



UPTOWN PARKING ALTERNATIVES ANALYSIS

EVACUATION TECHNICAL MEMORANDUM

Date: October 24, 2023

Subject: Uptown Parking Alternatives Analysis - Evacuation

Introduction

The City of Sedona is in the process of reviewing parking growth, limitations, and potential improvements throughout the high traffic area of Uptown. As part of this process seven options have been presented:

1. No new parking
2. New intercept parking lots
3. Surface Lot –Forest Road
4. New Garage –Forest Road
5. New Garage – Municipal Lot
6. Consolidation of Public Lots –Forest Road and Expansion
7. Garage + Consolidation of Public Lots

This memorandum is prepared as supplemental material to evaluate potential impacts of a garage on Forest Road for two emergency evacuation scenarios. It should be noted an overall evacuation strategy for Sedona is currently underway as a different project with a different consultant team running a different type of VISSIM model.

The model used for this evaluation is a modification of a six-hour static VISSIM traffic model (10 AM to 4 PM) the design team has used for various traffic simulations for the Sedona in Motion (SIM) Program. To simulate a potential evacuation volume of traffic, the design team doubled a known peak hour volume and routed traffic as noted in the Evaluation Criteria section. Two future roadway improvements are also included in the model: Forest Road Connection (under construction) and Uptown Northbound Improvements (advertised for Construction).

Evaluation Criteria

In a September 21, 2023, meeting with Sedona Police and Fire along with Coconino County, the design team discussed modeling two evacuation scenarios:

1. Threat from the North resulting in the need to evacuate traffic to the South and West
2. Threat from the West resulting in need to evacuate traffic East and South

Additionally discussed in the meeting with Police and Fire were general best practices for emergency evacuation including: Traffic Splits at the roundabouts, 2 hour window for evacuating a parking garage, free flow movements from connector roads to highways when the lane capacity is available. For safety and security purposes, the full evacuation strategy,

including staging, staffing and sequenced traffic control, was not disclosed to the design team.

With the information provided at the September 21st meeting, the team set the following parameters for each scenario:

Threat from North (Evacuation to West)

- Double the hourly volume
- No vehicles run north on SR 89A
- All NB SR 179 vehicles are rerouted south at the Schnebly Roundabout
 - Creekside Plaza is the exception
- All Forest Road vehicles routed west
- Pedestrian activities remain
- Forest Road Connection (future project) is a SB free flow right turn
- WB 89A merges to one lane west of Brewer Roundabout
- 100% of Jordan Road SB traffic remains on Jordan Road
- 200 vehicles added to WB Forest Road to represent neighborhood utilizing local roads west of Jordan
- Garage evacuates in 2 hours (272 vehicles)

Threat from the West (Evacuation North and South)

This scenario is more challenging to model as there are alternative routes that may be utilized by emergency responders. Additionally, two lanes of SR 89A traffic is routed to one lane on NB SR 89A and one lane of SB SR 179.

- EB SR 89A traffic splits
 - 10% SB at Brewer Roundabout
 - 50% SB at SR 179
 - 40% NB SR 89A
- All Forest Road vehicles are routed East
 - 60% NB SR 89A
 - 40% SB SR 89A
- Brewer NB traffic routed to Ranger Road then SB 179
- Pedestrian activity for first 30 minutes (assume key roadway corridors are cleared of pedestrian conflict to allow for full vehicular access for the last 30 minutes)
- Garage evacuates in 2 hours (272 vehicles)
 - Forest Road EB split
 - 60% NB SR 89A
 - 40% SB SR 89A
- Consolidate parking
 - Remove 272 vehicles from side streets
 - Simulate consolidation of parking into garage

Lastly, the group discussed the benefits of consolidated parking when it comes to traffic management during an event or emergency. The benefits include but are not limited to:

1. Improved parking access and wayfinding. In an emergency, proper wayfinding to consolidated lots allows for more efficient movement of pedestrians when compared to smaller, more spread-out lots.
2. Less personnel required to provide needed traffic control in an emergency evacuation.
3. Less vehicles on local streets which leads to less congestion/conflicting traffic movements during evacuation.
4. Ability to stage personnel and equipment at a proximate facility or consolidated lot.

Results

Below are the results of the two evacuation scenarios, modeled in VISSIM, with or without a garage on Forest Road. Both results yield a 0% increase in overall system delay. However, as mentioned above, several benefits would be gained for emergency management, in relation to evacuation of Uptown, if a garage were located on Forest Road.

It should be noted the results below are an average vehicle delay for a car within the modeled traffic network when compared to a free flow scenario (ie: 0 second delay). For example, in the VISSIM model, it takes a vehicle 62 seconds to exit the bounded traffic network. A vehicle evacuating from the Hyatt would take less time to exit west while a vehicle evacuating from north of Uptown would take longer than the average time.

Threat from West

Evac To North/East Vehicle Delay (seconds)	Without Garage	With Garage	Increase %
System wide Average Delay	59	59	0%

Threat from North

Evac To West Vehicle Delay (seconds)	Without Garage	With Garage	Increase %
System wide Average Delay	62	62	0%

Figures 1 – 4 on the following pages are screen shots from the VISSIM Model.

Evac to West



Figure 1 - Evacuation to West at 12:15 PM (VISSIM Model)

Evac to West



Figure 2 - Evacuation to West at 12:25 PM (VISSIM Model)

Evac to East



Figure 3 - Evacuation to East at 12:15 PM (VISSIM Model)

Evac to East



Figure 4 - Evacuation to East at 12:25 PM (VISSIM Model)