# COMMUNITY CONVERSATIONS

Futures Group
6/16/2020

# Agenda

- Welcome & Introductions - Brett Fusco

- Keynote Speaker - Robert Goodspeed, PhD

- Futures Group & Long-Range Planning - Brett Fusco

- Community Conversation
  - Lead Facilitator - Brett Fusco
  - Response Facilitator - Jackie Davis
  - Technical Host - Mike Boyer

- *Dispatches from Alternate Futures* - Jackie Davis

In the chat box, tell us where you're joining us from!

# Welcome & Introductions

Brett Fusco
DVRPC Manager, Long-Range Planning

@dvrpc | #makingconnections

## Scenario Planning for Cities and Regions

### MANAGING AND ENVISIONING UNCERTAIN FUTURES

ROBERT GOODSPEED

*Robert Goodspeed is an assistant professor of urban and regional planning at the University of Michigan's Taubman College of Architecture and Urban Planning. He teaches and conducts research in the areas of collaborative planning, urban informatics, and scenario planning theory and methods. He is a member of the American Institute of Certified Planners and serves as a board member of the Lincoln Institute of Land Policy's Consortium for Scenario Planning.*
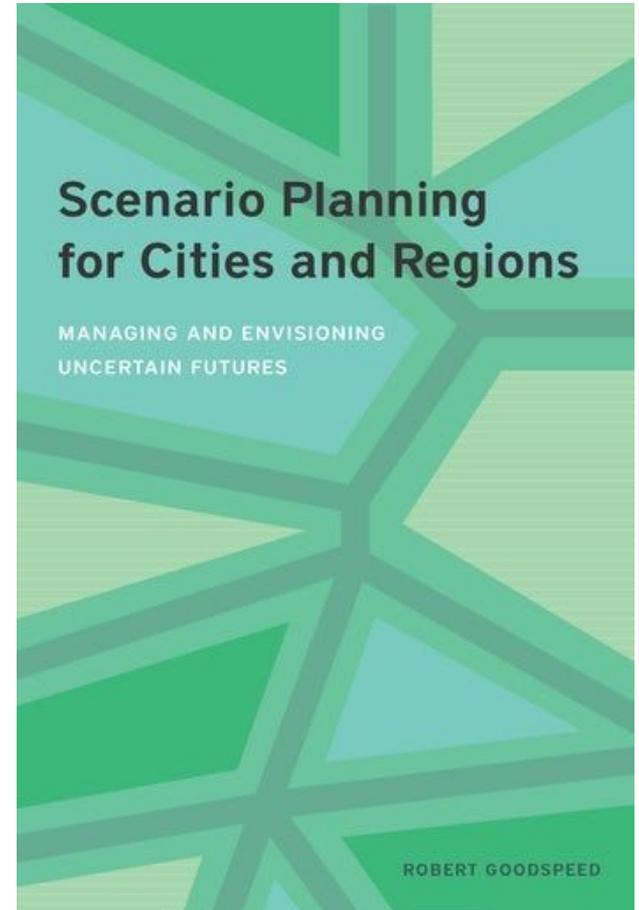
*"... [A] good decision is one that minimizes an individual's biases and maximizes information and insights—which scenario planning can readily do. This perspective contrasts with the common view in urban planning that good decisions are those that implement specific normative agendas, such as smart growth, new urbanism, strong towns, or the just city."*

- Robert Goodspeed

# Scenario Planning for Cities and Regions

Dr. Robert Goodspeed
University of Michigan

# Scenario Planning for Cities and Regions: Managing and Envisioning Uncertain Futures
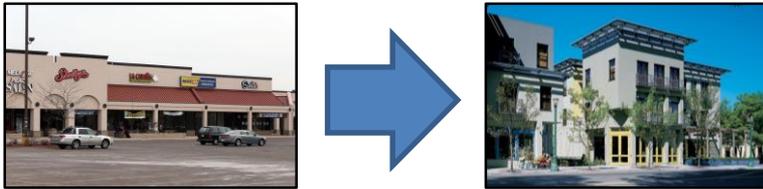
Robert Goodspeed, PhD, AICP

*DVRPC Futures Group 6/16/20*

TAUBMAN COLLEGE
architecture + urban planning
University of Michigan

# Overview

- Urban Complexity
- Competing Approaches
- Scenario Planning Defined
- Tools & Evaluations

# Scenario Planning Helps Planners Respond to Contemporary Planning Challenges





**Transformation**: How can the physical and functional pattern of a city be changed to improve sustainability?
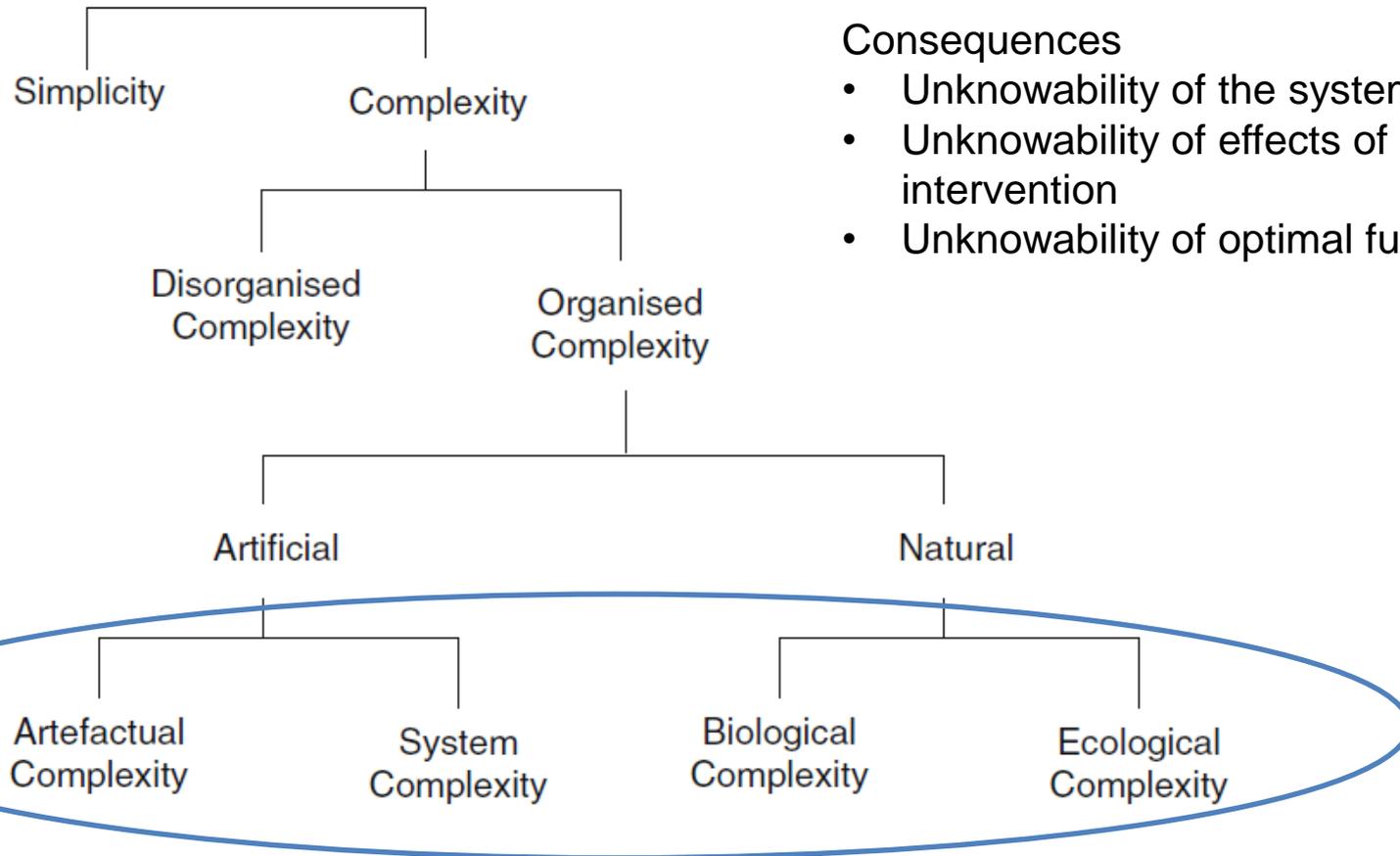
**Resilience**: How can cities be prepared for uncertain external forces, such as climate change impacts or new technologies?

# What Kind of Problem is a City?

- **Simplicity?**
  - E.g., billiards balls
- **Disorganized complexity?**
  - E.g., a gas which can be described with statistics
- **Organized complexity?**
  - E.g, a living organism

Jacobs, Jane. 1961. *The death and life of great American cities.* [New York]: Random House., Ch. 22
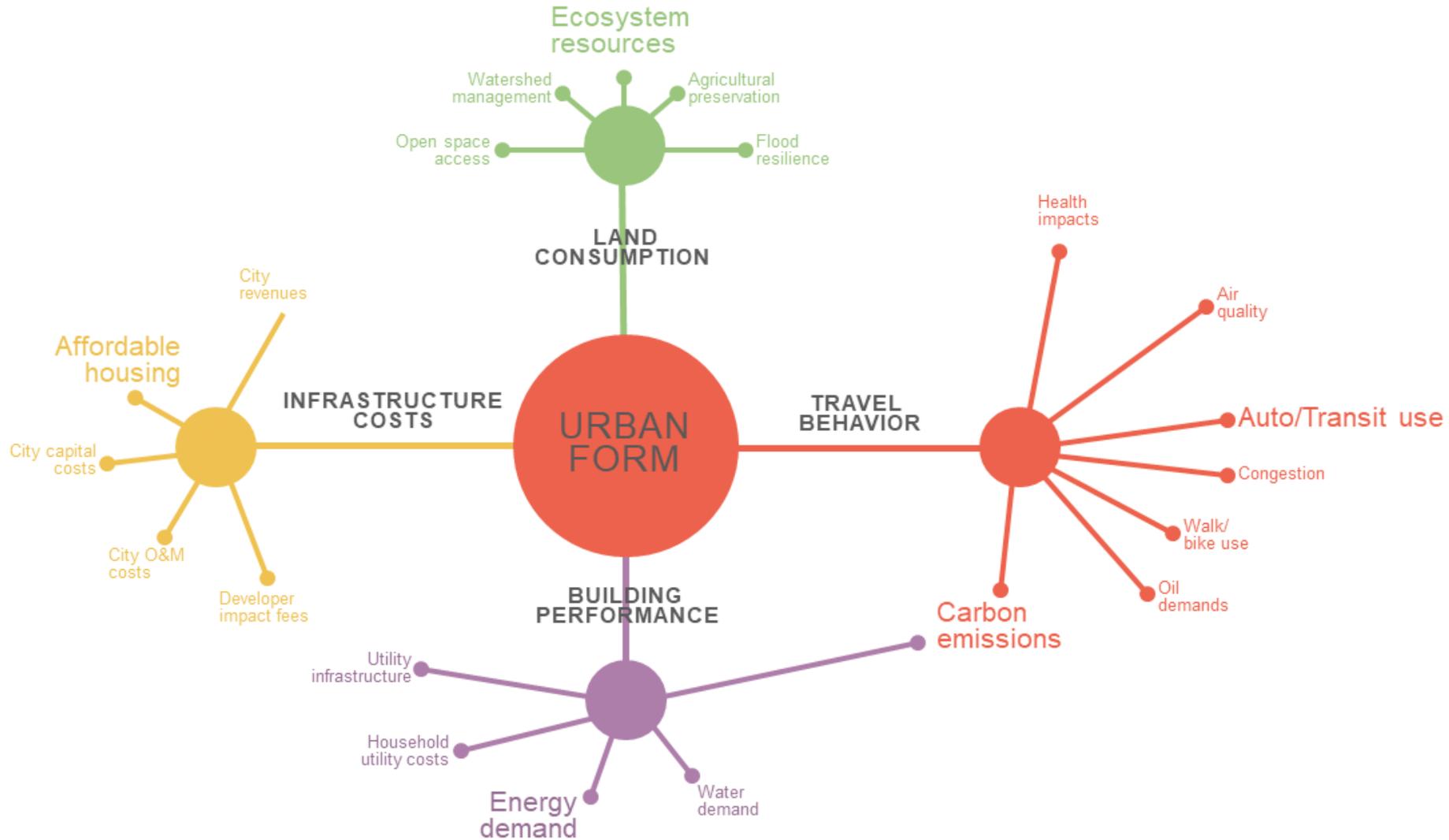
# Complexity in Cities



Consequences
- Unknowability of the system as it is
- Unknowability of effects of intervention
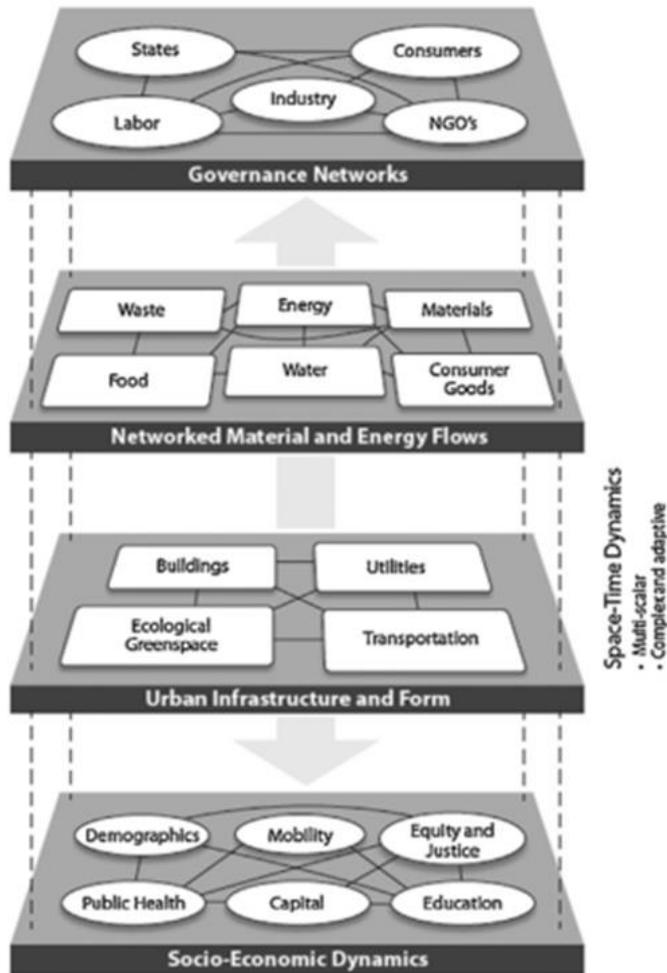- Unknowability of optimal future state

**Fig. 1** Four different kinds of organised complexity

Source: p. 197, Marshall, Stephen. 2012. "Planning, Design and the Complexity of Cities." In *Complexity Theories of Cities Have Come of Age: An Overview with Implications to Urban Planning and Design, edited by Juval Portugali, Han Meyer, Egbert Stolk and Ekim Tan, 191-205. Berlin, Heidelberg: Springer Berlin Heidelberg.*

# URBAN FORM CONNECTS THE DOTS



Source: Peter Calthorpe

# Cities are Complex Systems



**Fig. 3.** A simplified conceptual schematic of the urban 'system'. *Note:* Schematic design inspired by Dicken (2011).

Consequences of this perspective:

- Difficult to address problems in isolation

- There is no "solution" – only different goals we might pursue, which may or may not align

- Anything isn't possible! A good plan describes a possible future – although one where some things may be different.

- Since we must plan from **within the system**, Collaborative Planning Theory provides ideas on how (not discussed here).

# Planning Approaches



Visioning

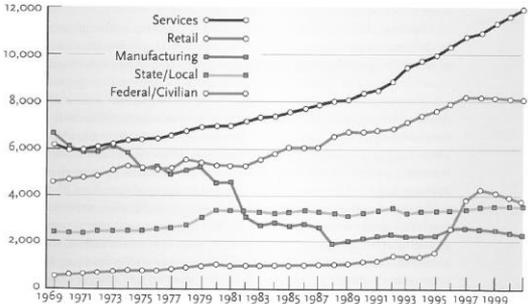# Planning Approaches



Visioning

- Whose vision?
- Data?
- Plausibility?
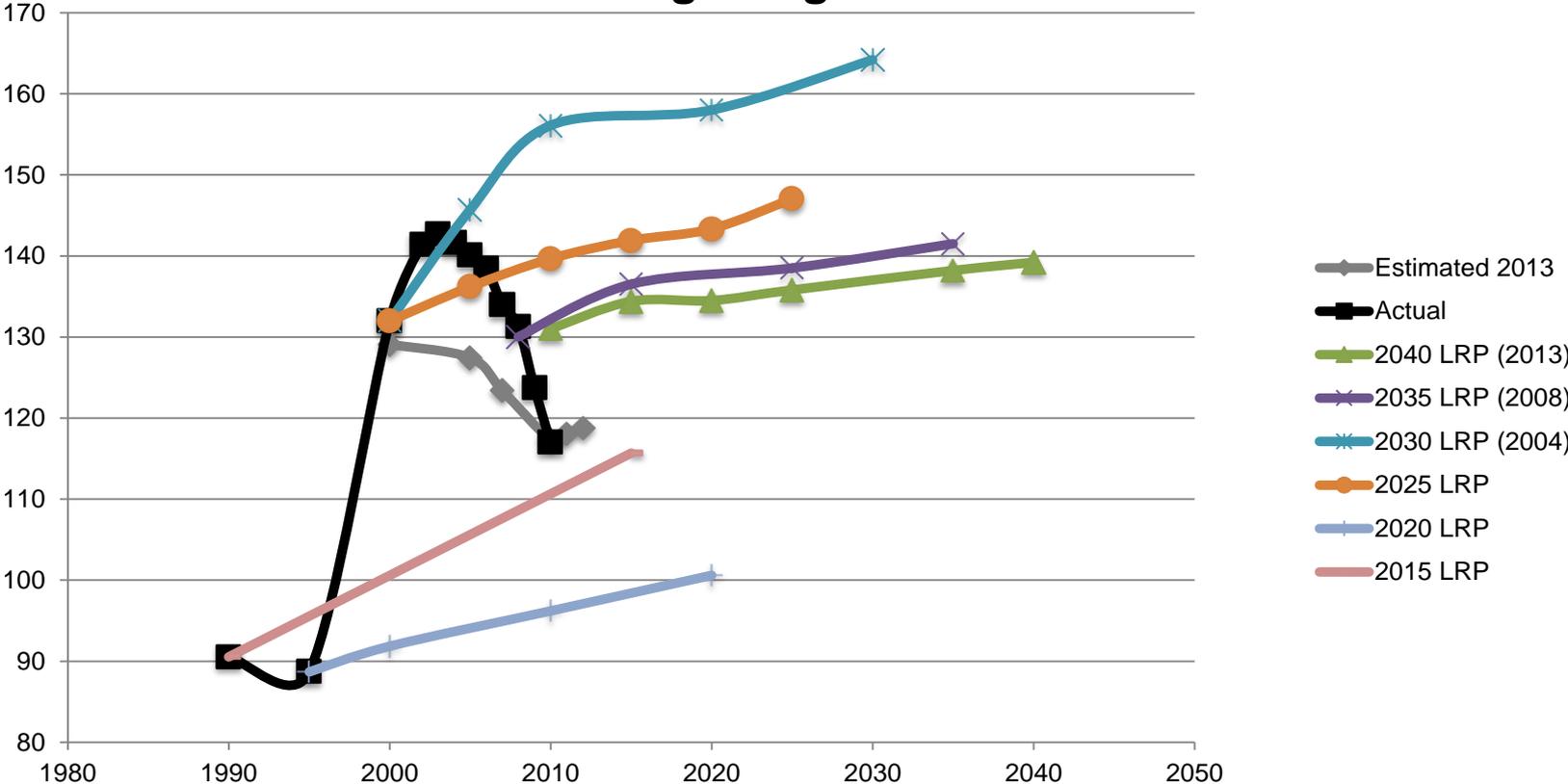
# Planning Approaches



Visioning



FIGURE 9.5
Harrison County Employment, Five Major Sectors, 1969–2000

Forecasting

# Quantitative Trends Are Difficult to Predict…

**Metro Detroit Average Daily VMT, Actual and Forecast in Long-Range Plans**



Legend:
- Estimated 2013
- Actual
- 2040 LRP (2013)
- 2035 LRP (2008)
- 2030 LRP (2004)
- 2025 LRP
- 2020 LRP
- 2015 LRP

Note: VMT estimation methodology varies between studies. Data Sources: SEMCOG, Richard Murphy

# … and Technological and Economic Trends Aren't Easier

"Heavier-than-air flying machines are impossible."
> – Lord Kelvin

"I think there is a world market for about five computers"
> – Thomas Watson, IBM Chairman, 1943

"With over fifty foreign cars already on sale here, the Japanese auto industry isn't likely to carve out a big slice of the U.S. market for itself."
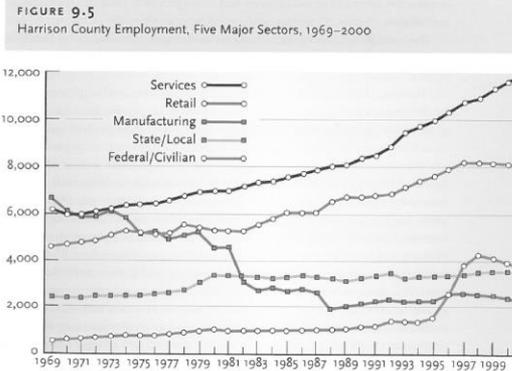> – Business Week, 1968

"One year from now, we will have more than one million fully self-driving robotaxies on the road."
> - Elon Musk, April 2019

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# Planning Approaches


Visioning



FIGURE 9.5
Harrison County Employment, Five Major Sectors, 1969–2000

Forecasting


Strategic Planning

# Strategic Planning
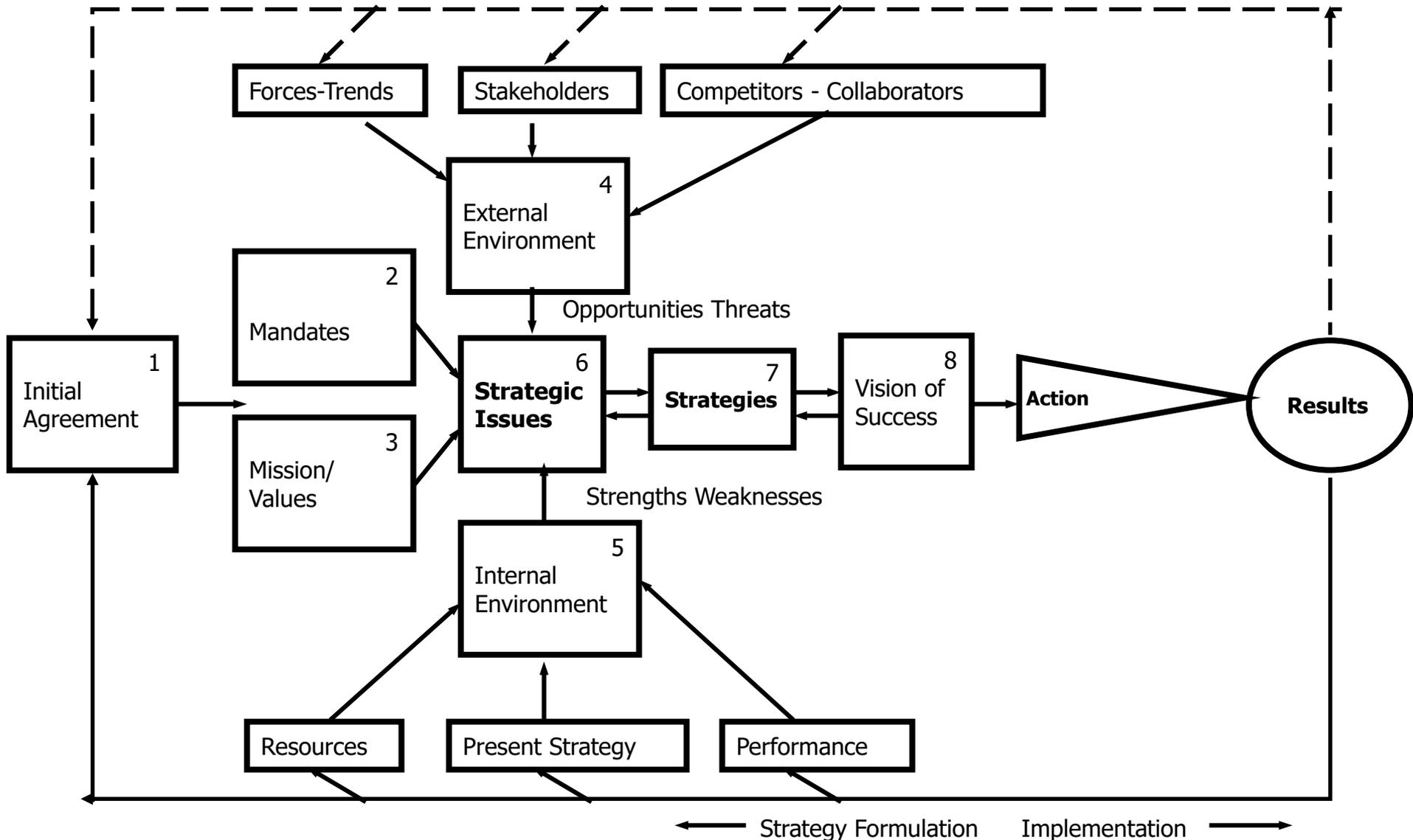


Source: Bryson, John, *Strategic Planning for Public and Nonprofit Organizations*
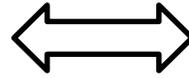
# Planning Approaches


Visioning


Forecasting


Consensus Building


Strategic Planning

# Planning Approaches

**Internal Project Focus**
Mutual Understanding  ⟷  **External Focus**
Trends & Systems
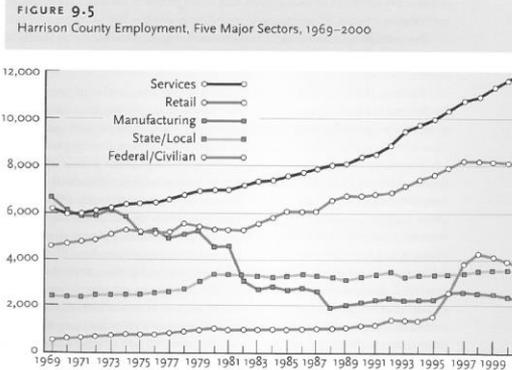
**Future Focus**
Single Vision



Visioning
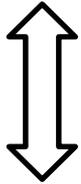


Forecasting

**Present Focus**
Anticipates Plural
Viewpoints



Consensus Building



Strategic Planning

# Scenario Planning in Urban Planning

**Elements Found in Scenario Planning Practice**

**Scenario Planning Ideas**

**Visioning**
- Inspiring visions
- Charrettes

**Forecasting**
- Plausibility
- Trend analysis

**Strategic Planning**
- Strategic Issues
- Values
- Goals
- Strategies

**Consensus Building**
- Stakeholder Engagement
- Participation

Urban Scenario Planning Practice
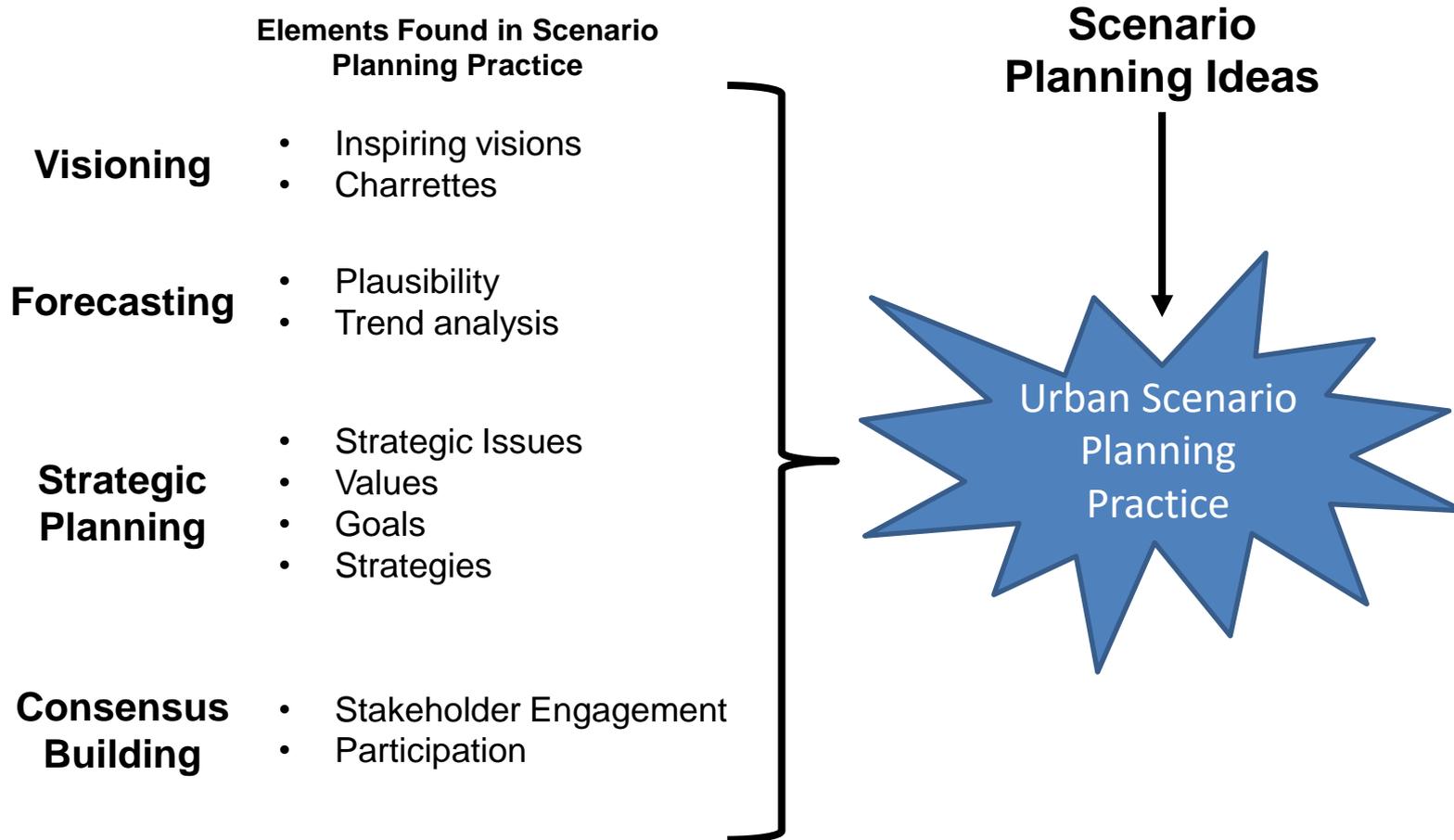
# A Forecasting Metaphor



How to anticipate the road ahead?
Curvy or straight? Types of obstacles?

Forecasting    Scenarios    Hope

Influence

F    S    H

Uncertainty

Predetermineds

Distance into the future
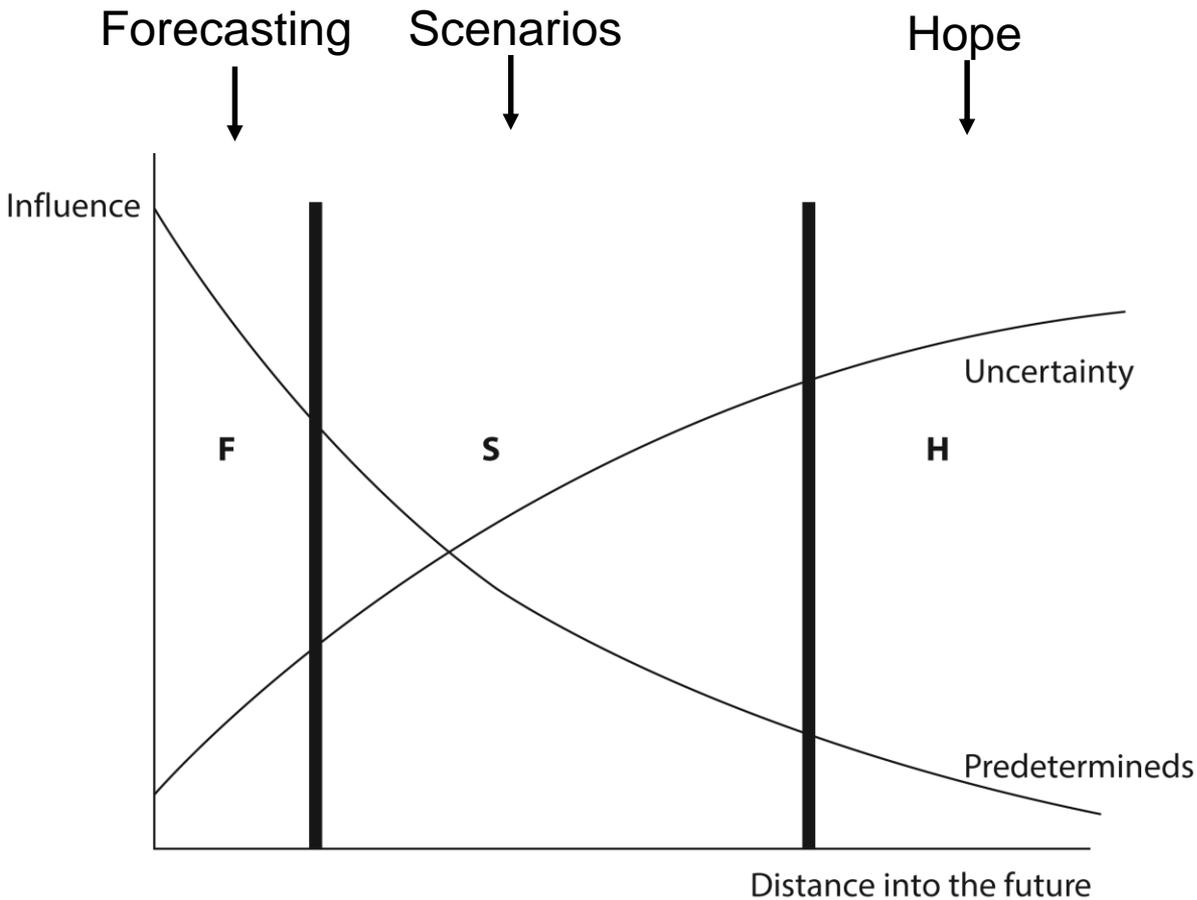
## What Are Often Analyzed in City Scenarios?

- Uncertainties:
  - Population or employment growth
  - Location, type, and density of new development
- Predetermineds
  - Existing housing and infrastructure
  - Current institutions such as private property markets

Source: Chapter 6, Van der Heijden, Kees. 1996. *Scenarios : the art of strategic conversation. Chichester, England New York: John Wiley & Sons.*

# Scenario Can Describe Trends, Decisions, or Events
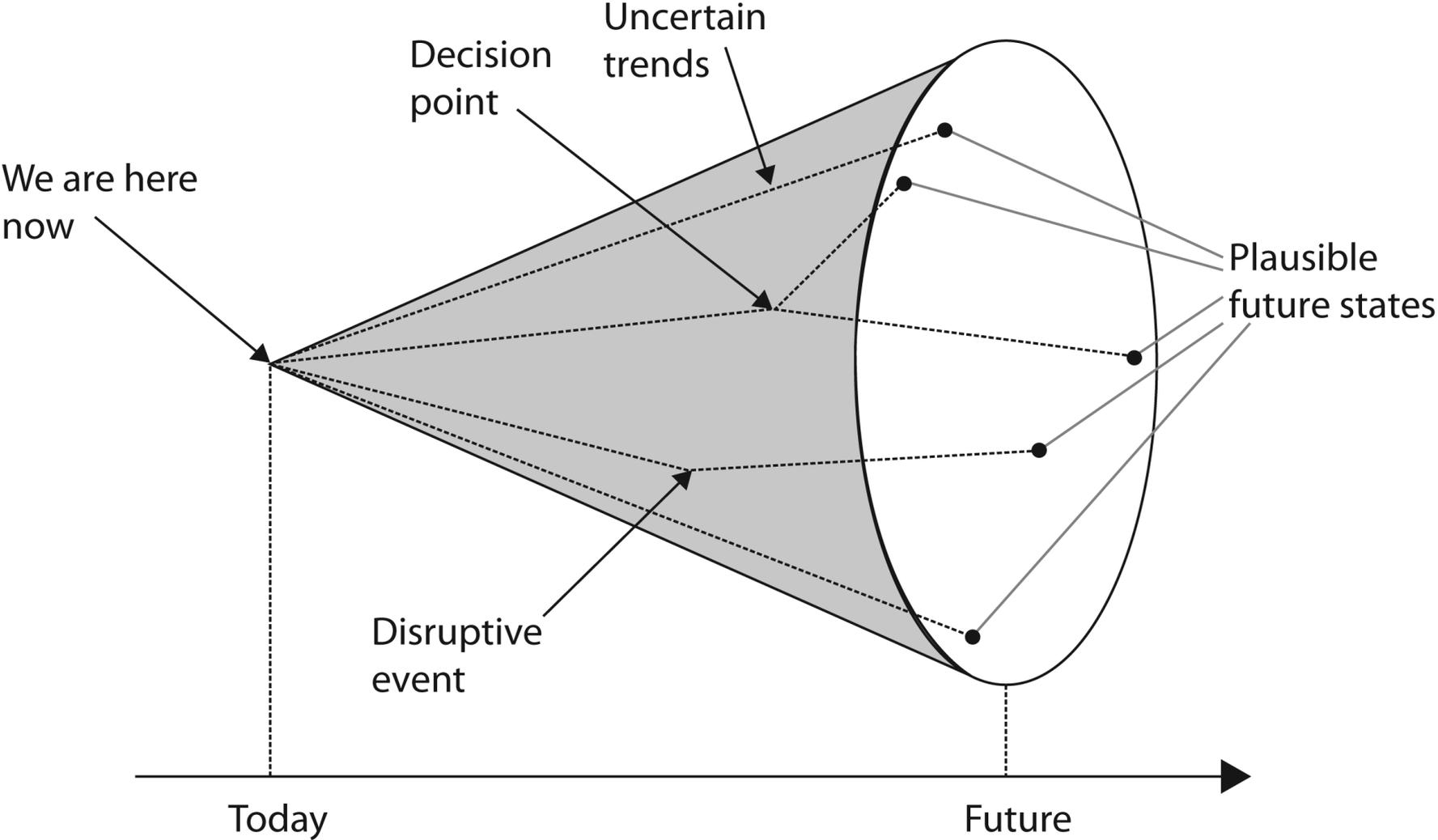
# Why create scenarios in urban planning?

| Project Type | Goal | Measures of Success |
| --- | --- | --- |
| Normative | • Create a shared vision through creating and comparing several scenarios | • Consensus on vision, implementation strategies, goals, indicators, etc… <br> • Quality of vision(?) |
| Exploratory - Focused on Decisions | • Make better decisions through creation of scenarios | • Plans which allow for better decisions (robust, contingent strategies) <br> • Number, quality, analysis of strategies |
| Exploratory Projects | • Improve understanding of uncertainty and future trends | • Foresight? <br> • Enlightenment? |

In all cases, the goal is achieved through the comparison of a **set of scenarios**, designed to be *similar* in some ways and *different* in others.

# Normative Scenario Projects

## Oregon Model for Normative Scenarios
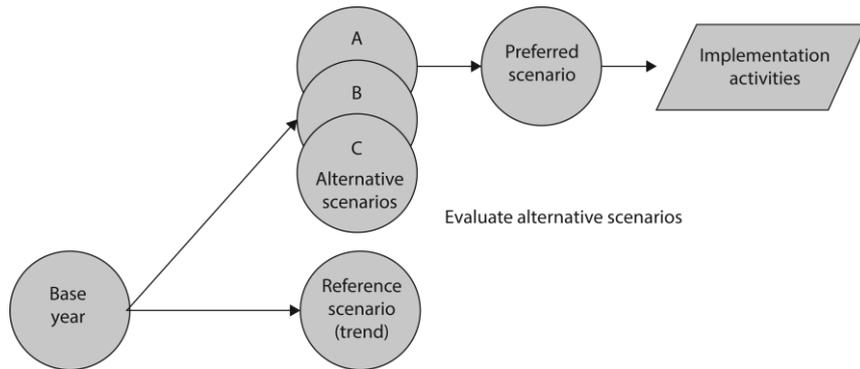


Oregon Department of Transportation. Oregon
Scenario Planning Guidelines. 2013.

## Backcasting
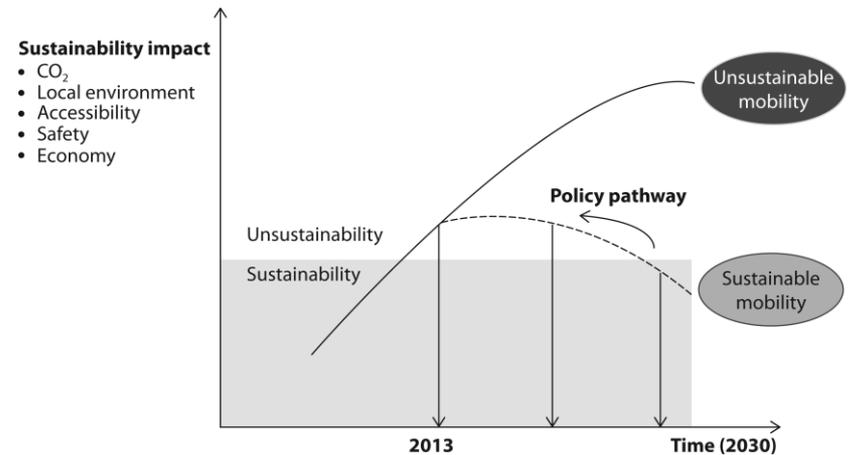


Hickman, Robin, and David Banister.
*Transport, Climate Change and the City.
Routledge Advances in Climate Change
Research. 2014.*

# Project Success Measures

| Project Type | Goal | Measures of Success |
|---|---|---|
| Vision Projects | • Create a shared vision through creating and comparing several scenarios | • Consensus on vision, implementation strategies, goals, indicators, etc… <br> • Quality of vision(?) |
| Decision Projects | • Make better decisions through creation of scenarios | • Plans which allow for better decisions (robust, contingent strategies) <br> • Number, quality, analysis of strategies |
| Exploratory Projects | • Improve understanding of uncertainty and future trends | • Foresight |

# Digital Scenario Tools

- Generic Systems Modeling
    - Gaming
    - Systems Dynamics
    - Fuzzy Cognitive Maps
- Economic, Demographic, Travel Demand Models
    - Cohort-Component Population Projection
    - Economic Base Analysis
    - Input-Output Models / REMI
    - Four-step and activity-based travel forecasting models
- **Place-Type Development and Analysis**
    - CommunityViz
    - Envision Tomorrow
    - UrbanFootprint
- Urban Systems Models
    - Cellular Automata (e.g., SLEUTH)
    - Statistical Models of Land Use Change (e.g., LEAM)
    - Spatial Interaction Models (e.g., MetroScope)
    - Agent-Based Models (e.g., UrbanSim)
- Tools for Participation, Communication & Visualization
    - Various, e.g., CrowdGuage, MetroQuest, etc.
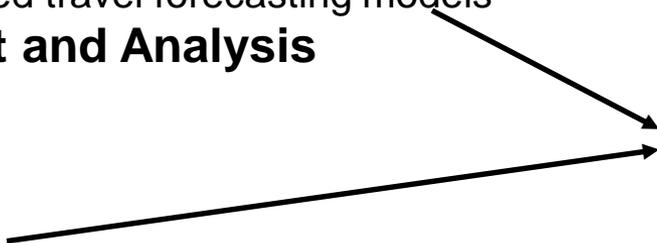
Does your model facilitate **exploration** or bake-in present assumptions?

# Place-type Development Overview

**Buildings**
ROI Model

**Development Types**
Scenario Spreadsheet

**GIS Painting**
ArcGIS

**Evaluation Criteria**
Scenario Spreadsheet

**Other Assumptions**
(e.g., street network type and widths)

5 Story Mixed Use

2 Story Mixed Use

3 Story Apartment

Townhome

Compact Single Family

Conventional Single Family

Town Center

Town Neighborhood

Residential Subdivision

Density & Mix
Travel
Health
Sustainability
Investment
Fiscal Impact

**Housing Mix**

Large Lot Single Family
Small Lot Single Family
Multifamily
Conventional Lot Single Family
Townhome
Mobile Home

Slide Source: Fregonese Associates (describes Envision Tomorrow Plus tool)

# Evaluation Indicators Rely on Quantitative Representation & Empirical Research

Development Types

Quantitative Representation

Evaluation Indicators

**Town Center**

- Compact and walkable
- Streetfront retail
- Residential, office and service uses
- Community gathering places
- Mostly 2 - 3 floors
- One chip = 1 acre
- Jobs per chip = 32
- Households per chip = 24

| Building: Infill Residential | |
|---|---|
| Lot Coverage (%) | 68% |
| Parking Coverage (%) | 22% |
| Building Size | 73,455 SF |
| Avg. Rent | $1,225/month |
| SF per use | 70% residential, 20% retail |

| Neighborhood: Mixed Use | |
|---|---|
| Block Size | 400 ft |
| Lanes | 4 |
| Lane Width | 11 |
| Bike Lakes | Y |
| Sidewalk Width | 12 |
| % Cul-de-sacs | 0% |
| Intersection Density | 127 / mi$^2$ |
| Street Miles / Acre | 0.12 |
| % Land for streets, civic, parks | 27% |

Population
Density
Housing Unit Mix
Land Use Mix
Developed Acres
Housing Cost
Housing Unit Size
Parking Spaces

Descriptive

Energy Use
Water Use
CO2 Emissions
Vehicle Mi. Traveled
Mode Choice
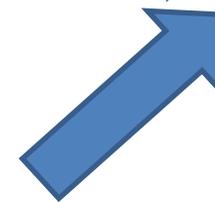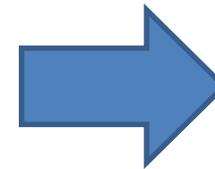
Predictive

**Assumptions & Empirical Studies**

# More Good Stuff

- How and why should scenarios be created **collaboratively**? (Ch. 1, 6)

- What are the qualities of **good scenarios**? (Ch. 6)

- What **evidence** exists that this is an effective way to plan? (Ch. 7, 8, 9)

- How can scenarios be used to imagine more **transformative futures**? (Ch. 10)

**Scenario Planning for Cities and Regions**

MANAGING AND ENVISIONING
UNCERTAIN FUTURES
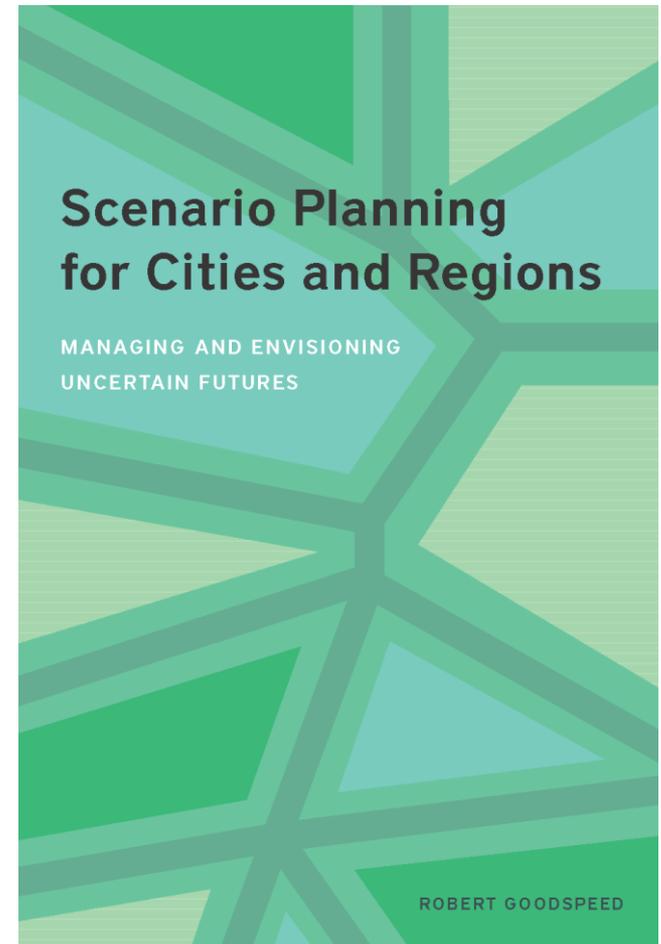
ROBERT GOODSPEED

Now Available

# Discussion

Robert Goodspeed

[rgoodspe@umich.edu](mailto:rgoodspe@umich.edu)

@Rgoodspeed

For resources, see "Scenario Planning" page

[https://sites.google.com/umich.edu/rgoodspe/home](https://sites.google.com/umich.edu/rgoodspe/home)



**Consortium for Scenario Planning**

An initiative of the Lincoln Institute of Land Policy

[http://www.scenarioplanning.io/](http://www.scenarioplanning.io/)

# Q & A

Use Q&A button in tools bar to open a dialogue box and type your question in.

# The Futures Group
# **& DVRPC Long-Range Planning**

# Collaborative Planning

**2050**

1. **Urban areas are made up of complex, adaptive (sub)systems.**
2. **Social conditions can be reconsidered and social transformation can be achieved through:**

## 1. Ongoing Dialogue
With diverse stakeholders and public.

## 2. Shared Values & Goals
Recognizing a diversity of perspectives, which cannot be fully reconciled.

## 3. Decision Making
Guided by values and goals.

### Scenario Planning
To obtain views of multiple plausible futures through:
- Stakeholder dialogue,
- research,
- technical analysis, and
- evaluation criteria to compare scenarios.

### Indicators
To track progress over time.

### Evaluation
Did the plan influence decisionmaking?

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# 2050 Tracking Progress

## www.dvrpc.org/trackingprogress

filter by: category

**Economy**

**Environment**

**Community**

**Transportation**

**Equity**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Air Quality | Bridge Conditions | Commute Mode | Congestion | Educational Attainment | Exported Goods | Global Connectivity | Greenhouse Gas Emissions |
| 30% more permits in appropriate development areas | Housing Affordability | Income Disparities | Innovation | Job Growth | Land Consumption | Miles Driven | Pavement Conditions |
| Population Growth | Racial & Ethnic Disparities | Roadway Safety | Sex Disparities | Transit Conditions | Transit Ridership | Water Quality | 2050 |

2050 Long-Range Planning

**2. Where Are We Going?**

Scenario A

Adaptive / Contingent Actions

Scenario B

**1. Where Are We Today?**

**3. Where Do We Want To Go? (Values & Goals)**

*Tipping Points / Signposts / Leading Indicators*

Scenario C

No-/Low- Regret Actions

Universal / Robust Actions

time

**4. How Do We Get There? (Strategies)**

**5. Are We Getting There? (Evaluation)**
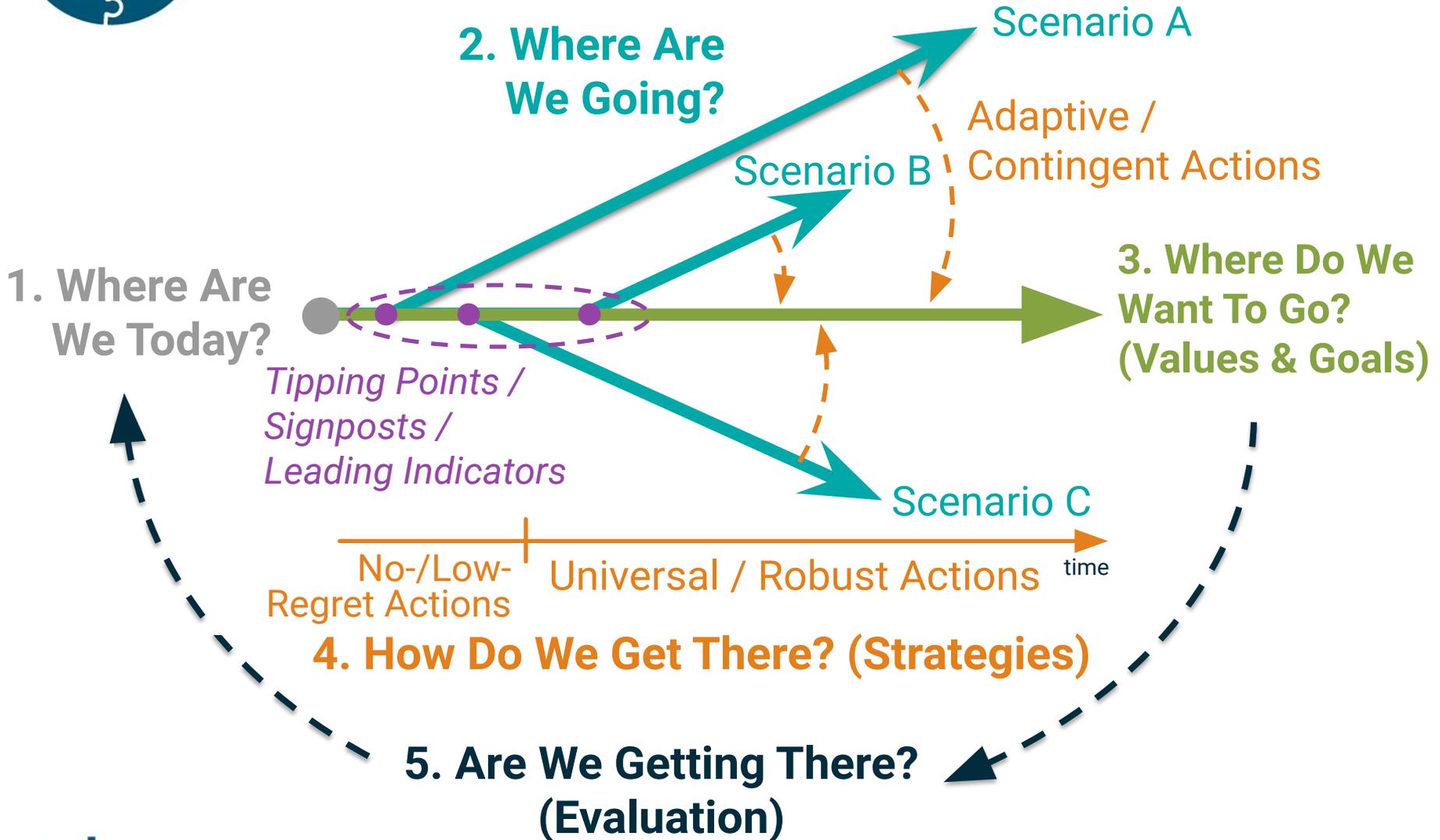
# Long-Range Plan Timeline

**SPRING-SUMMER 2019**

Identify alternative future scenarios

**FALL-WINTER 2019**

Identify current conditions

**SPRING-SUMMER 2020**

Identify an Aspirational Vision

**FALL-WINTER 2020**

Determine policies and actions to achieve the Vision

**SPRING 2021**

Seek Public Review and Comment on Draft Plan

**SUMMER 2021**

Present the Plan to the DVRPC Board for Adoption

# Community Conversations:
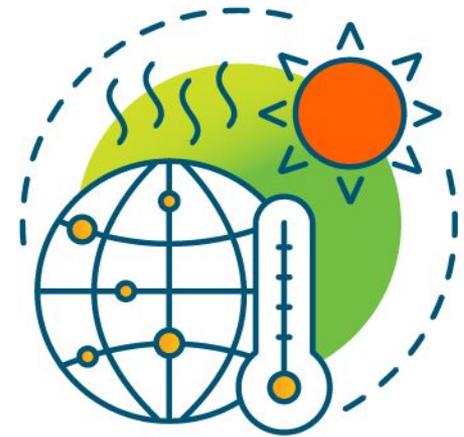## Setting a Vision for Greater Philadelphia in 2050

# Forces with Highest Impact & Greatest Uncertainty

**The Digital Revolution**

**Rising Inequality**

**Climate Change**

# Dispatches from Alternate Futures

**Technology**

Incremental Change — Transformative Change

**Climate Change & Equity**

Political Will / Collective Action

## People Power

*Grass roots democracy gives citizens more input into the development of their communities and the economy; while readily available technologies are deployed to fight climate change.*

## Inclusive Tech

*A collaborative, networked, open-source economy of abundance emerges from societal efforts to make technological advances more sustainable and equitable.*

Market Forces / Individual Responsibility

## Delayed Expectations

*Climate change, sharp political swings, ongoing civil discord, and an innovation slowdown lead to a lack of direction and economic stagnation.*

## Technology in the Driver's Seat

*Markets drive economic growth through Big Data, algorithms, and innovation.*
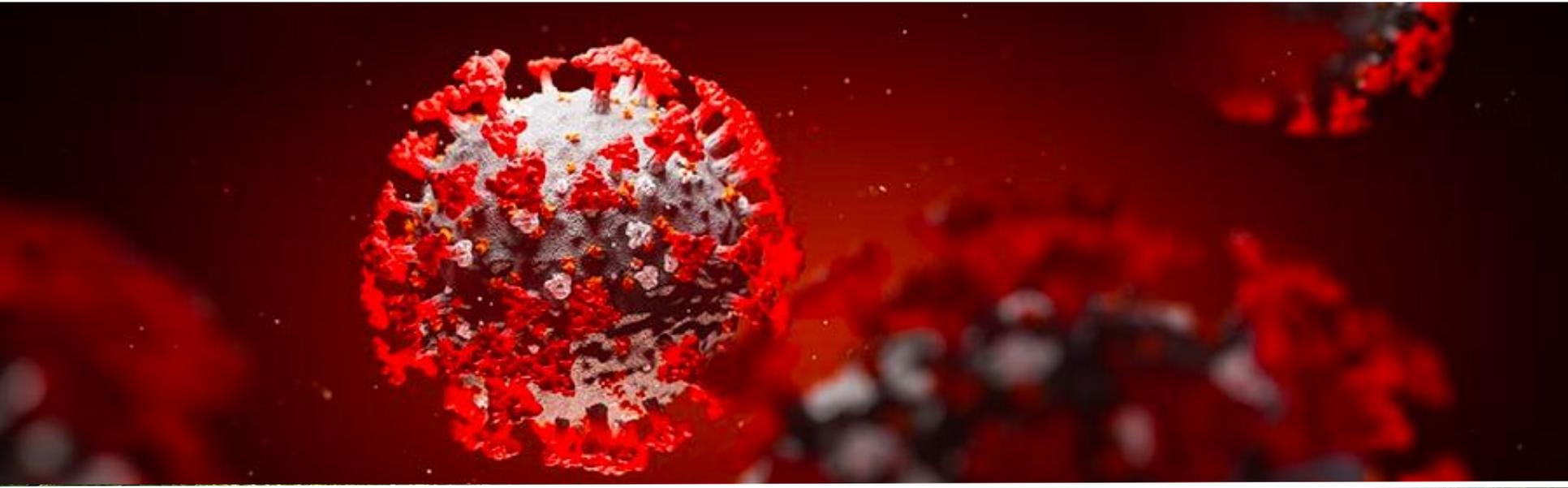
# How Scenarios Inform Outcome of Current Events

**Technology**

Incremental Change | Transformative Change

**Climate Change & Equity**

*Political Will / Collective Action*

## People Power

*Antibody vaccine developed in ~3 years, case made for universal healthcare. BLM protests spur dialogue and organizing to support major reforms.*

## Inclusive Tech

*Prolonged COVID-19 crisis ends with biotech vaccine developed without patent. Among BLM protest reforms is the use of technology to combat misinformation, reduce surveillance, and truly give everyone a voice.*

*Market Forces / Individual Responsibility*

## Delayed Expectations

*COVID-19 evolves to be less harmful in early 2020s. BLM protests fail to gain traction on wider reforms.*

## Technology in the Driver's Seat

*Biotech vaccine rapidly developed, but inoculation is slow; Big Tech emerges from pandemic stronger than ever & threatens progress made in aftermath of BLM protests.*
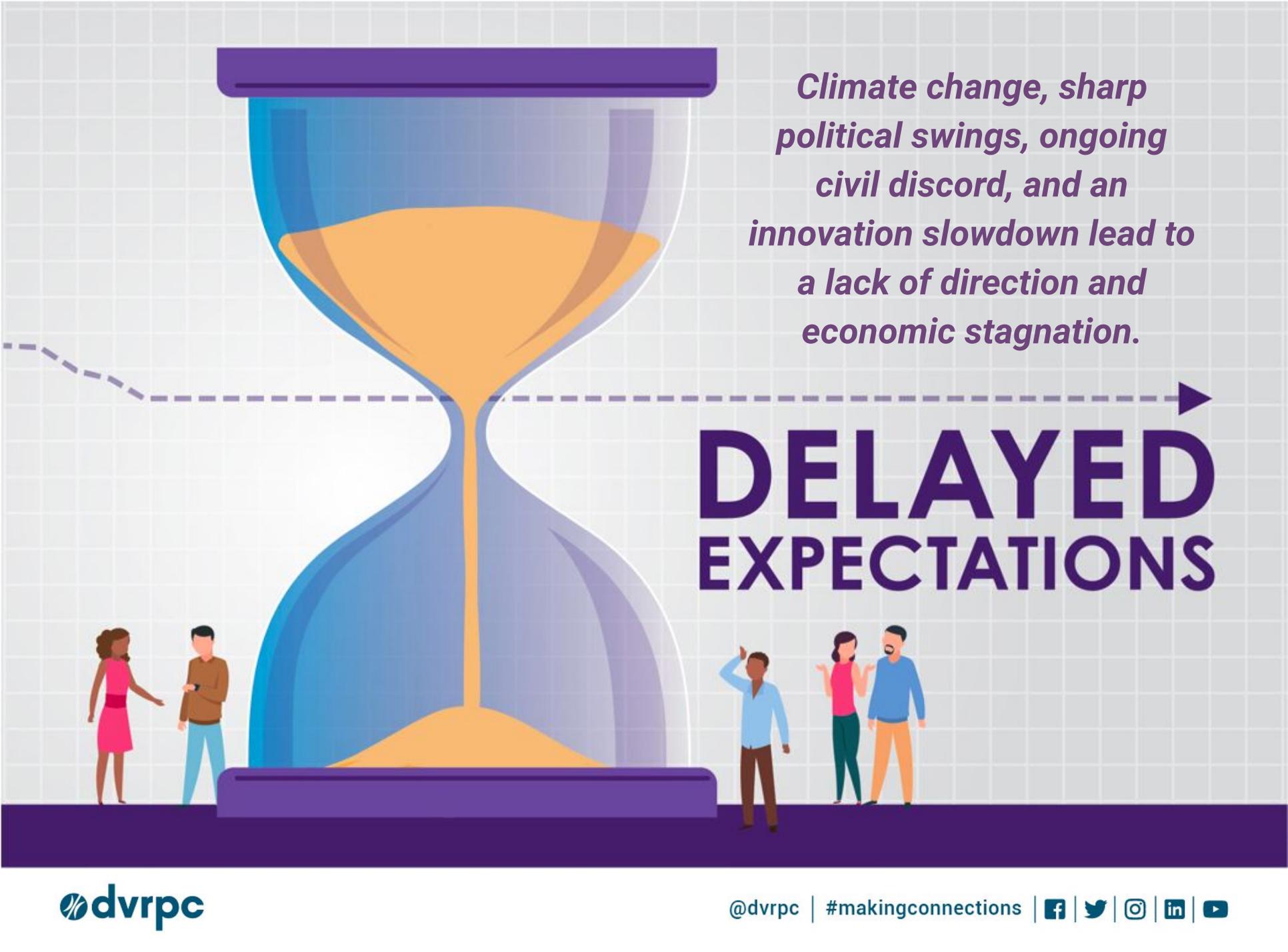
Climate change, sharp political swings, ongoing civil discord, and an innovation slowdown lead to a lack of direction and economic stagnation.

DELAYED EXPECTATIONS


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# Delayed Expectations:
# A Less Connected & Open World

**2050**

# Delayed Expectations: Political Partisanship

**Gas Tax** → **Mileage-Based User Fee (MBUF)**

Source: I-95 Corridor Coalition

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# Delayed Expectations: Mother Nature In Charge

# PEOPLE POWER

Grassroots democracy gives citizens more input into the development of their communities and the economy; while readily available technologies are deployed to fight climate change.

# People Power



Build a Better Tomorrow
THE FAIR NEW DEAL
People | Green Jobs
The Environment | Equity
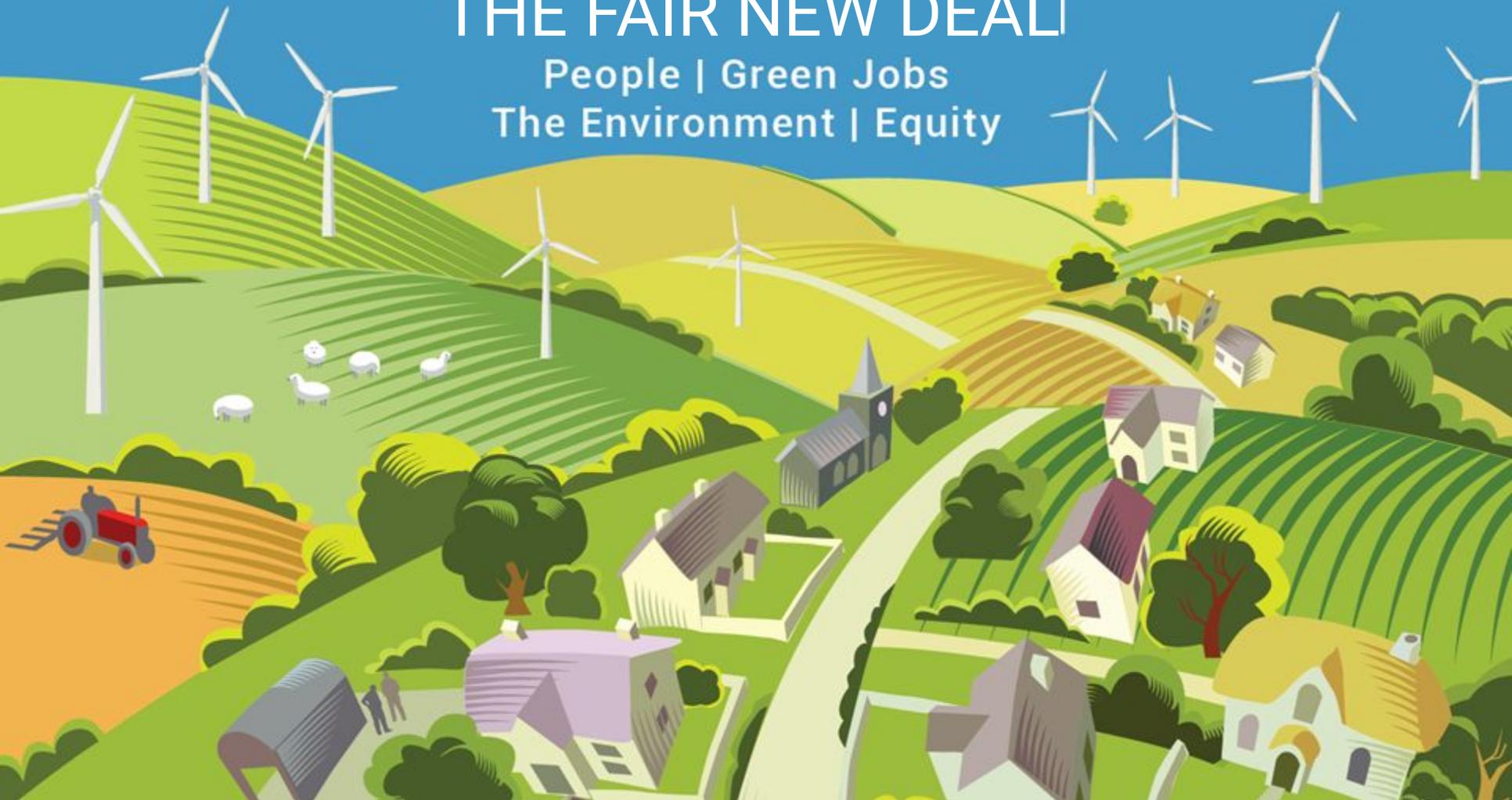
# People Power:
# Transit Investment

*Source: AD Marble*

# People Power:
# Truck Platoons (& Automated Shuttles)



*Source: U.S. DOT*

TECHNOLOGY IN THE DRIVER'S SEAT

Markets drive economic growth through Big Data, algorithms, and innovation.

# Technology in the Driver's Seat: Level 4 HAVs in Early 2020s

# Technology in the Driver's Seat: More Data Collection & Tech Disruption

# Technology in the Driver's Seat: Sustainable Suburbs

*A collaborative, networked, open-source economy of abundance emerges from societal efforts to make technological advances more sustainable and equitable.*

INCLUSIVE TECH

# Inclusive Tech:
# Open Source Economy
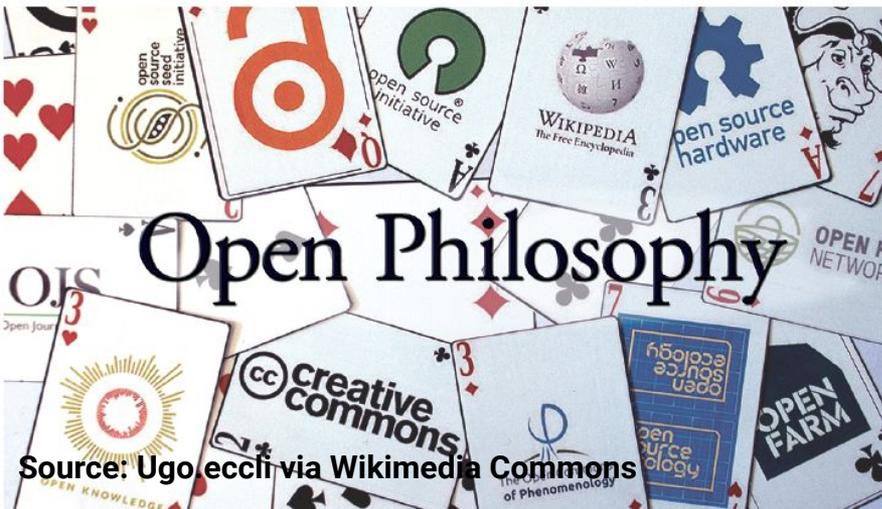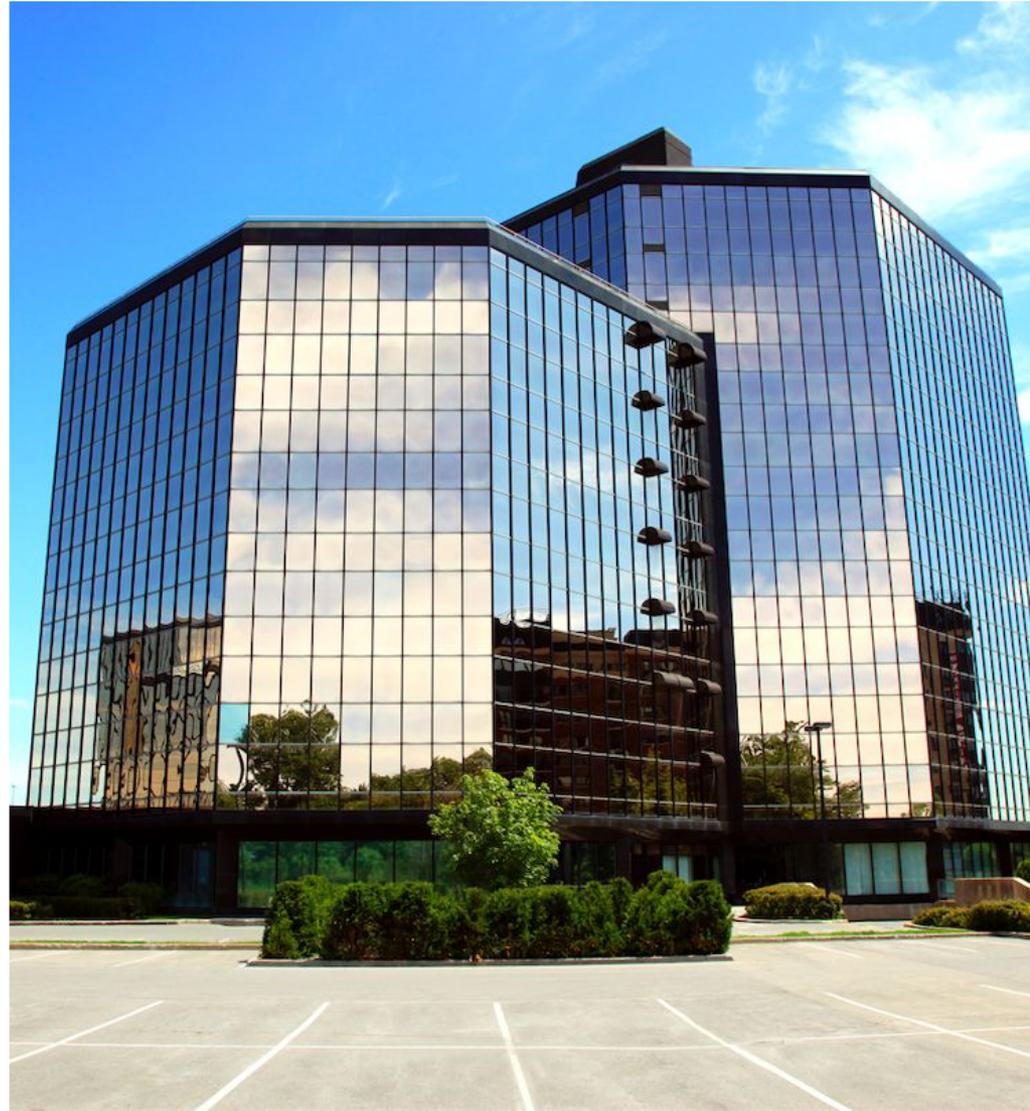


Source: Ugo eccli via Wikimedia Commons

# Inclusive Tech:
# Wide Variety of Level 5 HAVs



Self-Driving Microhouses

*Source: Kasita*

# Inclusive Tech:
# New Vistas for Human Experience



**70 is the new 50**

# Sneak Preview:
# *Dispatches from Alternate Futures*

Jackie Davis
Senior Planner, Long-Range Planning

EXPLORATORY SCENARIOS FOR GREATER PHILADELPHIA

# DISPATCHES
## from
# ALTERNATE
# FUTURES

**DELAYED EXPECTATIONS**
A world overcome by climate change and economic slowdown

**PEOPLE POWER**
Grassroots movement to a more just and sustainable future

**TECHNOLOGY** IN THE **DRIVER'S SEAT**
Big Tech takes control

**INCLUSIVE TECH**
A new equitable economy emerges through open source technologies

**IN THIS ISSUE**

**COVID-19**
**BREAKING NEWS FROM THE REGION**

See pages 26, 40 , 54, and 68

JUNE 2020

2050

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DELAWARE VALLEY
REGIONAL PLANNING COMMISSION

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# CONTENTS

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DELAWARE VALLEY REGIONAL PLANNING COMMISSION

| FOCUS AREA | DELAYED EXPECTATIONS | PEOPLE POWER | TECHNOLOGY IN THE DRIVER'S SEAT | INCLUSIVE TECH |
|---|---|---|---|---|
| CLIMATE CHANGE AND ENVIRONMENT | Climate change advances far more rapidly than forecasted; inability to reduce GHG emissions means that geoengineering is increasingly seen as the only solution. | Focus on deploying readily available technologies to slow climate emissions, and proactive retreats from coastal and low-lying areas. | GHG emissions continue to rise, creating economic, societal, and environmental risks. | Carbon taxes and regulatory incentives are used to stimulate clean technology innovation; investment in direct air capture technologies that pull climate from the atmosphere; and proactive retreats from coastal and low-lying areas |
| DEMOGRAPHICS | Increasing chronic health conditions shorten lifespans; lack of social safety net reduces birth rates; climate refugees are on the rise, but many residents are also leaving Greater Philadelphia. | Increased social safety net, including better parenting support and universal healthcare, leads to higher birth rates; climate change is bringing more people from the Eastern Seaboard to the region. | Major healthcare breakthroughs are extending lifespans for those who can afford them. | Universal healthcare and new drugs improve health outcomes for nearly everyone, extending lifespans across the board; birth rates drop as more people care for elderly relatives. |
| THE ECONOMY AND WORK | Jobs do not change much but do use more technology; continued growth in freelancing and gig economies. | Jobs look similar to today but continue to displace low-skill positions with high-skill ones; cooperatives and benefit corporations become the principal business structures. | A handful of large, monopolistic firms use data to dominate the economy; automation displaces some jobs, while technology requires more workforce skills. | Digital fabrication democratizes the means of production, reducing scarcity and deconcentrating economic power; work weeks shorten, and more people work for themselves |

| FOCUS AREA | DELAYED EXPECTATIONS | PEOPLE POWER | TECHNOLOGY IN THE DRIVER'S SEAT | INCLUSIVE TECH |
|---|---|---|---|---|
| INEQUALITY | Economic growth is slow, with more income going to those at the top as attempts to retrain and retool the workforce for modern economic needs have not kept up. | Governments invest heavily in education and workforce retraining, and try to both deconcentrate poverty and prevent low-income and minority communities from displacement. | UBIs substitute for hard-to-come by work. | Governments increase education funding and modernize curriculums, create community jobs, pay caretakers for their work and individuals for their data, and work to broaden capital ownership. |
| HOUSING AND DEVELOPMENT | Low-density communities struggle to keep up with infrastructure maintenance as it ages | Governments continue to subsidize existing low-density development in order to keep housing affordable while trying to improve walkability. | Development patterns continue to recentralize until highly automated vehicles (HAVs) arrive, leading to more decentralized land uses. | Automated technologies are applied to small, mobile housing units that enable relocation for work and quick evacuation from emergency situations. |
| TRANSPORTATION INFRASTRUCTURE AND FINANCING | Revenues move to mileage-based fees but are not set at a level that catches up on road maintenance needs. | Revenues shift to a fee based on how many vehicle miles traveled (VMT) each property generates along with a tradable driving credits system, where each person gets an annual allotment of VMT; this helps pay for major new transit investments around the country. | Congestion pricing is used to curtail traffic and emissions but leads to significant road expansion and a focus on maintaining higher-volume roads; calls to privatize the most profitable roads, to better address maintenance and keep technologies up to date. | Funding significantly increases thanks to carbon taxes but then decreases as emissions levels decline; these taxes also incentivize less carbon-intensive forms of transportation and infrastructure. |
| TRANSPORTATION TECHNOLOGY | Technological limitations have stymied efforts to create HAVs; little investment in CV technologies. | HAV rollout has been challenged by technology and business model problems; in response, the federal government is piloting truck platoons and automated shuttles, and implementing CV technologies. | HAVs, which can operate in designated zones, are deployed before anyone is ready for them; CV technologies are not pursued. | Quantum computing and artificial general intelligence (AGI) help to speed up HAV development and deployment of vehicles that bear little resemblance to traditional cars and trucks. |

SOURCE: DVRPC, 2020.

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# UBIQUITOUS CRYPTOCURRENCY UNDERMINING THE U.S. DOLLAR

November 3, 2035

**M**ore than a decade since the last economic recession, markets are coming to a head with the question that has loomed over cryptocurrency since its swooping takeover of the U.S. banking industry. The early 2020s Debt Bubble recession and the currency crisis that followed led to such high inflation on the U.S. dollar that many turned to crypto, then touting its open, low-cost, and secure access to the financial ecosystem.[65]

The "buyer, beware" approaches to regulation at the time meant all kinds of questionable products were readily available for consumption as nefarious actors took advantage of the down market.[66] But while volatility proved fatal for Bitcoin, a few select companies were able to insert themselves into the general public's daily lives—and purchases—with the backing of a reserve of real assets.[67]

Facebook's Libra, governed by the Libra Association, was one such crypto that everyday people—not just speculators—started using to buy goods and services. Where other cryptocurrencies failed to persuade consumers to actively use their cryptos to buy things, Facebook's omnipresence via its social media platform to 1.7 billion daily users made its blockchain wallet, Calibra, an easy transition.

To be sure, there have been positive effects as a result of a global currency and financial infrastructure that is free to access. Hundreds of millions of people previously without bank accounts now have access to crypto accounts, and the seamless transfer of funds has created enormous economic efficiencies.[68] And unlike Bitcoin, which was decentralized and difficult to track, the Libra has actually made it easier for law enforcement to track tax evasion and illegal trade.[69]

However, as the cryptocurrency market continues to grow and expand, it undermines the sovereignty of governmental monetary policies. Where the Federal Reserve has controlled the circulation of money in the United States for over a century, its power in controlling inflation and stimulating investments is eroded with every blockchain transaction. The once almighty dollar has continued to depreciate due to the wide adoption of Libra in the United States and abroad. Indeed, the size of Facebook's network—that which made its widespread adoption so seamless—made it so devastating to the U.S. dollar, and Calibra locating its headquarters in Switzerland put it further out of the federal government's taxation and regulatory reach.

In a last-ditch effort, the House, on Tuesday, passed a bill authorizing a Fed-issued digital currency. But the role of the U.S. dollar, whether market-based or by government fiat, as the world currency may have been reassigned to another central agent altogether. ■

# AMERICAN BUMBLEBEE OFFICIALLY EXTINCT

August 24, 2037

**B**ombus pensylvanicus, the American bumblebee, had joined some 1,200 other bee species native to North America in receiving a designation from which they will not return: Extinct. This furry, iconic pollinator, once commonly seen buzzing around gardens and fence posts, is a symbol of the biodiversity crisis facing not just North America but the entire global ecosystem.

The International Union for Conservation of Nature released a report earlier this week naming the American bumblebee among the hundreds of insect species recently added to its "Extinct in the Wild" list, indicating survival only in captivity, cultivation and/or outside its native range."[70] But while this tiny pollinator is having a big impact on the survival of native plant species and propagation of cultured food sources alike, it is a drop in the bucket compared with the overall impact of pollinator extinction globally.

Pollinators like the American bumblebee are integral to the propagation and species survival of wild and cultivated plants alike, and their disappearance is already having drastic effects on wild ecosystems and food production. Thirty species of orchids, once pollinated exclusively by bees, are now grown only with human intervention.[71] Wild populations of the bumblebee's predators, such as badgers and shrikes, have also been declining over the last several years and are having their own effects on native food webs.[72] In food production, crops such as tomatoes must now be pollinated via ag-drones or robotic systems in vertical gardens.

The mass extinction of bees and other pollinators has long been attributed to agricultural use of herbicides and insecticides, in addition to habitat loss, pests and diseases, and lack of nutrition resulting from crop monocultures and more areas having a limited number of flowering species.[73] The collapse of bee populations may be our own canary in the coal mine. Colonies often contain trace residues from hundreds of pesticides, each of which is benign on its own but can become toxic when mixed together.[74]

These trends have necessitated a shift in farming to more controlled environments as natural pollinators disappear from farms. Vertical agriculture operations have shown themselves to be a more sustainable and eco-friendly option to food production, having lower emissions, higher-nutrient produce, and reduced water usage and runoff than their traditional farming counterparts.[75] This industry shift will, perhaps, be the savior of remaining insects, plants, and animals, which will hopefully experience a resurgence in the absence of the chemicals and land uses that have threatened their populations to extinction. ■

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# 2020s
## DELAYED EXPECTATIONS

Big data continues to be collected ubiquitously but is causing an increase in uncertainty, as market and public actors analyze, understand, and react to data in different, often conflicting ways. Technology suffers a massive loss of trust due to surveillance fatigue; increasing cyberterrorism; lack of reliability of the internet; and a reaction against 5G deployment, which requires major new wires, poles, and digital equipment to be erected across the country. Mother Nature continues to unleash infectious diseases, hotter weather, sea level rise, fires, and flooding; worsening the steep economic decline that started with the COVID-19 outbreak.

As transportation funds run low, infrastructure conditions continue their long-term decline—hastened by climate-driven severe weather. Without new incentives for sharing or more efficient transportation options, people hold on to their cars. ∎

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December 13, 2027

# BREAKING NEWS
### New Novel Coronavirus in China Raising Concerns About Another Global Pandemic

A new novel Coronavirus is rapidly spreading in southeast Asia just a few years since the SARS-CoV-2 virus killed hundreds of thousands worldwide. It could shut down the economy just as there are finally signs of recovery. However, the political fortitude to do this is lacking. While most people have tried to move on from the 2020 pandemic and its aftermath, the federal government has bowed out of international efforts to streamline vaccine development. Other big questions loom. Have we done enough to rebuild the strategic national stockpile of personal protective equipment and medical supplies? Can we set up isolation centers to keep entire households from becoming infected? Can we trace the contacts of those who become sick? Can we retrofit hospitals, and produce needed medicines and medical equipment? Ongoing political sniping over the COVID-19 response suggests we have not learned from recent missteps. If this virus is as contagious as the last one, the results could be even more disastrous.

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# CLIMATE REFUGEES COMPOUND CRISIS ON SOUTHERN BORDER
### January 14, 2024

The humanitarian crisis at the U.S. southern border has reached a new breaking point, with nearly 1,000 new migrants showing up every day and finding no place for respite after their long travels. Whereas a large majority of migrants during the 2010s were reported to be fleeing gang violence and poverty,[15] the wave of the 2020s has increasingly been the result of climate change and extreme weather in Central and South America.

The World Food Program has declared the food shortages in Guatemala, El Salvador, Honduras, and Nicaragua a catastrophic famine, affecting over four million people throughout the Central American Dry Corridor, which extends from southern Mexico to Panama.[16] Many of the migrants are subsistence farmers who have been especially hard hit by what is now on record as the longest drought recorded in the Americas.[17]

"We must reach across the aisle and develop a robust resettlement program," argues María Cristina García, Howard A. Newman Professor of American Studies in the College of Arts and Sciences at Cornell University. García briefed policymakers in Washington, DC, last month on the asylum classifications that put climate refugees at a particular disadvantage.

"The term refugee is defined very precisely in international law," she explains. "In U.S. law, for example, refugees are defined as individuals persecuted because of race, religion, nationality, membership in a particular group, or political opinion. Nowhere does climate figure into it. It leaves this entire group of people without international protection or recognition."[18]

In the absence of a resettlement program in the United States, organizations like the United Nations High Commissioner for Refugees have been providing aid, but it is hardly enough. Refugee camps like the one in Ciudad Juárez, Mexico, located just 10 miles south of El Paso, are bursting at the fences.[19] Ciudad Juárez itself holds some 50,000 migrants unable to reach the United States and fearful to leave the camp.

As immigration continues to be restricted in every way possible, it is not just the immigrants who are being harmed. Agricultural and business operations throughout the country have a hard time finding badly needed workers. Many slow-growth regions, including communities throughout the country, including those in Greater Philadelphia, continue to struggle due to a lack of migrants helping to breathe new life into local economies.

Still, no progress is being made on Capitol Hill to alleviate the crisis. This hotly contentious issue has been a rallying cry from both the Democratic and Republican presidential candidates, but consensus is nowhere to be seen. ∎

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The FND aimed to reduce vehicle miles traveled (VMT) and double fleetwide average fuel economy for all cars and light trucks by 2035 as key ways to reduce greenhouse gas emissions. This combined with transit investments helps stimulate redevelopment in both urban and suburban locations to build more walkable communities. The region's transportation network is increasingly multimodal, even as private market interest in shared mobility services wanes. While transportation network companies have been in decline, there has been growth in small, shared rideable modes such as bikesharing, e-bikes, and e-scooters, which are generally operated by public or non-profit organizations.

As flooding concerns mount, governments and insurance companies no longer support redevelopment in floodplains and focus instead on high and dry infrastructure. Subsidies for green building practices have given way to a strong market demand for resource efficiency, occupant health, and waste reduction in residential and commercial development. On-site renewable solar, wind, and geothermal energy production are now applied in most new construction, and energy is being decentralized in older buildings as well. Most corporations are reincorporating, as either benefit corporations that can operate more in the public interest or as worker-owned cooperatives in response to growing consumer and worker demand for more sustainable and worker-friendly business practices. ∎
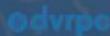
## EXTREME WEATHER TIPPING POINT FOR DECENTRALIZED ENERGY

November 20, 2035

This week, PECO became the third major public utility company in the United States to decentralize its energy platform for existing residential and commercial buildings. Following a decade of disruptive power outages caused by increasingly intense storm events, the Exelon Company has presented a five-year plan for implementing Decentralized Renewable Energy (DRE) through the use of microgrids, picogrids, solar lanterns, and solar-powered unit boxes to its entire service area.[47]

Leading the charge has been Pacific Gas & Electric, which became the first utility to provide DRE in 2026 in response to its losing battle against drought-induced forest fires and its ensuing reorganization. Con Edison, serving New York City and Westchester County, New York, followed, citing blackouts and brownouts as a primary catalyst for its transition.

PECO has been setting the stage for this shift for some time now. Expanding its green building subsidies over the last decade, the Exelon company has been supporting off-grid energy distribution for new construction since 2030. Its latest program expands this service to existing construction, largely via modular solar homes systems and bidirectional electricity meters that enable peer-to-peer electricity trading.[48]

While PECO is on the front end of decentralization, this shift is representative of a larger national trend of power and utility companies responding to strong market demands for resource efficiency, occupant health, and waste reduction in residential and commercial development. The pivot not only opens new revenue opportunities in a highly digitized energy ecosystem but also solidifies existing companies' roles as central players, hedging against their replacement by direct-to-consumer apps and services.[49]

In addition to utility subsidies, homeowners can take advantage of federal tax incentives to underwrite the installation DRE equipment. By taking a lead on climate change and resiliency efforts in this way, the United States is positioning itself to become the market leader in clean technology. ∎

A handful of multinational firms use technology and intellectual property to maintain control over a hotter and wetter planet. Automation, robotics, and AI have displaced many workforce tasks and pushed many workers into the gig economy. A universal basic income now fills gaps in pay. Despite this, there is a sharper contrast between haves with employment and have-nots than ever before—based on who controls the algorithms and data that largely define daily life. Social cohesion is reduced by concerns about every movement being tracked, ubiquitous facial recognition technologies, and an increasing coverage of digital screens is reducing the desirability of urban places. Isolation is on the rise as many to turn away from the public realm, while marriage and birth rates decline. Healthcare is focusing more and more on upgrading the healthy— at least those with deep pockets— rather than healing the sick. ∎

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**2040s**

**TECHNOLOGY** IN THE **DRIVER'S SEAT**

R ecently released U.S. Census Bureau data estimates that Greater Philadelphia's population was 6,106,189 on April 1, 2040. The region's population rose by more than 395,000 people over the past decade, a 7.5 percent increase. This is a sharp contrast from the 2030 census, when the region lost 7,000 people.

A strong regional economy has propelled growth, as jobs increased by 3.4 percent over the past decade. Every suburban county grew, led by Chester and Montgomery, reversing two decades of recentralization. However, the city's population decreased by 0.7 percent.

The region has averaged 61,700 live births each year compared to 74,400 deaths since 2030. Domestically, an average of 22,000 more residents came into the region each year than went out (156,000 versus 134,000). In the last decade, 631,500 immigrants have moved into the region, while 330,800 U.S. citizens moved abroad.

The number of people of color increased by 10 percent since 2030, and now make up 43 percent of the region's population. Asians were the fastest-growing demographic group, growing by 23 percent to 668,174 persons. The number of Hispanic individuals increased by 16 percent to 836,195 persons. The region's white population increased by 4 percent to 3,473,218, while the Black population rose by 1 percent to 1,169,708 individuals.

The region's median age is now 41.9 years old. Population under age 16 increased by 2 percent over the last decade, with 970,000 in this age range. Growth in the over-65 segment continues to surge, having increased by more than 13 percent over the past 10 years. There are now nearly 1.28 million residents over age 65 in the region.

The Greater Philadelphia region is now the eighth largest in the country—trailing the New York; Los Angeles; Chicago; Dallas-Fort Worth; Houston; Washington, DC; and Miami regions. ∎

### GREATER PHILADELPHIA DECENNIAL CENSUS POPULATION (IN THOUSANDS)

| COUNTY | 2010 | 2020 | 2030 | 2040 | % Change 2010-2040 |
|---|---|---|---|---|---|
| BURLINGTON | 449 | 444 | 450 | 491 | +9.4% |
| CAMDEN | 514 | 510 | 519 | 555 | +8.0% |
| GLOUCESTER | 288 | 289 | 294 | 323 | +12.0% |
| MERCER | 368 | 372 | 382 | 407 | +6.8% |
| NJ SUBREGION | 1,618 | 1,633 | 1,646 | 1,776 | +9.7% |
| BUCKS | 625 | 620 | 590 | 657 | +5.1% |
| CHESTER | 499 | 514 | 494 | 563 | +12.9% |
| DELAWARE | 559 | 560 | 535 | 590 | +5.6% |
| MONTGOMERY | 800 | 819 | 779 | 864 | +8.0% |
| PHILADELPHIA | 1,526 | 1,591 | 1,668 | 1,656 | +8.5% |
| PA SUBREGION | 4,009 | 4,104 | 4,066 | 4,330 | +8.0% |
| GREATER PHILADELPHIA | 5,627 | 5,719 | 5,712 | 6,106 | +8.5% |

SOURCE: DVRPC, 2020.

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## OPEN SOURCE, INCLUSIVE TECH ALLOWING EVERYONE TO DESIGN THEIR COMMUNITY

February 7, 2043



**T**he "democratization of production" has been the 21st century's biggest story.[97] The factory is everywhere, and everyone can contribute to design and production through open source technologies.[98] The decentralized nature of this emerging cooperative, open tech economy is empowering individuals, who can create and make most of what they need for themselves. A scan of recent, seemingly unrelated, headlines shows how these decentralizing technologies are reshaping Greater Philadelphia and beyond:

▸ Economists Struggling to Adapt Theories to Growing Abundance

▸ Rethinking Patents and Copyrights in an Open Source World

▸ 70 is the New 50. What Does this Mean for Healthcare, Pensions, Marriage, and the Job Market?

▸ As Artificial General Intelligence Overtakes Work, the Community Jobs Program is an Opportunity Lifeline

▸ Corporate Profits Continue to Decline as "Collaborative, Open Sharing" Comprises a Growing Portion of Economic Activity

▸ Unable to Stem the Flow of Information, China's Communist Party Falls

▸ Artificial General Intelligence is All Knowing;

▸ This Year's Top Sabbatical Ideas: Ashram Residences, Buddhist Retreats, Low Tech Living with the Amish, Mega Marathons, and Hunter-Gatherer Wilderness Adventures

▸ The Traditional Economy's Last Stand: Will Conscious Machines Overtake Caring and Community Jobs

These headlines show how open source, digital technologies are changing the nature of the economy, vastly extending lifespans, breaking down large organizations, and challenging individuals to find new meaning in a world with less need for work. The productive efficiencies brought about by these technologies are bringing net marginal production costs to near zero.[99] In other words, it is almost impossible to turn a profit. Trade is in decline as individuals increasingly use 3D printers to create many of the things they previously purchased. This path was set in the 2020s with the massive build-out of the Internet of Things, along with constructing decentralized micropower plants and retrofitting buildings for energy efficiency.[100] This provided the last major private market job creation and wage increases.[101]

The fossil fuel bust in the 2030s can now be seen as the dying breath of the old economy. Since then, there has been a painful but fascinating readjustment as the economy reorganized around renewable energy. What will humanity do in its next act? That is the exciting question that is just starting to be addressed.

The world's complexity goes beyond the capability of any individual or group of individuals to understand. In response, more power and decision making—from governance to tackling climate change—has been delegated to artificial general intelligence (AGI) programs. Collaborative, democratic networks have brought nearly every citizen into a Federal Cooperative that manages the nation's affairs in a much flatter, vertical organization. These AI-powered networks respond to citizen desires and preferences, as well as the unique, complex dynamics occurring in each community, rather than a reliance on one-size-fits-all, top-down solutions to challenges. They also offer access to community-based work, ensuring that everyone can find a job. Though, concerns are growing for community and caring jobs, especially if AGI achieves consciousness.

While it's not easy to adapt to this new normal, many are enjoying being less tethered to an office job. As science continues to better understand our biological and evolutionary needs, diets, exercise, and how we spend our day is changing. Early on in the smartphone era, people tried to walk 10,000 steps per day. The goal now is 25,000. Running has moved from sport to obsession. The Christmas Day Continental Army Ultramarathon from the Delaware River to Trenton, New Jersey then to Princeton, New Jersey and back, had 60,000 runners participate last year—about 25 times as many troops who fought with General Washington. Federal guidance recommends everyone take at least a two-week sabbatical to focus on mental well-being each year. Nature and natural functions are being embedded into the fabric of our communities as they never have before.

Average lifespans are pushing well into the 80s. Not only are people living longer, but they are also more active and healthier later into life. This is clearly a good thing, but longer lifespans are challenging retirement savings and pension funds; and elderly divorce rates are on the rise. Intelligent robots are increasingly available to help care for the elderly and provide companionship.

If there is a downside to this era, it is a lack of privacy. Remaining anonymous in the digital age largely depends on the sheer overwhelming amount of data collected about everyone. Although if someone or an organization wants to track you, they can.

**THIS MAY JUST BE A PRICE WE HAVE TO PAY FOR OUR GROWING ABUNDANCE OF ALL KINDS OF PRODUCTS, WHICH IS BRINGING DOWN THE COST OF NEARLY EVERYTHING—AND OPENING UP WHOLE NEW VISTAS FOR THE HUMAN EXPERIENCE. THE WORLD IS OPEN. WHAT DO WE WANT TO DO WITH IT?** ∎

# Thank you!

**Stay Involved:**

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"*Planning's crisis of confidence, which coincided with the publication of Rittel and Webber's article, came with the collapse of traditional notions rationality and comprehensive planning under overwhelming criticism. In response, planners pursued reduced modes of practice such as incremental planning, middle-range planning, advocacy planning, or today's tactical urbanism and placemaking. Collectively, these styles suggest potential for broader transformation through small-scale or short-term planning activities. However useful these more modest approaches may be, though, the need for large-scale, long-term planning has never gone away. Ambitious planning remains indispensable to--and even a legally mandated aspect of--contending with the consequences of large-scale decisions and preparing for uncertain futures.*"

# Scenario Planning for Cities and Regions

*"Scenarios today explore the long-term consequences of decisions and trends, consistent with collaborative theory's view of planning as a process of ongoing learning. In this view, the goal of planning is to make more intelligent decisions today, not to achieve perfect knowledge of the future. "*

*"...planning could also foster emancipation, because 'good futures research does not present any self-fulfilling prophecies. Conditional prognoses and conditional plans oppose reification of developments, and demonstrate alternatives and possibilities for change through active measures' (Sandberg 1976). In [this] view, the publication of trends and prophecies can be the first step toward criticizing and breaking them."*