SILICON VALLEY 2.0
SPUR

22-SEPT-2015   **County of Santa Clara Office of Sustainability**

THE
Strategic Growth Council

AECOM

WHY NOW?

THE 4 FAULTY PRESUMPTIONS OF ADAPTATION

- It is too speculative
- It is too far away
- It has no present benefits
- It costs too much
- (Re)Insurance / FEMA will take care of it
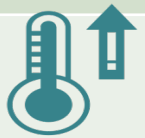
WHAT IS IT? WHAT IT IS NOT!

SILICON VALLEY 2.0 PLATFORM

- A Decision-Support designed for flexibility, expansion, replication
- A suite of resources to minimize the anticipated impacts of climate change within the County boundary
- A living Guidebook that provides a recommended set of short, mid, and long term strategies for implementation
- Helps establish a proactive framework for collaboration between the County, cities, agencies, stakeholders (State and federal authorities, private landowners, et al)
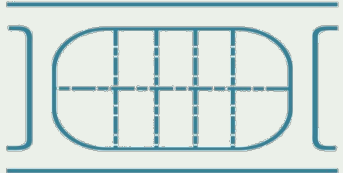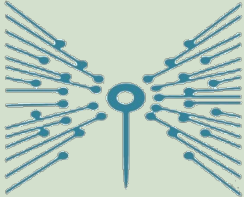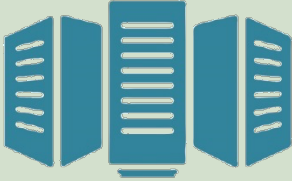
<u>Not</u> designed as a "plan" to be adopted by one or many jurisdictions

CLIMATE VARIABLE DATA

Climate Variable	Historical (frequency + trend)	Future
Sea Level Rise	0.8 inches/decade ↑	• Mid-century: 11-19 inches • End-of-Century: 30-55 inches
Riverine Flooding	Annual (trend uncertain)	• No annual change • Reduced spring and autumn precipitation • Generally wetter winter precipitation • Increased intensity • Increased frequency of strong storms
Wildfire	Multiple/decade ↑	• Increasing in frequency and duration • Change in severity unknown
Extreme Heat	Multiple/decade ↑	• Increasing in frequency, duration + severity
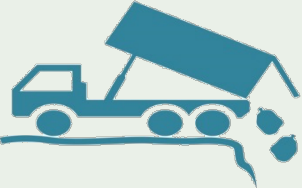
COMMUNITY ASSET DATA

ASSET SECTOR	SUB-ASSET SECTORS (TYPES)	
Shoreline Flood Protection (All)	• *Engineered flood protection (dikes + levees)* • *Non-engineered berms* • *Wetlands* • *Serving other assets regionally*	
Buildings + Properties	• *Buildings (per parcel)* • *Property (vacant urbanized land, not large-scale open space or agricultural land)*	
Communications	• *Fiber optics lines* • *Data centers* • *Communication towers*	
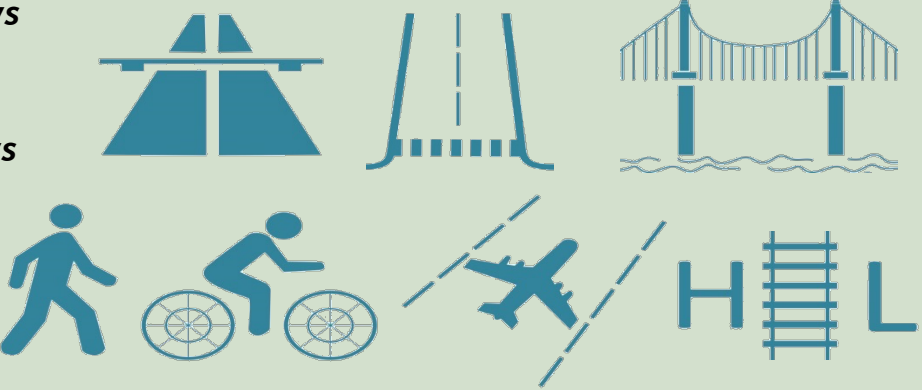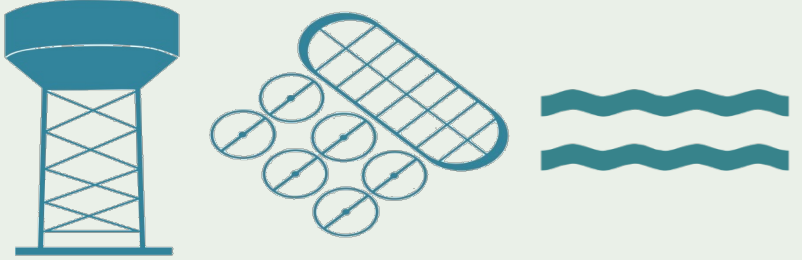
ASSET SECTOR	SUB-ASSET SECTORS (TYPES)	
Ecosystems	• Natural landscapes (includes large regional open spaces and parks)	Coastal wetland (coastal salt marsh marsh)
		Coastal scrub
		Riparian and riverine
		Grassland
		Freshwater wetland
		Chaparral and scrubland
		Oak woodland
		Coniferous forest
		Redwood forest
		Hardwood forest
		Lakes and ponds
Energy	• Energy generation facilities • Substations • Transmission infrastructure (electrical)	

ASSET SECTOR	SUB-ASSET SECTORS (TYPES)
Public Health	• *General populations* • *Vulnerable populations (seniors >65, children <5, disadvantaged, those with health conditions)* • *Healthcare facilities and workers*
Solid + Hazardous Waste	• *Solid waste facilities (landfills, recycling facilities, transfer stations, composting)* • *Contaminated land sites (Superfund, State Response, surface and ground toxicity)* • *Hazardous waste sites (household and industrial waste storage)*

ASSET SECTOR	SUB-ASSET SECTORS (TYPES)
Transportation	• **Roads (highways and local)** • **Bridges** • **Pedestrian ways and bikeways** • **Airports** • **Rail (heavy and light)**
Water + Wastewater	• **Water treatment plants (potable water)** • **Wastewater treatment plants** • **Reservoirs**

ECONOMIC CONSEQUENCES

» **RATING SCALE, AS APPLIED COUNTYWIDE**

- Rating scale for Replacement Costs, Interruption of Economic Activity, and Operational Costs based on estimated Countywide GDP

- Rating scale for loss of fiscal revenue based on estimated County and local jurisdiction property and sales tax revenue

- *NOTE: all values = 2014$*

Rating Scale for Replacement Costs, Interruption of Economic Activity, and Operational Costs

Low	$1 to less than $100 million
Moderate	$100 million to less than $500 million
High	$500 million to less than $3 billion
Very High	$3 billion to less than $13 billion
Extreme	$13 billion or greater

Rating Scale for Fiscal Revenue Loss

Low	$1 to less than $1,000,000
Moderate	$1,000,000 to less than $4,000,000
High	$4,000,000 to less than $18,000,000
Very High	$18,000,000 to less than $90,000,000
Extreme	$90,000,000 or more

ECONOMIC CONSEQUENCES

ASSET EXAMPLE

» **TRANSPORTATION SECTOR: HIGHWAYS**

Summary of Economic Consequences for Highways by Climate Variable

	SEA LEVEL RISE	SEA LEVEL RISE + STORM SURGE	RIVERINE FLOODING	WILDFIRE	EXTREME HEAT
Replacement Cost	Low	Low	High	N/A	N/A
Loss of Fiscal Revenue	N/A	N/A	N/A	N/A	N/A
Change in Operational Costs	N/A	N/A	N/A	N/A	N/A
Interruption of Economic Activity	High	High	Very High	N/A	N/A
Overall Economic Consequences	**High**	**High**	**Very High**	**N/A**	**N/A**

ECONOMIC CONSEQUENCES

» **KEY FINDINGS: TOTAL ASSETS**

Aggregate Economic Consequences for All Assets in Mid-Century Scenario

	SEA LEVEL RISE	SEA LEVEL RISE + STORM SURGE	RIVERINE FLOODING	WILDFIRE	EXTREME HEAT
Replacement Cost	Very High	Very High	Extreme	Extreme	N/A
Loss of Fiscal Revenue	High	High	Very High	Very High	N/A
Change in Operational Costs	N/A	N/A	N/A	N/A	Low
Interruption of Economic Activity	High	Very High	Extreme	High	N/A
Overall Economic Consequences	Very High	Very High	Extreme	Extreme	Low
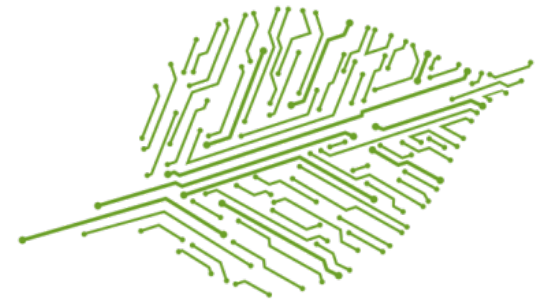
SV 2.0 Climate Change Preparedness Decision Support Tool - Demo

RISK FOR BUILDINGS / COUNTYWIDE

SEA LEVEL RISE [100 CM] + STORM SURGE [100-YEAR]

CLIMATE VARIABLE	ASSET	CONSEQUENCE	LIKELIHOOD	RISK

SEA LEVEL RISE + STORM SURGE — BUILDINGS

REPLACEMENT COSTS: $20,172
INTERUPTION OF ECONOMIC ACTIVITY: $10,813
CHANGE IN OPERATIONAL COSTS: $0
FISCAL LOSS OF REVENUE: $36
Total: $31,021

Consequence: EXTREME, VERY HIGH, HIGH, MODERATE, LOW
Likelihood: NEAR CERTAINTY, HIGHLY LIKELY, MODERATELY LIKELY, UNLIKELY, REMOTE
Risk: EXTREME, VERY HIGH, HIGH, MODERATE, LOW
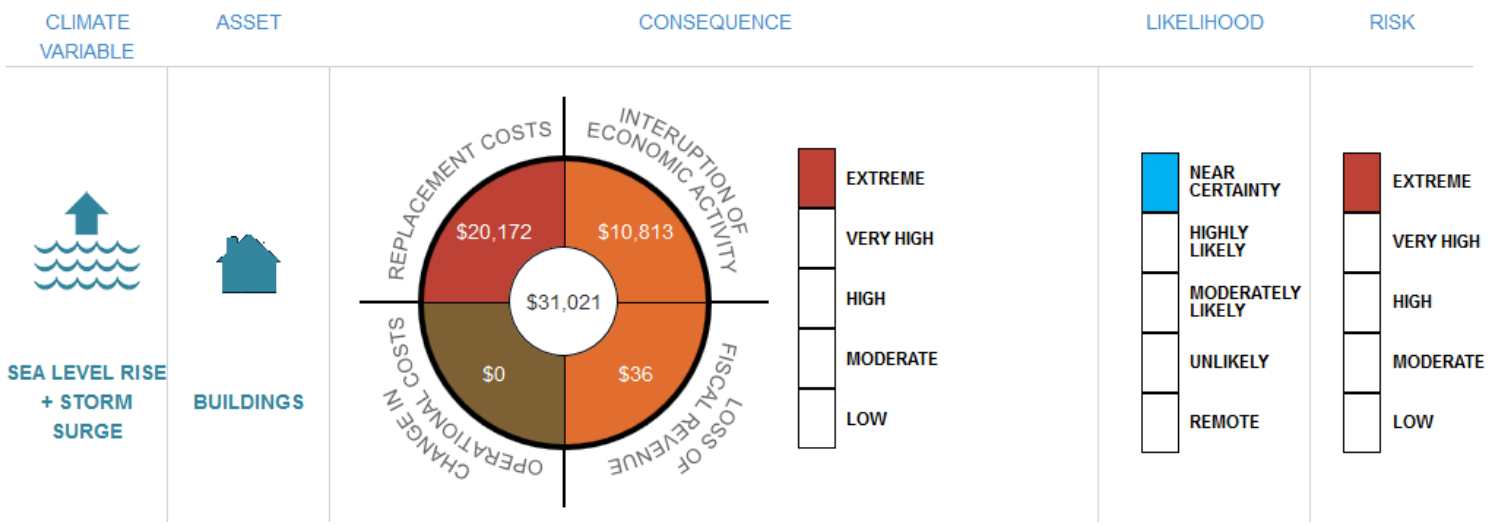
RISK FOR WASTEWATER TREATMENT / COUNTYWIDE

SEA LEVEL RISE [100 CM] + NO STORM SURGE

CLIMATE VARIABLE	ASSET	CONSEQUENCE	LIKELIHOOD	RISK

SEA LEVEL RISE + STORM SURGE — WASTEWATER TREATMENT

REPLACEMENT COSTS: $1,527
INTERUPTION OF ECONOMIC ACTIVITY: $197
CHANGE IN OPERATIONAL COSTS: na
FISCAL LOSS OF REVENUE: na
Total: $1,724

Consequence: EXTREME, VERY HIGH, HIGH, MODERATE, LOW
Likelihood: NEAR CERTAINTY, HIGHLY LIKELY, MODERATELY LIKELY, UNLIKELY, REMOTE
Risk: EXTREME, VERY HIGH, HIGH, MODERATE, LOW

RISK FOR BUILDINGS / PALO ALTO

SEA LEVEL RISE [100 CM] + STORM SURGE [100-YEAR]
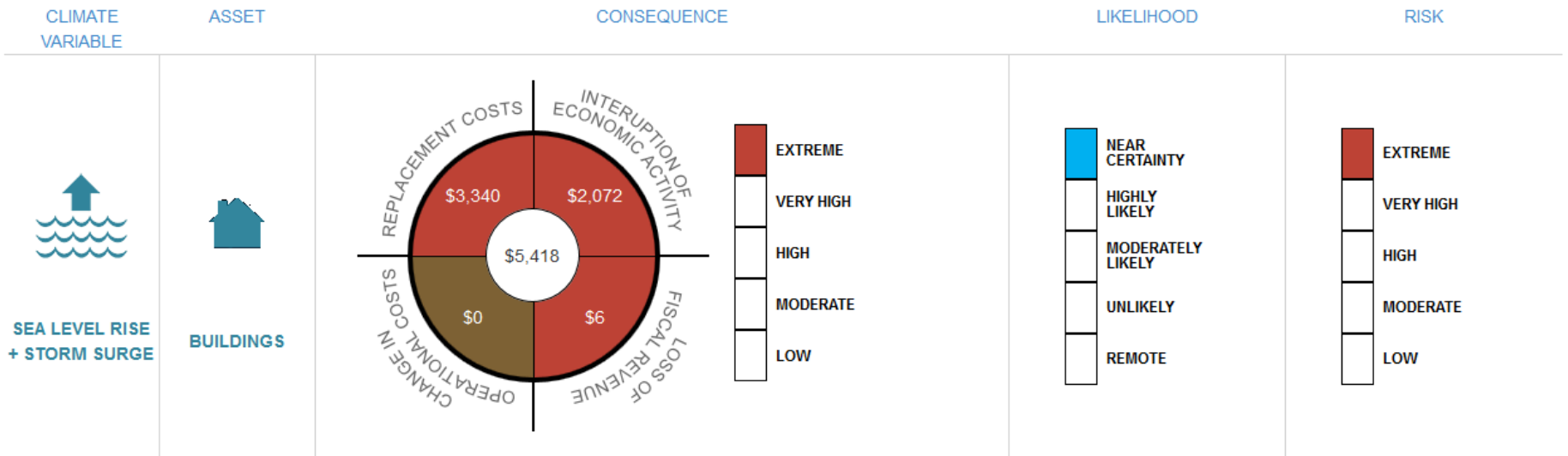
CLIMATE VARIABLE | ASSET | CONSEQUENCE | LIKELIHOOD | RISK

SEA LEVEL RISE + STORM SURGE | BUILDINGS

Consequence wheel values:
- REPLACEMENT COSTS: $3,340
- INTERUPTION OF ECONOMIC ACTIVITY: $2,072
- FISCAL LOSS OF REVENUE: $6
- CHANGE IN OPERATIONAL COSTS: $0
- Center: $5,418

Consequence scale: EXTREME, VERY HIGH, HIGH, MODERATE, LOW

Likelihood scale: NEAR CERTAINTY, HIGHLY LIKELY, MODERATELY LIKELY, UNLIKELY, REMOTE

Risk scale: EXTREME, VERY HIGH, HIGH, MODERATE, LOW

Rating Scale for Replacement Costs, Interruption of Economic Activity, and Operational Costs

Low	$1 to less than $10,000
Moderate	$10,000 to less than $100 million
High	$100 million to less than $300 million
Very High	$300 million to less than $1.4 billion
Extreme	$1.4 billion or greater

Rating Scale for Fiscal Revenue Loss

Low	$1 to less than $40,000
Moderate	$40,000 to less than $200,000
High	$200,000 to less than $1 million
Very High	$1 million to less than $5 million
Extreme	$5 million or more

SILICON VALLEY 2.0
CLIMATE CHANGE PREPAREDNESS DECISION SUPPORT TOOL

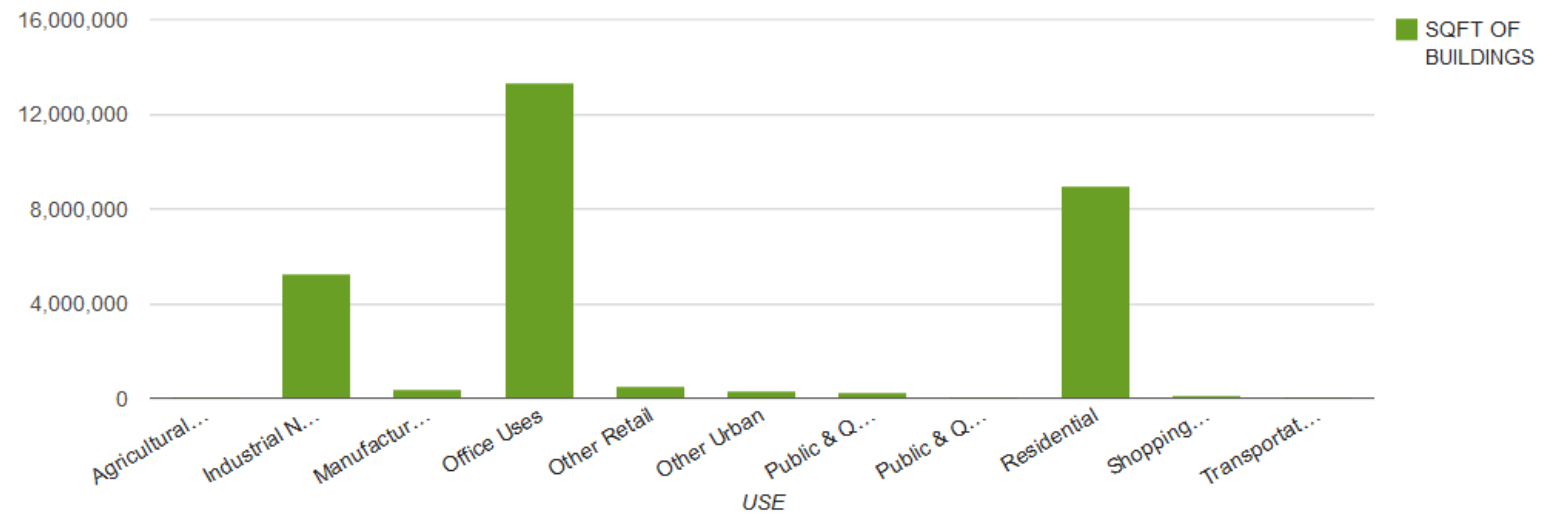| HOME | SET UP | CLIMATE CHANGE IN SCC | VULNERABILITY | RISK | REPORTS + OUTPUTS |

VULNERABILITY ASSESSMENT OVERVIEW

MAPS

TABLES AND CHARTS

HOW IS VULNERABILITY CALCULATED

VULNERABILITY BY CATEGORY

BUILDINGS VULNERABILITY BY USE

USE	SQFT OF BUILDINGS
Agricultural, Extractive & Open Space	0
Industrial Non-Manufacturing	5274399
Manufacturing	417665
Office Uses	13346287
Other Retail	506712
Other Urban	311793
Public & Quasi-Public Buildings and Uses	272502
Public & Quasi-Public Open Space	0
Residential	8965028
Shopping Centers	121785
Transportation, Communications and Utilities	24760

STRATEGY DEVELOPMENT

ASSET	CLIMATE VARIABLE		
STRATEGY TITLE			
Strategy Description			
SCALE	CLASS	INITIATION TIMING	LEAD
CROSS ASSET SECTOR APPLICABILITY		POTENTIAL FOR NEAR-TERM CO-BENEFITS	
IMPLEMENTATION NOTES		*Timing, Potential Challenges + Solutions, Additional Benefits*	
PRECEDENTS		*Relevant Case Studies*	

STRATEGY SELECTION CRITERIA

Does the strategy…

- Cross over climate variables and multiple sectors/assets
- Upstream-downstream benefits (chronologically)
- Geographic scope and collaborative scale
- Address critical facilities, lifeline routes, social/environmental equity
- Provide a positive impact on habitat protection or restoration?
- Require very high upfront capital cost, and therefore require complex financing arrangements?
- Provide a positive impact on the economy?

QUESTIONS?
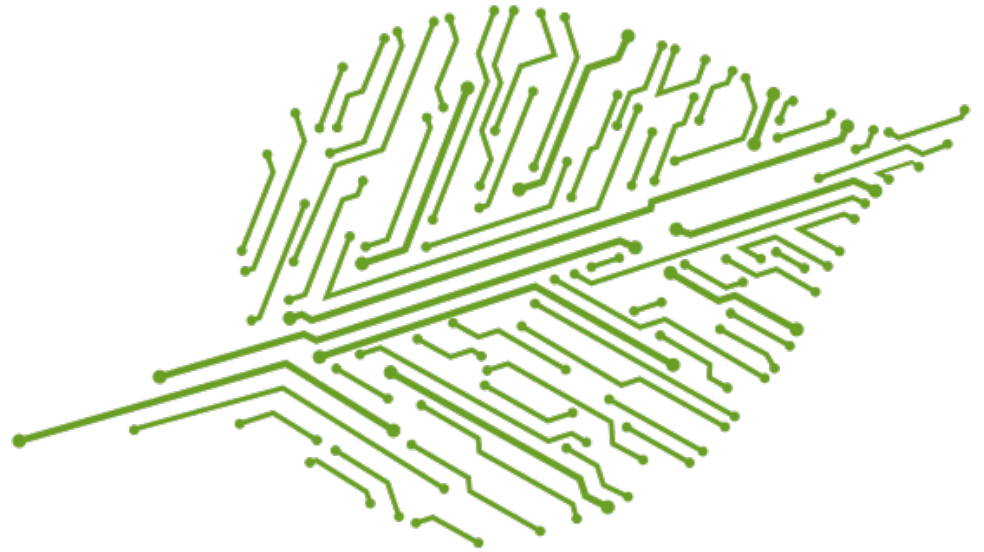
SILICON VALLEY 2.0
A REGIONAL CLIMATE ADAPTATION PLATFORM

County of Santa Clara Office of Sustainability

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