



Alternative Analysis Report

Final



LEMMON DRIVE
P R O J E C T

Washoe Regional Transportation Commission &
Nevada Department of Transportation

**Lemmon Drive Traffic Improvements
and Resiliency Project**

March 2025



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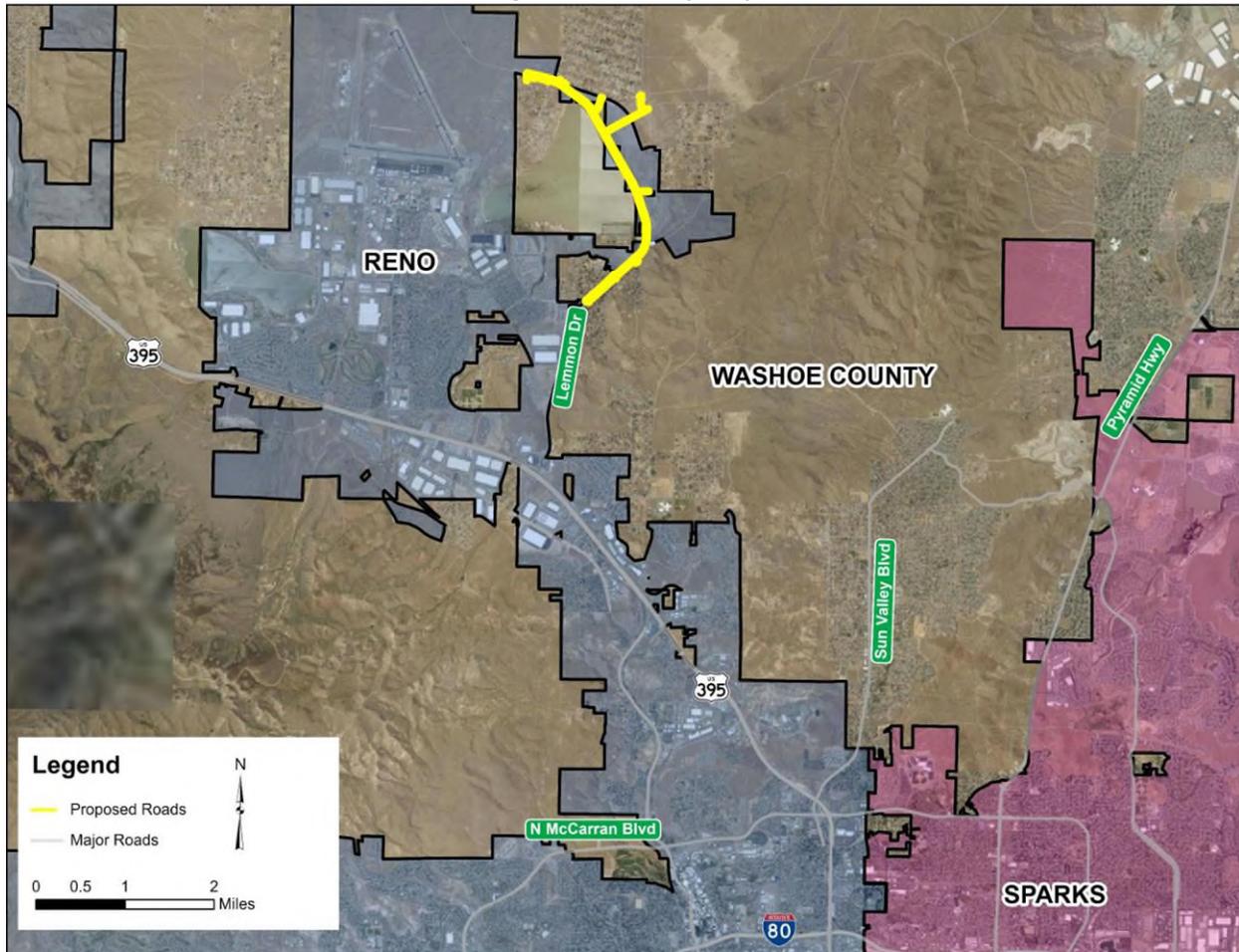
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1.0 Introduction

The RTC, in conjunction with the City of Reno, Washoe County, City of Reno, City of Sparks, and FHWA, is proposing to improve Lemmon Drive, located in the City of Reno and Unincorporated Washoe County, Nevada (see Figure 1).

Figure 1 - Vicinity Map



This report summarizes the project and the history of the alternative evaluation.

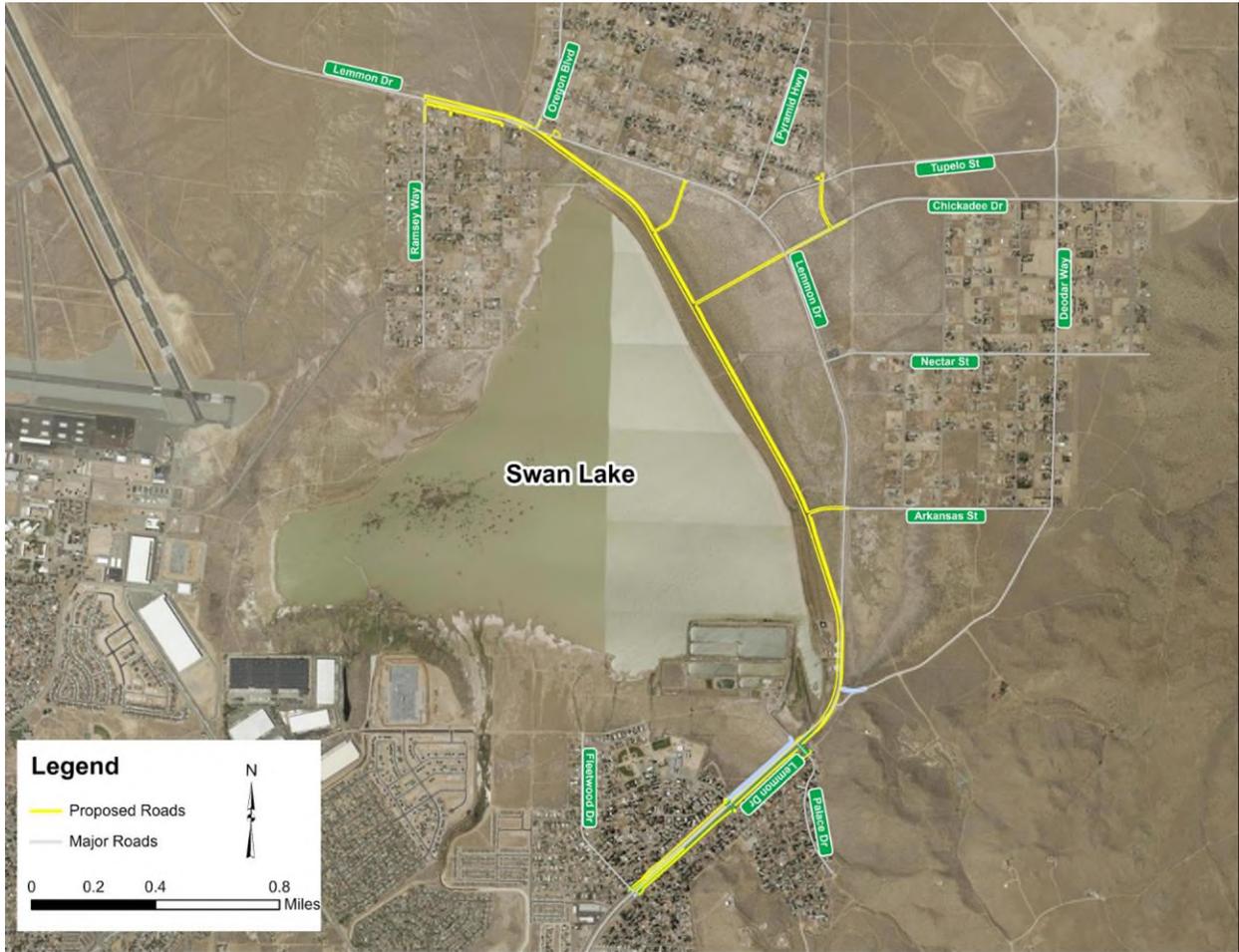
In late 2017 and early 2018, Lemmon Drive was overtopped by floodwaters and faced emergency closures and an extensive mitigation response. A series of wet weather events and snowmelt runoff resulted in a significant flood event in Lemmon Valley. Lemmon Valley is a closed hydrographic basin, with Swan Lake being the lowest point of the basin. Residential areas were flooded, and the principal access route, Lemmon Drive, was inundated. To mitigate the flooding and restore access, Washoe County installed HESCO flood barriers and provided continuous pumping until the lake level receded (see Figure 2).

Figure 2 - HESCO Flood Barrier/Pumping



The proposed project includes reconstructing and widening Lemmon Drive from Fleetwood Drive to Palace Drive, then realigning Lemmon Drive from Palace Drive to Ramsey Way (see Figure 3). The realigned section will also raise the profile of Lemmon Drive above the Federal Emergency Management Agency (FEMA) Letter of Map Revision (LOMR) 100-year Base Flood Elevation to provide all-weather access on Lemmon Drive. Improvements and modifications to Lemmon Drive and adjacent local roadways are also proposed, including safety, multimodal, and ADA enhancements.

Figure 3 - Location Map



2.0 Purpose and Need

The 2017 flood event highlighted the need for a more resilient roadway. Washoe County has limited financial and human resources to continuously provide flood mitigation for Lemmon Drive and private properties. The total cost for maintenance, HESCO barrier placement, and continuous pumping for the 2017-2019 flood event was \$11.6 million (Washoe County, 2022).

In addition, multimodal enhancements were identified as a community need in the *RTC North Valleys Multimodal Transportation Study*, February 20, 2017.

The purpose of the project is to provide a safe and reliable regional road with at least one dry lane in each direction of travel during a 100-year flood event as well as improve safety for all multi-modal users.

3.0 Project Design Criteria

All roadway rehabilitation and new roadways will conform to the City of Reno Public Works Design Manual, RTC and City Standard Details, and Standard Specifications for Public Works Construction. The project will also implement ADA and PROWAG standards for sidewalks, driveways, and pedestrian ramps.

Two lanes in each direction on Lemmon Drive will be provided from Fleetwood Drive to Palace Drive. One lane in each direction will be provided for the new roadway north of Palace Drive. The proposed embankment will be designed to accommodate a future lane in each direction (should additional widening be required in the future). Constructing the additional embankment now provides forward compatibility by reducing future embankment construction inefficiencies and additional required volumetric mitigation (described below).

The new roadway will be designed to provide a dry lane in each direction during a 100-year ponding elevation of 4924.7 feet to ensure all-weather access in each direction plus an additional eighteen inches along the realigned section for wave action created by prevailing winds. The project will be designed to mitigate any adverse drainage impacts up to the 100-year event to adjacent properties.

As stated, Swan Lake is a closed basin. Any embankment placed within the 100-year floodplain must be mitigated by replacing the lost volume to ensure the embankment placed will not increase the lake level. Volumetric basins will be excavated at a ratio of 1.3:1, as required by Washoe County.

An existing berm through Swan Lake somewhat separates the east and west sides of the lake. Low areas within the berm allow flows to equalize between the east and west sides. The new roadway realignment will include equalization features, Reinforced Box Culverts (RCB), to allow flood waters to balance on the east and west sides underneath the new roadway to account for independent storms occurring on either side of the roadway.

4.0 Initial Studies

4.1 RTC Studies

The RTC initiated the Lemmon Drive Safety Improvement Project, which was identified in the 2040 and updated 2050 Regional Transportation Plans (RTP). The *North Valleys Multimodal Transportation Study*, completed in February 2017, identified the need for long-term transportation improvements for regional roads and intersections in the North Valleys area.

Phase 1

To improve mobility, the RTC, in partnership with the Nevada Department of Transportation (NDOT), designed the reconfiguration of the Lemmon Drive/US 395 interchange into a Diverging Diamond Interchange (DDI) and a reconstruction and widening of Lemmon Drive from US 395 to Fleetwood Drive. This project phase has been constructed (and is not part of the current NEPA process).

Phase 2

The RTC conducted a study to develop alternatives for the next phase of the project which includes Fleetwood Drive to Ramsey Way. The first screening, referred to as Level 1 Alternatives Analysis Screening for the Lemmon Drive Traffic Improvements and Resiliency Project, was completed in early 2020. Twelve alternatives, including the No Build, were developed and evaluated against project goals at the February 2020 Technical Advisory Committee workshop.

Three of the twelve alternatives advanced to the next screening (referred to as Level 2) and were presented to the RTC Board in August 2020. Those alternatives were Alternative 2, Alternative 6, and Alternative 8 (see Figure 4).

Figure 4 - RTC Level 2 Screening Alternatives (August 2020)



For the segment of roadway between Fleetwood Drive and Palace Drive, all the alternatives proposed to reconstruct Lemmon Drive. Improvements included converting a portion of Lemmon Drive into a frontage road to eliminate dangerous driveway connections, reconstructing the multi-use path that has been damaged and closed due to floods, improving signals and lighting, and adding sidewalks and ADA improvements. The existing drainage channel for this area will also be improved.

From Palace Drive to the north the alternatives varied:

Alternative 2

This alternative proposed to elevate Lemmon Drive above the 100-year floodplain elevation, requiring the profile to be raised approximately two to ten feet. This would create challenges for providing access to adjacent driveways and streets where differences in elevations were higher. The higher profile would also require significant drainage features to convey flood flows under the roadway without causing adverse flooding impacts to upstream properties, as well as additional volumetric mitigation for additional fill in the flood pool (as compared to Alternative 6). This alternative is more difficult to construct while continuing to provide local access and also has a higher construction cost estimate.

Alternative 6

This alternative proposed realigning Lemmon Drive, west of the existing alignment, following an existing naturally elevated area. This alignment would allow the roadway to be constructed along an alignment that is mostly above the existing Federal Emergency Management Agency (FEMA) 100-year flood elevation.

The proposed alignment would include intersections at Deodar Way, Arkansas Drive, Chickadee Drive, Oregon Boulevard, and Ramsey Way. Lemmon Drive was proposed to be converted to a local frontage road access between Oregon Boulevard and Chickadee Drive. From Chickadee Drive to Deodar Way, Lemmon Drive was proposed to be closed to the public and used as utility/emergency corridor.

The realignment would eliminate direct access to the new Lemmon Drive for those residences along the existing Lemmon Drive from Waterash Street to Oregon Boulevard. The existing Lemmon Drive pavement will remain for driveway access and act as a frontage road, providing access to the new Lemmon Drive via Oregon Boulevard.

Equalization culverts would be needed to replicate existing conveyance areas between the east and west sides of the existing berm during higher Swan Lake water elevations. These equalization culverts would be located at existing breaks in the berm north of Deodar Way and at the north end of the lake near Idaho Street. Volumetric mitigation (described in Section 3) basins would also be constructed between the new, realigned Lemmon Drive and the existing Lemmon Drive within the FEMA floodplain.

Alternative 8

This alternative followed the Deodar Way alignment north to Chickadee Drive. At the north end of this alternative, variations of the alignment were evaluated along Heartline Street and Fir Drive, extending to Chickadee Drive.

This alternative did not meet the long-term regional connectivity needs, would impact developed residential areas, and did not address the resiliency needs of the project, and therefore, was discarded from further consideration.

The remaining Alternatives 2 and 6 were screened in August of 2020. Table 1 presents the screening results of that workshop.

Table 1 – Level 2 Alternative Screening Workshop Results

	Raise Lemmon (Alt. 2)	Natural Berm (Alt. 6)
Safety		
Access Management		
Emergency Response		
Construction Impacts		
Volumetric Mitigation		
Permitting		
Cost	\$44M - \$48M	\$34M - \$38M

As a result of this workshop, Alternative 6 was selected as the RTC Endorsed Alternative.

5.0 Alternative Development

5.1 Public Information Meeting #1

Since the initial workshop, minor refinements were made to Alternative 6.

The first Public Information Meeting (PIM #1) was held on February 7, 2024, to present the purpose and need as well as the history and evolution of alternatives. The RTC Endorsed Alternative, Alternative 6, was presented as shown in Figure 5.

Figure 5 - RTC Endorsed Alternative (PIM #1, Feb 2024)



5.2 Public Information Meeting #2

RTC received various comments and concerns from the community about the project. The proposed alternative was subsequently modified to address some of the concerns related to neighborhood access. Before formally presenting the revised alternative at the scheduled PIM #2, RTC coordinated three “pop-up” events to present the revisions and provide additional opportunities to address/collect public concerns and comments.

Based on the input from PIM #1 and the pop-up events, the RTC Endorsed Alternative was modified to improve local traffic circulation. Arizona Street is proposed to be extended to the new Lemmon Drive alignment. The Lemmon Drive conversion to frontage road (for vehicular access) is proposed to be extended from Waterash Street to Chickadee Drive. Also, it was decided to modify the existing Lemmon Drive from Chickadee to Arkansas as an emergency access/utility corridor. Figure 6 shows the revised alternative as presented in the August 2024 PIM #2.

Figure 6 - RTC Endorsed Alternative (PIM #2 August 2024)



6.0 Results and Recommendations

Throughout this project development, meaningful public engagement was successful. Key concerns and input from the public have been considered and incorporated into the project. The public concerns, comments, and input will continue to be addressed as the project progresses.

It is recommended to proceed with the NEPA process with the current RTC Endorsed Alternative as the proposed build alternative, as shown in Figure 6.