

Why does this matter?

Regardless of their size, cities need to act now to future proof urban development and infrastructure before communities become locked into unsustainable development pathways.

"We can develop resilient cities that are prepared to react, respond, recover, adapt, and transform to meet future needs in a way that catalyzes social and economic prosperity."

—Prof Dr Uwe Krueger,
Chief executive officer

"U.S. cities need to take proactive steps now to future proof. The process requires an integrated, multi-disciplinary, multi-skilled approach to understand and respond to the complex risks and challenges faced by today's cities. Using an integrated approach, we can create comprehensive solutions and innovatively fund future cities which are more environmentally, socially, and economically prosperous. It is critical that all of us—public and private—who live, work, and invest in our cities act now to protect our future."

—L. Joe Boyer, Chief executive officer,
North America

Atkins innovation: Leading public agencies into Future Proofing

As one of the world's leading engineering, design, and municipal management consulting firms, Atkins excels at delivering challenging urban development and infrastructure projects that respond to the critical need for sustainability.

Whether developing master plans, mitigating failing infrastructure, developing and implementing complex public outreach efforts or applying cutting-edge technology to enhance analysis and processes, we plan, design, and enable solutions.

Plan – From cost and risk planning, feasibility studies, and logistics to impact assessments and stakeholder engagement activity, we plan every aspect of our clients' projects.

Design – Atkins designs physical structures such as bridges, pipelines, pump stations, buildings and highways. We also design intellectual capital such as management systems and business processes.

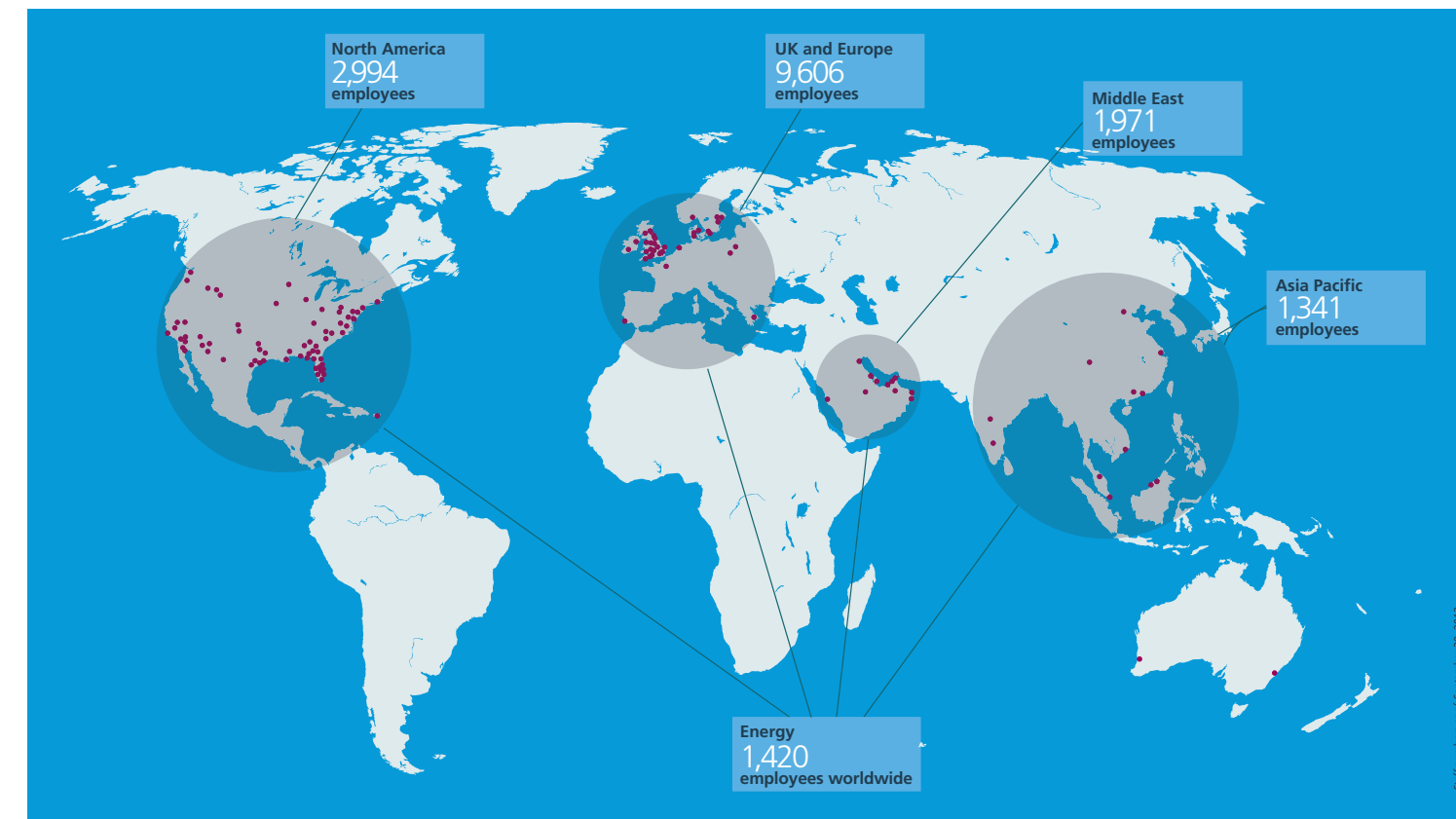
Enable – Our clients trust us to manage their projects, people, and issues, ensuring that deadlines are met, costs are controlled, and success is delivered.

We have the depth and breadth of expertise to respond to the most technically challenging and time-critical urban infrastructure challenges.

- Asset management
- Civil engineering
- Construction services
- Emergency management
- Energy
- Environmental
- Facilities architecture and engineering
- Geomatics/surveying
- GIS and data management relations
- Intelligent transportation systems
- Landscape architecture, master planning and urban design
- Planning
- Ports and coastal engineering
- Project controls and program management
- Public affairs/community
- Staff extension and development review
- Structures
- Transportation
- Water and wastewater
- Water resources

For more information on
Future Proofing Cities services:
+1.800.880.5949

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FUTURE PROOFING CITIES

THE TIME TO **ACT IS NOW**
policy—planning—preparation—participation

Urbanization¹

With three quarters of the world's population expected to live in cities by 2050, it is cities that will be at the forefront of managing the challenges of climate change, resource scarcities, and damage to vital ecosystems.

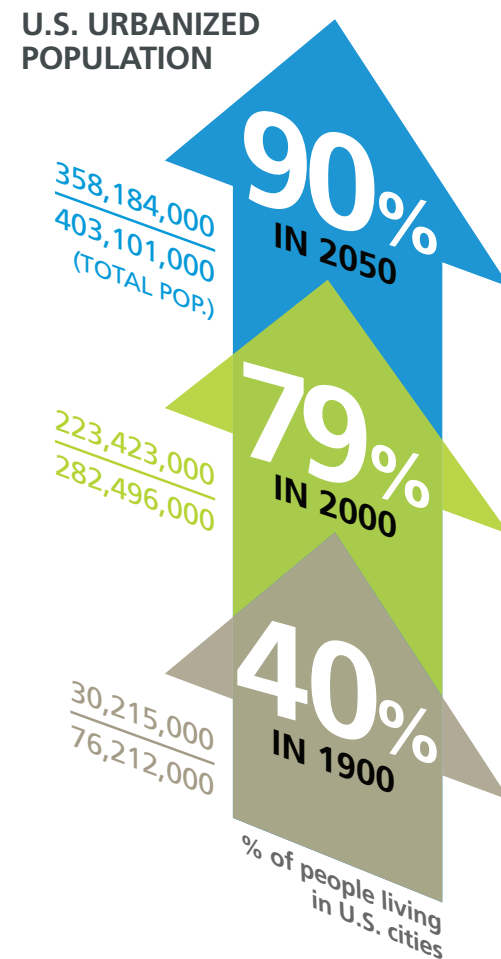
While cities can be natural units for driving innovation and higher standards of living, cities increasingly face a range of risks which are likely to threaten their long-term prosperity if not managed in the right way.

The U.S. is projected to approach 90% urbanized population on 9% of U.S. land area by 2050. 50% of the current U.S. population is located on the coasts, translating to nearly 40% of the U.S. population at risk of coastal flooding.

Cities are threatened by climate hazards such as flooding and hurricanes, are highly vulnerable to fluctuations in the price and availability of critical natural resources (such as energy and water), and are susceptible to damage of their vital ecosystems by urban expansion. Cities occupy only two percent of the earth's land, yet account for 75% of global carbon emissions and between 60-80% of energy use.

In short, cities need to take steps to future proof their urban development. Future proofing is about supporting cities to respond to the risks to their social and economic prosperity associated with complex environmental change.

By 2050 75% of the globe will be urbanized and the U.S. population will increase by 30%



Extreme weather events²

- Caused more than \$160B in losses
- 1,100 lives lost
- \$130B in federal disaster relief—Fiscal Years 2011-2013
- Many notable U.S. cities have or are dealing with stress and shock-related issues and stand to benefit from an FPC-based approach to urban planning, including:
 - New York City (Hurricane Sandy)
 - Austin, Texas (severe drought)
 - Boulder, Colorado (record flooding)

In 2011 and 2012 alone, there were 25 "billion dollar" extreme weather events in the U.S.

Impacting all 48 contiguous states



Aging infrastructure

America's infrastructure is currently in need of a staggering \$3.6 trillion in improvements to meet appropriate standards. The American Society of Civil Engineers (ASCE) estimates an investment shortfall of over \$200 billion a year between now and 2020 across all infrastructure categories³—and such improvements are desperately needed to protect trillions of dollars in U.S. GDP and trade value.⁴ Investing in the resilience of cities and their assets is equally important to both private citizens and commercial interests. As McKinsey Global Institute researchers recently noted, "The overwhelming role that U.S. cities play as home to the vast majority of

Americans [and] as a dominant driver of U.S. and global economic growth argues for a keen focus on their prospects."⁵

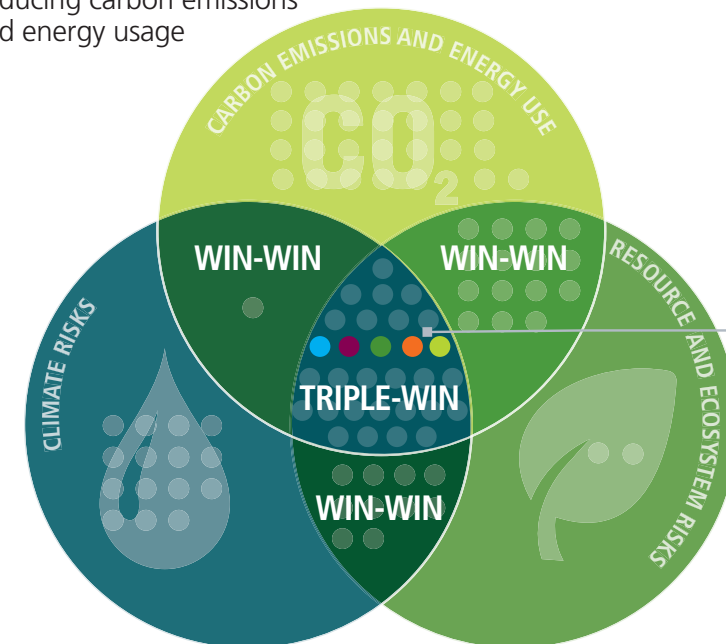
Unfortunately, the level of investment required to future proof a modern city is very likely beyond the capacity of local and federal governments. Therefore, private equity interests, business and philanthropic investors, and the public at large have no choice but to collaborate to get the job done—and get it done right. To succeed, city decision-makers must create unique blends of public-private interests, financing, and strategies for broad-based public engagement.

Cities should focus on policies/actions which respond to multiple risks that deliver win/win and triple/win benefits

To maximize the benefits of opportunities and investments for future proofing, cities should identify and focus on policies, actions and programs which respond to multiple risks. Our analysis shows that a wide range of policies and actions can respond to multiple risks by:

- Considering urbanization and its impacts
- Reducing carbon emissions and energy usage

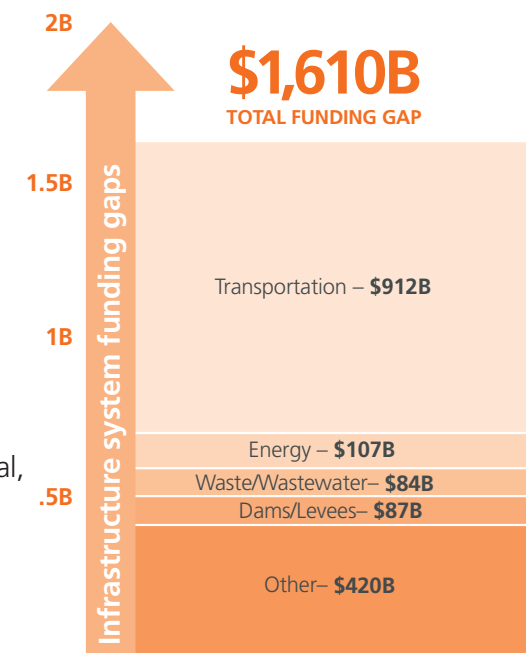
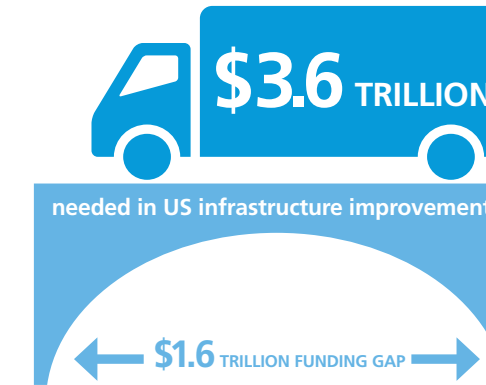
- Responding to extreme climate events/hazards
 - Helping protect or manage water, food, and natural eco-systems
- These actions/policies are extensions of sound, integrated urban planning and infrastructure investment strategies that generate win/win and triple/win environmental, economic and social benefits.



Options and policies with the greatest return on investment

- Combined mitigation and adaptation to climate change
- Integrated waste management
- Future proofing infrastructure
- Natural resource protection
- Renewable energy

\$200 billion needed per year to catch up by 2020



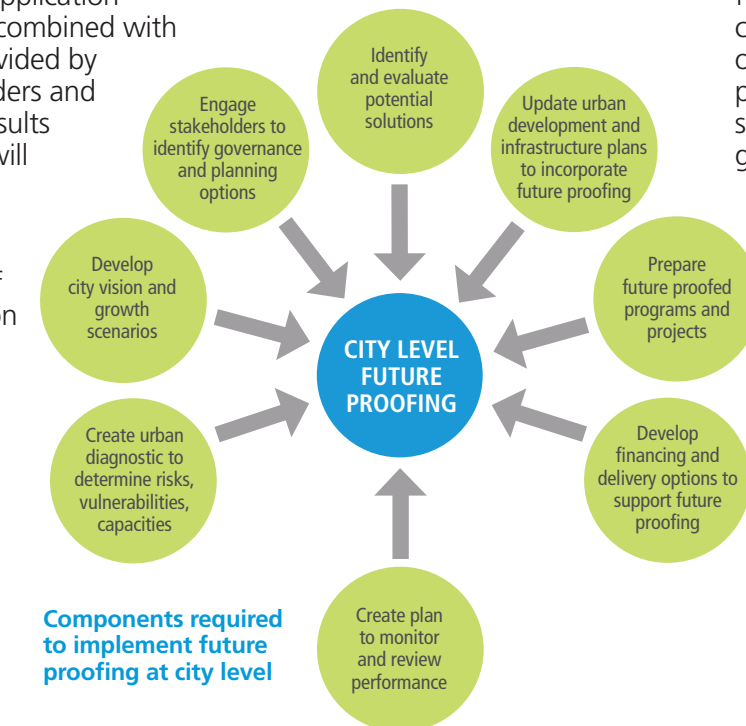
A holistic approach

Future proofing cities provides a fresh approach to the urgent issues arising from rapid urbanization, impending resource constraints and climate change challenges. The approach for each city is based on which options are most relevant and will be of the greatest benefit to the community at large.

This forward-looking method of research brings together policy expertise and practical application from the outset. When combined with actionable planning provided by world-class thought leaders and technical experts, the results are compelling—cities will not only be prepared to overcome challenges, but will also be poised to transform into centers of social progress, innovation and economic strength.

The future proofing process

Developing a robust strategy for future proofing a U.S. city starts with an in-depth, integrated, and customized diagnostic study of the city's risks, vulnerabilities, and capacities. Decision-makers can then use the diagnostic to identify and evaluate potential future proofing opportunities. To avoid creating long "shopping lists"



Components required to implement future proofing at city level

of unachievable solutions, city managers must carefully prioritize future proofing investments to ensure that the needs with the greatest potential overall impact are dealt with soonest.

Another key component of FPC strategy is the full engagement of all city stakeholders to identify the roles they must play in the future proofing process and then collaborate to develop a shared vision of the future. Every city has a unique political economy, so it is vital that all stakeholders work together to assess governance and planning options as well as to identify financing options and instruments.

In addition, a robust monitoring and evaluation system is needed to track performance over time and verify success—which will provide the foundation for attracting additional investment.



1. United Nations, Department of Economic and Social Affairs, Population Division (2012), *World Urbanization Prospects: the 2011 Revision*, CD-ROM Edition; US Census Bureau, Table 1, *Urban and Rural Population: 1900 to 1990*, October 1995

2. National Climatic Data Center - National Oceanic and Atmospheric Administration

3. ASCE 2013 Report Card for America's Infrastructure

4. *Failure To Act: The Impact of Current Infrastructure Investments on America's Economic Future*, American Society of Civil Engineers, Reston, Virginia, March 2013.

5. *Urban America: US cities in the global economy*, McKinsey Global Institute, San Francisco, California, April 2012.

Future Proofing Cities Report, 2012