as well as the RCC curbsfront. Two alternative configurations were modeled: 1) the RCC bus fleet remains in service; and 2) the PHX SkyTrain is extended to the RCC with the bus fleet removed. These comparative analyses were performed at forecasted future levels of passenger activity, in terms of Million Annual Passengers (MAP). The results of these analyses will serve as a basis for this traffic impact evaluation.

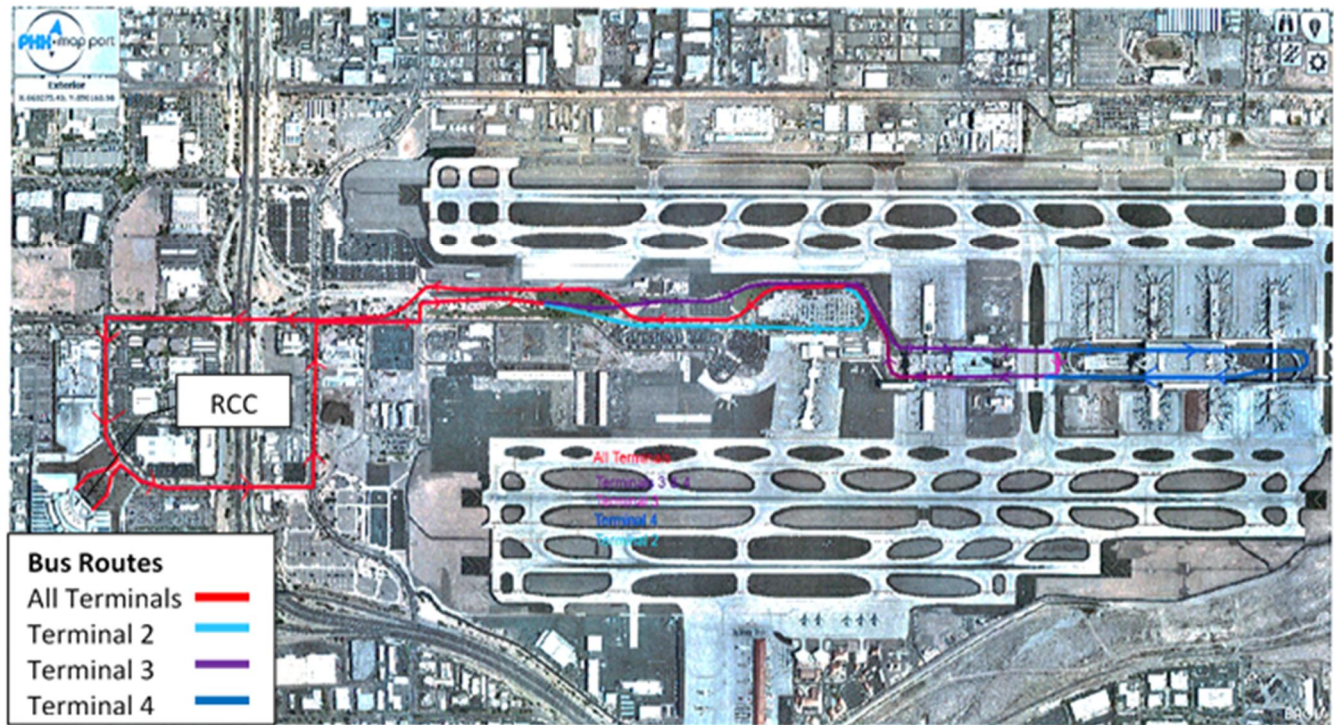
**2016 CONDITIONS**

**Rental Car Center/ Rental Vehicles**

Currently, air passengers that use a rental vehicle either pick up or drop off their rental vehicles at the RCC, located west of PSHIA. A bus fleet provides transportation to and from the terminal curbsides to the RCC curbside via a route that utilizes Sky Harbor Boulevard, Buckeye Road, 24th Street, and Sky Harbor Circle. **Figure 1** below highlights the RCC bus routes.

During peak arrival periods, especially at Terminal 4, large numbers of pedestrians must cross the inner curbside roadway to reach the outer curbside island where the RCC bus picks up passengers. This heavy pedestrian activity results in significant vehicular congestion on the inner curbside roadways while vehicles stop and await pedestrian crossings.

**Figure 1. Rental Car Center Terminal Shuttle Routes**



Source: PHX Airport Ground Transportation Staff, February 2016

**Ground Transportation Vehicles**

Additionally, ground transportation vehicles such as hotel shuttles, offsite parking shuttles, charter buses, and van service vehicles utilize Sky Harbor Boulevard to pick up and drop off passengers at each individual terminal. Terminal 2, Terminal 3, and Terminal 4 each have designated drop off and pick up areas for ground transportation vehicles.

**FUTURE CONDITIONS**

With the extension of the PHX SkyTrain to the RCC and implementation of a new ground transportation center attached to the PHX SkyTrain, there are several demonstrated and anticipated impact reductions. For this comparative analysis, the assumed future passenger level of activity is 48 Million Annual Passengers (48 MAP), which generally corresponds with a future forecast year of 2021.<sup>1</sup>

**Removal of RCC Bus Fleet**

The RCC bus fleet consists of approximately 100 40-foot buses with an assumed operational capacity of 27 passengers with baggage. Currently, the RCC bus fleet operates at an average interval between bus arrivals (known as headway) of 3 minutes for trips to and from Terminal 4, and approximately 5.5 minutes for trips to and from Terminals 2 and 3. During peak periods, these headways are smaller, with buses operating greater frequencies. Also, during peak periods, additional buses are operated between Terminal 4 and the RCC to accommodate peak terminal 4 arrival demand<sup>1</sup>.

With the proposed extension providing PHX SkyTrain service to the RCC, the presence of the bus fleet on the roadway system and terminal curbside is eliminated. This impact reduction includes elimination of roundtrip travel between the terminals and the RCC, as well as elimination of vehicle idling at both the RCC and the terminals.

**Table 1 – Modeled Daily RCC Bus Traffic Counts**

	<b>48 MAP Estimated</b>	<b>With SkyTrain Extension</b>
<b>Westbound on Sky Harbor Blvd To RCC</b>	1,437	0
<b>Eastbound on Sky Harbor To Terminals</b>	1,421	0

Source: Kimley-Horn and Associates, Inc. ALPS™ Model, 2016

**Table 2 – Modeled RCC Bus Travel Times**

<b>Trip Link</b>	<b>Average Trip Time (minutes)</b>	<b>Maximum Trip Time (minutes)</b>
<b>Terminal 4 Pick Up → RCC</b>	12.7	23.6
<b>RCC → Terminal 4 Drop Off</b>	12.5	21.1

Source: Kimley-Horn and Associates, Inc. ALPS™ Model, 2016

<sup>1</sup> Aviation Activity Demand Forecast – Phoenix Sky Harbor International Airport – March 2015

The need for pedestrians to cross the inner curbside roadway to reach the RCC bus fleet is also eliminated, improving curbside level of service during peak periods and reducing extended vehicular idling.

### Reduced Ground Transportation Travel

At the time of this analysis, the exact allocation of ground transportation modes that will be reallocated to the proposed ground transportation center is not yet known. However, it is anticipated that the majority of ground transportation vehicles will be removed from direct terminal access and the associated travel necessary to reach the terminal.

With the proposed extension, it is assumed that most ground transportation vehicles will pick up and drop off passengers at a new centralized facility in the western airport vicinity that is directly connected to the proposed PHX SkyTrain extension. This shift in drop-off/pick-up location eliminates the need for ground transportation vehicles to travel to each individual terminal, resulting in reduced travel distance for the vehicles, as well as reduced recirculation around the terminals, as many shuttles recirculate to stop at both sides of the terminal.

The removal of several modes of ground transportation from terminal curbsides also reduces the need for pedestrians to cross the inner curbside lanes. During peak periods, significant congestion on the curbsides can be directly attributed to pedestrian crossings from the terminal to the outer curbside lanes to board ground transportation vehicles.

It is also anticipated that this ground transportation center will have an attached long term parking garage. With a shift in long term parking activity to the west, long term parking customers who may have previously traveled into the terminal area parking garages now have the option of parking at the ground transportation center. This alternative reduces the travel time for vehicles and removes a portion of the Sky Harbor Boulevard private auto traffic.

## FINDINGS

Because of the implementation of the proposed action, a significant reduction and eventual elimination of RCC bus activity is anticipated at the terminal curbside roadways, RCC curbside, and on Sky Harbor Boulevard. Additionally, a significant reduction in ground transportation vehicle travel time and recirculation is anticipated due to reallocation of these vehicles to a centralized ground transportation center.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.



Jacob Bowers, AICP