

Journal of • Virtual Worlds Research

jvwresearch.org ISSN: 1941-8477

The Metaverse Assembled

Volume 2, Number 5



Volume 2, Number 5

The Metaverse Assembled

April 2010

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The Journal of Virtual Worlds Research
is owned and published by the
Virtual Worlds Institute, Inc.
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May 2010

Trucking Towards a Virtual World: The Development and Implementation of FMCSA's *Transportation Nation* Second Life Island

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Abstract

The U.S. Department of Transportation continues to explore the use of Web 2.0 technologies, including the business-level application of virtual worlds for gathering organizational information, simulating program processes, and supporting new training and instructional initiatives. One such example is Transportation Nation, a Second Life based virtual island created by the Federal Motor Carrier Safety Administration (FMCSA), an Operating Administration within the Department of Transportation. FMCSA's Transportation Nation island expertly draws upon functionality unique to virtual worlds for government application, including virtual motor carrier vehicles for simulated safety inspections, a multi-floored replica of DOT Headquarters for web-based conferencing and instruction, and consolidated access to federal and state office-based organizational information. The successes and ongoing challenges of utilizing Transportation Nation by FMCSA are an important model for state and federal government agencies seeking to integrate virtual worlds in their day-to-day program activities.

Keywords: U.S. Department of Transportation, Federal Motor Carrier Safety Administration (FMCSA), Virtual Worlds, Second Life, *Transportation Nation*

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The U.S. Department of Transportation (DOT) strives to be a government leader in identifying, developing, and utilizing new technologies and tools to meet strategic and business needs. To that end, DOT encourages Operating Administrations to use new technologies as contemporary vehicles for change and process improvement. The Federal Motor Carrier Safety Administration (FMCSA), an Operating Administration within DOT, began exploring the use of virtual worlds in 2009. Specifically using the Second Life platform, DOT developed *Transportation Nation* (Figure 1), a virtual island for FMCSA staff. In the future, DOT envisions making this technology available to the American public to interact with mission-critical motor carrier safety information and data. FMCSA's use of *Transportation Nation* is ongoing, and the agency continues to explore, experiment, and expand the use of Second Life to achieve departmental priorities.

Second Life use is not limited to the U.S. Department of Transportation. Virtual worlds will continue to be explored by other state, local and federal government agencies. By better understanding the successes and challenges FMCSA has encountered in the development and use of *Transportation Nation*, federal, state, and local government agencies seeking to use virtual worlds can benefit greatly in their own planning and development activities.

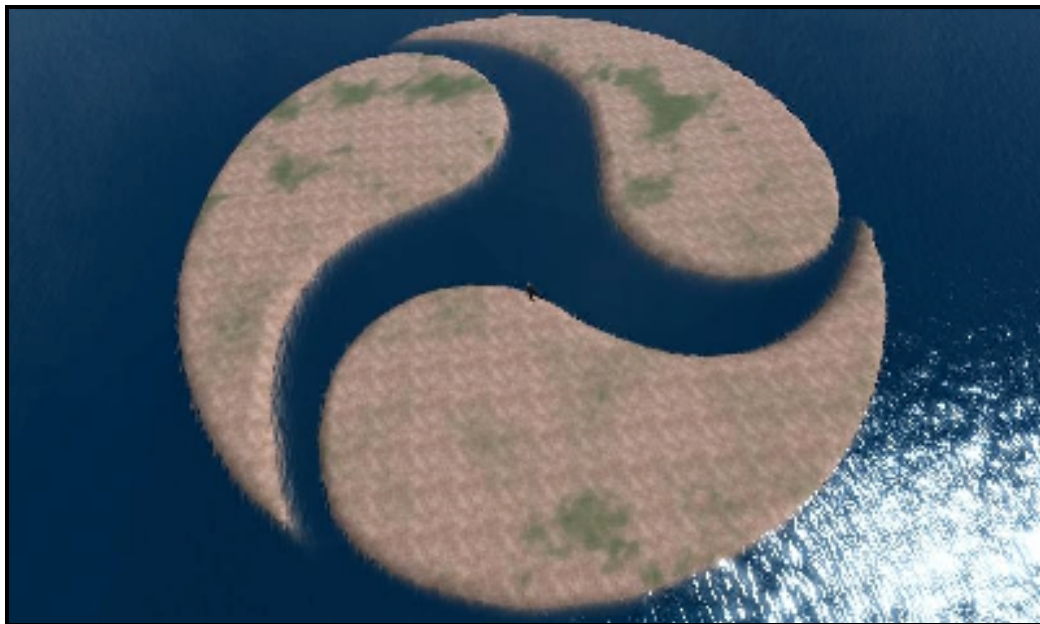


Figure 1: An aerial view of Federal Motor Carrier Safety Administration (FMCSA)’s virtual world *Transportation Nation*. The island’s shape was inspired by the U.S. Department of Transportation logo.

The exploration and operation of virtual worlds as a business-level solution for interacting with both internal and external stakeholders is an excellent option for both public and private organizations. As use expands, the value and importance of virtual worlds needs to be further analyzed. Accordingly, scholars are increasingly seeking to explain and understand the practical application of virtual worlds within organizations. Much of the research on virtual worlds has been occupationally-focused, e.g. educational specialists have written about the use of Web 2.0 technologies and virtual worlds at colleges and universities. However, the findings of these authors—and all scholars seeking to explain the capabilities and significance of virtual world use for collaboration, outreach, and interaction—can be applied to the government example. The existing research provides valuable insights for government agencies seeking to create or enhance their virtual presence; while also illuminating FMCSA’s experience developing and implementing *Transportation Nation* as an important case study.



Figure 2: An avatar examines one of several motor vehicles located on *Transportation Nation*. Each vehicle on *Transportation Nation* includes video-performance capability as well as interchangeable and examinable parts at the chassis for Safety Investigator training

Virtual worlds are a new and important location within the *public sphere* which, as defined by Eiko Ikegami and Piet Hut, are “sites of political discourse outside the realm of the political institution of the state” (2008). As both a tool and a resource for governments to utilize given the “proliferation of various non-traditional types of cyber-based media” (Ikegami & Hut, 2008) virtual worlds can be seen as contemporary *public spheres*. Virtual worlds exist within the *public sphere* “on the basis of the more casual and flexible social interactions and to ephemeral voluntary human ties, which have historically provided society with increased flexibility by providing open circuits for communication” (Ikegami & Hut, 2008).

In 2006 and 2007, Time Magazine contributor Jeff Howe defined the processes within Web 2.0 applications that reflect the contemporary ways in which these technologies will be

used to support interaction and public discourse for Sharing user-contributed content (Collins & Moonen, 2008):

- evolving community-developed tagging and organizational schemes for large sets of user contributed content
- developing of content collections by the user community
- finding not only objects but trends and contributions

Howe's definition of how to apply Web 2.0 technologies is informative, but commentators Collins and Moonen (2008) suggest a logical expansion of his classification to include virtual worlds. They suggest that it is significant how users can create "artifacts within the worlds that they are simulating and then interact within the virtual worlds with their newly created artifacts". Therefore, virtual worlds, like other Web 2.0 technologies, encourage further openness and facilitate discourse at all levels of government by facilitating processes that "represent new ways of making, sharing and consuming digital documents" (Collins & Moonen, 2008).

The term *affinity spaces*, as interpreted by Clare Strawn, is applicable in further defining the significance of virtual worlds and in complimenting the understanding of virtual worlds within the *public sphere*. As an *affinity space*, virtual worlds "instantiate participation, collaboration, distribution, and dispersion of expertise and relatedness," (Strawn, 2009) for government employees and Americans who elect to access public information and data. Therefore, participation in virtual worlds provides internal and external stakeholders with a comprehensive experience. As an *affinity space* rooted firmly in the *public sphere*, virtual worlds can encourage interested participants to collaborate, contribute, and interact with government information and data in innovative and dynamic ways.



Figure 3: An area within *Transportation Nation*, featuring an interactive map connecting users to information about FMCSA field offices.

Public discourse and collaboration are not the only benefits of using virtual worlds. Similar to educational and private-sector institutions, governments can use the inherent virtual world functionality to interact with and share information across and within stakeholder groups. Author Gilly Salmon suggests that organizations can exploit virtual worlds to meet business objectives in new and creative ways. Salmon suggests that virtual worlds allow for:

- the illusion of [three-dimensional] space which offers infinite possibilities..., including the ability to “fly” by avatars (Cheal, 2007)
- virtual [artifacts] that can be manipulated in ways impossible in [the real world] or used as a ‘spark to start a dialogue’ (Edirisingha, et al., 2007; Salmon, 2002)
- new visual environments and tools for interaction and participation between individuals and within groups (Ditullio, 2008)
- adaptation to almost any discipline or context (*The future of (second) life and learning*, 2009).

Given Salmon’s suggestions, government agencies that elect to integrate the strategic and business-level goals of their organization with the creative capabilities of virtual worlds throughout the development and enhancement of a virtual presence will be more successful. In doing so, government can begin institutionalizing a new and innovative approach to public-sector interaction and collaboration.

Another critical factor to consider is the dramatic growth in the use of virtual worlds as currently expected by scholars in the next quarter century. Executive Vice President of the Asia Society, Jamie F. Metzl, argues that virtual worlds will “have overtaken the two-dimensional Internet as the predominant system of non face-to-face human interaction” (Metzl, 2008). Envisioning that “business meetings will seat people across the world around three-dimensional tables in a matter that will very closely replicate the look, feel, and experience of real world meetings,” Metzl suggests that “virtual worlds will become less a playground of fantasy and more the primary environment in which humans interact” (Metzl, 2008). The crux of his argument, and one that government agencies cannot afford to ignore, is that virtual worlds provide a venue in which “people will interact in meaningful ways [and] relationships will flourish” (Metzl, 2008).

The impact of technology, technological growth and the virtualization of business relationships on both public and private organizations will be considerable. Since the advent of the Internet, researchers strive to understand the role of new technologies in “shaping organizational form and function,” particularly as information technology penetrates everyday life (Zammuto, et al, 2007). Virtual collaboration, as defined by Zammuto, et al., is a contemporary affordance of new technology on organizations in the 21st century. As user participation continues to expand, virtual worlds will increasingly become a primary vehicle for virtual collaboration.

As a dominant mechanism for discourse, virtual worlds will be an *affinity* space that permeates the *public sphere*. In this context, Zammuto, et al. provide an important definition of virtual collaboration as “the ability to share and integrate others’ knowledge when that knowledge is primarily conveyed through virtual media” (2007). Their characterization greatly encompasses virtual worlds, particularly as an organizational tool which “is highly dependent upon intertwining technological and organizational features in ways that encourage open knowledge sharing, knowledge acquisition, knowledge maintenance and knowledge retrieval” (Zammuto, et al., 2007). This definition helps to further explain how local, state, and federal government agencies can utilize virtual worlds for collaboration, interaction and information sharing across internal and external stakeholder groups. Specific benefits include:

- expanding participation in an organization’s work processes and decision making by including people located at its periphery through the proper intertwining of organization and information technology

- increasing the potential for bringing people from different organizations and disciplines together dynamically...who would not otherwise have the opportunity to become engaged in a particular activity
- providing opportunities to capture decision rationales and work processes as work is being done, enabling future participants to reuse or learn from past work
- enhancing the potential for organizations to extend their boundaries temporarily, experimentally, or permanently (Zammuto, et al., 2007).

Each benefit will likely become more apparent to organizations using virtual worlds for collaboration, particularly as use of the technology becomes more pervasive. Robin Hastings, an Information Technology Manager for the Missouri River Regional Library in Jefferson City, Missouri, has written extensively about the use of Web 2.0 technologies for gains in virtual collaboration. Though her research was specifically applied towards use within libraries, many of her findings are applicable to the government example. Given that participants can access Second Life and other virtual worlds from any location worldwide, virtual worlds and other Web 2.0 technologies promote the ability for organizations to “use many different channels of communication in... collaborative efforts” (Hastings, 2009). As virtual world participants are not required to be physically and geographically centralized, the benefits of virtual worlds in supporting a “communication infrastructure” are apparent by “[eliminating] the constraints of distance between collaborators” (Hastings, 2009).

The connection between community engagement and virtual collaboration through virtual worlds is provided by Jaime Metzl. Local, state and federal agencies must seriously consider developing and implementing new virtual worlds, particularly if participation shows that “new and discrete virtual worlds... emerge where common standards form the foundation of community engagement” (Metzl, 2008). Thus virtual worlds increase “[the number] of new social contracts... formed online among participants...” (Metzl, 2008). While virtual worlds inherently allow for interaction, meaningful collaboration will likely occur when virtual world environments “support learner-centered teamwork” that facilitates “mastering content and developing general learning skills” (Falloon, 2010).

While the benefits are many, establishing a virtual presence can be challenging. Local, state, and federal government agencies must remain considerate of the quality of technology they are implementing and the interactive experience of internal and external stakeholders accessing a government-run virtual world. Several barriers may exist that prevent users from fully exploiting the unique capabilities of virtual worlds. For example, Collins and Moonen note that “newly emerging Web 2.0 tools and systems will not be directly integrated into existing information technology (IT) systems because of institutional IT management processes” (Collins & Moonen, 2008). All new users of virtual worlds, including both government employees and the American public, will have differentiated knowledge of the technology, creating “a gap between the experience and skill sets of [users]... with respect to Web 2.0 tools and processes” (Collins & Moonen, 2008).

Government organizations can expect the use of virtual worlds to increase. However, this escalation must coincide with a corresponding boost in “computing power, storage, broadband, digital tools, e-spaces and networked applications” (Salmon, 2009). If not, technological advancement will occur disproportionately, and virtual world implementation by government agencies will occur within a bubble that does not carefully consider the usability for internal and external stakeholders. Other important considerations and government responsibilities, such as

Section 508 compliance for people with exceptional needs, must also continue to be met throughout the implementation of new technologies like virtual worlds through government diligence.



Figure 4: An automated PowerPoint display on *Transportation Nation* to feature mission-critical safety information.

Safety and privacy of information is an important consideration that cannot be ignored by governments seeking to develop a virtual world. Government-based virtual worlds must be created, modified, and monitored with new and innovative approaches to information security. Collins and Moonen suggest that “Web 2.0 processes runs counter to institutional IT perspectives on quality where orderly, robust and secure processes are highly valued” (*Web 2.0*, 2008). At the onset, governments seeking to establish a virtual world must recognize that new technologies represent “different ways of working with, and having control over, technology” (Collins & Moonen, *Web 2.0*, 2008).



Figure 5: An avatar of David Anewalt, Deputy Chief Information Officer at FMCSA, on *Transportation Nation*

The legal ramifications of using virtual worlds also must be considered by government organizations. Constitutional law scholar Jack M. Balkin's article *Virtual Liberty: Freedom to Design and Freedom to Play in Virtual Worlds* provides some important, foundational insights for agencies seeking to develop a virtual presence. In 2004, Balkin acknowledged the mounting significance of virtual worlds, stating that "platforms will be adopted for commerce, for education, for professional, military and vocational training, for medical consultation and psychotherapy, and even for social and economic experimentation to test how social norms develop" (Balkin, 2004). While many skeptics suggest that "most virtual worlds today are an outgrowth of the game [entertainment] industry," Balkin is correct to acknowledge that virtual worlds "will become much more than that in time," (2004) requiring preemptive legal consideration.

Early security and legal deliberation of developing a virtual presence is critical to ensure government confidence in virtual worlds as a safe and productive work environment. In fact, Balkin suggests that a significant amount of regulation of virtual worlds "will occur through real-world law, not outside of it: through contract law, through property law, and through the protection of values of freedom of speech and association" (2004). Balkin's article, however, focuses on the "relationship between the state on one-hand, and the players [stakeholders accessing the virtual world] and the designers of virtual worlds on the other hand" (2004). To be most successful, scholars and practitioners of virtual worlds must consider the ramifications of the government as both the state (the guardian of the legal and constitutional rights of the citizenry) and as the player/designer (the beneficiary of information and interaction) of virtual worlds.

Government organizations planning a virtual world presence will best benefit in their development and enhancement activities through the conjunction of "information technology and organization features coupled with managerial intent" (Zammuto, et al., 2007). Overall, the benefits of using virtual worlds are extensive. Virtual worlds "have the potential to enhance social interaction and [support] connectedness, particularly among those individuals who may have difficulty facilitating communication on a face-to-face basis" (Falloon, 2010). Falloon identifies three primary benefits virtual worlds, complimenting the existing literature on virtual world functionality and collaboration. With the expansion of virtual worlds in both the public and private spheres, organizations can expect that:

- users will have the ability to carry out tasks that could be difficult for them in the [real world] due to constraints, including cost, scheduling or location
- a natural persistence will allow for continuing and growing social interactions, which can serve as a basis for [collaboration]
- virtual worlds will adapt and grow to meet user needs (Falloon, 2010).

The expanding breadth of scholarly research on virtual worlds reinforces the notion that usage is increasing significantly, though comprehensive statistics about participation, particularly in the case of Second Life, "are neither well coordinated nor reliable" (Salmon, 2009). Nonetheless, the experience of organizations currently involved in developing and implementing a virtual world can provide useful and anecdotal evidence that compliments the existing literature. For local, state, and federal government agencies seeking to create a virtual presence, FMCSA's experience in developing *Transportation Nation* as a Second Life-based virtual world is a particularly meaningful case study.

The Federal Motor Carrier Safety Administration seeks to “reduce crashes, injuries and fatalities involving large trucks and buses” (U.S. DOT, 2009a). FMCSA’s mission extends across the United States and accomplishes its safety mandate as a DOT Operating Administration that:

- develops and enforces data-driven regulations that balance motor carrier (truck and bus companies) safety with industry efficiency
- harnesses safety information systems to focus on higher risk carriers in enforcing safety regulations
- targets education messages to carriers, commercial drivers, and the public
- partners with stakeholders including federal, state, and local enforcement agencies, the motor carrier industry, safety groups, and organized labor on efforts to reduce bus and truck-related crashes (U.S. DOT, 2009b).

FMCSA employees are located across the country in all fifty states and at DOT Headquarters in Washington, D.C. The persistent and continuing partnership of FMCSA employees with state governments and the motor carrier industry is fundamental to FMCSA’s safety philosophy. Creating new and improved techniques and processes for the ongoing interaction between FMCSA Headquarters personnel, FMCSA employees in the field, the motor carrier industry, and the American public is critical for FMCSA to succeed in fulfilling its safety mission.

In 2009, senior managers at FMCSA decided to explore creating a virtual world island using the Second Life platform. This pilot program was tasked to and primarily envisioned by staff within the Office of Information Technology at FMCSA to compliment many of FMCSA’s other strategic initiatives, including:

- the COMPASS Program, an effort to modernize FMCSA’s IT safety systems by integrating new information technologies with improved business processes
- the Motor Carrier Safety Assistance Program (MCSAP), a federal grant program which provides states with financial assistance to hire staff and implement strategies to enforce Federal Motor Carrier Safety Regulations (FMCSRs) and Hazardous Materials Regulations (HMRs)
- the Comprehensive Safety Analysis 2010 (CSA 2010) Program, which seeks to improve large truck and bus safety by introducing a new enforcement and compliance model which allows FMCSA and its state partners to contact a larger number of carriers earlier in order to address safety problems before crashes occur (U.S. DOT, 2009c).

In addition to these and other important strategic initiatives, FMCSA continued to implement the use of other Web 2.0 tools for internal and external communication and collaboration, including development of an FMCSA presence on Twitter and implementation of Microsoft’s instant messaging tool, a component of Microsoft’s Office Communicator Server product.

FMCSA originally identified using a Second Life-based virtual world as a way to provide internal training for federal staff and FMCSA partners located worldwide. While a significant population of the FMCSA workforce is located in the Washington, D.C. area, senior leaders continue to examine and identify new and creative ways to reach, instruct, and inspire FMCSA stakeholders. For examples, safety investigators (SIs), who are based throughout the United

States, are central to FMCSA's ongoing efforts in "investigating high risk carriers and enforcing compliance with agency safety regulations" (DOT, *Safety Investigators [SIs] Fact Sheet*, 2009). The National Training Center (NTC), a facility of the U.S. Department of Transportation and FMCSA located outside of Washington, D.C., has served as a primary hub for the training of safety investigators and other FMCSA employees. SIs and other FMCSA-field based employees frequent the National Training Center each year to receive significant instruction about investigation procedures, federal rulemaking changes, and other safety information. At the inception, *Transportation Nation* was considered a possible venue for web-based interactive and informative training events to mitigate some of the costs associated with hosting trainings centralized at NTC. With limited direct experience in managing a virtual world, the staff at FMCSA was able to establish a process for developing *Transportation Nation* that quickly illustrated the many capabilities and functionality of Second Life. This process reflected many of the recommendations made in the existing scholarly literature about virtual world development, through which FMCSA staff identified the many benefits and challenges inherent in creating, managing, and utilizing a virtual world.

After deciding to pursue *Transportation Nation*, FMCSA senior staff focused on establishing intermodal support and participation in the development process. FMCSA staff coordinated with several existing governance boards within DOT to support the project. Given ongoing efforts at DOT to utilize and implement Web 2.0 technologies, FMCSA staff believed it was imperative to collaborate with other technology stakeholders, notably the DOT Chief Information Officer (CIO) Council. Much like the federal CIO Council, the DOT CIO Council meets monthly to discuss and prioritize IT projects and initiatives across the Department of Transportation. Membership of the Council includes the Chief Information Officers from each DOT Operating Administration, including FMCSA, the Federal Aviation Administration (FAA), the Research and Innovative Technology Administration (RITA), the Federal Highway Administration (FHWA), and others. Politically-appointed and career civil service executives, senior managers and employees from the Office of the Chief Information Officer also served as members. The DOT CIO Council and the former Chief Information Officer for the Department of Transportation were encouraged by FMCSA's efforts to develop *Transportation Nation* and provided financial support to FMCSA for the project.

Upon receiving approval from the DOT CIO Council, FMCSA senior managers used a two-pronged approach to successfully develop *Transportation Nation*. After purchasing space within Second Life for the virtual island, FMCSA procured the services of a web- and graphics-development contractor who specialized in the creation of Second Life environments. The contractor was responsible for the physical build and deployment of *Transportation Nation*. Staffs from the contractor and FMCSA met weekly and remained in close contact and collaboration throughout the development process. FMCSA employees defined and established the look, feel, and functionality of the virtual environment, while the contractor was responsible for realizing FMCSA's vision within Second Life and on the *Transportation Nation* island.

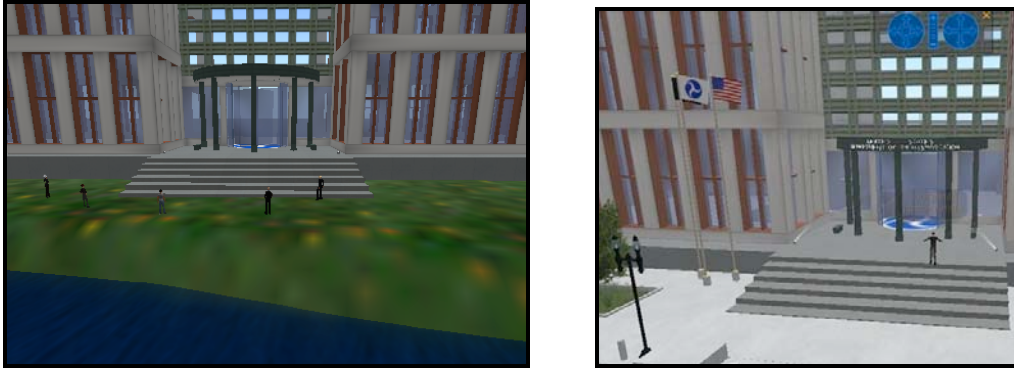


Figure 6 and Figure 7: The Washington, D.C.-based Headquarters of the U.S. Department of Transportation, an interactive meeting place and networking building on *Transportation Nation*

One particular innovation that FMCSA employed throughout the development of *Transportation Nation* was creating the *Social Media Extreme Team* (SMET). FMCSA senior managers assigned young professionals within the Office of Information Technology to manage and monitor the progress of *Transportation Nation* and to explore implementation of other Web 2.0 technologies at FMCSA and at DOT. Managers specifically identified “next generation” employees for the SMET as an effort to empower new, less seasoned staff with direct responsibility for a large project and to leverage the knowledge of several employees who had existing experience with Web 2.0 technologies. The SMET was a multicultural group of employees that had a wide variety of expertise from within the Office of Information Technology, including planning and project management, IT development, and IT operations. Senior leadership encouraged the team to pursue multiple out-of-office training events and conference-based learning opportunities in support of and throughout the development of *Transportation Nation*.

By carefully procuring a contractor for development of the Second Life, FMCSA managed the initial development process of *Transportation Nation* very successfully. SMET was able to create a virtual world that significantly captured the vision of FMCSA senior management. Highlights of the functionality of *Transportation Nation* include virtual motor carrier vehicles for simulated safety inspections (Figure 2), a multi-floored replica of the U.S. DOT Washington, D.C.-based Headquarters building for web-based conferencing and instruction (Figure 6; Figure 7), and consolidated access to federal and state office-based organizational information (Figure 3). Upon completion of the project, however, FMCSA staff responsible for the ongoing utilization of *Transportation Nation* identified three primary issues that need to be addressed.

First, supplementing *Transportation Nation* with additional information and functionality requires ongoing financial and workforce support. While members of the SMET continue to interact with FMCSA’s Second Life island, significant enhancements to the site have stagnated since the initial development concluded. FMCSA senior staff and other stakeholders who have visited *Transportation Nation* have been pleased with the early functionality of the island, though further work is required. FMCSA does not currently employ a virtual world or Second Life expert and remains reliant on outside contractors for significant enhancements and further functional development of *Transportation Nation*. Given that FMCSA operates on a safety-based

budget through Congress' three-year review cycle, the immediate fiscal support required to fully exploit the potential of Second Life and *Transportation Nation* remains difficult to sustain. Fortunately, both the SMET and FMCSA senior staff remain committed to *Transportation Nation* and continue to explore alternative financial solutions to further expand the island.

A second challenge that FMCSA has identified is the level of restriction required to safely operate *Transportation Nation*. Second Life, like other virtual worlds, can be unwieldy and difficult to monitor, as users are able to and are encouraged to pursue the endless opportunities of a virtual existence. As the Second Life user community and American public access FMCSA's virtual world, illicit and more uncontrolled behaviors may become prevalent. To date, FMCSA has elected to use specific restrictions, including safeguarded access to *Transportation Nation*, to ensure the safety and security of the site and other DOT information and data. While FMCSA hopes to continue expanding access to *Transportation Nation*, the amount of ongoing effort required to maintain a well-functioning virtual island is not insignificant.

Third, Second Life is an easy-to-operate software package that can be downloaded at no cost from the Second Life website, though the technical requirements for most effective use of *Transportation Nation* functionality are not available to all FMCSA stakeholders. Once an FMCSA employee or member of the public downloads Second Life, they can visit *Transportation Nation* immediately. After *Transportation Nation* was developed, however, FMCSA found that each user had a different experience when accessing Second Life. Given that FMCSA employees and the American public are located across the country and have access to significantly different levels of telecommunications, bandwidth and desktop hardware, the use of *Transportation Nation* will be different, and, at times, challenging, depending on the user. In future development efforts on Second Life, FMCSA will seek to optimize the functionality available on *Transportation Nation* while ensuring a quality user experience for all FMCSA stakeholders seeking to access organizational information and data via Second Life.

Rectifying these challenges and continually improving the *Transportation Nation* island remains a priority for FMCSA, and developments and enhancements to the virtual world will occur in 2010 and 2011. Additionally, Second Life and virtual worlds should be considered by local, state and federal governments as a possible tool for complying with the Obama Administration's "Open Government Directive," which was issued on December 8, 2009. The "Open Government Directive" specifies that "executive departments and agencies are [required] to take specific actions to implement the principles of transparency, participation, and collaboration" (The White House, *Open Government Directive*, 2009). The engagement of the American public, as mandated by the Open Government Directive, includes efforts to implement:

- Transparency, which promotes accountability by providing the public with information about what the Government is doing;
- Participation, which allows members of the public to contribute ideas and expertise so that their government can make policies with the benefit of information that is widely dispersed in society; and
- Collaboration, which improves the effectiveness of Government by encouraging partnerships and cooperation within the Federal Government, across levels of government, and between the Government and private institutions (The White House, 2009).

The U.S. Department of Transportation and the Federal Motor Carrier Safety Administration consider virtual worlds and *Transportation Nation* to be an example of a Web 2.0 technology for government use that contributes to meeting the goals of the Open Government directive, that will be used as a vital component of the array of tools and processes that continue to encourage government transparency and interaction with the public. Still, the Open Government Directive is only a single example of a business-solution being met through the use and application of virtual worlds in government. The full potential of virtual worlds has not yet been fully exploited, though more government organizations are sure to examine the use of virtual worlds as an innovative solution for future business needs.

The development and implementation of *Transportation Nation* by the Federal Motor Carrier Safety Administration and the U.S. Department of Transportation is an important case study for understanding the increasing importance of virtual worlds. Similarly, the existing research on virtual worlds can help practitioners to understand the capabilities and significance of virtual world use for collaboration, outreach, and interaction, specifically in the government example. Scholars have already begun to highlight and observe the important benefits of using virtual worlds. While a relatively new technology, virtual worlds can act as contemporary sights for collaboration and discourse within the *public sphere*. Moreover, virtual worlds will increasingly act as an *affinity space* for individuals seeking to interact with government information and data in a new and creative forum. The existing research should also be used as a tool for government agencies seeking to develop and implement a virtual world, particularly providing foundational information related to best practices of the safety, legality, and effective usability of virtual worlds. Ultimately, by drawing upon the functionality unique to virtual worlds, local, state and federal government organizations will experience new successes in meeting business needs.

FMCSA's effort to implement and explore virtual worlds through *Transportation Nation* is a meaningful model for governments seeking to utilize new technologies. FMCSA strategically identified *Transportation Nation* as a contemporary technology solution. FMCSA also prioritized the project, engaged stakeholder communities within DOT, and utilized existing resources to develop and implement the project. In doing so, FMCSA has created a base within *Transportation Nation* for future training, interaction, and dialogue with internal and external stakeholders. *Transportation Nation* is indicative of the U.S. Department of Transportation and the Federal Motor Carrier Safety Administration's efforts to be a government leader in identifying, developing and utilizing new technologies to meet strategic and business needs. The effort to implement *Transportation Nation* is also emblematic of DOT and FMCSA's commitment to serving the American public through new technologies that will positively impact how government conducts business in the future.

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