



H O R I Z O N

REMI Modeling For the MTC Horizon Project

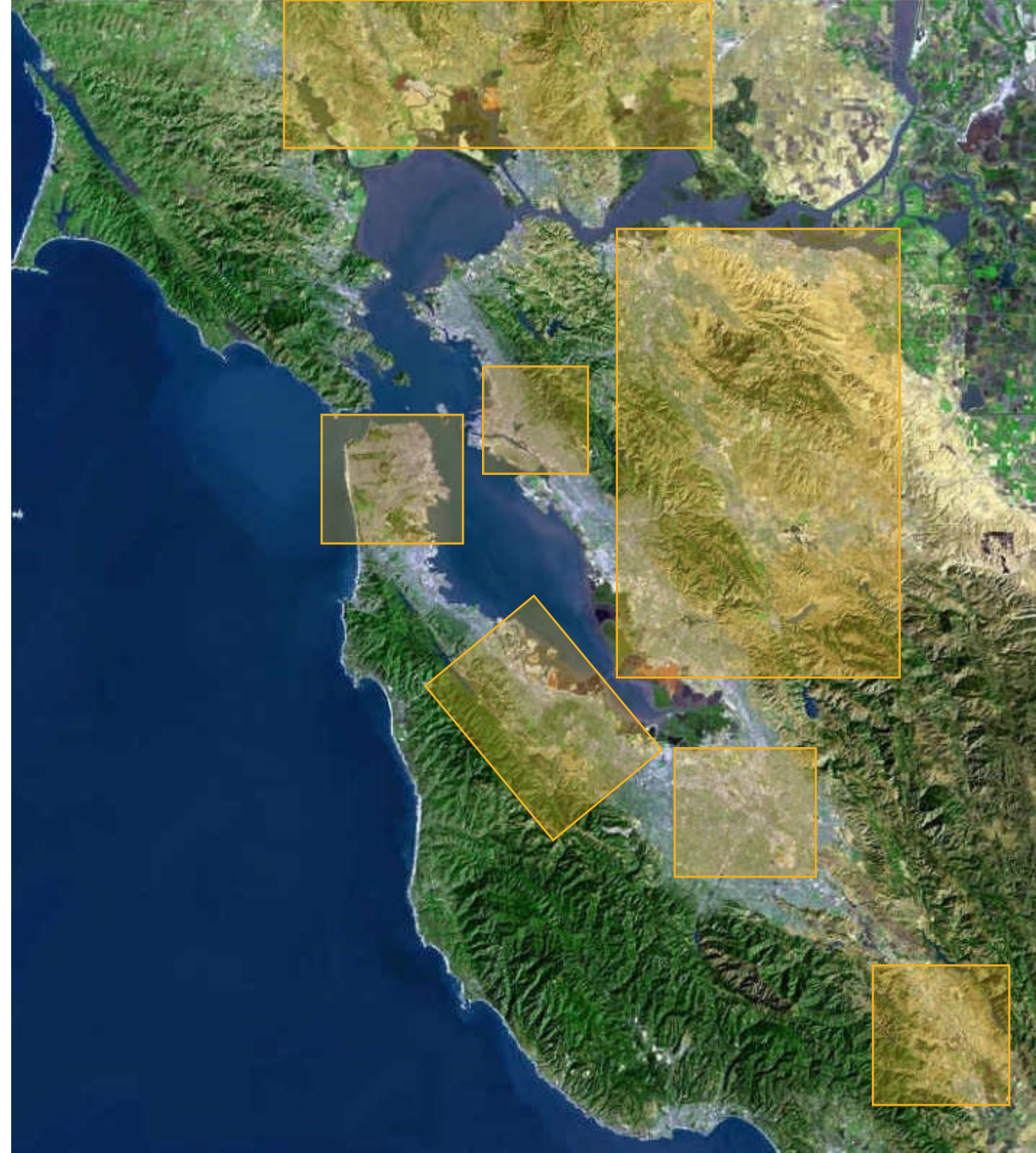
Bobby Shijia Lu

Association of Bay Area Governments / Metropolitan
Transportation Commission

February 5th, REMI Webinar

Welcome to the San Francisco Bay Area!

- We are a region of nearly 8 million people and 4 million jobs spread across 101 cities
- Our region includes a wide variety of place types, including:
 - Agricultural communities in the North and South Bay
 - Urbane San Francisco, San Jose, and Oakland
 - Jobs-dense Silicon Valley
 - Primarily residential East Bay



Bay Area by the Numbers (Compared to 10 Large U.S. Metro Peers)

#4

Most populous region in the U.S.
(8 million)

#1

Highest per-capita GDP in the U.S.
(\$115,000)

#2

Highest share of population vulnerable to sea level rise
(3%)

#2

Lowest auto commute mode share in the U.S.
(75%)

#2

Highest displacement risk in the U.S.
(42% at risk)

#4

Largest employment in the U.S.
(4 million)

#1

Highest median home price in the U.S.
(\$1 million)

#3

Lowest air pollution levels in the U.S.
(in O₃ and PM₂)

#3

Largest number of per capita public transit trips in the U.S.
(70 per year)

#3

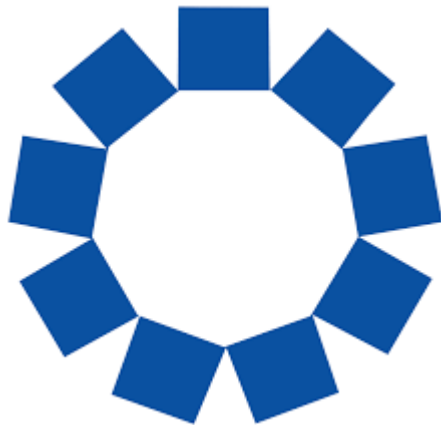
Smallest share of middle-wage jobs in the U.S.
(20%)

Agency Context: regional planning in the Bay Area is coordinated by our joint agencies



Metropolitan Transportation Commission

- Metropolitan Planning Organization
- Responsible for planning, financing, and coordinating transportation in the Bay Area



Association of Bay Area Governments

- Council of Governments
- Coordinates local planning action across member jurisdictions (the 101 cities and 9 counties of the Bay Area)

What is Plan Bay Area?

- The regional plan is a **blueprint for growth and infrastructure** for the next 30 years.
- The regional plan is **updated every four years**, with this major update due in 2021.
- The regional plan is a reflection of **the shared priorities of the diverse nine-county San Francisco Bay Area**.
- The regional plan is **fiscally-constrained**, even as it aspires to tackle the Bay Area's big challenges with specific strategies.
- The regional plan is **not an expenditure plan**; it is focused on setting priorities and over the long term and looking holistically across “silos”.





**Spring 2015 to
July 2017**

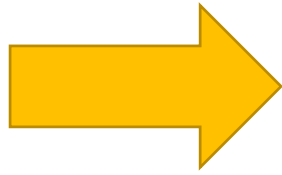


**February 2018 to
September 2019**



**August 2019 to
June 2021**

The **Horizon** initiative will seek to explore a suite of challenging questions that transcend the traditional framework used for past Plan Bay Area efforts to inform **Plan Bay Area 2050**.



Horizon and Plan Bay Area 2050 will address four core topic areas, and two cross-cutting themes.

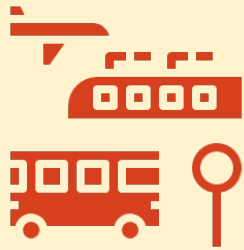
Cross-Cutting Issues



Equity



Resilience



Transportation



Housing



Environment



Economy

Highlights from Horizon



**Perspective
Papers**



Futures



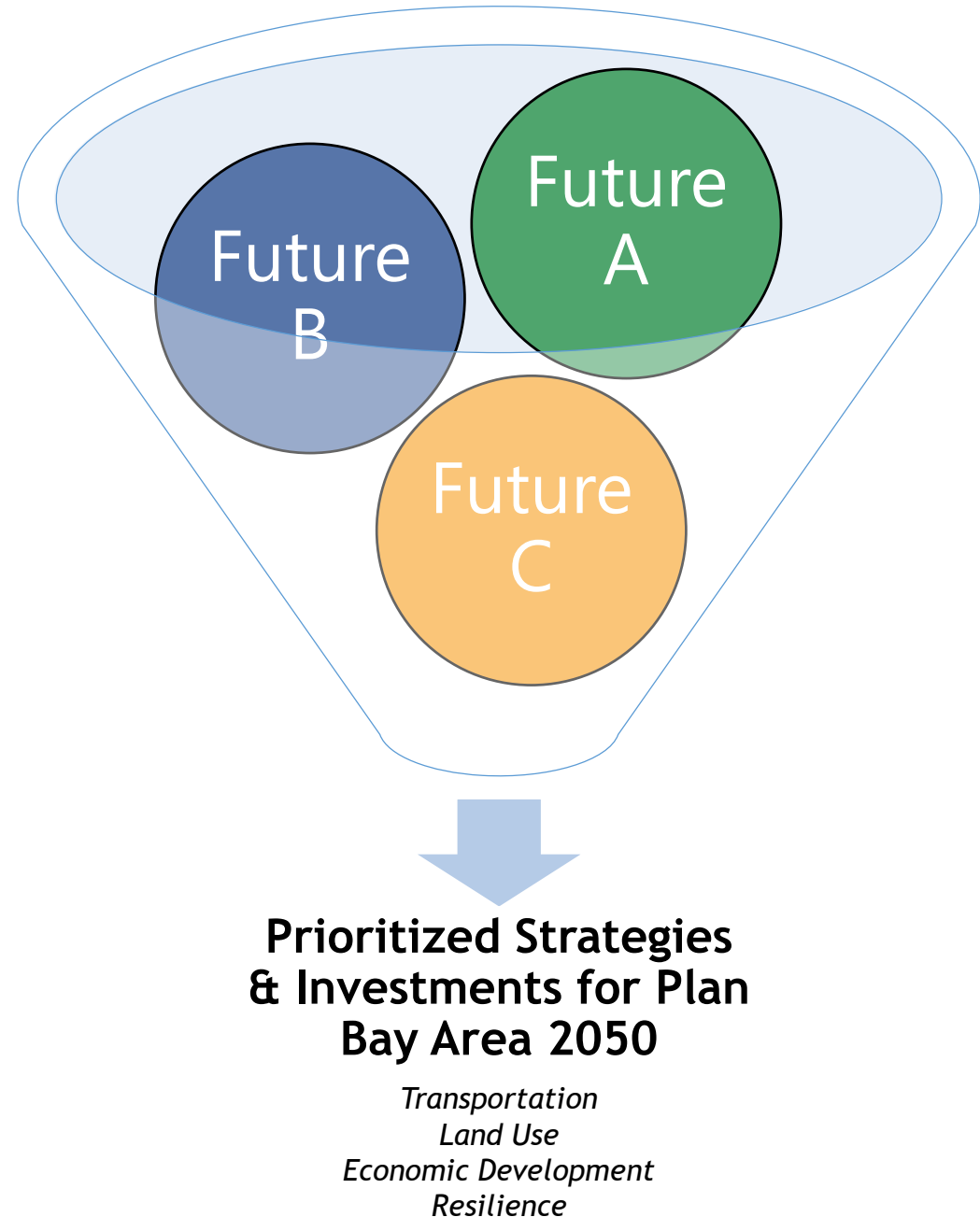
Outreach



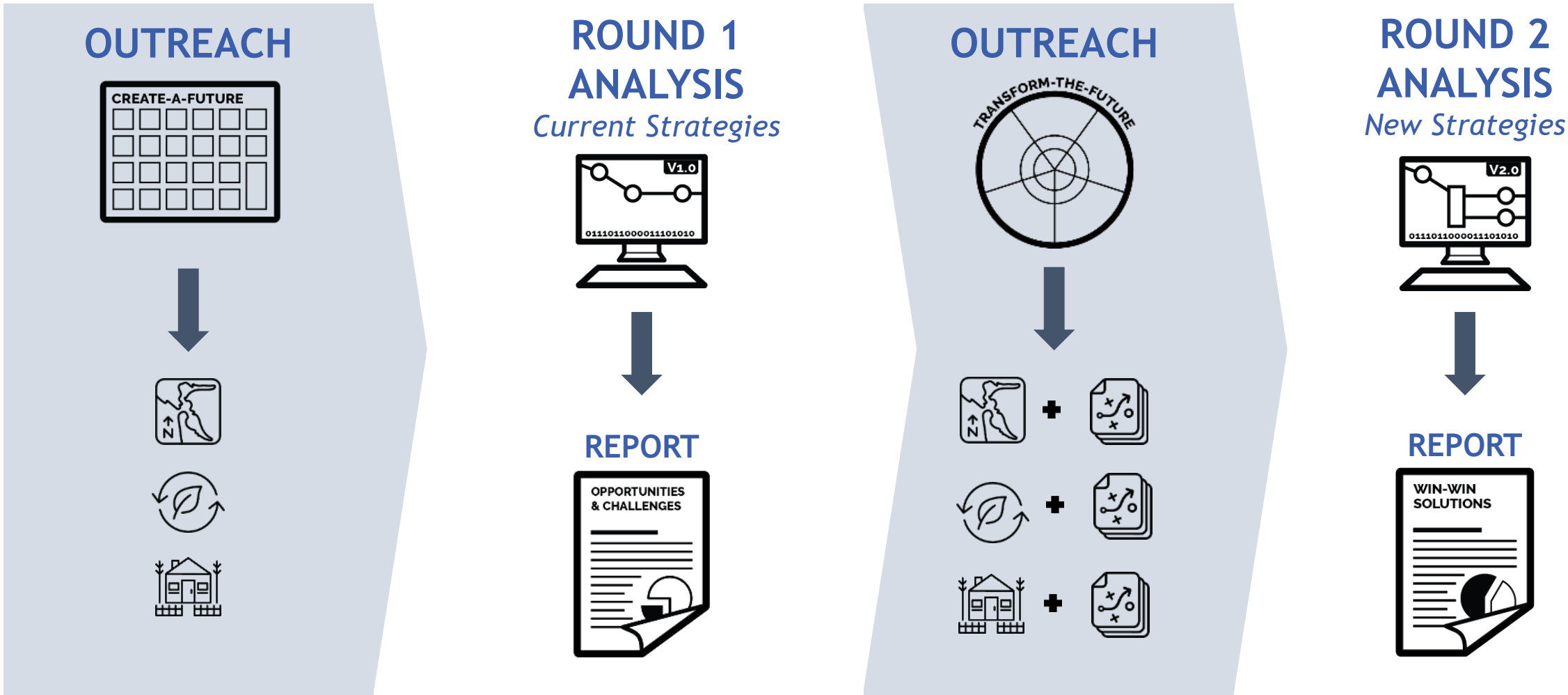
**Project
Performance**

Why Are We Creating Futures?

Creating a range of divergent futures will allow us to envision how the San Francisco Bay Area would respond to a wide range of external forces. The futures enable us to “stress test” policies and investments to ensure they are effective under a range of future conditions.



Futures Process



Three Futures - “What If?” Scenarios

A



Clean
and Green

What if... new technologies and a national carbon tax enabled greater telecommuting and distributed job centers?

B



Rising Tides,
Falling
Fortunes

What if... the federal government cuts spending and reduces regulations, leaving more policy decisions to states and regions?




C



Back to
the Future

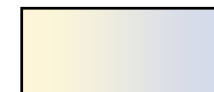
What if... an economic boom and new transportation options spur a new wave of development?

Summary: External Forces

#	FUTURE NAME	IMMIGRATION AND TRADE	NATIONAL TAXES AND FUNDING	NATIONAL GROWTH	LAND USE PREFERENCES	NATIONAL ENVIRONMENTAL POLICY	NEW TECHNOLOGIES	NATURAL DISASTERS
A	 Clean and Green	Similar to today	Higher funding via carbon tax	Similar to today	Housing: more urban	Stricter regulations (1' SLR)	Widespread	Magnitude 7.0 Hayward Fault earthquake
					Jobs: more dispersed			
B	 Rising Tides, Falling Fortunes	Reduced	Lower funding due to tax cuts	Limited	Housing: more urban	Relaxed regulations (3' SLR)	More limited	Magnitude 7.0 Hayward Fault earthquake
					Similar to today			
C	 Back to the Future	Increased	Similar to today	Rapid	Housing: more dispersed	Similar to today (2' SLR)	Widespread	Magnitude 7.0 Hayward Fault earthquake
					Jobs: more urban			

COLOR LEGEND

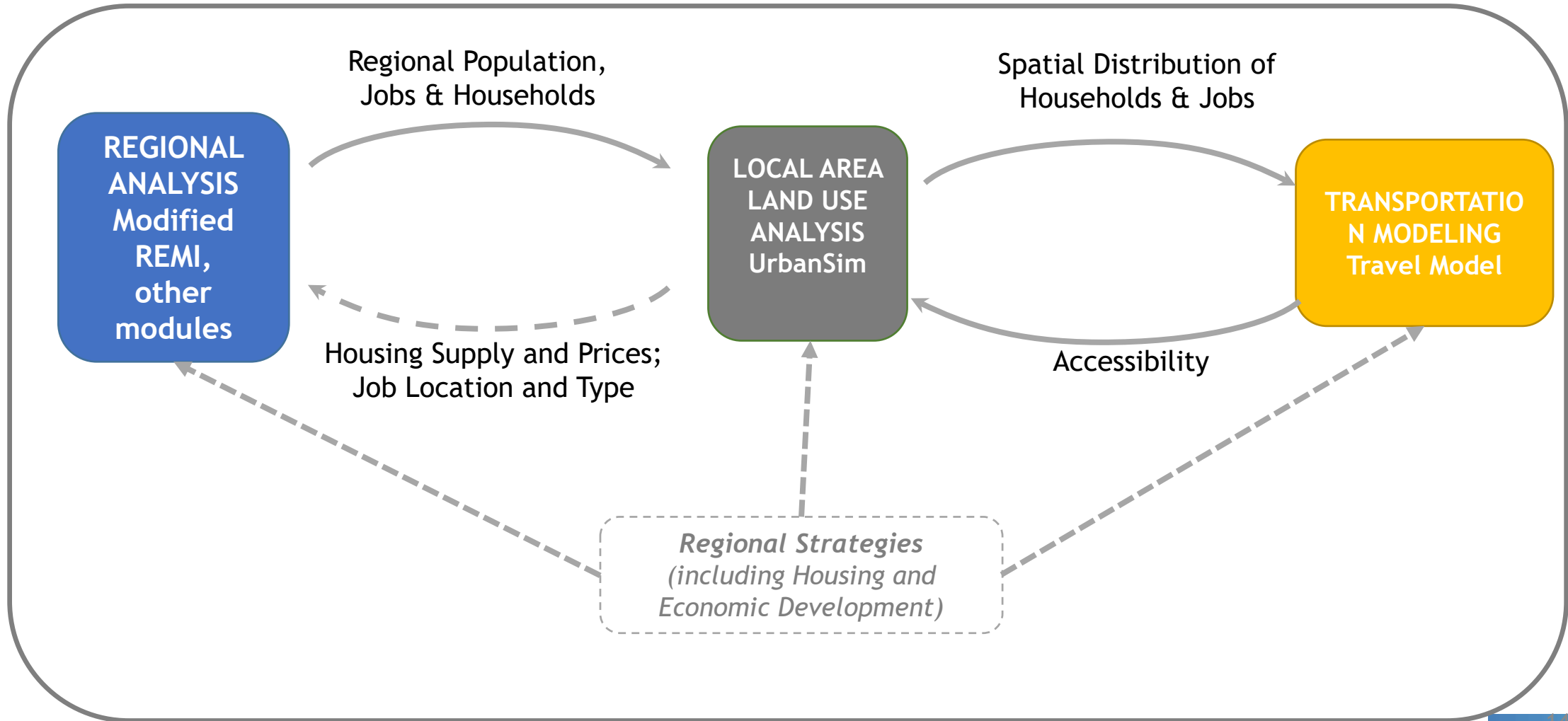
Lower value



Higher value

			2 + 4	3 + 5 + 11	8 + 10
External Forces			Clean and Green	Rising Tides, Falling Fortunes	Back to the Future
Environmental	1	Sea Level Rise	1 Foot	3 Feet	2 Feet
	2	Natural Disasters	2035 Hayward Fault Earthquake (magnitude 7.0)	2035 Hayward Fault Earthquake (magnitude 7.0)	2035 Hayward Fault Earthquake (magnitude 7.0)
Political	3	U.S. Political System	Healthy Democracy	Flawed Democracy	Healthy Democracy
	4	U.S. Standing in the World	Multiple Superpowers	Declining Power	Preeminent Global Power
	5a	U.S. Tax Rates	Higher Tax Rates	Lower Tax Rates	Similar to Today
	5b	U.S. Tax Structure	Carbon Tax	Income Tax (Similar to Today)	Income Tax (Similar to Today)
	6a	U.S. Spending Levels	Higher Expenditures	Lower Expenditures	Similar to Today
	6b	U.S. Spending Distribution	Similar Share to Today	Reduced Share for Metro Areas	Larger Share for Metro Areas
	7	Immigration Policy	80,000 Annual Immigrants (to Bay Area)	20,000 Annual Immigrants (to Bay Area)	240,000 Annual Immigrants (to Bay Area)
	8	Trade Policy	3% Average Tariff Rate	10% Average Tariff Rate	0% Average Tariff Rate
	9	Environmental Policy	Increased Regulations	Reduced Regulations	Similar to Today
Economic	10	U.S. Population Annual Growth Rate	+1.0%	+0.5%	+2.5%
	11	U.S. Jobs Annual Growth Rate	+0.5%	+0.5%	+2.5%
	12	U.S. Jobs Distribution	currently being refined	currently being refined	currently being refined
	13	U.S. Productivity	+4.0%	+2.0%	+2.0%
Land Use	14	Housing Preferences	Greater Preference for Urban Housing	Greater Preference for Urban Housing	Greater Preference for Dispersed Housing
	15	Workplace Preferences	Greater Preference for Dispersed Employment Centers	Similar Preference to Today	Greater Preference for Urban Employment Centers
	16	Telecommute Share	30%	15%	6%
	17	E-Commerce Market Share	50%	20%	50%
	18	Interregional Volumes	Current Growth Rates	Limited Growth Rates	Faster Growth Rates
Transportation	19	Transportation Technologies	High Speed Rail, Autonomous Rail and Buses, Freight Aerial Drones	Autonomous Buses	Hyperloop, Autonomous Rail and Buses, Freight Aerial Drones, Lower-Cost Helicopter Transport
	20	Autonomous Vehicle Market Share	95%	10%	75%
	21	Electric Vehicle Market Share	95%	10%	75%
	22	Sharing Preferences	Greater Preference	Similar Preference to Today	Reduced Preference
	23	Per-Mile Vehicle Operating Cost	\$0.50 per Mile	\$0.30 per Mile	\$0.15 per Mile
	24	Annual Federal Transportation Funding (Bay Area)	\$2.5 Billion	\$0.0 Billion	\$2.5 Billion

MTC Modeling System

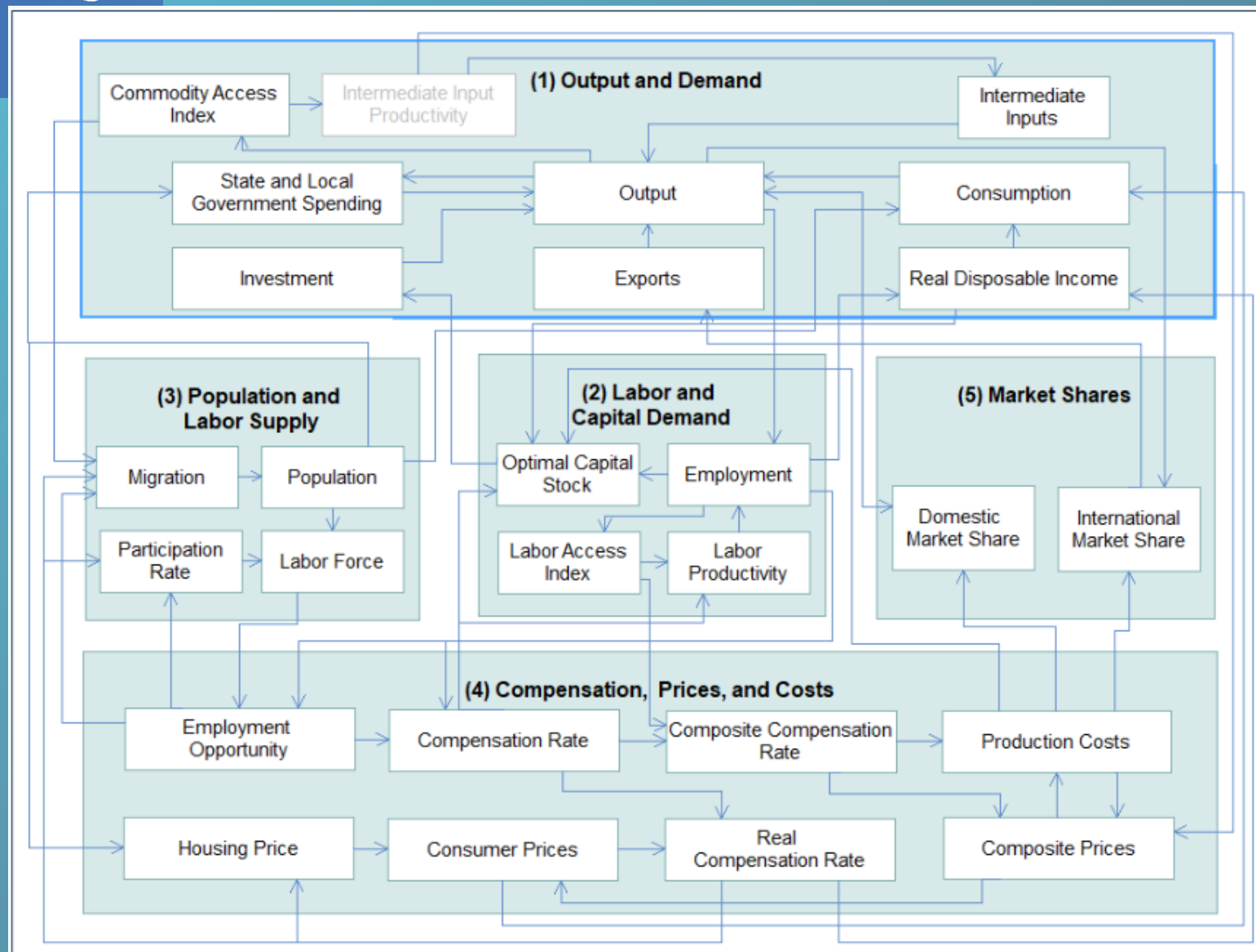




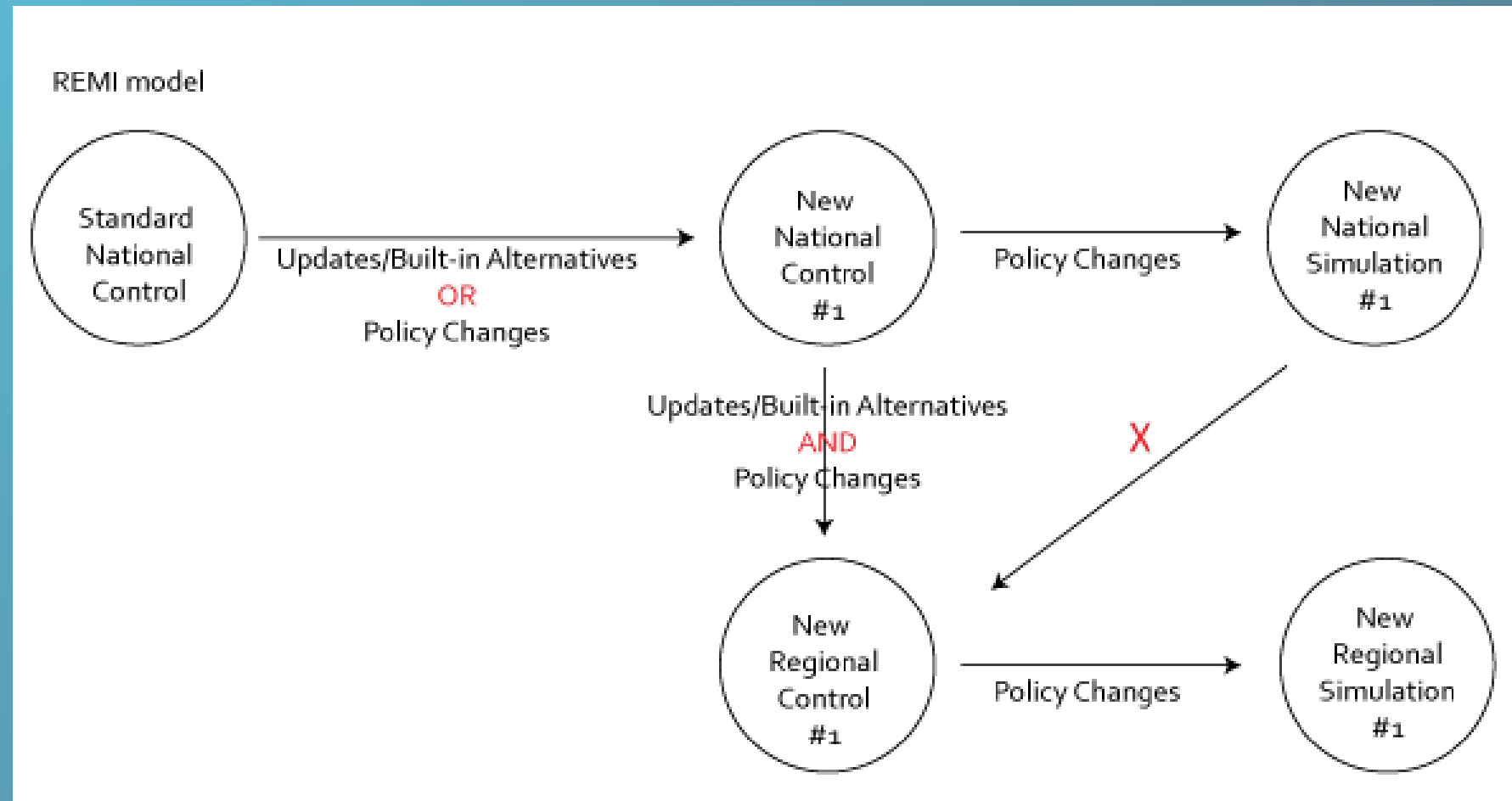
HORIZON

Turning Futures Into Numbers -- Round 1 REMI Analysis

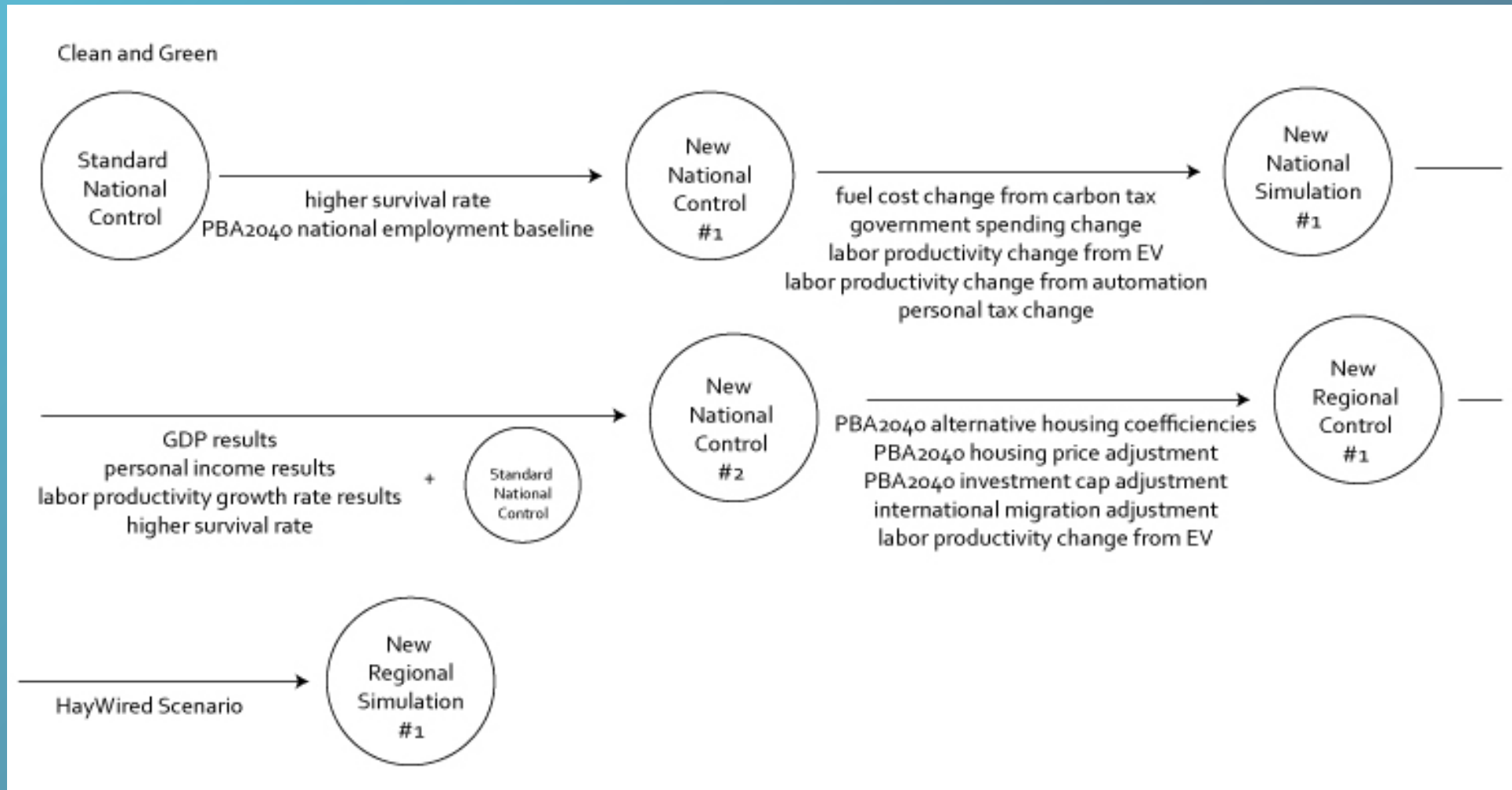
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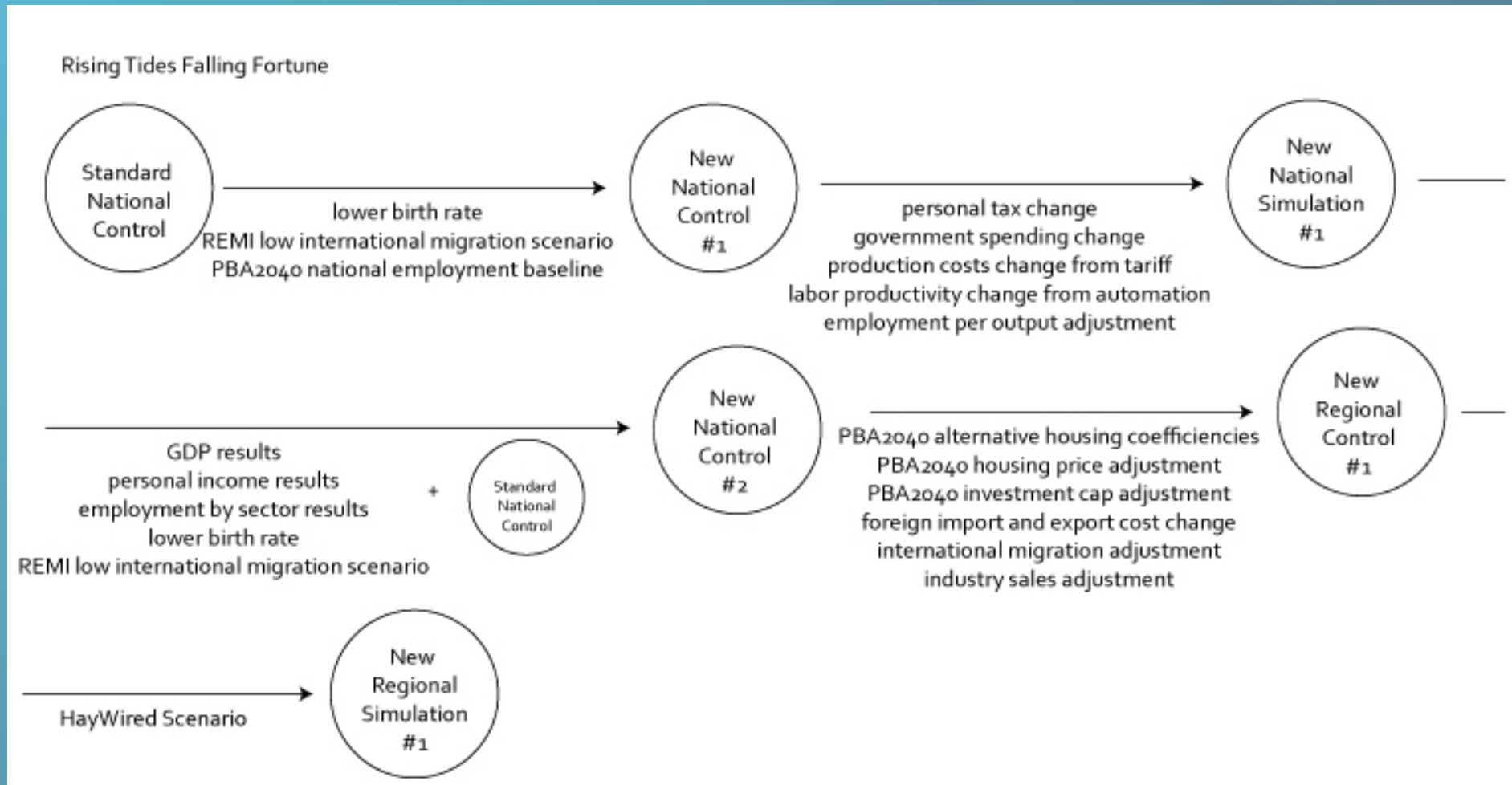
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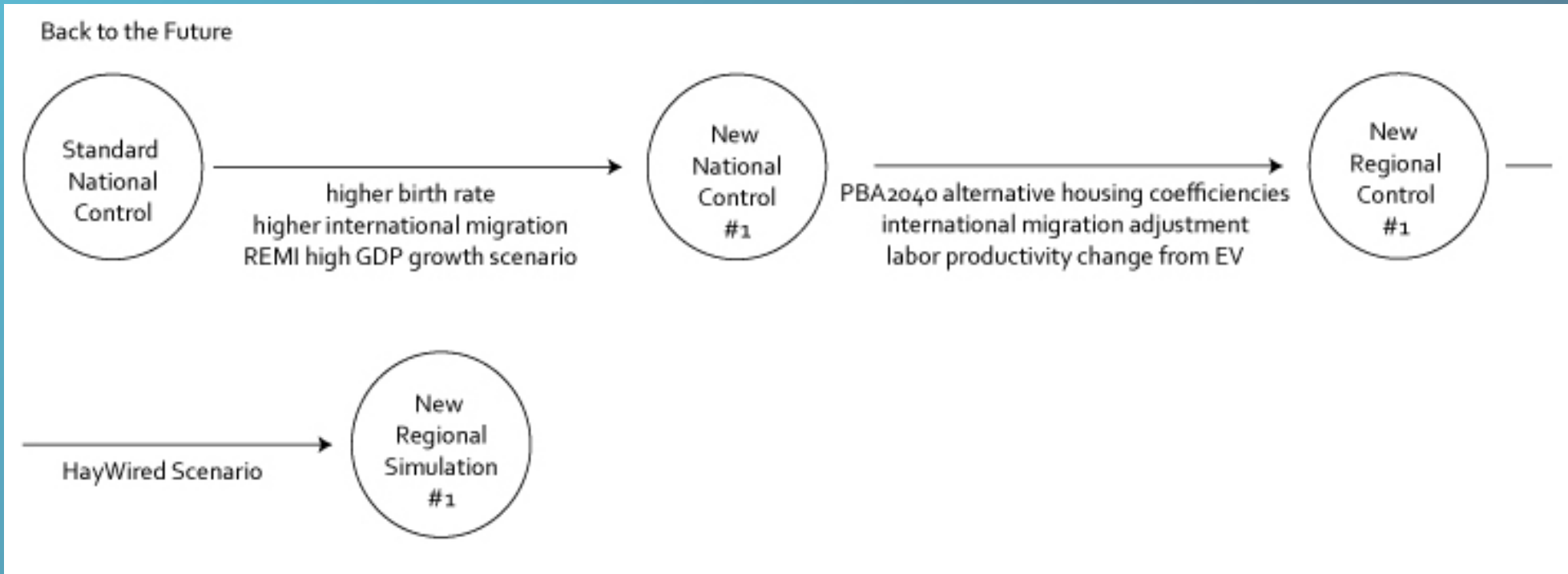
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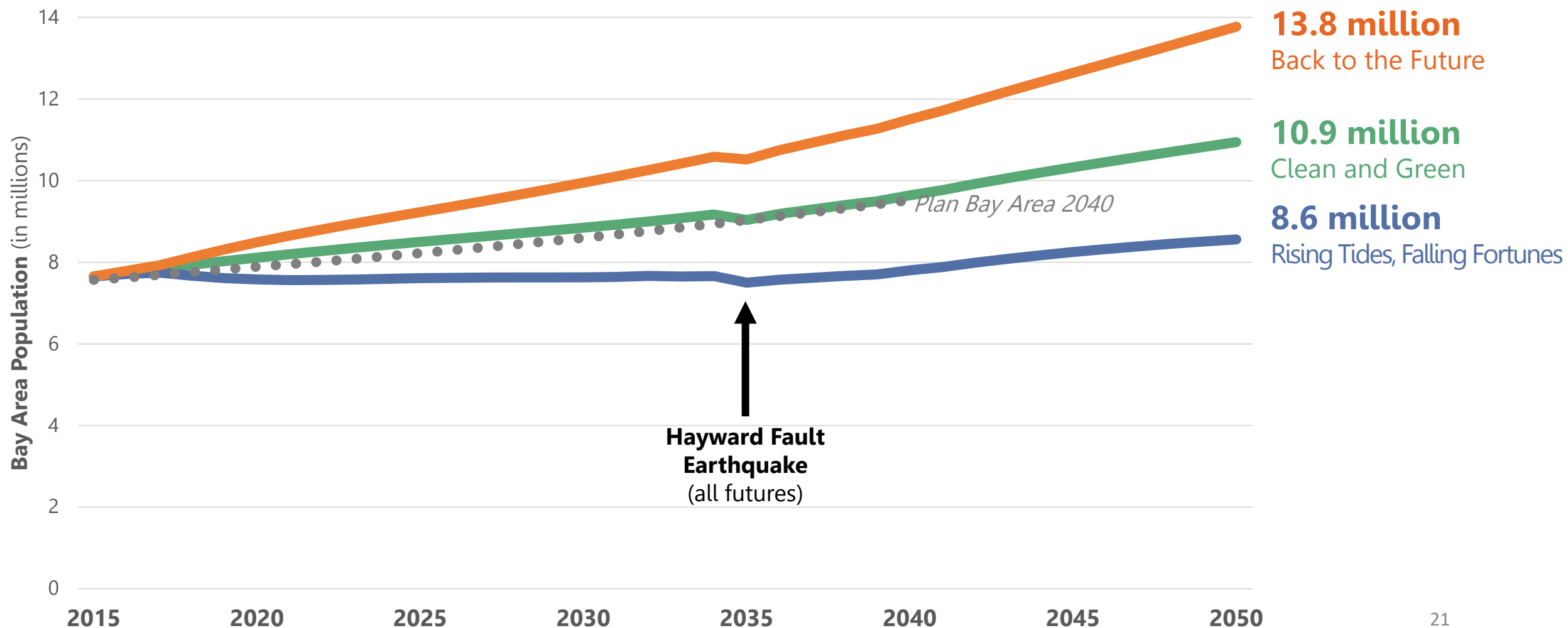
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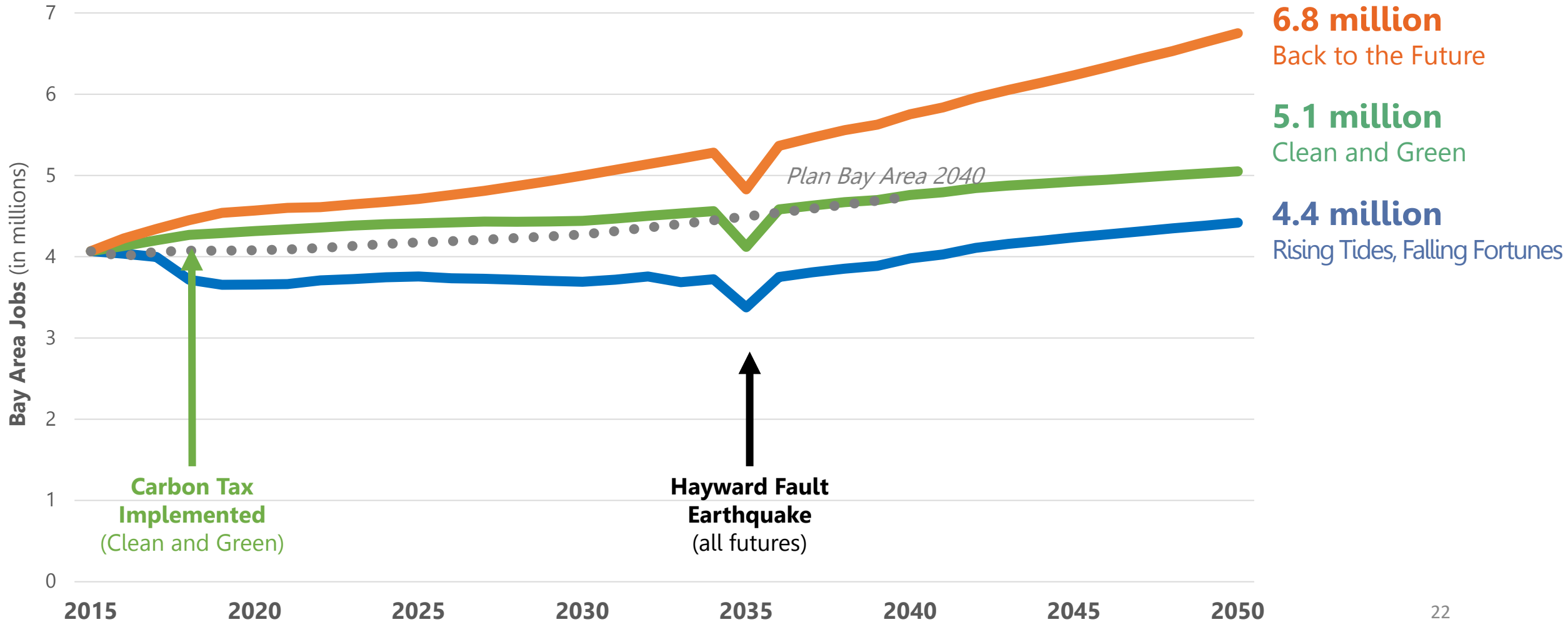
HORIZON



Futures: Bay Area Population



Futures: Bay Area Jobs



Key Challenges Identified in Round 1

- **Affordability** - without new strategies in place, Bay Area housing affordability continued to get worse.
- **Connected** - public transit, walking, and bicycling saw limited gains in mode share compared to 2015 conditions.
- **Diverse** - A significant share of lower-income households remained at risk of displacement in each Future.
- **Healthy** - Unmitigated impacts from sea level rise and other disasters resulted in significant damage across the region.
- **Vibrant** - land use strategies included in Plan Bay Area 2040 were insufficient to address the region's longstanding jobs-housing imbalance.

Futures Analysis: Round 2

Plan Bay Area 2040

Adopted in July 2017

Horizon Futures Round 1 Analysis

- *How does the region's currently-adopted Plan fare in an era of uncertainty?*
- *What are the opportunities and challenges the region may face?*



Baseline



PBA 2040
Strategies



Baseline



**External
Forces**



PBA 2040
Strategies

Horizon Futures Round 2 Analysis

- *How might new strategies result in improved outcomes in each future?*
- *Which strategies are effective across many futures?*



Baseline



External
Forces



**New
Strategies**

35 Strategies Analyzed with MTC Models

Strategies were designed to support these nine priority areas, based on the Futures Interim Report findings. While new revenues were assumed in all Futures, fiscal constraint did mean that some strategies were omitted from Rising Tides, Falling Fortunes.



Improve Economic Mobility



Shift the Location of Jobs



Spur Housing Production



Retain & Expand Affordable Housing



Improve Access, Speed, and Reliability of Transportation



Prioritize Active Modes



Price Transportation Services



Reduce the Environment's Impact on Us



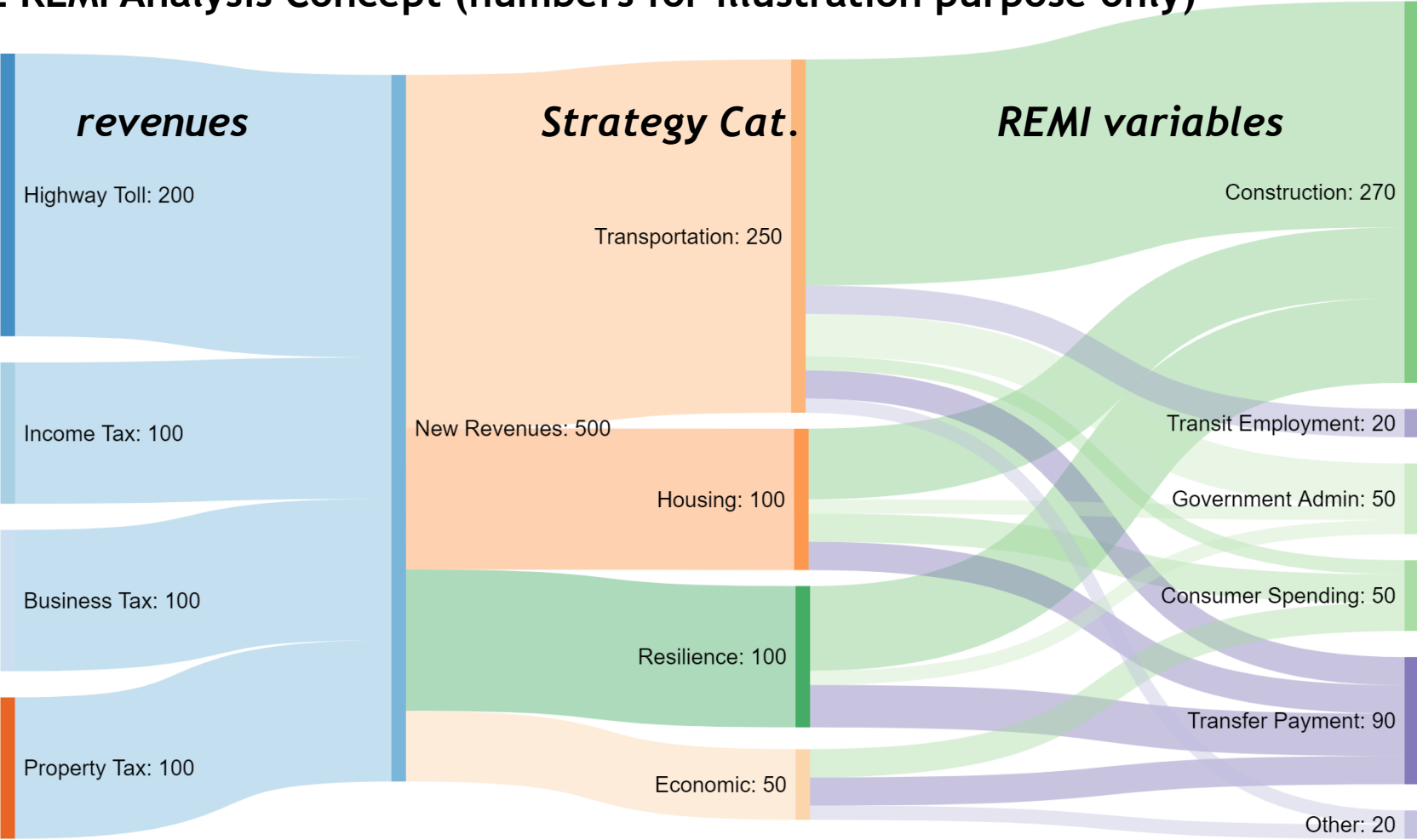
Reduce Our Impact on the Environment

REMI Approach

- Detailed analysis of benefits of two economic strategies
 - Expand Construction Workforce Training Programs
 - Provide Childcare Subsidy for Low-Income Households
- Broader Revenue and Investment Assumptions

From Revenues to Investment in REMI

Futures Round 2 REMI Analysis Concept (numbers for illustration purpose only)



Futures Round 2: Top 5 findings

- A mix of strategies to retain and expand affordable housing made progress in addressing the current affordable housing gap.
- Shifts in transportation mode choice were most pronounced for active transportation, driven in part by micro-mobility strategies.
- Road pricing reduced roadway congestion, but equity concerns need to be addressed before advancing this strategy further.
- Adaptation and retrofit strategies boosted our region's resilience.
- A large tax package (to fund subsidies / projects) focused on higher-income individuals and businesses did not have significant adverse impacts on the economy.

New Release!

Futures Final Report

Download link:

<https://mtc.ca.gov/our-work/plans-projects/horizon/futures-planning>

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Thank you!

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