GOLD CANYON
AREA DRAINAGE MASTER PLAN

FEMA

Technical Team

JE FULLER

LUMOS & ASSOCIATES

Silver City Schoolhouse Community Center
June 15, 2026

WHAT IS AN AREA DRAINAGE MASTER PLAN? (ADMP)

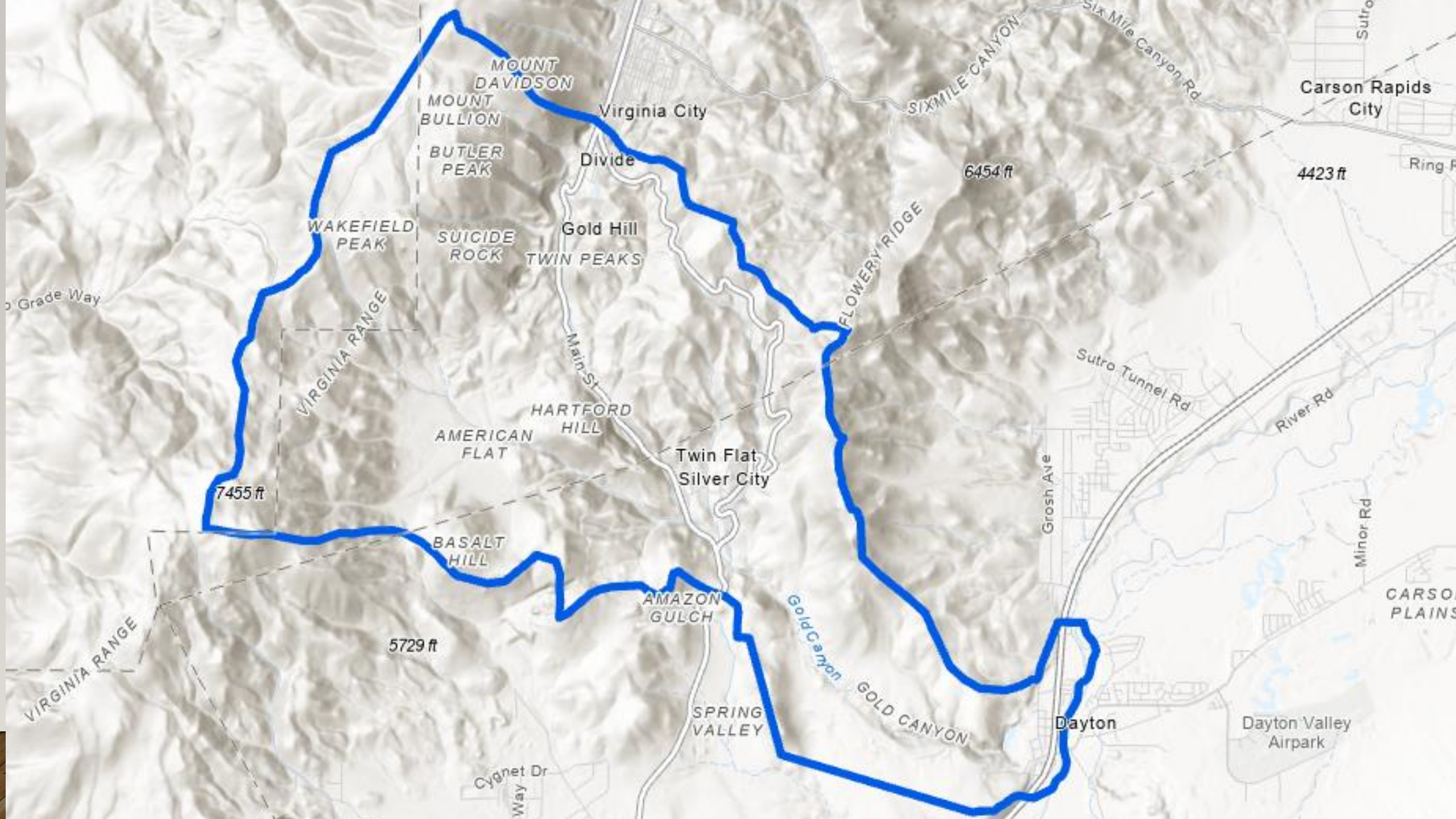
- Planning-level study of flooding hazards within a watershed
  - Multiple watercourses

- Goals:
  - Develop a comprehensive understanding of the drainage existing conditions
  - Identify potential flooding/sediment issues
  - Develop alternative mitigation solutions

GOLD CANYON ADMP

Project Funding

- FEMA Cooperative Technical Partner (CTP) grant
- CWSD Funding Administrator
- Lyon & Storey Counties – in-kind leverage


MOUNT DAVIDSON
MOUNT BULLION
BUTLER PEAK
Virginia City
Divide
SIXMILE CANYON
Six Mile Canyon Rd
Carson Rapids City
6454 ft
4423 ft
WAKEFIELD PEAK
SUICIDE ROCK
Gold Hill
TWIN PEAKS
FLOWERY RIDGE
Grade Way
VIRGINIA RANGE
Main St
Sutro Tunnel Rd
River Rd
HARTFORD HILL
AMERICAN FLAT
Twin Flat
Silver City
7455 ft
Grosh Ave
Minor Rd
BASALT HILL
AMAZON GULCH
Gold Canyon
GOLD CANYON
5729 ft
VIRGINIA RANGE
SPRING VALLEY
Dayton
Dayton Valley Airpark
Cygnet Dr

ADMP STUDY AREA

Watershed Characteristics

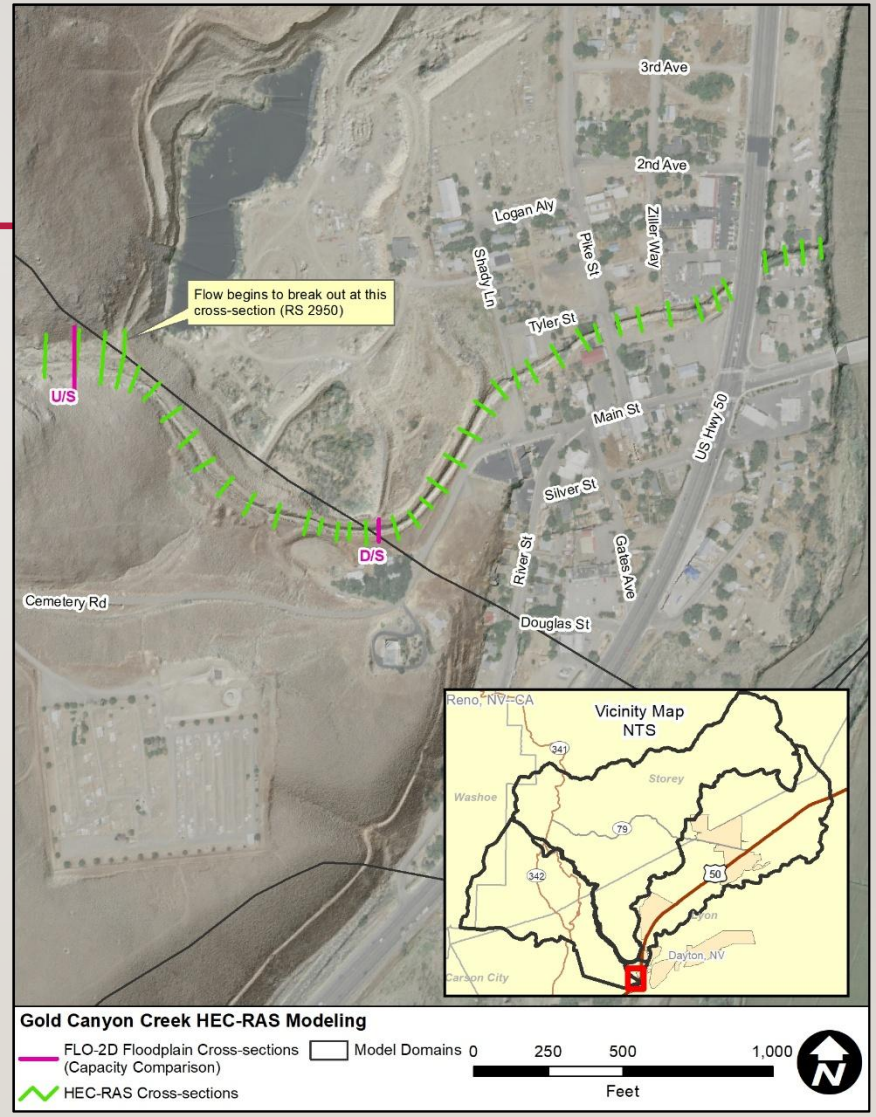
- Dominantly Tributary Flooding Pattern
  - Gold Canyon
  - American Ravine
- Sedimentation
  - Clogged culverts
  - Debris on roadways

Near S. Main St. and Sky Lane

ADMP PROJECT ELEMENTS

Prior Study – Dayton Valley ADMP (2019)

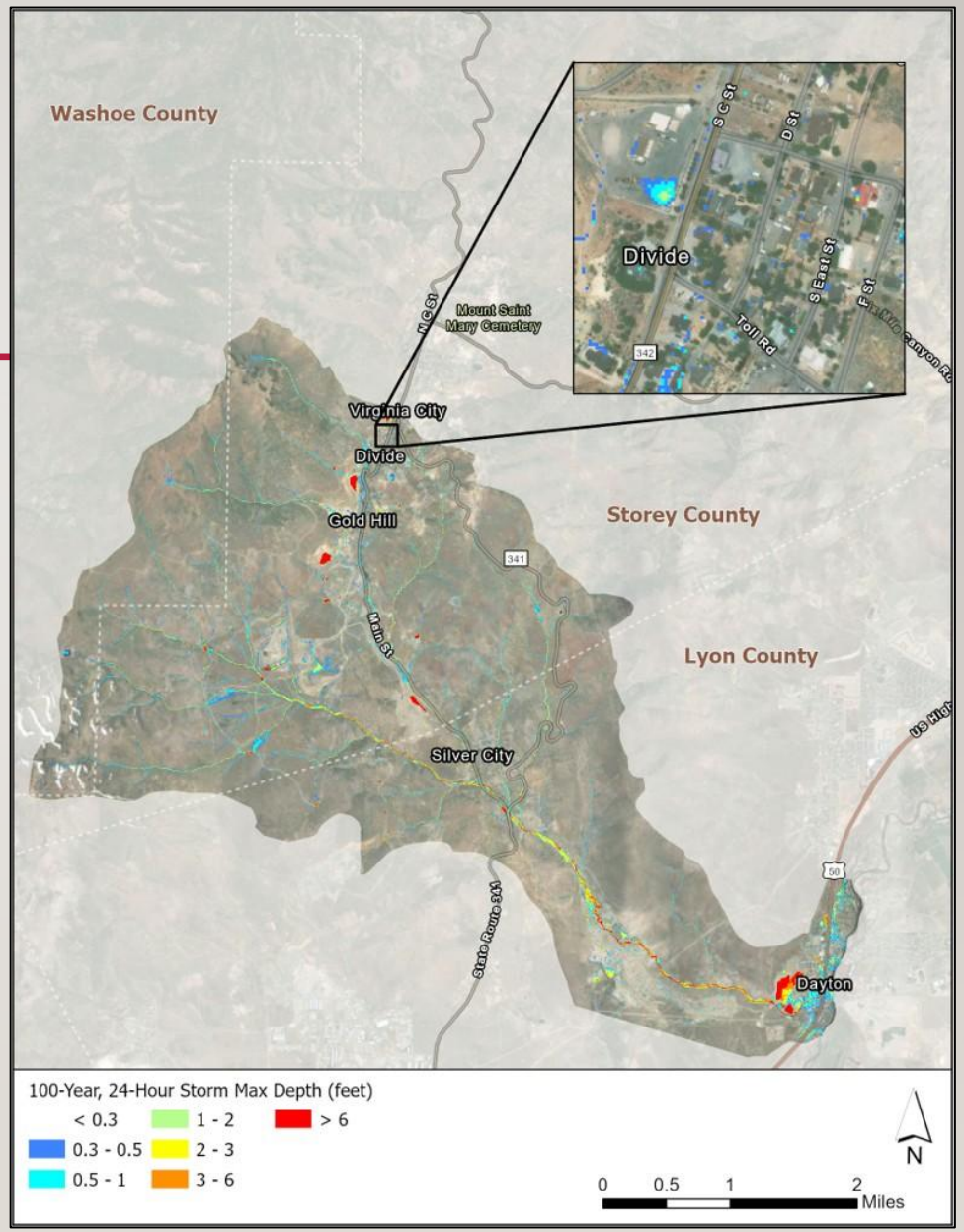
- Included Gold Canyon watershed
- Primary focus was Town of Dayton
- Dayton Valley model was updated with higher resolution data
  - 10-ft versus 15-ft cells
  - Additional culvert inventory
  - NDOT Green-Ampt Infiltration Parameters



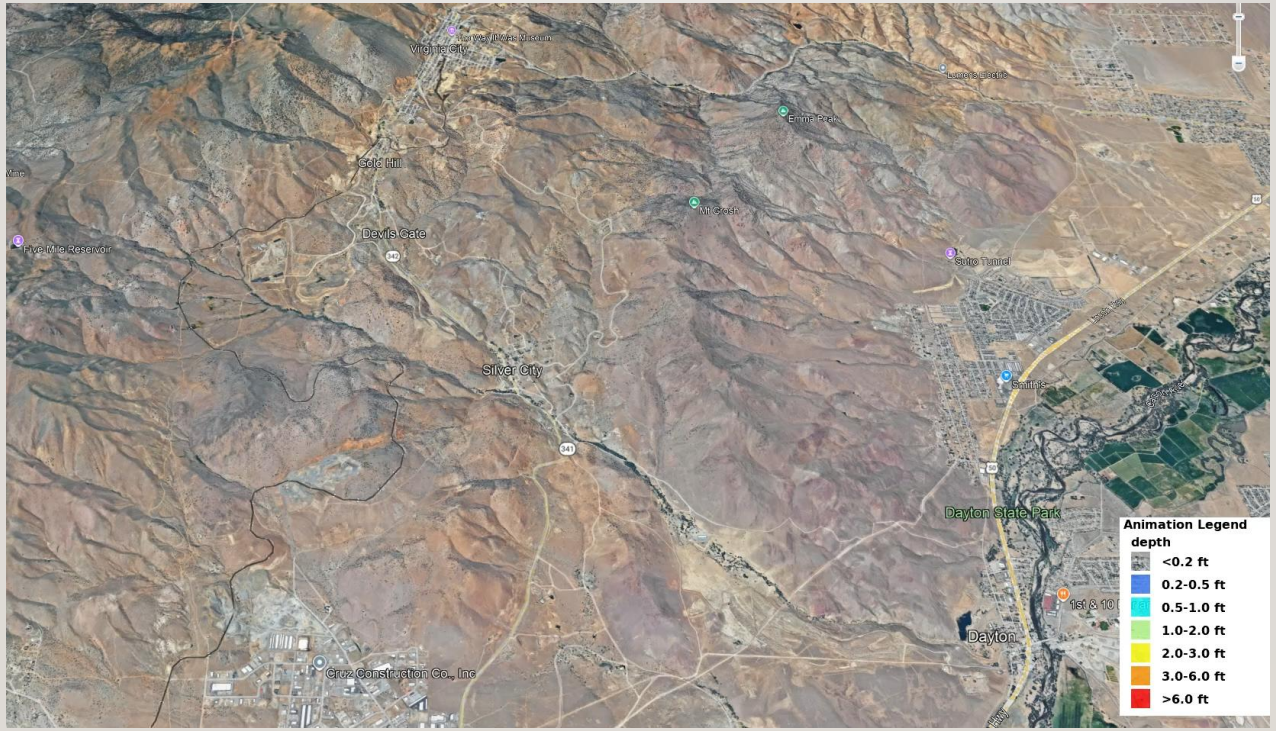
ADMP PROJECT ELEMENTS

Hydrologic and Hydraulic Modeling

- Where do flood flows come from?
  - Rainfall & Runoff
  - Storms
    - 25-year, 100-year storms
  - NDOT hydrologic parameters
- Where does the storm runoff go?
  - Two-Dimensional hydraulic model (FLO-2D)
    - Latest technology
    - Best tool for complex, urban flooding
    - High resolution, detailed results
      - Flow Depth
      - Flow Velocity



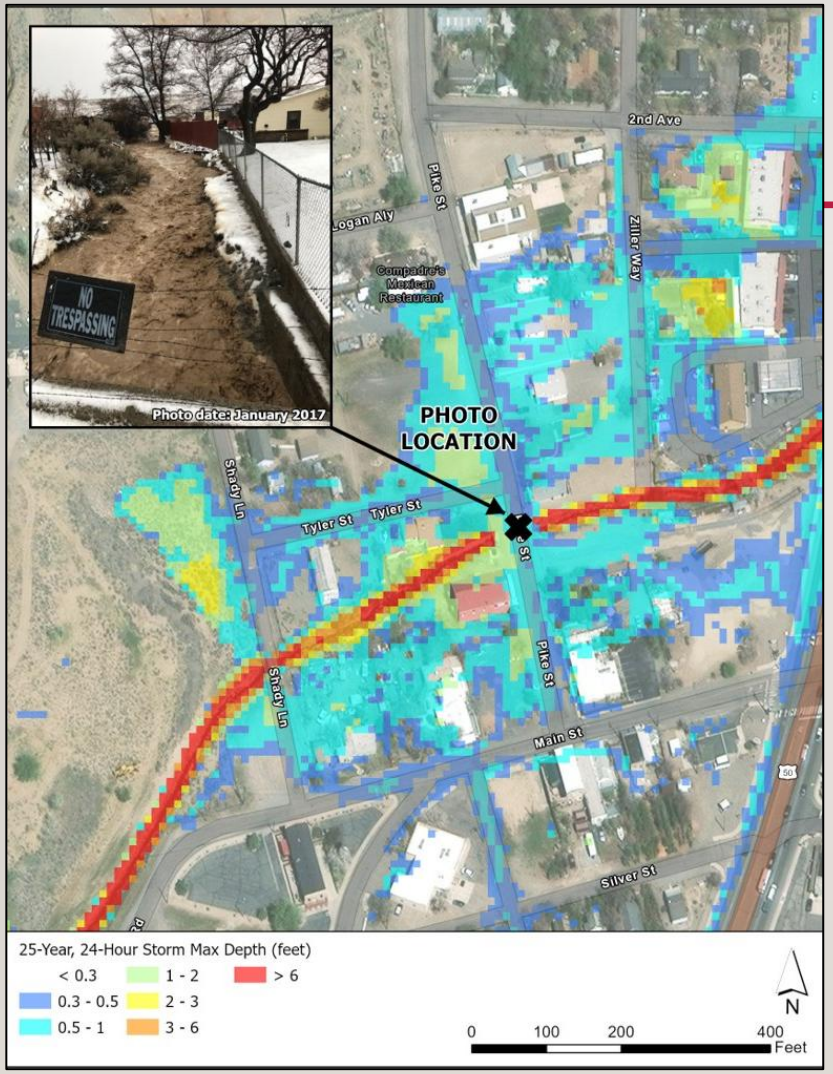
ADMP STUDY AREA - ANIMATION

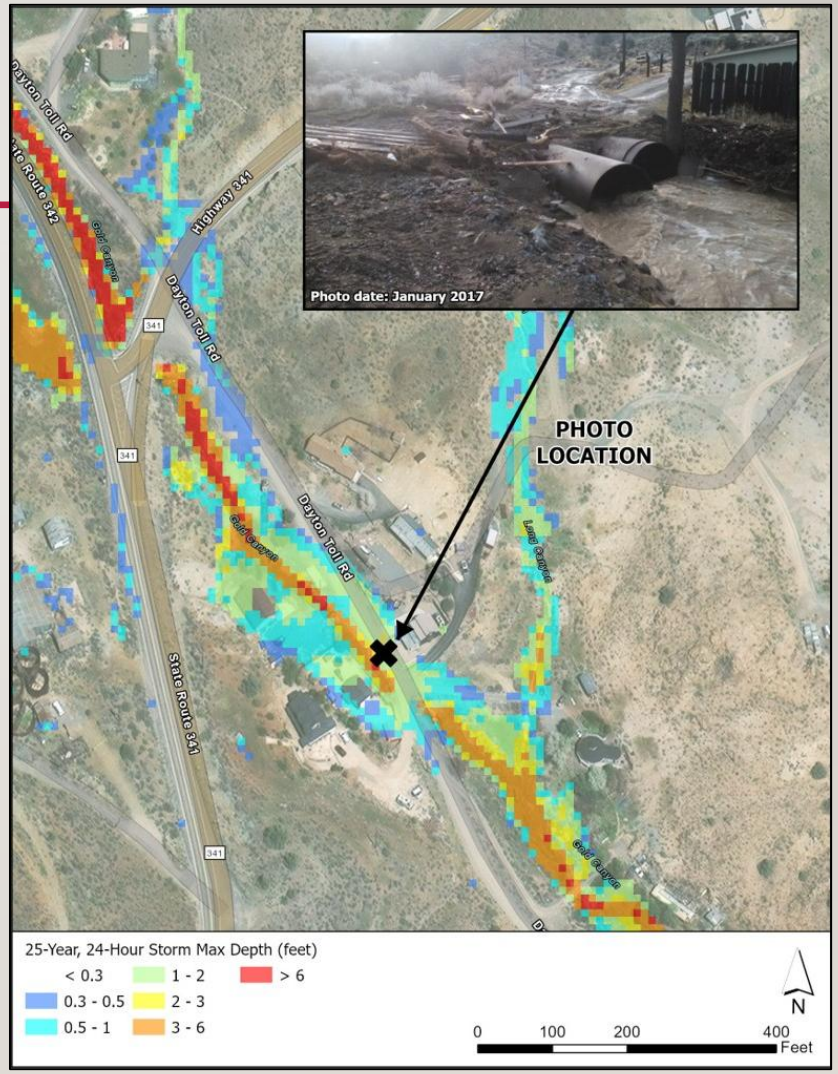


GOLD HILL - ANIMATION

SILVER CITY - ANIMATION

RESIDENT VIDEOS/PHOTOS AND DOCUMENTATION



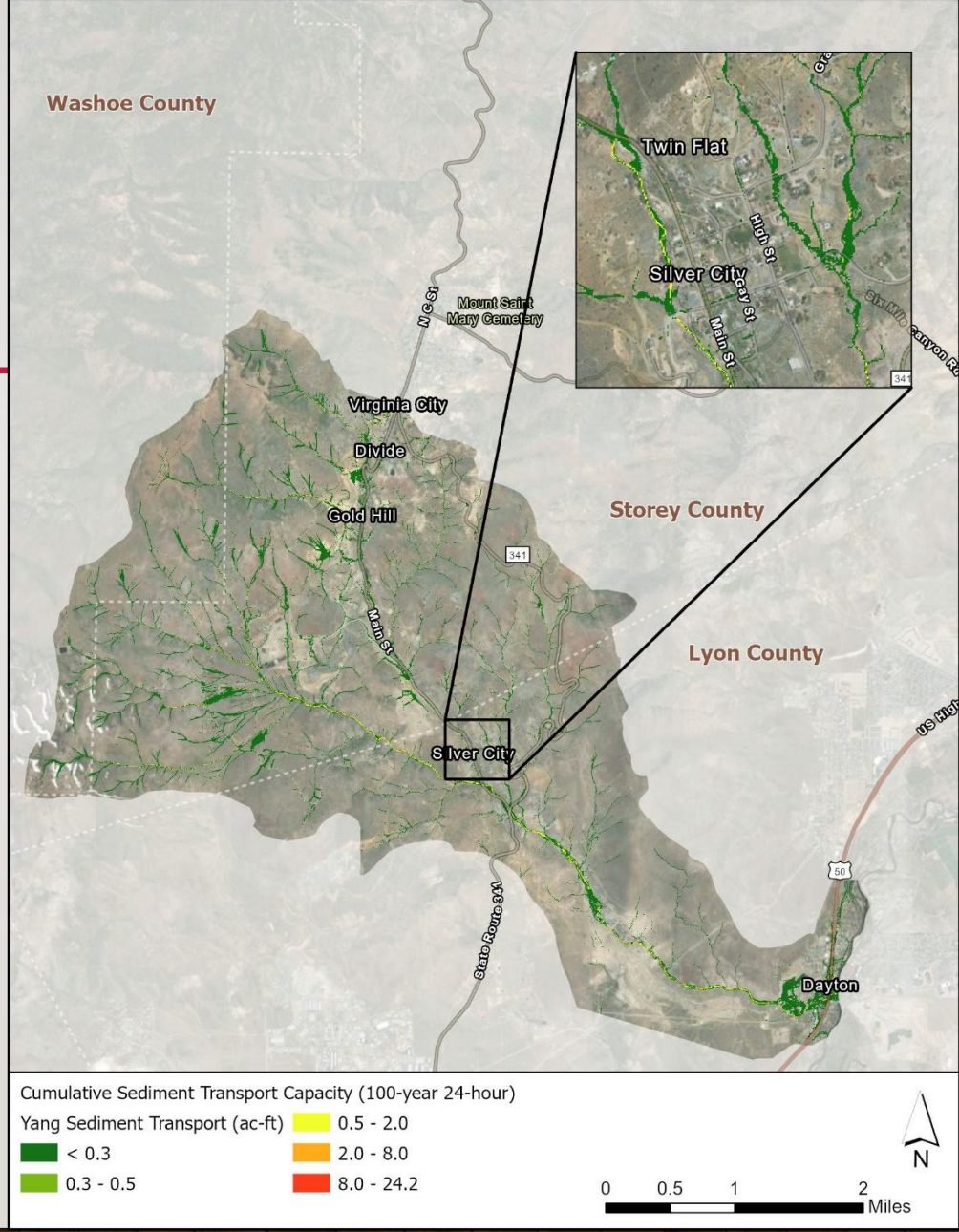


ADMP PROJECT ELEMENTS

Sedimentation Assessment

- Collected Sediment Samples
- Sediment Transport Analysis

Pike Street (Dayton)
January 2017

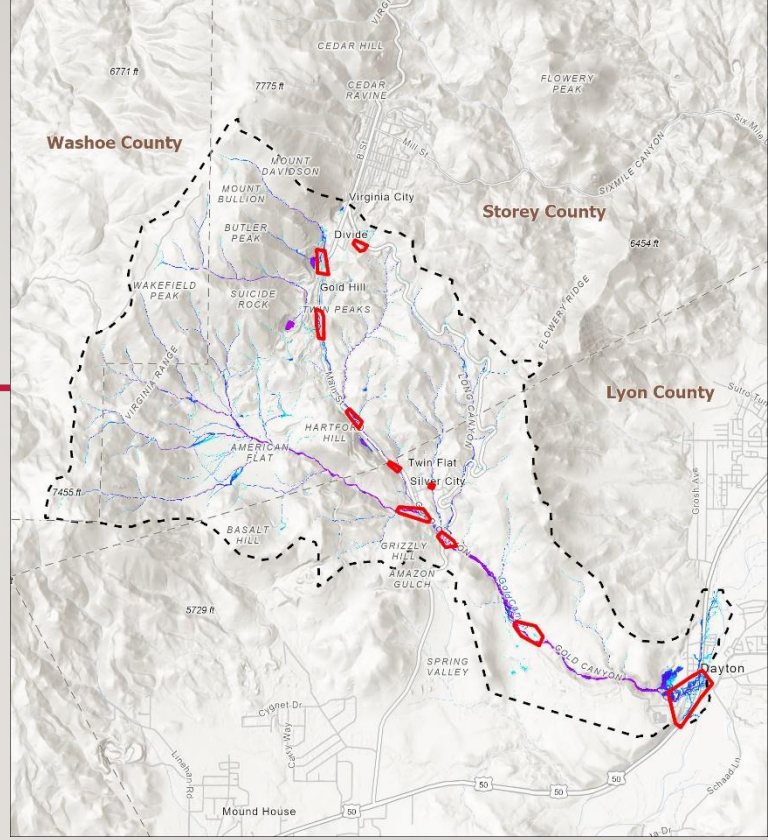


ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Identify Areas with Flooding/Sediment Issues

- Mitigation for the 25-year | 100-year storms
- Conceptual Design Plans



10 Areas Initially Identified → 6 Areas Selected for Further Analysis → 9 Potential Projects Selected for Concept Design

ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Storey County

- **Area 5**
  - **Project 1** – Divide Option 1: New culvert at Ophir Grade and open channel conveying runoff directly into a large open pit mine.
  - **Project 2** – Divide Option 2: Pipe inlet upstream of SR 342 with storm drain along N Main Street discharging to the mine.
  - **Project 3** – Divide Option 3: Grate inlet and storm drain along SR 342 discharging to the mine.
- **Area 4**
  - **Project 4** – SR 342 East-to-West Diversion System: Open channels and culverts capturing flow east of SR 342 and conveying beneath the highway to improved west-side channels.
- **Area 7**
  - **Project 5** – Channel and Culvert Improvements with Diversion: Culvert and channel upgrades with diversion beneath SR 342 to the mine.

ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Storey & Lyon County

- **Area 8**
  - **Project 6** – SR 342 Culvert Improvements: Upgrade existing culverts to reduce or eliminate overtopping.

ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Lyon County

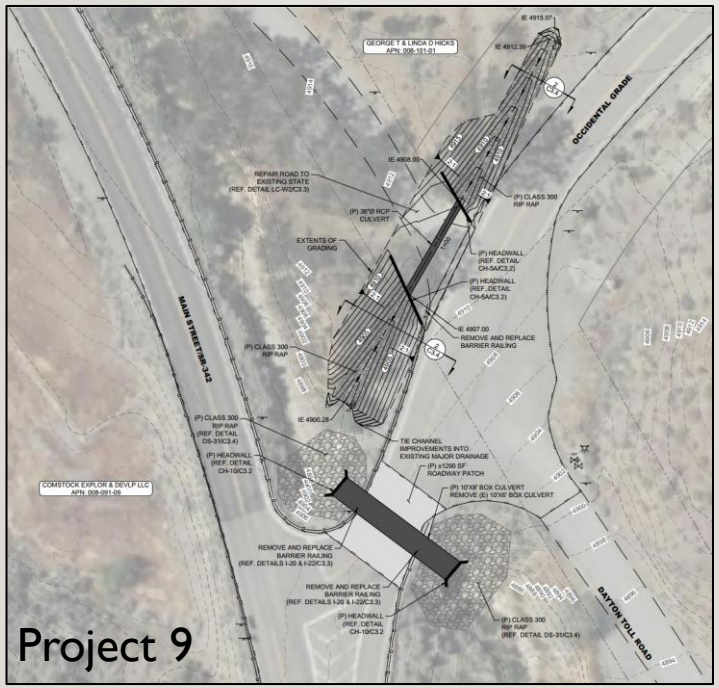
- **Area 3**
  - **Project 7** – American Ravine / Gold Canyon Confluence Improvements: Culvert and downstream channel improvements to reduce floodplain impacts.
- **Area 2**
  - **Project 8** – SR 342 / SR 341 Intersection (Option 1): Culvert upgrades at the intersection, downstream channel improvements, and Dayton Toll Road culvert improvements.
  - **Project 9** – SR 342 / SR 341 Intersection (Option 2): Construction of a retention basin west of SR 342 with upstream diversion and potential downstream improvements.

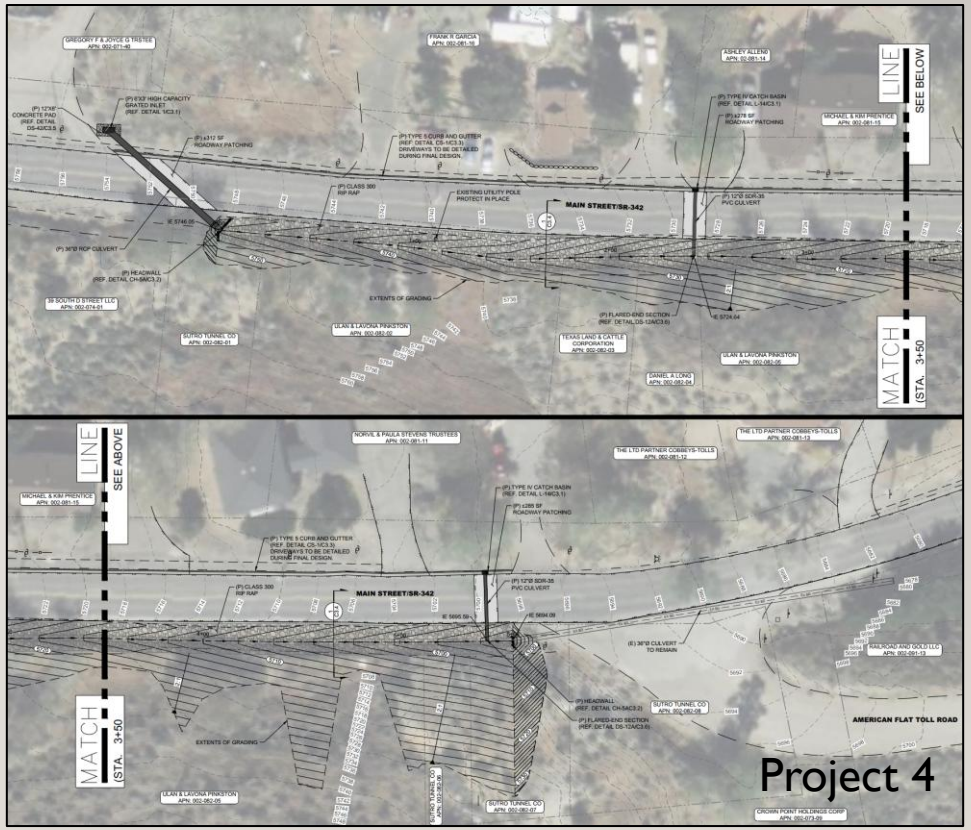
ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Projects Selected for Concept Design

- **Project 4**
  - **100-year**
- **Project 6**
  - **25- and 100-yr**
- **Project 9**
  - **25-year**





ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Project Benefits

ID	Mitigation Alternative	Design Level	Area of Reduced WSE (acres)		Buildings with Reduced Risk	
			25-yr Storm	100-yr Storm	25-yr Storm	100-yr Storm
Project 4	SR-342 East-to-West Diversion System	100-yr	2.97	2.97	8	8
Project 6	SR-342 Culvert Improvements	25-yr	0.48	0.74	0	0
		100-yr	0.93	1.10	0	0
Project 9	SR-342/SR-341 Culvert Improvements	25-yr	1.19	1.87	0	0

ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Project Costs

ID	Mitigation Alternative	Project Cost	O&M Cost (over 20 years)	20-year Net Present Values
Project 4 (100-yr)	SR-342 East-to-West Diversion System	$ 1,077,600	$ 49,500	$ 1,127,100
Project 6 (25-yr)	SR-342 Culvert Improvements	$ 591,600	$ 49,500	$ 641,100
Project 6 (100-yr)	SR-342 Culvert Improvements	$ 1,081,200	$ 49,500	$ 1,130,700
Project 9 (25-yr)	SR-342/SR-341 Culvert Improvements	$ 986,400	$ 49,500	$ 1,035,900

ADMP PROJECT ELEMENTS

Flood Mitigation Alternatives

Potential Funding Sources

Grant	Funding Agency	Qualifications
Pre-Disaster Mitigation (PDM)	FEMA	FEMA approved Hazard Mitigation Plan.
Flood Mitigation Assistance (FMA)	FEMA	Structures insured under the NFIP. Projects submitted for consideration must be consistent with the goals and objectives identified in the agency's Hazard Mitigation Plan.
Hazard Mitigation Grant Program (HMGP)	FEMA	Presidential Major Disaster Declaration. 25% cost share from applicant.
Building Resilient Infrastructure and Communities (BRIC)	FEMA	Upgrading and modernizing the nation's infrastructure against the growing risks to communities and the need for natural hazard risk mitigation activities to promote resilience for natural hazards.
Watershed Protection and Flood Prevention Operations (WFPO) Program	NRCS (USDA)	To qualify for the NRCS Watershed Protection and Flood Prevention Operations (WFPO) Program, projects must have a public sponsor such as a state, local, or tribal government entity and be located within a watershed of 250,000 acres or less.
NDOT Cost Share	Counties/NDOT	Several projects are within NDOT jurisdiction.

ADMP PROJECT ELEMENTS

Public Meetings and Outreach

- Open House – May 13, 2025
- Meeting #2 – Tonight
  - Present project results, mitigation alternatives
- CWSD Board
- Lyon/Storey County Commissioner Meetings