National Capital Region Geospatial Data Exchange

Data Inventory Report

Findings and Recommendations from a Survey of NCR Data Needs and Resources

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1.1 Document Information

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1.2 Document History

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2.0 Introduction

The KCI Team has been contracted by Metropolitan Washington Council of Government's CIO Committee's Subcommittee for GIS to establish a **National Capital Region Geospatial Data Exchange**. In addition to performing a series of tasks to customize the vUSA open source software to the NCR's needs and standing up a working Geospatial Data Exchange capability, it was requested that the KCI Team inventory the data needs and resources of the NCR participants. The primary tasks of the data inventory are to:

- Survey local, state, regional and federal agencies to identify available data feeds and data stores
- List existing data services consumed by jurisdictions
- Identify existing data sources of value to emergency operations
- Briefly review the HSIP Gold NAVTEQ data made available to the NCR
- Identify data that should be hosted centrally versus consumed from data services provided by NCR participants
- Determine if gaps in availability or sustainability existing and formulate a plan to address identified gaps

This document presents the information, findings and recommendations resulting from the performance of the requested data inventory.

2.1 Data Inventory Survey Procedures & Methods

The performance of the NCR data inventory observed the following procedures and methods:

1. The KCI Team met June 5 with the GIS Subcommittee Project Steering Committee to discuss the objectives of the inventory and to determine expectations and issues that need resolution when conducting the inventory.
2. The KCI Team drafted a Data Inventory Report Outline that presented the basic structure of how the KCI Team would like to organize the expected results of the data inventory. The COG GIS Subcommittee reviewed and approved the Data Inventory Report Outline in a review session conducted on June 22, 2011. It was decided a two phased data inventorying approach would be adopted. In Phase 1 an open request to NCR participants would be made asking each for a listing of the GIS data they have available. This response would be reviewed to determine additional information collection to be collected in Phase 2.
3. A formal request to GIS Managers to provide an inventory of their GIS data was emailed to NCR participants in early August. Twelve jurisdictions responded to the request (4 cities, 7 counties and Washington D.C.) A compilation of these inventories was assembled September 29th, completing the first phase of the inventory.
4. A review of the data received from the Phase 1 effort revealed that to more adequately address the objectives of the data inventory the second phase needed to:

a. Collect information not just on GIS data stores, but with a focus on the availability of data feeds, the need for map and incident data from outside jurisdictional boundaries, and the current GIS infrastructure readiness of the NCR participants.

b. Collect information from a larger number of participants achieving a broader sampling of NCR participants, working to receive input from regional, federal, utility and non-governmental agencies in addition to city, county, state entities.

5. A survey instrument was designed by the KCI Team in mid-October to address Phase 2 of the data inventory. The Phase 2 survey was crafted with an explicit focus on gathering information about the availability of data feeds, the need for map and incident data from outside jurisdictional boundaries, and the current GIS infrastructure readiness of the NCR participants. A hardcopy of the survey instrument is provided in Appendix A.

6. The KCI Team utilized the online survey system available from the SurveyMonkey web service (www.SurveyMonkey). SurveyMonkey allowed the KCI Team to prepare on-line web forms that asked all the questions contained in the Phase 2 survey instrument (Appendix A). An invitation was sent to all NCR participants and stakeholders providing them user login credentials to access the Phase 2 NCR GDE Data Needs and Resources survey. The responses from each of the NCR participants who completed the survey were collected, stored and analyzed using tools available through the SurveyMonkey site and the hand compilation of raw data collected by the survey.

7. The KCI Team encouraged NCR participants to complete the survey by sending follow-up emails and reminders, and by explaining the importance of completing the survey in the two Round 1 Build Review workshops conducted on November 9th and 10th.

8. The SurveyMonkey site was made available to the NCR participants for approximately one month. The site was closed for access on November 23.

2.2 NCR GDE Data Needs and Resources Survey Participants

A much better response with a broader sampling of NCR participants was received using SurveyMonkey and the Phase 2 survey instrument, with 45 NCR agencies participating in the survey. Table 1 and Table 2 provide information on the geographic distribution of respondents and their primary work focus.

Table 1
Participant Response to Data Needs and Resources Survey by Geography and Jurisdiction

		CITY	COUNTY	STATE	FEDERAL	REGIONAL	UTILITY	UNIVERSITY	
	Total	**8**	**13**	**11**	**5**	**5**	**1**	**2**	
Representation	MD	4	11	4				2	47%
	VA	4	2	0			1		16%
	DC			7					16%
		18%	29%	24%	11%	11%	2%	4%	

Table 2
Participant Response to Data Needs and Resources Survey by Jurisdiction and Function

Last Name	Jurisdiction	GIS Administration	Public Safety	Emergency Response	Planning	Infrastructure	Environment	Transportation	Research	CIO	Aiport Operations	Public Health	Land Management
CapWin	CapWin, NCR		◆		◆	◆							
Molvadas	City of Alexandria, VA			◆									
Trobridge	City of Alexandria, VA									◆			
Hansen	City of Falls Church, VA	◆	◆	◆		◆	◆						
Rioux	City of Falls Church, VA	◆	◆	◆	◆	◆	◆						
Eby	City of Gaithersburg, MD				◆								
Weinshenker	City of Rockville, MD	◆	◆		◆	◆	◆						
Beavers	College Park, MD				◆	◆							
Price	College Park, MD	◆			◆								
Liddle	Fairfax County, VA	◆		◆									
Needle	Federal, FBI		◆	◆									
Baker	Federal, FBI		◆										
Ferrantino	Federal, FEMA			◆	◆	◆	◆						
Stidham	Federal: National Park Service	◆			◆		◆						
Mcwreath	Federal: US Dept. of the Interior		◆	◆		◆	◆						◆
Warthen	Frederick County, MD	◆											
Osborne	Joint Forces Headquarters, NCR			◆	◆								
Miller	Maryland	◆	◆	◆	◆	◆	◆						
Gilbertz	Maryland		◆										
Marquess	Maryland State Highway		◆	◆	◆	◆							
Sheffer	Maryland State Highway	◆											
Hirsch	Metro Washington Airports Auth.	◆	◆	◆	◆		◆				◆		
Baltrotsky	Montgomery County, MD		◆	◆		◆							
Ierley	Montgomery County, MD		◆										
Ferritti	Montgomery County, MD		◆										
Teng	Montgomery County, MD	◆											
Vandeyar-Wise	Montgomery County, MD		◆	◆									
White	NVERS, Virginia		◆	◆	◆								
Shean	Prince Georges County, MD				◆								
Wood	Prince Georges County, MD		◆	◆									
Callahan	Prince Georges County, MD	◆											
Shean	Prince Georges County, MD				◆								
Wood	Prince Georges County, MD		◆										
Prescott	Prince William County, VA	◆	◆	◆	◆		◆						
Ivanov	University of MD								◆				
Pack	University of MD	◆	◆	◆	◆			◆					
Lees	Utility: Loudon Water, VA					◆							
Crumpler	Virginia	◆	◆	◆									
Johnson	Washington D.C.		◆										
Pritchet	Washington D.C.			◆	◆							◆	
Bianchi	Washington D.C.		◆										
Goldberg	Washington D.C.		◆										
Field	Washington D.C.	◆											
Faust	Washington D.C.	◆											
Wells	WMATA	◆						◆					
	45	**18**	**24**	**19**	**18**	**11**	**9**	**2**	**1**	**1**	**1**	**1**	**1**
		40%	53%	42%	40%	24%	20%	4%	2%	2%	2%	2%	2%

Table 1 presents a breakdown of survey respondents by jurisdiction. Responses from Maryland dominated the survey, with 20 participants. Virginia and Washington D.C. (classified as a "state" for the purposes of this analysis) provided 8 and 7 respondents respectively. However, as shown in Figure 1, the survey also received input from federal, regional, utility and university NCR participants, enabling an expanded understanding of the NCR's information needs and resources.

Further strengthening the value of the survey, representation from a wide range of functional interests was achieved (Table 2). In addition to an expected high level of participation from GIS Administrators and Public Safety/Emergency Response representatives, the survey also captured information about the data needs and resources of NCR participants interested in planning, infrastructure management, environmental analysis, transportation, airports, public health and land management.

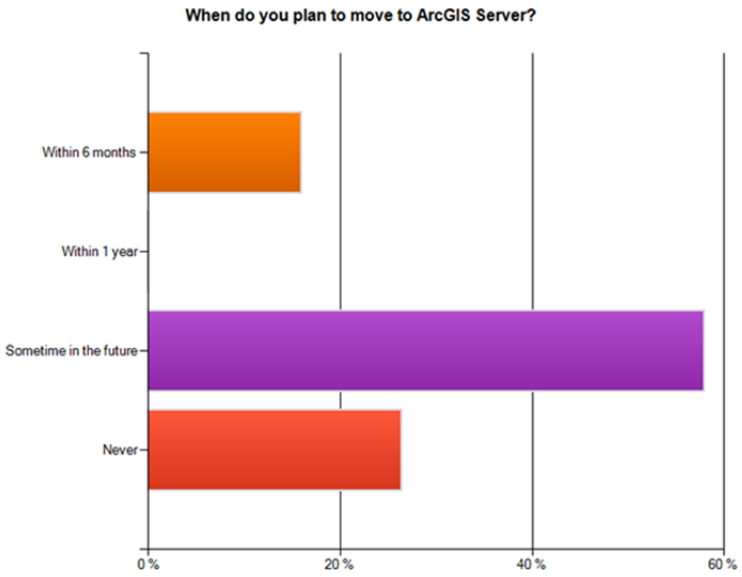
3.0 Technical Environment of NCR Participants

3.1 Readiness and Status of GIS Data Publishing

The NCR GDX is the web-portal developed to enable the sharing of GIS and incident data between NCR participants. The primary mechanism by which the NCR GDX web portal enables information sharing is giving participants secure access to GIS and incident data feeds that have been published using web technology. Accordingly, one objective of the Phase 2 data inventory was to determine the extent to which the NCR participants had adopted the GIS technology (in this case, ESRI's ArcGIS Server) needed for web-publishing data.

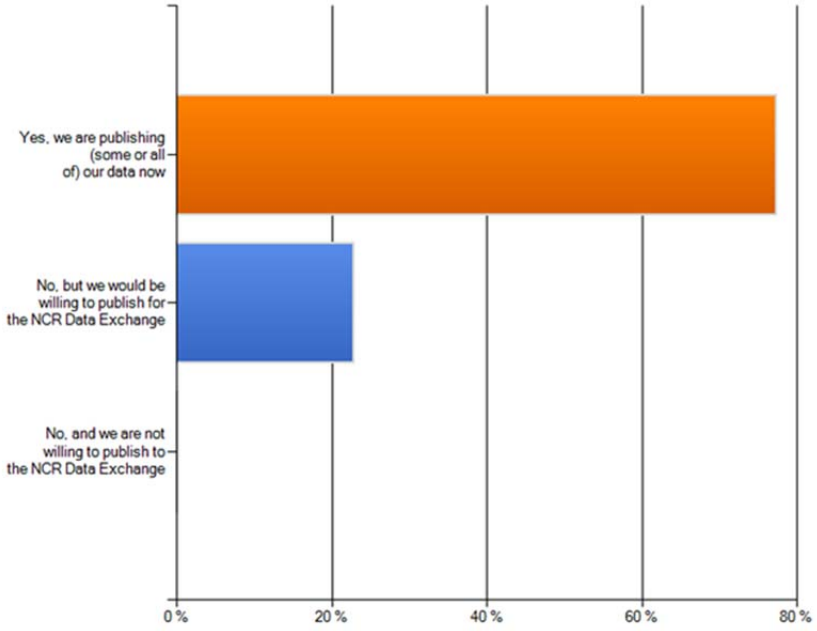
Of the 45 NCR participants that responded to the survey, 59% reported that they had implemented ArcGIS Server. Of the responding NCR participants that had not yet implemented ArcGIS Server, the majority (approximately 75%) reported that they planned to implement ArcGIS Server within 6 months or sometime in the future, with a little over 20% reporting they do not plan to implement the software (Figure 1).

Figure 1
Participant's Planning to Implement ArcGIS Server



Of the participants who had already implemented ArcGIS server, 77% reported that they were currently publishing their GIS data for web access and none reported they are unwilling to publish their GIS data for access by NCR participants (Figure 2).

Figure 2
ArcGIS Server Users Willing to Publish and Share to the NCR Their GIS Data



3.2 System Environment

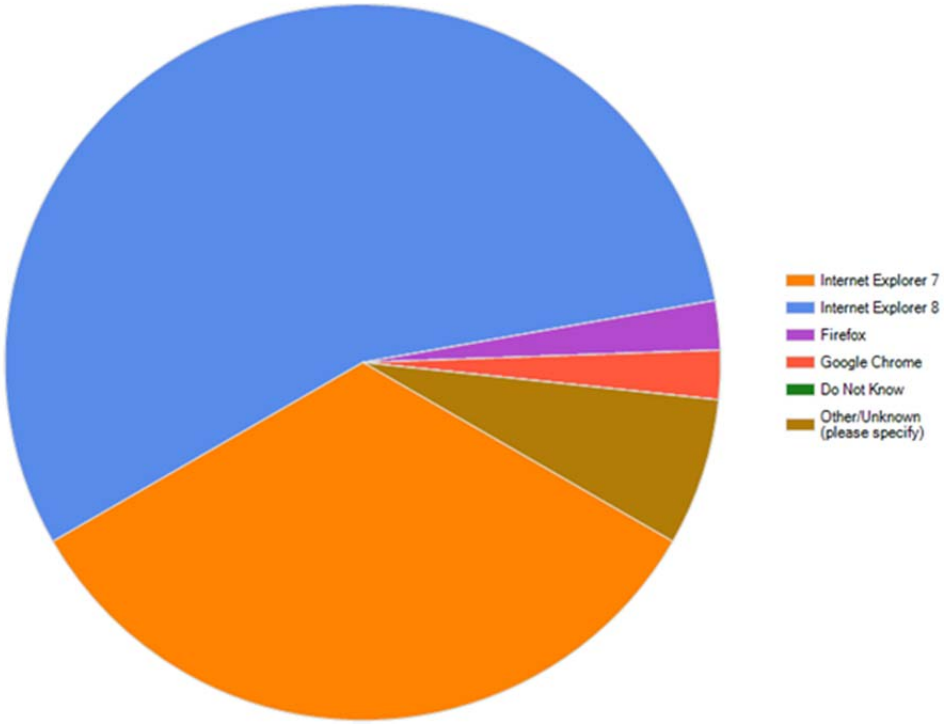
To be used by the maximum number of NCR participants, the NCR GDX web-portal needs to support the range of internet browser technology being used throughout the NCR as well as the various GIS Viewer technology that has been adopted. The Data Inventory survey, therefor, collected information on the internet browser and GIS Viewer technology that has been implemented in the NCR.

Internet Browser

As reported in Figure 3, the majority of organizations responding to the survey have standardized on Microsoft Internet Explorer version 7 or 8 (greater than 88%). However, a few respondents identified they either were using a different browser technology or their organizations had not yet adopted a standard. If the survey respondents are exemplary of the variety of internet browser technology in use, in addition to Internet Explorer, the NCR GDX web portal needs to support:

- Google Chrome
- Firefox
- Safari

Figure 3
Internet Browser Technology Utilized by NCR Participants



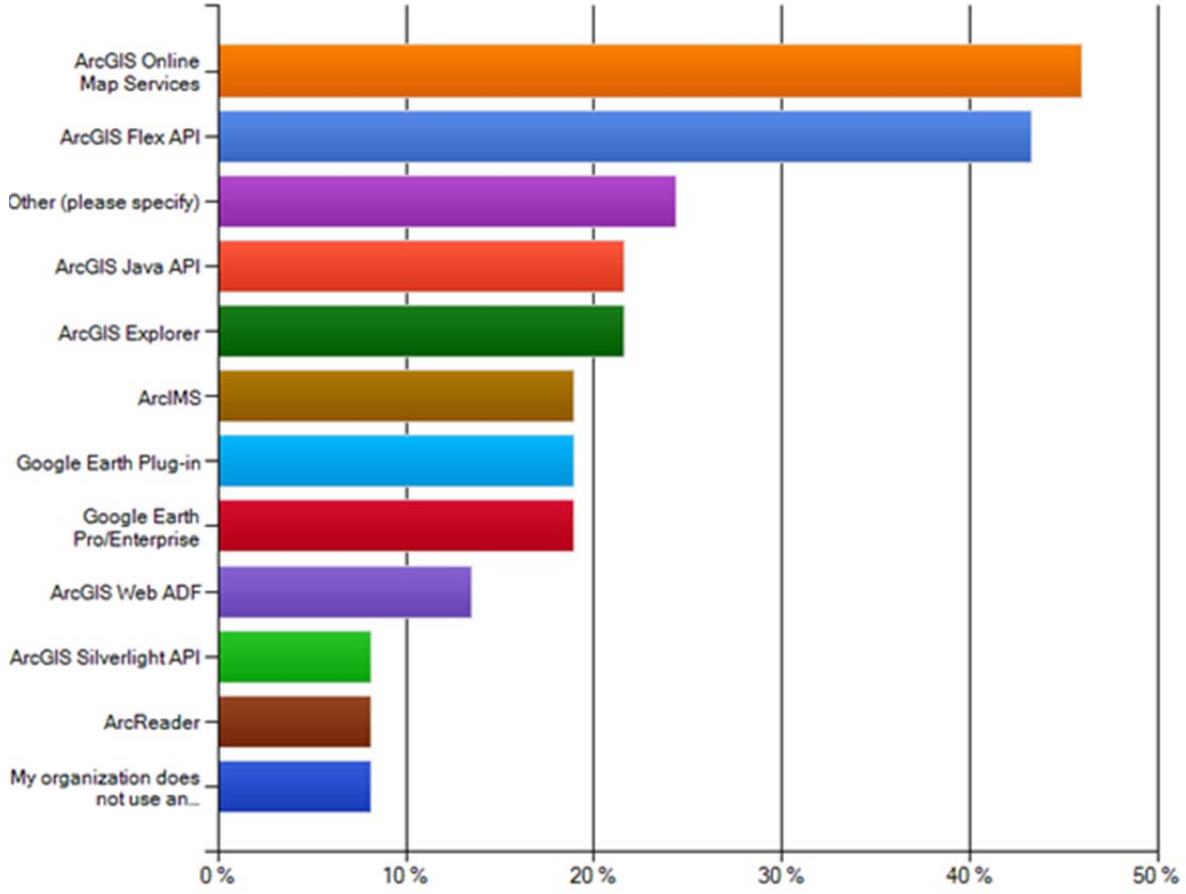
GIS Viewers

The survey discovered a wide range of GIS Viewer software is in use across the various jurisdictions and agencies of the NCR. While the majority were either using ESRI's ArcGIS Flex API or ArcGIS online map services, a full range of other ESRI map viewing software is in use along with a variety of map viewing software provided by Google and other software companies (Figure 4). As shown in Figure 6, fully 24% of the respondents are using GIS map viewing software that was grouped in an "Other" category. Within this category is found the following GIS map viewing software:

- Virtual Fairfax (Skyline Globe)
- RITIS
- ISAVE (ISAVE Sandbox, ISAVE Knowledge Wall)
- DHS OneView
- Pictometry's viewer

The survey response suggests that in addition to supporting Flex technology, the NCR GDX needs to consider supporting the ArcGIS Java API (used by 21% of the respondents), Google (to be delivered as part of this project), and the ArcGIS Silverlight API. In addition, the software technology used by the various software products identified above in the "Other" category should be analyzed to determine if any additional technologies need to be considered to ensure the maximum degree of NCR GDX integration into the existing system environments of the NCR.

Figure 4
GIS Viewer Software Used by NCR Participants



3.3 GIS Projection Systems in Use

One additional aspect of system and data integration that was considered by the survey was to better understand the range of map projections being used by the NCR participants. While there was some confusion among some of the survey participants on how to answer this question, the following projection systems, measurement systems and datums were reported:

- Virginia State Plan, feet, NAD83 (5 respondents)
- Maryland State Plane, feet, NAD83 (12 respondents)
- Maryland State Plan, meters (1 respondent)
- WGS-84 (4 respondents)
- UTM (1 respondent)
- Web Mercator (1 respondent)

In addition to the systems identified above, one participant reported that they are unable to publish their GIS data in either State Plane or WGS-84.

4.0 Available NCR Data

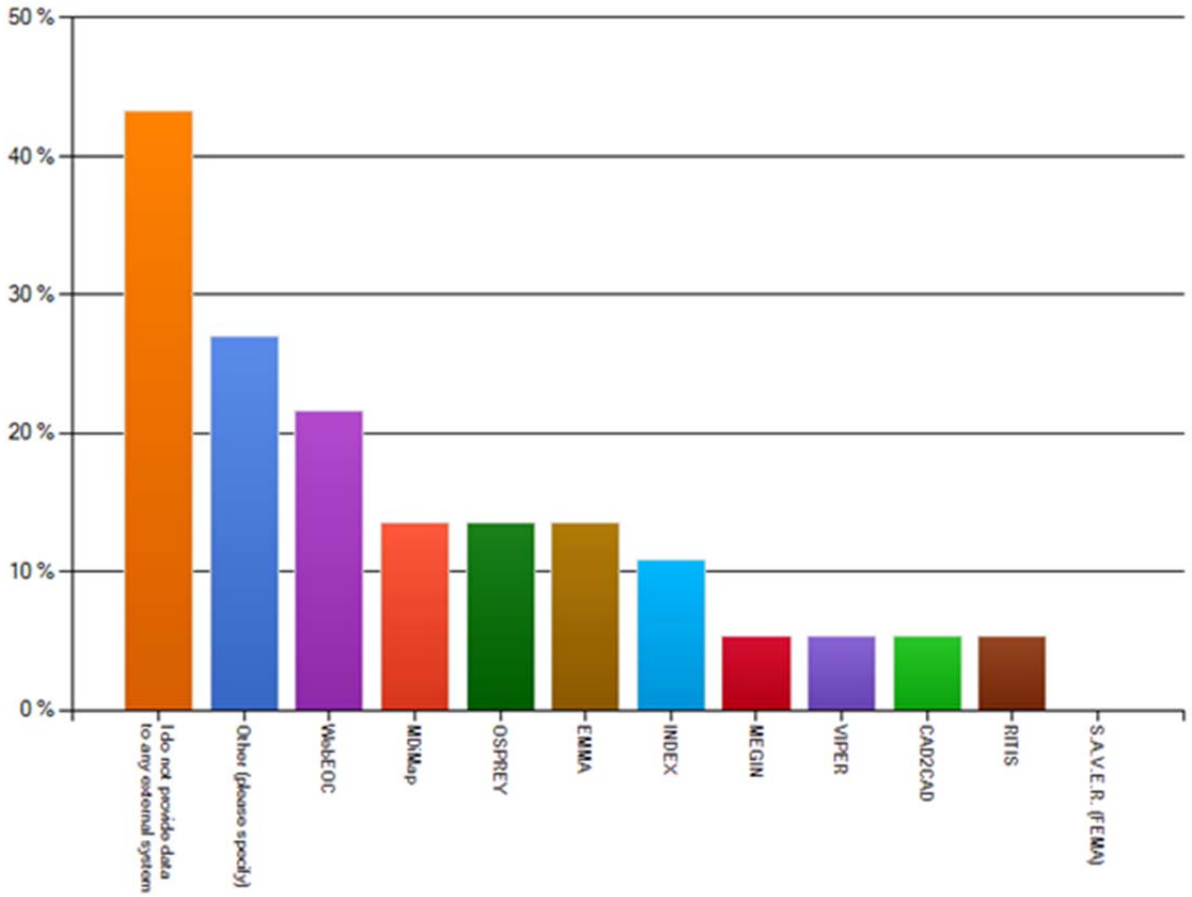
The survey requested information from participants regarding their current data sharing practices and their willingness to make available the data they manage to other NCR members.

4.1 Data Currently Shared With External Systems

The NCR participants responding to the survey report that many currently share data with external GIS and emergency response systems. As shown in Figure 5, over 50% of the respondents say they provide data for use by external systems, revealing that a fairly healthy spirit of cooperation is already in place with the members of the NCR. The WebEOC is receiving data from the greatest number of participants, while a wide range of other systems are receiving data provided by two or more of the NCR participant responding to the survey.

In the "Other" category, several respondents identified they were sharing data with traffic and transportation systems not listed on the survey form. The "Other" category also contained comments that some respondents are planning to share data with the SAVER2 and DHS OneView systems.

Figure 5
NCR Participant Systems That Use Data Published/Provided by Other NCR Members



Respondents were further requested to list the data they provide to these external systems. The types of data being provided by NCR members are listed in Table 3. Reviewing Table 3, a clear pattern

emerges showing that the map features managed and maintained by local governments (streets, addresses, buildings, public safety facilities and boundaries) are being supplied by these organizations and the data unique to the responsibilities of states, utilities and universities are being provided by those organizations.

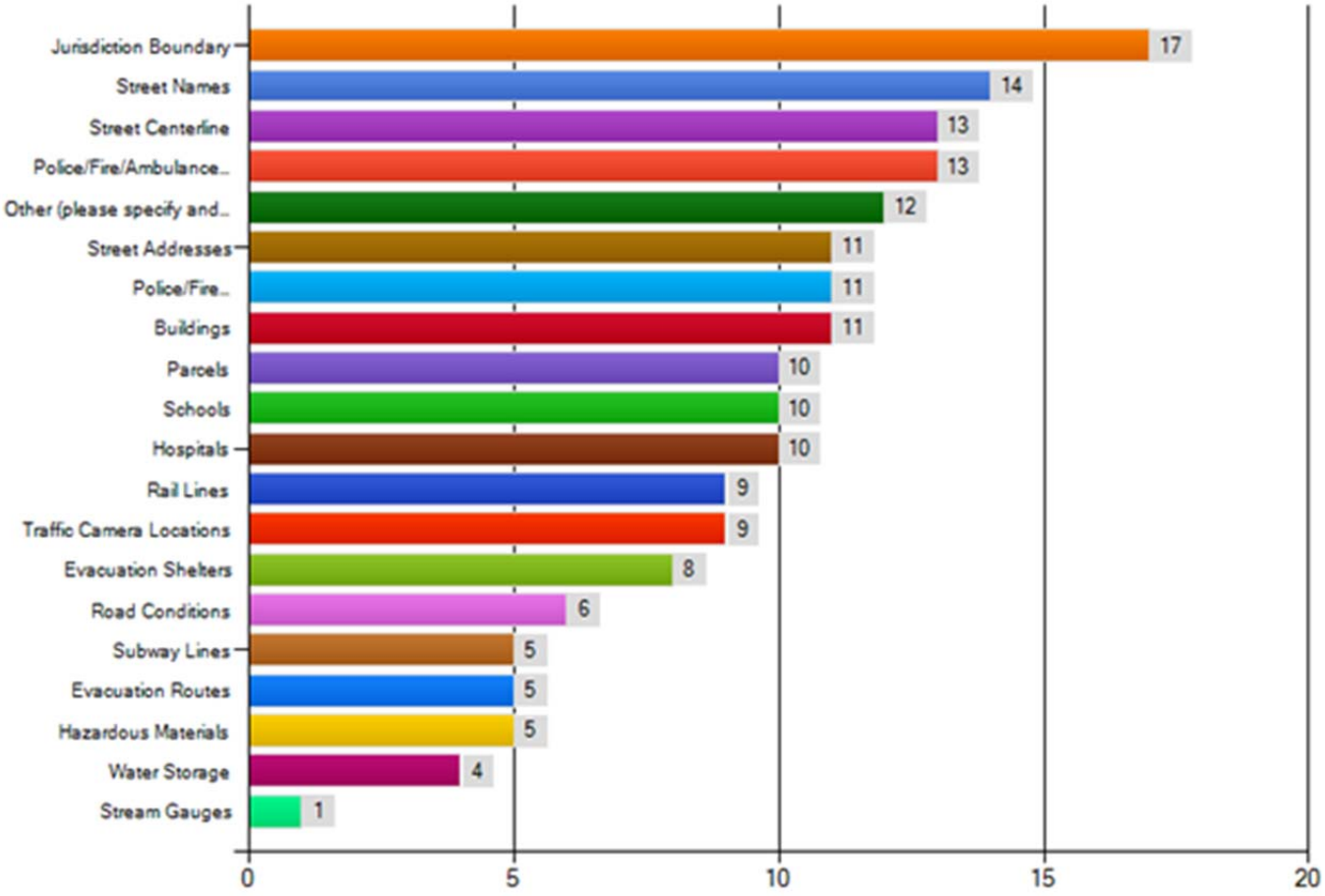
Table 3
Types of Data Provided to External Systems

Map Feature	City	County	State	Utility	University
Street Centerlines	◆				
Address Points	◆				
Streams & Water Bodies	◆	◆			
Buildings	◆	◆			
Hospitals		◆			
Train & Metro Lines/Stations		◆			
Police & Fire Stations	◆	◆			
Railways		◆			
Police & Fire Incidents		◆			
CAD Incidents	◆	◆			
Jursidication Boundaries	◆	◆			
Schools	◆	◆			
Airports		◆			
Water and Sewer Mains/Valves				◆	
Hyrdrants	◆	◆		◆	
Parks	◆	◆			
State Owned Towers			◆		
Fiber Lines (existing, proposed)			◆		
Traffic Data (speed, volume)					◆
Traffic Control Points					◆
Road Closures					◆
Fuel Stations					◆
Evacuation Routes					◆
Staging Areas					◆
Radio Scanner Feeds					◆
CCTV Feeds					◆
Weather Radar and Alerts					◆

4.2 Available Data

The survey requested that respondents identify the GIS data and incident/real-time data they manage within their jurisdiction that they are willing to share with other members of the NCR. Figure 6 provides a chart identifying the GIS map features that are available from NCR members. The number annotated at the end of each map feature bar identifies the number of respondents that would make their data available.

Figure 6
GIS Data Available from NCR Participants



4.2.1 GIS Map Data

Of the map features reported as available by the survey respondents (Figure 6), the most commonly reported are base map features, including: jurisdictional boundaries, street names, street centerlines, street addresses, parcels and buildings. Recalling that 8 cities and 13 counties responded to the survey representing a total of 21 local governments (see Table 1), it appears that most of the NCR local government participants are willing to share their base map information (which commonly consists of these features).

In addition, map features of importance to emergency response and response planning were also reported as available. These map features include police/fire/ambulance response boundaries, police/fire stations (the labels for these two items are cut off in the Figure), schools, hospitals, rail, traffic camera locations, evacuation shelters, road conditions, subway lines, evacuation routes, hazardous materials, water storage and stream gauges.

The lower number of respondents signaling their willingness to share these categories of data does not necessarily signify a resistance among NCR participants to share this type of information and instead may reflect the limited availability of this information (further analysis would need to be performed to explain the reason for the lower number of responses for these items).

4.2.2 Incident and Real-time Data

Some agencies operating within the NCR manage incident data or real-time data received from monitoring devices. In many cases these data are either classified or extremely sensitive and can only be shared with individuals that have received a security authorization or clearance from their organization. A primary objective embraced by the NCR GDE is to enable and improve the inter-regional sharing of sensitive data between authorized NCR recipients during emergency events. Accordingly, the survey requested the respondents identify if they manage sensitive data, if they are willing to share this sensitive data and if so, what level of sensitivity would they assign to the data.

Table 4 summarizes the information collected by the survey, identifying the percent of respondents reporting for each data category with the total number of respondents shown in parentheses. While incident and real time data is not managed by the vast majority of agencies responding to the survey, this information is available from some NCR participants. If adequate provisions and assurances can be implemented through NCR governance procedures, and adequately supported through the technical implementation of the NCR GDX web portal software, it appears there is a willingness to more broadly share sensitive information with authorized NCR participants.

Table 4
Availability and Sensitivity of Incident and Real-time Data

Incident or Real-time Data Category	Not Available	Available But Sensitive	
		Sensitive: Law Enforcement	Very Sensitive: Peer-to-Peer Only
Evacuation Routes	71.9% (23)	18.8% (6)	3.1% (1)
Stream Gauge Readings	81.3% (26)	18.8% (6)	0.0% (0)
Weather	81.3% (26)	18.8% (6)	0.0% (0)
WebEOC	81.3% (26)	9.4% (3)	3.1% (1)
Traffic Flow	90.6% (29)	6.3% (2)	0.0% (0)
Water Storage & Lines	71.9% (23)	3.1% (1)	9.4% (3)
Oil & Gas Facilities	90.6% (29)	3.1% (1)	3.1% (1)
License Plate Readings	90.6% (29)	0.0% (0)	6.3% (2)
Electric Lines & Equipment	90.6% (29)	0.0% (0)	6.3% (2)
Gas Lines	87.5% (28)	0.0% (0)	6.3% (2)
Chemical Facilities	93.8% (30)	0.0% (0)	3.1% (1)
Radiologic Monitoring	93.8% (30)	0.0% (0)	3.1% (1)

4.2.3 HISP Gold NAVTEQ Data

The Department of Homeland Security has made available to the NCR NAVTEQ's HISP State Release data. The availability of this data is a result of the extension of NAVTEQ's agreement with the National Geospatial-Intelligence Agency (NGA) Homeland Security Infrastructure Program (HISP) that

enables State and Local Homeland Security Responders access to NGA HSIP applications using NAVTEQ® map data. NAVTEQ maps provide an accurate representation of the detailed road network including attributes like turn restrictions, physical barriers and gates, one-way streets, restricted access and relative road heights. In addition, NAVTEQ maps include geospatial information in addition to the road network such as political boundaries, physical features, places, railroads, census boundaries, parks, schools, fire departments, police departments, and hospitals.

The KCI Team has reviewed the information available about the availability and use of the HISP NAVTEQ Gold data. The following provides a listing of important information related to the NCR's ability to use this valuable information resource:

The HISP NAVTEQ State Release data

- Can be used by organizations like the NCR GDE project that embrace a Homeland Security/Homeland Defense (HLS/HD) or Emergency, Planning, Response and Recovery (EPR&R) mission.
- Can be used in the support of steady state or routine operations as well as during the EPR&R stages of an event.
- Uses WGS'84 geographic coordinates in the M.m (decimal minutes) format.
- Needs to be handled as "Unclassified For Official Use Only (FOUO) and is not releasable to the public.
- Can be used by web mapping services but needs to be secured with user access controls and password protection with no download capability.
- Products derived using the HISP NAVTEQ data need to include attribution and documentation as follows: "© NAVTEQ – All rights reserved."
- NAVTEQ reports that it has made provisions for integrating into their map data more accurate State and county data through its data quality feedback mechanism found at http://mapreporter.navteq.com.

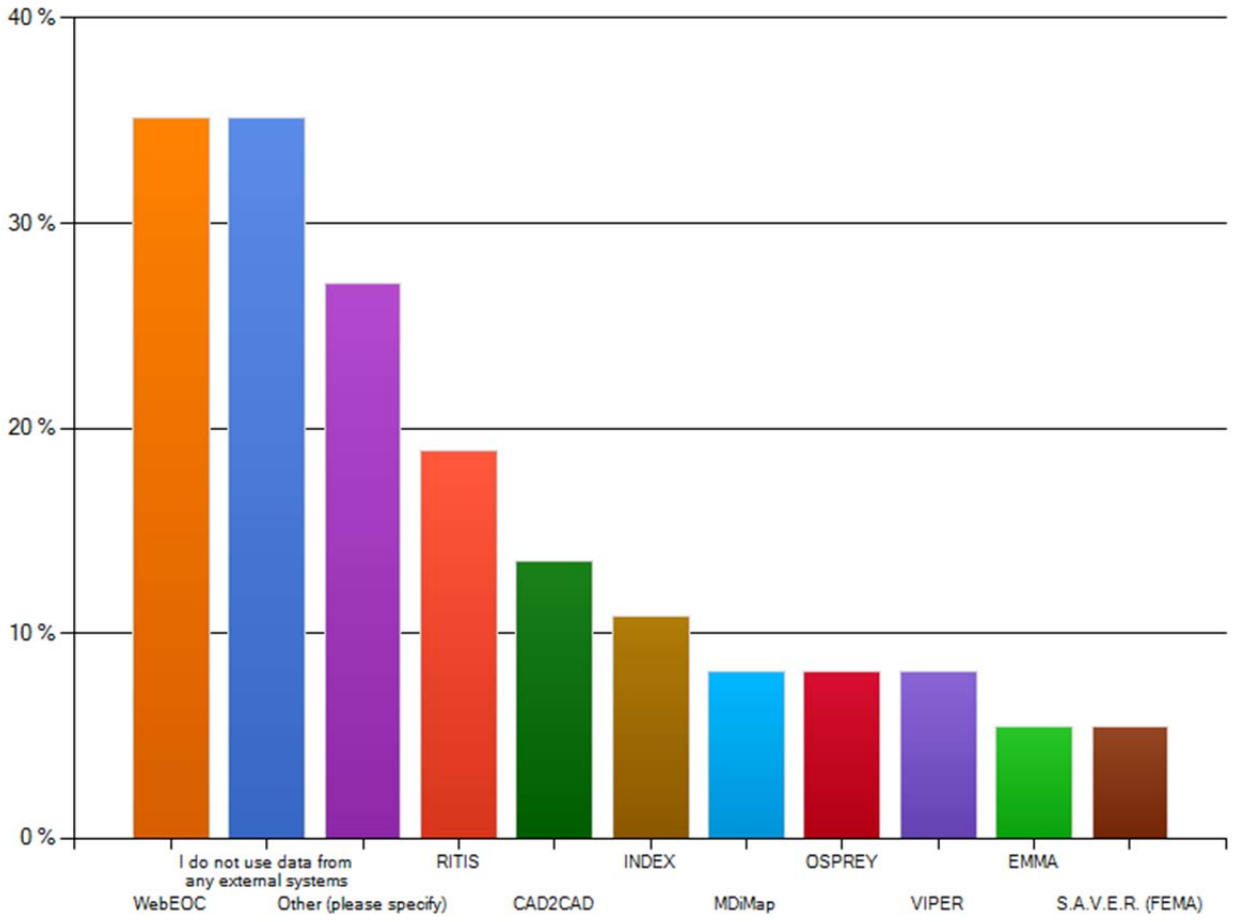
5.0 NCR Needs for Extra-jurisdictional Data

The survey also sought to identify the information needs of each respondent for data from outside their jurisdictional boundary. This information was requested by first asking about data that is currently being accessed from external systems, followed by specific requests for the identification of map and incident/real-time data of interest to the survey respondents.

5.1 Data Currently Being Accessed and Used from External Systems

As illustrated in Figure 7 a relatively large number of respondents reported they access WebEOC or do not access any external systems for information (approximately 35% each). Multiple respondents report they use RITIS, CAD2CAD, INDEX, MDiMap, OSPREY, VIPER, EMMA and SAVER. Within the "Other" category, the following external information systems were reported: VDOT, MDOT, Traffic Management Centers, TrafficLand and the National Weather Service.

Figure 7
Data Currently Accessed from External Systems

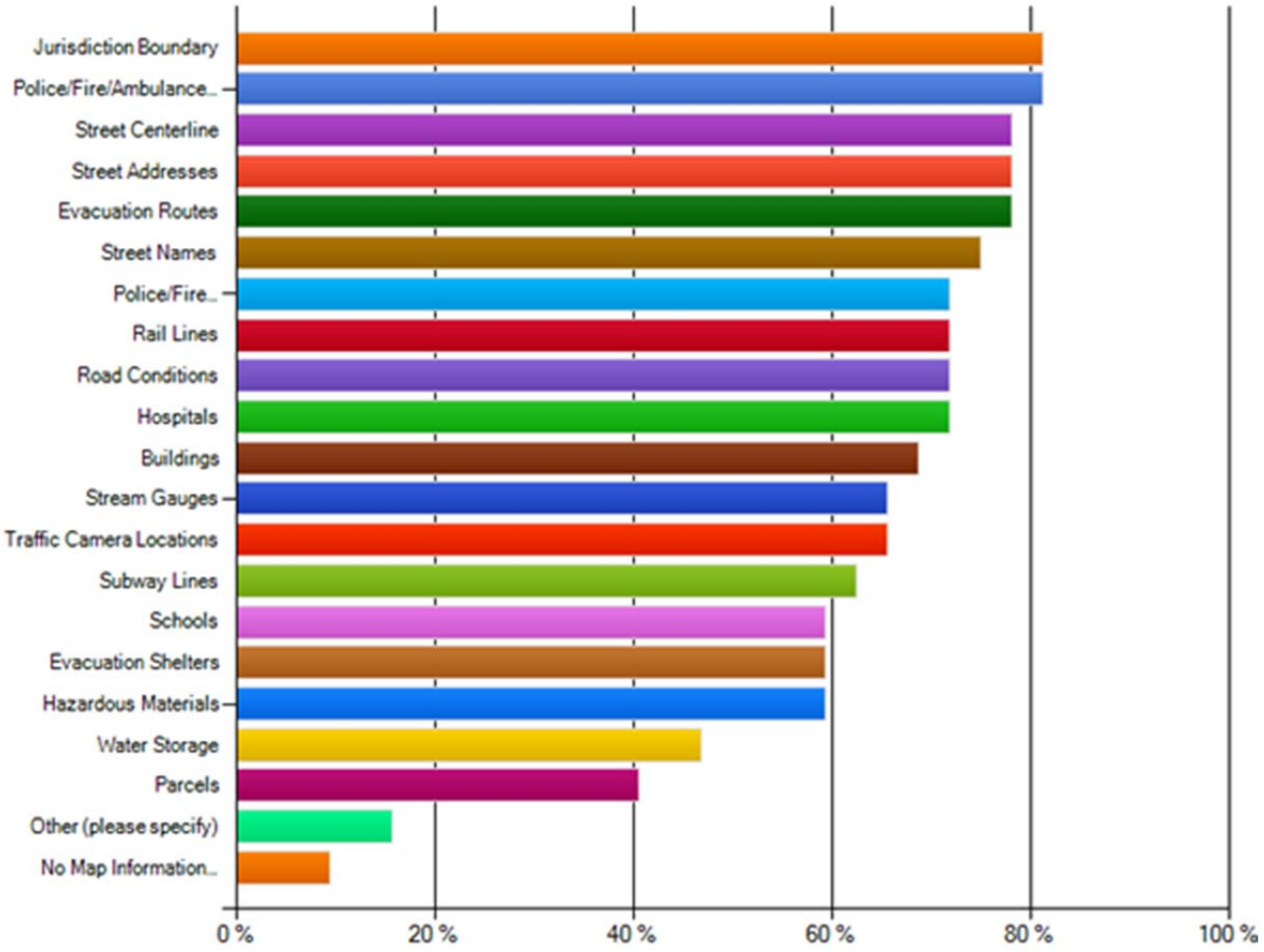


5.2 GIS Map Data

Figure 8 reports the types of map information the respondents would like to receive for areas outside of their jurisdiction. The response indicates there is a large number of the respondents (40% or greater) have high interest in both base map information and map information associated with emergency response and response planning.

Comparing the statement of need in Figure 8 with the respondent's earlier identification of map data they are willing to share (Figure 6), it appears the NCR GDX web portal can provide an environment where many of the needs for extra-jurisdictional map information can be satisfied.

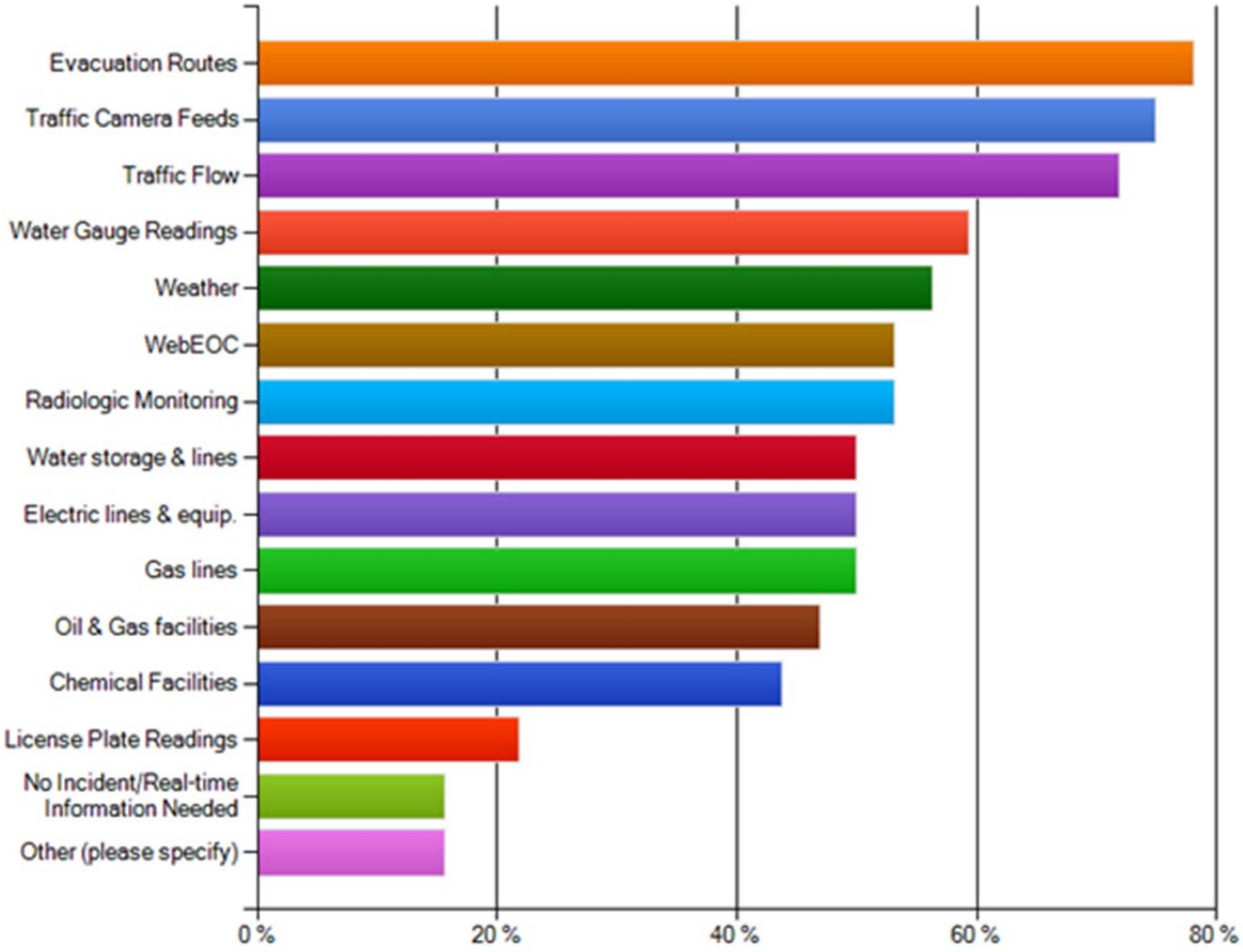
Figure 8
Extra-jurisdictional GIS Map Data of Interest to NCR Members



5.3 Incident and Real-time Data

Figure 9 reports the extra-jurisdictional incident and real-time data that the NCR respondents are interested in receiving. What is particularly noteworthy in this response is the existence on the part of a large number of respondents of an interest in data that is considered by the managers of the data as sensitive or highly sensitive (reference the response recorded by Table 4). Determining the extent to which the sharing of sensitive data can be achieved will need to be explored in greater detail by the NCR leadership with a focus on implementing governance policies and procedures that maximize the availability of useful information while ensuing sensitive information is properly handled and protected.

Figure 9
Extra-jurisdictional Incident and Real-time Data of Interest to NCR Members



6.0 Findings

KCI's Phase 2 data inventory effort resulted in a relatively broad sampling of the jurisdiction types and functional areas represented by the NCR participants involved in the Geographic Data Exchange project. If it can be assumed that the responses received from the survey are generally representative of the technology status, data resources and data needs of the larger NCR, several key findings can be culled from the survey responses. These findings have been organized into the following four categories:

1. NCR Technology Readiness
2. Available Data and Existing Data Service Consumption Practices
3. Data Sources of Value to Emergency Operations
4. Extra-jurisdictional Data Needs

NCR Data Inventory Findings and Recommendations

NCR Technology Readiness

- Most (50%+) of the NCR participants appear to have implemented ArcGIS Server and are experienced with publishing GIS data feeds.
- NCR adoption of ArcGIS Server technology could reach greater than 75% over the next few years.
- There is a need for the NCR GDE project to continue providing a capability for NCR participants to publish their map data without the use of ArcGIS Server.
- Most of the participants in the NCR are using Microsoft's Internet Explorer browser technology.
- Some NCR participants are using Google Chrome, Firefox and Safari internet browser technology, so the NCR GDX web portal will need to support these other browser technologies if it is to serve the broader NCR participant population.
- Most NCR participants are using Flex-based map viewers to access and view map information.
- Some NCR participants are using Java-based and Silverlight-based map viewing technology, so the NCR GDX will needs to provide plug-ins and widgets that enable the integration of the NCR GDX into NCR participant map viewers utilize Java and Silverlight.

Available Data and Existing Data Service Consumption Practices

- The NCR participants express a willingness to share a wide range of GIS map date with other members of the NCR.
- NCR Participants are willing to share much of the data they collect that is unique to their mission. For cities, counties and water utilities this embraces property, address, building and facility information. For state agencies this involves state owned land, highway and facilities and potentially certain environmental information. The NCR's regional transportation operators have transportation facility data and transportation utilization information available. Universities have NCR data related to evacuation routes, staging areas, weather and CCTV/Radio Scanner feeds.
- NCR participants have well established data sharing and data consumption practices. Many are providing their data to support state, regional and federal GIS interoperability systems, and many are accessing and using data provided by these systems.

Data Sources of Value to Emergency Operations

- A wide range of map data appear to be available that have value to emergency, planning, response and recovery (EPR&R) operations. This includes police/fire/ambulance response boundaries, police/fire stations, schools, hospitals, rail, traffic camera locations, evacuation shelters, road conditions, subway lines, evacuation routes, hazardous materials, water storage and stream gauges.
- Highly sensitive incident and real-time data is available to qualified recipients for the support of EPR&R operations. This includes data coming from WebEOC incident responses, traffic

flows, oil & gas facilities, license plate readings, gas line, chemical facilities and radiological monitoring.

Extra-jurisdictional Data Needs

- Broad interest across NCR participants exists for map information from outside the participant's jurisdictional boundary.
- 'Standard' map information about jurisdiction boundaries, response areas, streets, addresses, property, buildings, rail and subway lines for the greater NCR region is of interest to most NCR participants.
- EPR&R map information for the greater NCR region is also of interest to most NCR participants, including information on road conditions, hospitals, schools, traffic cameras, stream gauges, water storage, evacuation shelters, evacuation routes and hazardous material storage.
- Many NCR participants would like access to data sources and feeds considered by their providers as sensitive or highly sensitive, including WebEOC incidents, evacuation routes, electric and gas lines, chemical facilities, license plate readings and radiological monitoring.

7.0 Issues and Recommendations

The volume of responses and limits to the depth and range of data that the data inventory could collect prevents an analysis of issues like achieving full and consistent NCR coverage for certain data types or the adequacy of data maintenance practices. Despite these limitations, however, the KCI Team has identified a few salient issues related to supporting NCR data needs through the NCR GDE project. The following presents these issues along with recommendations on how to address each issue.

Issue #1 – Need for a Consistent, Common Base Map

Although the NCR has local government participants willing to share essential base map information it is difficult to tell from the survey if a consolidated and consistent base map of at least street centerlines and address ranges could be assembled and kept reliably up-to-date. Considering one critical base map features – routable street centerlines – while the best and most up-to-date street addressing data will be available from each local jurisdiction, it has been acknowledged that these local sources will not edge-match at jurisdiction boundaries.

Recommendation #1: Utilize the HISP NAVTEQ State Data

The KCI Team recommends the NCR utilize the HISP NAVTEQ State data as an NCR region street centerline base map. The HISP NAVTEQ data set would serve in addition to local street centerline line data, but used as the primary routing feature for regional incidents and planning.

It is also recommended that the NCR Leadership Team determine if the NCR GDX needs consistent orthophotography to supplement the NCR base map. If it is determined that orthophotography is needed, a follow-up effort will be required to identify the best source(s) for the rectified photography and make provision for the acquisition and central storage of this data set.

Issue #2 – Need to Determine Standardization Requirements for Regional Data Sharing

Currently, the various participants in the NCR GDE project use a variety of coordinate systems and datums. Without a coordinate system standard being adopted and participant data published using the standard, the various sources of shared map information will not geographically align and overlay.

Recommendation #2-A: Consider Standardizing on HISP NAVTEQ's Coordinate System

To provide a consistent and useable frame of reference the NCR needs to define a standard coordinate system that will be used for all data so that arrangements can be made by each participant to publish their GIS data using the coordinate system or have their published data transformed interactively.

It is suggested that the NCR consider adopting the coordinate system used by the HISP NAVTEQ State date – i.e., WGS'84 geographic coordinates in the M.m (decimal minutes) format. The impacts of this potential standard will need to be evaluated by an NCR GDX data standards working group to determine if it is practicable and if it is not, a datum and coordinate system should be identified that can be adopted as a standard.

Recommendation #2-B: Create NCR GDX Data Standards Working Group or Sub-committee

In addition to determining a coordinate system standard, a variety of other data sharing issues can be anticipated that will need to be considered for standardization. These might include:

- Content standards for certain map feature classes (for example transportation and hydrography)
- Normalizing jurisdiction boundaries
- Coordinating the acquisition of orthophotography

As part of its work on establishing governance for the NCR GDX, the project's leadership group needs to consider the creation of a NCR GDX Data Standardization working group or sub-committee to advise and respond to the data standardization needs associated with optimizing the sharing of NCR information using the GDX.

Issue #3 – Expanding Ability to Integrate NCR GDX into Native NCR Systems

The NCR GDX currently offers a Flex-based widget that allows participants with GIS systems utilizing Flex to imbed access to the NCR GDX portal directly into their native application (avoiding the need to open a separate session window to access NCR GDX data). The NCR GDE project has as one of its deliverables the creation of a widget that enables integration with Google Enterprise. This leaves native systems that utilize other map viewing technologies unaddressed, in particular: Java, Silverlight and HTML5 map viewers. NCR participants with map viewers and native systems based on these technologies will not be able incorporate NCR GDX access into their applications.

Recommendation #3-A: Develop NCR GDX Widgets to Support Non-Flex Viewers

The KCI Team recommends that the NCR GDX include in its software development agenda and development of widgets that support map viewing technologies based on Java, Silverlight and HTML5.

Recommendation #3-B: Ensure NCR GDX Support for Alternative Web Browser Technologies

The data needs inventory also reveals that while Microsoft's internet technology is in dominate use, there are NCR participants using alternative web browser technologies that includes Google's Chrome, Mozilla's Firefox, and Apple's Safari. This underscores the importance of including support for these alternative web technologies in the on-going enhancement of the NCR GDX portal software.

Issue #4 – Expanding the Utilization of the NCR GDX

While a fairly high degree of participation occurred during the course of the NCR GDE project the ongoing success of the NCR GDX requires that a continuing process be put in place dedicated to expanding participation in and utilization of the NCR GDX.

Recommendation #4 – Develop and Implement an Education, Outreach and Support Program

It is recommended that an NCR GDX education and outreach program be developed and implemented to encourage and deepen the utilization of the NCR GDX. Elements of the program should include:

- The development of communication media (hard copy and video) that explains the vision of the NCR GDE program, the capabilities of the NCR GDX, and the benefits of participation.
- An outreach program specifically targeting the law enforcement and emergency response community, explaining the features of the NCR GDX for ensuring information security and soliciting the involvement of this community in the NCR GDX.
- A program of periodic on-site visitation by NCR GDX staff with participating agencies to provide NCR GDX training, technology and data support.
- A mechanism for providing help desk and remote technology support to participants.
- The development and periodic execution of event preparedness exercises that engage NCR participations across jurisdictions, levels of government and sectors in a collaborative, data sharing response to staged emergency events.

8.0 Approval

The signatures below indicate review and acceptance of the NCR Geospatial Data Exchange Requirements document, and will initiate the development and implementation of the solution by the KCI team. Any additional requirements identified that are outside of the defined scope as detailed in the Requirements document will be managed and using a change management process to ensure proper analysis and design steps are executed.

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Mr. Robert Horne Date
Contract Manager / NCR Geospatial Data Exchange
District of Columbia Office of Chief Technology Officer

Appendix A

The following provides a hardcopy version of the Survey questions implemented using Survey Monkey.

-- INSERT PDF of Designed Survey --