

Memorandum 4

Meeting 3 Summary

SCENARIOS & IMPLICATIONS

Between Futures Working Group meetings 2 and 3, participants voted on likelihood, impact, uncertainty, and relationships. DVRPC then took these voting results to form the axes of uncertainty and scenarios shown in Figure 1 (see also Memo 3-link, scroll down-for more information about the voting and formation of axes and scenarios).

Figure 1. Four Scenarios Formed from Axes of Uncertainty

	Incremental Change	← Axis 1 → Transformative Change
2 → Political Will / Collective Action	Strength in Numbers – Citizens have more say in the development and regulation of technology, the communities, the economy, and privacy. Focus is deploying already existing technologies, as innovation has slowed.	neir the development and regulation of technology, their
Polarization ← Axis 2	Delayed Expectations – Political uncertainty, slo innovation, and lack of direction leads to econom stagnation. Long-anticipated technologies have been slow to roll out after hitting a few bumps in road.	increasing control over technological development & deployment, the economy, and how communities grow and

The third meeting began to consider the implications from the four scenarios. Each participant and breakout group focused on just one of the four scenarios. Participants responded to four questions, and gave responses related to their specific scenario.

- 1. What are the key implications for this scenario in terms of climate change, demographics, jobs and the economy, inequality, transportation technologies, infrastructure and funding for it, health, and others?
- 2. What doesn't change in this future?
- 3. What are the sources of conflict in this future?

Connecting People, Places & Prosperity in Greater Philadelphia

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4. Write three news headlines for key stories in this future from different times between now and 2050 (i.e. one in 2027, another in 2036, and the last one in 2045). These should highlight specific, critical events and developments, have led the world and region along this future pathway. This could be the outcome of trade negotiations, an election, a technological breakthrough, a major corporate merger, or others.

Each of these scenario discussions are summarized in the tables on the following pages by time period and scale (for implications).

Next Steps

Below is a summary of the steps involved in the Future Forces 2050 Scenario Planning exercise, with completed tasks greyed out. Meetings 1 and 2 focused on steps 1 through 4. Steps 5 through 7 were completed offline after the second meeting. Meeting 3 focused on step 8.

- 1. Define Research Statement
- 2. Brainstorm Future Forces
- 3. Short Presentations on Future Forces with Highest Knowledge Gaps
- 4. Vote for Working List Forces Most Probable and Relevant to Research Statement
- 5. Vote on Impact and Uncertainty for Top 20 Voting List Forces (identified in Step 4)
- 6. Use Impact-Uncertainty voting results to form axes of uncertainty.*
- 7. Use axes of uncertainty to form scenarios.*
- 8. Facilitated discussion of scenario implications.
- 9. Facilitated discussion on scenario recommendations.
- 10. Model and develop scenario narratives.
- 11. Review draft report.
- 12. Publish final report and communicate key findings.

Meeting 4, scheduled for Thursday, May 2, 2019 will continue the discussion on scenario implications.









^{*} DVRPC staff-led steps.

STRENGTH IN NUMBERS

Scale	Short Term	Medium Term	Long Term
Global Implications	Green Building becomes norm (government subsidized).	Green Building becomes norm (market driven).	Green Building becomes norm (market driven).
National/ Multi-State Implications	 Distrust of government and technology. Health disparities persist. Inequities – minorities always exist. 	 AV focused more on freight/goods movement. Health Disparities persist. Inequities – minorities always exist. 	 Climate Change is reactionary, not forward thinking. Inequities – minorities always exist.
State/ Regional Implications	 Local food production/ agricultural factories: vertical farming. Courageous leadership. Aging population and service providers. Local/regional economies, shorter supply chains. 	 Insurance/FEMA/Government leads/directs where development happens. Multimodal investment project delivery. 	 More transportation options in all neighborhoods. Change Tax Structure of paying for public education. More and Equal Access [to education]. Private Business directs subjects for training. Multimodal inv. project delivery.
County/ Municipal Implications	 Local food production/ agricultural factories: vertical farming. Courageous leadership. Aging population and service providers. 	 Insurance/FEMA/Government leads/directs where development happens. Redevelopment Potential. 	•
Neighborhood/ Household/ Individual Implications	 Local food production/ agricultural factories: vertical farming. Courageous leadership. Aging population and service providers. On-demand mobility. 	 Insurance/FEMA/Government leads/directs where development happens. Energy Decentralization. 	•
Things That Don't Change	 Always a minority. Health disparities. Feeding a growing population. Difficult to get tax and bond structure to pay for these things, driven by private market. Mix of industries. Built environment, roads/infrastructure. 	 Mix of industries. Built environment, roads / infrastructure. 	•





Scale	Short Term	Medium Term	Long Term
Sources of Conflict	 Aging Population. Health Disparities. Tax policy. Distrust of government. Resource Comp. Funding constraints (local reliance). Preserving Inequality. 	 Loss of privacy. Property rights vs. "for the good." Climate change responses (man vs. nature). 	Not training/educating in the right subjects/topics.
Headlines	 First H.A.V. Hits Road. New Urban Farm, North Philadelphia (Mushrooms). WPA 2.0 Pilots. Midterm Wave. Catastrophic Hurricane. Who's Left Behind? Homelessness Ended in PA/NJ/DE. Amazon Broken Up. Inequality & Plausible Solutions. State Moves Away from Property Taxes Funding Public Schools. 	 Penn Breakthrough, Attracts Investment/Empoyment. 40% U.S. Work at Home. National Implications of Philadelphia Pharma Decline. Biking Team. McMansions Converted to Multi-Family. Individual vs. Community is a 	 The Untold Story of the Florida Oranges. Fusion! WPA 2.0 Maintenance. U.S. Population Starts to Decline. Universal Healthcare. Obesity Rates Decrease. Coastal Flooding. Seniors on Kibbutz.





TECHNOPOLITICAL TRANSFORMATION

Scale	Short Term	Medium Term	Long Term
Global Implications	Travel to vacation/other rec destinations increases due to increased free time.	 Climate Implications of changing infrastructure utilization, how, where, why? Transformative event - catastrophe or innovation (radical). 	 How will we feed ourselves? Land use change. Mobile housing = loss of social cohesion, waste, emergency response. Tech won't replace social cohesion.
National/ Multi-State Implications	 Travel to vacation/other rec destinations increases due to increased free time. 3D Printing may not deconcentrate power. 	 Climate Implications of changing infrastructure utilization, how, where, why. Transportation Tech: threat of hacking and power grid failure, need for non-tech backup. 	•
State/ Regional Implications	Travel to vacation/other rec destinations increases due to increased free time.	 Climate Implications of changing infrastructure utilization, how, where, why? Loss of jobs = idleness = fulfillment? How to fund societal needs? 	Recharacterization of welfare state.
County/ Municipal Implications	 Travel to vacation/other rec destinations increases due to increased free time. Competition over desirable places to live, rise of nomadic living. 	 Transportation importance of reimagined work. Scenario: work from anywhere and self-reliant. Loss of Jobs = idleness = fulfillment? How to fund societal needs? 	•
Neighborhood/ Household/ Individual Implications	Change in street life and street use due to change in work place density.	 Loss of jobs = idleness = fulfillment? How to fund societal needs? Health tech may not improve behavior. 	 Better health = increased longevity, creates needs for better planning for seniors. Global exchange of ideas, culture.
Things That Don't Change	 Racial inequality. Wealth distribution. Population. Inequality. Climate hotter and wetter, point of no return. 	 Racial inequality. Wealth distribution. Population. User fees change landscape and inequality, pay to play. 	 Racial inequality. Wealth distribution. Population. Need for human interaction. General human behavior.
Sources of Conflict	 Change in energy systems. Public vs. private transportation and the economic impact at every level and for individuals. Lack of political consensus. Building of conventional infrastructure and development patterns. Limited resources, personal benefit? 	 Change in energy systems. Public vs. private transportation and the economic impact at every level and for individuals. Lack of political consensus. Desirable places to live. 	 Change in energy systems. Public vs. private transportation and the economic impact at every level and for individuals. Lack of political consensus. Individualism vs community ownership? Concept of sharing. Throwaway society via hypermobility.





Scale	Short Term	Medium Term	Long Term
Headlines	 Lifespan Expanding in Past 20 Years, but Only for Small Percent of Population. California Implements UBI. East Coast Recovery Continues, Led by Citizenbased Groups. Philadelphia Creates Utopian Society Community. Mobility Breakthrough for Quadriplegic Woman via Tech Implants. Vacation Island Built Off Cape Cod. Transit Strike Shuts Down Delaware Valley. 	 Economic Power has not been Distributed as Evenly as Predicted by The Rise in Technology. Popular Vote Wins. States Eliminate Electoral College through Constitutional Convention. Universal Pre-K Enrollment reaches 100%. Amazon, Microsoft and GM Merge. Walmazon implements same day Drone Delivery, Competing with Uboogle. Florida Farmer brings in 6th Crop this Year, Better Tech in Tractors and GMOs. Council Approves Tiny House Senior Development. Fridays Officially Included as Part of Weekend Calendar. 	 Cyberterrorist Attack Shuts Down Nation. Living off the Grid is Better than Ever! My Tiny House Crushed the Last Turtle: A Memorial. Nanny Robots on Strike! Driving Obsolete. Florida Floods, Mass Evacuation via AVs. Philly Region Voted Most Desirable in U.S. Cyborg V.P. Technoske Mandates 3-D Printing for New Construction. Public Votes to Allow AI to Decide on Climate Policy. More Choosing Digital Life and Discarding Body. Seniors Found Dead in Home Energy System failure. Airport Literally Underwater-City Spends 10 Billion on Drain.





DELAYED EXPECTATIONS

Scale		Short Term		Medium Term		Long Term
Global Implications	•	Climate Change refugee impacts (5-year focus).	•	Less rushed adoption = more time for adjustment.	•	
National/ Multi-State Implications	•	Climate change driven storms worsen over time but only rich are able to build and repair, displacement occurs.	•		•	
State/ Regional Implications	•	No one at wheel.	•	Deterioration of Transit OR Increased use of transit.	•	
County/ Municipal Implications	•		•		•	
Neighborhood/ Household/ Individual Implications	•	Rural/Urban Divide.	•		•	
Things That Don't Change	•	Natural gas is clean burning but more potent when leaked.	•		•	
Sources of Conflict	•	Local opposition and energy source conflict can impact pipeline decision.	•	Drastic regional differences worsen over time.	•	
Headlines	•	Success in unexpected locations (e.g., current transit success in smaller cities)	•		•	Philadelphia Weathers the Climate Change Storm. Heat Related Deaths Skyrocket to All-Time High I-95 Abandoned: Latest Segment of Failing Interstate System Closed, PennDOT says Inconvenience will be Minimal. UN Army Invokes Global Martial Law at Tibetan Accords. Galveston Becomes Largest City to Unincorporate: Population Decline by 90% Over 20 Years. Last One Out Turn Out the Lights.

General 'Delayed Expectations' Notes:

- Private sector drives innovation.
- Work force catches up.
- Energy innovation.
- No safety net.
- Middle class down, poverty up (no super rich).
- Non-coop -> suburban sprawl, health implications, supply side labor market.
- Immigration is key background force, less students for eds.
- Tipping point between 1-5 years and 5-15 years.

TECHNOLOGY IN THE DRIVER'S SEAT

Scale	Short Term	Medium Term	Long Term
Global Implications	 Fossil Fuel Companies starting to think of ways to transition to Renewable Energy and geotechnical solutions (Carbon Capture and Storage). Insurance (property, infrastructure, finance) begin pulling out of markets or only insuring 10%. Decreasing demand for commuting travel. Efficiency of technology struggles with impact on humanity/safety/lives. Tech will be initially disruptive, but will eventually serve to help all people. 	 Fossil fuel companies begin deployment. Insurance companies play increasing role in property development. Climate change impacts intensify due to inability to curb emissions in 11 years or less. 	 Carbon reductions? Retreat from areas impacted by sea level rise, fires, flooding (climate change impacts). Climate change intensifies exponentially.
National/ Multi-State Implications	 Health care is universal but basic, private market offer Cadillac option to 100%. Corporate media bubbles -> lack of facts, but underground media exists. Housing \$ down, quality down, health down (except for 10%). 	Declining birth rates, increased need to care for elderly, lower tax base.	
State/ Regional Implications	 Health care is universal but basic, private market offer Cadillac option to 100%. Corporate media bubbles -> lack of facts, but underground media exists. Housing \$ down, quality down, health down (except for 10%). Uneven distribution of wealth and poverty (i.e., Charles Murray- UBI). 		
County/ Municipal Implications	 HAV companies deploy locally, keep data hidden, begin connecting to each other for safety (diverging from [?]). More pressure/need for higher education with fewer opportunities (less labor force participation, so less need for work oriented higher education). 		





Scale	Short Term	Medium Term	Long Term
Neighborhood/ Household/ Individual Implications Things That Don't Change	 Mobility declines (AI, drones, less money), obesity rises (still connected though, virtually). Increased neighbor-neighbor interaction (more time on hands, can't travel far). Gentrification. Lack of multijurisdictional cooperation. Governments still find it hard to make investments in long term decisions. Phillies never again go to World Series. Society still needs to address how people eat, live, human needs, waste management, housing, etc. Humans/people preserve community organizations/more time available for socialization (need still there). Increasing income inequality, still underfunded infrastructure. 	 Paralysis of state and federal governments. Society still needs to address how people eat, live, human needs, waste management, housing, etc. Humans/people preserve community organizations/more time available for socialization (need still there). Increasing income inequality, still underfunded infrastructure. 	 People have to eat and drink. Society still needs to address how people eat, live, human needs, waste management, housing, etc. Humans/people preserve community organizations/more time available for socialization (need still there). Increasing income inequality, still underfunded infrastructure.
Sources of Conflict	 Inequality. Concentrated poverty. Automation drives out jobs. How to tax the rich to pay for UBI/ increase UBI. 	 Loss of self-repair (for appliances, electronics, etc.). 	Climate change.





Scale	Short Term	Medium Term	Long Term
Headlines	 Amazon Hacked! Web Services Down. Comcast buys PMA, Makes Access Free for Comcast Customers. Students Organize Major Rebellion (Shut Down Philly!) as Part of 'Extinction Rebellion.' Safety Regulations for Vehicles Loosened Nationwide. Crime Rates Skyrocket in Philly. Nationwide Trend, X Population to Blame. Suicide Rates Skyrocket in 2029 Across All Demographics. U.S. DOT Grants Uber AV Contract. Crime Rates Rise Due to Climate Refugee Crisis, Crackdown by Private Security Forces. "My Data Security Firm" Announces Plan to Control Your Own Data. Philly Closes CBD to All Vehicles Except AVs and Emergency Vehicles. Musk and Zuckerberg Forced to Put Big Data to Use in Transportation. Jeff Bezos endows nonpartisan Social Welfare PAC. 	 Amazon Purchases U.S. Postal Service, Bezos Becomes Postmaster General. U.S. Economy Shrinks 5% Again 10th Year in a Row. Femme/Gender-Nonconforming Revolution Takes to the Streets. De-GrowthFinally Succeeding! Private Water Co. Saves City of Philadelphia From Dehydration After 5 Year Drought. Long Prison Term Sentences for Neighborhood Block Party Participants who Opened Hydrant. PHL opens Largest Urban Hydroponic Facility in the Nation. Congress passes UBI and Universal Healthcare. Amazon Opens 1st Hospital and Charter School Combo (to Prepare Next Generation and Extend Life of Current). Lidar Installation Complete Across Philadelphia. President Zuckerberg and Prime Minister Musk Combine Economies of U.S. and Canada. Google joins PPP to Manage Port Authority of NY/NJ EZ Pass, PA/NJ Turnpikes to Manage Infrastructure. Majority of Peace Corp Deployments Now in U.S. UBI Continues to Displace Factory Workers; Cities Focus on Changing Curriculums for School Children. 	Closes. PHL Finishes Completion of Aero Island. Delaware River Basin Commission Completes New Series of Dams to Aid in Flood Control, Supply Water. Major Philadelphia University Purchased by China. UBI Implemented Nationwide,





