



Interactive Visualization

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NEVADA DOT

ASSHTO COD

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All Overview

The AASHTO Innovation Initiative (All) advances innovation from the grassroots up: by agencies, for agencies, peer-to-peer. The program actively seeks out proven advancements in transportation technology, investing time and money to accelerate their adoption by agencies nationwide.

Each year, the program selects valuable technologies, processes, software, or other innovations that have been adopted by at least one agency, are proven in use, and will be of significant benefit to other agencies. The Interactive Visualization innovation is a peer-selected focus innovation for the All.



Proposed Focus Technology

Interactive Visualization is an emerging, new-generation virtual-reality-based mode for project visualization

- 3D engineered models with proposed design information, existing as-built roadways, proposed new landscaping, and surrounding project context including buildings and other structures

More interactive and immersive experience, where the user **participates in a virtual world experience**

- Sense of being physically present in the environment with 360° panoramic views in a 3D simulated landscape of both natural and built environment

Goals & Objectives

- **Create more effective involvement & engagement of both internal and external customers to foster project understanding**
 - Public is more engage and vocal in transportation related decisions
 - Higher Expectations in their interactions with transportation agencies
- **Take the next step in the Visual Experiences**
 - Meet the demand of the public by providing more experiential visualization including touch, simulations, virtual reality
 - Also extend to the needs of stakeholder and technical peer reviews

What Makes It Different?



What Makes It Different?



PROJECT HIGHLIGHTS

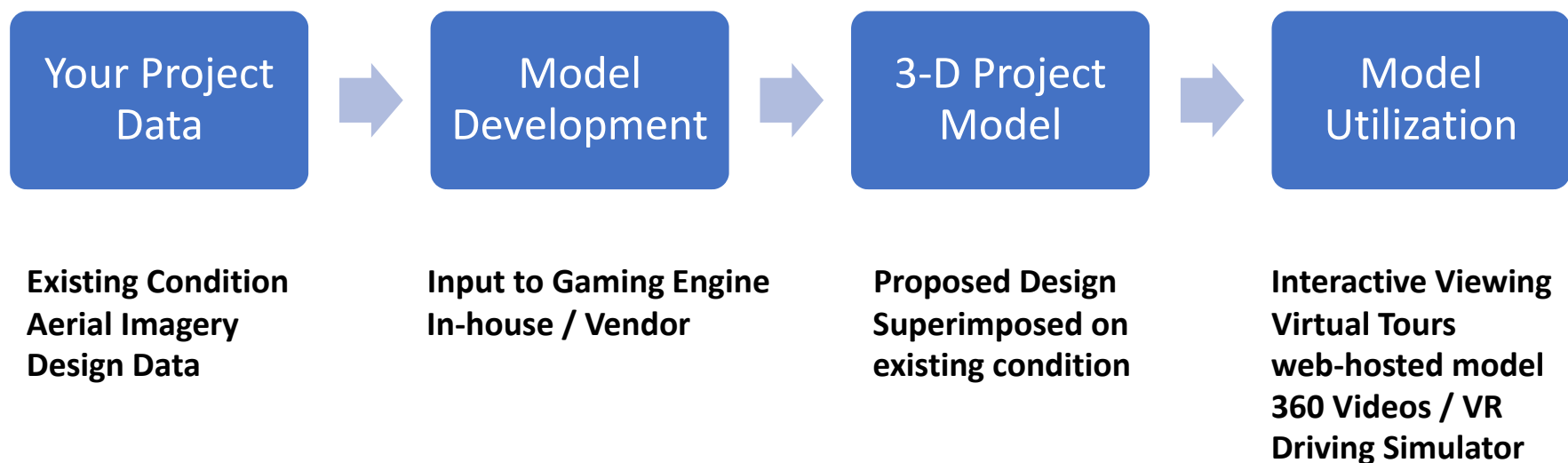
What Makes It Different?

The screenshot shows the AASHTO website interface. At the top, there is a navigation bar with six items: 'LEARN the project' (with a location pin icon), 'KNOW before you go' (with a location pin icon), 'VIEW maps & photos' (with a magnifying glass icon), 'READ our latest news' (with a book icon), 'JOIN the team' (with a hard hat icon), and 'CONTACT for information' (with a phone icon). Below the navigation bar is a large banner for 'I-15 Lane Restrictions'. The banner features a night cityscape background with a 'CT N' sign on the left. The text on the banner reads: 'As of January 9, I-15 southbound has one outside lane closed between Sahara Ave and Spring Mtn Rd, and I-15 northbound has one outside lane closed between Sahara Ave and Charleston Blvd. Beginning early February, the outside lane closure on I-15 northbound will extend from Desert Inn Rd to Sahara Ave.' Below the text is a 'READ MORE' button. White arrows point left and right from the text area. The background of the banner also shows a person wearing a hard hat.

The Need

- **To increase the technical awareness level among peer agencies**
 - Ensure agencies see value in technology
 - Interest in implementing the technique on their projects
- **To streamline the delivery of interactive visual content creation**
 - Near-term need to establish and implement processes
 - Develop standards and specifications for procurement

Trust the Process:



Applications

1. Visualization at Public Meetings

- Presentations
- Personalization with Stakeholders
- Public Interaction / Resolution

3. 360° Virtual Reality on YouTube

- Goggles
- Deploy different scenarios

2. Integration to Project Website

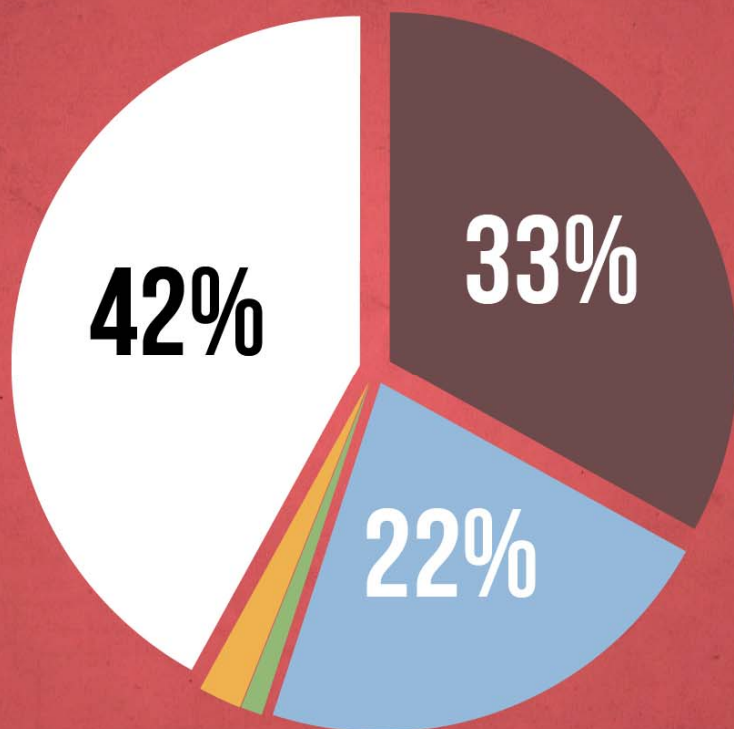
- 3-D Interactive Tours
- Sharing 24/7
- Self-driven

4. Mobile Applications

- Integrate with MOT Setups
- Push Notifications / Alerts

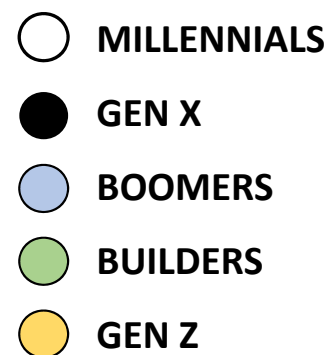
NEXT GENERATION ENGAGEMENT

THE GENERATIONS	AGE	NUMBERS
GENERATION Z	< 20	50+ million
MILLENNIALS	21-37	76 million
GENERATION X	38-53	51 million
BABY BOOMERS	54-72	75 million
BUILDERS	73-90	56 million*
G.I. GENERATION	91+	60 million*



2018 Workplace

- 5 Generations Represented



75%

25%

2025 Workplace

▪ *Ohhhh.... S*#!*

○ MILLENNIALS

○ OTHER GENERATIONS

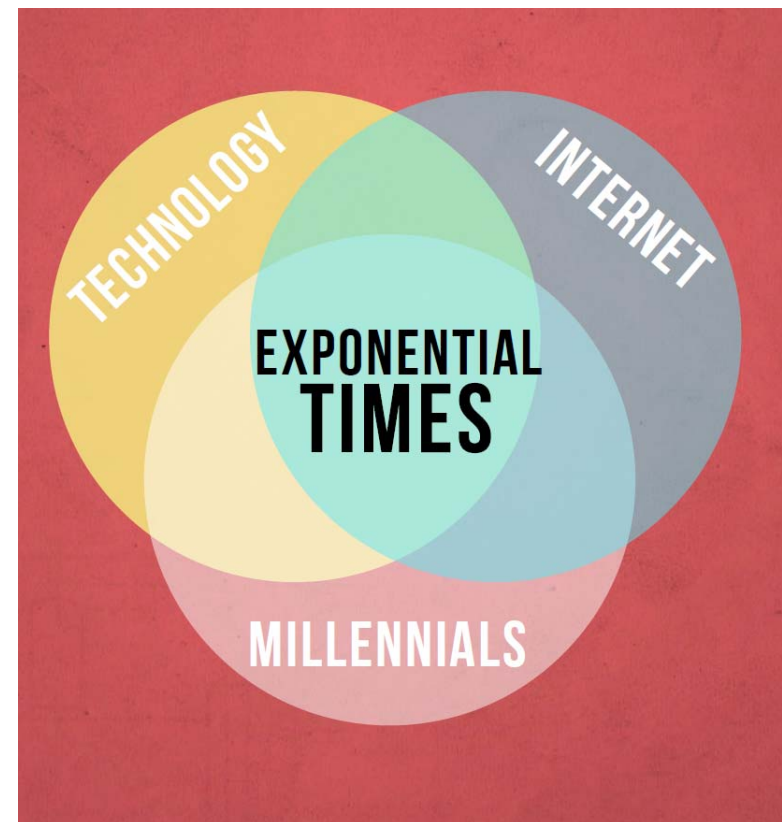
COMMUNICATION PREFERENCES

- **SUMMARY:** Authentic & Fast
- **VIEW:** Text, Instagram, Skype, Bitmoji
- **ATTITUDE:** Efficient & Mobile Friendly



WHY IS TODAY SO DIFFERENT?

- Exponential TIMES
- Millennials are a Critical Mass of Change Agents
- EXAMPLE
 - MARRIOTT: 1 Million rooms since 1927
 - AIRBNB: 2 Million rooms since 2008
- EXAMPLE
 - NETFLIX: Only 8% of College students don't have access to Netflix (started in 2007)



Benefits

1. Interactive Visualization **increases public participation** in the outreach process
 - Public and stakeholder involvement has become an integral part of the project development process
2. Interactive Visualization facilitates better and **informed decision making**
 - Allows a wide range of end-users including traveling public, homeowners, local stakeholders, regulatory agencies to visualize the future impacts of proposed project
3. Interactive Visualization **appeals to younger generations** of the public
 - Becoming the preferred mode of communication in a social virtual world

Benefits

4. Interactive Visualization **makes use of technological advancements** in computer-mediated engineering
 - Use of 3D-engineered design modeling, geospatial data and technologies
5. Interactive Visualization serves as an **effective risk management tool**.
 - Can aid the quality control and technical review processes by allowing the project team to work with peer reviewers
6. Interactive Visualization **fits into our future, the future**.
 - Expect agencies to keep pace with the use of technology they see in the private sector.

Cost

Influenced by the geographic location and complexity of the project as well as the level of detail used in visualization.

- **Higher for a multi-year, multi-phase, complex project in an urban environment**

Cost to establish a base model may remain low and fairly the same for projects in both urban and rural areas

- **The inclusion of details such as buildings in the urban landscape significantly adds to the total cost.**

Cost

Cost Range: \$25,000 to \$300,000

- **Complex project in an urban area will cost about \$150k - \$200k to communicate the overall description of the project, while visualization products to communicate construction phasing and maintenance of traffic plans will cost about \$50k - \$100k.**

Not Only for Large Projects

- **Recent complete street project in Downtown Las Vegas: \$25,000 (3D Modeling, textures, traffic animation)**
- **Rural Intersection: \$15,000 (2-D design files exported, basic representation of surrounding areas)**

RFP Scope of Services

[Visit All Webpage](#)

The SERVICE PROVIDER will develop an interactive model of the project corridor for the preferred alternative. The models will be built on the alignments and surface models created as part of the Engineering scope. The accuracy of the models will reflect the design development at the time, but the quality of the presentation will be realistic.

The 'interactive model' as described below consists of a realistic 3D model of the existing corridor, proposed project development and surrounding existing context that a user can navigate in real-time. This is made possible due to using real time gaming engines such as Unity 3D or Unreal and the optimization of the assets within the model. This interactive model can be then used for a variety of 'visual experiences' including:

- Image and video renders based on pre-set cameras or from the free moving camera
- Interactive kiosks used via touch screens (can be used to develop image and video renders)
- 360 Degree virtual reality videos
- Other visual experiences such as driving simulator, mobile apps and augmented reality which are outside the scope of this current project but could be applied for future phases.





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