

A white car is partially submerged in turbulent, blue water. The car is tilted, with its roof and rear window visible above the surface. Debris, including what appears to be a log or large branch, is floating near the car. The background shows a blurred shoreline with buildings and trees under a bright sky.

Concurrent Session Flood Project Update

February 1, 2016

Jay Aldean, PE

Executive Director TRFMA

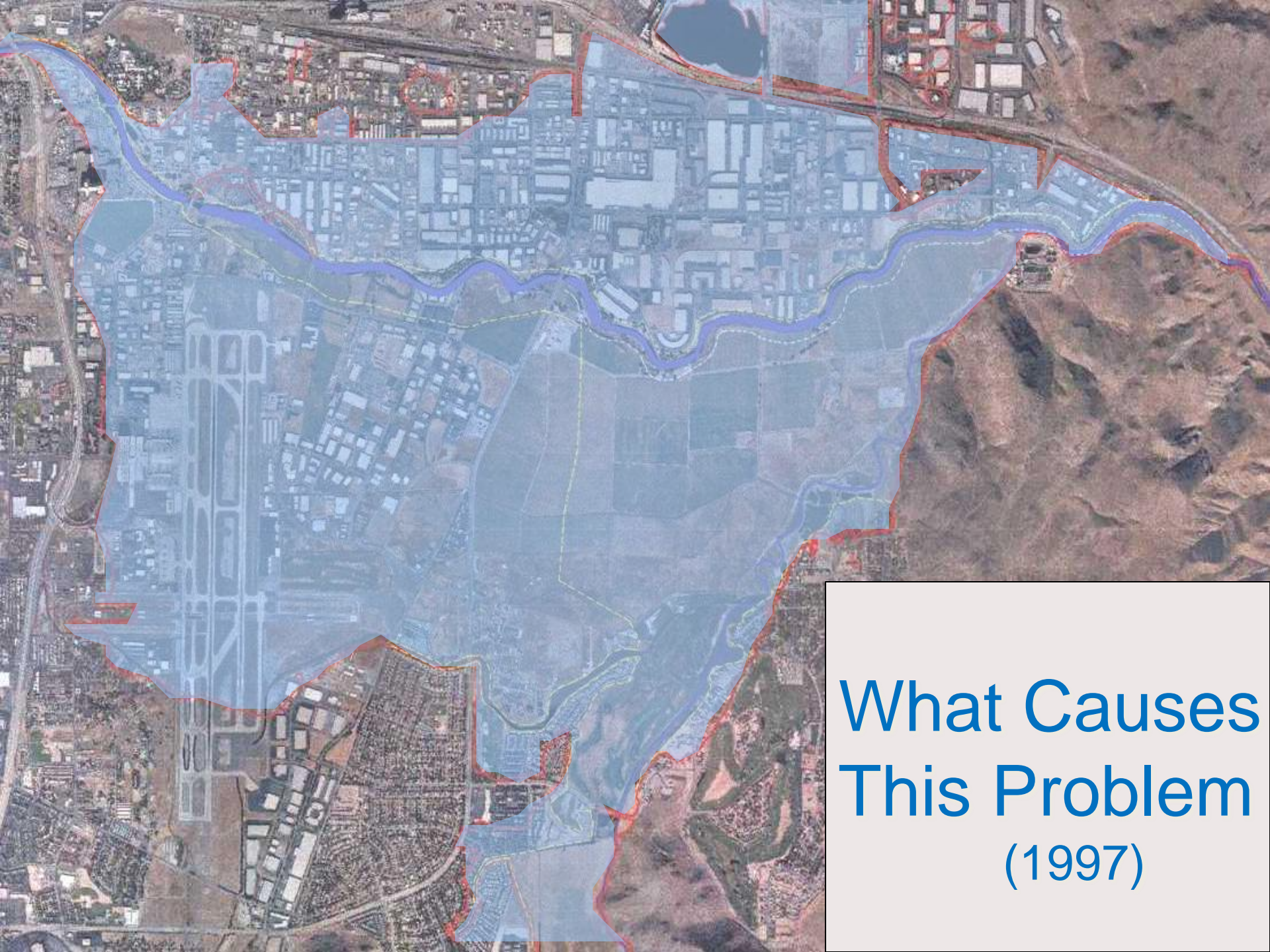
Perspective -

“Building in the floodplain is like pitching a tent in the middle of a highway when there are no cars coming.” - ASFPM

A great community enhances the quality of life -

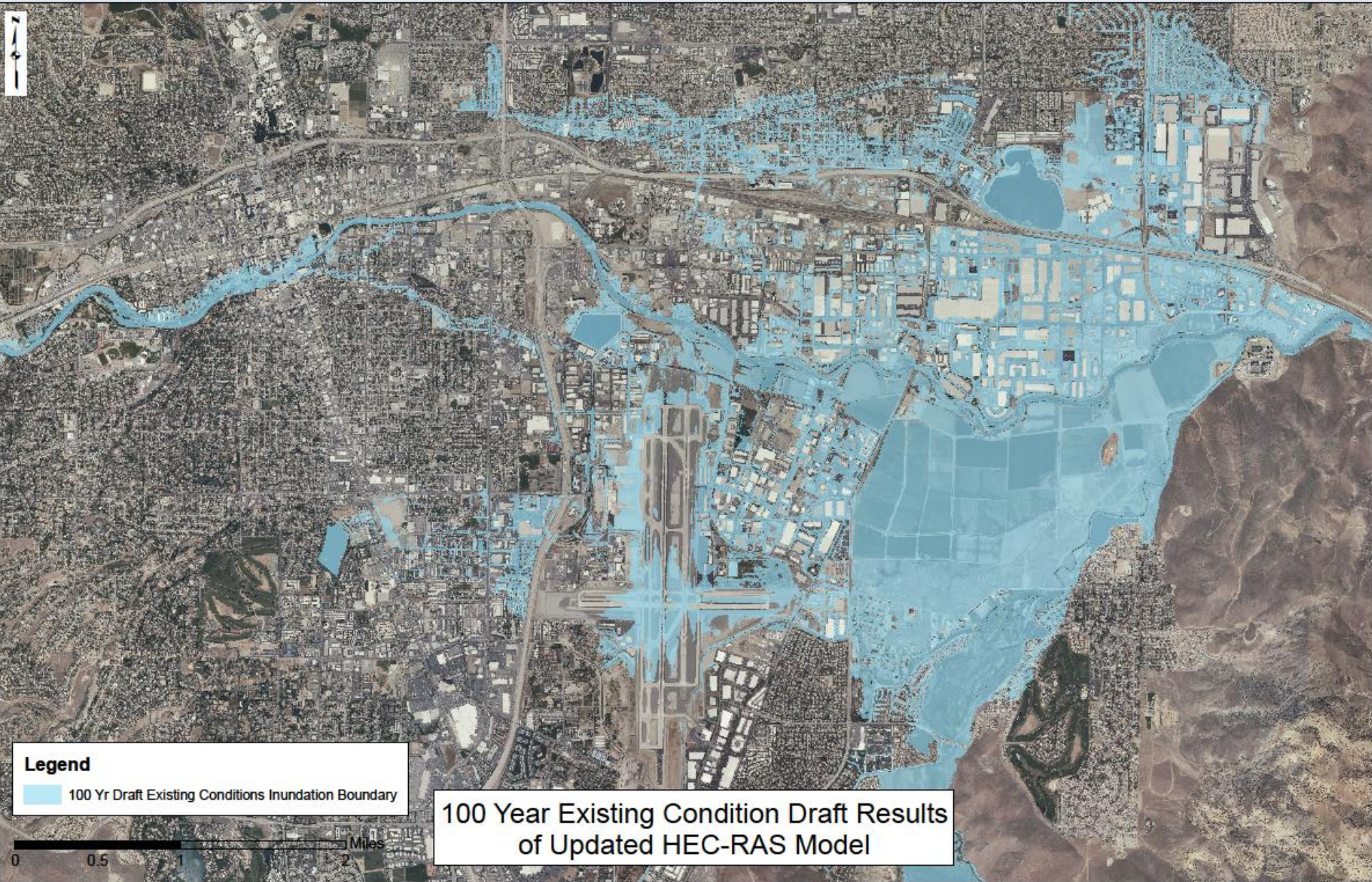


July 1929



What Causes
This Problem
(1997)

Revised 2-D Model of Existing 100-yr Floodplain



Truckee River Floodplain – view to the south

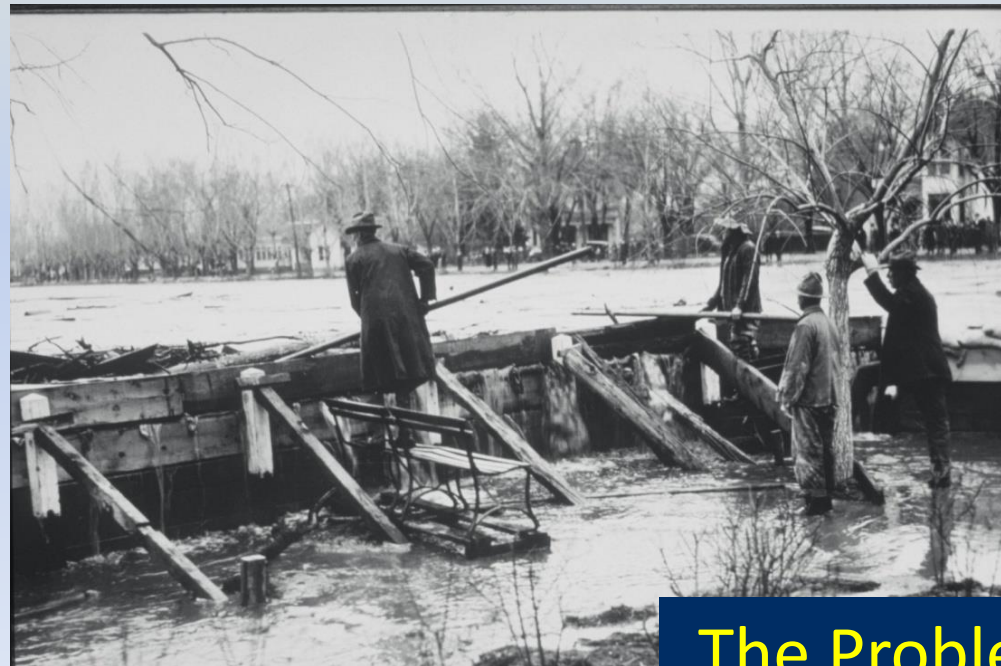
1997 Event

Airport runways appear to be open

Mill Street

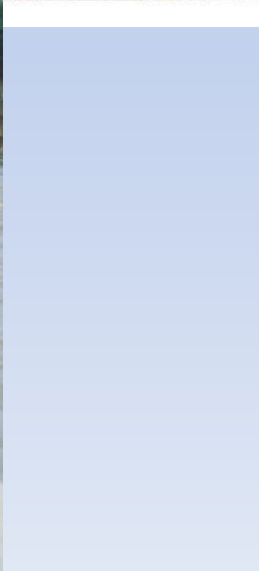
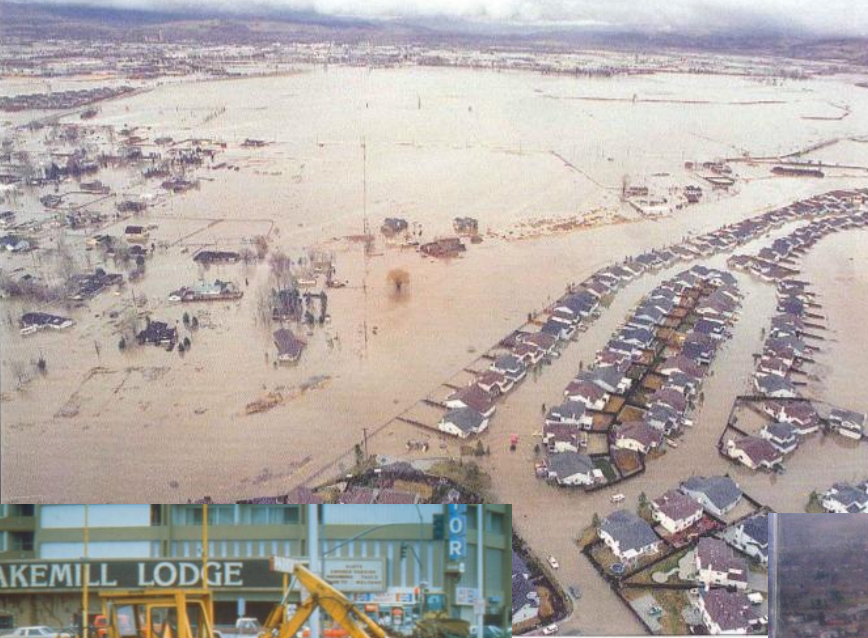
Truckee River





The Problem - 1950s

The Problem - 1997



The Problem – 1997

Reno Tahoe International Airport



The Problem - 2005



Downtown Reno¹ Flooding History

Date	Peak Flow	Return Freq.	
Early 1862 - Ark Storm		double 100yr	
March 18, 1907	18,500 cfs	90 yr	
January 16, 1909	10,100 cfs	30 yr	
March 26, 1928	18,800 cfs	90 yr	
December 11, 1937	17,000 cfs	80 yr	
November 21, 1950	19,900 cfs	95 yr	
December 4, 1950	11,700 cfs	35 yr	Flood Control Act of 1954
December 23, 1955	20,800 cfs	100 yr	
February 2, 1963	18,400 cfs	90 yr	
December 23, 1964	11,300 cfs	35 yr	Water Resources Development Act of 1988
February 17, 1986	14,400 cfs	50 yr	
January 1, 1997	23,200 cfs	117 yr	Water Resources Reform & Development Act of 2014
December 31, 2005	16,400 cfs	70 yr	

¹ At the Reno Gage located just west of the Hwy 395 bridge

Next Flood?

- Do we expect a flood this year?
 - Most likely NO
 - Majority of the flood season is over
 - There has never been a flood during an El Nino
- Do we expect a major flood soon (± 4 years)?
 - Most likely YES
 - ± 15 year span between major events
 - Floods tend to end droughts in the Sierra
 - Heading into a La Nina/neutral zone when floods occur

Regional Strategy

- **Critical Importance of a Regional Solution**
 - Fixes the FEMA floodplain accuracy issue
 - Provides safety to the public
 - Reduces property damages and disruptions
 - Strengthens the economy of the region
- **USACE Plan Critical to Regional Strategy**
 - Most likely never receive Federal approval for another study
 - We now plan for NO Federal \$\$ to be conservative
 - However; we likely will receive Federal reimbursement

Potential loss of life,
industry, jobs and tax
revenue to the
Region





Events, Accomplishments & Goals

2011	<ul style="list-style-type: none">▪ Corps of Engineers decides to kill the Federal project investigation
2012	<ul style="list-style-type: none">▪ Senator Reid and TRFMA staff meet with Corps to revive Federal project▪ TRFMA staff proposes dual planning strategies utilizing independent local and USACE resources▪ TRFMA approves contract w/ HDR to develop local 100-yr flood plan▪ TRFMA agrees to fund USACE's completion of GRR (50-yr plan)
2013	<ul style="list-style-type: none">▪ TRFMA approves Local Rate Plan (100-yr flood plan)▪ TRFMA approves Downtown Reno LRP plan addition
2014	<ul style="list-style-type: none">▪ USACE recommends approval of 50-yr plan to Congress▪ Senator Reid inserts language into tentative bill to allow the Corps to accept our LRP in-lieu of their 50-yr plan (Section 1036)▪ With support from Senator Reid, Senator Heller and Congressman Amodei, Congress approves WRRDA 2014
2015	<ul style="list-style-type: none">▪ TRFMA staff directs HDR to complete remodeling of floodplain▪ TRFMA's financial consultant FCS completes analysis on flood fee's▪ TRFMA Board rejects flood fees – too expensive for some sectors▪ TRFMA staff, with lobbyist support, begin negotiations with the Corps:<ul style="list-style-type: none">▪ Review of 100-yr LRP▪ Reduce local obligation of Federal project planning costs
2016	<ul style="list-style-type: none">▪ Board members & staff met with Commercial & Industrial community▪ TRFMA staff proposes alternative funding concept

Virginia Street Bridge Replacement



North Truckee Drain Realignment



Truckee River Flood Management Authority



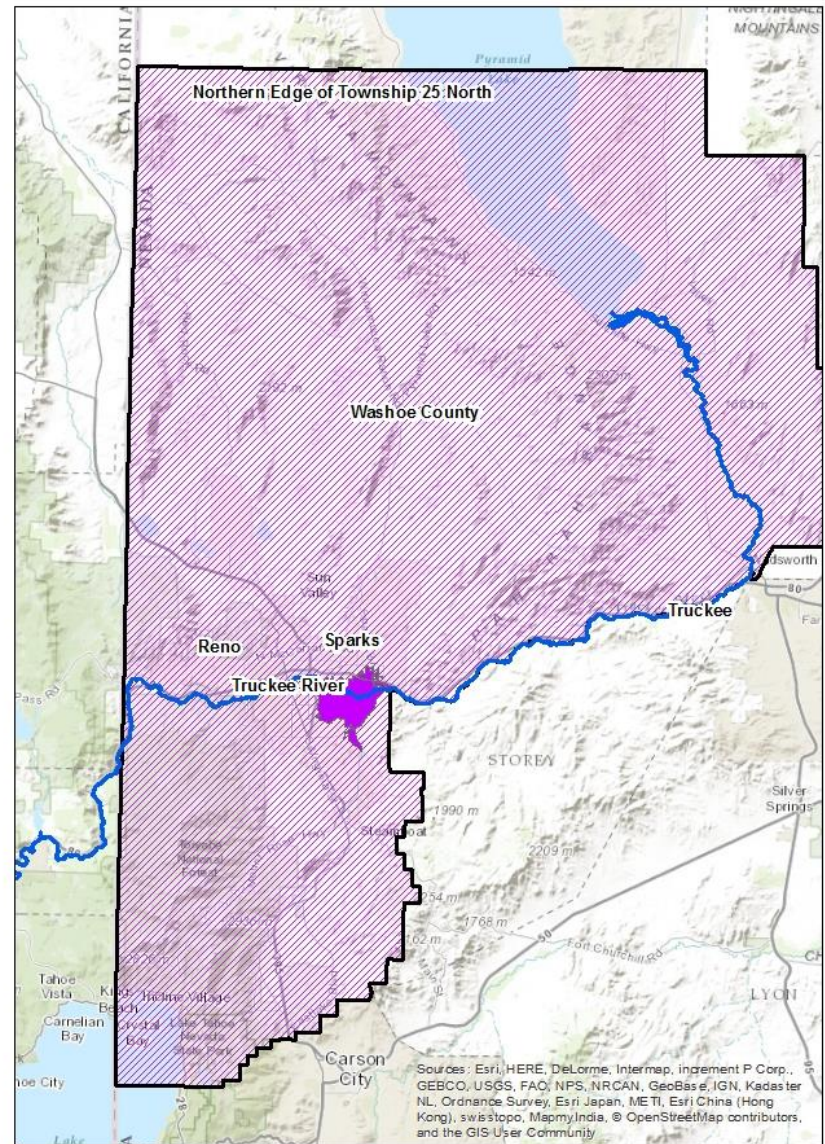
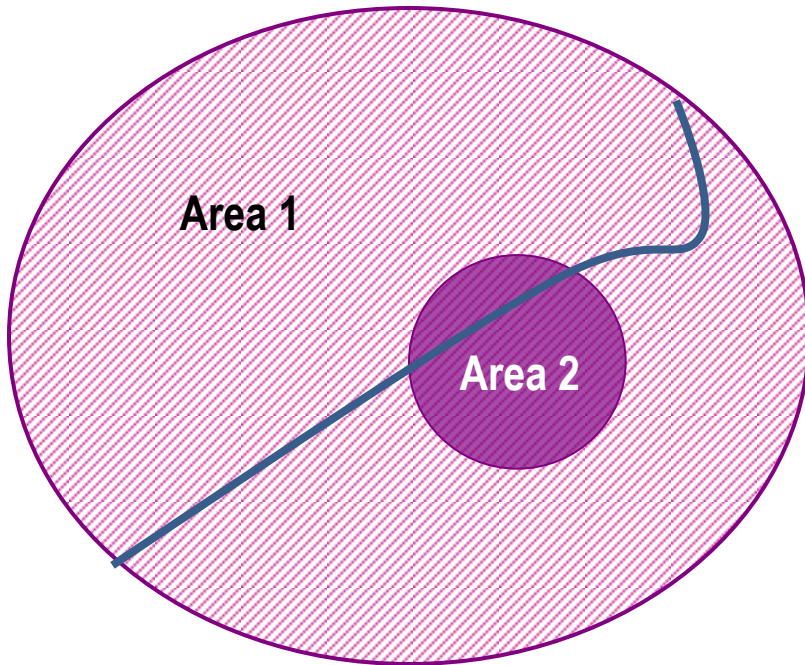
Rate Model Update

October 9, 2015



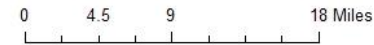
Rate Design

- ◆ Ratepayers in Area 1 (area in Washoe County south of Township 25)
- ◆ Ratepayers in Area 2 (area in existing 100-year flood zone)



Legend

- Area 1
- Area 2





Revenue Requirement Scenarios

Construction Scenarios

18-Year Construction

10-Year Construction

Construction Funding Scenarios

Pay-As-You-Go
(only for 18-Year construction)

Debt Funded Construction

State Bond Bank Bonds

TRFMA Revenue Bonds

Billing Scenarios

Billing by TRFMA
(\$2M/Year)

Billing by County Treasurer
(\$750k/Year)¹

Emergency Reserve Scenarios

\$15M Reserve by FY 2039-40²

\$43.3M Reserve by FY 2019-20³
(only for 18-year debt funded construction using state bonds with County Treasurer billing)

- 1 Billing by County Treasurer requires state legislative amendment
- 2 Proposed replacement reserve
- 3 Interlocal Cooperative Agreement (ICA) reserve requirement



Estimated Monthly Rates

Scenario Comparison	Scenario 1	Scenario 2A	Scenario 2B	Scenario 3A	Scenario 3B	Scenario 3C
Construction Period	18 years	18 years	10 years	18 years	10 years	18 years
Rate Duration	18 years	Bond Retirement*	Bond Retirement*	Bond Retirement*	Bond Retirement*	Bond Retirement*
\$2M Annual Cost of Billing Scenario						
First Year Revenue Requirement	\$24,155,661	\$19,850,000	\$30,100,000	\$17,000,000	\$25,800,000	
Area 1 Rate per SFD – Residential	\$9.46	\$7.77	\$9.84	\$6.66	\$8.43	
Area 2 Rate per SFD – Residential	\$27.39	\$22.50	\$47.49	\$19.27	\$40.71	
Area 1 Rate per kSF - Commercial/Other	\$1.97	\$1.62	\$2.11	\$1.39	\$1.81	
Area 2 Rate per kSF - Commercial/Other	\$12.43	\$10.21	\$21.30	\$8.74	\$18.26	
\$750k Annual Cost of Billing Scenario						
First Year Revenue Requirement	\$22,791,926	\$18,700,000	\$28,900,000	\$15,850,000	\$24,500,000	\$16,980,000
Area 1 Rate per SFD - Residential	\$8.93	\$7.32	\$9.44	\$6.21	\$8.01	\$6.65
Area 2 Rate per SFD - Residential	\$25.84	\$21.20	\$45.60	\$17.97	\$38.65	\$19.25
Area 1 Rate per kSF - Commercial/Other	\$1.86	\$1.53	\$2.02	\$1.30	\$1.72	\$1.39
Area 2 Rate per kSF - Commercial/Other	\$11.72	\$9.62	\$20.45	\$8.15	\$17.34	\$8.73

- ◆ **Scenario 1:** Pay-As-You-Go Construction over 18-year period
- ◆ **Scenario 2:** Debt-funded Construction using TRFMA Revenue Bonds
 - 2A: 18-Year Construction Period
 - 2B: 10-Year Construction Period
- ◆ **Scenario 3:** Debt-funded Construction using State Bond Bank Bonds
 - 3A: 18-Year Construction Period
 - 3B: 10-Year Construction Period
 - 3C: 18-Year Construction Period with emergency reserve requirement set at \$43.3M in FY 2019-20



Pay-As-You-Go Construction, 10-Year Period

First Year Revenue Requirement with \$750k annual billing costs	\$43,864,885
Area 1 Rate per SFD – Residential	\$14.33
Area 2 Rate per SFD – Residential	\$69.21
Area 1 Rate per kSF - Commercial/Other	\$3.07
Area 2 Rate per kSF - Commercial/Other	\$31.04

10-Year Cost Allocation Summary	Residential: SFD	Commercial/ Other	Total
Area 1 (regional benefit area)	\$299,500,000	\$141,500,000	441,000,000
Area 2 (100-Yr flood boundary)	\$13,300,000	\$241,400,000	254,700,000
Overall Benefit	\$324,700,000	\$371,000,000	695,700,000

Funding Alternative

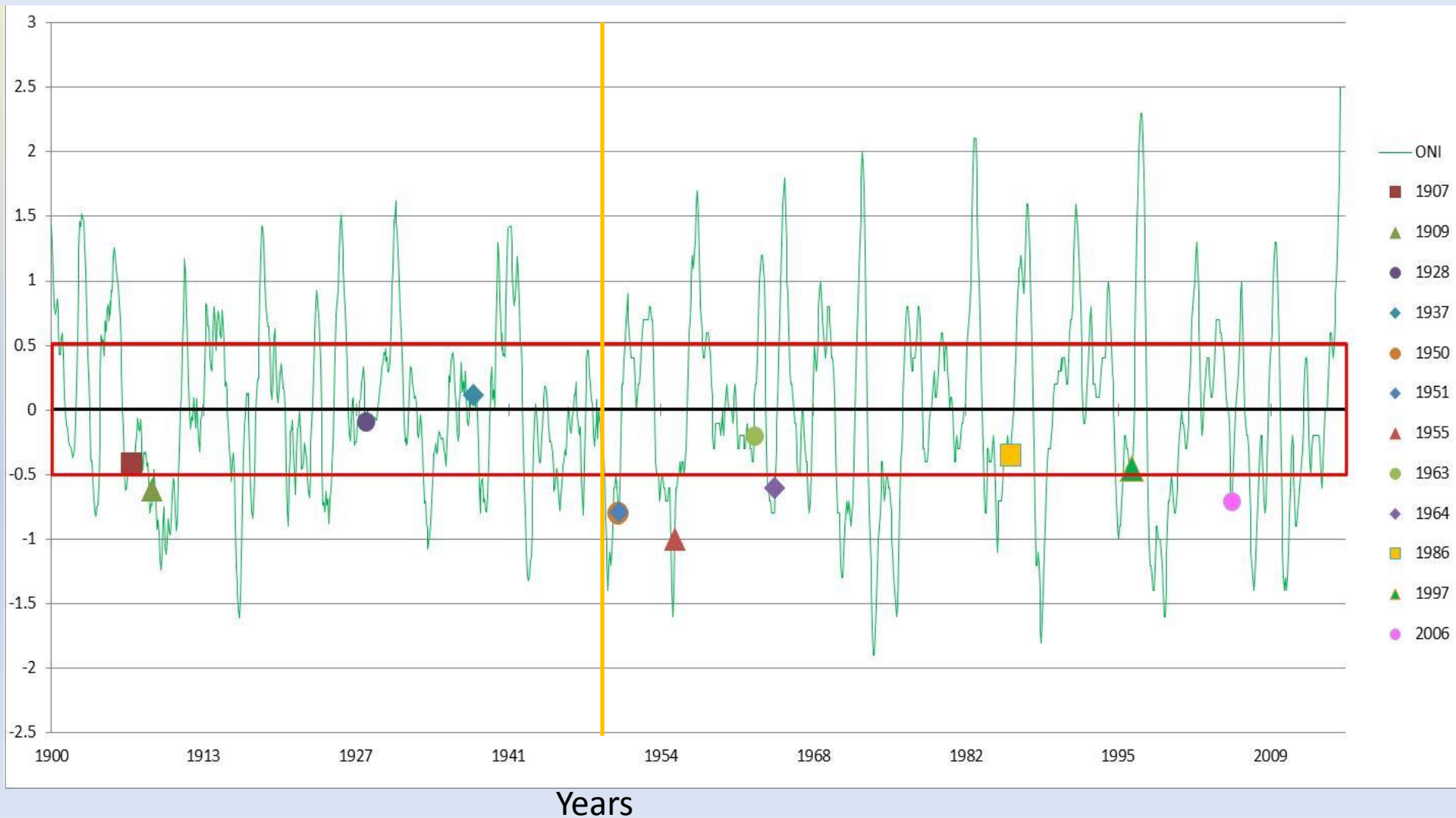
- Hybrid funding concept
 - Fee imposed on the direct benefit area
 - Those gaining the most pay the most
 - Legal arguments support direct pay fee
 - Sales tax
 - Recognizes regional benefits to the project
 - Captures the regional nature of the flood project by passing portion of funding to regional users / tourists
 - Most all flood improvements are funded by sales tax

A Challenge

Elected officials are obligated to provide flood prevention infrastructure for our community to protect the citizens and enhance the quality of life

End of Presentation

Oceanic Niño Index – 115 yr Extrapolation



Operations and Maintenance Assumptions

Assumption Category	Assumptions
Operations and Administration	<ul style="list-style-type: none"> ◆ Wages & Benefits: ≈ \$1.07M in FY 2015-16 ◆ Services & Supplies: ≈ \$2.8M in FY 2015-16 <i>(lowers to 25% of wages and benefits after construction period)</i> ◆ Billing & Collections (costs dependent on scenario) <ul style="list-style-type: none"> - \$2.0M in FY 2017-18 = Billing by TRFMA - \$750k in FY 2017-18 = Billing by County Treasurer¹ ◆ Expenses increase with general cost inflation
Maintenance	<ul style="list-style-type: none"> ◆ 0.2% of asset value net of LERRDs² (\$62k – \$1M) until construction is complete ◆ \$4M after construction completed
Other Income	<ul style="list-style-type: none"> ◆ Sales tax revenue: \$6M per year <i>(increases by 4.0% – 6.0% per year)</i> <ul style="list-style-type: none"> - Additional \$1.4M in FY 2027-28 because of retired bonds ◆ Miscellaneous: \$20k per year

1 Billing by County Treasurer requires state legislative amendment

2 LERRDS: Land, Easements, Rights-of-Way, Relocations, and Disposal Areas

Construction Assumptions

Assumption Category	Assumptions
Capital Cost	<ul style="list-style-type: none"> ◆ Flood projects: \$412M total cost (2013 dollars) <ul style="list-style-type: none"> - Includes \$67M for LERRDs¹ ◆ FY 2015-16 capital projects: \$10M (for Virginia St. Bridge)
Construction Period	<ul style="list-style-type: none"> ◆ 10 or 18 Years ◆ Construction begins in FY 2017-18
Capital Cost Inflation	<ul style="list-style-type: none"> ◆ 3.00% per year
LERRD Cost Inflation	<ul style="list-style-type: none"> ◆ Initially 4.0% per year decreasing to 2.8% per year (<i>based on growth in assessed value</i>)

Real project costs are spread evenly over the construction period (nominal values escalate)

1 LERRDS: Land, Easements, Rights-of-Way, Relocations, and Disposal Areas

Escalation/Reserve Assumptions

Assumptions Category – Escalators	Assumptions
General Cost Inflation	◆ 1.93% - 3.50%
Customer Growth Rate	◆ 1.14% – 1.91%
Sales Tax Revenue Growth	◆ 6.00% first two years - 4.00% thereafter
Interest Earnings Rate	◆ 1.50% - 3.25%
Assumptions Category – Reserves	Assumptions
Operating Reserve	◆ 25% of Annual Operating Expenses ¹
Construction Reserve	◆ No Minimum
Emergency Replacement Reserve	◆ Dependent on scenario: - \$15M by 2039-40 ² - \$43.3M by 2019-20 ¹
Bond Reserve	◆ Depends on Bond Type

1 Requirements per Interlocal Cooperative Agreement (ICA)

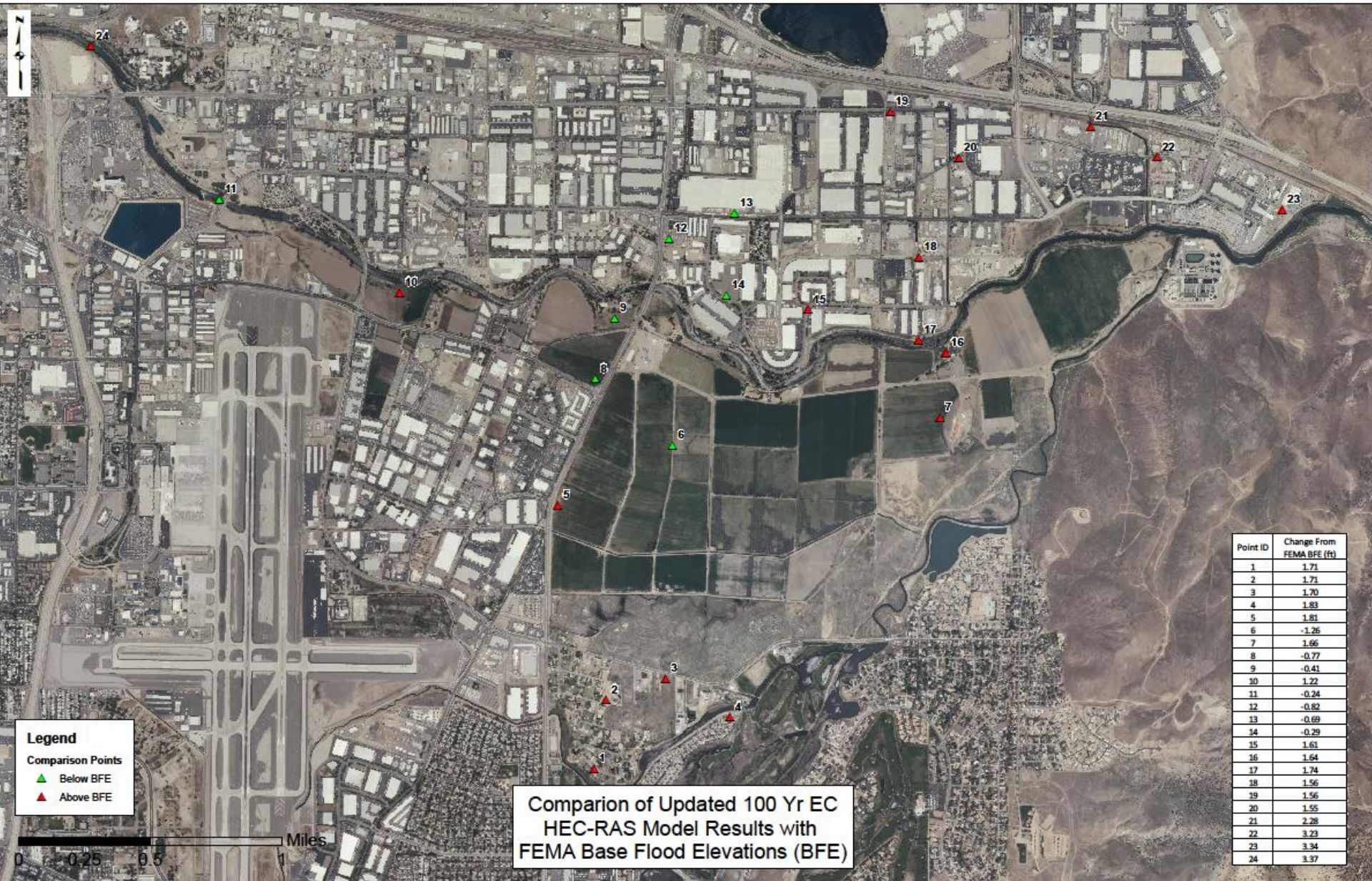
2 Proposed replacement reserve

Debt Assumptions

Debt Parameters	State Bond Bank ¹	Revenue Bonds
Issuance Costs (% of Amount Issued) -Includes underwriters discount (0.5% of par) and issuance fees	1.08%	0.79%
Interest Rate	5.83%	6.05%
Repayment Period (Years)	30	30
Reserve Req. (<i>Multiple of Annual DS</i>)	N/A	1.0
Coverage Req. (<i>Multiple of Annual DS</i>)	1.20 ²	1.50

1 State bond bank bond requirements (coverage requirement, reserve requirement, etc.) can be negotiated with the State.

2 Coverage requirement minimum mandated by ICA.



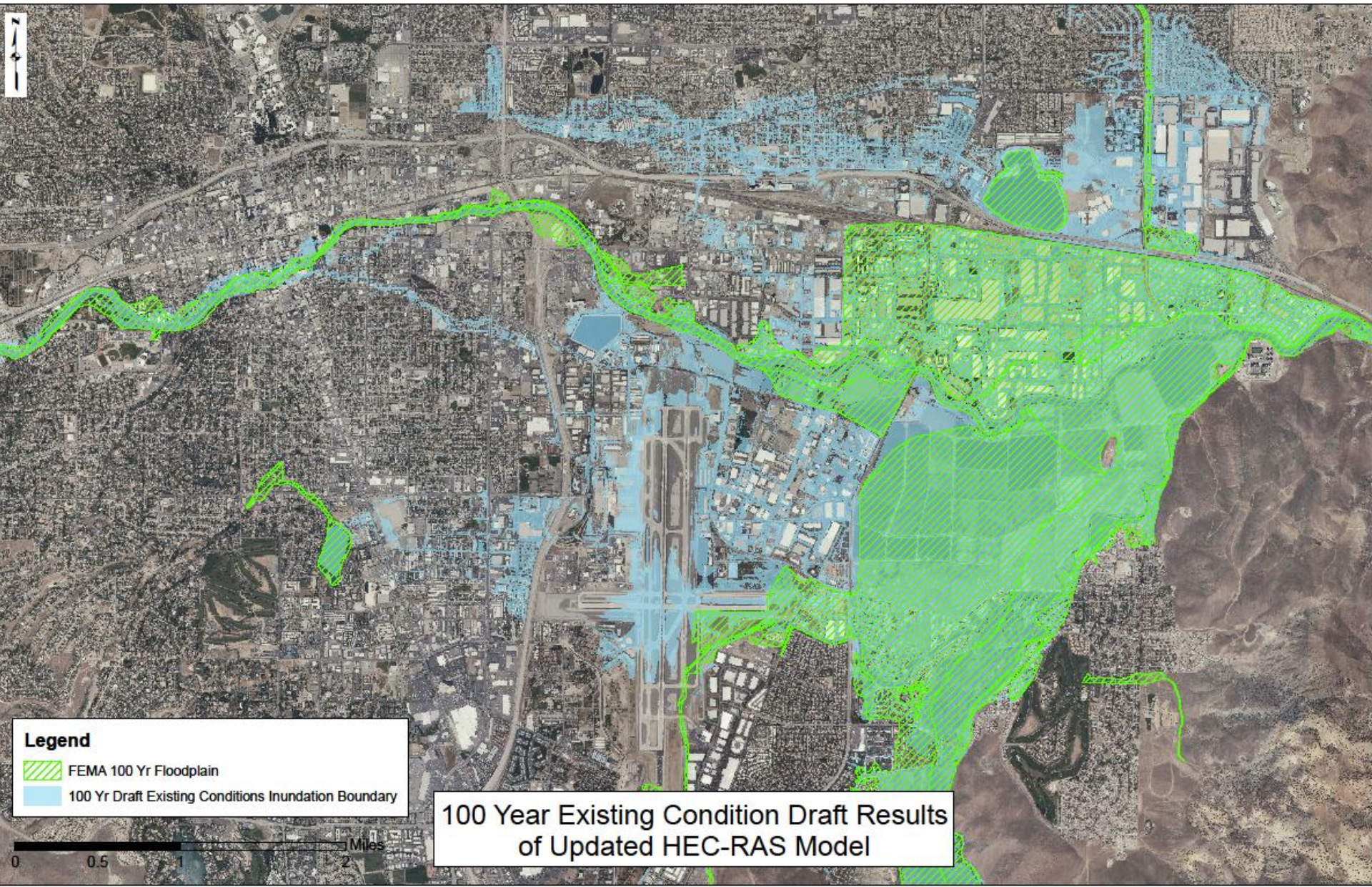
Legend

Comparison Points

- ▲ Below BFE
- ▲ Above BFE

Comparison of Updated 100 Yr EC HEC-RAS Model Results with FEMA Base Flood Elevations (BFE)

Point ID	Change From FEMA BFE (ft)
1	1.71
2	1.71
3	1.70
4	1.83
5	1.81
6	-1.26
7	1.66
8	-0.77
9	-0.41
10	1.22
11	-0.24
12	-0.82
13	-0.69
14	-0.29
15	1.61
16	1.64
17	1.74
18	1.56
19	1.56
20	1.55
21	2.28
22	3.23
23	3.34
24	3.37



Legend
FEMA 100 Yr Floodplain
100 Yr Draft Existing Conditions Inundation Boundary

100 Year Existing Condition Draft Results
of Updated HEC-RAS Model