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Gateway National Recreation Area – Sandy Hook Unit
Highlands, New Jersey

Sandy Hook
Traveler Information System

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Contents

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This effort was undertaken in fulfillment of PMIS 16635C, *Sandy Hook Traveler Information System.* The project statement of work was included in the 2007 modification #0007 to the 2004 interagency agreement between the National Park Service and the Volpe Center (NPS agreement F4505041114). The project's initial statement of work called for the development of a concept of operations and requirements for a Traveler Information System (TIS) that will provide Sandy Hook visitors with real-time updates on traffic, parking conditions, and other destination-relevant content based the on interests and information delivery preferences expressed by visitors to the TIS. After additional discussion with Gateway NRA, the NPS Northeast Regional Office (NERO), and the Federal Highway Administration (FHWA) staffs, the purpose of this project was modified to encompass the review of transportation or transportation-related data that is currently available, needed, and missing for visitors to Sandy Hook. The Volpe Center was to identify the numerous current and potential outlets available to gather data and communicate the information with visitors, including intelligent transportation systems (ITS) components and social media, such as Facebook and Twitter. The Sandy Hook staff sought recommendations on a non-cumbersome process to collect data from the multitude of sources and get information to several dissemination sources in a sustainable manner. This report examined what are Sandy Hook's needs for equipment, system, and process between inputs and outputs. The focal point of this report is the response to the question, "What does the Data Compiler, Data Analyzer, Information Disseminator (the "*black box*") look like?"

A number of resources were referenced as part of this effort:

- *Using Traveler Information Systems to Facilitate Wayfinding in Transit Systems*, August 2010, Prepared by the US DOT Volpe Center for the Federal Transit Administration (FTA) Office of Mobility Innovation
- *Role of Social Media in Online Travel Information Search*, April 2010, Tourism Management, Volume 31, Issue 2, authored by Zheng Xiang (University of North Texas, Denton, TX) and Ulrike Gretzel (Texas A&M University, College Station, TX) , Accessed at: *http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V9R-4W14HJ5-1&_user=645219&_coverDate=04%2F30%2F2010&_rdoc=1&_fmt=high&_orig=search&_origin=search&_sort=d&_docanchor=&view=c&_searchStrId=1508204970&_rerunOrigin=*

google&_acct=C000034688&_version=1&_urlVersion=0&_userid=645219&md5=26a8271c71a6dc8ce126675c9c364867&searchtype=a

- *Lighting a Virtual Campfire: Creating Podcasts to Attract Young People to National Parks in New York Harbor*, authored by John Harlan Warren. Published March 31, 2009. Consulted October 6, 2010. In J. Trant and D. Bearman (eds). *Museums and the Web 2009: Proceedings*. Toronto: Archives & Museum Informatics, Accessed at: http://www.archimuse.com/mw2009/papers/warren/warren.htm
- *Current Uses of Web 2.0 Applications in Transportation*, March 2010, produced by the US DOT Volpe Center for the Federal Highway Administration's (FHWA) Office of Interstate and Border Planning, Accessed at: http://www.gis.fhwa.dot.gov/documents/web20report/web20report.pdf
- *Utilizing Information Technology in Innovative Marketing Approaches for Public Transportation*, February 2010, produced by the National Center for Transit Research (NCTR) Center for Urban Transportation Research at the University of South Florida for the Florida DOT Research Center, Accessed at: http://www.nctr.usf.edu/pdf/77810.pdf
- *Sandy Hook Alternative Access Concept Plan and Vehicle Replacement Study*, June 2009, produced by the US DOT Volpe Center for the National Park Service's Gateway National Recreation Area, Accessed at: http://publiclands.volpe.dot.gov/projects/pdfs/sandyhook2_finalRpt.pdf
- *Gateway National Recreation Area – Sandy Hook Unit Automated Fee Entrance Plaza and Intelligent Transportation System Technical Requirements,* August 2008, produced by the US DOT Volpe Center for the National Park Service's Gateway National Recreation Area, Accessed at: http://publiclands.volpe.dot.gov/projects/pdfs/sandyhook1_finalRpt.pdf
- *Gateway National Recreation Area – Sandy Hook Unit Parking Management Study*, December 2003, produced by the US DOT Volpe Center for the National Park Service's Gateway National Recreation Area, Accessed at: http://www.volpe.dot.gov/nps/docs/gateway-sh.pdf
- *Sandy Hook – Route 36 Corridor Summer Traffic Management and Agency Coordination Plan,* February 2001, prepared by Monmouth County Planning Board, Accessed at: http://co.monmouth.nj.us/documents/24/Sandy%20Hook%20RT36%20Corridor%20Study.pdf

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Acronyms / Definitions

The following terms are used in this report:

API	Application programming interface
ATS	Alternative transportation system
BLM	United States Bureau of Land Management
CCTV	Closed circuit television (camera)
CMAQ	Congestion Management and Air Quality - federal grant program used to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief
CMS	Changeable message sign (same as DMS and VMS)
COA	Clean Ocean Action
CPU	Central processing unit
CTSS	Controlled traffic signal system
DMS	Dynamic message sign (same as CMS and VMS)
DOT	Department of Transportation
FWS	United States Fish and Wildlife Service
GATE	Gateway National Recreation Area
GPS	Global positioning satellite
HAR	Highway advisory radio
ITS	Intelligent Transportation System
MPO	Metropolitan Planning Organization
NDFD	National Digital Forecast Database
NFC	Near-field communication
NJAS	New Jersey Audubon Society
NJDOT	New Jersey Department of Transportation
NPNH	National Parks of New York Harbor
NPS	National Park Service
NWS	National Weather Service
OMB	United States Office of Management and Budget
PMS	Parking management system
QR	Quick Response code
RSS	Really simple syndication
RWIS	Road weather information system
SAHO	Sandy Hook Unit of the Gateway National Recreation Area
SMS	Short message service
TE	Transportation Enhancement – federal grant program used to help expand transportation choices and enhance the transportation experience
TIS	Traveler information system
TRANSCOM	Transportation Operations Coordinating Committee
USDOT	United States Department of Transportation
VMS	Variable message sign (same as CMS and DMS)
XML	Extensible markup language

Section 1: Introduction

This section introduces the Sandy Hook Unit of the Gateway National Recreation Area, the Traveler Information System concept, and the existing communication structure available at the unit and around the region.

Sandy Hook Unit Overview

Situated on the northeastern coast of New Jersey, the Sandy Hook (SAHO) unit of Gateway National Recreation Area (GATE) is a 1,665 acre barrier peninsula. Sandy Hook's six miles of pristine coastline, diverse bird habitat, and rich history as a former military complex, makes the unit a popular summer destination for bathers, birders, and history buffs alike. Given the site's close proximity to Manhattan and northern New Jersey the unit's current parking supply is not sufficient to serve all recreational visitors destined for Sandy Hook's beaches on peak summer weekends. As such, Sandy Hook has been identified as one of the two worst congested recreational shore points in the country. Figure 1, below depicts the location of the Sandy Hook unit in relation to the other units of GATE and the greater New York region.

Figure 1 Gateway National Recreation Area and the Sandy Hook Unit

Source: Gateway National Recreation Area website http://www.nps.gov/pwr/customcf/apps/maps/showmap.cfm?alphacode=gate&parkname=Gateway%20National%20Recreation%20Area and "Planning Your Visit" section of the website: http://www.nps.gov/gate/planyourvisit/upload/Map%20of%20Sandy%20Hook%20peninsula.2008%20unigrid.pdf

Recent reports indicate that congestion levels have remained constant over the past several years despite a well-formulated and coordinated effort with regional partners to manage congestion using both roadway countermeasures and information dissemination. Over the coming years, as visitation to Sandy Hook continues to increase, the parking supply will continue to pose challenges for Sandy Hook visitors and park staff. On busy days, access to the unit is restricted due to the limitations of the existing parking supply. Undoubtedly, as a major area attraction, closing the park to visitors once the parking supply is filled, leads to congestion along State Route 36 and the Jersey Shore.

Sandy Hook Traveler Information System Concept

The U.S. DOT Volpe Center was tasked with creating a concept of operations for a traveler information system (TIS) at Sandy Hook. Initially conceived as a component of a broader Parking Management System (PMS), the current Sandy Hook Traveler Information System (TIS) has been deployed as a tool with which to mitigate adverse traffic impacts to the unit's central access point - State Route 36. This report now focuses on equipment and procedural solutions for gathering and disseminating a wide range of visitor information, including real-time traveler information data relating to traffic and parking at Sandy Hook. Based on an evaluation of the existing TIS efforts, park geography, regional partner agencies, and other data and information opportunities available, this report describes the TIS concept recommended for Sandy Hook. A conceptual framework for a text-based communication platform is presented as a short-term, tangible solution for TIS communication.

Loosely defined, the TIS is intended to serve as a portal with which to collect and disseminate pertinent traffic, transit and other similar information to park visitors and partner agencies. TIS includes a broad range of advanced computer and communication technologies. This study incorporates the use of new media applications into a broader Sandy Hook-specific TIS, detailing how Sandy Hook might use social media, such as Facebook and Twitter, to communicate with visitors on a range of issues important to them. Working collectively with existing TIS tools including dynamic message signs (DMS) and highway advisory radio (HAR), the new media applications can expand upon the information dissemination structure through a simple, streamlined process.

The recommended TIS is intended to help visitors plan their visit to Sandy Hook accordingly. For example, if visitors are aware of the status of the park in advance, they could make better trip-making decisions by adjusting their departure time to make it to the park before parking lots reach capacity, take an alternative means of transportation to the park depart the park and surrounding areas at an appropriate time, or decide to travel to a destination other than the park. The TIS could also be integrated with applications that would allow the visitor to experience a variety of scheduled activities at Sandy Hook.

Existing Traveler Information System

The traffic delays that have occurred as a result of the Route 36 Highlands Bridge Replacement project have required an increased level of collaboration between Sandy Hook officials and regional transportation managers. The bridge construction has led to increased delay accessing the park, varied travel patterns, and general delays for visitors exiting the site. Sandy Hook officials rely on both internal and external traveler information systems to aid with these and other travel issues. Many of these processes and systems were highlighted in the *2001 Sandy Hook – Route 36 Corridor Summer Traffic Management and Agency Coordination Plan*, an agreement among 13 local, regional and state entities. Sandy Hook staff work closely with the NJDOT to utilize external collection and dissemination equipment and systems. As of 2010, the New Jersey DOT owns and operates a number of Intelligent Transportation System Devices in Monmouth County:

- 10 closed circuit television (CCTV) Cameras
- 28 controlled traffic signal systems (CTSS)

- 3 dynamic message signs (DMS)
- 4 roadway weather information systems (RWIS)
- 3 EZ Pass tag readers along Route 36.

In addition, as a mitigation measure employed during the bridge construction, NJDOT added CCTV cameras and DMS along Route 36. NJDOT plans to relocate these to other construction sites after the conclusion of the bridge construction project in early 2011. However, NJDOT will add an additional five EZ Pass tag readers (for a total of eight readers) along the 12-mile stretch of Route 36 from the Shrewsbury River (Highlands) Bridge to the Garden State Parkway Exit 117. The additional tag readers will allow NJDOT to better track the congestion levels of this primary roadway to Sandy Hook.

The Sandy Hook park officials also utilize other external contacts and systems for traveler information. Travelers can review the 511NJ website (http://www.511nj.org/ is maintained by the New Jersey DOT) for current traffic conditions and reference 511NY (http://www.511ny.org/ is maintained by the New York State DOT) for regional transit information. The Sandy Hook communications staff also maintains phone communication with the Transportation Operations Coordinating Committee (TRANSCOM) to transmit park closure information to the appropriate state agencies. TRANSCOM is a coalition of 16 transportation and public safety agencies in the New York Tri-State Metropolitan Region (States of New York, New Jersey, and Connecticut)[1].

Figure 2 EZ Pass RFID Toll Tags are used to Monitor Traffic Flows

New Jersey DOT will be expanding its ability to read EZ Pass Radio Frequency Identification (RFID) toll tags along State Route 36, increasing its ability to monitor congestion. Shown (left) is a portable solar –powered RFID reader being tested by the New York State DOT.
Photo courtesy of Rensselaer Polytechnic Institute

The Sandy Hook Unit owns and operates two portable DMS's. These DMS are moved outside the park boundaries and placed on pre-approved NJDOT right-of-way locations during peak weekend days. The messages are manually controlled by Sandy Hook's traffic control personnel. As part of

[1] TRANSCOM was established in 1986 to provide a cooperative, coordinated approach to regional transportation management (accessible online at: http://www.xcm.org/).

the mitigation efforts for the bridge construction, New Jersey DOT has also installed some permanent DMS at the Sandy Hook entrance station. To monitor traffic within the unit and along the key approaches to the Highland Bridge construction site, the NJDOT has also deployed a number of portable cameras. Sandy Hook also operates a Highway Advisory Radio (HAR) that broadcasts at a low level within the Sandy Hook boundary. Internal park wayfinding is also maintained through numerous traditional static directional and information signs.

Figure 3 Existing Portable DMS / 511 advisory and Static Signage within Sandy Hook

Picture source: USDOT RITA Volpe Center, Taken September 2010

Figure 4 Existing Portable Camera

Picture source: USDOT RITA Volpe Center, Taken September 2010

Section 2: Relevant Communication Platforms

This section highlights common web 2.0 applications currently in use by transportation entities (DOTs, MPOs, car/vanpool services, transportation agencies, etc.) It outlines other relevant traveler information system initiatives and also presents information on other national park use of web 2.0 platforms.

Social Media / Web 2.0

Social media platforms have revolutionized the way people communicate, interact, and obtain information. The transportation field is no exception. While little substantiated research exists on the effect this growing form of communication on transportation-specific use, the abundant number of 2.0 tools dedicated to facilitating access to transportation resources is indicative of the effect social media is playing on the field.

"Web 2.0" is an umbrella term for websites and online applications that are user-driven and emphasize collaboration and user interactivity. The term was created by a media company in 2004 to describe the next generation of websites that regularly incorporated user interactivity in creating content, differing from previous websites that provided only static content or provided limited opportunities for user interaction.[2] These technologies made it easier for users to interact with websites, converse with other site users, and add or edit content without the need to use a coding language.

Gov 2.0

In the public sector, dynamic web pages that support user-driven content are now known as "government 2.0" applications.[3] Government 2.0 applications are a sub-set of web 2.0 tools that specifically promote user interactivity and collaboration in a government context. Typically, the goals of government 2.0 applications include supporting more transparent governance, citizen involvement in government decision-making, or making internal government agency communication more efficient.[4]

The development of 2.0 applications in a government context is a recent trend that has been institutionalized in Federal policy and guidance. In December 2009, for example, the Federal Office of Management and Budget (OMB) issued a directive to promote a culture of open government, requiring Federal executive agencies to publish high-value data sets for public consumption on websites that allow public feedback and input.[5] A January 2009 Presidential Memorandum[6], later clarified in an OMB directive[7], states that government should be transparent, participatory, and collaborative. The White House 2009 Memorandum on Transparency and Open Government[8] also underscored the Federal government's commitment to use 2.0 tools as a means to support public involvement and citizen engagement.

The institutionalization of 2.0 forums in Federal directives has led to these types of applications being prevalent at the Federal level. Examples of 2.0 tools in Federal government include the U.S.

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[2] David Wyld. The Blogging Revolution: Government in the Age of Web 2.0. IMB Center for the Business of Government. 2007. Available at www.businessofgovernment.org/pdfs/WyldReportBlog.pdf

[3] To avoid overly technical distinctions between web and government 2.0 applications, the general term "2.0 tools" is used throughout this report to describe state DOTs' use of web-based applications that focus on user interactivity.

[4] www.esri.com/news/arcuser/1009/geoweb20.html

[5] OMB Directive: www.whitehouse.gov/omb/assets/memoranda_2010/m10-06.pdf

[6] Transparency and Open Government Directive from President Obama, 2009. www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment/

[7] Open Government Directive: www.whitehouse.gov/omb/assets/memoranda_2010/m10-06.pdf

[8] Memorandum on Transparency and Open Government: www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment/

Secretary of Transportation's blog (FastLane)[9] and the USDOT online Citizen Engagement Tool[10], which encourages the public to submit and rate ideas on how the USDOT can improve the quality of USDOT information, work with the public, collaborate with other agencies, and be more efficient.[11] These applications demonstrate 2.0 principles in providing forums through which government agencies can seek and respond to citizen feedback and provide government data more freely and frequently to users.

2.0 Tool Functionalities

Many different types of 2.0 applications exist, including blogs, wikis, podcasts, social media, mashups[12], and photo- or video-sharing sites. Some 2.0 tools are used primarily for one purpose. In general, however, 2.0 tools are flexible and the lines between 2.0 applications and their functionalities are often blurred. An agency might chose to use a 2.0 tool for one reason but then find that the application in fact serves several different purposes.[13] Use of 2.0 tools can thus evolve over time. As a result, it can be challenging to categorize these tools in static categories.

Nevertheless, it is useful to develop a general framework to organize the array of tools and their primary functions. A transportation consulting company based in Vienna, Austria, developed four categories to describe the major functionalities of 2.0 applications.[14] The four categories are described below and include brief examples:

- ***Information Provision***. Applications used for information provision focus on serving information to users who have chosen to be recipients. An example of a 2.0 application used primarily for information provision is *FastLane*, the USDOT Secretary's blog. The primary purpose of *FastLane* is to provide transportation news, updates, and articles to users who choose to access the blog.
- ***Planning and Administration***. Applications used for planning and administration focus on offering ways for multiple users to concurrently view, create, and edit content, or receive and provide feedback in an interactive environment.
- ***Social Networking***. Applications used for social networking purposes—social media tools— focus on creating and expanding social networks, developing virtual 'communities of interest' focused on a particular topic or issue, and enabling dialogue between and within networks.
- ***Analysis and Evaluation***. Analysis and evaluation applications focus on enabling users to use web-based tools to collaboratively provide, analyze, and share data to reach solutions to specific transportation issues or problems.

At a basic level, all 2.0 applications focus on sharing information with audiences in different ways than in the past, but these applications have the capacity to serve broader purposes. Table 1 provides a more detailed overview of specific types of 2.0 tools and their primary functionalities in a transportation context.

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[9] fastlane.dot.gov

[10] Available at opendot.ideascale.com/

[11] A compilation of U.S. government blogs is available at www.usa.gov/Topics/Reference_Shelf/News/blog.shtml

[12] A *mashup* is a Web page or application that uses and combines data, presentation or functionality from two or more sources to create new services

[13] For a general guide to use of social media applications for public transportation agencies, see Routes to New Networks. National Center for Transit Research. November 2009. Available at www.gosocialtransit.com/routes_to_new_networks.pdf

[14] The table is adapted from the one included in a November 2009 paper by Andy Nash at Vienna Transport Strategies. See www.andynash.com/nash-publications/2009-Nash-Web2forPT-14nov09.pdf

Twitter

A social networking and micro-blogging service, Twitter enables users to send and receive user updates known as “tweets” which are text posts limited to 140 characters in length. Tweets are posted on the user’s profile page and delivered to users who have signed up to “follow” the particular user. Twitter is accessible via the Twitter website, Short Message Service (SMS), Really Simple Syndication (RSS) feeds, or through a number of proprietary mobile applications. Twitter is a free service and has recently announced plans to incorporate multimedia (e.g. pictures, video) tweets.

Facebook

With approximately 500 million users worldwide, Facebook is the most widely used social media website. Facebook users develop a user profile, entering demographic information, personal interests, and contact information. Users can connect with friends, send messages, update their personal profiles, and join organized networks (e.g. workplace, college). Users can also create and join interest groups and "like pages”. Facebook enables users to share and distribute multimedia content such as pictures, videos, and web-links.

YouTube

You Tube is a video-sharing website on which users can upload, share, and view videos. This free service enables users to create profiles, “subscribe” to user channels, and comment on user media. A number of public institutions such as State DOTs, MPOs, and local governments distribute public advisories, commercials, and other video-content on official pages.

Flickr

Primarily known for its image hosting capacity, Flickr has recently expanded it service permitting users to upload videos to the site. In addition to being a popular website for users to share and embed personal photographs, the service is widely used by bloggers to host images that they embed in blogs and social media.

Blogs

A blog (web log) is a website that contains regular entries or “postings” submitted by an individual or organization. Blogs are usually tailored to a specific subject matter and feature multimedia content in addition to text. Blogs are typically interactive, permitting visitors to the site to leave comments and message other users through “widgets” on the site.

Table 1. Overview of 2.0 Tools by Main Function and Overall Category

2.0 Tool	Main Function(s)	Functionality Category			
		Information Provision	Planning and Administration	Social Networking	Analysis and Evaluation
Wikis (e.g., Wikipedia)	Streamline review and editing of documents; provide interactive forums to assist agency processes.	X	X		
Social media tools (e.g., Facebook, MySpace)	Share relevant information with the public or with internal agency groups; encourage discussion with users; promote agency mission and projects; allow users to create interest groups and develop and maintain social networks.	X		X	
Mashups (e.g., Bikewise)	This tool brings together two different data sources into a unified application (i.e., street map and traffic conditions). Provide visual representations of transportation projects or travel updates customized to a users' location; allow users to submit comments on geographically specific issues (e.g., a broken streetlight).	X			X
Podcasts (e.g., White House podcasts)	Provide information to the public on selected or specific topics.	X			
Media-sharing sites (e.g., YouTube, Flickr, Slideshare)	Post videos or pictures highlighting transportation projects or agency events; post slideshows.	X		X	
Really simply syndication (RSS) feeds	Allows users to know when website updates occur.	X			
Blogs (e.g., *FastLane*, the USDOT blog)	Provide general information to the public; support dialogue by allowing agency responses to public comments; allow agencies to follow others' news.	X		X	
Micro-blogging services (e.g., Twitter)	Share general agency and transportation information with the public; monitor public references to the agency; expand audiences for transportation information by reposting others' posts.	X		X	

2.0 Tool	Main Function(s)	Functionality Category			
		Information Provision	Planning and Administration	Social Networking	Analysis and Evaluation
Interactive surveys (e.g., Cyclopath)	Enable users to receive customized information based on preferences		X		
Shared documents (e.g., Google documents)	Post and share documents with specific stakeholder groups; allow group users to edit and create content.	X	X	X	X
Virtual meetings, meeting-sharing tools (e.g., Slideshare)	Provide information on meetings and meeting materials; allow participants to interact with meeting hosts and speakers via chat or other features.	X	X		
Professional networking sites (e.g., LinkedIn)	Allow users to share information regarding professional affiliations and network with other professionals.	X		X	
Virtual worlds (e.g., Second Life)	Provides simulated environments where users can interact, share information, and build networks with others.			X	
Bookmarking sites (e.g., Digg.com, delicious.com)	Allows users to share information about websites and access web bookmarks from a centralized location.			X	
Cloud-based computing (e.g., Google documents/groups)	Enable users to use web-based tools to collaboratively enter, analyze, share data, and reach solutions.	X	X		X
Crowd sourcing (e.g., Next Stop Design)	Allows multiple users to collaboratively develop solutions to specific issues, make recommendations, or develop tools.		X		X
Simulation games (e.g., Mobility)	Provides simulated environments where users interact with game components or with other users; primarily used as educational tools.				X

Integration with Traveler Information Systems

An essential component of utilizing 2.0 applications is the ability to integrate them with TIS to provide meaningful and accurate data to visitors. Once the TIS sub-systems (including the DMS and HAR) are operational, Sandy Hook parking and traffic information could be disseminated using these media. Cellular access to the DMS will allow for immediate communication of parking information to the signs via a phone call. HAR updates will require a recorded message. For example, a fully automated parking management system (PMS) would disseminate parking information directly to the DMS, the HAR, and other traveler information systems in the region.

Marketing TIS Tools

As a cost-effective communication tool, 2.0 platforms have become the method of choice for transportation organizations to communicate with travelers. An attractive aspect of 2.0 platforms is their potential to be used as a marketing tool helping to engage, educate, and inform visitors about the events and services offered by Sandy Hook. The flexible and personalized nature of 2.0 platforms enables visitors to choose the form of communication that best suits their needs and lifestyles, expanding the Park's reach and ability to communicate effectively with a broader audience.

Social media and 2.0 applications are collaborative and require users and organizations to work closely to achieve goals. A critical component to achieve a useful life for these applications as TIS tools requires Sandy Hook to work closely with visitors to provide and disseminate information in a clear and useful manner. The 2.0 tools can go beyond their TIS intentions and be used as a broader customer relations tool, monitoring and responding to visitor questions while providing information or guidance on the attractive aspects of the site. This stream of two-way communication could alleviate many of the routine telephone inquiries received by the unit.

While 2.0 applications are generally free, they do have significant time considerations which must be considered when developing a social media strategy. Social media is a dynamic field that requires constant research and monitoring and cannot be relegated solely to normal business hours. As such, an agency deploying these applications must be ready to respond at any time. The flexibility of 2.0 platforms enables their use as a PR tool, not only for promoting events and updates, but also for crisis control and prevention.

Existing Transportation Use of 2.0 Platforms

A number of transportation agencies including state DOTs, MPOs and transit agencies are increasingly using these 2.0 applications and platforms as effective means of communication. A recent report by the US DOT Volpe Center titled *Current Uses of Web 2.0 Applications in Transportation*, finds that a majority of state DOTs are using a wide array of 2.0 tools, including wikis, social media (e.g., Facebook), podcasts, blogs, microblogging services (e.g., Twitter), and shared documents (e.g., Google documents, Sharepoint).

While state DOTs differ in purpose, structure, and nature than Sandy Hook and the NPS in general, some key findings from the report on general use and implementation of 2.0 platforms can be useful for any government agency developing 2.0 content. Key findings from the report include:

- ***Many types of 2.0 tools can be effective for transportation agencies.*** State DOTs are using a wide array of 2.0 tools, including wikis, social media, podcasts, blogs, micro-blogging services, and shared documents. In most cases, agencies were using multiple tools concurrently to achieve similar objectives, indicating that the tools are not mutually exclusive and can be combined as a suite.

- ***State DOTs are using 2.0 tools for many different purposes but primarily to provide information to the public in newer ways than in the past.*** The most common use of 2.0 tools was to provide information and data to the public in newer ways than in the past. Newer 2.0 technologies have enabled agencies to directly communicate with the public without the need for a liaison and on a more frequent basis.

- ***The benefits of 2.0 tools outweigh the challenges.*** As with any new technology, agencies should carefully consider each type of tool available to assess whether it is appropriate to accomplish its intended objectives. These benefits include the realization of time and cost savings through more efficient resource allocation and reduced inquiries from the media and stakeholders, as well as the ability to support new forms of public involvement.

- ***There is a need to develop clear guidelines for public use of 2.0 tools.*** Transportation agencies face a unique challenge in implementing 2.0 tools due to the potential for distracted driving, particularly with respect to those tools focused on providing travel information to the public and accessed via mobile devices. Although emerging technologies, such as vehicle dashboard displays, might alleviate this challenge, transportation agencies using 2.0 technologies will likely need to develop clear guidelines and recommendations for when and how it believes the public should use these tools.

- ***Use of 2.0 tools will continue and increase in the future.*** It is likely that more agencies will be using 2.0 technologies in the future to achieve numerous objectives. There is a trend towards agencies providing highly customized information to the public in real-time. Additionally, some state DOTs noted a trend toward using 2.0 to specifically engage the public via virtual meetings. This could range from posting public outreach videos online to streaming live public meeting broadcasts, complete with chat features that allow input.

In summary, state DOTs are using a wide variety of 2.0 tools to accomplish numerous goals, including to provide information to new and broader audiences, streamline internal communication and efficiencies, build communities of interest around transportation, and support collaborative content creation and problem-solving. Agencies generally believed that the use of 2.0 applications provided time and cost savings through more efficient resource allocation and reduced inquiries from the media and stakeholders. Overall, these tools can help agencies more effectively address customers' needs and further business missions.

Current Platforms Utilized by National Parks and Public Lands

There are many examples of public lands agencies using social media applications to reach the public. The most popular applications among parks and public lands agencies are generally the most popular with users and include Facebook, Twitter, blogs and RSS feeds. Agencies are also using YouTube and Flicker to share information with the public. As part of the Sandy Hook TIS research, the Volpe Center conducted a brief scan of how social media is in use by parks and public lands agencies at the federal and state level. A full listing of public lands agencies that use these applications is not readily available, nor is research complete on their effectiveness on reaching the public. Much of the current information on the value of 2.0 applications has been compiled largely from anecdotal reviews from visitors and staff.

Federal Level

At the Federal level, public lands agencies use social media in different ways, but all with the goal of reaching the public. The National Park Service's maintains a Twitter feed, a Facebook page, and RSS feeds. The NPS's Twitter site is available at http://twitter.com/NatlParkService.

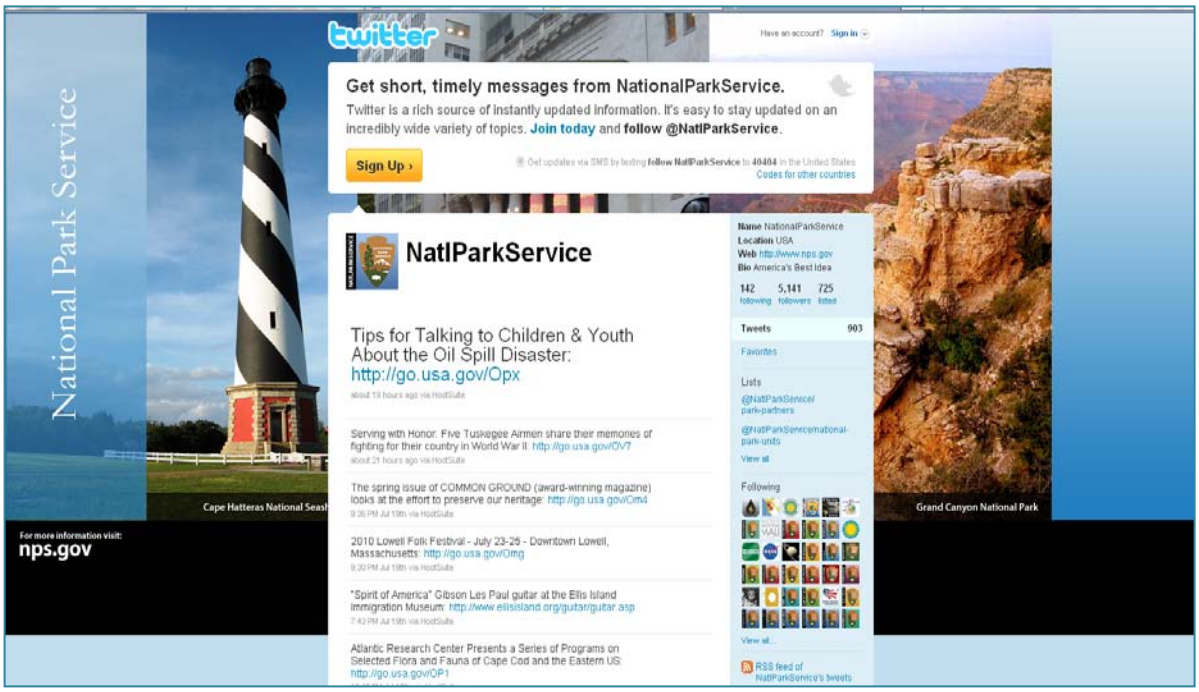
The NPS Facebook page (http://www.facebook.com/nationalparkservice) has over 50,000 fans. One recent example of Facebook usage was to raise money for the *Flight 93 National Memorial*. Members of Facebook were asked to become a fan on Facebook with Range Resources Corporation out of Texas donating $1 for every new fan by July 4, 2010. NPS also uses the site to promote specific units and distribute educational items of interest. For example, on July 16, 2010, the NPS responded to a question commonly posed by visitors: "When were horses brought to Assateague Island?"

The National Parks Conservation Association is also on Twitter (http://twitter.com/npca), disseminating *National Parks News.* Their Twitter site currently has 7,018[15] followers.

National Parks Conservation Association®
Protecting Our National Parks for Future Generations®

Individual NPS units also use social media and other technology to reach the public. *Grand Canyon National Park* in Arizona has podcasts, webcams, and weather links. *Big Bend National Park* in Texas uses webcams to display real-time activities and conditions. However, some of Big Bend's other web-linked applications provide infrequent information and are not as useful. The Federal sites had varying degrees of web-linked applications, but Twitter is growing rapidly in popularity among the NPS units. The most thorough compilation of NPS units using Twitter is available at http://www.roadup.com/national-parks-twitter.

Figure 5 National Park Service's Twitter Page



NPS's Twitter site is available at: http://twitter.com/NatlParkService, Accessed September 23, 2010

[15] As of September 23, 2010

Figure 6 National Parks on Twitter

National Parks on Twitter, http://www.roadup.com/national-parks-twitter, Accessed September 23, 2010

Individual park units are also on sites such as Facebook. *Grand Teton National Park* uses Facebook to inform visitors of special events, display images, and provide the latest news. They also encourage visitors to the site to share their thoughts. The link to the Grand Teton Facebook page is prominently displayed on the Park's homepage. Grand Teton's Facebook page is consistently up-to-date, as evidenced by the on-going new postings.

The *Santa Monica Mountains National Recreation Area* in California is also on Facebook, as well as utilizing Twitter and Flickr applications. This site features a "Ranger Question of the Week" that allows rangers to interact with Facebook users. Figure 7 shows a ranger asking users to identify a mysterious flower and some of their responses. This feature aids in keeping the Facebook site "fresh" and has accounted for a large number of followers. A similar pattern of use is seen with the Santa Monica Mountains' Twitter site.

Figure 7 Santa Monica Mountains National Recreation Area Facebook Page

Santa Monica Mountains NRA's Facebook is available at: http://www.facebook.com/santamonicamtns, Accessed Sept. 23, 2010

Golden Gate National Recreation Area, which includes Alcatraz Island in the San Francisco Bay has set up Facebook and Twitter applications. The Golden Gate Twitter has over 750 followers and is listed on (linked to) over 140 accounts. However, the Alcatraz Twitter site, providing significantly more detailed and targeted information, has substantially more followers and is listed on more accounts than its "parent" site. The Alcatraz Island Twitter site contains a downloadable file, "**Secrets of Alcatraz GPS Tour"**. The file shows the exact GPS coordinates of the original prison, the escape route of Doc Barker in 1939, the location of the 1882 Army hospital, and more virtual information.

Mobile Applications

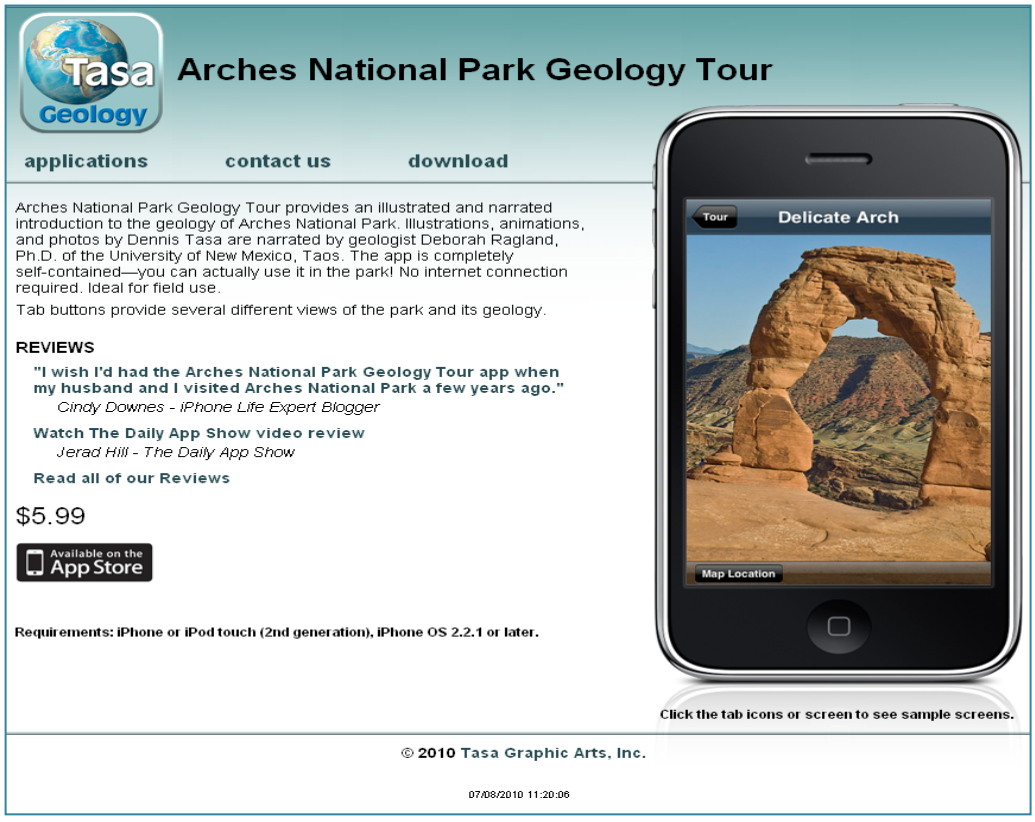
Mobile applications are emerging as a new way for public lands agencies to reach the public. One example is a Chimani, LLC-developed iPhone and Android applications for Acadia National Park that provides users with points of interest, guided tours, GPS-enabled maps, information on ranger-led events, trail maps and bicycle guides, information on the Island Explorer, and more. Currently under development are mobile applications for *Cape Cod National Seashore* and *Yosemite National Park*. Due to cell phone reception issues at many parks, the applications include all of this information on a user's device and do not depend on a constant cellular connection. The Acadia application is now available from the iTunes store for $9.99.

Arches National Park in Utah is also accessible via an iPhone application. The Arches National Park Geology Tour is another self-contained application (no cell reception necessary) that provides illustrations, animations and photos along with narration by a PhD of Geology. The application costs $5.99 from the iTunes store.

Figure 8 Chimani, LLC-developed iPhone and Android Applications for Acadia National Park

Source: http://itunes.apple.com/us/app/chimani-acadia-national-park/id373153975?mt=8

Figure 9 Tasa Geology Arches National Park Geology Tour iPhone Applications



Source: http://www.tasagraphicarts.com/arches.htm

Glacier National Park in Montana prominently explains its social networking activities on its home page (http://www.nps.gov/imr/glac/) and links to the Glacier Social Networking webpage. This webpage (http://www.nps.gov/glac/parknews/socialnetworking.htm) displays a link to all of its

social networking activities. Glacier NPS encourages people to follow the park on Twitter, Facebook, Flicker, YouTube and has several blogs at: http://www.nps.gov/glac/parknews/blogs.htm. Glacier National Park uses its blog to keep the public connected with what is happening in the park. There are 10 separate staff blogs with each community having a correlating staff member that is interested in public communication in specific areas, such as volunteers and fires. Glacier National Park also has two RSS newsfeeds, delivering news and/or events and web updates directly to the desktop of those who sign up. Glacier provides the public with free images of Glacier National Park on its Flicker page, requesting only that users give proper citation if they use the images in their own works. The Park also solicits feedback on individual images on their Flicker page.

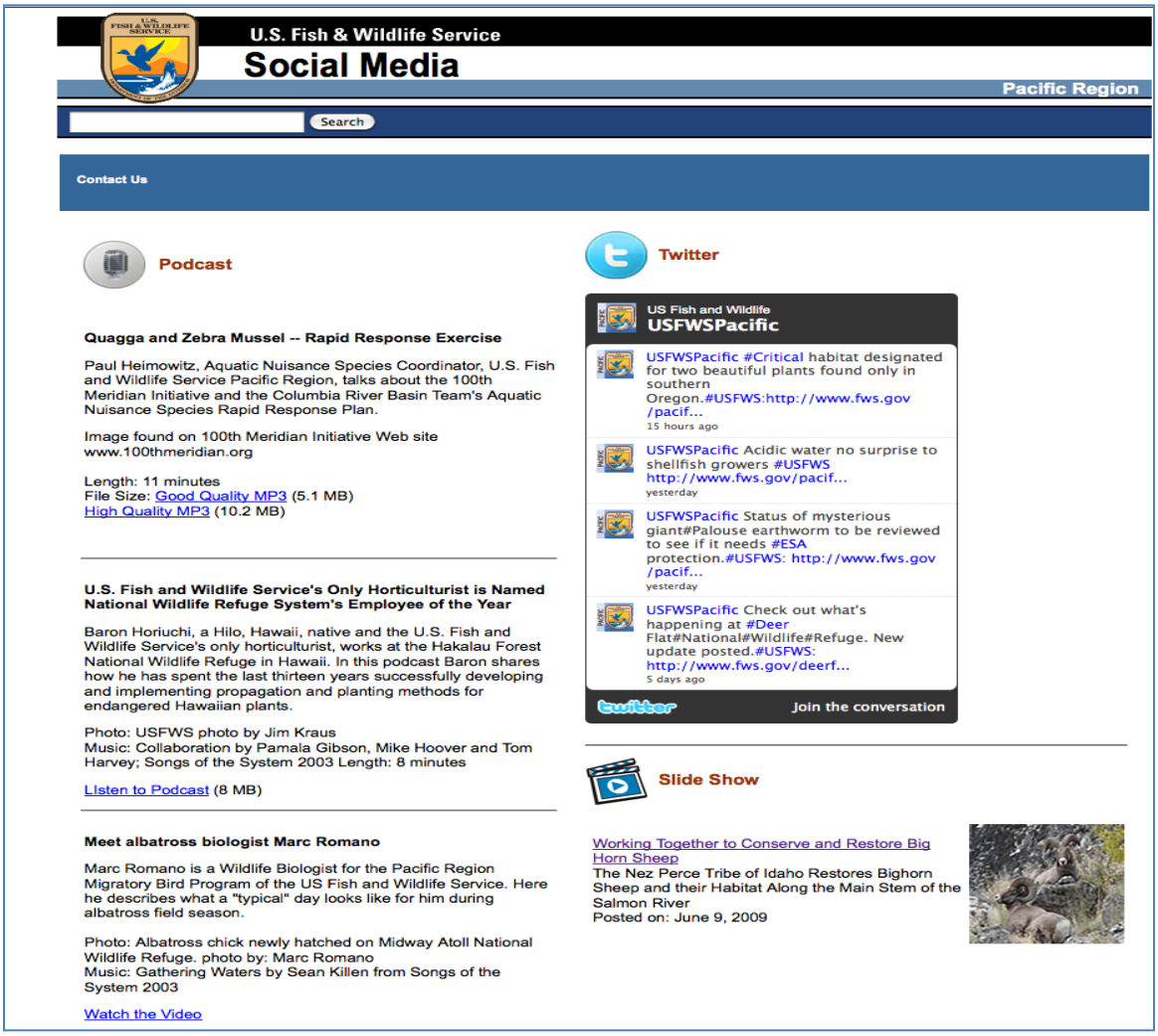
Figure 10 Glacier National Park Social Networking

Mock-ups of Glacier National Park's Home Page (http://www.nps.gov/imr/glac/) and Social Networking Webpage (http://www.nps.gov/glac/parknews/socialnetworking.htm). The Glacier website makes it very easy to locate social network opportunities through simple descriptions and links.

Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) has broad social media outreach. There are links to FWS region social media-specific websites (http://www.fws.gov/home/socialmedia/) located on the main FWS website. This main social media hub is designed in part to assure users that they are accessing official FWS websites. This is in consideration of the proliferation of information available on the internet. The site also embeds both Facebook and Twitter feeds as well as their YouTube channel and Flicker stream. The FWS uses the format of the main social media site to integrate their region feeds providing podcasts and video casts as well as Twitter updates to visitors in those regions. FWS specifically welcomes comments on their social media site, with guidelines on what is appropriate and not appropriate on display prominently.

Figure 11 U.S. FWS Pacific Region Social Media Site

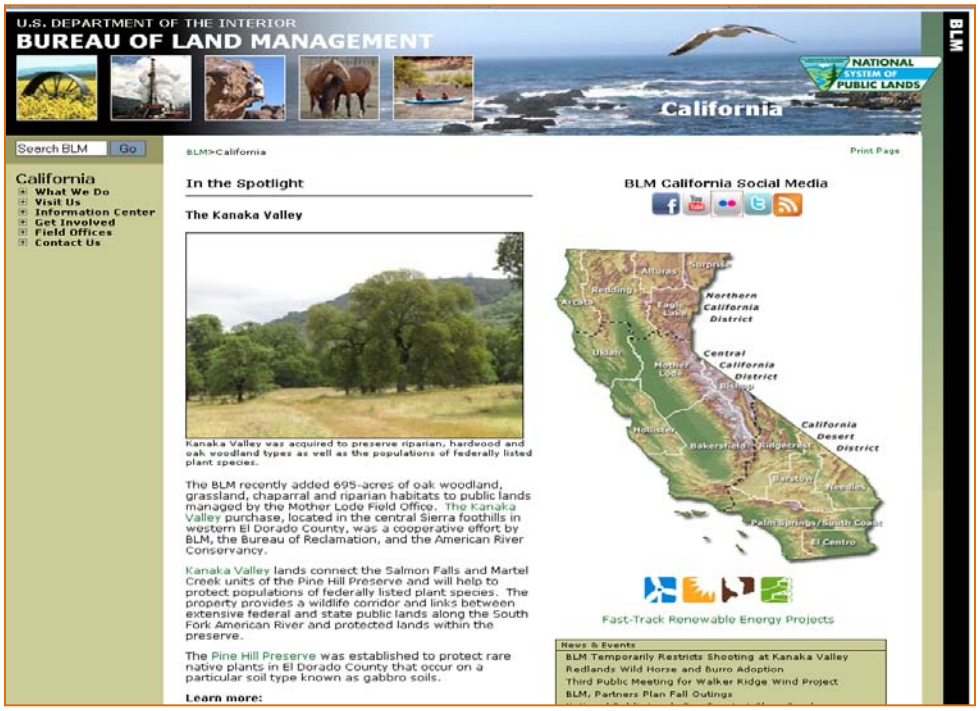


Source: http://www.fws.gov/pacific/socialmedia/, Accessed July 23, 2010

Bureau of Land Management

The U.S. Bureau of Land Management (BLM) California also uses Facebook, YouTube, Flicker, Twitter and RSS feeds as social media applications. Links to social media sites are on display prominently on the main BLM California website.

Figure 12 BLM California Main Web Page – Social Media Access Prominently Displayed



Source: http://www.blm.gov/ca/st/en.html, Accessed September 28, 2010

State Level

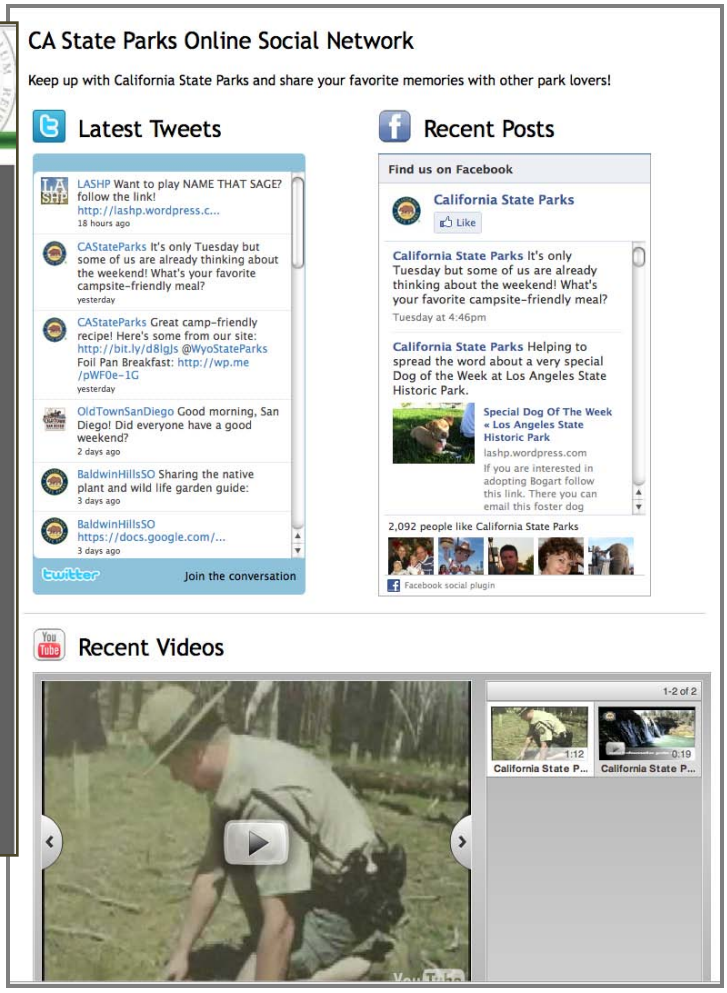
At the state level, park and public lands agencies are also embracing social media to reach the public. A few of the many state examples of social media in use by their public lands agencies are presented. The Massachusetts' *Department of Conservation and Recreation* (DCR) utilizes a blog, RSS feeds and Twitter to update users on news and events at their facilities (http://environment.blog.state.ma.us/). DCR also maintains photos on Flicker. *California State Parks* also utilizes social media such as Twitter, Flicker, YouTube and Facebook to communication with the public. California State Parks maintains all updates to all park services on one website http://www.parks.ca.gov/SocialNetwork/). Arizona has map links to state parks, Facebook, Twitter links. All state parks have a 511 access code. The Arizona website contains an interactive map with parks directions and information. The Texas Parks and Wildlife Department (http://beta-www.tpwd.state.tx.us/socialmedia) provides a compilation of social media sites for Facebook, Twitter, YouTube and Flicker on a website that is currently undergoing beta testing.

Summary of Current Social Media Applications by National Parks and Public Lands

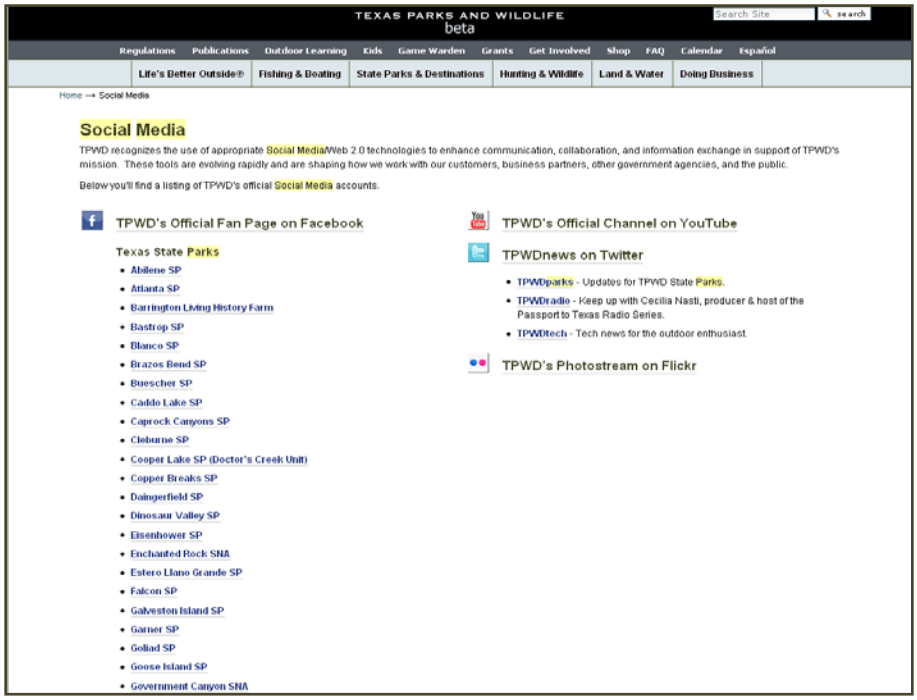
This section briefly offers glimpses of how national and state public lands agencies are using social media to reach the public. The social media applications currently popular with these agencies are generally those popular with the public. The applications not only allow agencies to push information out to the public, but also allow the public to provide feedback to the agencies and share information with others. An important lesson to apply for any of these social media applications is that to be both used and useful, each site must stay fresh, which requires ongoing inputs of relevant information and continued maintenance of the site.

Figure 13 Social Network Applications by State Parks

Massachusetts Department of Conservation and Recreation link to social media
Source: http://environment.blog.state.ma.us/
Accessed July 23, 2010



California State Parks online social network Source:
http://www.parks.ca.gov/SocialNetwork/
Accessed July 23, 2010



Texas Parks and Wildlife Department's social media compilation beta website
Source: http://beta-www.tpwd.state.tx.us/socialmedia
Accessed September 28, 2010

Section 3: Traveler Information System Data

This section examines what data are needed, current data collection and information dissemination platforms, necessary improvements to these flows, and opportunities presented to make these improvements.

Available Data and Information Needs

There are over 30 data points that would be useful for Sandy Hook officials to be able to communicate among staff and with the visitors to the park. These data points cover general park information, trip itinerary details, traffic conditions, environmental conditions, and other specialized information that may affect or influence the potential visitor's agenda, trip to and from Sandy Hook, or experience within the park. Desired data points that have been raised by Gateway officials include the following:

General Park Info
• Location
• Park map
• Region map
• Days/Hours of operation
• Fees (other costs)
• What is available at Unit
• Interpretive information
• SAHO images / pictures

Trip Itinerary
• Directions to / from GATE-SAHO
• Regional Travel - general
• Modal options
• Trip length
• Alternate routes
• Automatic re-routing
• Trip costs / fees
• Regional services
• Regional alternate sites

Traffic Conditions
• Traffic volume
• Traffic speed
• Delay / Choke points
o Traffic incidents
o Road construction
o Extreme congested areas
• Parking availability
• Traffic related fee / costs
• Travel electronic alerts
• Images of Route / Traffic

Environmental Conditions
• Weather
• Water quality
• Air quality
• Waves – height / riptides

Other Specialized Information
• Emergency warnings
• Special events
• Park changes
• Audio information

The most critical visitor-related data to collect and information to disseminate concerns (1) park closure, (2) parking, (3) traffic, (4) weather, (5) water conditions, including waves (for specific beach locations) and (6) water and air quality. This report provides a summary of the current data available, specifically targeting the critical data points. In addition, this report identifies the flows required to provide the data to the end users and recommends improvements in the data collection and information dissemination processes.

General Transportation

The primary mode of access to Sandy Hook is by private vehicle. Based on previous studies, up to 85% of the visitors to Sandy Hook arrive via Route 36 eastbound, most entering Route 36 from the

Garden State Parkway at Exit 117. Remaining motor vehicles arrive from the south along Ocean Avenue (Route 36) feeding from Rumson Road (State Route 520 and the Shrewsbury River Bridge) or from other points south, including off of the Garden State Parkway at Exit 105.[16]

For over a decade, the Sandy Hook Foundation has facilitated the ferry services to SAHO (current seasonal ferry service is provided by SeaStreak under direct contract with the Gateway NRA). The ferry service operates from New York City (East 35th Street and Pier 11 in Manhattan), docking at the Fort Hancock Ferry Landing at the northern end of the peninsula in the Fort Hancock Historic District. At the docks, visitors can either walk to the beaches or transfer to an intra-park shuttle (also initiated by the Foundation) that provides a distributor service to/from the beaches and historic sites. Walking and transit are unlikely access options for most visitors, as walking conditions along the main access points to the park are poor and New Jersey Transit bus route 834 serves areas in proximity to but not within the park. The newly reconstructed Highlands Bridge will have much improved pedestrian and bicycling facilities with direct access to the recently lengthened and improved SAHO Multi-Use Pathway (MUP), which is popular among bicyclists.

Figure 14 Route 36 Highlands Bridge over the Shrewsbury River

The former Route 36 Highlands Bridge over the Shrewsbury River links Sea Bright Borough and Sandy Hook on the Atlantic Ocean with Highlands Borough on the mainland. *Photo courtesy of New Jersey Department of Transportation*

Rendering of the new Highlands Bridge over the Shrewsbury River *Rendering courtesy of New Jersey Department of Transportation*

Visitors looking for information on ways to travel to SAHO have a number of options. The Gateway-Sandy Hook park website lists driving directions to the park, routing visitors from all directions onto Route 36. Language currently posted on the park website warns visitors of potential delays caused by the construction of the Highlands Bridge, urging visitors to use caution when entering and exiting the park. A link to the park's location on Google Maps is also provided. One concern regarding current intra-park wayfinding is that Google Maps does not list the numerous park road names.

[16] Volpe Center, Sandy Hook Alternative Access and Concept Plan and Vehicle Replacement Study, 2009

Recent technological innovations have provided new methods for visitors to obtain travel directions. Many web-mapping applications feature options for calculating directions between sites. Providers such as Google Maps, Yahoo Maps, and MapQuest offer driving directions with an increasing trend towards providing transit, walking, and bicycling directions from any origination point. These services estimate total travel times, and provide live traffic information in some instances. Global positioning system (GPS) navigation software is a readily-available consumer device equipped in many vehicles and within smart phones, providing driving directions which can re-calculate en-route given the location of the vehicle. Regional trip planners offered through public transportation agencies can also be a source of driving and transit directions. For example, New York State's 511 system features a transit trip planner for any location in the New York metropolitan area featuring the SeaStreak ferry service to SAHO.

Parking Lot At Capacity / Park Closure/ Park Reopening

The closure and reopening of SAHO parking lots impose unique concerns on communities along the Route 36 corridor. Owing to the immense popularity and unique offerings of SAHO beaches, visitors arriving at the park following its closure will oftentimes "hover" around the outlying areas just outside the park entrance on both the east and west sides of the Highlands Bridge, instead of returning home or visiting another area beach. This behavior is detrimental in many ways. Vehicles continue to release emissions, worsening air quality in surrounding communities. As roads are in constant use, traffic remains congested in these areas. Additionally, spaces in parking lots nearby SAHO, many used for shops and restaurants, are utilized by these visitors to idle, decreasing the number of available spots for customers. The timely and widespread distribution of information related to the closing and reopening of SAHO's parking lots is crucial to reducing some of these impacts on local roads

Decisions to close SAHO parking lots are done in a relatively straightforward manner. Park rangers monitor parking lots as they fill, relaying information via handheld transceivers to dispatch staff, centrally-located at the Ranger Station. When lots become full, staff at the entry gates manually adjust signs at the park entrance to reflect the status of a parking lot as "full". There is a historical sequence in which individual lots become filled. When a particular lot is full, signage on Hartshorne Drive diverts traffic to the next upstream lot. Although approximate, these times are:

- Lot G (Gunnison Beach lot) - 9:30 AM,
- Lot C (windsurfing, fishing) -10:00 AM,
- Lot D (main bathing beach) – 10:30 AM,
- Lot I (North Beach) – 11:30 AM,
- Lot E (fishing and bathing beach) -11:30 AM,
- Lot B (southern most access to MUP) – 11:45 AM,
- Lot J (North Beach)-11:45 AM
- Lot K (North Beach overflow lot) - park is usually closed before this reaches capacity[17]

On average, a closing lasts approximately two hours any time between 11:00 AM and 2:30 PM. SAHO officials make their decision to close the park to vehicular traffic based on the number of lots that are closed, the time-of-day, and the volume of traffic entering versus leaving the park during a block of time. There is the potential for closing the park each weekend day and holiday of the summer season. In recent years, the first closing happened the first weekend of June and the last closing occurred on Labor Day.

Conversely, re-opening the park is based on the number of parking spaces available, which parking lots the available spots are located, and the volume of exiting traffic. As a general rule, between 350-400 open spots (about 10% of the total spaces available at the park) is considered adequate before the park can reopen. Park rangers continue to monitor lots once the park is reopened. If incoming

[17] Sandy Hook Alternative Access Concept Plan and Vehicle Replacement Study, June 2009, produced by the US DOT Volpe Center for the National Park Service's Gateway National Recreation Area

traffic is deemed too heavy relative to the outbound traffic, then the park will once again close to private vehicles.[18] Inconsistency over when the park reopens has been cited as a cause in people "hovering" near the SAHO entrance and parking on private property near SAHO, waiting for the park to reopen.

A unique challenge for SAHO staff concerns relaying real-time information on parking lot status to visitors before they reach the site. The park coordinates lot closures with the Transportation Operations Coordinating Committee (TRANSCOM), a coalition of 16 transportation and public safety agencies in the New York City region. TRANSCOM collects and disseminates a wide variety of traffic and transportation information to the public. The SAHO dispatch center contacts TRANSCOM via an "800" line when the determination has been made when to close and reopen the park. When the TRANSCOM Operations Information Center is notified of a park closure, it disseminates this information to impacted local member and affiliated agencies such as the New Jersey Department of Transportation (NJDOT), in addition to updating state 511 systems to reflect this information. NJDOT's South Region Traffic Operations Center in Cherry Hill then broadcasts this information over DMS and HAR in the region. One troublesome aspect of this process is the speed at which this information is disseminated to end-users. It is not uncommon for 30 minutes to pass before the decision from Sandy Hook staff to close parking lots reaches travelers throughout the region.

Dissemination platforms utilized in this process are fairly conventional. NJDOT uses two of its permanent DMS located before primary Sandy Hook Exits 117 and 105 on the Garden State Parkway. These signs post that "*Sandy Hook is closed until XX:XX PM"* (a set time for reopening is usually indicated). This is done in an attempt to inform visitors at least 12 miles away of the closure and prevent congestion from forming near the park. While the DMS notifications have improved the traffic flows to and around Sandy Hook, they have not always proven completely successful due to the continued backups at the park entrance and "hovering" congestion within the gateway communities. A third permanent NJDOT DMS that displays Sandy Hook closures is located approximately 10 miles south of the park in Long Branch. Traveler information is also distributed on the radio using the park's 680 AM frequency. The HAR also provides general information about the park.

Figure 15 Dynamic Message Signs used for Traveler Information to Sandy Hook Unit

NJDOT Dynamic Message Signage at the Garden State Parkway Exit 117. This sign and a DMS at the Parkway's Exit 105 notify travelers when Sandy Hook is closed due to full parking capacity.

[18] Volpe Center, Sandy Hook Alternative Access and Concept Plan and Vehicle Replacement Study, 2009, produced by the US DOT Volpe Center for the National Park Service's Gateway National Recreation Area

One of NJDOT's permanent Dynamic Message Sign located in Long Beach, NJ, south of Sandy Hook.

Picture source: USDOT RITA Volpe Center, Taken September 2010

There are a number of other dissemination platforms available for the park to directly reach out to visitors regarding parking lot status. The proliferation of mobile phone applications allows owners to receive information from multiple parties regarding park and travel conditions. A SMS akin to that offered by the state's 511 system would allow the park to communicate to service subscribers through short texts. This application is particularly ideal as almost all mobile phones in use today are enabled to receive text messages. Many advanced mobile phones are equipped with wireless internet access, opening up the possibility of disseminating parking lot updates through a text-based social networking platform such as Twitter. The advantage of this type of service is that park messages are not restricted to a pre-defined set of users, but rather are open to anyone with an internet connection.

Traffic Alerts / Advisories

Traffic congestion entering and exiting Sandy Hook is a concern for both park staff and local and regional authorities. The conditions at Sandy Hook have been identified as a serious congestion management issue for the region by the North Jersey Transportation Planning Authority, the region's metropolitan planning organization.

NOTE: The State of New Jersey has a full texting while driving ban, as well as stringent cell phone regulations while operating a vehicle. The visitor-information systems discussed within this report should be developed with the consideration of these distracted driving regulations by New Jersey and other states. In-vehicle visitor information is expected to be disseminated to the non-operators within a vehicle-in-motion and not in any manner that will encourage

Information regarding traffic information is gathered from many different sources. Common forms of data collection include automated traffic counters, closed-circuit video cameras, and police radio frequencies. TRANSCOM, which is responsible for collecting and disseminating traffic information to the public, operates the TRANSMIT system. TRANSMIT (TRANSCOM's System for Managing Incidents & Traffic) uses vehicles equipped with electronic toll-collection tags (E-ZPass) as anonymous probes for transportation management and traveler information. As tags are detected by successive readers installed along roadways, the TRANSMIT system compiles aggregate data on average speeds and travel times.[19] This information is provided to NJDOT and fed into the state's 511 system. NJDOT currently has three tag readers along the 12-mile stretch of Route 36 between

[19] TRANSCOM's Mission Statement: http://www.its-ny.org/pdf/NYSDOTWC08/TRANSCOM%20Coalition.pdf

the Sandy Hook entrance and Exit 117 on the Garden State Parkway. NJDOT has plans to add another five tag readers to provide even more accurate congestion reports along Route 36.

Improved information dissemination regarding traffic conditions along Route 36 and throughout the region would help visitors make better decisions regarding trip planning. New Jersey's 511 traveler information service (NJ511) provides data on construction, congestion, and travel speeds along Route 36, as well as along the tollroads, parkways, and interstates leading to Route 36 and other primary roads in the region. The 511NJ system also offers a phone service where motorists can learn the latest road conditions for a specified route, as well as an alert system notifying subscribers of accidents, incidents, and construction along state roads via email. NJDOT is looking to expand this subscriber alert system to send SMS to mobile phones. The 511 system and the NJDOT website also let users access webcams along area roads to see traffic conditions first-hand. NJDOT's closed-circuit video cameras near Sandy Hook are located along Hartshorne Drive, at the main entrance to the park, and at the intersection of Route 36 with Navesink Avenue in Middletown. There is a vibrant private market for providing traffic reporting services to news media and customers as well.

A number of technologies allow motorists to access traffic information while in their vehicles. In addition to the services offered by 511NJ and the NJDOT, mobile phone applications let motorists to access traffic information provided by news media outlets or private traffic reporting services using customized applications or social media platforms such as Twitter. In-vehicle GPS devices can also be equipped to provide traffic information. Other prevalent sources of traffic information include highway advisory radio, satellite radio, and dynamic message signs.

Water Safety / Water Quality

The considerable number of recreational visitors to Sandy Hook's beaches on peak summer weekends are the primary source of the park's traffic management issues. It is not uncommon for the parking lot of Sandy Hook's most popular beach, Gunnison Beach, to reach capacity by 9:30 AM on an ideal summer weekend. Water safety and water quality factors influence a visitor's decision to visit Sandy Hook's beaches. Favorable and adverse conditions can impact the level of vistation to the unit and traffic congestion along area roads.

Water quality measures the physical, chemical, and biological characteristics of water relative to the requirements of human contact. Waterborne diseases pose a risk to beach visitors when water quality metrics fall below safe levels. The Cooperative Coastal Monitoring Program, administered by the New Jersey Department of Environmental Protection's (NJDEP) Water Monitoring and Standards Program with the New Jersey Department of Health and Senior Services and local environmental health agencies, measures recreational beach water quality in the state on a weekly basis in the summer. Testing is performed on Mondays and throughout the week as necessary. At Sandy Hook, testing occurs at six locations covering each side and end of the peninsula. If enterococcus concentrations exceed the standard of 104 per 100 ml sample for two consecutive days the beach will be closed. Beach conditions, beach closings, and the reasons for beach closings are posted on NJDEP's website (www.njbeaches.org), as well as on the NJDEP Sandline (800-648-SAND) each weekday and on weekends if conditions change.[20]

NJDEP's Cooperative Coastal Monitoring Program tests water quality at state beaches.
Graphic courtesy of the New Jersey Department of Environmental Protection

Water hazards relate to any number of conditions which impact the physical safety of visitors when in the water. Hazards at Sandy Hook include rip currents and marine life intrusion. The National

[20] NJDEP Cooperative Coastal Monitoring Program: http://www.nj.gov/dep/wms/bmw/bathingbeach/reports/2010qaplan.pdf

Weather Service (NWS) issues a Surf Zone Forecast for all coastal forecasting offices, with information related to coastal hazards such as rip currents, wave height, coastal winds, water temperature, UV index, and lightning risk. NWS and private forecasting companies also distribute conditions related to water conditions, such as coastal winds, water temperature, and tides, as part of standard weather forecasting measures. A decision to close any beach to swimming based on dangerous conditions rests with the National Park Service. Weather conditions, as well as severe alerts, can be found at the official NWS site (www.weather.gov), as well as through private weather information providers such as AccuWeather and The Weather Channel (more information on dissemination platforms for weather conditions can be found in the "Weather Forecast" section).

Beach closures due to marine life (jelly fish, sharks, etc.) are rare. Shark sightings throughout the Jersey Shore are quite common, especially when water temperatures are above normal. While there has not been a confirmed shark attack in New Jersey in half a century, sightings do have the potential to cause concern and panic among bathers. Beach managers are left to their own authority to close for shark threats.

Weather Forecast

Weather conditions play a central role in determining whether visitors will travel to Sandy Hook and which activities offered at the park they will engage. Changing weather conditions over the course of the day have the ability to push visitors to shorten or prolong certain recreational activities. Adverse weather conditions can impact different Sandy Hook attractions in different ways. Examples include air temperature and cloud cover (beach recreation), wind speeds (windsurfing, kite flying), and humidity (hiking, biking).

Visitors and staff can acquire weather information from many different sources. The National Weather Service (NWS), one of six agencies of the National Oceanic and Atmospheric Administration (NOAA), is the nation's public provider of weather, hydrologic, and climate forecasts. Weather conditions, as well as severe alerts, can be found at the official NWS site (www.weather.gov). Weather conditions can also be obtained through NOAA Weather Radio All Hazards (NWR), a nationwide network of radio stations broadcasting continuous weather information directly from the nearest National Weather Service office. NWR broadcasts official Weather Service warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week. It requires a special radio receiver or scanner capable of picking up the signal (these receivers run up to $200).[21]

Companies such as AccuWeather and The Weather Channel also provide weather forecasting services. Local media is oftentimes a popular source of weather information, with weather forecasts playing a large role in television and radio news broadcasts. For on-demand weather data, the internet has become a ubiquitous source of information, allowing the user to seek specific conditions. Weather-centric widgets are an increasingly popular source of current weather information online. SMS messaging and smart phone applications also provide instant weather conditions for mobile phone users.

Weather Alerts/Advisories

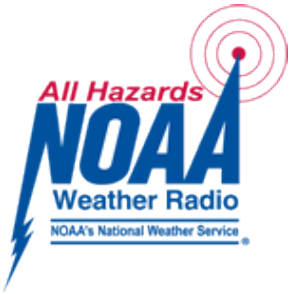
In the event of severe weather, the park circulates alerts as quickly as possible to ensure the safety of both visitors and park staff. Weather alerts and advisories are disseminated through many of the

[21] http://www.weather.gov/nwr/ - Monmouth County has 3 NWR stations providing service to this area:

COUNTY/CITY/AREA	SAME #	NWR TRANSMITTER	FREQ.	CALL SIGN	WATTS	REMARKS
Monmouth	034025	New York City, NY	162.550	KWO35	500	Except SW
Monmouth	034025	Philadelphia, PA	162.475	KIH28	1000	
Monmouth	034025	Southard	162.450	WXM60	300	

same platforms described in the "Weather Forecast" section. Weather conditions, as well as severe alerts, can be found at the official NWS site (www.weather.gov). Weather conditions can also be obtained through NOAA Weather Radio All Hazards. Private weather forecasting companies like AccuWeather and The Weather Channel also broadcast weather alerts.

The use of social media to disseminate weather alerts and advisories can be beneficial for the park, but must be carefully coordinated so as to not interfere or disrupt normal emergency procedures. For example, a Twitter feed offered by the park can automatically notify feed subscribers of a weather event first before word from park personnel can be distributed. However, the park must still follow standard operating procedures to make sure that all visitors are notified. Additionally, visitors seeking information on weather alerts are unlikely to seek out park technology feeds (such as a Twitter account), but rather look to weather providers first. Thus, social media applications can play a complementary, but not central, role in disseminating severe weather information. Efforts could be better utilized if coupled with other attempts to drive popularity of Sandy Hook technology usage, such as through applications providing interpretive information or daily weather forecasting. A well-connected visitor base while at the park would allow dissemination of severe weather alerts to reach more visitors.



NOAA Weather Radio All Hazards continuously broadcasts weather conditions 24 hours a day
Graphic courtesy of National Weather Service

Other Alerts/Advisories

A number of other alerts relating to the current status of park recreational activities hold value for visitors to know prior to visiting or while at Sandy Hook. Information relating to beach conditions, whether due to a water quality issue or dangerous water hazards, holds important safety implications if not properly relayed to visitors. Additionally, possible maintenance and construction within the park may impact the status of interpretive exhibits, parking lots, or other recreational options.

The best methods for disseminating these types of information are through typical resources visitors will access prior to visiting the park. The official Sandy Hook website is a commonly used resource for potential visitors. It features the ability for Sandy Hook staff to update on an as-needed basis to reflect important information. For example, the park posts information about lifeguard staffing seasons on its website in red, bolded text. Bathers are strongly advised to only swim when lifeguards are on duty.

Another source of information distribution, as explored more deeply in the "Special Events" section, is Gateway's Twitter feed. Currently, the park's Twitter account posts information relating to upcoming special events and has not been widely used for alerts or advisories for any of the Gateway units. The micro-blogging service has established itself as a popular source for businesses and other cultural institutions to provide the latest news and updates regarding their affairs. Visitors could access Gateway's Twitter account to find the latest information regarding the status of park attractions and offerings for that day. Other micro-blogging and social media applications, such as Facebook, can also serve this use.

Special events

Special events at Sandy Hook offer visitors an opportunity to explore the park in new manners. The National Park Service, along with the 12 partner organizations[22] residing at Sandy Hook offer a

[22] NPS partners at Sandy Hook in education and research are: (1) The Sandy Hook Foundation (Official Friends Group); (2) American Littoral Society; (3) Army Ground Forces; (4) Brookdale Community College; (5) Clean Ocean Action; (6) National Oceanic and Atmospheric Administration, Northeast Fisheries Center / Sandy Hook Laboratory; (7) James J. Howard Marine Laboratory; (8) Marine Academy of Science and Technology (MAST); (9) New Jersey Lighthouse Society; (10) New Jersey Marine Sciences Consortium; (11) Sandy Hook Partners (events coordinators); (12) Sandy Hook Child Care Center

plethora of special events, ranging from nature walks and guided tours to art exhibits, public concerts, assorted fundraising events, and theatrical productions. Program event guides are distributed each season at Gateway sites, as well as available to read online. Other dissemination methods are available for the park to inform visitors of program offerings as well.

Social media offerings, which allow Sandy Hook staff to interactively engage users with negligible effort, present a promising opportunity to promote special event information to interested parties. Twitter, a micro-blogging service which allows users to post messages of up to 140 characters, has presented itself as a leading low cost means for businesses and other entities to distribute promotional information and advertise services. Gateway NRA has made use of Twitter to publicize special events at park units. These short posted messages, or "tweets", are accessible to followers of the park's Twitter feed, who are able to see recent posts when logged on to the Internet from a computer or a smart phone. Additionally, visitors to Twitter's website (http://twitter.com/) can access Gateway's feed (http://twitter.com/GatewayNPS) for a history of recent postings. Gateway's Twitter usage primarily concerns the advertisement of special events, providing dates, times, location, and a short one or two sentence description of the event. Steady use of Twitter by Gateway enables followers of the park to stay informed of upcoming events, opening up new ways for the park to stay connected with the types of visitors most likely to attend. Additionally, informing park visitors of the Gateway feed while en route to or at Sandy Hook introduces the possibility that these visitors will discover and attend an event while at the site. The table at the end Section 3 highlights the details of Gateway NRA's Twitter through September 2010.

Other forms of interactive media, such as Facebook and Sandy Hook's official website, are also effective tools for promoting special events. As visitors will often seek out program information prior to visiting the park, supplying this information at sources visitors will reference is ideal. Unlike data like traffic or weather conditions, which is subject to change, special event information is formalized well in advance to it occurring. More static dissemination platforms, where information can be displayed over a long period of time (signage, billboards, banners, newsletters, websites), are suggested. However, the ability to remind visitors of upcoming events, such as on Twitter, is also a benefit. Social media platforms which foster two-way interaction with visitors, such as Facebook, also pose advantages. Website visitors can post favorable feedback of past events they attended, as well as provide favorable commentary of upcoming events they look forward to attending. This reflects positively upon the park to website visitors, and could drive further support of park events and initiatives.

Interpretive information

Interpretive information is utilized to enhance the enjoyment of Sandy Hook attractions for visitors. More than simply promoting the presence of park attractions, this information seeks to confer the cultural and historical significance behind park attractions. Established forms of information dissemination, such as on-site informational displays, effectively reach the majority of visitors but are hindered by an inability to entice visitors to seek repeat visits. Recent innovations have drastically improved the ability of cultural institutions to provide interpretive information beyond these more static forms.

Traditionally, interpretive information has been provided on-site through the form of posted material at site attractions. Visitors can read informational displays to learn of the cultural and historical relevance of a site attraction, or of the park itself. Displays are positioned in locations which attract attention from visitors and thus are one of the most effective and utilized sources of interpretive information. Park rangers also provide interpretive information to visitors through guided tours, or informally in conversation. While rangers represent the park system's richest source of knowledge, it is impossible for a ranger to be available to answer every visitor question. Recently, the Internet has become a source of interpretive information for visitors. Official park websites often feature segments on a park's history, cultural relevance, and natural features. Interpretive information available over the internet is particularly advantageous as one doesn't have to be present at the park itself to experience its features.

Today, a well-connected and data-heavy world is changing the way interpretive information can be delivered. Select social media applications stand out in the ways online visitors can interact with the park unit. Visitors to park unit Facebook pages are presented with new opportunities to interact with park staff and other interested users. Interpretive information such as videos, photos, news media, and park news allow the park to reach thousands of involved users. Video and photo-sharing websites, such as You Tube and Flickr, allow parks to post information for public consumption and use. Mobile phone applications created by private developers can both couple and support park activities through providing historical and cultural information beyond what the park can be expected to supply. With new products and applications constantly being introduced, the ability for visitors to learn more about the features around them is becoming increasingly complex and inventive.

Gateway National Recreation Area – Twitter Details – September 2010

Inception: February 1, 2010 @ 2:16PM	**Details as of September 24, 2010**
TWEETS since inception: 336	
TWEET SUBJECT:	**% TOTAL**
Tourism / Activities	59.8%
Event (volunteering, alerts, concerts, plays, BioBlitz)	16.1%
General Comments	9.7%
General Info (photos, historical, botanical, zoological)	8.8%
Schedule (openings / closures)	5.3%
Transportation (parking, traffic)	0.3%

TWEETS since inception: 336		**Listings: 58** - Lists GatewayNRA is on	
TWEETS by PARK UNIT:	**% TOTAL**	**LISTINGS by GROUP:**	**% TOTAL**
Gateway NRA	16.6%	Individual	58.6%
Jamaica Bay Unit	39.5%	Business	13.8%
Sandy Hook Unit	24.7%	Government	10.3%
Staten Island Unit	16.3%	Non-Profit Groups	10.3%
Other (comment / response)	3.0%	National Park Service	6.9%

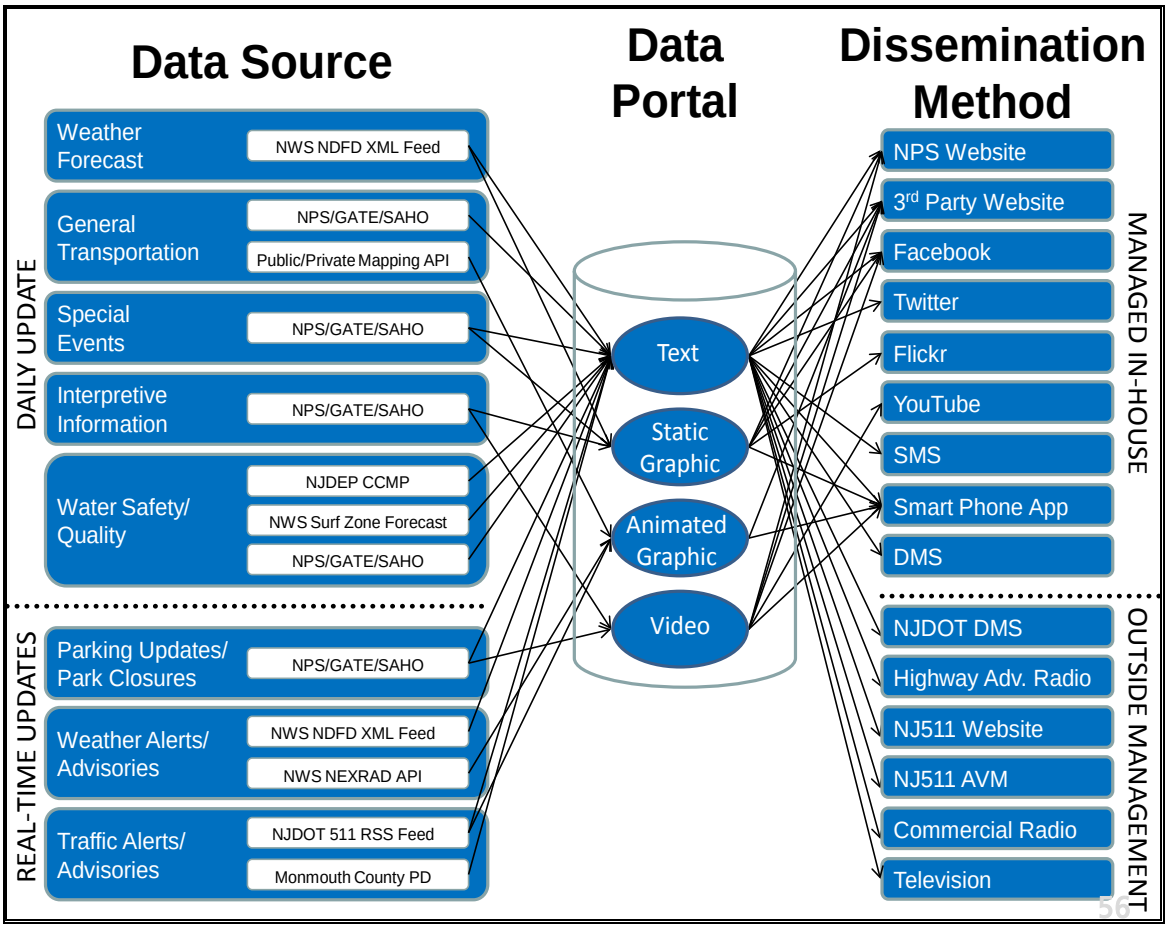
Followers: 446 - Following GatewayNRA		**Following: 341** - GatewayNRA is following	
FOLLOWERS by GROUP:	**% TOTAL**	**FOLLOWING by GROUP:**	**% TOTAL**
Individual	50.8%	News/Press/Journalism/Magazines	26.6%
National Park Service	15.2%	Individual	21.2%
Other Business	12.1%	National Park Service	17.3%
Tourism Information	10.0%	Tourism Business	7.5%
Non-Profit Groups	4.9%	Tourism Information	7.2%
Tourism Business	1.6%	US Government	6.0%
US Government	1.6%	Non-Profit Groups	5.4%
State Government	1.4%	State Government	3.9%
News/Press/Journalism/Magazines	1.2%	Local Government	2.1%
Local Government	0.7%	Other Business	1.8%
Education	0.5%	Education	1.2%

Section 4: Conceptual Data Management System Architecture

This section provides a concept of how to best link visitor information, including travel-related information from the source to the end user (primarily the visitor to the Sandy Hook Unit.)

The Sandy Hook Visitor Information Technical Architecture (Figure 16) is a framework for gathering, processing, and disseminating pertinent visitor information to the public. The architecture provides suggestions for potential available data feeds and dissemination platforms, allowing Gateway/Sandy Hook to identify data flows and develop implementation priorities based on startup costs, maintenance needs, and technical capabilities.

Figure 16 Sandy Hook Visitor Information Technical Architecture



Data Portal

The most important component of the architecture is the data portal. The portal is a gateway through which all data flows, minimizing the total number of data flows and providing full control over the information that will ultimately reach the public. The data portal must therefore be able to retrieve, receive, compile, manipulate, and send data. These types of processes can be performed by a fairly simple web-enabled data server. Based on the anticipated volume of data required by Sandy Hook, the server could be housed in a simple, commercially available central processing unit (CPU).

In order to perform the desired tasks, the data portal will have to be custom programmed. The sophistication of the programming will depend on the types of data to be processed, as well as the amount of manipulation required to change incoming data to outgoing information to be consumed by the public. In order to assess program requirements, the architecture first identifies potential data sources that are often employed by similar visitor service applications, and then highlights potential methods of dissemination and the types of data formats that are likely to be supported.

Data Sources

The architecture broadly categorizes data sources as those that are updated daily and those that are updated in real-time. Data to be updated daily represents information that generally remains the same throughout any given operating day at the park. Real-time data refers to information that may affect visitor decisions throughout any given day that the park is operating. As such, the data portal will need to be programmed to quickly receive data directly from the data source as it is generated.

Weather Forecast (updated daily)

Weather forecast data is made publicly available to government entities in a variety of forms. In particular, the National Weather Service's (NWS) National Digital Forecast Database (NDFD) is provided to the web programming public in easily translated Extensible Markup Language (XML) format. The data is provided in either text or graphic form.

General Transportation (updated daily)

Daily transportation information focuses on data developed by Sandy Hook (driving directions, ferry information, scheduled construction, etc.) as well as any of the popular commercial internet-based mapping applications.

Special Events (updated daily)

Special event data will have to be generated by Sandy Hook and may come in many different forms. Text-based "blurbs", images, and videos all potentially play a role in the visitor information architecture.

Interpretive Information (updated daily)

Like special events, interpretive information and the format of its source data is largely dependent on what the park chooses to generate. While text is an option, photos and videos are better suited to provide the kind of interpretive information that visitors are seeking.

Water Safety and Water Quality (updated daily)

Environmental data such as water safety and quality are most easily generated in text form. Data sources may include the National Weather Service Surf Zone Forecast and the New Jersey Department of Environmental Protection's Cooperative Coastal Monitoring Program.

Parking Updates and Park Closures (updated in real-time)

Data related to parking lot occupancy status and resulting park closure plays a major role in the overall visitor information picture. The data will be generated from within the park, originating with Sandy Hook staff who are thoroughly familiar with parking patterns throughout the park. As parking lots fill, radios are used to relay information to the park dispatcher, who will then need to generate text-based data that can be processed within the data portal. As a future alternative, the parking staff could generate text-based data in the field, eliminating the voice-to-text conversion process in the dispatch center.

Weather Alerts/Advisories (updated in real-time)

Alerts and advisories pertaining to severe weather are generated by NWS, who currently provides a service that pushes this information to interested parties. The data is currently in a text-based format and can be automatically sent to the data portal by the NDFD program. A future alternative

may be to provide the public with an animated weather radar application programming interface (API) developed by NWS.

Transportation Alerts/Advisories (updated in real-time)
A real-time traffic advisory feed is currently disseminated to the public via the New Jersey 511 website as well as by SMS subscription service. The same feed could be pushed to the Sandy Hook data portal as text-based data, or it may be possible to receive graphic data similar to that published on the NJ511 website.

Dissemination Methods

The architecture places dissemination methods into two categories: methods that are instituted and managed by the park and/or park partners, and those that are managed by organizations completely removed from the park. The architecture then examines each method by the data formats most commonly supported by the platform.

National Park Service Website
The NPS Website is most often used for static information and is rarely used to disseminate information in real-time. As a non-real-time dissemination method, the NPS website can support a variety of media, including text, photos, and videos.

Third Party Website
A third party website is available to host any kind of media that the park or third party wishes to provide to the public. This may include both static and real-time text, graphics, animated graphics and video.

Facebook
Facebook is most often used as a platform for sharing text, photos, and video. The sharing of information happens in real-time, but the site is not typically used for animated real-time spatial imagery such as traffic maps or weather radars.

Twitter
Twitter is most well-known for its SMS text services (see below), though recently the company has begun adding capabilities in support of other types of media, including photos and video. Twitter feeds are able to be viewed on the Twitter website, as well as with any device capable of processing SMS.

Flickr
Primarily operated as a photo-sharing site, Flickr has recently begun supporting video.

YouTube
YouTube works entirely with video formats.

Short Message Service (SMS)
Short messages are entirely text-based and allow no more than 140 characters per message. SMS text messages are compatible with standard (not web-enabled) cellular phones and have become a popular dissemination method for subscription-based advisory and alert programs.

Smart Phone Application
One of the newer phenomena in the world of social media, application development for smart (web-enabled) phones has blossomed into a large industry. A smart phone application has the potential to support a variety of media, including all formats that hold potential for Sandy Hook visitor information. Frequently, smart phone applications are designed, marketed, and sold by a third party, particularly if the necessary data is made publicly available.

Dynamic Message Signs (DMS)

Typically, DMS refers to roadside digital signs that disseminate information in a text-based format to motorists. The signs are portable and can be moved to new locations as conditions warrant. Currently, Sandy Hook has access to two DMS signs, which can be placed throughout the park and in several select locations (as permitted by NJDOT) outside the park's boundaries.

Other Dissemination Methods - Independent Information/News Agencies

Several independent organizations are interested in reporting news and traveler information related to the park. These agencies may include NJDOT, NYDOT, NYCDOT, TRANSCOM, and commercial news providers such as local TV stations, radio stations, and newspapers. These types of organizations are fully responsible for their methods of dissemination, and as such, are not dependent on the format of the data supplied to them. In the past, information has generally been passed to these organizations via the telephone. It is believed (though unconfirmed) that text-based data would be just as easy, if not easier, to receive and process for public dissemination.

Section 5: Recommendations and Future Strategies

Presented here are both short-term activities and long term strategies to enhance traveler and visitor information for the users of the Sandy Hook Unit. If proven successful with the Sandy Hook Unit, these initiatives could also be applied to the entire Gateway National Recreation Area and considered for the National Parks of New York Harbor.

The recommendations presented in this Section were presented to the Sandy Hook and Gateway NRA officials on September 30, 2010. While still focusing on how to best deliver traffic and transportation information, it became evident that a wide-ranging *visitor* information system that aided the potential visitor in the entire trip to and from Sandy Hook would be more useful than a more narrowly-focused *traveler* information system. The Volpe Team offered five short-term recommendations and a longer-term visitor information system vision. These recommendations followed from the conclusion that the visitor information system could be enhanced with relatively minimal effort, time and costs. The five short-term recommendations are:

1. Develop partnerships
2. Identify data and information priorities
3. Utilize existing resources
4. Hire a programmer
5. Develop an operations framework (this recommendation also encompasses a longer-range visitor information vision)

Develop Partnerships

Sandy Hook and Gateway NRA officials should utilize, when practical, the assistance of the numerous partners present at the SANDY HOOK unit. Private sector and non-profit groups such as The Sandy Hook Foundation, Friends of Gunnison Beach, Clean Ocean Action (COA), and the New Jersey Audubon Society (NJAS) have access to many park visitors through their website, newsletters, and other communication options such as Blogs (NJAS), Twitter (COA, NJAS), Flicker (NJAS), YouTube (COA, NJAS), and Facebook (COA, NJAS) sites. The National Park Service, as well as a number of other federal agencies, are examining how to best use these social media options. The third party, non-governmental entities have greater flexibility in the look, content, and distribution channels over the government counterparts. The external parties will be capable of determining how to best reach select and targeted audiences (the visitors to Sandy Hook).

While most of this discussion has centered on the sharing of information with and use of non-governmental groups, there are a number of public agencies that can potentially be valuable partners to the Sandy Hook Unit in the development of a wide-reaching and sustainable visitor information system, namely New Jersey DOT, New Jersey Transit, North Jersey Transportation Planning Authority, and Monmouth County. These agencies can provide access for Sandy Hook to additional communication outlets (transportation technologies, websites, and social media applications) to visitors. An ancillary benefit to using partners, both public and private, is the potential to gain support for funding requests and access to additional funding sources such as Transportation Enhancement (TE) and Congestion Management and Air Quality (CMAQ) funds.

Prioritize Information

The initial steps to creating this information system is to select the critical data, then determine the simplest and most effective methods of disseminating that information, while also creating a system and procedure for expanding the information sharing capabilities. Section 3 identified over 30 data points that cover general park information, trip itinerary details, traffic conditions, environmental conditions, and other specialized information that may affect or influence the potential visitor's agenda, trip to and from Sandy Hook, or experience within the park. Sandy Hook and Gateway officials narrowed the most critical visitor-related data to collect and information to disseminate to

six items: (1) park closure, (2) parking, (3) traffic, (4) weather, (5) water conditions, including waves (for specific beach locations) and (6) water and air quality.

Based on current park procedures and resources, the architecture described and illustrated in Section 4 described how text-based data would provide the wide-ranging capabilities to disseminate the necessary park-related information. Not only is text the simplest data format considered in this study, it also satisfies the majority of the park's data needs and potential dissemination methods. By focusing on a text-based visitor information system, the park will maximize the potential for both data inputs and information outputs, while creating a foundation for future implementation of a more dynamic, multi-media visitor information center.

Utilize Existing Resources

As discussed in detail throughout this document, for each of the data needs, much of the information that will benefit the public is already provided in one form or another. By harnessing existing services and taking advantage of other entities' willingness to share data, the Sandy Hook Visitor Information Center can offer plenty of data that is already closely monitored by other partners. There is little or no data that will need to be collected from scratch by Sandy Hook, only the development of a process, equipment, and system to receive and compile that data.

There are likewise many existing opportunities beyond what Sandy Hook may create to collect data for Sandy Hook staff or disseminate the information to the current and potential Sandy Hook visitors. New Jersey DOT has a large number of ITS equipment as well as planned technologies that may provide expanded opportunity to utilize in the occurrence of park entry restrictions, emergencies, or special event operations at Sandy Hook. New Jersey Transit and EZ Pass both utilize radio frequency identification cards that are widely used in the region. These cards or toll tags could provide additional data collection opportunities for Sandy Hook staff to monitor traffic volume entering and exiting Sandy Hook and potential waves of incoming traffic along Route 36. (These existing systems could also be used for fee collection at the Sandy Hook entrance.) As noted above, the partners, through their existing communication channels, could likewise provide additional means for Sandy Hook to disseminate information to targeted populations.

Hire a Programmer

A strong recommendation is for the Sandy Hook Unit or Gateway NRA management to contract with a professional programmer to create the data portal, which is the key to the Sandy Hook Visitor Information Center. It is estimated that the implementation costs will run up to approximately $100,000 to purchase and install the hardware (including server), develop the software that compiles, analyzes the data and disseminates the information, as well as provide on-going operations for the first year. The programmer is a relatively low-cost outlay based on benefits experienced by other agencies when they implemented their traveler information system. It is not relevant which website houses the visitor information (e.g., The Sandy Hook Foundation, etc.). What will be necessary is to ensure that the programmer remains with the information system for at least the first two years to ensure maintenance is ongoing during the critical startup years and that there is extensive familiarity with the system. The institutional knowledge of this information system will allow a more knowledgeable effort to expand the data collected and information provided.

SANDY HOOK VISITOR INFORMATION ESTIMATED IMPLEMENTATION COSTS	
ITEM	**COST RANGE**
Server (initial hardware)	$3,000 - $5,000
Software	
Text-based Application	$18,000 - $25,000
Multi-media Application (with smart phone compatibility)	$30,000 - $45,000
Operations (initial year)	
Staff training	$1,000 - $2,000
Updates	$5,000 - $10,000
Development of standards	$5,000 - $7,000
Maintenance (per year)	$8,000 - $12,000
TOTAL	**$70,000 - $101,000**

Develop an Operations Framework

As presented in Figure 16, the Sandy Hook Visitor Information Technical Architecture presents a framework for gathering, processing, and disseminating pertinent visitor information to the public. The framework includes various data sources and dissemination methods along with the type of data and information formats. If Sandy Hook and Gateway management decides to follow the architecture presented in this document, most of the material in Sections 4 and 5 should be capable of providing significant information and direction as part of any prospective statement of work (SOW), with limited manipulation. As part of the operations framework, the data collection and dissemination needs could be prioritized (see the second recommendation above). The proposals for programming service could provide costs for set up based on the various stratified information needs. The stratification within the SOW would run from the most basic service (provision of the most critical data points and select distribution channels (using text format)) all the way up to all identified data points and all distribution channels utilizing all data and information formats. At the lowest effort, the SOW for the Visitor Information System should seek to get the hardware purchased, the software developed and the information distribution process initiated. While the SOW may not cover the full framework highlighted in this document, the SOW should convey the concept of both short-term development and implementation and the long-range expansion and enhancement of the system, which could take two to five years to attain the full framework design with all the links and functionality sought (potentially beyond the SOW period of performance).

Gateway NRA officials have commented that if the Sandy Hook information system proves effective, then they would consider expanding this model to encompass the other two units of the Gateway National Recreation Area and possibly to the National Parks of New York Harbor. The Sandy Hook information system could eventually be used as the platform for the previously conceptualized Virtual Visitor Information Center. Locally, the Sandy Hook information system could expand to use Quick Response (QR) code or near-field communications (NCF) to enhance the Interpretation Division's efforts by providing concise or detailed information on a building or other notable site retrievable via a smart phone. These objectives could be attained in the future horizon after the initial visitor information system has been developed and proven useful for Sandy Hook visitors and staff.

Figure 17 Future Visitor Information Technologies: Quick Response (QR) Code and Near Field Communication (NFC)

Quick Response (QR) code is a mobile device technology. QR code is a two-dimensional, matrix bar code used to store information that can be decoded at high speeds. QR code information can provide travelers with site-specific information, such as local attractions and businesses, as well as links to informational websites. Museums and art galleries are now experimenting with the use of QR codes on a number of displays.

Near-field communication (NFC) is a new short-range radio technology for mobile devices. It allows for the transfer of information between mobile devices when an NFC-enabled device is brought in close proximity (roughly four centimeters) with another NFC–enabled device. One application of NFC is mobile reservations and ticketing

Appendix A: NPS Parks on Twitter

NPS Parks on Twitter - 2010			
Park / Unit	**Location**	**TWITTER Site**	**Other**
1. National Park Service	Washington D.C.	http://twitter.com/NatlParkService http://twitter.com/USInteriorNews http://twitter.com/NPSEducation http://twitter.com/NPS_parkstores http://twitter.com/GoParks http://twitter.com/smokey_bear http://twitter.com/NPCA http://twitter.com/NPSArcheology http://twitter.com/WENPS http://twitter.com/NPSYouth	NPS / Department of the Interior / 1849 C Street, N.W. / Washington DC 20240 http://www.nps.gov
2. National Capital Region NPS Office	Washington, D.C.	http://twitter.com/DCParksEastNPS	
3. Alaska Region NPS Office	Alaska	http://twitter.com/AlaskaNPS	240 West 5th Avenue / Room 114 / Anchorage, Alaska, 99501
4. Bering Land Bridge National Preserve	Alaska	http://twitter.com/BeringLandNPS	
5. Cape Krusenstern National Monument	Alaska	http://twitter.com/CKrusensternNPS	
6. Denali National Park	Alaska	http://twitter.com/DenaliNPS http://twitter.com/DenaliTrails	
7. Gates of the Arctic National Park & National Preserve	Alaska	http://twitter.com/GatesArcticNPS	
8. Glacier Bay National Park & National Preserve	Alaska	http://twitter.com/GlacierBayNPS	
9. Katmai National Park	Alaska	http://twitter.com/KatmaiNPS	
10. Kobuk Valley National Park	Alaska	http://twitter.com/KobukValleyNPS	
11. Lake Clark National Park	Alaska	http://twitter.com/LakeClarkNPS	
12. Noatak National Preserve	Alaska	http://twitter.com/NoatakNPS	
13. Wrangell-St. Elias National Park & Preserve	Alaska	http://twitter.com/WrangellStENPS	
14. Yukon-Charley Rivers National Preserve	Alaska	http://twitter.com/YukonCharleyNPS	
15. Arizona Trail National Historic Trail	Arizona	http://twitter.com/ArizonaTrail	
16. Casa Grande Ruins National Monument	Arizona	http://twitter.com/CasaGrandeNPS	
17. Juan Bautista de Anza National Historic Trail	Arizona California	http://twitter.com/AnzaTrailNPS	1800 miles, over 250 settlers, more than 1000 head of cattle, and no freeways - all happening in 1776
18. Saguaro National Park	Arizona	http://twitter.com/SaguaroNPS	
19. Buffalo National River	Arkansas	http://twitter.com/BuffaloNPS	
20. Alcatraz Island	California	http://twitter.com/AlcatrazIsland	
21. Death Valley National	California	http://twitter.com/DeathValleyNPS	

NPS Parks on Twitter - 2010			
Park / Unit	**Location**	**TWITTER Site**	**Other**
Park			
22. Fort Point National Historic Site (The Presidio)	California	http://twitter.com/FortPointNPS	
23. Golden Gate National Recreation Area	California	http://twitter.com/GoldenGateNPS	
24. Joshua Tree National Park	California	http://twitter.com/JoshuaTreeNP	
25. Lassen Volcanic National Park	California	http://twitter.com/LassenNPS	
26. Muir Woods National Monument	California	http://twitter.com/MuirWoodsNPS	
27. Redwood National Park &State Parks	California	http://twitter.com/RedwoodNPS	
28. Santa Monica Mountains National Recreation Area	California	http://twitter.com/SantaMonicaMtns	
29. Sequoia & Kings Canyon National Park	California	http://twitter.com/SequoiaKingsNPS	
30. Yosemite National Park	California	http://twitter.com/YosemiteNPS http://twitter.com/YosemiteScience http://twitter.com/YoseNatureNotes http://twitter.com/YosemiteDNC	
31. Denver Service Center - National Park Service	Colorado	http://twitter.com/DenSrvcCtrNPS	NPS / 12795 W Alameda Pkwy / Lakewood, CO 80228-2822 // (303) 969-2000
32. Dinosaur National Monument	Colorado	http://twitter.com/DinosaurNPS	
33. Florissant Fossil Beds National Monument	Colorado	http://twitter.com/FlorissantNPS	
34. Rocky Mountain National Park	Colorado	http://twitter.com/RMNPOfficial	The official twitter page of Rocky Mountain National Park. Updates and important information
35. Weir Farm National Historic Site	Connecticut	http://twitter.com/WeirFarmNPS	735 Nod Hill Road / Wilton, CT 06897-1309 (203) 834-1896
36. Biscayne National Park	Florida	http://twitter.com/BiscayneNPS	
37. Dry Tortugas National Park	Florida	http://twitter.com/DryTortugasNPS	
38. Everglades National Park	Florida	http://twitter.com/EvergladesNPS http://twitter.com/EvergladesFire	
39. Gulf Island National Seashore	Florida Mississippi	http://twitter.com/GulfIslandNPS	
40. Timucuan Ecological and Historic Preserve	Florida	http://twitter.com/TimucuanNPS	
41. Fort Pulaski National Monument	Georgia	http://twitter.com/FortPulaskiNPS	
42. Ala Kahakai National Historic Trail	Hawaii	http://twitter.com/AlaKahakaiNPS	
43. Haleakala National Park	Hawaii	http://twitter.com/HaleakalaNPS	

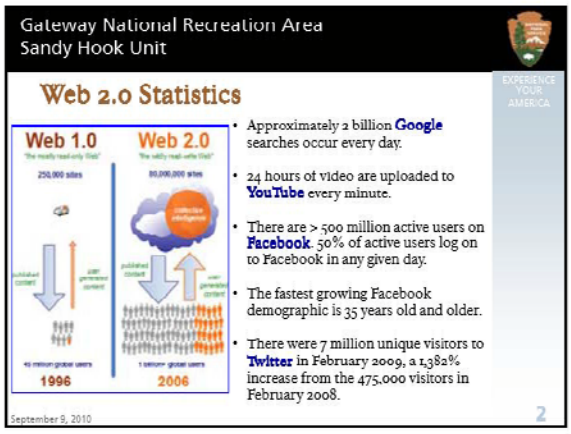
NPS Parks on Twitter - 2010			
Park / Unit	**Location**	**TWITTER Site**	**Other**
44. Hawai'i Volcanoes National Park	Hawaii	http://twitter.com/HawaiiNPS	
45. Kaloko-Honokohau National Historical Park	Hawaii	http://twitter.com/KalokoNPS	
46. Pu'ukohola Heiau National Historic Site	Hawaii	http://twitter.com/PuukoholaNP http://twitter.com/Mauiparkranger	
47. USS Arizona Memorial	Hawaii	http://twitter.com/WWIIValorNPS	1 Arizona Memorial Place / Honolulu, Hawaii 96818 // (808) 422-3300 // nps.gov/valr/index.htm WWII Valor in the Pacific National Monument preserves and interprets the stories and key events in the Pacific Theater from Pearl Harbor to 1945 surrender.
48. Herbert Hoover National Historic Site	Iowa	http://twitter.com/HooverNPS	
49. Mammoth Cave National Park	Kentucky	http://twitter.com/MammothCaveNP	1 Mammoth Cave Parkway / Mammoth Cave, KY 42259 (270) 758-2180 // nps.gov/maca
50. Assateague Island National Seashore	Maryland	http://twitter.com/AssateagueNPS	
51. Chesapeake & Ohio Canal National Historical Park	Maryland	http://twitter.com/COcanalNPS	
52. Thomas Stone National Historic Site	Maryland	http://twitter.com/ThomasStoneNHS	Home of a Maryland signer of the Declaration of Independence
53. Lowell National Historical Park	Massachusetts	http://twitter.com/Lowell_NPS	
54. Keweenaw National Historical Park	Michigan	http://twitter.com/KeweenawNPS	
55. Jefferson National Parks Association Jefferson National Expansion Memorial (Gateway Arch, Old Courthouse); Ulysses S. Grant National Historic Site; Chippewa National Forest; Mississippi National River & Recreation Area; Voyageurs National Park; Lewis & Clark Visitor Center at Gavin's Point Dam; National Great Rivers Museum; Little Rock Central High School National Historic Site	Missouri Minnesota South Dakota Illinois Arkansas	http://twitter.com/jnpa	Non-profit supporting America's national parks and historic places with educational services, products and public contributions. Join us on FB too.
56. Glacier National Park	Montana	http://twitter.com/glaciernps	
57. Homestead National Monument of America	Nebraska	http://twitter.com/HomesteadNM	
58. Niobrara National Scenic	Nebraska	http://twitter.com/NiobraraNSR	

NPS Parks on Twitter - 2010			
Park / Unit	**Location**	**TWITTER Site**	**Other**
Riverway			
59. Lake Mead National Recreation Area	Nevada	http://twitter.com/LakeMeadNRA http://twitter.com/LakeMeadRanger	
60. Morristown National Historic Park	New Jersey	http://twitter.com/MorristownNPS	Morristown NHP preserves sites of the Continental Army's encampment and the headquarters of General George Washington during the winters of 1777 and 1779–80
61. Bandelier National Monument	New Mexico	http://twitter.com/BandelierNPS	
62. African Burial Ground National Monument	New York	http://twitter.com/AFBurialGrndNPS	NM established in 2006 that is the final resting place for an estimated 15,000 free and enslaved Africans in the 17th and 18th centuries.
63. Ellis Island NPS	New York	http://twitter.com/EllisIslandNPS	
64. Federal Hall National Memorial	New York	http://twitter.com/FederalHallNPS	This National Park Service site in NYC is the site of the first capital of the USA and where George Washington was inaugurated as the fist president.
65. Gateway National Recreation Area - NPS Area	New York New Jersey	http://twitter.com/GatewayNPS	The wonderful backyard to the NYC Metro area, biking, birding, hiking, swimming alongside history and heritage. Come visit!
66. General Grant National Memorial	New York	http://twitter.com/GrantsTombNPS	
67. Governors Island National Monument	New York	http://twitter.com/GovIslndNPS	
68. Hamilton Grange National Memorial	New York	http://twitter.com/HamiltonGrngNPS	This National Park Service site preserves the only home Alexander Hamilton ever owned.
69. Hyde Park National Historic Sites	New York	http://twitter.com/NPS_HydePark	
70. New York Harbor Parks	New York New Jersey	http://twitter.com/NYHarborPrksNPS	National Parks of New York Harbor represents the 10 national parks in the NYC metro area.
71. Niagara Falls State Park	New York	http://twitter.com/NiagaraParksPR	
72. Sagamore Hill National Historic Site	New York	http://twitter.com/SagamoreHillNHS	
73. Statue of Liberty National Monument	New York	http://twitter.com/StatueLibrtyNPS	
74. Theodore Roosevelt.	New York	http://twitter.com/TRBirthplaceNP	This National Park Service

NPS Parks on Twitter - 2010			
Park / Unit	**Location**	**TWITTER Site**	**Other**
Birthplace National Historic Site		S	site is the boyhood home of Theodore Roosevelt, our 26th president.
75. Cape Hatteras National Seashore	North Carolina	http://twitter.com/CapeHatterasNPS	
76. Wright Brothers National Memorial	North Carolina	http://twitter.com/WrightBrosNPS	Official site for Wright Brothers NM, site of the first successful airplane flights by Orville and Wilbur Wright.
77. Theodore Roosevelt National Park	North Dakota	http://twitter.com/TRooseveltNPS	
78. Crater Lake National Park	Oregon	http://twitter.com/CraterLakeNPS http://twitter.com/CraterLakeTrust	
79. Fort Necessity National Battlefield	Pennsylvania	http://twitter.com/FortNecessity	
80. Johnstown Flood National Memorial	Pennsylvania	http://twitter.com/JohnstownFldNPS	Johnstown Flood NM shares the story of the Johnstown Flood of 1889.
81. Valley Forge National Historical Park	Pennsylvania	http://twitter.com/ValleyForgeNHP	
82. Great Smokey Mountains National Park	Tennessee North Carolina	http://twitter.com/gsmnp (unofficial)	
83. Lyndon B. Johnson National Historic Park	Texas	http://twitter.com/LBJohnsonNPS	LBJ State Park / Stonewall, Texas 78671 (830) 644-2252
84. Bryce Canyon National Park	Utah	http://twitter.com/BryceCanyonNPS	
85. Zion National Park	Utah	http://twitter.com/ZionNPS	
86. Colonial National Historical Park	Virginia	http://twitter.com/ColonialParkNPS	
87. George Washington Birthplace National Monument	Virginia	http://twitter.com/NPSGEWA	
88. Richmond National Battlefield Park	Virginia	http://twitter.com/RichmondNPS	
89. Shenandoah National Park	Virginia	http://twitter.com/ShenandoahNPS	
90. Ft. Vancouver National Historic Site	Washington	http://twitter.com/FtVancouverNPS	
91. Mount Rainier National Park	Washington	http://twitter.com/RainierVIPs http://twitter.com/Visitmtrainier	
92. Harpers Ferry National Historic Park	West Virginia	http://twitter.com/HarpersFerryNPS	
93. Grand Teton National Park	Wyoming	http://twitter.com/GrandTetonNPS	
94. Yellowstone National Park	Wyoming	http://twitter.com/YellowstoneNPS	
95. The National Park of American Samoa	American Samoa	http://twitter.com/Amer_SamoaNPS	American Samoan village leaders and the U.S. Congress have set aside the finest samples of the

NPS Parks on Twitter - 2010			
Park / Unit	**Location**	**TWITTER Site**	**Other**
			islands' land and seascapes as a national park.
96. American Memorial Park	Northern Mariana Islands (Saipan)	http://twitter.com/AmericanMemNPS	AMP Ampitheater / Garapan / Northern Mariana Islands (670) 234-7207 // nps.gov/amme American Memorial Park honors the American and Marianas people who gave their lives during the Marianas Campaign of World War II.
97. Pacific Islands National Parks	Hawaii, Guam, American Samoa, Northern Mariana Islands (Saipan)	http://twitter.com/PacificNPS	From active volcanoes, exotic cultures & amazing wildlife, the wonders of the Pacific Island National Parks are just a click away!
98. Ontario Parks	Ontario, Canada	http://twitter.com/ontarioparks	Natural Resources / 300 WATER ST / Peterborough, Ontario/ K9J 3C7, Canada // (800) 667-1940
99. Banff National Park	Alberta, Canada	http://twitter.com/Banff_Squirrel	224 Banff Avenue / Banff, Alberta AB T1L, Canada (403) 762-1550 // banfflakelouise.com
100. Point Pelee National Park	Ontario, Canada	http://twitter.com/PointPeleeNP	
Created on Oct 16, 2009 / Updated Aug 29, 2010 By RoadUP - http://www.roadup.com/national-parks-twitter#comments			

Appendix B: Volpe Interim Presentation – September 9, 2010



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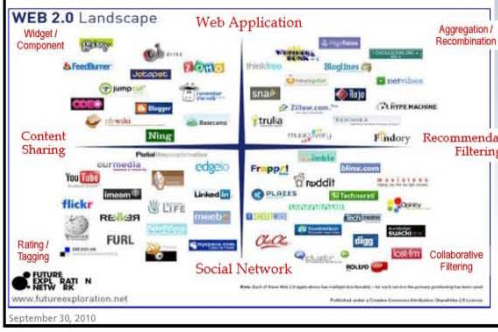
Sandy Hook Unit

Social Media Platforms



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Social Media Can Help…

…provide directions for visitors

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Social Media Can Help…

…alert travelers of regional traffic

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Sandy Hook Unit

Social Media Can Help…

Traffic Alert: BRX: DEEGAN EXPWY re Traffic Jam I-87 (BRX/WESTCHESTER) NB Between W 230TH ST/X10 And VAN CORTLANDT PARK
about 2 hours ago via Newswire from Greenwich Village, New York

Traffic Alert: NYC Stop And Go Traffic GWB UPPER LEVEL WB Between HARLEM RIVER DRIVE/AMSTERDAM AVE And MID-SPAN NY SIDE HUDS
about 6 hours ago via Newswire from Greenwich Village, New York

Traffic Alert: re Traffic Jam I-95 SB Between SHERIDAN EXPWY/I-895/X4A And DEEGAN XPWY/I-87/X1 BRX: CROSS BX EXPWY
about 7 hours ago via Newswire from Greenwich Village, New York

…alert travelers of local traffic

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Social Media Can Help…

…alert travelers of site advisories

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Social Media Can Help…

…enhance visitor interpretation

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Social Media Can Help…

…promote upcoming events

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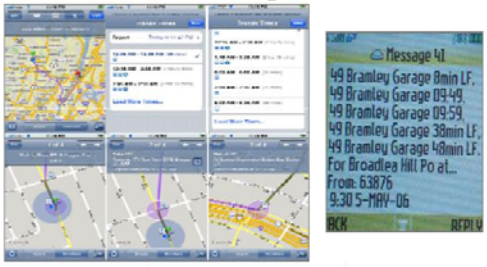
Sandy Hook Unit

Social Media Can Help…



…disseminate transit departure times

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How Can the Recreation Area Use It?

1. Listen
   - What are people saying about the Recreation Area?
2. Discover users
   - Platforms being used
   - Topics of interest
   - Demographics
3. Develop meaningful content
   - Connect with different users on various platforms
4. ***Convert virtual users to visitors***
   - Exclusive promotions for followers

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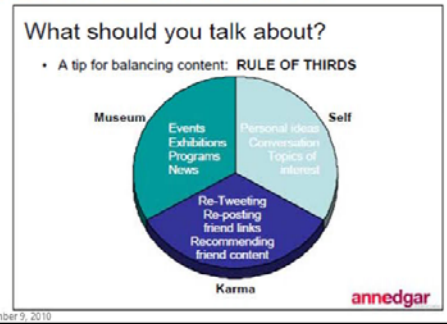
Gateway National Recreation Area
Sandy Hook Unit

What Should You Talk About?



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Problems and Solutions

- Gaining support of the organization
  - Keep people involved
- Boring content
  - Keep listening! Don't be a marketer
  - Involve the user
- Users don't visit Park website
  - Social media provides viral content
- Users voice criticism
  - Transparency is good

September 9, 2010 17

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Tips for Use

- **facebook**
  - Encourage two-way interaction
  - Post upcoming events
  - Post photographs
  - Advertise the park
- **twitter**
  - Provide alerts, advisories, special events
- **YouTube**
  - Use video to enhance visitor interpretation
- **flickr**
  - Upload photographs for public domain
  - Allow visitors to upload photographs

Take advantage of existing platforms, feeds, APIs

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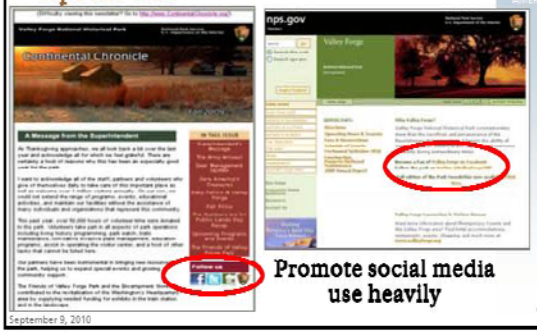
Tips for Use



Promote social media use heavily

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Tips for Use

Develop partnerships with local businesses and stakeholders

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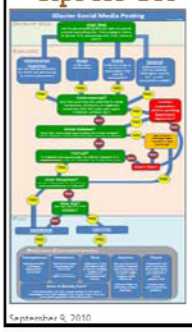
Tips for Use



Decision trees are utilized at Glacier NP when determining…

- what platform to post information
- when to take action on inappropriate discussion board postings.

Consider developing a framework for operations

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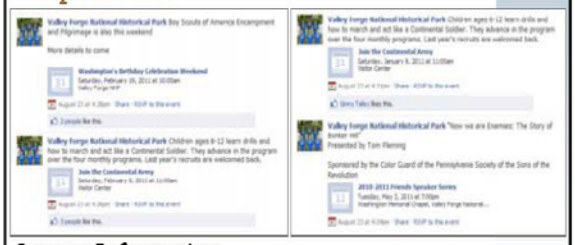
Tips for Use



Stagger Information…

Don't Post Too Much at Once

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Tips for Use

Involve Users and Encourage Interaction

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Tips for Use

Staff members responsible for social media…

should display effort and enthusiasm

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Questions?

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Data & Information:
Collection
Analysis
Distribution
Needs

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Sandy Hook Traveler Information Data

General Park Info	Collects	Distributes	Needs
• Location			
• Park Map			
• Regional Map			
• Days / Hours of Operation			
• Fees (other Costs)			
• What is available			
• SAHO Images/Pictures			

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Sandy Hook Traveler Information Data

Trip Itinerary	Collects	Distributes	Needs
• Directions (to/from SAHO)			
• Regional Travel - general			
• Modal Options			
• Trip Length			
• Alternate Routes			
• Automatic Re-routing			
• Trip Costs / Fees			
• Regional Services			
• Regional Alternate Sites			

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Sandy Hook Traveler Information Data

Traffic Conditions	Collects	Distributes	Needs
• Traffic Volume			
• Traffic Speed			
• Delay / Choke Points			
◦ Traffic incidents			
◦ Road congestion			
◦ Extreme congested areas			
• Parking Availability			
• Traffic-Related Fees/Costs			
• Travel Electronic Alerts			
• Images of Route / Traffic			

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Sandy Hook Traveler Information Data

Other Information	Collects	Distributes	Needs
• Weather			
• Water Quality			
• Emergency Warnings			
• Special Events			
• Park Changes			
• Audio Information			
◦ Applicable for a wide range of travel and visitor details			

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Sandy Hook Traveler Information Data

1. When will this data / information be used?
2. What equipment will be used for:
   - Collection?
   - Analysis?
   - Dissemination?
3. Who is the responsible entity for the information (responsible entities)?

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Sandy Hook Traveler Information Data

Visit Lifecycle

- Pre-Trip
- Trip Planning
- Inbound Transit
- At Initial Site
- In Transit to New Site
- At Additional Site
- Outbound Transit
- Post-Trip

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Sandy Hook Traveler Information Data

Dissemination Equipment

Pre-Trip
- Website
- 511 telephone
- Cell phone feeds
- Kiosks (at businesses)

Enroute
- 511 telephone
- Dynamic Message Sign
- Highway Advisory Radio
- Vehicle Detection
  - Along highway
  - In parking areas

Continuous
- Personal Mobile Devices (social media links)

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Sandy Hook Unit

Data Discussion

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Sandy Hook Unit

Sandy Hook Traveler Information System

David W. Jackson
Benjamin W. Cotton
Gabriel J. Lopez-Bernal
Michael H. Clark

Systems Operations and Assessment Division (RVT-91)
Volpe National Transportation Systems Center
Research and Innovative Technology Administration (RITA)
U.S. Department of Transportation (USDOT)
55 Broadway, Cambridge, MA 02142-1093

Appendix C: Volpe Final Presentation - September 30, 2010

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Sandy Hook Traveler Information System

September 30, 2010

John A. Volpe National Transportation Systems Center
Research and Innovative Technology Administration
U.S. Department of Transportation

the VOLPE center

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Sandy Hook Unit
Sandy Hook Traveler Information System

Outline

1. Background
2. Data Needs
3. Social Media, Traveler Info, & National Parks
4. Data Management Architecture
5. Findings & Recommendations
6. Discussion

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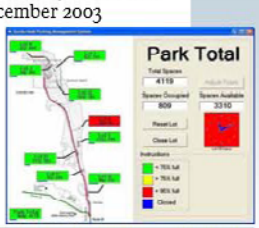
Sandy Hook Unit
Sandy Hook Traveler Information System

Background

Gateway National Recreation Area – Sandy Hook Unit
Parking Management Study - December 2003

1. Pneumatic tube detectors, wireless transmitters, customized PMS software (central computer)
2. Goals –
   a) Integrate real-time tech
   b) Provide traffic count info
   c) Monitor vehicles to Ft. Hancock area
   d) Monitor areas with problems (Lot D)
   e) Disseminate info via HAR, VMS, TRANSCOM
3. Provided info to ITS – CCT DMS, loop detectors, HAR



LESSON: Preference for manual / visual PMS rather than low cost automated system

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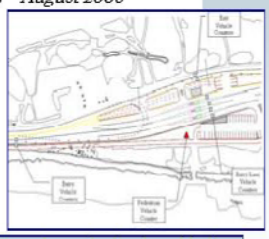
Sandy Hook Unit
Sandy Hook Traveler Information System

Gateway National Recreation Area – Sandy Hook Unit
Automated Fee Entrance Plaza & Intelligent Transportation System Technical Requirements – *August 2008*

1. Improvements to: (1) fee collection operations; (2) vehicle & ped data collection; (3) park visitor experience
2. ITS for: (1) automated vehicle access; (2) visitor counting; (3) traveler info; (4) safety & security
3. Park Technologies –
   a) Radio Frequency ID (RFID) entry
   b) Automated lane gates
   c) Ped counters
   d) Vehicle counters
   e) DMS
   f) Electronic parking lot space sign
   g) CCTV cameras
   h) Single user work station for RT data



LESSON: Harsh outdoor environment makes tech selection critical
NOTE: 5 years after PMS – still a desire for improved information flow

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Sandy Hook Traveler Information System

Sandy Hook - *Alternative Access Concept Plan and Vehicle Replacement Study* - *June 2009*

1. Options examined:
   a) Access during peak season, especially when parking at capacity
   b) Inter-park shuttle replacement vehicle ("ferry shuttle")
2. Next Steps –
   a) TRIP funds for bar-code, OC-based management info system for bike access incentive program
   b) TRIP funding for 2 new buses – 60' & 40' hybrids (diesel-electric) with partnership with Rutgers University

LESSONS:
1. Wayfinding / Traveler Info is critical component for success of any option
2. Funding options are also available via the MPO (NJTPA) – CMAQ, TE funds

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Sandy Hook Unit
Sandy Hook Traveler Information System

Intelligent Transportation System Technologies are one component to a successful traveler information / visitor information system.

- **Portable DMS** - $15-$30K; Operations: up to $2K per yr
- **HAR** - $15-$30K; Operations: up to $1K per year / Approx $10K for stronger antennae to boost signal
- **CCTV Cameras** - $8-$17K; Operations: $1-$2K per year 35-Foot camera polo: $5K
- **Loop Detectors**- $2-$/K (4 lanes); Operations: up to $50K
- **Infrared (IR) Sensors** - $5-$8K; Operations: up to $2K/yr
- **EZ Pass Tag Readers** - $1-$5K per lane; Operations: $50K service contract per lane / year

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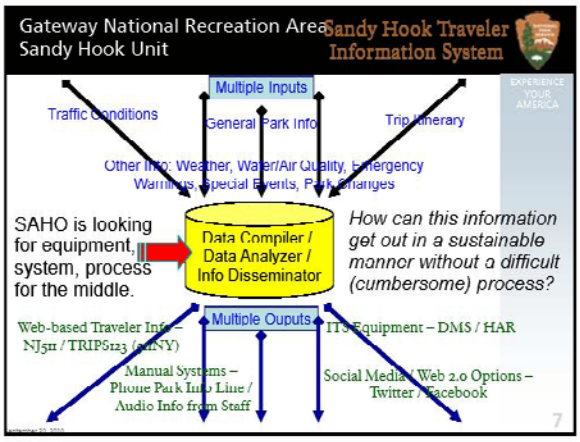


Data Needs

Data Needs

- General Transportation
- Water Safety/Water Quality
- Weather Forecasts

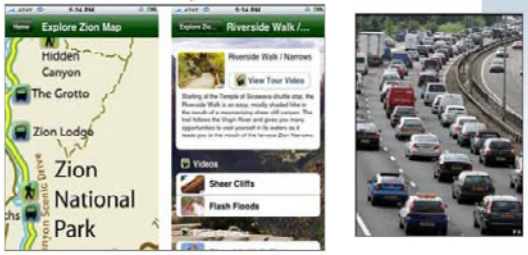
Data Needs

- Parking Lot Closure/Reopening
- Traffic Alerts/Advisories
- Weather Alerts/Advisories
- Other Alerts/Advisories

Data Needs

- Interpretive Information
- Special Event Information

Social Media, Traveler Information, & National Parks



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Sandy Hook Unit

Sandy Hook Traveler Information System

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Web 2.0

Information Provision - focus on serving information to users who have chosen to be recipients

Planning and Administration - focus on offering ways for multiple users to concurrently view, create, and edit content, or receive and provide feedback in an interactive environment.

Social Networking - focus on creating and expanding social networks

Analysis and Evaluation – enable users to use web-based tools to collaboratively provide, analyze, and share data

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Gateway National Recreation Area
Sandy Hook Unit

Sandy Hook Traveler Information System

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Web 2.0 Lessons Learned

- Many types of 2.0 tools can be effective for transportation agencies
- State DOTs are using 2.0 tools for many different purposes but primarily to provide information to the public in newer ways than in the past
- The benefits of 2.0 tools outweigh the challenges
- There is a need to develop clear guidelines for public use of 2.0 tools
- Use of 2.0 tools will continue and increase in the future

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Sandy Hook Traveler Information System

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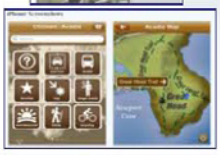
Web 2.0

- Social Media
- Mobile Applications
- Microblogging



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Current NPS Twitter Use

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Data Management Architecture

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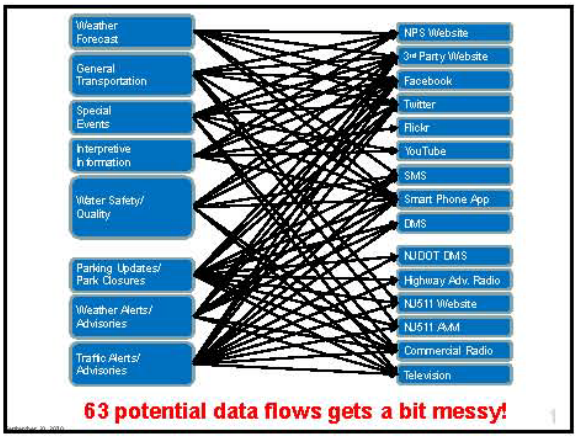
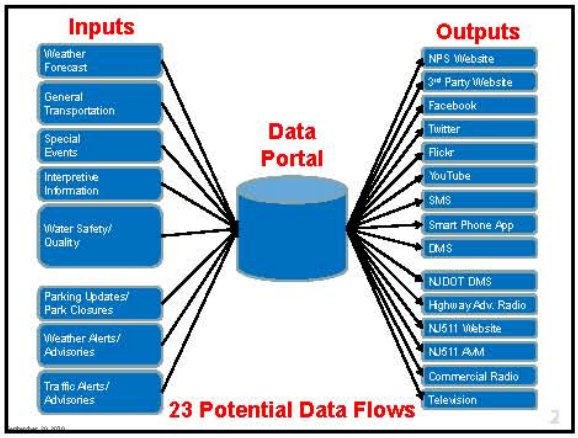
September 30, 2010 VOLPE 1


Weather Forecast
General Transportation
Special Events
Interpretive Information
Water Safety/ Quality
Parking Updates/ Park Closures
Weather Alerts/ Advisories
Traffic Alerts/ Advisories
NPS Website
3rd Party Website
Facebook
Twitter
Flickr
YouTube
SMS
Smart Phone App
DMS
NJDOT DMS
Highway Adv. Radio
NJ511 Website
NJ511 AVM
Commercial Radio
Television
63 potential data flows gets a bit messy!


Inputs
Outputs
Weather Forecast
General Transportation
Special Events
Interpretive Information
Water Safety/ Quality
Parking Updates/ Park Closures
Weather Alerts/ Advisories
Traffic Alerts/ Advisories
Data Portal
NPS Website
3rd Party Website
Facebook
Twitter
Flickr
YouTube
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Smart Phone App
DMS
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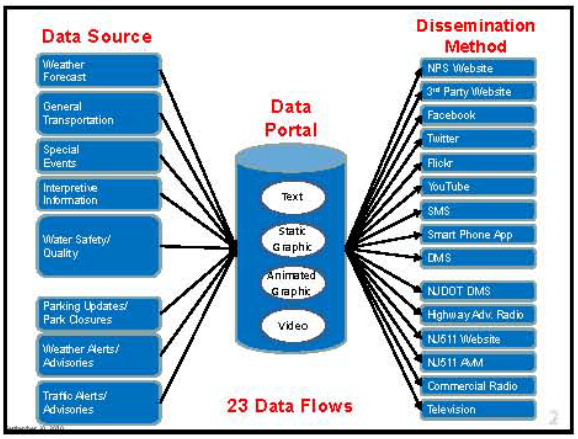
Highway Adv. Radio
NJ511 Website
NJ511 AVM
Commercial Radio
Television
23 Potential Data Flows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Dissemination Method
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General Transportation
Special Events
Interpretive Information
Water Safety/ Quality
Parking Updates/ Park Closures
Weather Alerts/ Advisories
Traffic Alerts/ Advisories
Data Portal
Text
Static Graphic
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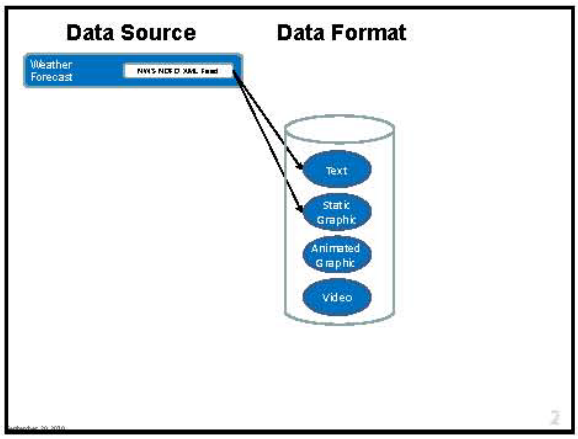
NJ511 Website
NJ511 AVM
Commercial Radio
Television
23 Data Flows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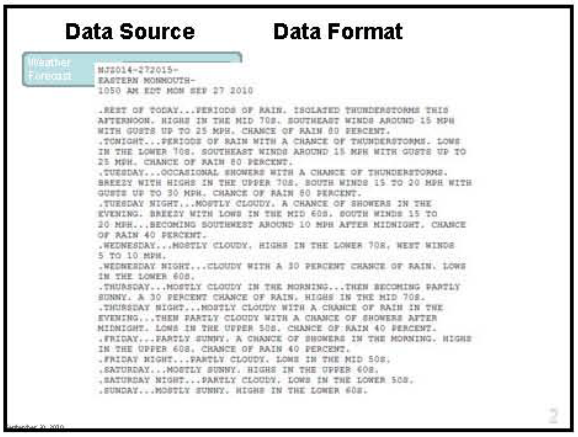
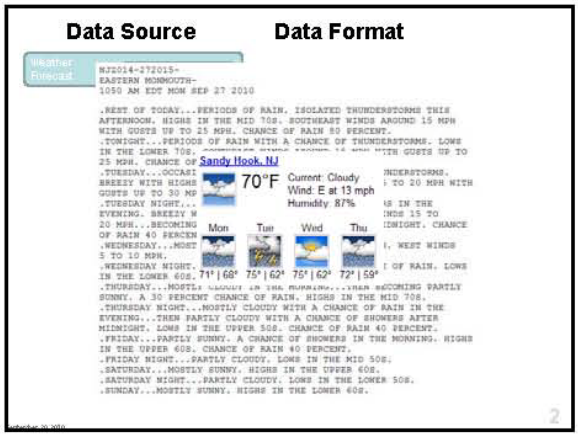
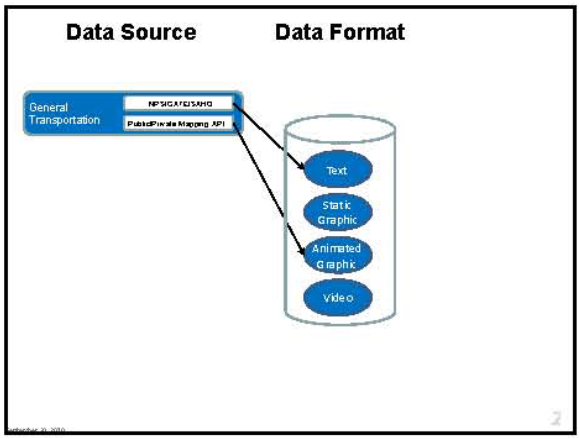
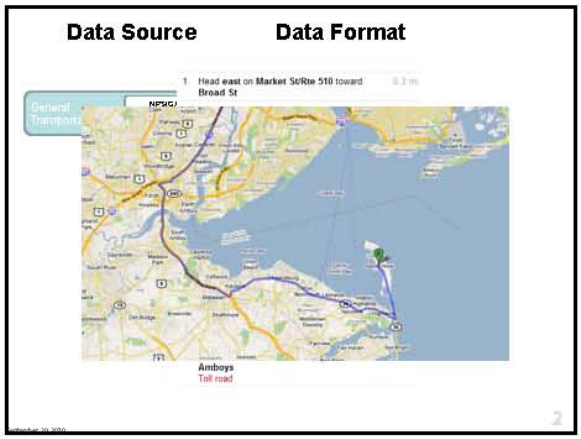
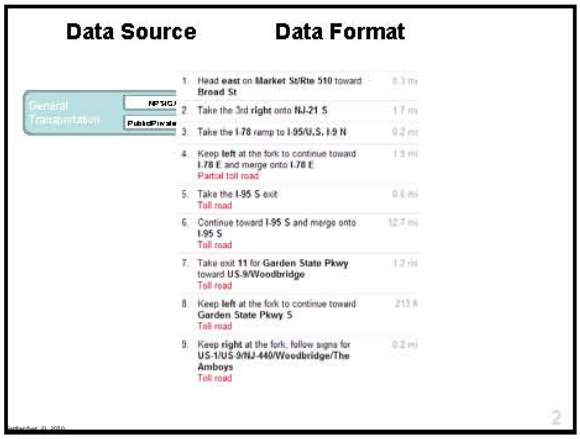
NWS NDFD XML Feed
Text
Static Graphic
Animated Graphic
Video

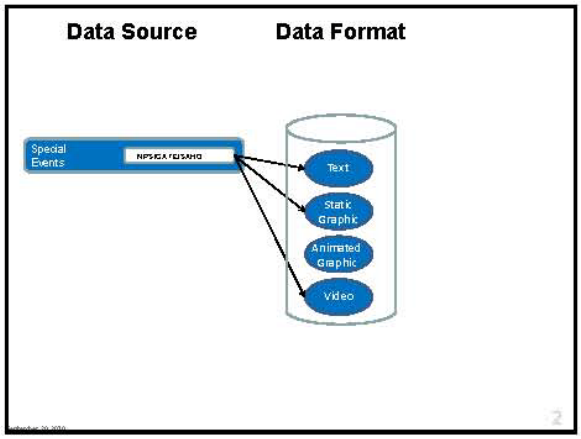

Data Source
Data Format
Weather Forecast
NJZ014-272015-
EASTERN MONMOUTH-
1050 AM EDT MON SEP 27 2010
.REST OF TODAY...PERIODS OF RAIN. ISOLATED THUNDERSTORMS THIS AFTERNOON. HIGHS IN THE MID 70S. SOUTHEAST WINDS AROUND 15 MPH WITH GUSTS UP TO 25 MPH. CHANCE OF RAIN 80 PERCENT.
.TONIGHT...PERIODS OF RAIN WITH A CHANCE OF THUNDERSTORMS. LOWS IN THE LOWER 70S. SOUTHEAST WINDS AROUND 15 MPH WITH GUSTS UP TO 25 MPH. CHANCE OF RAIN 80 PERCENT.
.TUESDAY...OCCASIONAL SHOWERS WITH A CHANCE OF THUNDERSTORMS. BREEZY WITH HIGHS IN THE UPPER 70S. SOUTH WINDS 15 TO 20 MPH WITH GUSTS UP TO 30 MPH. CHANCE OF RAIN 80 PERCENT.
.TUESDAY NIGHT...MOSTLY CLOUDY. A CHANCE OF SHOWERS IN THE EVENING. BREEZY WITH LOWS IN THE MID 60S. SOUTH WINDS 15 TO 20 MPH...BECOMING SOUTHWEST AROUND 10 MPH AFTER MIDNIGHT. CHANCE OF RAIN 40 PERCENT.
.WEDNESDAY...MOSTLY CLOUDY. HIGHS IN THE LOWER 70S. WEST WINDS 5 TO 10 MPH.
.WEDNESDAY NIGHT...CLOUDY WITH A 30 PERCENT CHANCE OF RAIN. LOWS IN THE LOWER 60S.
.THURSDAY...MOSTLY CLOUDY IN THE MORNING...THEN BECOMING PARTLY SUNNY. A 30 PERCENT CHANCE OF RAIN. HIGHS IN THE MID 70S.
.THURSDAY NIGHT...MOSTLY CLOUDY WITH A CHANCE OF RAIN IN THE EVENING...THEN PARTLY CLOUDY WITH A CHANCE OF SHOWERS AFTER MIDNIGHT. LOWS IN THE UPPER 50S. CHANCE OF RAIN 40 PERCENT.
.FRIDAY...PARTLY SUNNY. A CHANCE OF SHOWERS IN THE MORNING. HIGHS IN THE UPPER 60S. CHANCE OF RAIN 40 PERCENT.
.FRIDAY NIGHT...PARTLY CLOUDY. LOWS IN THE MID 50S.
.SATURDAY...MOSTLY SUNNY. HIGHS IN THE UPPER 60S.
.SATURDAY NIGHT...PARTLY CLOUDY. LOWS IN THE LOWER 50S.
.SUNDAY...MOSTLY SUNNY. HIGHS IN THE LOWER 60S.

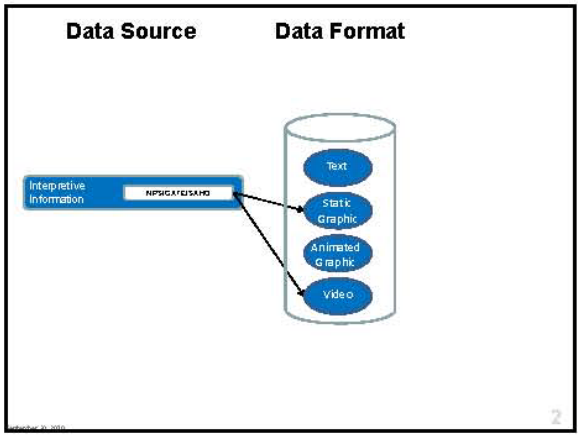

Data Source
Data Format
Weather Forecast
NJZ014-272015-
EASTERN MONMOUTH-
1050 AM EDT MON SEP 27 2010
.REST OF TODAY...PERIODS OF RAIN. ISOLATED THUNDERSTORMS THIS AFTERNOON. HIGHS IN THE MID 70S. SOUTHEAST WINDS AROUND 15 MPH WITH GUSTS UP TO 25 MPH. CHANCE OF RAIN 80 PERCENT.
.TONIGHT...PERIODS OF RAIN WITH A CHANCE OF THUNDERSTORMS. LOWS IN THE LOWER 70S. SOUTHEAST WINDS AROUND 15 MPH WITH GUSTS UP TO 25 MPH. CHANCE OF RAIN 80 PERCENT.
Sandy Hook, NJ
70°F
Current: Cloudy
Wind: E at 13 mph
Humidity: 87%
Mon
Tue
Wed
Thu
74° | 68°
75° | 62°
76° | 62°
72° | 59°
.THURSDAY...MOSTLY CLOUDY IN THE MORNING...THEN BECOMING PARTLY SUNNY. A 30 PERCENT CHANCE OF RAIN. HIGHS IN THE MID 70S.
.THURSDAY NIGHT...MOSTLY CLOUDY WITH A CHANCE OF RAIN IN THE EVENING...THEN PARTLY CLOUDY WITH A CHANCE OF SHOWERS AFTER MIDNIGHT. LOWS IN THE UPPER 50S. CHANCE OF RAIN 40 PERCENT.
.FRIDAY...PARTLY SUNNY. A CHANCE OF SHOWERS IN THE MORNING. HIGHS IN THE UPPER 60S. CHANCE OF RAIN 40 PERCENT.
.FRIDAY NIGHT...PARTLY CLOUDY. LOWS IN THE MID 50S.
.SATURDAY...MOSTLY SUNNY. HIGHS IN THE UPPER 60S.
.SATURDAY NIGHT...PARTLY CLOUDY. LOWS IN THE LOWER 50S.
.SUNDAY...MOSTLY SUNNY. HIGHS IN THE LOWER 60S.


Data Source
Data Format
General Transportation
Text
Static Graphic
Animated Graphic
Video


Data Source
Data Format
1. Head east on Market St/Rte 510 toward Broad St
Amboys
Toll road


Data Source
Data Format
1. Head east on Market St/Rte 510 toward Broad St
2. Take the 3rd right onto NJ-21 S
3. Take the I-78 ramp to I-95/U.S. I-9 N
4. Keep left at the fork to continue toward I-78 E and merge onto I-78 E
Partial toll road
5. Take the I-95 S exit
Toll road
6. Continue toward I-95 S and merge onto I-95 S
Toll road
7. Take exit 11 for Garden State Pkwy toward US-9/Woodbridge
Toll road
8. Keep left at the fork to continue toward Garden State Pkwy S
Toll road
9. Keep right at the fork, follow signs for US-1/US-9/NJ-440/Woodbridge/The Amboys
Toll road


Data Source
Data Format
Special Events
Text
Static Graphic
Animated Graphic
Video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Data Format
Interpretive Information
Text
Static Graphic
Animated Graphic
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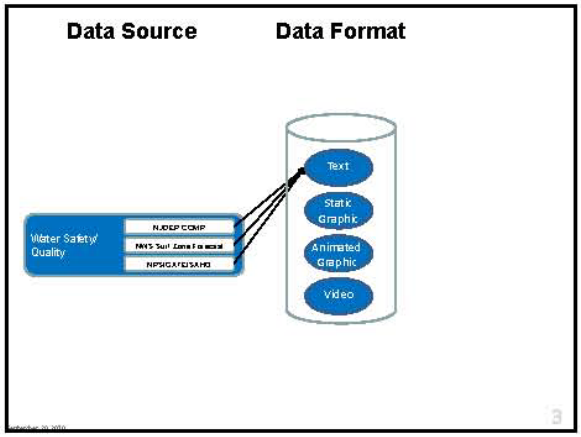
Data Source
Data Format
Water Safety/ Quality
Text
Static Graphic
Animated Graphic
Video

Data Source **Data Format**

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FZUS61 KPHI 271000
SRFPHI

SURF ZONE FORECAST FOR NEW JERSEY AND DELAWARE
NATIONAL WEATHER SERVICE MOUNT HOLLY NJ
600 AM EDT MON SEP 27 2010

.FOR THE BEACHES OF NEW JERSEY AND DELAWARE...

DEZ004-NJZ014-026>026-272300-
DELAWARE BEACHES-EASTERN MONMOUTH-ATLANTIC COASTAL CAPE MAY-
COASTAL ATLANTIC-COASTAL OCEAN-
600 AM EDT MON SEP 27 2010

THE RIP CURRENT RISK FOR TODAY IS...MODERATE.

WAVES IN THE SURF ZONE TODAY WILL BE 3 OR 4 FEET.

SURF TEMPERATURES ARE AROUND 70 DEGREES OR IN THE LOWER 70S.

A MODERATE RISK OF RIP CURRENTS IMPLIES THAT INDIVIDUALS PLANNING TO
ENTER THE SURF SHOULD CHECK WITH LOCAL BEACH PATROLS FIRST. BE SURE
TO SWIM WITHIN SIGHT OF A LIFE GUARD, AND NEVER SWIM ALONE OR AT
NIGHT.

DO NOT SWIM ON UNGUARDED BEACHES, AT NIGHT, OR ALONE.

$$
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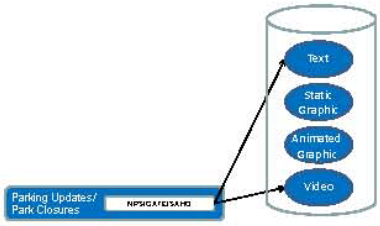
Water Safety/ Quality

3

Data Source **Data Format**



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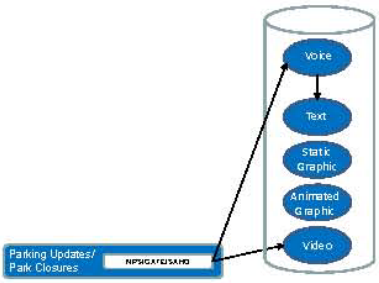

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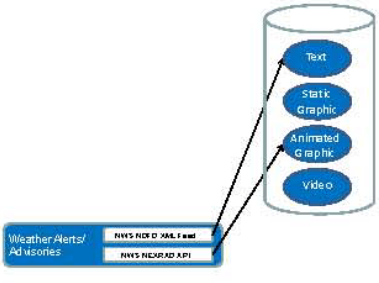
Data Source **Data Format**

3

Data Source **Data Format**



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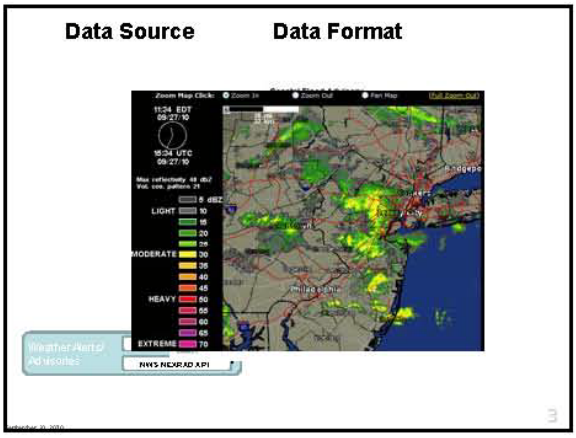
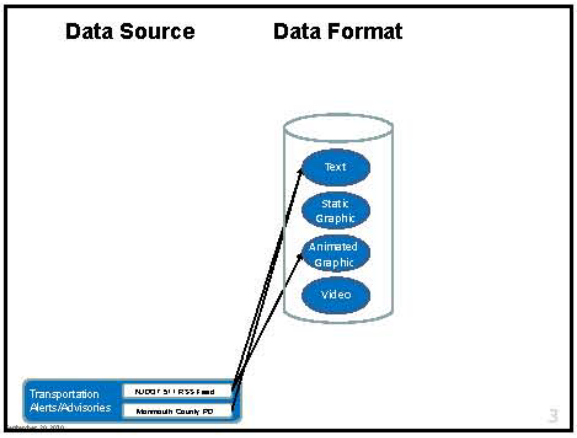
Data Source **Data Format**

3


Data Source
Data Format
Weather Alerts/ Advisories
NWS NEXRAD API


Data Source
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Text
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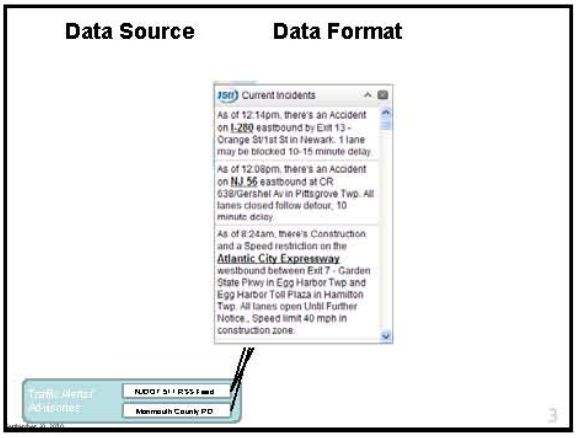
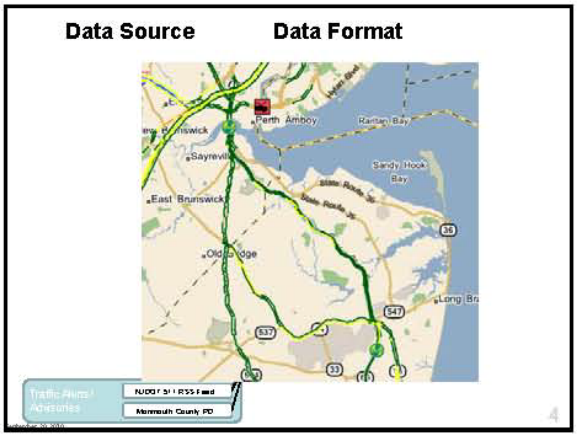
Video
Transportation Alerts/Advisories
Monmouth County PD


Data Source
Data Format
Current Incidents
As of 12:14pm, there's an Accident on I-280 eastbound by Exit 13 - Orange St/1st St in Newark. 1 lane may be blocked 10-15 minute delay.
As of 12:08pm, there's an Accident on NJ 56 eastbound at CR 638/Gershel Av in Pittsgrove Twp. All lanes closed follow detour, 10 minute delay.
As of 8:24am, there's Construction and a Speed restriction on the Atlantic City Expressway westbound between Exit 7 - Garden State Pkwy in Egg Harbor Twp and Egg Harbor Toll Plaza in Hamilton Twp. All lanes open Until Further Notice., Speed limit 40 mph in construction zone.
Monmouth County PD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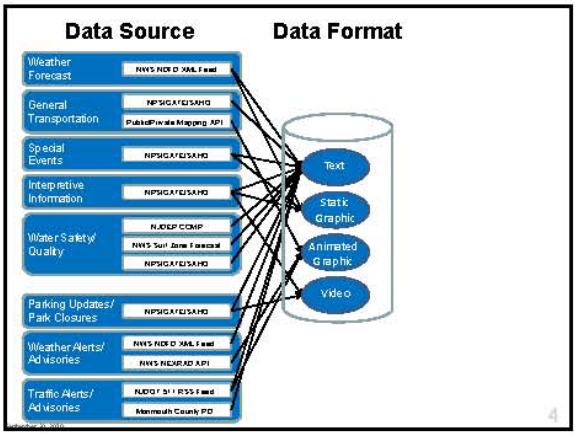
Perth Amboy
Raritan Bay
Sayreville
Sandy Hook Bay
East Brunswick
Monmouth County PD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Special Events
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Parking Updates/ Park Closures
Weather Alerts/ Advisories
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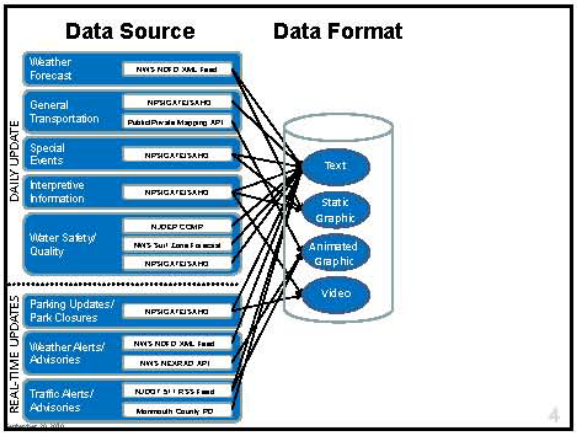
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DAILY UPDATE
REAL-TIME UPDATES
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General Transportation
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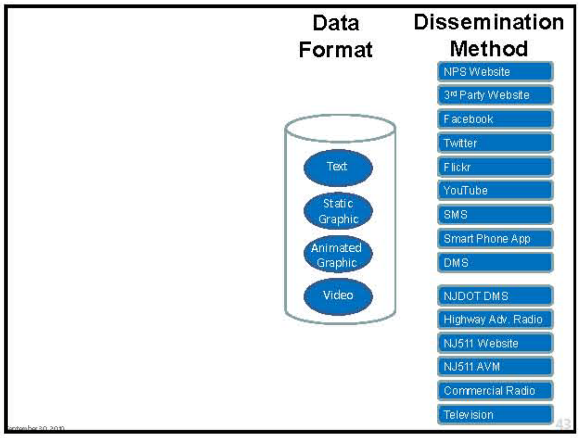
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DMS
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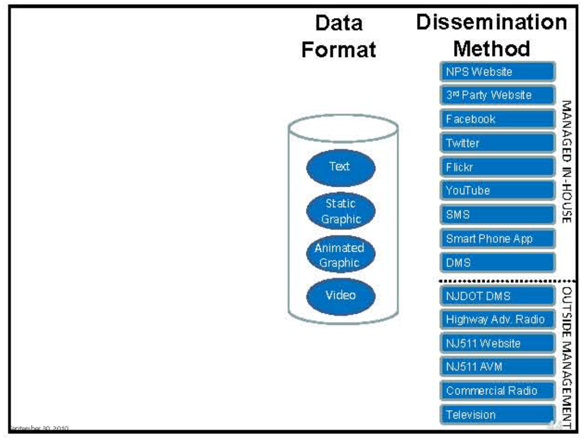
Highway Adv. Radio
NJ511 Website
NJ511 AVM
Commercial Radio
Television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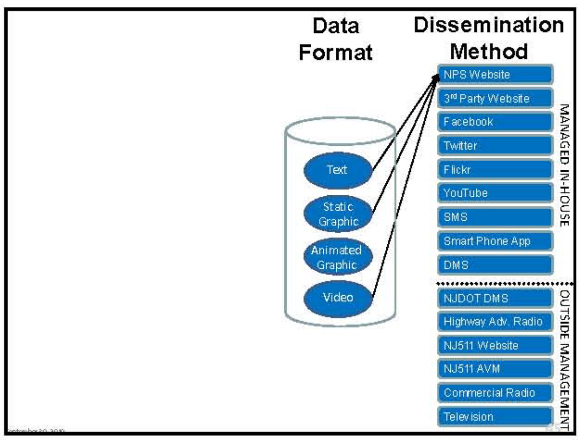
MANAGED IN-HOUSE
OUTSIDE MANAGEMENT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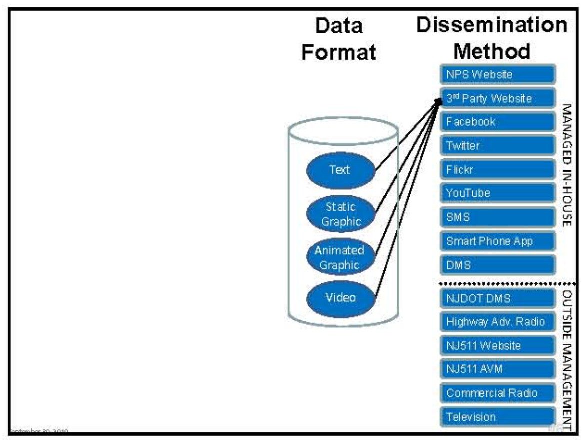
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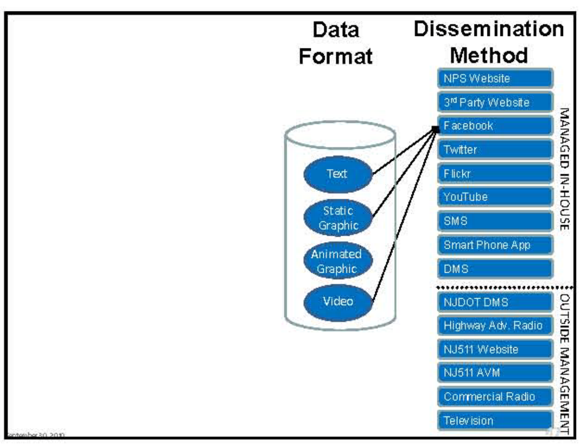
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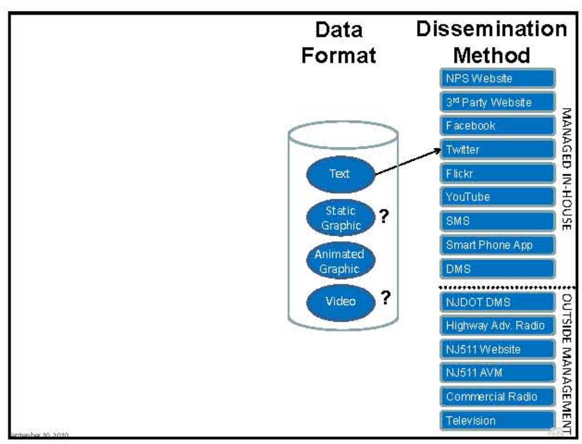
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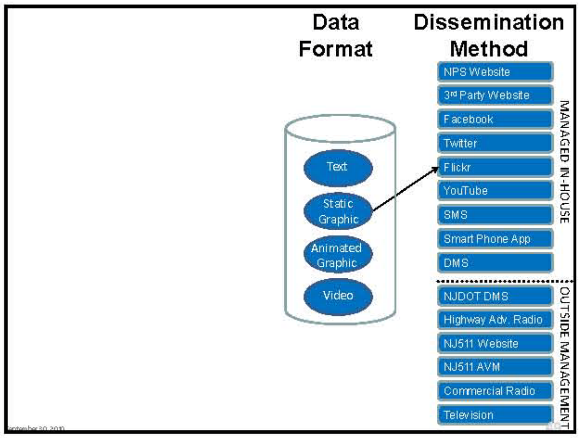
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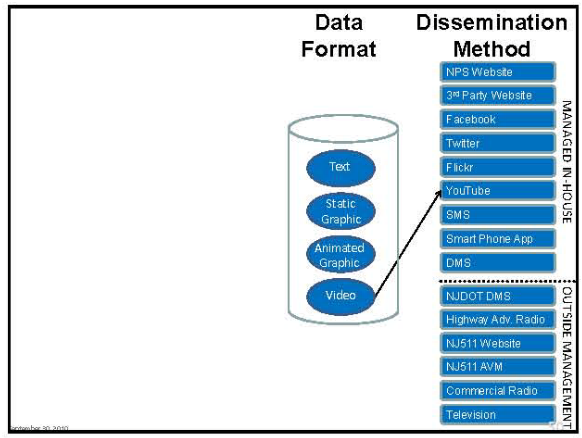
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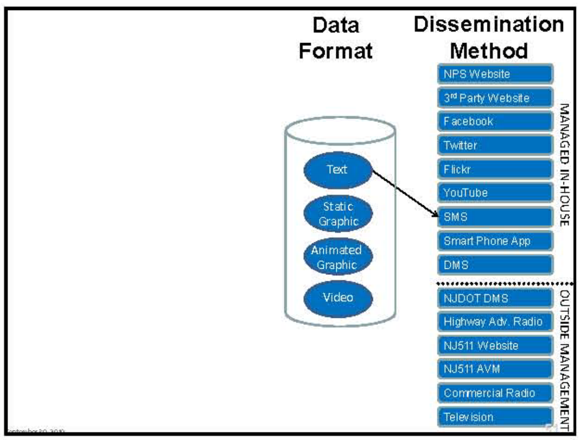
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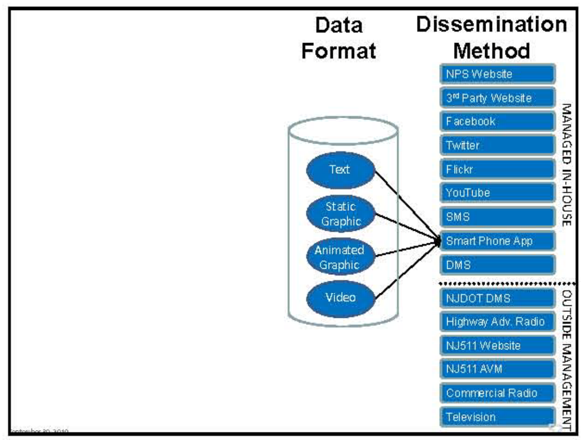
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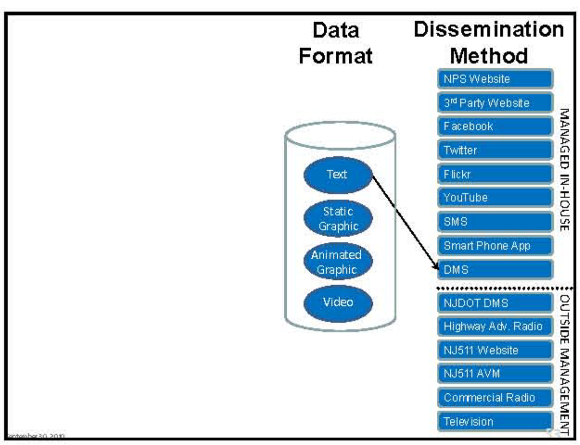
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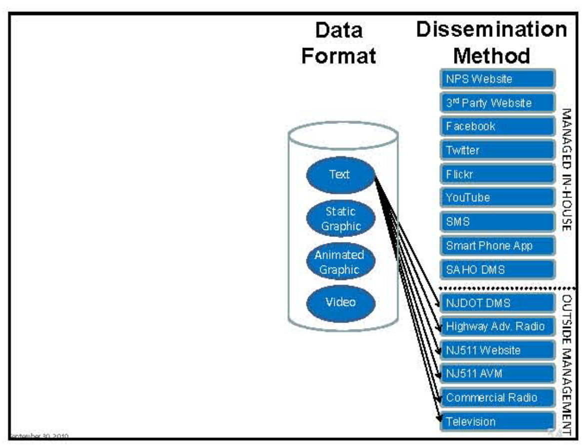
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SAHO DMS
NJDOT DMS
Highway Adv. Radio
NJ511 Website
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Commercial Radio
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REPORT DOCUMENTATION PAGE

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Traveler Information System

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5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

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Michael Clark (Macrosys)

5d. PROJECT NUMBER

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13. SUPPLEMENTARY NOTES

14. ABSTRACT

This report focuses on equipment and procedural solutions for gathering and disseminating a wide range of visitor information, including real-time traveler information data relating to traffic and parking at the Sandy Hook Unit of the Gateway Recreation Area. Based on an evaluation of the existing traveler information system (TIS) efforts, park geography, regional partner agencies, and other data and information opportunities available, this report describes the TIS concept recommended for Sandy Hook. A conceptual framework for a text-based communication platform is presented as a short-term, tangible solution for TIS communication.

15. SUBJECT TERMS

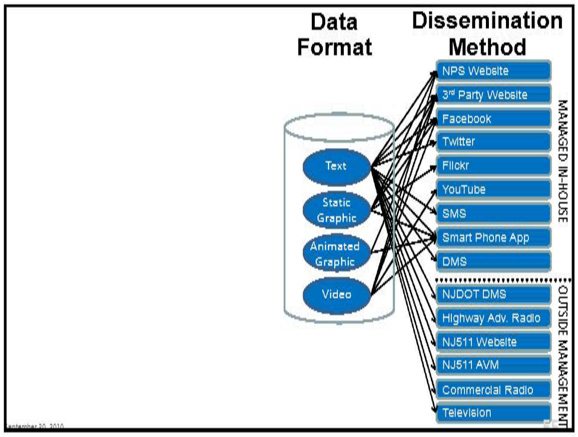
traveler information systems, communication platforms, Web 2.0, data management system architecture

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Peter Steele, NER & James Grant, SAHO
None	None	None	NA		19b. TELEPHONE NUMBER *(Include area code)*: 617-223-5130, NER / 718-354-4620, SAHO

Reset

As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

646/108866 / September 2010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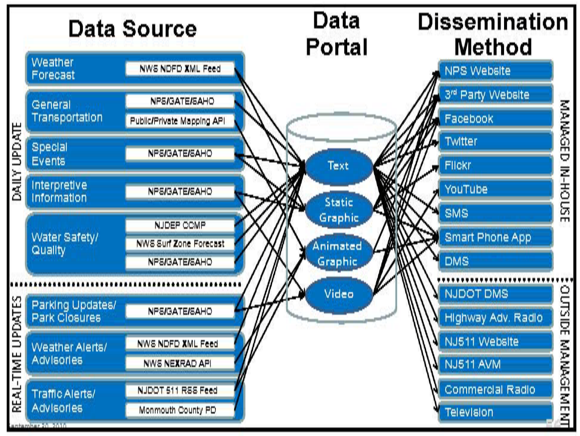
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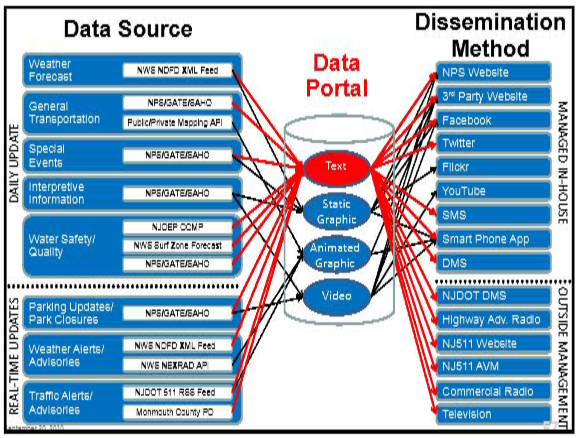
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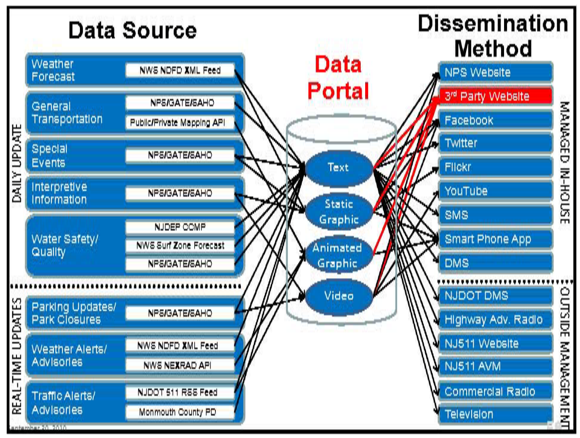
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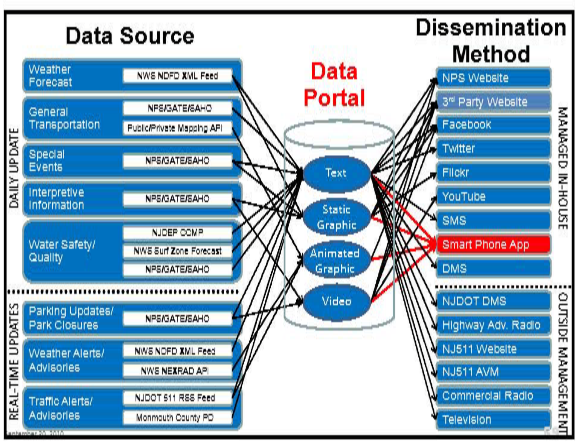
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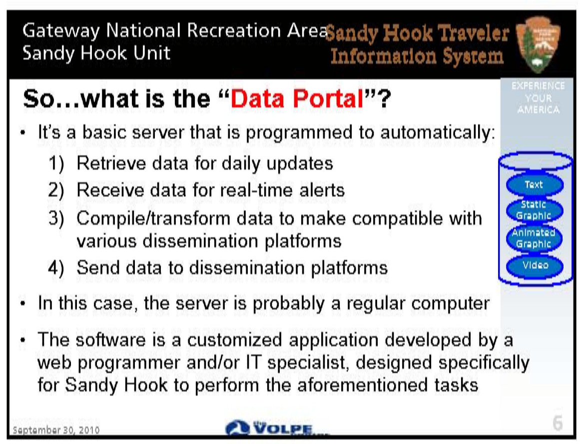
Gateway National Recreation Area
Sandy Hook Unit
Sandy Hook Traveler Information System
So…what is the "Data Portal"?
• It's a basic server that is programmed to automatically:
1) Retrieve data for daily updates
2) Receive data for real-time alerts
3) Compile/transform data to make compatible with various dissemination platforms
4) Send data to dissemination platforms
• In this case, the server is probably a regular computer
• The software is a customized application developed by a web programmer and/or IT specialist, designed specifically for Sandy Hook to perform the aforementioned tasks
Text
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Welcome to the Sandy Hook Visitor Information Center
September 30, 2010

DAILY UPDATES

Weather Forecast

Mostly sunny. Hi: 86, Lo: 65. Winds SE 5-10 mph. Chance of afternoon thunderstorms 50%.

General Transportation

- Road construction, Rte 36, Atlantic Highlands between First Ave and Grand Ave
- Bridge construction, Rte 36, Highlands, two lanes open
- Sea Streak Ferry operating as scheduled. Click here for details.
- For detailed driving directions, click here

Special Events

- Birds of Sandy Hook. Ranger-led event. Meet at Visitor Center at 1:00 PM. Click here for details.

Water Safety/Quality

- Waves: 1-2 ft
- Water quality: good
- Rip current forecast: moderate

REAL TIME ALERTS

Sign up here to have real-time alerts sent to your mobile phone. Follow us on Facebook and Twitter.

3:06 PM
Sea Streak Ferry delayed due to inclement weather. New departure time from Sandy Hook is 4:45 PM.

2:29 PM
Severe thunderstorm warning for eastern Monmouth County. Take shelter immediately.

12:38 PM
Parking lot C is closed.

12:12 PM
Come check out Birds of Sandy Hook at 1:00 PM, Visitor Center.

11:04 AM
Parking lot D is closed.

10:25 AM
Parking lot G is closed.

6

Welcome to the Sandy Hook Visitor Information Center
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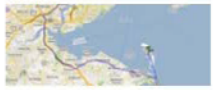
Weather

70°F

Directions



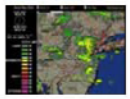
Today at Sandy Hook

Birds at Sandy Hook Ranger-led nature walk.

Meet at Visitor Center at 1:00 PM.

Parking Area Webcams

Weather Radar



Traffic Conditions

6

Gateway National Recreation Area
Sandy Hook Unit

Sandy Hook Traveler Information System

EXPERIENCE YOUR AMERICA

Estimated Implementation Costs

Server	$3,000 – $5,000
Software	
Text-based Application	$18,000 – $25,000
Multi-media Application (with smart phone compatibility)	$30,000 – $45,000
Operations	
Staff training	$1,000 – $2,000
Updates	$5,000 – $10,000
Development of standards	$5,000 – $7,000
Maintenance	$8,000 – $12,000
TOTAL	**$70,000 -- $101,000**

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Gateway National Recreation Area
Sandy Hook Unit

Sandy Hook Traveler Information System

EXPERIENCE YOUR AMERICA

Visitor Information Center Implementation Considerations and Recommendations for Next Steps

- Develop partnerships
- Identify data/information priorities
- Work with a web programmer and/or IT specialist
- Utilize existing resources
- Develop an operations framework

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Gateway National Recreation Area
Sandy Hook Unit

EXPERIENCE YOUR AMERICA

Sandy Hook Traveler Information System

David W. Jackson
Benjamin W. Cotton
Gabriel J. Lopez-Bernal
Michael H. Clark

Systems Operations and Assessment Division (RVT-91)
Volpe National Transportation Systems Center
Research and Innovative Technology Administration (RITA)
U.S. Department of Transportation (USDOT)
55 Broadway, Cambridge, MA 02142-1093

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