NCPC Planning Process & Innovation
Commission Membership

Executive Branch
Federal Representatives
- Presidential Appointee (Maryland)
- Presidential Appointee (Virginia)
- Presidential Appointee (At-Large)
- U.S. Department of Defense
- U.S. Department of Interior
- General Services Administration

Local Representatives
- Mayor, District of Columbia
- Mayoral Appointee
- Mayoral Appointee
- Chairman, Council of the District of Columbia

Congressional Representatives
- U.S. Senate
- U.S. House

Chairs of Committees
w/ review authority over the District
NCPC protect and enhance the natural and built environment and improve the visitor experience in the region.
Smart Cities Tools and Technology

- Collaborative Problem Solving
- Virtual Design and Planning
- Smart Object Modeling
- Data Analytics
- Digital Sensors
- Cloud Computing
Planning Innovation Timeline I

2008  BIMStorm Tshwane South Africa
Crowdsourced Online Design Charrette
Collaborative Problem Solving
Crowdsourced
Virtual Design and Planning
Smart Object Modeling
Data Analytics
Digital Networks

2010  Southwest EcoDistrict
Energy Modeling
Collaborative Problem Solving
Virtual Design and Planning
Smart Object Modeling
Sensors (options)
Data Analytics
Digital Networks

2011  EyeSite Augmented Reality
Virtual Viewshed Application
Collaborative Problem Solving
Virtual Design and Planning
Smart Object Modeling
Sensors (options)
Data Analytics
Digital Networks
The Problem

The need to understand the visual, ecological and technical impacts of new construction on an intended building site is an important part of the NCPC project analysis process. However there is a large cost associated with the survey development, geotechnical studies, site staking for visual analysis and other rituals calculated to understand the aforementioned impacts.

A typical site staking involves using wooden stakes and post, strings of various colors and balloons, which are laid out on a building site to give people a clear understanding of the physical impact of a planned new building or structure on that site. These staking take several hours to create at a cost of up to $20,000 US at a time.
Drawings of proposed new construction is submitted to NCPC for review, analysis and comments from our commission at various stages of the design process. While NCPC only requires hard copies of the proposed project drawings, much of this work is created in BIM applications.

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AVATARS CAMERA
Augmented Reality is a live, direct or indirect, view of a physical, real-world environment whose elements are overlaid by computer-generated sensory input such as video, graphics or GPS data.

Fiducial Marker is an object used in the field of view of an imaging system which...
EyeSite AR App.
Schematic

1) User points IPAD towards construction site. Junaiq App connects to Junaiq Server.
2) Junaiq Server loads REST end point on ArcGIS Server on the IPAD. 3D Models is served via the ArcGIS Server.
3) User sees 3D Model in scene via camera.
EyeSite AR App Test Site
EyeSite AR Study Massing

10th Street

E Street

Pennsylvania Ave.

9th Street
Memorials for The Future Competition

Memorials for the Future

https://future.ncpc.gov/
Memorials for The Future Competition Entries

VOICEOVER
Team: Troy Hillman, Amy Catania Kulper, Anca Trandafirescu, Yurong Wu
The IM(MIGRANT): Honoring the Journey

Team: Sahar Coston-Hardy, Janelle L. Johnson, Michelle Lin-Luse, Radhika Mohan
Memorials for The Future Competition Entries

American Wild: A Memorial
Team: Shelby Doyle, Justine Holzman, Forbes Lipschitz, Halina Steiner
Goal:
Identify current maintenance conditions within the Pennsylvania Avenue National Historic Site and Federal Triangle.

Propose strategies to:
Improve day-to-day appearance and upkeep along the Avenue
Initiative Goal:
Set universal IoT standards for Smart Cities and advance the incubation and deployment of Smart Cities Technologies.

NCPC Staff Pitch:
Use Smart Cities Tech to improve the day to day maintenance of Pennsylvania Ave.

Improve the visitor experience, and influence visitors to see others areas Of the city outside of the Monumental Core.
Immersive Experience Using GIS, CAD, BIM and Reality Capture

PA 2040 (Washington DC)

10.

America's Mainstreet

An Interactive Experience!

1-2 Block Initial Implementation

Smart Streetlights
Smart Parking
Measuring Crime
Reduce Energy

Sensor, Camera, CT

Holographic President!
NCPC Staff Pitch:

Use Smart Cities Tech to improve the day to day maintenance of Pennsylvania Ave.

Improve the visitor experience and influence visitors to see others areas of the city outside of the Monumental Core.
The Approach

- **Smart City Projects**
  - U.S.
    - New York
    - Las Vegas
    - Austin
    - Washington DC
    - Montgomery County
    - Others...
  - Europe
    - Amsterdam
    - Genco
    - Valencia
    - Others
  - Asia
    - Chikuma
    - Busan, Daegu
  - Africa, South America, Australia, etc.

- **Action Clusters (Teams)**
  - Air quality, Climate, Traffic management
  - Renewable energy, Green Technologies, Microgrids
  - Emergency response, Disaster resilience
  - Building automation, Manufacturing
  - Healthcare
  - Security, Others...

- **Technology Innovators**
  - Sensor Systems
  - Cyber/Physical Security
  - Wearable devices
  - Infrastructure
  - Cloud Services
  - Medical Services
  - Visualization
  - Utilities
  - Robotics
  - Building Controls
  - Etc.,...

Funding Opportunities for GCTC

- **NSF EAGER Grant (NSF Office Hours today and tomorrow)**
  - Up to $300,000 for each award for fundamental research inherent to the real-world problems.
  - Grant applications are due April 1, 2016.
  - For US participants who are an active member of a GCTC Action Cluster, working on a project that will build upon the results of a previous or active NSF-funded project.

- **US-Ignite GCTC Leadership Fund**
  - Cash awards to exceptional Action Clusters and travel support to the GCTC Expo in June 2016, available to both US and non-US participants.
  - Applications are due April 15th, 2016.
  - Info: [https://www.us-ignite.org/globalитетeam/leadership-fund/](https://www.us-ignite.org/globalитетeam/leadership-fund/)

- **NIST Replicable Smart City Technologies (RSCT) Grant Program**
  - For US local governments participating in the GCTC.
  - Three $100,000 awards for US local governments participating in the GCTC.
  - The application deadline is May 12, 2016.
PA 2040: A Global Cities Challenge Project

PA 2040 will feature CCTV-enabled Smart Cameras. These cameras will be capable of surveillance for security purposes, will be utilized for Cisco’s Smart + Connected City Parking system.

Additionally, the cameras will be used for real-time pedestrian, bicycle, and automobile traffic counts. These counts will be used by planners to make future adjustments in the use of public space, eventually leading to automated changes that can be made in real time using the Solar Roadway tiles.

Public Wi-Fi will be provided via hotspots embedded in infrastructure elements, such as light poles. The wireless Internet capabilities provided will allow internet access for all workers and visitors in the area, while also serving as the backbone of the smart infrastructure along the corridor, allowing the various components, such as the Smart Cameras and Solar Roadway, to interact.

A Solar Roadway will generate electricity to run much of the infrastructure along the corridor, while also serving numerous other key purposes: adjustable lane/parking alignments via LED lighting, which takes the place of paint in road markings, collision awareness/warning via pressure-sensitive tiles, and the LED lighting, and endless other possibilities using data fed to the system from the other Smart + Connected City elements.

Charging Stations will be built into light pole bases and other street furniture along the avenue. Most of the electricity for the charging stations will be generated by the Solar Roadway.

Current Partners
- Cisco
- National Capital Planning Commission
- Golden Triangle BID
- DC OCTO
- Amsperger LLC
- Ohio University

Potential Partners
- The George Washington University
- Solar Roadways
Approach

NetSense transforms light fixtures into an applications platform

High-Speed, High-Bandwidth Communications

Distributed Intelligence

Noteworthy Sensory Nodes

Cloud with open API

Creative Development Community

Smart Lighting

Traffic Analytics

Parking Analytics

Safety & Security

Maintenance

Plus 100’s of Additional Apps

Public Wi-Fi / Smart Cameras

Environmental Sensors

PA 2040 /Smart Lighting
PA 2040 /GCTC Data and the Visitor Experience

PA 2040
The Vision - A Connected City

Building Stats:
- 352 people checked in.
- Water quality OK
- Air Quality OK

Street Light:
- It's cloudy, light set to DIM

Parking Spot:
- Available

Video Surveillance

Traffic Counter:
- 12 bikes
- 50 Cars
- Average 25 mph

Manhole Cover/ Water Sensor

Air Quality and Climate Sensing

DC Wi-Fi

Water Bed:
- Moisture content high

Transit Kiosk
PA 2040 Phase II – Advanced Traffic Analytics

Key Focus

1. Traffic Monitoring
   - Direction/Volume/Speed
   - Near Misses
   - Signal Violation
   - Jaywalking

2. Traffic Analytics
   - Vehicles
   - Biking
   - Pedestrians

3. Parking Management
   - Street Parking
   - Loading Zone
   - Double Parking

4. Privacy & Data Mgt.
   - Data Ownership
   - Anonymize Data
   - Data Distribution

5. Civic Engagement
An optical fiber cable is a cable containing one or more optical fibers that are used to carry light. The light is converted to data using different terminal connections. For this proposed autostereoscopic point cloud projection application, a light field projector and lens arrays are being suggested.

The proposed 3D display system. The flat holographic optical element lens array works as a virtual curved lens.

The light field uses an array of micro-lenses placed in front of an otherwise conventional image sensor to sense intensity, color, and directional information. Multi-lens arrays are a type of light field. Holograms are a type of film-based light fields. This concept replaces film with Point Clouds.

A point cloud is a set of data points in some coordinate system. In a three-dimensional coordinate system, these points are usually defined by X, Y, and Z coordinates, and often are intended to represent the external surface of an object.
Historic Preservation and Emerging Technology

Interactive archaeological site preservation (AHP) involves an immersive virtual reality approach. Virtual Reality (VR) and augmented reality (AR) technology can enhance archaeological site preservation by allowing researchers and visitors to explore historical sites in a more immersive and interactive way.

In the context of virtual archaeology, VR and AR technologies can provide a new dimension to the study and conservation of historical sites. These technologies allow for the creation of virtual environments that accurately replicate the original sites, providing researchers and visitors with a more detailed and engaging experience.

VR technology can be used to create immersive environments that replicate historical sites, allowing researchers to explore the site in a more interactive and detailed manner. This can be particularly useful for areas that are difficult to access or have been damaged over time.

AR technology, on the other hand, can be used to superimpose historical data onto the real world, allowing visitors to better understand the context and history of the site. This can be particularly useful for educational purposes, as it allows visitors to grasp the significance of the site in a more tangible way.

Overall, the integration of VR and AR technologies in archaeological site preservation offers a new and exciting approach that can enhance both the research and the experience of visitors. It allows for a more interactive and engaging way to explore and understand historical sites, providing new insights and perspectives that were previously inaccessible.
Cross-Agency Priority Goals (CAP Goals) - have been established to drive implementation of the President's Management Agenda (PMA) and tackle critical government-wide challenges that cut across agencies.

Team CAP Goal:
Federal agencies will provide a modern, streamlined, and responsive customer experience across Government, comparable to leading private-sector organizations.
Big Technology | Little Ways

Swipe to select your Funky Avatar

Facial Recognition helps! Remember you, and

Motion tracking helps users connect with their Funky Avatar.

Voice Recognition Talk to your Funky Avatar

One (1) Tech = Three (3) Solutions

Predictive Analytics

E Pluribus Unum / From Many One (1)
Form Simplification
How Might We create a person centered portal/platform that would allow new and small U.S. innovators to market their inventions to the federal government.
Innovation in Government/ DESIGN THINKING

**ONE NATION**

**PARTNER AGENCIES**
- IRS
- Transportation Security Administration
- Social Security Administration
- U.S. Citizenship and Immigration Services

**KEY ACTIVITIES**
- Border Security
- Reduce time at border crossing
- Airport Security
- No wait TSA service
- Port Security
- AutoFill Tax Forms
- AutoFill Student Loans
- My Face is my Passport

**KEY RESOURCES**
- Facial Recognition
- Predictive Analytics
- Smart Cameras
- Blockchain
- Edge Computing
- Form Simplification
- Speech Recognition

**CITIZEN APPS & AIDS**
- My Face is My Passport
- Brides Don't Wait
- Faster Filing
- AutoFill
- Verified Safe at the Border

**VALUE PROPOSITION**
- Federal agencies will provide a modern, streamlined, and responsive customer experience across Government, comparable to leading private-sector organizations.

**CITIZEN EXPERIENCES**
- My Face is My Passport
- Brides Don't Wait
- Faster Filing
- AutoFill

**ROI**
- Using an information-centric approach to presenting information and data;
- Collaborating on a shared platform across government agencies;
- Providing customer-centric data that allows people to shape, share and consume information; and
- Protecting privacy through a secure platform.

**MY FACE IS MY ID**
FACET IS ID

Innovation in Government/ DESIGN THINKING

Provide a modern, streamlined, and responsive customer experience across government, comparable to leading private-sector organizations.
Innovation in Government/ DESIGN THINKING

HOLABAC.gov

Avatar: OK... you need help from a federal agency

Using M. AI, voice recognition citizen expresses real-time concerns to Gov. Using an avatar that makes them feel great

The avatar uses predictive analytics to address the concerns in near-real-time

The avatar seeks answers from key federal agencies via AI

holabac platform serves as a 24/7 town hall for citizens to talk to Gov

OK citizen... you are all set. I updated your VA benefits, scheduled a DR appointment and sent out a reimbursement check... need anything else?

The avatar gets result for the citizens' key issues

Happy citizen

yes... and if you like we can make it even easier... how you say? Just take a picture with your holabac app... and never wait in line again

The avatar explains that ever better results can be achieved if they use their face as their ID

Awesome!! Now my face is: My passport
Social security card
Green card
Military ID
TSA pre-check
And provides services like: IRS autofill
FAMC and CNN autofill
Asa registration
Medicaid and Medicare form autofill

Yes... and USDS will continue to add services based on the feedback we get at holabac.gov

That's what I call making America great again!!!

Cross agency priority (CAP) and the President's Management Agenda (PMA) goals are met!