

More Than a Loss Estimator

Using Hazus as a Tool for Drainage Master Planning

Geoff Brownell, P.E., CFM



What is Hazus?

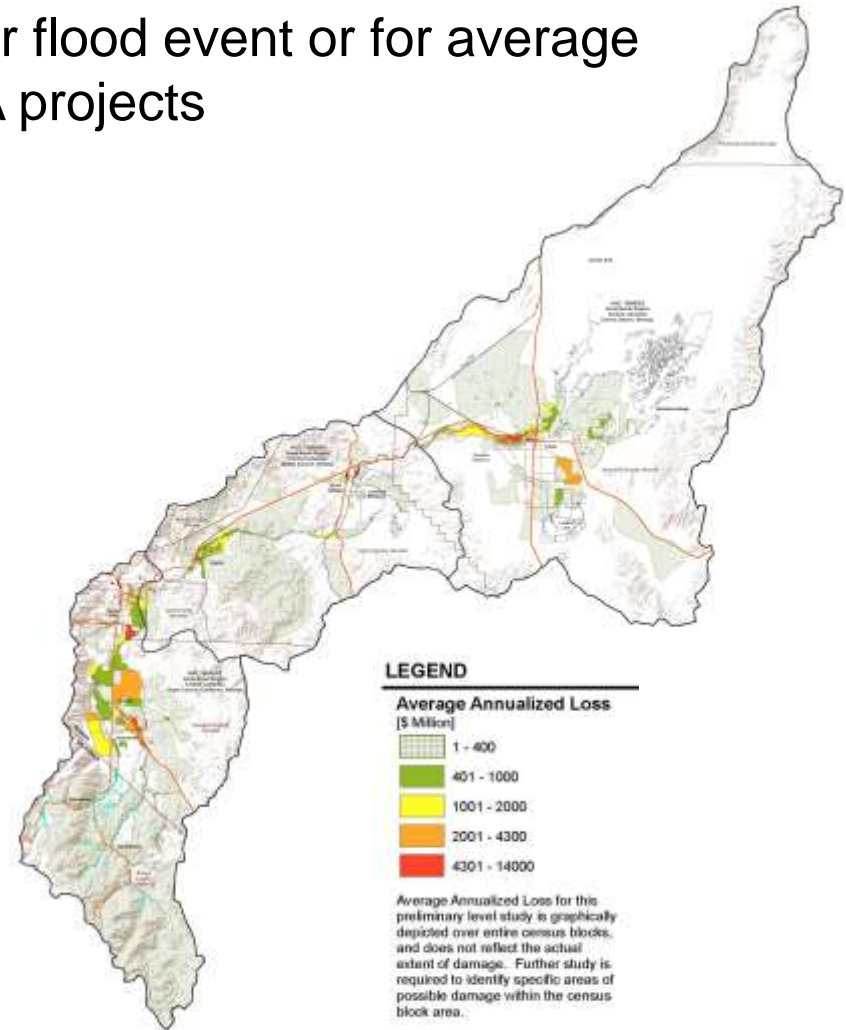
Hazus is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes.



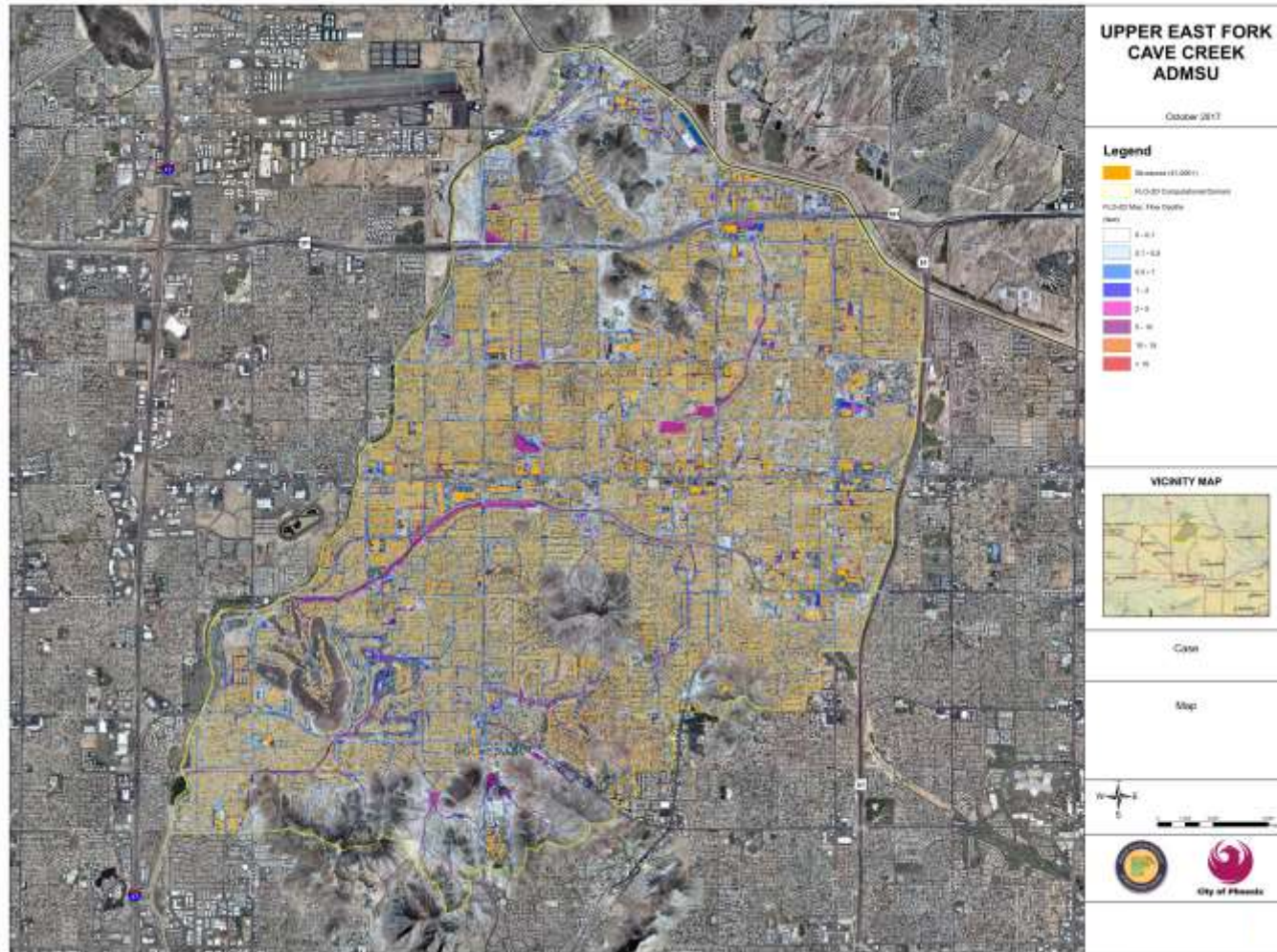
FEMA



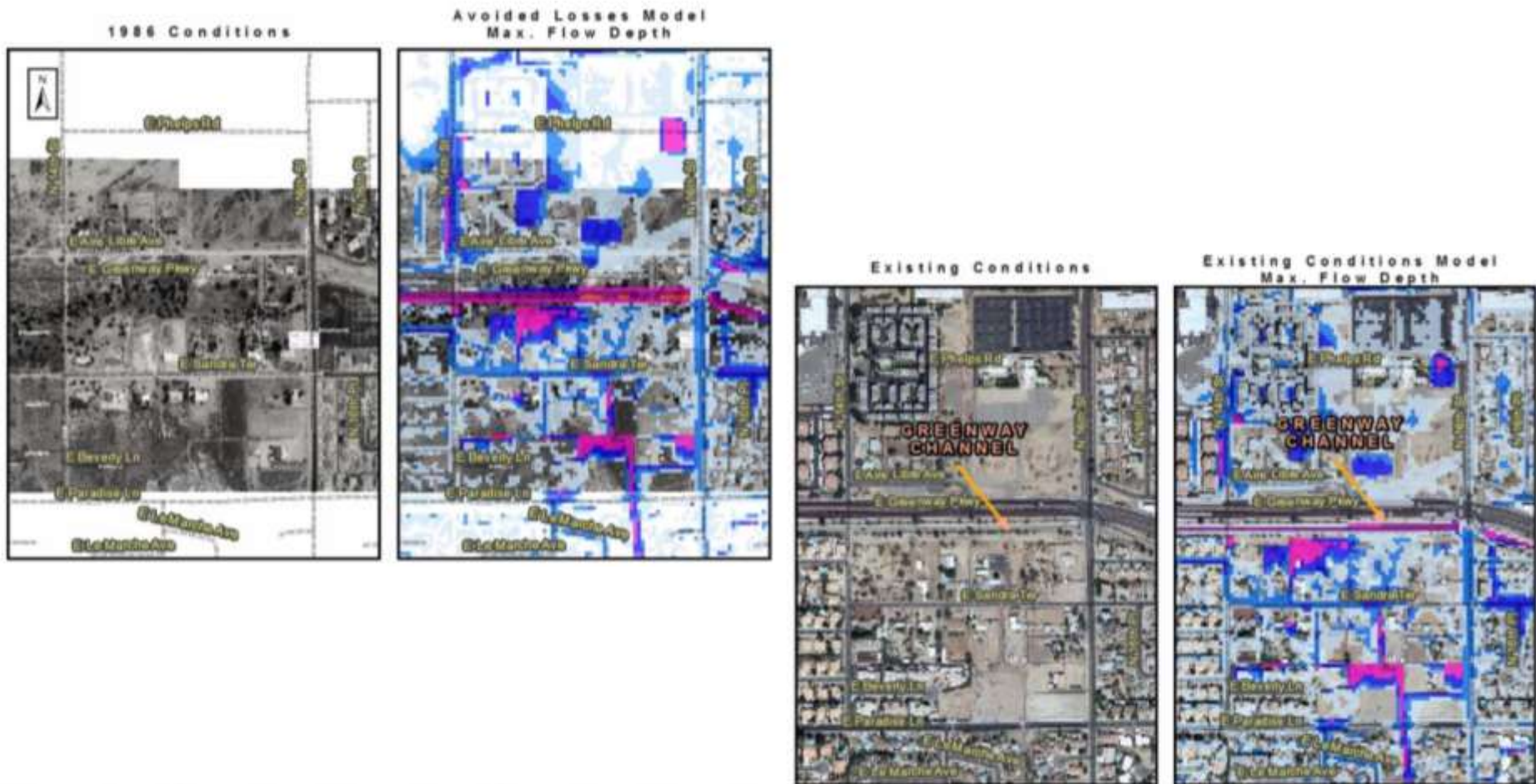
WATERSHED LOCATION



Upper East Fork Cave Creek ADMS



Upper East Fork Cave Creek ADMS – Avoided Loss Analyses



Ahwatukee Foothills ADMP

- Hazus used to quantify the economic benefit of recommended alternatives



- Existing vs. Proposed
 - 10-year
 - 100-year



Gila Bend ADMP

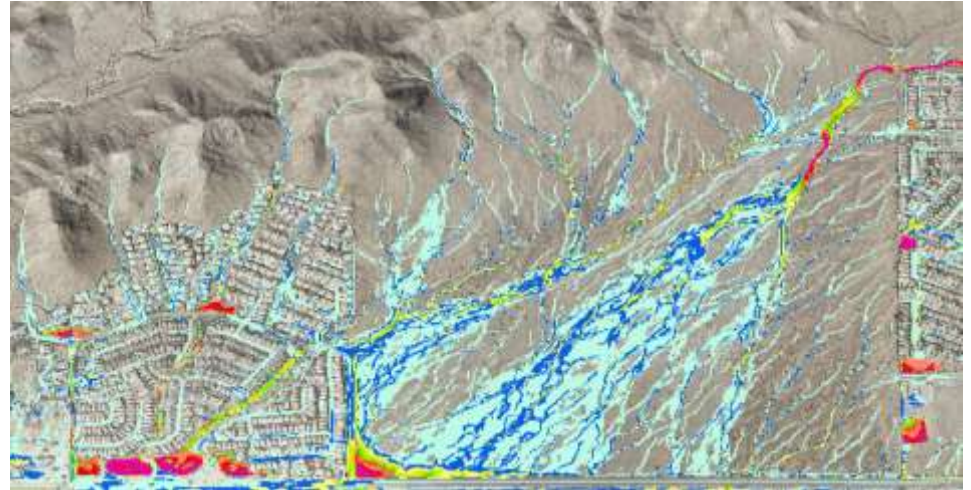
- Hazus used to help determine which improvements provide the most benefit for construction phasing



What Do You Need?

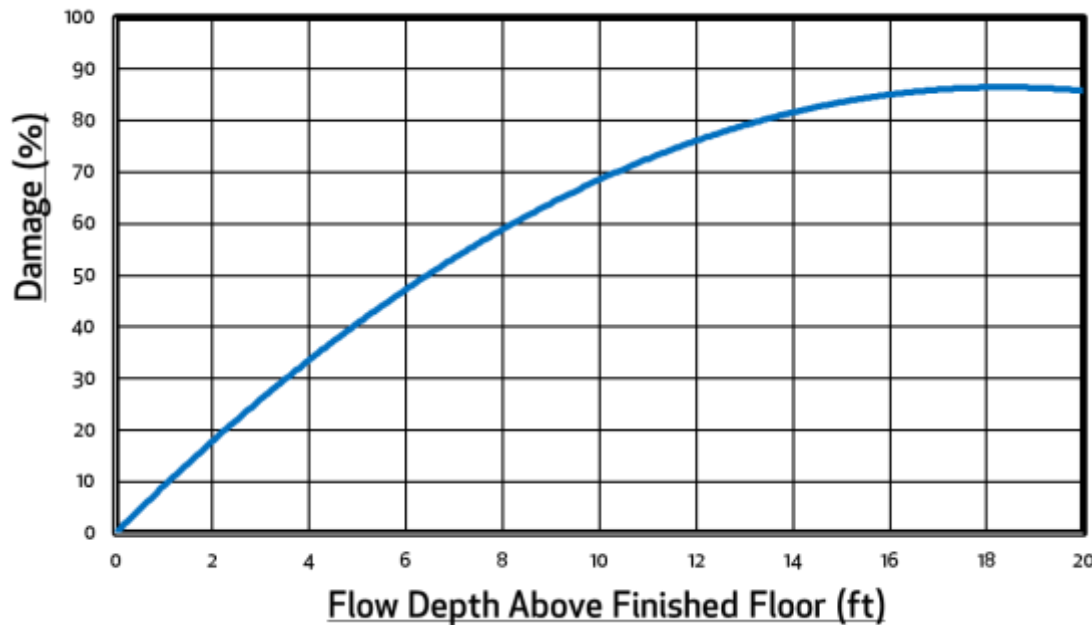
■ Level II or Enhanced Analysis

- Depth Grids
 - FLO-2D
 - HEC-RAS
- Building Polygons
- Finished Floors
- Valuation Data



Challenges

- Determining finished floor elevations
- Building valuation and replacement costs
- Appropriate depth/damage curves



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301-78-940

Owner Information

Owner Name:
Property Address: 15847 S 22ND ST PHOENIX 85048
Mailing Address: 15847 S 22ND ST PHOENIX AZ 85048
Deed Number: 180788844
Sale Date: 8/31/2011
Sale Price: \$1,450,000

Property Information

Lat/Long: 33.502051, -112.036872
S/T/D: 34 TS SE
Jurisdiction: PHOENIX
Zoning: DE-35
Lot Size (sq ft): 51,732
MCD #: 448-50
Subdivision: PARCEL 1C AND 37 AT THE FOOTHILLS
Lot #: 43
Floor: 1
Construction Year: 2005
Living Space (sq ft): 6,160

Valuation Information

Tax Year:	2018	2017
FCV:	\$1,414,300	\$2,446,000
UPV:	\$1,581,181	\$3,315,410

RSMeans data
from **GORDIAN**®

Determining Finished Floor Elevations

- Easy if only a couple of structures, not so easy for regional-type studies
- Different building standards, depending on year of construction
- Varying conditions in steeper terrain
- Sunken rooms



Determining Finished Floor Elevations

Google Earth Street View



Google Earth 3D Buildings



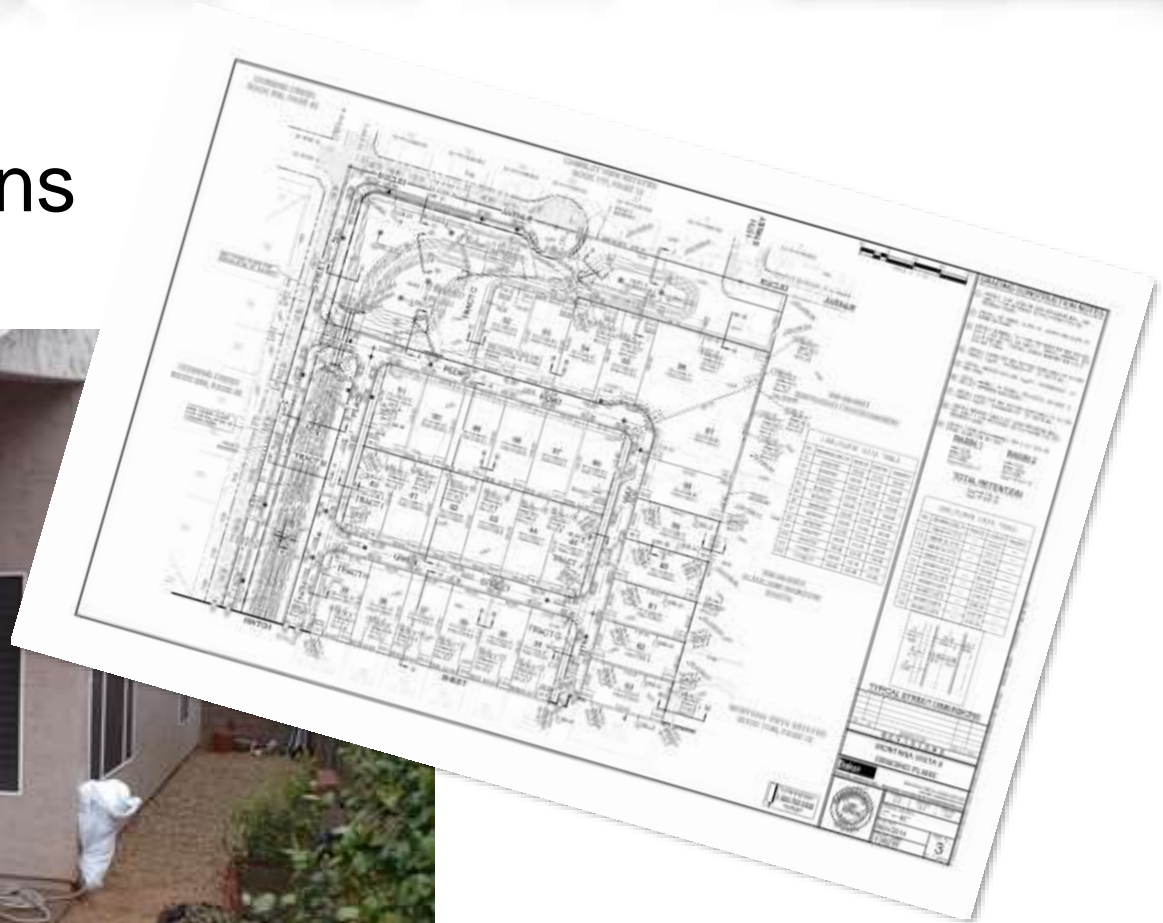
Windshield Surveys



Mobile LiDAR



Field surveys/plans



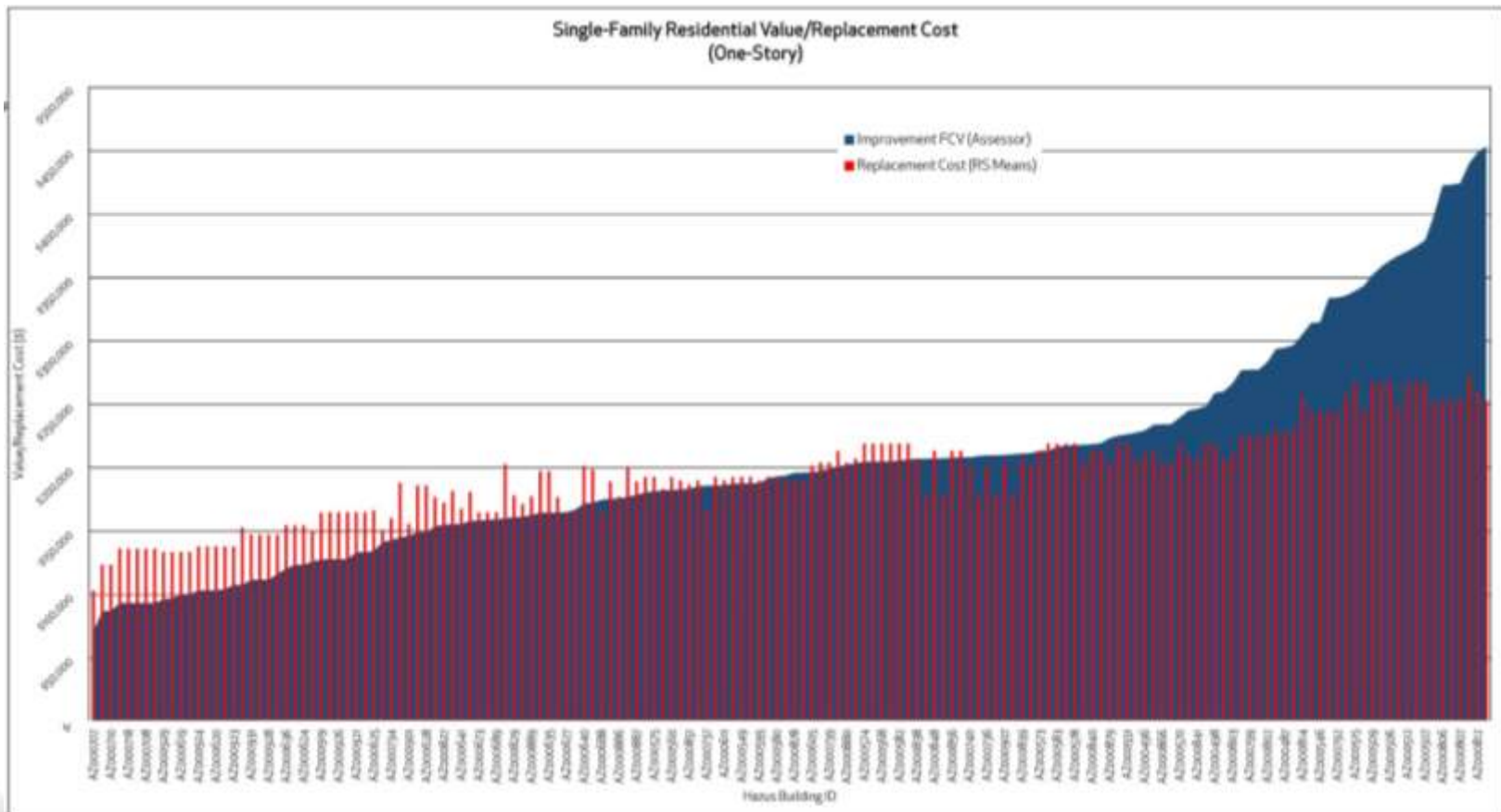
Determining Finished Floor Elevations

- Rules of thumb
- Tract Home – 3”
- Mobile Home – 3’



Building Valuation and Replacement Cost

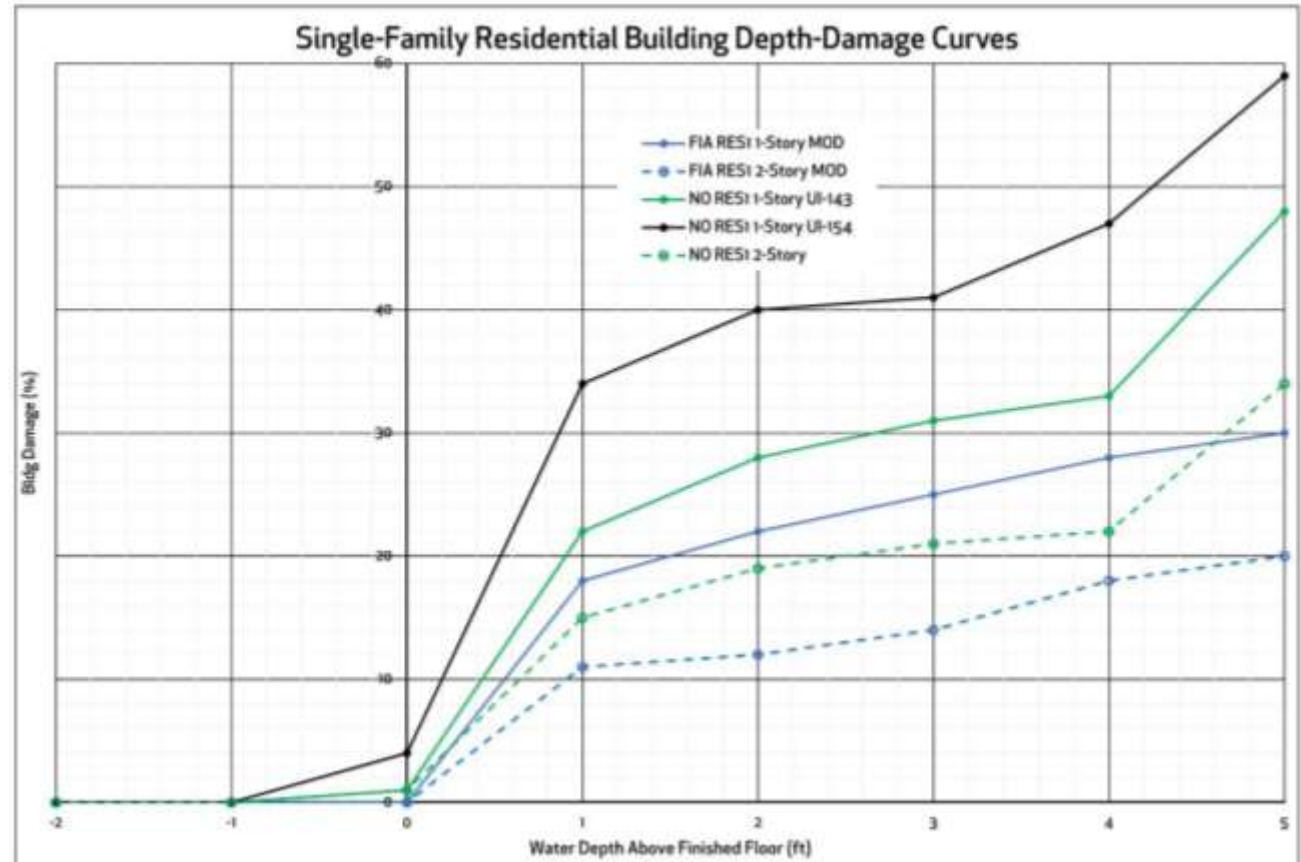
- RS Means vs Assessor's data
- Cost to construct vs valuation
- Neither are replacement cost



Appropriate Depth/Damage Curves

Hazus comes with predefined depth/damage curves

- Many to choose from, not a lot of metadata



Ahwatukee Foothills ADMS/P

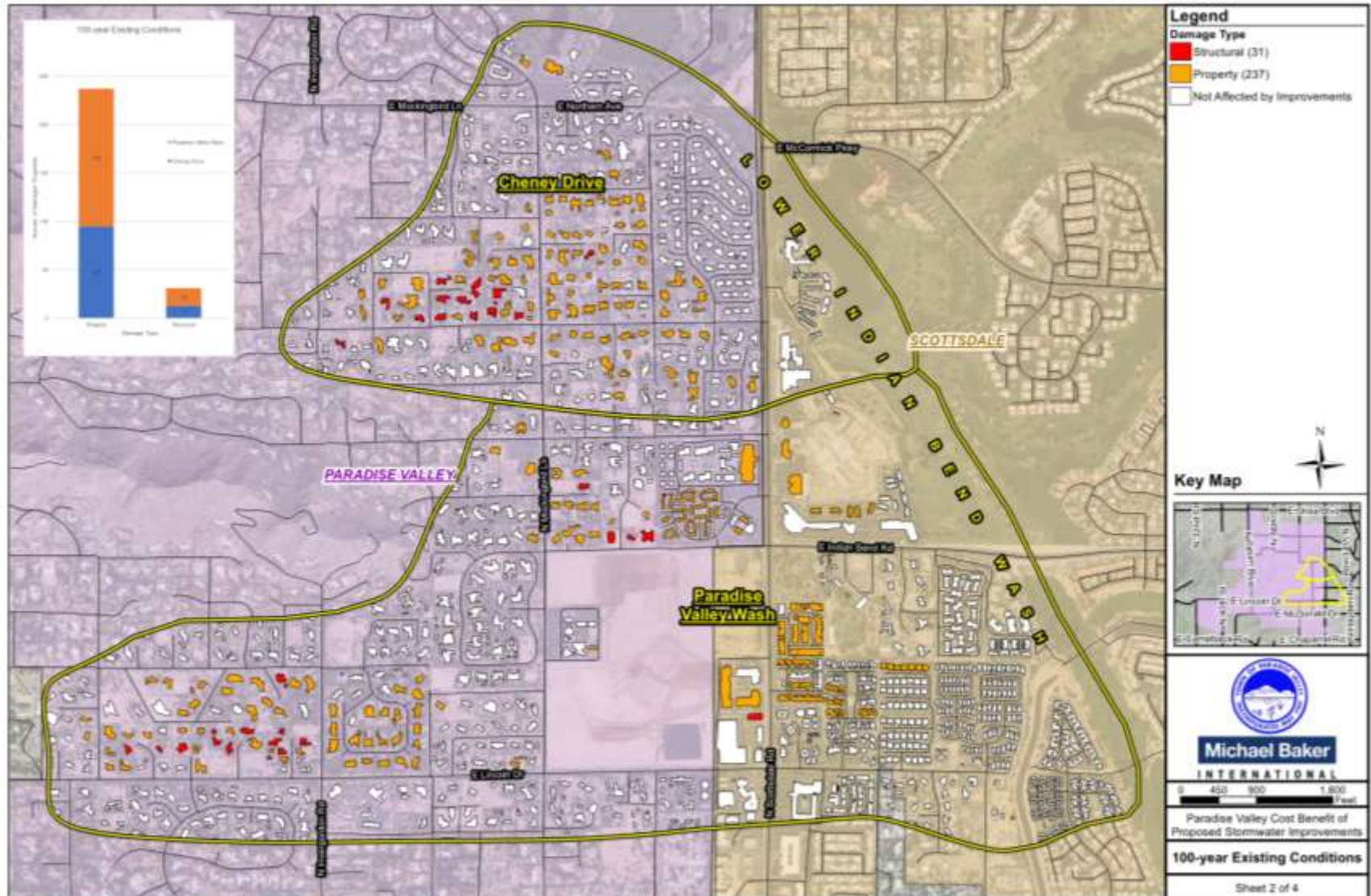


Ahwatukee Foothills ADMS/P

FLOOD HAZARD NUMBER	FLOOD HAZARD NAME	POTENTIAL ECONOMIC LOSS (\$)			
		10-YEAR EXISTING	10-YEAR PROPOSED	100-YEAR EXISTING	100-YEAR PROPOSED
1	Glenhaven Drive & 30 th Street	3,000	--	12,000	--
2	Amberwood Drive & 29 th Avenue	480,000	--	709,000	--
3	Wildwood Drive & 7 th Drive	49,000	--	295,000	--
4	South Fork Drive & 1 st Street	136,000	--	202,000	--
5	Silverwood Drive & 7 th Street	9,000	--	94,000	--
6	Frye Road & Desert Foothills Parkway	28,000	--	108,000	--
7	Amberwood Drive & 11 th Place	23,000	--	67,000	--
8	Briarwood Terrace & 17 th Street	46,000	--	154,000	--
9	Muirwood Drive & Clubhouse Drive	186,000	--	376,000	--
10	Pecos Road & 24 th Street	2,429,000	--	2,951,000	--
11	Brookwood Court & 27 th Street	26,000	--	129,000	--
12	Cottonwood Lane & 41 st Street	14,000	1,000	204,000	7,000
13	Cholla Canyon Drive & 39 th Place	41,000	--	155,000	--
14	Desert Flower Lane & 24 th Way	7,000	--	78,000	--
15	Dry Creek Road & 35 th Place	83,000	83,000	430,000	427,000
16	Ray Road & Ranch Circle	180,000	8,000	434,000	105,000
17	Ranch Circle & 36 th Street	94,000	94,000	1,118,000	945,000
18	44 th Street & Ponca Street	3,000	2,000	80,000	20,000
19	Kiowa Street & Mandan Street	--	2,000	842,000	3,000
20	Cheyenne Drive & 51 st Street	1,108,000	1,087,000	2,795,000	1,820,000
21	48 th Place & Olney Drive	60,000	--	331,000	--

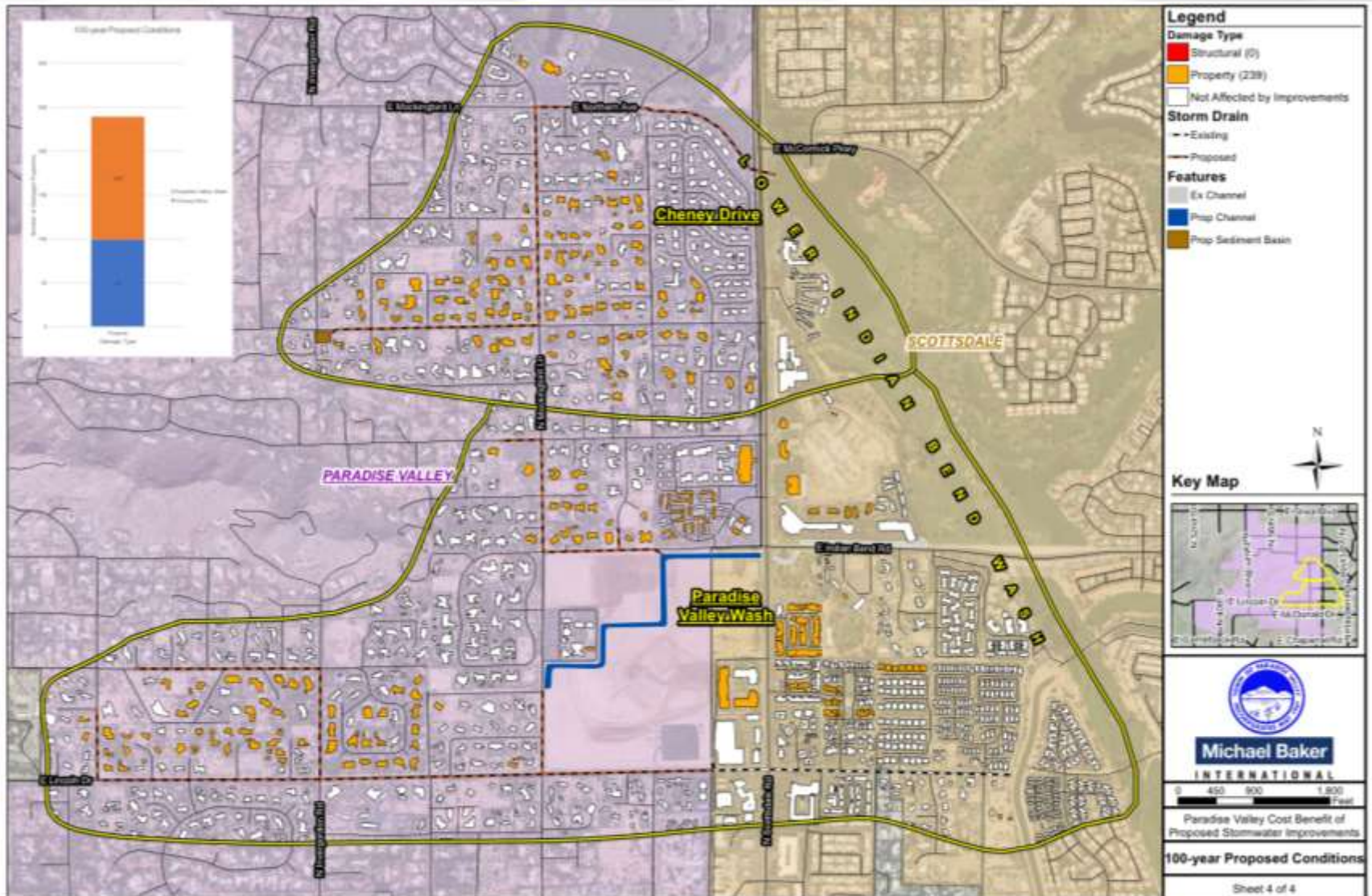
Paradise Valley CIP

Michael Baker
INTERNATIONAL



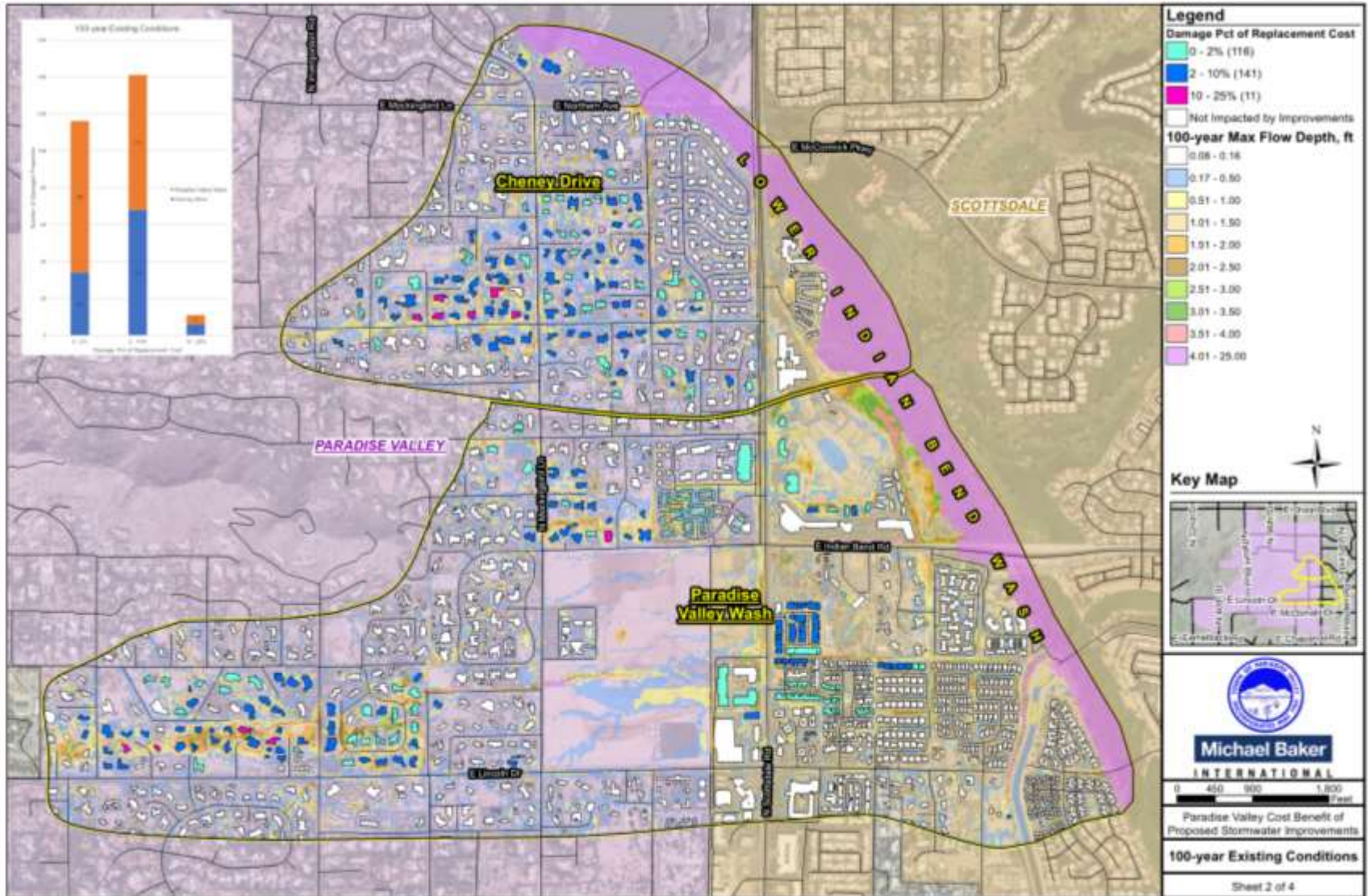
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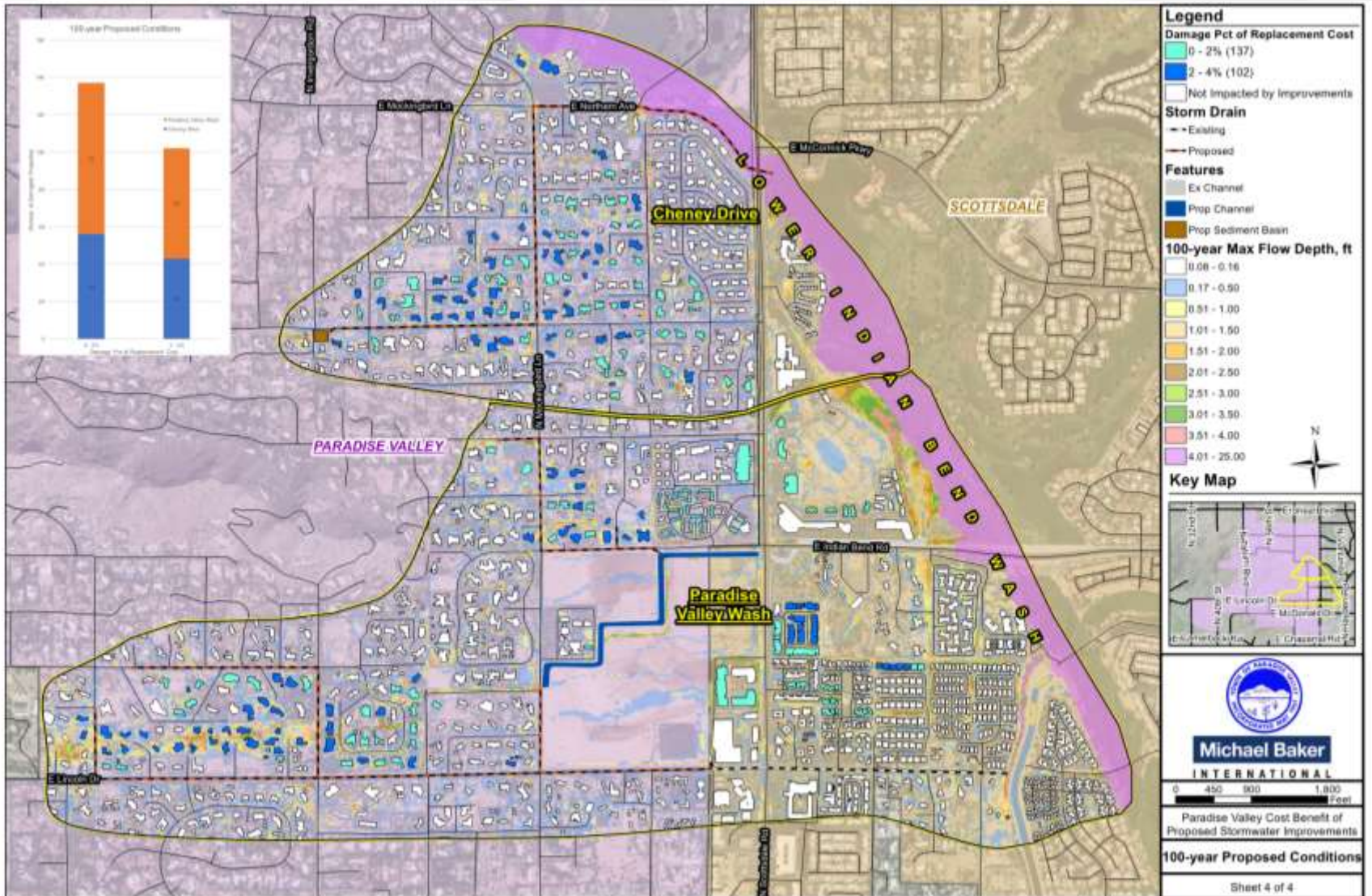


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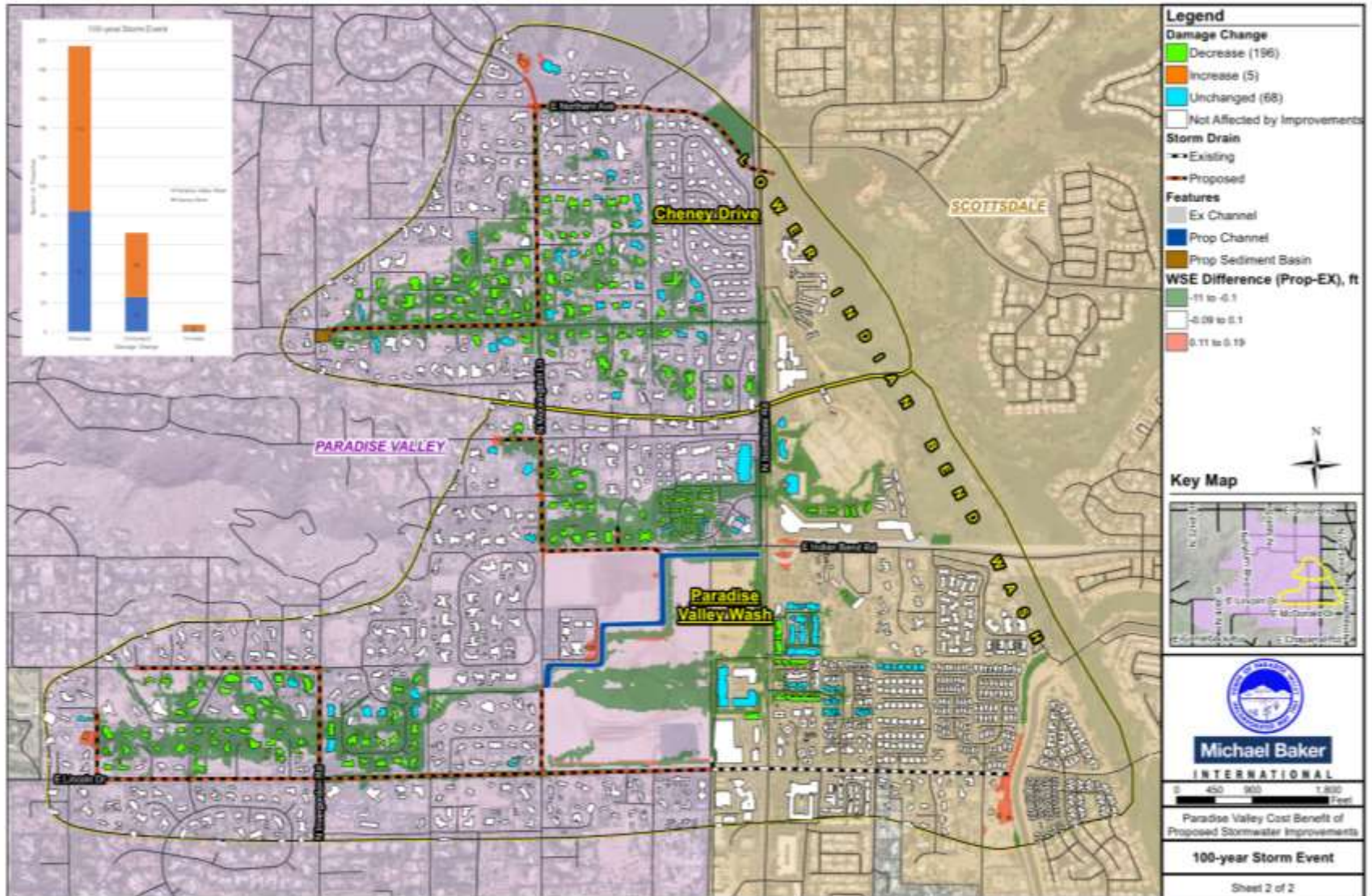


Paradise Valley CIP



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INTERNATIONAL



Total Potential and Prevented Economic Losses

IMPROVEMENT AREA	TOTAL POTENTIAL ECONOMIC LOSS, \$				POTENTIAL PREVENTED ECONOMIC LOSS, \$ (EX-PROP)	
	EXISTING		PROPOSED			
	10-YEAR	100-YEAR	10-YEAR	100-YEAR	10-YEAR	100-YEAR
Chaney Drive	\$5,496,000	\$6,248,000	\$2,448,000	\$3,048,000	\$3,048,000	\$3,019,000
Paradise Valley Wash	\$5,517,000	\$6,922,000	\$3,073,000	\$4,242,000	\$2,444,000	\$2,680,000
Total	\$11,013,000	\$13,170,000	\$5,521,000	\$7,471,000	\$5,492,000	\$5,699,00

Revised BCRs (10-Year and 100-Year)

IMPROVEMENT AREA	COST OF IMPROVEMENTS (\$)	BCR (10-YEAR & 100-YEAR)
Chaney Drive	\$7,500,000	2.57
Paradise Valley Wash	\$12,500,000	1.25
Total	\$20,000,000	1.74

QUESTIONS?

Geoff Brownell, PE, CFM
gbrownell@mbakerintl.com