# Network Planning Action Team

State/EPA
Information Management Workgroup

# Exchange Network Business Plan

**March 14, 2005**

Prepared for:
State/EPA Information Management Workgroup

*Contract Number:*     *GS00T99ALD0203*
*Task Order Number:*   *T0002AJM038*

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We, the members of the Network Planning Action Team (NPAT), submit this report to the State/EPA Information Management Workgroup (IMWG) for its consideration. This report encapsulates NPAT's key discussions about the Exchange Network (Network), including those related to Network governance and funding, and provides specific proposals for enhancing the effectiveness and operation of the Network.

By signing, we are endorsing this report and calling on IMWG to act promptly to implement the report's proposals.
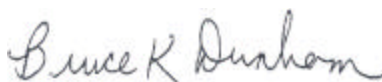
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# Acknowledgements

This document reflects the support and analytic contributions of a number of individuals and programs within EPA, states, and tribes. These individuals offered valuable insight, lessons learned from their Network implementation experiences, and hard work in creating the Exchange Network Business Plan.

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# Section 1.  Executive Summary

The State/EPA Information Management Workgroup (IMWG) commissioned the Network Planning Action Team (NPAT) to develop a Business Plan for the Exchange Network (Network). This Business Plan contains a set of related strategies and proposals for the IMWG that are intended to guide the Network's operation, evolution, and growth, as it moves from a period of conceptualization and initiation to a period of managing implementation and expansion. The Executive Summary provides a broad overview of the six most significant proposals detailed in the Business Plan.

## 1.1  Refined Network Vision

The NPAT proposes the following vision as the foundation for the further evolution of the Network:

> *"The Exchange Network is a <u>partnership</u> to support better environmental decisions through improved access to, and exchange of, improved environmental information."*

Partners will achieve this vision by establishing a network of shared environmental data based on shared services, tools, and infrastructure, in order to support access to, collection of, and exchange of more and higher quality data among more partners. The Network vision leads to three goals: better data, better exchange of information, and better access to information. These goals have seven specific objectives (relevant goal or goals identified in parenthesis):

1. Increase the *speed and timeliness* of data exchange by allowing data exchanges to happen more frequently, thereby decreasing the lag between partner systems. (Exchange)

2. Increase the *efficiency of data exchange* by reducing administrative burden, including reducing or eliminating manual intervention for tasks such as scheduling, re-submissions, or security. (Exchange)

3. Improve the *quality of data* through additional and more efficient error checking and/or earlier detection of errors and discrepancies, as well as electronic collection. (Quality)

4. Improve *standardization and comparability* by using common data standards and formats to provide additional definition, structure, and integration opportunities. (Quality)

5. Harness *economies of scale* through shared infrastructure and shared tools, to achieve reduced costs and expanded functionality. (Exchange, Access, and Quality)

6. Increase the amount of data shared among partners by encouraging *more flows* over the Network and *among more partners*. (Exchange, Access)

7. Increase *data use and integration across institutional boundaries* by leveraging a common strategy for environmental Web services. (Access)

## 1.2   Refined Network Components

Detailed below are NPAT's proposed expansions and refinements to the original Network components. Each of these components contributes to at least one of the seven objectives above.

*Shared strategy for environmental Web services:* The NPAT calls for establishing a shared strategy for environmental Web services as a core component of the Network. This concept, of partners publishing and consuming environmental data via the Network, has been a presumed (by many) but largely unspoken and unsupported premise of the Network.

*Data standards and shared formats:* These formerly separate components are integrated as a reflection of our implementation experience. This experience is also reflected in the NPAT governance proposal, detailed below, to integrate and strengthen Network activities and data standards leadership and management into the Exchange Network Leadership Council. Data standards are documented agreements among partners on the names, definitions, and formats for data. Partners commonly use shared formats, specifically XML schema.

*Common exchange and access tools:* This component refines and expands on the original concept of Network nodes to include network clients and the associated applications partners are building to publish and consume published resources.

*Common business practices, procedures, and software for electronic reporting and data collection:* This component includes the set of related shared practices, procedures, and software used for electronic collection of data from sources, such as regulated entities, laboratories, and field personnel and stations.

*Shared services and infrastructure:* This component recognizes that the most important shared assets may be services, rather than physical infrastructure, and that there are opportunities to use Network partnerships to create new, shared services that could be widely deployed. These represent the next frontier of material partnership.

*Trading partner agreements:* No major changes proposed.

## 1.3   Detailing Network Exchange Scenarios

The Network Blueprint presented a simplified schematic for how EPA and its partners would use the Network to exchange data. Network experience has shown that EPA and its partners are engaged in a much more complex and rich web of data flows than previously depicted, and that the Network components themselves contribute to a far more complex set of possible exchange scenarios. Until fairly recently, most Network participants expected that all state agencies and tribes with Network connections would have complete nodes in place to handle data exchanges and queries. However, it now appears that this will not necessarily be the case. The NPAT establishes a series of exchange scenarios detailing several ways in which partners can exchange data and shows how each of the scenarios use the Network components.

## 1.4   Enhancing Flow Development and Management

Designing a progressive Network of flows requires real, collective work — it is not simply a matter of switching from a flat file to XML or using CDX. The non-regulatory and state-to-state flows are important to the Network, of interest to partners, and are going to become increasingly

focused. Therefore, a key challenge facing the Network now is how to support partners in designing and managing the flows that will leverage the value of the Network, and in doing so, expand it. Enhancing use of the Network will require more explicit attention to how and where partners apply Network components to flows. To support this, NPAT addressed:

- Key design decisions in selecting and designing Network flows

- Application of the design patterns of "automated flows" and "data publishing"

- Support and management of flow development and operation

# 1.5   Network Data Area Strategies

The Network Blueprint proposed a scrupulous separation between the administration of the Network and any consideration of programmatic, media, or regional data needs or customers. The intent was to buffer the infrastructure of the Network from disagreements among partners about programmatic and other policy priorities. Partners were left on their own to identify (or create) communities of interest, understand the Network, develop the exchange scenarios relevant to these communities, and implement them. However, this approach has acted as a barrier to implementation on both the programmatic and technical fronts.

Going forward, the Network governance must assert its role in supporting communities of interest around a given flow as these communities negotiate and document their business objectives, their connection to the Network vision, and the role of each flow part. The Network governance has no "power" over these communities — only the communities themselves can forge agreements — but the Network governance can convene and connect. Network success depends, in part, on the success of these communities.

To support communities of interest, the Network should actively support the development of Network Data Area Strategies. The content of these strategies will be up to the communities of interest, but should include the following framework components:

- A definition of the data area, a delineation of its scope, and a catalogue of linkages to other data areas

- An inventory of current major partner programmatic activities and initiatives

- An inventory of existing Network projects

- A list of major information gaps and/or priorities

- Opportunities and requirements for grant coordination (both Network and other)

- A list of shared objectives and opportunities for flows, along with a sketch of the relevant partners and exchange scenarios for each flow

# 1.6   Funding and Governing the Network

Based on the refinements of the vision, components, and uses of the Network — and informed by our lessons learned from recent implementation experience — NPAT proposes a governance structure based on five high-level conclusions, reached by NPAT after a great deal of deliberation. These conclusions are:

1. Stronger leadership and oversight of the Network is needed, and it is not being provided by the IMWG plenary.

2. Responsibility for strategic direction and policy should be separated from responsibility for operations.

3. The functions of the Environmental Data Standards Council (EDSC) and the Network Steering Board (NSB), and its sub-groups, should be strengthened and integrated.

4. States and EPA should continue to host joint Network governance entities; no new legal entity or formal organizational affiliation should be created. This approach retains the option of using co-regulator entities, such as ECOS or others, as administrative and/or fiscal agents. Changes to organizational hosting are not ruled out for the future.

5. The position of an Exchange Network Executive Coordinator should be created.

From these five conclusions, NPAT identified the following revised organizational structure:

- Exchange Network Leadership Council — would provide high-level direction, prioritization, and management of information exchange issues, including data standards. These issues are centered on (but not limited to) the Network and include providing leadership and management of data standards.

- Network Operations Board — would have primary responsibility for the operations of the Network, especially the shared services and infrastructure provided to partners, such as help desks, guidelines, security servers, and implementation support. The Network Operations Board would report to the Exchange Network Leadership Council.

- Exchange Network Executive Coordinator — would be a new position (supported by other staff) that would be responsible for coordinating and reporting on the status of all major collective and individual partner Network activities. These activities include flow development, flow implementation, and the associated infrastructure and services. The Exchange Network Executive Coordinator would report to the co-chairs of the Exchange Network Leadership Council, but work with all levels of the governance and coordinate with the key partner staff working on the Network.

For funding, this Business Plan describes the current funding sources and the Network funding categories for the next 3–5 years. It also provides an illustrative scenario for the completion of the initial development of the Network and analysis concerning Network financing trends and vulnerabilities. NPAT arrived at the following five key findings about funding:

1. Network flow implementation has been and will continue to be the dominant cost of the Network. These costs are a key leverage point, because we seek cost reductions through economies of scale and technology transfer — especially for the collection, access, and exchange tools. Once implemented, we expect each flow to shift mostly to operations and maintenance costs, which should be much lower.

2. Efforts to estimate costs and benefits of the Network, including an illustrative resource estimate in this Business Plan, have been hampered by our limited implementation experience, the immaturity of base technologies, and the diffuse nature of many of the relevant expenditures. The Exchange Network Leadership Council should commission and oversee development of a formal assessment of the benefits, costs, and costs avoided for the Network as an enterprise.

3. The Exchange Network Grant Program is the single most important funding component. Without it, Network progress would unquestionably be slowed, if not stopped. For the next five years, the Network's primary vulnerability is a funding shortfall prior to the completion of a substantial portion of development. Until the Network is no longer an ancillary project, competing for funding with business critical projects, Network development and operations and maintenance (O&M) costs must be substantially and externally supported.

4. It is imperative that the Network grants be strategically coupled with Network priority outcomes to produce products for the Network community — products that can be used by other partners, products that can encourage subsequent participation, and products that help partners with their business. For instance, prioritization of funds to ameliorate specific impediments to priority flow implementations. Network Data Area Strategies should inform this effort.

5. Establishing strong linkages to the programmatic and business priorities of the Network community must be a core priority. Programmatic grant alignment is one of the most critical initiatives concerning Network financing. Programmatic grants are a stable funding source and at a minimum must not discourage use of the Network. Conversely, at the point where the Network becomes a preferred or primary mechanism, and is incorporated into the partner business processes, programmatic grants must support Network O&M.

# Section 2.  Introduction to the Exchange Network Business Plan

## 2.1   Business Plan Objectives

The State/EPA Information Management Workgroup (IMWG) commissioned the Network Planning Action Team (NPAT) to develop a Business Plan, with a five-year planning horizon, for the operation, evolution, and growth of the Exchange Network (Network). This Business Plan builds upon previous work, including the *"Blueprint for a National Environmental Information Exchange Network"* (Blueprint) and *"Implementation Plan for the National Environmental Information Exchange Network"* (Implementation Plan). It also builds on the experiences to date of Network implementers.

The objectives for this Business Plan are to:

- Describe the vision for the Network, and the components and types of data exchanges that flow from that vision

- Establish a Network use and growth strategy

- Identify financing imperatives for the Network

- Establish a sustainable governance structure for the Network

## 2.2   Business Plan Audience

This Business Plan contains a set of related strategies and proposals for the IMWG. Its primary audience is therefore the co-chairs and members of the IMWG. This Business Plan proposes a sustainable framework from which the Network community and Network governing bodies can develop, maintain, and operate the Network. This Business Plan assumes a working knowledge of the Blueprint, the Implementation Plan, and of the existing Network.

## 2.3   Business Plan Context

There are four reasons to create the Network Business Plan now:

1. EPA and the states, tribes, and territories that form most of the current Network community are moving from conceptualization and initiation to managing implementation and expansion of the Network. This movement requires planning.

2. The Network community's experience with implementation has advanced the collective understanding of the Network's design, use, and value. The Network community must now agree on and document this advanced understanding to ensure that everyone is building the same Network.

3. The Implementation Plan only covered through the fourth quarter of 2004. This is where we are as we develop this Business Plan.

4. To ensure that we collectively make best possible use of the public funds being used for Network purposes.

Moving toward Network implementation and expansion poses challenges for the Network community. Network partners are attempting to leverage a technological change while simultaneously improving their business processes. Each activity is hard. It is even harder to do both together. Over the past few years, the Network community has spent a great deal of time, energy, and resources on technological change, creating a stable technical architecture. This architecture provides the Network community with a base from which it continues to grow. However, without linking the technical activities to business processes that can ultimately help partners improve environmental decisions, the Network is simply a demonstration of a new technology.

## 2.3.1   Review of Previous Network Planning Efforts

The Blueprint defined the initial Network vision and design principles. It also provided a high-level business case for the Network and identified key Network components. While this Business Plan will be consistent with core Blueprint concepts, some of its material refines or supersedes concepts identified in the Blueprint. The Network community's implementation experience has enhanced its vision and understanding of the Network.

The first Network strategic planning document, the Implementation Plan (2002), described Network implementation milestones through the fourth quarter of 2004. The core concepts in the Implementation Plan still apply to this Business Plan. The Implementation Plan described Network development strategies, such as learn by doing, demonstrate successes, build incrementally, be flexible, and commit to changing the way data is exchanged. As the Network community continues to build the Network, partners are raising issues beyond the scope of the Implementation Plan. Many of these are about operation and maintenance of the Network, rather than conceptualization and initiation. They are issues of long-term Network sustainability. For example, the Network Blueprint and Implementation Plan describe only one primary way of interacting with the Network; however, now that the Network community has more implementation experience, it is clear that there will continue to be many ways of interacting with the Network. This Business Plan addresses those long-term issues and describes, for the first time, different types of Network use.

In June 2004, the Environmental Council of States (ECOS) produced the *"Exchange Network Management Review"* (Johnstone Report). The Johnstone Report contained over 30 recommendations on how the Network should evolve. Included were preliminary recommendations on a revised Network governance structure. A key recommendation was to begin a strategic planning effort in 2004 to guide the transition from the Network's "start up" phase to the Network's operation and maintenance phase. The Johnstone Report identified a number of other issues, but in most cases, referred them to the IMWG for consideration and further development. This Business Plan is the first major component of the IMWG's response to the Johnstone Report.

## 2.3.2   Network Successes to Date

Ultimately, the Network community envisions utilizing the Network for applications that span the entire spectrum of environmental data and exchange partners. This process is just beginning, but partners have achieved a number of important successes to date.

Key Network successes have been of two types. First are "getting ready" projects, in which partners organized and implemented their technical capacity to use the Network, and made corresponding adjustments to their internal organization and external relationships. Second are "first flows/first projects," in which partners, individually or in groups, implemented specific flows. Specific examples of both types of early successes include:

- Implementation and demonstration of the basic technical infrastructure needed to flow data across a wide variety of flows for over 30 state partners by the end of 2004

- Establishment of many significant joint products, including:

  - 15 major data standards and over 20 major XML schema

  - A growing set of guidance and flow documentation

  - Shared infrastructure and services, such as a common security server and the www.exchangenetwork.net Web site

- Development and implementation of multi-state tools for electronic reporting in several major program areas, including surface water, drinking water, air emissions, and others

- Implementation of data sharing collaborations for surface water (i.e., the Pacific Northwest Water Quality Data Exchange), which are now being actively targeted for replication and expansion by other partners

A much more complete description of Network successes to date can be found on the www.exchangenetwork.net website.

In addition to these successes, awareness of the Network as a viable tool for exchange has also continued to grow. The Network is now the default or the "default alternative" for many flow re-engineering projects or new flow efforts.

As discussed at length in this report, a key challenge currently facing the Network is to take these successes and build them into a robust, reliable framework of tools and exchanges. This must include broad implementation and replication by partners of multiple flows, including those that leverage Web services to provide new functionality based on common specifications. It must also include broad implementation and replication of electronic reporting and access tools, which in turn support additional flows of data.

For now, the Network is competitive as an exchange approach because of the resources of the grant program, the enthusiasm of early partners, the enthusiasm of new partners attracted to the Network's progressive technical approach, and the support of EPA. Future penetration and expansion of the Network will require that it demonstrate its operational and performance advantages.

## 2.3.3 Business Plan Organization

The Blueprint and Implementation Plan provided a basis for the *conceptualization and initiation* of the Network. This Business Plan provides the basis for *managing the implementation and expansion* of the Network. It highlights "findings" and "proposals" to present the Network community's shared understandings and decision points for the IMWG to discuss.

Section 3 focuses on the question "What is the Network?" It contains an updated vision, goals, and objectives for the Network. It then describes the components of the Network and how partners can use them for different kinds of data exchanges.

Section 4 describes how partners can and should use the Network. It begins by describing how the concept of "using the Network" has evolved. The section then focuses on data flows, including flow design. It then calls for an ambitious effort by the Network community to realize the Network's full capabilities. It closes by describing the particular challenges faced by tribes participating on the Network.

Sections 5 and 6 explain "How the Network is Sustained" by describing strategies for financing (Section 5) and governance (Section 6).

# Section 3.   Refined Description of the Network

*"Strategic planning is worthless—unless there is first a strategic vision."*

— *John Naisbitt*

Section 3 describes the Network. This section builds on the Blueprint and Implementation Plan to illustrate how the Network has evolved and to outline a Network vision, the components that make up the Network, and how the our new understanding has clarified Network use. This next generation of understanding underpins how the further growth and use of the Network can be managed. Section 3 begins by refining the Network vision and associated goals and objectives. Next, it describes a recast set of Network Components that support the Network vision. Finally, it discusses how the most common types of data exchanges use the Network components to meet business needs.

## 3.1   Exchange Network Vision, Goals, and Objectives

The Network has achieved widespread popularity and acclaim[1]. However, if you ask partners to define the Network — its opportunities and commitments — the diverse answers show there is still work to do. The broad reach of their answers reflect both the broad scope of the effort, and the ambiguity and complexity in the underlying ideas. This report seeks to continue the work of the Blueprint and the Implementation Plan by refining and focusing the Network vision and its practical realization; this is the only sound basis for planning. Building on our current success and overcoming our challenges now requires a compelling Network vision that captures an evolving understanding of the Network. This developing understanding will serve as the foundation for a much more detailed plan for how the Network will expand and operate.

In 1998, the IMWG established vision and operating principles for data exchange among EPA, states, and other entities. The vision and operating principles calls for partners to:

> "…build locally and nationally accessible, cohesive, and coherent environmental information systems that will ensure that both the public and regulators have access to the information needed to document environmental performance, understand environmental conditions, and make sound decisions that ensure environmental protection.[2]"

The vision described by the IMWG inspired our current Network success, and it is still a valid guide. The Network vision described in this report is about implementation of the Network, which is only a piece of the vision and operating principles. This Business Plan asserts the following Network vision:

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[1] Richard W. Walker. "Interstate exchange: Management was key to putting EPA network together," <u>Government Computer News</u>, Vol. 23, No. 30, pp. 34-36 (October 11, 2004).

[2] Information Management Working Group. *"State/EPA Vision and Operating Principles for Environmental Information Management,"* (March 1998). Available at: http://www.epa.gov/oei/imwg/files/vop.pdf

| **The Exchange Network Vision** |
| --- |
| The Exchange Network is a partnership to support better environmental decisions through improved access to, and exchange of, improved environmental information. |

Partners will achieve the vision by establishing a network of shared environmental data based on shared services, tools, and infrastructure, in order to support access to, collection of, and exchange of more and higher quality data among more partners. The Network vision provides a link between the IMWG vision and the technological means to achieve the vision by explicitly linking Network technology to improved environmental decisions.

Implicit in the Network vision are three goals: better data, better exchange of information, and better access to information. These goals have seven specific objectives that identify how the Network will contribute to better access, better data, and better exchange. The objectives are identified below along with the relevant goal or goals identified in parentheses.

1. Increase the *speed and timeliness* of data exchange by allowing data exchanges to happen more frequently, thereby decreasing the lag between partner systems. (Exchange)

2. Increase the *efficiency of data exchange* by reducing administrative burden, including reducing or eliminating manual intervention for tasks, such as scheduling, re-submissions, or security. (Exchange)

3. Improve the *quality of data* through additional and more efficient error checking and/or earlier detection of errors and discrepancies, as well as electronic collection. (Quality)

4. Improve *standardization and comparability* by using common data standards and formats to provide additional definition, structure, and integration opportunities. (Quality)

5. Harness *economies of scale* through shared infrastructure and shared tools to achieve reduced costs and expanded functionality. (Exchange, Access, and Quality)

6. Increase the amount of data shared among partners by encouraging *more flows* over the Network and *among more partners*. (Exchange, Access)

7. Increase *data use and integration across institutional boundaries* by leveraging a common strategy for environmental Web services. (Access)

## 3.1.1  Proposals

- Adopt and use the vision in this plan as the basis for management and collaboration on the Network

- Agree to continue validating and refining this vision though practice

- Adopt the goals and objectives, and affirm through periodic review that the Network, as outlined in this Business Plan, is the best way to achieve them

- Agree to continue validating and refining the goals and objectives through practice

# 3.2   Revised Exchange Network Components

This subsection is a detailed description of Network components necessary to achieve the Network goals and objectives. These components are:

- Shared strategy for environmental Web services

- Data standards and shared formats

- Common exchange and access tools

- Common business practices, procedures, and software for electronic reporting and data collection

- Shared services and infrastructure

- Trading Partner Agreements

This set of components builds on the Network components in the Blueprint. As predicted in the Blueprint, the Network has developed along the paths of greatest need and interest to the partners. The new components reflect those needs and interests. Some of the components originally described in the Blueprint, such as data standards, are combined with other components, such as data exchange templates/schema components, because of their deep inter-relationships and co-evolution. Some of the components, such as access and exchange tools, are expanded to reflect current practice. Other components, like electronic reporting, have been implicit in the Network, but not explicitly identified. Finally, some new components, such as Web services[3], have emerged and been added as technology as our understanding has advanced.

To some, the Network components described here simply restate the obvious; to others they will significantly expand the scope of the Network. To those with the latter perspective, it is critical to note that the components do not cover all things related to information and environment. The components establish a stronger basis (and operational criteria) to identify core Network issues and projects. Of course, just as this Business Plan updates the components described in the Blueprint, partners must continue to review and update components on a regular basis as technology and/or business needs change.

Each of these components is described in detail below.

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**An Analogy for the Network Components**

The electronic components of a radio serve as a good analogy for how the Network is greater than the sum of its parts. By putting specific (but generic) electronic components together in a specific way, they create something greater — a radio. Each of the radio's components is important — the radio cannot operate without any one of them. At the same time, each component can be used for many purposes other than building a radio. For the Network, while the components can and will be employed separately, only when they are assembled do they constitute a Network flow.

To extend the radio analogy, if many people coordinate the way they assemble the electronic components, together they can create a new medium — broadcast radio. Like the radio's electric components, many partners may create some or all of the Network parts separately (e.g., Web services). By creating them in a coordinated way, via the Network components, they create new capabilities (i.e., broadcast radio) and efficiencies (i.e., the parts are cheaper because of standardization).

The shared strategy for environmental Web services Network component completes this analogy by proposing that just such a purposeful set of components be created in order to create a new kind of Network.

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[3] Web services are automated resources accessed via the Internet and use a standardized eXtensible Markup Language (XML) messaging system . XML lies at the core of Web services, and provides a common language for describing Web services and Web service directories.

For each component, a set of candidate next steps and preliminary goal statements are included. The goal statements are provided to help focus the implications and importance of working on these components. Taken individually, they provide direction for that component (e.g., that we envision both a large and growing constellation of shared Web services and an infrastructure to manage them); taken together, they provide an additional, more detailed picture of what a "mature" Network would look like and how it would operate.

## 3.2.1   Shared Strategy for Environmental Web Services

*Definition: Direction and support to enable coordinated design and use of environmental Web services on the Network.*

This Business Plan calls for establishing a shared strategy for environmental Web services as a core component of the Network. This concept of partners publishing and consuming environmental data via the Network has been a presumed (by many) but largely unspoken and unsupported premise of the Network. Web services are automated resources accessed via the Internet and are a technical foundation for the Network. By establishing a shared strategy for Web services, partners seek, from the beginning, to coordinate and collaborate on:

- Using Web services as the preferred approach when data publication is (or could be) the right model for partner interactions

- Jointly developing and mounting shared Web services that provide common, compatible information among partners and allow its easy integration, aggregation, and access

Publishing[4] data on the Network is a logical extension of Network technologies. Although the Blueprint never mentions "Web services" specifically, the concept they embody — partners establishing common services for the exchange of common data — was implicit throughout. Figure 1 illustrates potential uses of Network Web services.

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[4] In this Business Plan, "publishing data" and "Web services" are used interchangeably. When partners are described as "publishing data," it is understood that they are using Web services to do so.

Examples of Uses for Network Web Services
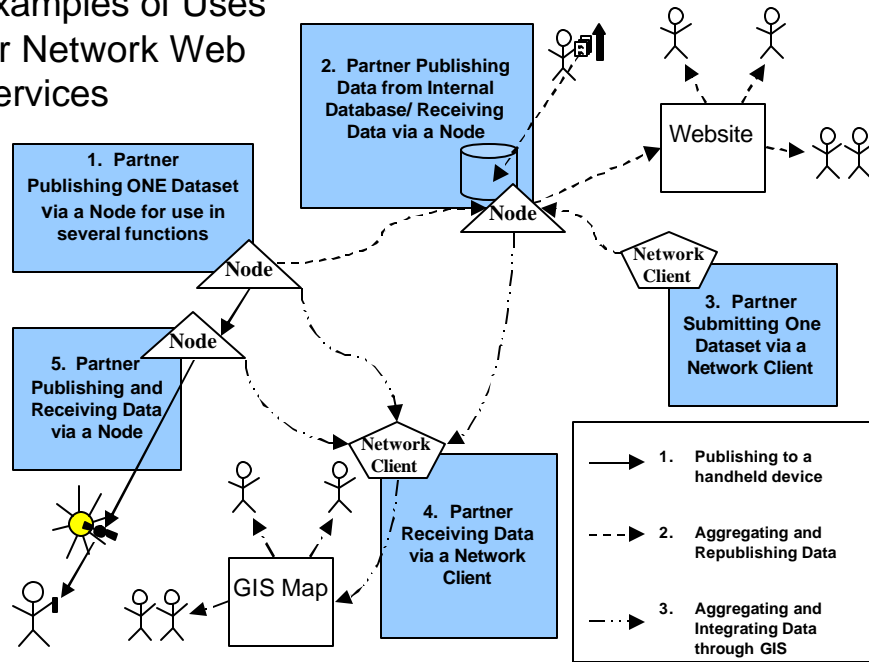


*Figure 1.  Using Network Web Services*

To date, individual Network implementers have had to discover and rediscover the concept of Web services on their own. Practitioners could infer that the Network had "something" to do with Web services, but their purpose and scope was not always clear. Network partners should now recognize that publishing data through Web services is a central component of the Network. In some cases, these publishing services will be a complement to traditional flows. In others, they will be the principal method of data exchange.

Across the Network, there are signs of renewed interest in using Web services to publish data.[5] It is important for the Network community to foster, accelerate, and guide their members in publishing data. For the purposes of the Network, the essential features of a shared strategy for Web services are:

- They allow users to go right to the source for data. For users who need only data access, this approach can avoid the problems of data latency and transactional processing associated with aggregating through other mechanisms. Queries go directly to the node that returns a response. These queries and responses, for the most part, presume no knowledge of the internal state of either partner's systems. These approaches still require agreement and support of common standards and queries.[6]

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[5] Until recently, the Pacific Northwest Water Quality Data Exchange was the Network's sole demonstration of publication of data using a Web services paradigm. However, several EPA projects underway will also provide these kinds of services. These include Facility Identification data, Air Quality summary data (from the OAQPS/OEI Air portal project), TRI data, and chemical nomenclature cross-reference information.

[6] Some business objectives (e.g., reporting to some national systems and other kinds of data aggregation) require establishing complex rules around transactions and data ownership. This is an inherently hard issue; the Network by itself does not "solve" this problem . Most solutions will require compromise and balance on all sides.

- They follow a "publish once–use many" pattern. Partners can reuse a data service in many ways, without any additional work for the provider. For example, users of the services established by the Pacific Northwest Water Quality Data Exchange (PNW WQDX) can drive a PNW WQDX website, integrate data with their own application, or use the data in an EPA regional office GIS application.

- They allow users (via their clients or nodes) to issue identical requests to multiple nodes (or just to one) and receive the data in a predictable format.

- They allow participants to use data from one or more sources, and combine or integrate that data dynamically for use in their own applications. This application may include the redistribution of aggregated, processed, or integrated data as a Web service.

The private sector provides useful examples of how Web services allow new kinds of functionality and partnerships. Both eBay and Amazon started out as storefront websites. Over time, however, both companies have used a Web services strategy to establish a complex and highly profitable network of relationships with other companies, individuals, and organizations, who might otherwise have been competitors. By "publishing" their business processes as Web services, both companies allow their partners to provide a customized "retail" front to their user communities, without the need to duplicate (or compete). This allows a community with common interests to integrate both eBay's and Amazon's services directly into their applications and websites.

By analogy, the Network's shared strategy envisions the ability of large and small data publishers to allow authorized Network partners to integrate other partners' data into their own locally tailored applications. The community "profits" by using this approach to make more powerful uses of more data. It also turns potentially redundant sources/copies of data into exchange partnerships, without subverting or limiting any partner's autonomy to create the applications and displays of data that suit their own local customers. The first uses of this approach are beginning to emerge on the Network. Oregon and Washington have established co-publication agreements that allow real-time integration of hazardous waste shipment information between the two states' data systems.

Web services will continue to gain acceptance as a development tool, and as they do, they will proliferate, Network or no Network. It is essential that the Network provide, as a service to its larger community, a shared strategy for managing this growth. The shared strategy will depict, as best it can, the issues and opportunities for collaboration on a Network of such Web services. Further, a shared strategy for environmental Web services is consistent with the Network vision and leads to the achievement of its goals and objectives by enhancing data integration and use. Web services create new ways for Network participants to identify and leverage useful data, use existing hosted services more effectively, and allow application developers to create new types of data exchanges. Increased availability and use of data, as well as coordination among users, will help Network partners improve data quality.

## 3.2.1.1 Shared Strategy for Environmental Web Services — Proposed Next Steps

- Develop an initial vision and coordinating framework for environmental Web services

- Identify the guidance and support needs of early Web service publishers

- Create a first generation catalog and tracking system for environmental Web services

### 3.2.1.2 Preliminary Goals for Shared Strategy for Environmental Web Services

- A robust, thriving, discoverable, and expanding catalog of Web services exists

- Most of the data currently reported between states and EPA will be available as standard Network Web services from partner nodes (either directly via that partner's node or indirectly through another's, perhaps EPA's node)

- An equivalent amount of new, more detailed, or more expansive, related data (e.g., minor facilities, more detail about reported facilities, or previously unavailable data) will be available from partner nodes

- Most major monitoring and laboratory electronic data will flow over, and be available from, partner nodes

- Much of the partners' semi-structured environmental data (e.g., documents such as EISs, area assessments, research reports, etc.) will be available via the Network in some form, for example, using linkages based on standardized high-level metadata

## 3.2.2 Data Standards and Shared Formats

*Definition: Data standards are documented agreements among partners on the names, definitions, and formats for data. Partners commonly use shared formats, specifically XML schema.*

The Blueprint treated a "data standards" component separately from a "data exchange template/schema" component. NPAT's decision to integrate these two areas into a single component for this Business Plan is based on the continued co-evolution and convergence of the components. As partners prepare to exchange more and new data, they find they need both new standards and shared schema at the same time. The restructuring of the components will help pace standards and schema, but standards setting will not proceed at "project pace"; the process to develop usable and accurate standards is collaborative and time-consuming, and data standards need to be more universal than a single application to a schema.

The use of data standards and shared formats follows the Network vision by streamlining data discovery, data comprehension, and data use via the Network's Web services. XML schema enable easier application of new formats and lower the transaction costs for exchanging data. Mutually intelligible exchanges cannot occur without data standards.

### 3.2.2.1 Data Standards and Shared Formats — Proposed Next Steps

- Using the integrated governance structure proposed in Section 6, establish an organizing framework for coordinating standards and schema development

- Establish a listing of standards and associated schema to support priority flow activities

- Evaluate how to make implementation of the standards easier

### 3.2.2.2 Preliminary Goals for Data Standards and Shared Formats

- Establish standards for most of the major state-EPA flows on the Network

- Register schema for all major state-EPA flows

- Develop and register draft (or better) schema for all flows the Network community identifies, while pursuing the goals of the Web services component (e.g., this would include basic shared metadata for document-based data)

- Identify standards that are important to state-EPA business and are potential future Network flows

## 3.2.3   Common Exchange and Access Tools

*Definition: Common exchange and access tools include nodes, clients, and their associated software that partners employ to use the Network. A node is a Web service provider that can correctly respond to all legitimate requests as described in the Network Node Functional Specification (Specification) and Exchange Network Protocol (Protocol)[7]. A Network client is an application that can only initiate data requests or data submissions to nodes.*

Evolution of the Network shows that partner development and sharing of data exchange and access tools are a vital and distinct Network component. The Blueprint referred only to "Network partner nodes." By broadening this component to "common exchange and access tools," this Business Plan acknowledges that the singular concept of Network nodes as the sole means of interacting with the Network was an oversimplification. Partners must have a management point for their interactions with the Network, and the management point can be a node or Network client. Nodes can both send and receive data — that is, they "exchange" data. Network clients allow ad hoc data submittal or retrieval to facilitate data exchange or access. Access tools are simple pieces of software that, either alone or as part of a larger system, provide defined access to particular sets of data. Access tools, as defined here, do not necessarily provide "public access" like Web sites, although they will often supply data to publicly accessible Web sites.

Nodes and Network clients are fundamental to achieving the Network goals and objectives because they are the means of data access and exchange. These tools can provide partners with dependable access to go with predictable Web services. As such, the value of common exchange and access tools depends on the successful deployment of an ever-expanding set of Web services, under the shared strategy.

### 3.2.3.1   Common Exchange and Access Tools — Proposed Next Steps

- Assess the adequacy and utility of current demonstrated node configuration software

- Assess client software development support

### 3.2.3.2   Preliminary Goals for Common Exchange and Access Tools

- Validated and supported demonstrated node configuration software will be available for all major platforms.

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[7] Network Exchange Protocol and Network Node Functional Specification are found at http://www.exchangenetwork.net

- Validated and supported client software and development kits will be available for all major platforms.

- Numerous applications that use nodes/clients to exchange/integrate partner information within/across organizational boundaries will be in use, providing new functionality.

## 3.2.4 Common Business Practices, Procedures, and Software for Electronic Reporting and Data Collection

*Definition: The set of related shared practices, procedures, and software used for electronic collection of data from data-generating sources, such as regulated entities, laboratories, and field personnel and stations.*

This component acknowledges the intimate role that data collection from various sources in general, and electronic reporting specifically, plays in a given Network data exchange. The electronic collection of data from sources that generate it is a critical step in the electronic lifecycle of data. Once agencies collect data electronically from sources (such as facilities), they can share it electronically with partners more readily than data collected manually. This component intentionally does not cover all possible electronic reporting projects among partners. Electronic reporting is part of the Network *only* where it is an inherent part of the lifecycle of getting data into the Network, and it covers only those efforts that are jointly developed and implemented by multiple partners and use other Network components, such as a shared format or data standard.

This component also includes other data collection practices and supporting technology, such as mobile devices for inspectors and other field personnel. Network Challenge Grant projects have produced some data collection products that are scalable or extensible to assist partners in data collection and electronic reporting.

Common business practices, procedures, and software for electronic reporting and data collection help achieve the Network goals and objectives by providing better access to the primary data sources. As part of the electronic information lifecycle, they support data access and exchange. The entire Network community benefits as more data is made available on the Network. This component can also encourage better data, because electronic reporting is now providing ways to conduct quality checks prior to submission.

### 3.2.4.1 Common Business Practices, Procedures, and Software for Electronic Reporting and Data Collection — Proposed Next Steps

- Develop an inventory and clearinghouse of major electronic reporting and electronic data collection activities

- Identify major opportunities for collaboration

### 3.2.4.2 Preliminary Goals for Common Business Practices, Procedures, and Software for Electronic Reporting and Data Collection

- One or more electronic reporting software packages, schema, procedures, and case studies are available for electronic reporting for all major partner programs requiring such reporting.

- One or more software packages, schema, procedures and case studies are available for electronic data collection (e.g., laboratory, field personnel or other partners) for all major media areas (air, water, and waste).

- Multiple projects are in place implementing "consolidated" electronic reporting systems, which achieve additional burden reduction or other benefits.

## 3.2.5  Shared Services and Infrastructure

> *Definition: The common technical services and infrastructure that support or enhance a flow. These services do not, by themselves, flow information, but they materially support (sometimes in an essential technical way) partner flows. They include registries, standards, guidelines, and the governance of these assets.*

Reflecting a similar trend in the broader information marketplace, Network practitioners have recognized that, in most cases, partners rely on, and see value in, the common services (e.g., a registry or security server) supporting the Network, as opposed to the hardware infrastructure hosting those services. Shared services and infrastructure achieve the Network vision, goals, and objectives by using economies of scale, encouraging standardization, and increasing the efficiency of exchanges. A common trade-press term for this is "service oriented architecture." The Blueprint provided the basis for the basic services of registries, standards, and guidelines. These components have remained largely unchanged in this plan. Instead, this component has been re-cast to emphasize and embrace the concept of services as well.

The remainder of the discussion below is drawn from a staff working paper[8] prepared for and discussed at the spring 2004 IMWG Meeting. NPAT deliberations did not significantly extend the concepts developed in that paper; instead, they focused on addressing what is perceived to be the most significant challenge to further improvements and expansion of this component: stronger leadership and stronger operational joint management. As described in the IMWG working paper, most partners believe our current governance capacity would be overwhelmed by the demands of operating services much beyond those currently offered. These considerations were a key driver of the revised governance structure proposed in Section 6.

The IMWG working paper defined the following categories of services and associated infrastructure:

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[8] Information Management Working Group. "New Opportunities for the State/EPA Information Management Partnership: Expanding the use of Shared Services to Support State and EPA Business," IMWG Staff Working Paper (May 10, 2004).

*Network and Other Data Exchange Support Services*

- Robust Network registry services: These services support more robust storage and management of XML schema used for exchanges of a wide variety of flows, including industry-to-agency and state-to-state flows. States could use the registry to manage their own "separate" but coordinated sets of XML, without having to develop their own registry.

- Data validation/"data checker" services: These services allow nodes (e.g., CDX) to act as advanced data validation and checking tools that can be used by partners to enforce stricter data quality rules. EPA and states are piloting the use of this kind of service for the annual Air Emissions Inventory Flow.

*Security Services*

- Server and certificate services: As any implementer knows, security is one of the most complex and expensive aspects of electronic reporting. Several states are interested in exploring whether EPA could provide security server/certificate services to states for use in their electronic reporting projects. These states would then be able to leverage both their node implementations and the common Network NAAS server.

*Electronic Reporting/Consolidation Services*

- States could use many of the functions of EPA's CDX as services to support some of their electronic reporting projects. In these areas, states could elect to authorize CDX to accept data from facilities, while maintaining state "ownership" and control of that data. Such an approach has already proved successful in the Drinking Water Program's UCMR Flow.

- Alone, or in combination with CDX, states or state-EPA groups could expand upon current collaborations to establish common software (as called out in the new Network component) which are either provided as or use shared services for some portion of the reporting process. Serious discussion of just such approaches are underway for many program areas, including e-DMR, e-Manifest, and others.

- In areas where states and EPA share or coordinate information collections (such as TRI, or state collections where the state is a direct user of an EPA system), the use of CDX shared services could provide significant burden reduction and savings. For example, a combined state/federal TRI report could be accepted, parsed, and securely delivered to states — eliminating the need for manual data entry and reconciliation.

## 3.2.5.1   Shared Services and Infrastructure — Proposed Next Steps

- Commission an assessment of services and infrastructure required for support of the Network, especially the shared strategy for environmental Web services (e.g., a discovery mechanism and common portal)

- Establish an ongoing process to evaluate emerging technology relevant to shared services and infrastructure

### 3.2.5.2   Preliminary Goals for Shared Services and Infrastructure

- NPAT did not develop preliminary goals for this component. Instead, deliberations focused on establishing a revised governance structure through which this vision (which is an essentially supporting role for the other components) could be developed.

## 3.2.6   Trading Partner Agreements

*Definition: Documented agreements and commitments between and/or among partners on the requirements of a specific Network flow.*

The Network Blueprint identified Trading Partner Agreements (TPAs) as a Network component These agreements were envisioned as documents formally adopted by two or more partners for the purpose of defining the responsibilities of each party, the legal standing (if any) of the proposed exchange, and the technical details necessary to initiate and conduct electronic information exchange. In April 2004, the Network Steering Board (NSB) issued a report summarizing the implementation status, outstanding issues, and recommendations for the further development and application of TPAs. This Business Plan reaffirms the importance and role of TPAs in the Network, but does not offer significant changes or refinements to the basic concept.

It is likely that the re-casting of other Network components and the clarification of partner roles in exchanges (especially publishing relationships) will, over time, require that TPAs play a more conspicuous role as the Network evolves. The following trends and issues will likely necessitate the strengthening of this component.

- As use of the Network evolves beyond  implementing regulatory flows (where TPAs are redundant with existing agreements and regulations), TPAs may be the only documentation of partner commitments.

- Where partners are seeking to implement new types of flows, especially those that use a publication model, they will need mechanisms to document their mutual commitment to how those flows will be operated and maintained. In these cases, TPAs will co-evolve as the business practice and policy complements to more technical 'Flow Configuration Template" documents.

- Where partners seek to integrate business processes along with data, TPAs may be used to capture business agreements about the data itself, rather than focus on the technical details of exchange. An example would be partners agreeing to check a relevant administrative status among partners, where the TPA would specify what steps/uses partners would make of the data accessed.

- As partners begin to leverage more of the data quality/validation mechanisms enabled by the Network, agreements will be needed as to how these additional data requirements would be implemented.

### 3.2.6.1   Trading Partner Agreements — Proposed Next Steps

- Create a repository for TPAs on the Network website that can be sorted by state, tribe, and flow type. Include templates to be used for creating new TPAs.

### 3.2.6.2 Preliminary Goals for Trading Partner Agreements

- The preliminary goals for TPAs should be consistent with the April 2004 NSB report's recommendations on further development and application.

# 3.3 Data Exchange Scenarios

The original Network Blueprint presented a simplified schematic for how EPA and its partners would use the Network to exchange data. Network experience has shown that partners are engaged in a much more complex and rich web of data flows than previously depicted, and that the Network components themselves contribute to a far more complex set of possible exchange scenarios (see Figure 2). The difference between the simplified concept of exchange in the Blueprint and the options available to partners has been a source of confusion.
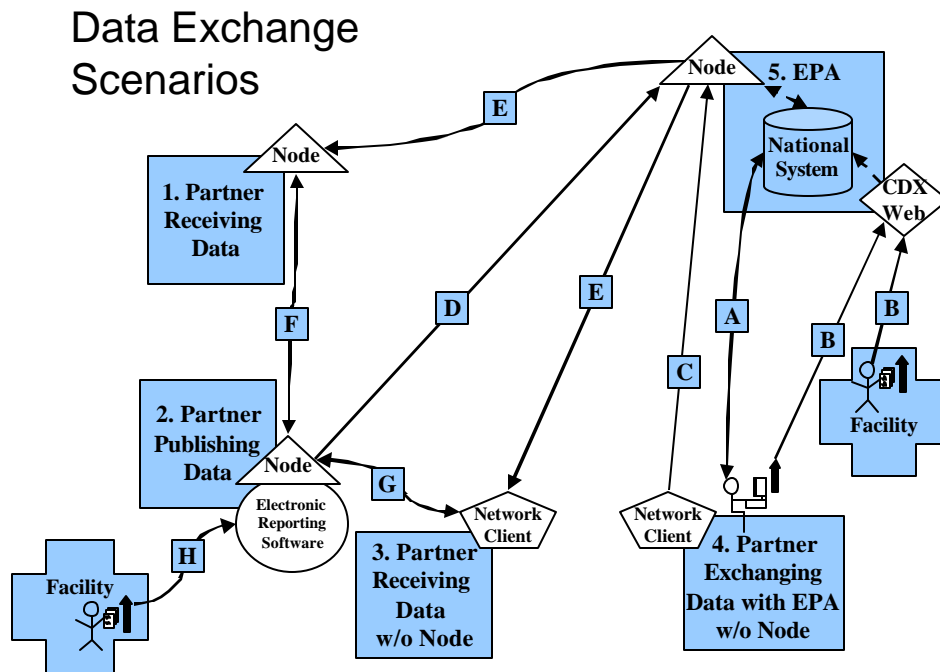


*Figure 2.  Data Exchange Scenarios*

The data exchange scenarios illustrated here capture the basic exchange paths, their interaction, and their synergies. In the descriptions that follow, partners should be able to see their flow-specific roles and understand how and where the Network contributes to their business needs.

To aid in the interpretation of the data exchange scenarios, it is useful to keep in mind that partners can engage in the following general modes of interaction:

- Exchanges that are node-to-node

- Exchanges that are node-to-client or client-to-node

- Exchanges that use Web forms via CDX or direct use

Partners can also play different kinds of primary roles:

- A "reporting" regulated entity

- A data submitter to a partner

- A data recipient from a partner

- A data provider of a Web service

- A consumer of a Web service

Although the various partner types are treated separately here for the purposes of illustration, a single partner may actually play many roles. EPA is called out specifically because it is a major data recipient, aggregator, and provider. EPA is often the first trading partner with whom new implementers will exchange data. The scenarios described in this subsection identify the many different modes of using the Network for these exchanges with EPA. As the Network grows, other partners with large-scale data exchange needs are likely to take on positions similar to EPA's. For example, other federal agencies (such as USGS) may act as major data aggregators and providers. Other entities may act as large-scale data aggregators and providers on behalf of regional data sharing consortia (e.g., those focused on the Great Lakes or Chesapeake Bay).

The following subsections provide narrative descriptions of the basic types of data exchange scenarios among partners. The descriptions are organized around the type of exchange being undertaken (i.e., node-to-node, Network client-to-node, etc.) and also include the parties involved and the business processes served. The references in parentheses below refer to Figure 2.

## 3.3.1   Partner to National System Direct User (Scenario A)

In this scenario, users enter data to and retrieve data from a national system (or any major partner system) directly, using Web forms or a dedicated application. These forms may be hosted by EPA CDX (for national systems). This scenario is included because it is anticipated that many partners using this scenario will also eventually use Scenario E to receive "return" data, via a Web service, for integration into local applications.
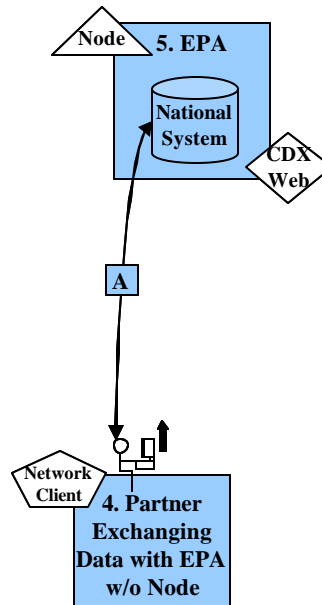


*Figure 3.  Data Exchange Scenario A — Partner to National System Direct User*

### 3.3.2 Partner or Facility to EPA Flow via CDX Web (Scenario B)

This exchange scenario illustrates how a partner or facility would provide an update to a national system via EPA's CDX Web. Users would typically enter data via Web forms and/or use CDX file upload capabilities to submit batches of data. The same opportunity as discussed above exists here for use of Scenario C for return data flows.
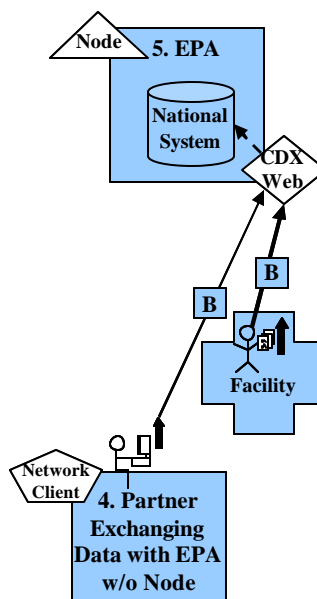


***Figure 4. Data Exchange Scenario B —
Partner to EPA via CDX web***

### 3.3.3 Partner to EPA Update Via a Network Client (Scenario C)

This exchange scenario illustrates how a partner would provide data to a national system via a Network client that communicates with EPA's node. These services may parallel those provided by CDX Web (e.g., routine batch uploads) or provide new functionality by tapping the capability of client[9] software. Partners with Network clients, however, could submit information to another participant on the Network or query information from them.
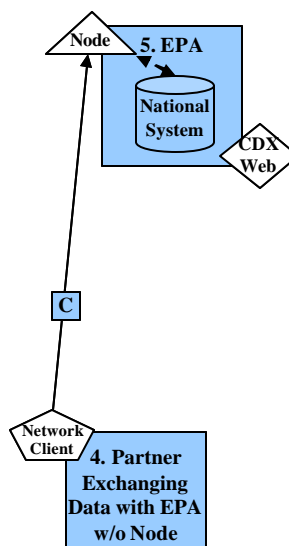


***Figure 5. Data Exchange Scenario C —
Partner to EPA via Network Client***

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[9] The client is not publishing data, only a node can publish data.

### 3.3.4 Partner to EPA Update via Partner Node (Scenario D)
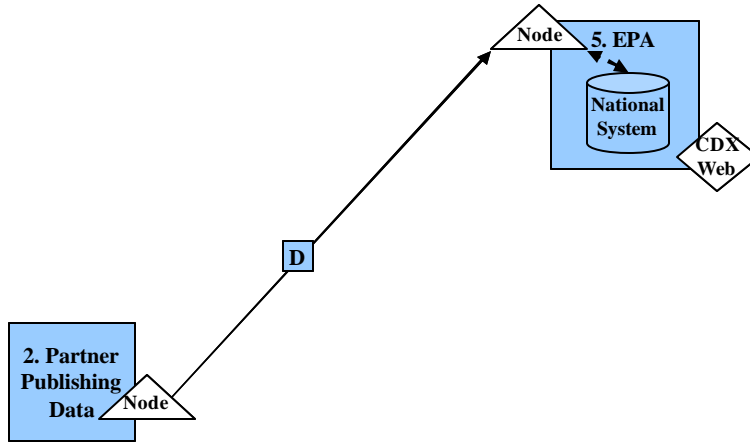


*Figure 6. Data Exchange Scenario D — Partner to EPA via Node*

This exchange scenario illustrates how a partner can provide an update to a national system using the partner's node to exchange data with EPA's node. This is the stylized "node-to-node" flow from the Blueprint in which a partner and EPA use their Network nodes for automated updates. Partners will usually automate these exchanges using scheduling and other workflow features of their nodes.

### 3.3.5 EPA to Partner Publishing (Scenario E)
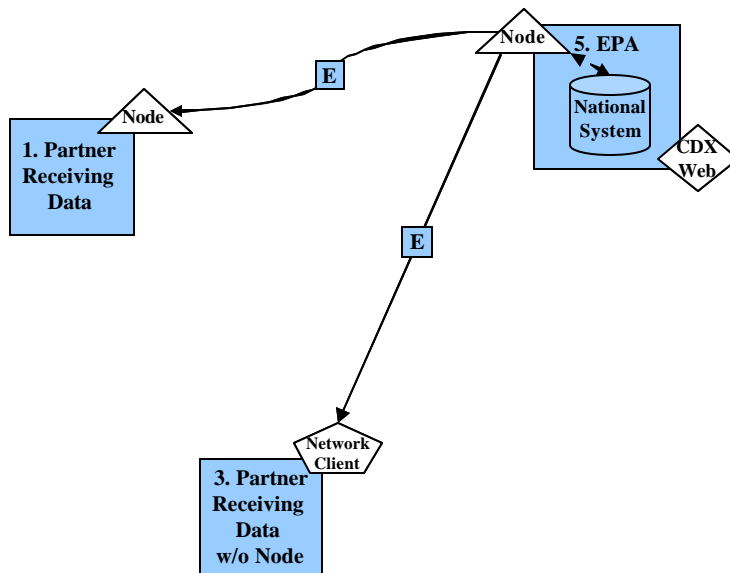


*Figure 7. Data Exchange Scenario E — EPA Publishing*

This exchange scenario illustrates how EPA would provide data to partners. The partner would consume data published as Web services by EPA. This data could include data the partner has previously provided to EPA (by a variety of possible exchange scenarios), data from other

partners (including EPA), and unique data aggregated or generated by EPA, including operations of its registries and other programs. Partners could receive the data from EPA through the partner's node or through their Network client.

### 3.3.6   Partner to Partner Exchange via Node (Scenario F)

This exchange scenario illustrates how partners communicate with each other through their Nodes for routine exchanges of either batch or interactive data transactions. Partners would use this exchange scenario when they have routine need to exchange data in a fully automated fashion.
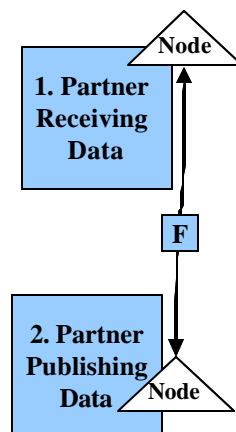


**Figure 8.  Data Exchange Scenario F —
Partner Node to Node Exchange**

### 3.3.7   Exchange Between Partner Nodes and Clients (Scenario G)

This exchange scenario illustrates how two partners can communicate with each other when one partner has a Network client rather than a node. This exchange is similar to Scenario E, but is included to illustrate that many partners, including EPA, will be publishing data that is of interest to other partners and accessed via clients.
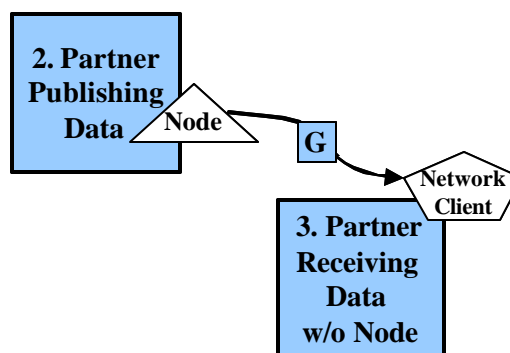


**Figure 9.  Data Exchange Scenario G —
Partner Node to Client**

### 3.3.8   Facility to Partner Electronic Reporting (Scenario H)

This exchange scenario illustrates the traditional use of electronic reporting software by a facility to transmit data to a partner. This scenario is illustrated because in many cases, the information partners receive via electronic reporting will and can ultimately be used on the Network, and the electronic reporting mechanism may use some of the node infrastructure and functionality.
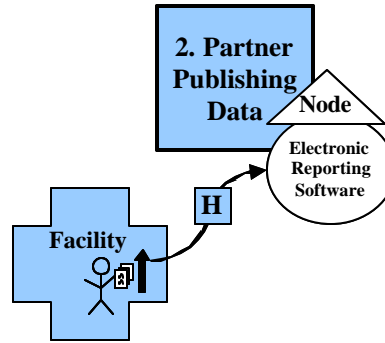
***Figure 10. Data Exchange Scenario H — Facility to Partner Electronic Reporting***

## 3.3.9 Using These Exchange Scenarios to Guide Flow Design and Implementation

Although somewhat complex, these exchange scenarios clarify partner roles in various uses of the Network components. In addition, they operationalize the definition of what "using the Network" means. (As further described in Section 4, Network use is defined in this Business Plan as two or more partners using multiple Network components to satisfy a business need.) In conjunction with the design patterns and choices identified in the next subsection, the exchange scenarios form the framework through which the next increment of Network implementation and expansion can be guided.

## 3.3.10 Proposal

- Adopt, use, and refine the exchange scenarios identified in this report to guide implementation of Network projects.

# 3.4 Summary of Section 3 Proposals

## 3.4.1 The Exchange Network Vision, Goals, and Objectives

The Network is a *partnership* to support better environmental decisions through improved access to, and exchange of, improved environmental information.

- Adopt and use the vision in this plan as the basis for management and collaboration on the Network

- Agree to continue validating and refining this vision though practice

- Adopt the goals and objectives, and affirm through periodic review that the Network, as outlined in this Business Plan, is the best way to achieve them

- Agree to continue validating and refining the goals and objectives through practice

# 3.4.2    Revised Exchange Network Components

- Adopt the Network components as described in this Business Plan, and review and update components on a regular basis as technology and/or business needs change

## 3.4.2.1    Shared Strategy for Environmental Web Services

- Develop an initial vision and coordinating framework for environmental Web services

- Identify the guidance and support needs of early Web service publishers

- Create a first generation catalog and tracking system for environmental Web services

## 3.4.2.2    Data Standards and Shared Formats

- Using the integrated governance structure proposed below, establish an organizing framework for coordination of standards and schema development

- Establish a listing of standards and associated schema to support priority flow activities

- Evaluate how to make implementation of the standards easier

## 3.4.2.3    Common Exchange and Access Tools

- Assess the adequacy and utility of current demonstrated node configuration software

- Assess client software development support

## 3.4.2.4    Common Business Practices, Procedures, and Software for Electronic Reporting and Data Collection

- Develop an inventory and clearinghouse of major electronic reporting and electronic data collection activities

- Identify major opportunities for collaboration

## 3.4.2.5    Shared services and infrastructure

- Commission an assessment of infrastructure required for support of the shared strategy for environmental Web services (e.g., a discovery mechanism and common portal)

- Establish an ongoing process to evaluate emerging technology relevant to shared services and infrastructure

## 3.4.2.6    Trading Partner Agreements

- Create a repository for TPAs on the Network website that can be sorted by state, tribe, and flow type. Include templates to be used for creating new TPAs.

### 3.4.3 Data Exchange Scenarios

- Adopt, use, and refine the exchange scenarios identified in this report to guide implementation of Network projects

# Section 4.  Refining Our Understanding of How Partners Use the Network and its Components to Flow Data

Section 4 begins by describing the early implementation experience with the Network and the lessons learned. Key lessons were the need to 1) have clear functional objectives for the application of the Network to a flow, and 2) understand how the Network components, separately and as constituted into a flow, achieved the objectives. This section then identifies two key flow design patterns — automation and publishing — and describes why they are especially important.

This section then discusses the requirements for design and support of flows to achieve the automation and publishing design patterns. As the Network has evolved, so have perceptions about where its real value lies. This is apparent both in how those involved with the Network perceive the Network and in how it has been used to date. This Business Plan advocates moving into a much more ambitious view of the potential value added by the Network, and provides a roadmap for implementing more ambitious Network data exchanges consistent with the flow design patterns of automation and data publishing.

This section continues with a description of partner commitments and what it means to "use" the Network (Network components), then proposes Network Data Area Strategies as a method of prioritizing flows. The section closes by discussing the unique issues faced by tribal partners in the Network.

## 4.1   Lessons from Early Network Implementation

### 4.1.1   Rationale and Learning from Our Early Focus on National Systems

The original aspiration for the Network as articulated in the Blueprint was for a gradual transformation of how we exchange data. It included fostering new kinds of cooperation and modes of intergovernmental business exchanges with new partners. These included concepts such as "consolidated reporting" or improvements in data availability for areas like TRI and surface water quality. Once the Network was launched, however, most of the attention of EPA and state agencies (and therefore most of the attention of the Network governance) shifted to demonstrating near-term progress on re-channeling the flows used to populate national systems (such as RCRA, NEI, SDWIS/FED, and BEACHES) to "use" the Network.

Most of these first generation efforts set essentially no new functional objectives other than to reproduce current processes "using the Network" with no diminution of service. Because nearly all flows populating national systems have focused on reproducing current processes, these flows have been captive to the inherent constraints of the target national system. Many of these systems were not originally designed to accept feeds from external sources, and there were significant challenges faced besides just "translating" data to XML.

Partners were often reluctant to use the Network because the flows themselves were "working" already, albeit with manual and sometimes intensive intervention. The Network was therefore viewed as an unnecessary intervention. This was particularly true for "mission critical" flows, in which both partners had regulatory and grant-related commitments. Partners on both sides of the flow were concerned that the inevitable bumps in first generation flows would cause them to be in default of these commitments.

The Network community had good reasons for focusing on these flows, but doing so resulted in the costs identified above. Further, industry best practices around the introduction of Web services into organizations suggest the following criteria for early projects:

- Pick non-mission critical areas, so participants are not risk-averse

- Identify a small set of new functionalities to be provided

- Identify functionalities that could not be accomplished by other means (i.e., focus on doing something NEW, not something better)

As a result of this early history, many partners and their staff maintained a range of perceptions about the Network's value and potential utility, depending on the projects they worked on. Their definitions of the Network range from "use of CDX with an absolute minimum number of changes to my existing business process," to "a bold new vision to accomplish NEW functionality and integrate NEW sources of data in NEW ways."

Many partners and potential partners are not spending their resources on the Network because they have reservations about its success. Some would rather wait and see what happens to the pioneer flows.

> **Two Network Value Propositions: Economies of Scale and the Network Effect**
>
> The Network creates value through two related mechanisms. A useful analogy is the cell phone network. Cell phones are cheap and getting cheaper, because as more and more are produced, the cost goes down. This is an *economy of scale*. For the Exchange Network, nodes, clients, schema, and other tools become "cheaper" as partners benefit from the investments of others through reuse, tech transfer, and specialized service providers. Likewise, each time a new cell phone or tower is established, ALL users benefit, because now there is a new person to call or be called by (assuming this is desired). This is a "*network effect*." For the Exchange Network, each new node, client, or set of common Web services mounted means there are that many more partners and data sources available; and is a benefit that accrues to all members.

## 4.2 Designing, Supporting, and Managing the Flows That Build the Network

If early implementation experience has taught Network participants anything, it is that designing a progressive Network of flows requires real, collective work. It is not simply a matter of switching from a flat file to XML, or using CDX. The key challenge facing the Network now is how to support partners in designing and managing the flows that will leverage the value of the Network, and, in doing so, expand it.

Enhancing use of the Network will require more explicit attention to how and where partners apply Network components to flows. To support this, this subsection addresses three inter-related questions:

- What are the key design decisions in selecting and designing Network flows?

- How and where can partners apply flow design patterns of "automated flows" and "data publishing?"

- How should the Network community support and manage flow development and operation?

## 4.2.1 What Are the Key Design Decisions in Selecting and Designing Network Flows?

Identifying how the Network can add value to a given data exchange is critical to the Network's success. The discussion of Network value that follows is predicated on three core concepts of how the Network adds value. These concepts apply to all Network data exchanges:

1. Use of shared tools, standards, and approaches improves efficiency, reduces costs, and allows one to do new things.

2. Web services architecture for large-scale data exchange allows new kinds of functionality — most importantly, the ability to integrate data and business processes (such as reporting) across organizational boundaries.

3. Existence of the Network provides a common overarching framework for exchange; a convergence point, especially for new projects, that results in "network effect" benefits where synergies across flows are possible.

In order to support partners in designing Network flows that make sense, NPAT, building on the work started by the NSB and its subgroups, established a set of five basic design questions. Since partners have exchanged data through many mechanisms (and will continue to do so), these questions should be used both to evaluate candidate "switchovers" for existing flows and as a checklist for designing new flows. Specifically, in support of flow management and operation, and to promote ambitious use of the Network, the Network governance and partners designing flows should seek to answer the following five high-level questions:

1. For an existing data exchange, can the use of the Network provide benefit by leveraging common infrastructure without a diminution of service? This is the minimum criteria for Network application.

2. For an existing data exchange, can the Network:

   – Allow the exchange to happen more frequently, thereby decreasing the lag between partner systems?

   – Make the exchange more efficient, and reduce or eliminate manual intervention, such as scheduling, resubmissions, or security?

   – Provide higher quality data due to additional or more efficient error checking and/or earlier detection of errors/discrepancies?

   – Use data standards and common formats to provide additional definition, structure, and integration opportunities?

   – Can it improve the exchange by leveraging shared infrastructure services (e.g., a node and/or CDX)?

3. Can the new Network data exchange expand upon the existing (or proposed) exchange to include additional data by:

   – Encouraging partners who did not previously provide data to do so?

   – Providing data on a broader universe of entities (e.g., new classes of facilities, new areas, or new contaminants)?

   – Allowing for more detailed data about the current entities (either in a system-to-system flow or interactively) than the original flow?

4. Does (or will) the flow leverage the use of Web services, within the larger framework of the Network's "shared strategy," to provide new functionality to the implementer and their flow partners?

5. How are the flow partners or their customers planning or aspiring to use these new capabilities and/or data to make improved environmental decisions?

## 4.2.2  How and Where Can Flow Implementers Apply Design Patterns of "Automated Flows" and "Data Publishing?"

The most powerful and far-reaching implementation of the Network will implement two design patterns, each with specific benefits and functions: fully automated flows and the "publishing" of data as Web services. The two design patterns are described below.

- Automated Flows — Automated flows involve automation of routine and batch transactions to enable other business processes (such as reporting, additional data processing, or aggregation). Automated flows provide scheduled and predictable transfers of predetermined data. Their primary value is in establishing low maintenance routine exchanges where the recipient needs a copy of the data for aggregation or processing.

- Data Publishing — Data publishing is partners making data available as Web services. The purpose of data publishing is to enable dynamic access to data and dynamic integration of data into local applications. Data publishing is the essential concept in the "shared strategy for environmental Web services" Network component. Data publishing provides dynamic parameter driven access to data.

Automated flows make the most sense when a flow occurs (or is desired to occur) frequently enough that the implementation investment is amortized over many cycles. Where frequency is low, and latency is not a driving concern, other semi-automated processes may suffice. Data publishing makes sense when parameter driven (i.e., question driven) access to data is desired, but obtaining a complete copy of partner data is not desired or is impractical.

These two design patterns can often work together, servicing different partners for the same flow "direction" (e.g., to an aggregator like EPA) and for the different directions of the flow. For example, states might use a mixture of semi and fully automated flows to provide data to EPA. EPA might then publish that data as a Web service for local integration. Further, for that same flow, states might publish additional, more detailed or more specific data for reported entities, not collected/aggregated by EPA (and therefore not available directly from them). This data

could be accessed directly from the partner node (e.g., by a neighboring state) and/or "linked to" from EPA published data.

## 4.2.3   How Should the Network Community Support and Manage Flow Development and Operation?

As indicated above, flow management is one of the most important aspects of successfully growing the Network. The Integrated Project Teams to date have shouldered the entire burden of designing and supporting Network exchanges, yet Integrated Project Teams have received little support, guidance, or resources. The proposal in Section 6, however, integrates flow management into Network governance. The key questions, then, are: 1) what support, guidance, and resources are required to support flow design, development, and implementation, and 2) where are support, guidance, and resources going to come from?  To answer these questions, the Network community must establish a framework from which to identify and track flow development activities, and to establish a formal mechanism to support them. The components of such a framework must include:

- Development, implementation, and maintenance of a system to track the status, barriers, issues, and lessons from ALL Network flows. This will serve a dual purpose, acting both as a tracking tool, and as a tool to identify current activities and those activities critical to the success of the Network.

- Integrated Project Team support through resources (monetary and other) to engage design issues (e.g., a flow that addresses design questions and incorporates Network design patterns).

- Leadership in identifying target opportunities for data publishing, in supporting the development of partnerships, and in the infrastructure to support the build-out of Web services. Subsequent coordination with potential incentives to develop the target opportunities.

- Support and stewardship of the products from the Integrated Project Teams (e.g., flow configuration documents) through outreach, marketing, and transparency around flow implementation activities and progress. This is important to inform, influence, and coordinate joint and individual partner Network planning and implementation efforts, to ensure the highest practical level of Network interoperability.

## 4.2.4   Summary of Findings

- Users and potential users of the Network are not fully utilizing the Network's capabilities to manage flows. Lack of information about the Network and a lack of infrastructure for developing, managing, and implementing flows are key aspects of the problem.

- There needs to be clear, shared, and documented agreements (and/or disagreements) on business objectives for every flow and how those objectives are connected to the broader vision of the Network. There needs to be clarity in how the flows and their components address these objectives.

- Certain types of data flows are more appropriate for the Network than others. Important considerations include the extent to which flows are likely capture the "network effect" by engaging multiple partners, as well as the volatility of data and frequency of exchange.

## 4.2.5   Proposals

- Strengthen the role of Integrated Project Teams by establishing a governance structure that provides the guidance and resources necessary to support flow design, development, and implementation. (See Section 6)

- Create a tool for tracking the status, barriers, issues, and lessons from all Network flows. The outputs must be made available to all partners.

- Develop a Network marketing plan that includes ways in which the Network can add value and that links sought-after partner activities with the vision, goals, and objectives identified in Section 3.

# 4.3   Partner Commitments and Uses of Network Components

As a broad partnership, the Network depends upon commitments of its members on many levels. These include general commitments to "participate" in the development and implementation of the Network by considering and implementing its tools in the normal course of business. These also include more specific commitments required for a given flow, such as a commitment to use a specific mechanism to provide data on a given schedule, or to establish and maintain a given Web service for the use of authorized partners.

It is critical to note that, although the technical tools of the Network will save partners time and money, in many cases nearly all bilateral and small multilateral projects will incur additional costs in order to achieve broader compatibility. This will be a balance point and Network compatibility will only be achieved gradually; however, it will not happen without some consideration and compromise.

Given the importance of the Network as a collaborative effort and the magnitude of governmental resources being invested, Network membership comes with the expectation that partners will consider and compromise for Network compatibility — even if doing so requires additional expense and design. In some cases, this may mean that partners implement multiple methods for exchanging common data. Given the number of partners and the uneven pace of evolution, some build-out will need to be anticipatory, especially until methods for prioritizing the development of flows (e.g., Network Data Area Strategies, discussed later in this section) mature.

At some midpoint between the general commitment to participate in the development and implementation of the Network and specific commitments for given flows, are commitments expected of partners with respect to the Network components themselves. For each of the Network components, these commitments are as follows:

1. Shared strategy for environmental Web services:

    – When implementing a flow, publish the applicable data per the registered method, even if, alongside these methods, alternative or tailored versions of these methods are also implemented.

- Where a data publication approach is merited, consider, critique, and implement registered methods for publishing prior to and/or alongside establishing entirely new methods for the same data.

- Register (for authorized discovery) the Web services provided.

- Participate in collective planning and design of services for relevant data areas.

- Consider, encourage, and pursue the use of data services provided from partners.

2. Data standards and shared formats:

- Evaluate and use applicable standards and shared formats when implementing the flows to which they apply.

- Where existing standards/schema do not meet all local business requirements, consider parallel implementations of both the standardized and tailored versions of data. This is done in support of the "shared strategy for environmental Web services" Network component identified above. Establish and publish applicable crosswalks between standard and tailored formats.

- Participate in and contribute domain expertise to collective standards/schema development efforts.

3. Common exchange and access tools:

- Consider for direct use existing exchange and access tools.

- Where new software is needed, develop Network Nodes and client software that are consistent with current Network specifications.

- Critique and participate in the refinement of current Network technical specifications.

- Where extensions to existing exchange tools are required, contribute those back to the Network community.

4. Common business practices, procedures, and software for electronic reporting and data collection:

- Consider existing tools for direct use.

- Where new software is needed, develop software that is consistent with current Network specifications.

- Critique and participate in the refinement of current Network specifications.

- Where extensions to existing exchange tools are required, contribute those back to the Network community.

5. Trading Partner Agreements:

- Use TPAs to define the responsibilities of each party to an exchange and the legal standing (if any) of the proposed exchange.

- Contribute to and utilize a repository for TPAs.

6. Shared services and infrastructure

- Use shared services and infrastructure.

- Contribute to the development and maintenance of shared infrastructures.

- Develop systems compatible with shared infrastructure.

- Build applications that link or integrate shared services.

- Avoid duplicative development efforts.

The above commitments can be used to define what it means to "use" the Network. In this Business Plan, "Network use" is defined as two or more partners using multiple Network components (as outlined above) to satisfy a business need. This flexible definition recognizes that the spectrum of participation in the Network is complex and highly variable. Different partners will participate in different ways and take advantage of Network capabilities to different extents.

Some Network partners will choose to use the Network by taking full advantage of all of its components. Such a partner would, for example, publish data that supports fully-automated node-to-node exchanges. This is the degree of "use" towards which this Business Plan sees Network partners ultimately working.

Other partners may choose to utilize only a few Network components, perhaps to enhance an existing business process. An example would be a state that supports electronic reporting by facilities using data standards, shared formats, and common business practices, procedures, and software for data collection.

| Defining "Use" of the Network |
|---|
| "Network use" is defined as two or more partners using multiple Network components to satisfy a business need. |
| The Network exchange components are: |
| – Shared strategy for environmental Web services |
| – Data standards and shared formats |
| – Common exchange and access tools |
| – Common business practices, procedures, and software for electronic reporting and data collection |
| – Trading Partner Agreements |
| – Shared services and infrastructure |

## 4.4 Organizing Communities of Interest to Use the Network: Network Data Area Strategies

The Blueprint proposed a scrupulous separation between the administration of the Network and any consideration of programmatic, media, or regional data needs or customers. The intent was to buffer the infrastructure of the Network from disagreements among partners about programmatic and other policy priorities. Partners were left on their own to identify (or create) communities of interest, understand the Network, develop the exchange scenarios relevant to these communities, and implement them. However, this approach has acted as a barrier to implementation on both the programmatic and technical fronts. While the infrastructure of the Network must be developed and implemented independent of any one data flow, NPAT recognized that a more active role in supporting and coordinating the design and use of the Network by communities was essential.

Towards this goal, NPAT developed the concept of Network Data Area Strategies that can be used to define, organize, and support communities of interest as they plan where and how to apply the Network to their collective objectives. Network Data Area Strategies are envisioned as living documents, maintained by respective communities of interest, and supported and coordinated by the Network governance. Network Data Area Strategies are intended primarily as an organizing and planning tool — they are not intended to constitute either comprehensive

information strategies and/or business re-engineering plans for their communities, both of which are far larger tasks. Network Data Area Strategies are voluntary, they are intended to assist communities of interest in planning, to provide the Network governance a formal point of engagement (if requested), and are initiated only when a need exists. They will provide programmatic or business context with which to identify projects and opportunities where the Network could add value. Network Data Area Strategies would be a collective partners' tool for linking the data priorities that partners have identified (to improve environmental decisions) and the Network. For example, the starting point for a Network Data Area Strategy for the "ground water protection" community of interest might identify the data flows (and associated Integrated Project Teams, if any) of UST, UIC, and wells as its highest priorities, and highlight key linkages with a broader drinking water Network Data Area Strategy.

In developing this concept, NPAT is simply translating the information management principle of "alignment with the business" and "communities of interest" into the Network context. If successful, Network Data Area Strategies should provide the following benefits:

- Provide a venue and framework for data area communities to refine their exchange interests, organize themselves around them, and for individuals/agencies to find others with shared interests. This grows the Network from the "inside" out.

- Provide a venue for connecting Network activities to those of broader external communities (e.g., the Association of State Drinking Water Administrators, the Association of State and Territorial Solid Waste Management Officials, etc.), whose interests will always be broader than Network technologies or a single flow.

- Provide programmatic context for refining and articulating how specific projects, flows, and/or services fit into a community's broader goals. This should strengthen the business case for Network use and encourage program participation by ensuring that the "Network message" is delivered from credible, relevant stakeholders.

- Allows identification of information available for use and information in need of development (e.g., standards or schema segments).

## 4.4.1 Network Data Area Strategies and Integrated Project Teams

As described throughout this report, NPAT identified the improved coordination and management of flow development and implementation as a key need. Traditionally, the Network community has used the term "Integrated Project Team" to loosely describe the groups of individuals organized to design and implement a specific flow. These groups have varied dramatically in their membership, cohesion, and effectiveness. NPAT recommends specific changes to Network governance to improve management and support of Integrated Project Teams — with the goal of improving their effectiveness in flow design and implementation. Network Data Area Strategies complement these proposals by addressing two key gaps in our current approach. First, Network Data Area Strategies provide a venue for the articulation of the broad (and then specific) business objectives that a given Network flow team (or Integrated Project Team) is addressing through an individual flow. Second, Network Data Area Strategies provide a means of organizing and coordinating the multiple Integrated Project Teams underway (as we do now) within a given data area (e.g., surface water quality). Network Data Area Strategies therefore support Integrated Project Teams by providing a broader program-focused context.

## 4.4.2 Support and Use of Network Data Area Strategies in Network Governance

In addition to the potential benefits successful Network Data Area Strategies provide to their respective communities, they should also provide an important planning, management, and outreach tool to Network governance. As they develop, Network Data Area Strategies can be used as a forward planning tool for identifying needed support/guidelines, since the strategies will always represent the "leading edge" of Network implementation (i.e., they will boldly identify possible future projects, in order to identify likely future trends and direction). Where the Network has multiple major flow implementation efforts underway for the same data areas, as it does now, Network Data Area Strategies will identify where and how should those efforts be coordinated, and to what end.

Ideally, communities of interest would spontaneously develop these strategies, and use them to design, advocate for, and implement Network exchanges. This may happen once the Network has matured, but for now, NPAT anticipates that communities will need some modest support and or incentives to do so. The most senior level of Network governance (the Exchange Network Leadership Council described in Section 6) is responsible for advocating Network Data Area Strategies. Senior-level advocacy is important to assure alignment of programmatic interests and support for the priorities and activities outlined in the Network Data Area Strategies. The subgroup of the Exchange Network Leadership Council, the Network Operations Board, will provide and coordinate the day-to-day support of the communities of interest and their Network Data Area Strategies. NPAT identified the following options for supporting/providing incentives for Network Data Area Strategies:

> **Applying the Concept of Network Data Area Strategies: Groundwater**
>
> Groundwater managers routinely search for and integrate data from a wide variety of sources. These include sampling data, well location and well log data, USTs, UIC, drinking water data, and many others. At the same time, across the Network, scores of project, touching some or all of these areas are underway. How do they fit together?
>
> As a starting point, a Groundwater Network Data Area Strategy might identify and convene these project leads, and interested stakeholders to exchange information and identify shared opportunities and priorities. Using the Network components as a guide, they could establish the key dependencies and linkages between their efforts. For instance, common standards (like the EDSC's ESAR) for monitoring data, and well logs (also a candidate standard); shared electronic tools for collection of field data; flow configurations for routine exchanges; geo-assets mounted as web services for boundary information; and a framework for how all of this data could be exposed as inter-operable Web services. These strategies would also provide the venue for coordination with already established regulatory flows such as those for Drinking Water (SDWIS) and Facility.
>
> New projects (e.g. one proposing to standardize and publish UIC information) could tap into this strategy understand how they fit in and the strategies themselves could be used by the community to identify new project opportunities and organize to obtain resources to pursue them.

- Provide modest staffing/outreach to communities (as part of the Network's broader outreach efforts), with the express intent to encourage the development of shared strategies.

- Make participation in/connection to Network Data Area Strategies an explicit criteria for allocating some categories of shared Network (or other) resources. (Based on the premise that communities of interest who are unable or unwilling to articulate, even in broad terms, their shared objectives, are also unlikely to have success in implementing flows in the first place.)

- Establish simple templates, models, and best practices for such strategies.

- Provide limited direct support and/or technical assistance to interested communities, especially those with strong mutual interests, but who lack a pre-existing exchange framework/tradition.

The content of these Network Data Area Strategies will be up to the communities of interest, but should include the following framework components.

- A definition of the data area, a delineation of its scope, and a catalogue of linkages to other data areas

- An inventory of current major partner programmatic activities and initiatives

- An inventory of existing Network projects within that data area

- A list of major information gaps and/or priorities

- Opportunities and requirements for grant coordination (both Network and other)

- A list of shared objectives and opportunities for flows, along with a sketch of the relevant partners and exchange scenarios for each flow

- Identification of how each of the Network components identified in this report could/should apply, broadly, to the data area

- Identification of the most likely data exchange scenario(s)

# 4.5   Supporting Tribal Participation

There are a number of unique considerations regarding tribes' roles as Network partners. These considerations result from the history of tribal involvement in the development of the Network, their unique regulatory responsibilities and relationships, their data needs, capacity, funding, and comfort with data sharing. This subsection attempts to further describe some of the unique tribal data needs and uses, and to articulate some strategies to increase tribal participation in the Network.

Tribal participation in the Network to date has not been extensive. While it is true that those tribes that have been participating in the Network through the Environmental Data Standards Council, grant programs, and otherwise are among the partners that have realized the benefits of data standardization and improved access that the Network can bring, it is also true that many tribes either are not yet aware of the Network or lack detailed information about it. Venues for getting information about the Network to tribes have not been fully utilized. As well, there is the perception that, because tribes have different data needs and capabilities, much of the Network discussion to date has not been highly relevant to them.

Network planning and discussions up to this point have often lumped states and tribes together, even though their roles as regulators are very different. Tribes are different from states in several ways:

- Although some larger tribes are beginning to get program delegation, overall very few tribes have delegated programs — whereas all states have at least one, if not several, delegated programs. Thus, unlike states, the majority of tribal data needs are not driven by flows to EPA national systems.

- In some areas, tribes are treated as municipalities and regulated entities. For example, treatment plants and disposal facilities operated on tribal lands are permitted and have the same data reporting requirements as similar regulated entities on non-tribal lands.

- Many tribes significantly lag behind states in their technological advancement. Only a small number of tribes have dedicated IT staff, resources, and access to technology. The ability of tribes to participate in the Network from a technical standpoint is not on par with states.

## 4.5.1   What We've Learned about Unique Tribal Data Needs and Usage

### 4.5.1.1   Data Collection and Submission

Over 100 tribes have received grants for monitoring activity, but most do not have reporting requirements. Those tribes that do submit data send it to EPA Regional offices, where it is maintained, but the data does not go into the national systems. Thus, most of the data currently collected and maintained by Regions is air and water quality monitoring data.

As mentioned above, only a small number of tribes currently have delegated programs. Those that do have data collection and submission requirements similar to states. However, many of the EPA national systems do not have tribal identifiers. Hence, retrieving data back from EPA systems is difficult and often requires using geo-based referencing to extract relevant datasets.

### 4.5.1.2   Data Access and Use

Many tribes are interested in accessing geographically-relevant data about natural resource attributes, such as the quality of the air, water, and fish on or near tribal lands. Often, tribes are interested in extracting such geographically based data from multiple sources (e.g., EPA, USGS, and/or the Bureau of Land Management) to paint a more complete picture of the natural resource attributes in their local area. As well, tribes often use this data for different purposes than state and federal environmental agencies. For example, tribes may be concerned about the levels of toxics in fish tissue because of subsistence fish consumption. Other agencies might examine toxics in fish tissue to develop strategies for improving water quality and related programs.

A number of geographically-based tribal data efforts are already underway. The EPA American Indian Environment Office is developing the Tribal Information Management System (TIMS), which uses geo-based extraction from the national systems to make data available to tribes. Several regionally/locally-maintained tribal data systems are also geographically based. An example is the SSHIAP (Salmon and Steelhead Habitat Inventory and Assessment Program) system built and maintained by the Northwest Indian Fisheries Commission.

### 4.5.1.3   Technical and Organizational Capacity

Tribes often have limited technical capacity — although that capacity is beginning to expand — and differing organizational capacities. Some tribes do not currently have the organizational capacity to support Network involvement (e.g., they do not have dedicated IT staff and/or dedicated environmental staff). Research finds general agreement that a reasonable number of

tribes that could be expected to engage in the Network to be in the range of 40-60. Because of capacity issues, many smaller tribes engage in data activities through tribal associations and intertribal councils (e.g., the Northwest Indian Fisheries Commission). To date, these intertribal groups have not been engaged in the Network (and are not eligible for receiving Network grants), but are a likely way of reaching many tribes.

Tribes typically have limited funding for IT and are highly dependent on federal grants for building technical capacity. These grants come from a variety of agencies, including BIA, EPA, and others. Federal grant funds usually have specific requirements that must be met, that may or may not be compatible with the Network. Most tribes do not have independent funding for IT and will not be able to participate in the Network without substantial funding support.

### 4.5.1.4   Data Sharing

Some tribes are wary of data sharing, often because of issues related to sovereignty. Data can also sometimes be part of a lawsuit or intergovernmental dispute. As well, historical trust issues exist between states, the federal government, and tribes, and also between tribes. In some cases, tribes have been willing to release data only after certain tags were removed. Sharing data with state and federal government agencies essentially means that the data is public (subject to FOIA). Some tribes are concerned that getting a grant to support information management will force them to share all of their information, sensitive or otherwise, with the public.

## 4.5.2   Findings

- There are a number of special considerations for the participation of tribes in the Network.

- Some larger tribes are more like states, but need more money/capacity to achieve Network participation. However, many tribes are not like states at all, and need a completely different and tailored approach to Network participation.

## 4.5.3   Proposals

For those tribes that have delegated programs and more organizational and technical capabilities:

- Continue to assist with Network readiness activities (e.g., building back-end databases), node building, and Web services development, with the aim of using the Network for data flows to and from EPA.

- Continue to work with EPA's American Indian Environment Office in developing strategies for using the Tribal Information Management System for tribal access to data submitted to EPA.

- Build in tribal identifiers as national systems are modernized.

- Recruit some tribes (and provide the necessary resources and support) to become more active in Network development activities/groups. This will help ensure that tribal data needs are considered and develop spokespersons who will champion the Network to other tribes.

- Add a place for tribes on Network governance groups (for the reasons above).

- Utilize existing forums to educate and inform tribes about the Network and its benefits.

- For those tribes that have fewer data submission requirements, and less organization and technological resources:

  – Continue to provide grant funding to enhance their capabilities

  – Pilot use of the Network through tribal associations and intertribal councils

# 4.6   Summary of Section 4 Proposals

## 4.6.1   Lessons from Early Network Implementation

- Support an ambitious plan for flow development on the Exchange Network, focusing on flows that are consistent with the full capabilities of the Network and that help to meet the Network vision. This involves new ways of developing, managing, prioritizing, and tracking progress on all Network flows.

## 4.6.2   Designing, Supporting, and Managing the Flows That Build the Network

- Strengthen the role of Integrated Project Teams by establishing a governance structure that provides the guidance and resources necessary to support flow design, development, and implementation (see Section 6).

- Create a tool for tracking the status, barriers, issues, and lessons from all Network flows. The outputs must be made available to all partners.

- Develop a Network marketing plan that includes ways in which the Network can add value and that links sought-after partner activities with the vision, goals, and objectives identified in Section 3.

## 4.6.3   Partner Commitments and Uses of Network Components

- Adopt a definition of "Network use" as two or more partners using multiple Network components to satisfy a business need.

## 4.6.4   Organizing Communities of Interest to Use the Network: Data Area Strategies

- Actively support the development of Network Data Area Strategies by convening and supporting communities of interest in establishing such strategies where they can identify key data areas, partners/customers, exchange needs/opportunities, and relevant

Network components and exchange scenarios. This function should be part of the operation of Network governance.

- Use the portfolio of Network Data Area Strategies to establish a revised Network priority flows list, which in turn can be used as the basis for the Network Project Plan.

## 4.6.5   Supporting Tribal Participation

For those tribes that have delegated programs and more organizational and technical capabilities:

- Continue to assist with Network readiness activities (e.g., building back-end databases), node building, and Web services development with the aim of using the Network for data flows to and from EPA.

- Continue to work with EPA's American Indian Environment Office in developing strategies for using the Tribal Information Management System for tribal access to data submitted to EPA.

- Build in tribal identifiers as national systems are modernized.

- Recruit some tribes (and provide the resources and support necessary) to become more active in Network development activities/groups. This will help ensure that tribal data needs are considered and develop spokespersons who will champion the Network to other tribes.

- Add a place for tribes on Network governance groups (for the reasons above).

- Utilize existing forums to educate and inform tribes about the Network and its benefits.

- For those tribes that have fewer data submission requirements, and less organization and technological resources:

  - Continue to provide grant funding to enhance their capabilities

  - Pilot use of the Network through tribal associations and inter-tribal councils

# Section 5.   Financing the Network

Section 5 describes the current funding sources, the Network funding categories for the next 3–5 years, an illustrative scenario for the completion of the initial development of the Network, and an analysis concerning Network financing trends and vulnerabilities. This Business Plan cannot establish a new, different funding model for the Network — that can only be accomplished by the Network community and the new Network governance bodies. Rather, it provides the information necessary for developing a long-term funding approach.

## 5.1   Illustrative Scenario for "Standing-up" the Network

As indicated in the findings and proposals at the end of this section, the several key categories of Network benefits, costs, and costs avoided have yet to be characterized. This subsection contains an illustrative estimate and description of a specific Network deployment scenario, depicting a full deployment of the Network by 2010 ("standing-up" the Network). This scenario was developed to provide, for the first time, a working "target" definition of deployment that can be used by the Network community to begin financial planning. The following criteria were used to define "full" deployment:

- Use of the Network by nearly all states, as many tribes as possible, and several additional federal partners

- Substantial coverage (but not necessarily full implementation) of all major regulatory program areas, including the availability of electronic reporting/collection and automated data exchange with multiple partners

- Substantial activity in "non-traditional/regulatory"[10] exchanges, including environmental indicator, administrative, public health, and research-related data flows

- Widespread deployment and use of nodes publishing, and clients consuming, environmental information through Web services

- Sufficient deployment to have begun reaping economies of scale for all Network component areas

The attributes for this scenario are listed below. These attributes are NOT proposed Network targets or milestones; rather, they are proposed to begin the next phase of planning with the Network community, managed by Network leadership, to establish formal milestones and a financial plan to achieve them. They are:

- 50 fully functional nodes servicing 15 major flows and their associated publishing services

- 50 major client applications in use by other partners for one or more flows

- 30 fully documented, tested, and implemented flows (15 traditional and 15 non-traditional), available for implementation on an essentially "map and flow" basis. These

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[10] "Non-traditional/regulatory" exchanges are those that are not part of a flow populating a national system.

would provide access via a Web service to substantial new sources of data in these areas (e.g., facilities, surface water, and habitat).

- Robust "industrial strength" Network infrastructure, including registries, security services, help desk, and reference services.

- Fully staffed Network support/governance organization/staff, including a "change management" support process for the inevitably uneven evolution of components and partner implementations.

Through the process of developing these attributes, NPAT also identified refinements of some of their underlying components. Some of the most significant of these are discussed below.

## 5.1.1   Network Nodes and Clients

Until fairly recently, most Network participants expected that all partners using the Network would have nodes. However, it now appears that this will not necessarily be the case. We have learned that many important exchange scenarios on the Network can leverage the use of Network clients (or other methods) as a step in publishing data on a node[11]. For many partners providing only one or two data feeds, it may be more efficient to use a client to deliver data on a routine automated basis to a partner node ("super node"), which publishes that data on the Network[12]. This recognition does not change the expectation that partners with primacy for large numbers of potential feeds, such as state agencies, would establish their own node and publish that data onto the Network directly[13].

## 5.1.2   Network Portfolio of "Ready to Implement" Flows

A stable, fully functional Network would consist of a "map and flow[14]" portfolio of at least 30 Network flows, ready for implementation. It is assumed that the 30 Network flows are implementable by a majority of Network partners, and require collaboration and shared investment. Facilitating partner engagement and establishing collective goals and mechanisms, through processes such as Network Data Area Strategies, is labor and resource intensive. Further, NPAT envisions that some products — such as flow configuration documents, schema, and data standards — are collectively funded, produced, and stewarded.

## 5.1.3   Network Flow Implementation by Partners

A stable, fully functional Network would consist of every node partner implementing on the order of 15 flows. Participating in a flow requires more than just installation of Network nodes and

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[11] A major Network growth area are clients used solely for secured access to one or more published services. Success of the Network, in part, is managing the proliferation of such clients.

[12] For example, the underlying architecture of the Pacific Northwest Water Quality Data Exchange is based on clients providing information to one node. The node then publishes the aggregated information.

[13] It is important to note that no Network exchange can take place between two Network clients; a node must always either accept a submission of information from a Network client or service a request from a Network client.

[14] "Map and flow" means that a comprehensive set of information is available to partners describing how they can and should implement a particular flow. All a partner would need to do in order to flow data would be to map its data to the shared standard, and format and connect to its common exchange and/or access tool.

clients. Individual partner source systems must be prepared, including system AND data improvements. Partners will also have the task of establishing the connection between the source system and the node or client. This task is both a technical task (e.g., writing the code to interface with a source system) and a data management task (e.g., mapping to the shared standards and formats).

Informal cost estimates developed by NPAT clearly identify the "cost per flow per partner" as the dominant cost factor. This re-enforces the importance of managing and reducing these costs through the development of sound, useful flow designs and documentation discussed in the previous component. These costs are a key leverage point, since we seek cost reductions through economies of scale/technology transfer — especially for the collection, access, and exchange tools. These must reduce/minimize the cost for future partners, with a ready data asset, to implement that flow. Once implemented, we expect each flow to shift mostly to operations and maintenance costs, which should be much lower.

Experience also clearly indicates that costs to develop and implement some flows will vary dramatically from flow to flow. Practitioners observe that many targeted, specific flows (some of which have already been demonstrated) can be mounted and used for one-tenth the cost associated with fully automating a "traditional" regulatory flow. As discussed in Section 4, these "small" flows may be just the place for early implementers to begin.

## 5.1.4   Stable Network Infrastructure

The Network infrastructure is those tools and services that partners need to assure operational reliability on the Network. Example Network infrastructure costs are design, development, and use of Network registries, Network security components, and shared services.

## 5.1.5   Stable Network Governance/Administration

The cost of Network governance covers all of the costs of managing the Network as an enterprise. A part of Network governance is supporting the salaries of those individuals whose primary responsibility is accountability to the Network. At EPA, approximately 25 FTE are dedicated to Network component development and management. The NSB currently uses Network Administration Grants, through the Environmental Council of the States, to support portions of three state staff positions totaling between 1-2 FTE. This figure does not account for the state staff resources that are contributed for Network administration (participation in the NSB and its subgroups). As the Network continues to grow, so too will the need for Network-resourced staff in states, tribes, and at EPA.

## 5.1.6   Summary of Findings and Proposals

Efforts to estimate costs and benefits of the Network, including the resource estimate in this section, have been hampered by our limited implementation experience, the immaturity of base technologies, and the diffuse nature of many of the relevant expenditures. Based on our recent implementation successes, and the direction and definition established by this Business Plan, the Network community is now in a position to commission a business case assessment for the Network.

The Network leadership (the Exchange Network Leadership Council) should commission and oversee development of a formal assessment of the benefits, costs, and costs avoided for the Network as an enterprise. The benefits (exchange efficiency, quality, access, new services, etc.) and costs identified in this report can provide a starting point for this assessment.

## 5.2   Network Funding Categories

The Network community must account for three general types of costs: those associated with development, operations and maintenance (O&M), and administration.

Development costs are any expenses associated with implementation and growth of the Network. This Business Plan assumes that development costs will be disproportionately high for the next 3–5 years as the Network establishes its core infrastructure, and a substantial number of states and EPA continue to establish exchanges and fund infrastructure. Development costs will always exist, but they are expected to attenuate and stabilize as infrastructure shifts from development to O&M. The illustrative scenario in Section 5.1 identifies a scenario which would complete initial development and implementation of the Network.

O&M costs are those associated with the day-to-day use of the Network. The task of establishing, predicting, measuring, and funding O&M costs for the Network is a tremendous financial planning challenge. Currently, it is not clear if programs have recognized that they have historically paid for data flows and explicitly identifying this might appear to potential users as a new cost. For example, in some instances, EPA and states do not charge users for logging into and sending data to a particular system, yet someone is paying for the O&M of the system. In some instances, O&M costs are folded into indirect cost relationships established by divisions within an organization.

In the cases where the Network will be providing shared infrastructure, like Network Web sites or registries, O&M costs must be collectively paid. For the near term, Network funding during build-out must cover some individual partner costs and O&M costs — especially for early implementers and flow "developers." The funding subsection assumes that over time, a greater and greater share of the per-node and per-flow O&M costs are incorporated into standard "cost of doing business" (seen happening in some states already).

Network administration costs are those costs that support Network governance. Network administration is now, and will always be, a shared cost. Major near-term sources for funding are direct EPA investments and Network Administration Grants. Network administration costs are likely to increase as the Network moves towards build-out, then stabilize. Near-term cost increases will likely be a result of an increased need to support the salaries of key Network personnel.

## 5.3   Current Network Funding Sources

Like building the Network, assuring its long term fiscal sustainability will be a long-term incremental process. Developing a long-term funding plan is beyond the appropriate scope of this Business Plan. Once a governance structure is established, a long-term financing plan must be developed. This plan will likely involve a refinement and extension of current funding approaches, which are identified in this subsection, and identification of new supplemental funding sources.

Currently, there are four major Network funding sources: Network grants (i.e., Implementation, Challenge, Mentoring, and Readiness Grants), Network Administration Grants, EPA programmatic grants (i.e., STAG grants), and independent partner investments.

For the past three years, the Network grants have gone to states, tribes, and co-regulators' organizations to promote Network growth and participation. Participants interviewed during the development of this Business Plan unanimously agreed that the Network grants have been paramount in getting the Network where it is today. State budgets have been plagued with significant budget shortfalls, forcing state environmental and health agencies to focus only on mission-critical expenditures and to institute hiring freezes or staff cutbacks. In most states, no Network development would have occurred without the Network grants.

State agencies cannot easily ask legislatures for IT money without a demonstrated return on investment; agencies have to justify how IT investment will add value. This provides the Network community with a dilemma: Network activities must be subsidized, initially, for their own sake, until enough participants and services exist to realize the benefits of economies of scale. The Network grants are the tool used to move the Network towards this necessary critical mass.

The Network Administration Grants have primarily been used to fund shared activities and to support to the NSB and its subgroups. For instance, administrative grant monies were used during the conceptualization and design of the basic technical guidance — a product that is truly for the Network. Funding for Network administration is an ongoing, long-term cost. The amount needed to appropriately fund Network administration is directly tied to the governance structure, the Network priorities, the somewhat unpredictable nature of how the Network will evolve, and the level of in-kind support and participation provided from the at-large Network community. For instance, many early Network adopters volunteered significant amounts of staff time and resources to participate in action teams and workgroups. The extent to which Network administration duties are absorbed by the Network community will mitigate the dollar amount needed to support Network administration.

EPA programmatic grants merit mention, even though there is no clear link between EPA grant dollars (over and above Network grants) and the Network. For example, 104(b) and 106 funds do not come with requirement that the tools/resources of the Network be utilized in order to qualify for their use. This Business Plan assumes, however, that over time, some of the Network per-node and per-flow O&M costs will be assumed by programs/users as the Network becomes incorporated into the standard "cost of doing business." As the Network is incorporated into the cost of doing business, it is likely that some of the EPA programmatic grants will be used to cover some portion of Network O&M costs. The Network community faces a major challenge in designing an appropriate funding model to support shared O&M costs.

There is a current grant alignment effort to identify ways to incorporate Network activities into state-EPA day-to-day business, focusing on Performance Partnership Agreements and Grants (PPAs/PPGs) and ongoing grant programs (OW, OSWER, OAR, etc.). The grant alignment effort is identifying ways to raise awareness of the relationships between Network grants and activities, and programmatic reporting requirements and efforts. Additionally, the grant alignment effort is attempting to draft boilerplate language for use by the Network and programs in guidance documents, grant documents, and state-EPA agreements.

## Funding Scenarios for the Network

### Current Network Funding

**Administration**
Network Administration Grant

**Development**
Exchange Network Grants and Partner Investment

**Operations & Maintenance**
Exchange Network Grants and Partner Investment

### Traditional Non-Network Exchanges

**Administration**
Variable:
• Program Cost
• State Funded via Administration Pool or Indirect Pool

**Development**
Programmatic Funds and Grants

**Operations & Maintenance**
Programmatic Funds and Grants
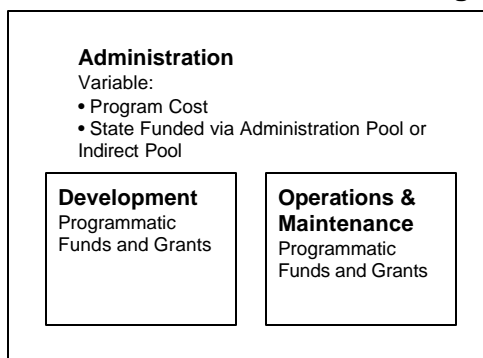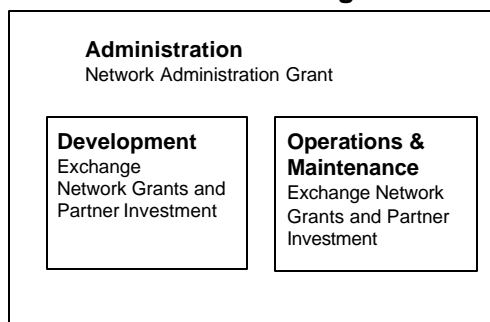
### Possible Future Network Funding

**Administration**
Unknown

**Development**
Exchange Network Grants and Partner Investment

**Operations & Maintenance**
Programmatic Funds and Partner Investment
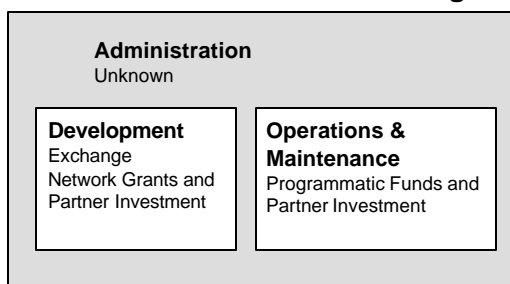
*Figure 11.  Current and Future Costs and Funding Sources*

The final source of funding is individual partner investments, which vary dramatically. Many of the costs for partners may stem from preparing a source system or preparing data for the Network. It is possible that some of the costs for partners may be lessened through shared development or shared infrastructure investment. Moreover, partners can expect infrastructure development costs to decline over time as the cost per additional flow (additional partner investment) decreases.

Figure 11, above, identifies the funding categories, as delineated in subsection 5.2, and matches them with funding sources, delineated in this subsection, for three different circumstances.

Further, the continuing evolution of Network technologies, partners, and exchange scenarios may present additional, supplemental funding sources for Network infrastructure. There is currently no party designated to identify and evaluate these opportunities. The Network leadership should establish, as part of its periodic strategic planning process, a scan for potential supplemental funding opportunities for Network infrastructure. Potential areas include sharing the costs of infrastructure with new partners or "share in savings" type partnerships with the private sector. Network Data Area Strategies and business case efforts identified in Section 4 should provide a good basis for the first such scan.

# 5.4 Financing Trends and Vulnerabilities

For the next five years, the Network's primary financial vulnerability is a funding shortfall prior to the completion of a substantial portion of development. The other vulnerability is failing to persuade and demonstrate to traditional EPA and state programs the value of the Network in real terms that the programs can understand. Until the Network is no longer an ancillary project, competing for funding with business-critical projects, Network development and O&M costs must be substantially and externally supported. The current mechanism, the Exchange Network Grant Program, is the single most important funding component; without it, Network progress would unquestionably be slowed, if not stopped.

To this point, financial incentives have been the primary mechanism to encourage Network participation. Financial incentives will ultimately be successful once a partner understands a business case for Network participation. It is imperative that the Network grants be coupled strategically with Network priority outcomes to produce products for the Network community — products that can be used by other partners, that can encourage subsequent participation, and that help partners with their business.

Establishing strong linkages to the programmatic/business priorities of the Network community must be a core priority. Programmatic grant alignment is one the most critical initiatives concerning Network financing. Programmatic grants are a stable funding source and at a minimum, must not discourage use of the Network. Conversely, at the point where the Network becomes a preferred or primary mechanism and is incorporated into the partner business process, programmatic grants must support Network O&M.

The Network Data Area Strategies identified in the previous section must be complemented by a concerted and ongoing effort to align the information components of EPA programmatic grants and Network grants with these priorities. Ensuring that EPA programmatic grants support and are supported by the Network is one of the most powerful ways of ensuring the Network's successful adoption.

The IMWG's current grant alignment effort should be strengthened, placed under the Exchange Network Leadership Council, and established as an ongoing (at least for the mid-term) effort. Given the history, size, and complexity of the EPA grant universe, this alignment will be an incremental and evolutionary process, but one that needs guidance and leadership.

# 5.5 Summary of Section 5 Proposals

## 5.5.1 Illustrative Cost Scenario for "Standing-up" the Network

- Commission and oversee development of a formal assessment of the benefits, costs, and costs avoided for the Network as an enterprise.

## 5.5.2 Network Funding Categories and Current Network Funding Sources

- Develop a long-term financing plan.

- Establish, as part of a periodic strategic planning process, a scan for potential supplemental funding opportunities for Network infrastructure, including sharing the costs of infrastructure with new partners or "share in savings" type partnerships with the private sector.

## 5.5.3 The Exchange Network Grant Program, Financing Trends, and Vulnerabilities

- Provide substantial external support — primarily through the Exchange Network Grant Program — for Network development and O&M costs until the Network is no longer an ancillary project competing for funding with business critical projects.

- Complement the Network Data Area Strategies identified in the previous section with a concerted and ongoing effort to align the information components of EPA programmatic grants and Network grants with these priorities.

- Strengthen the current grant alignment effort, place it under the Exchange Network Leadership Council, and establish it as an ongoing (at least for the mid-term) effort.

# Section 6. Network Governance

*NOTE TO READERS: Following the release of a draft of this report the subsequent IMWG State/EPA caucuses in December 2004, the NPAT received a substantial number of comments regarding the contents of Section 6 (See Appendix C). At the State/EPA caucuses, the respective caucuses debated and approved the high-level proposals contained in Section 6. To address the substance of those comments, the IMWG State/EPA caucuses charged a team to draft a charter of the Governance bodies, a position description for the Exchange Network Executive Coordinator, and a transition plan from the current structure to the organizational model described in this Report. Those documents while based on this section now supersede it. This section also includes recommendations for the role for the IMWG. These recommendations generated significant comments, which, along with the recommendations themselves, have been referred back to the IMWG for consideration.*

*This section remains unchanged from the draft reviewed by the IMWG State/EPA caucuses with the exception of changing the name of the Information Management Leadership Council to the Exchange Network Leadership Council.*

## 6.1 Introduction

Governance is the means and mechanism for leading, managing, and supporting partners in building one Network. Its purpose is to channel collective and individual efforts into successful Network development and management. To date, the first generation governance structure has done its best to serve this purpose for the Network. As the Network continues its evolution from implementation to operations, it is and will become more complex, and the development and management issues will become more challenging. A new, more formal governance structure is needed. This section outlines such a structure. The realignment toward a more formal structure should be viewed as an evolutionary adaptation to meet the needs of a successful and growing Network.

The governance structure outlined in this section is based on five high-level conclusions reached by NPAT after a great deal of deliberation. These conclusions are:

1. Stronger leadership and oversight of the Network is needed, and it is not being provided by the IMWG plenary.

2. Responsibility for strategic direction and policy should be separated from responsibility for operations.

3. The functions of the Environmental Data Standards Council and the NSB (and its sub-groups) should be strengthened and integrated.

4. States and EPA should continue to host joint Network governance entities; no new legal entity or formal organizational affiliation should be created. This approach retains the current option of using co-regulator entities, such as ECOS or others, as administrative/fiscal agents. Changes to organizational hosting are not ruled out for the future.

5. The position of an Exchange Network Executive Coordinator should be created.

# 6.2   Why Change and Why Now?

As identified in the Environmental Council of the States' Management Review and refined in this report, a new governance model is needed to support the Network transition from conceptualization and initiation to implementation, operation, and expansion. To make the case for change, this section first identifies how Network governance has operated; then reviews the original charge to the NSB and identifies gaps in this charge that must be addressed, and that motivate the proposed structure.

Before reviewing the original functions identified by the IMWG for Network governance, it may be helpful to review the three mechanisms by which governance has operated to date. First, Network governance has provided organizational, technical, and/or financial support directly to targeted joint infrastructure and flow implementation projects. Second, Network governance has provided forums in which joint issues can be deliberated, resolved, and/or elevated. Third, the Network governance has provided a structure by which the credibility of the members and the Network itself can be used to advocate and act on behalf of the Network.

In October 2001, when constituting the NSB, the IMWG identified the following high-level functional areas for Network Administration:

- Joint steering and oversight

- Network registry and repository operations

- Network specifications, guidance, and best practices development

- Provision of technical assistance to Network partners

- Communications/outreach

NPAT believes that all of these functional areas are still germane, but not comprehensive enough for the next phase of Network development and expansion. NPAT has identified five additional governance requirements that the current governance structure and composition cannot adequately address, and that drive the governance proposal outlined in this section. These requirements are:

1. Strengthening leadership and accountability for the Network as a common enterprise

2. Aligning Network activities with the Network vision

3. Strengthening coordination and management of Network Web services and flows

4. Allocating and formalizing the current operations, policy, and planning roles of the NSB

5. Integrating the core technologies of standards, nodes, and XML to strengthen flow support and development

Each of these additional requirements is discussed below, along with relevant gaps in current Network governance and proposals for future Network governance.

## 6.2.1 Strengthening Leadership and Accountability for the Network as a Common Enterprise

Building one Network requires managing some of the partnerships as a single enterprise. Currently, there is no one person accountable to the Network. The current governance structure reflects and perpetuates a duality — a duality in reporting, a duality in accountability, a duality in structure — between the interests of EPA (whose interests also vary by program) and those of states. To this point, because of the cooperation and goodwill among the parties, the duality has only nominally hindered the Network. However, as the Network continues to grow and the numbers of partners and activities increase, there is no way to assure the Network grows in a sustainable, strategic, and interoperable manner without governing the Network as one entity. The first step in governing the Network as a single entity is to create accountability to the Network as an enterprise. The proposed governance structure will feature an Exchange Network Executive Coordinator, whose primary responsibility will be to the enterprise and who will report directly to the co-chairs of the Exchange Network Leadership Council.

## 6.2.2 Aligning Network Activities with the Network Vision

Propelled and accelerated by the Exchange Network Grant Program, implementation of the Network now involves hundreds of staff across the country, working on scores of flows. However, many of these partners and bystanders remain unclear about how their efforts fit in. As a decentralized effort, supporting alignment of these partners towards the goals of compatibility and synergy is a core function of governance. This Business Plan proposes to engage communities of interest and to create customers for Network flows by convening Network Data Area Strategies. In addition, it envisions more specific and directed support to partners guided by the re-cast Network components and exchange scenarios. These investments will reap the benefits of aligned Network progress, but are beyond the capability of our current structure to provide.

## 6.2.3 Strengthening Coordination and Management of Network Web Services and Flows

When the IMWG created the original high-level functional areas of the NSB, it assumed that the IMWG itself would oversee the prioritization of flow implementation. The focus of the NSB was to be strictly on Network administration. The new Network components and the ongoing growth and implementation placed new demands on governance — particularly a demand to coordinate and manage the development of Web services and flows[15].

A new Network component — shared strategy for environmental Web services—assumes that partners and the Network should and will move to Web services. Inherent in this evolution, and necessary for maximizing the potential of the Network, is a need for coordination. The Network will and should move to Web services for the same reason databases were implemented and Web pages were built: the direction of the technology supported new and better ways of doing business. A conservative prediction would be that in three years there will be scores of individual Web services that publish environmental data available from partners. Many of these

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[15] At the May 2004 NSB meeting, the NSB recognized this shortcoming and identified the need for an Exchange Network Executive Coordinator.

will evolve with or without the direct support of the Network. The Network's goal should be to influence as many of these as possible towards compatibility and synergy, and the governance structure should be aligned toward doing so. In order to establish one Network, Web services must be published as a partnership. Network governance must continue and accelerate Network success by offering leadership and vision for this partnership. Further, this publishing paradigm is the only viable means by which the vast stores of semi-structured data of the research and scientific communities will ever be made more available.

## 6.2.4 Allocating and Formalizing the Current Operations, Policy, and Planning Roles of the NSB

The NSB, as the sole coordinator of the Network, is triple-tasked with resolving operations issues, establishing technology standards, and strategic planning. In theory, the IMWG is tasked with strategic planning and general oversight. While partners find the IMWG a useful forum for general discussion and sharing, all agreed that given its meeting schedule, fluid membership, and informal proceedings, it has not and cannot fulfill the functions of strategic planning and general oversight. By default, the NSB has shouldered these policy and planning responsibilities. Taken separately, the NSB's tasks are difficult enough; together they are overwhelming. Further, the NSB, as currently structured and populated, has evolved to meeting only 2–3 times a year. Two different entities making operations decisions and policy and strategic planning decisions are needed. The proposed governance structure separates operations from policy and planning.

## 6.2.5 Integrating the Core Technologies of Standards, Nodes, and XML to Strengthen Flow Support and Development

Currently, the Environmental Data Standards Council and the NSB are organizationally at the same level — subgroups to the IMWG. The Environmental Data Standards Council had been operational for several years prior to the creation of the NSB. The Network Blueprint identified data standards as a "core component" of the Network and the presumption was that standards would continue to be the purview of the Environmental Data Standards Council. The intricacies of the relationship between the NSB (at that time the Interim Network Steering Group) and Environmental Data Standards Council, and the two technologies — standards and XML — were just beginning to be understood. When the IMWG chartered the NSB, it was clear that a more formal coordination framework was needed. This framework was addressed in the NSB charter itself:

> *"Through a jointly developed framework and strategy for coordination, NSB (should) coordinate and work directly with the Environmental Data Standards Council on data standards and DET guidelines."*

This framework and strategy have yet to be formally developed or implemented. This proposal directly addresses these issues by proposing the integration and realignment of the Environmental Data Standards Council and the NSB into a newly formed Exchange Network Leadership Council. This proposal is motivated by the following, more detailed, management findings:

- As discussed in the Environmental Council of the States' Management Review and re-enforced by current experience with the joint production of shared schema components, the work of the Environmental Data Standards Council in establishing standard terms and XML tags overlaps significantly with the NSB Technical Resource Group's efforts to establish standard XML tags and terms for shared data elements and element groups.

- The Technical Resource Group and the Environmental Data Standards Council are also seeing the complexity and importance of the relationship between the discipline of standards development and its expression in XML. Standards are influencing our XML and XML is influencing the structure (but not meaning) of our standards as they are applied. The nascent concept of "semantic web" (i.e., a web of accessible standardized data) now emerging represents just such a convergence. We expect this trend to continue. The current organizational structure requires staff working in these areas to cross both philosophical and organizational boundaries.

- While the work of standards will have a fundamentally larger scope than the Network, the scale, intensity, and diversity of XML schema development underway by the Network community represents a unique opportunity to advance collective application of data standards to environmental data. Network momentum and resources can and should be coupled to advance standards. Integration of the standards leadership with the broader state-EPA leadership will best advance standards both within and beyond the Network domain. The convening of Network Data Area Strategy communities will provide an ideal opportunity to support and identify needed standards within the context of the business needs of that community and connect them to resources and other Network components.

- As a leadership group composed of senior EPA and state executives, the Environmental Data Standards Council's role has evolved to focus primarily on direction, prioritization, and representation of members' respective offices/media or organizations. Members oversee the actions of staff/experts to ensure that the work of the Environmental Data Standards Council is executed, but typically the members are not themselves substantially engaged in the individual standards development processes. These functions have substantial overlap and synergy with those identified for the proposed Exchange Network Leadership Council.

- As discussed above and throughout this report, the natural evolution of the Network will be towards the secured publication of ever-broader domains of environmental data. As this evolution occurs, it will place greater demands on the services provided to support discovery and characterization of data. Meeting this challenge will require integrated leadership on how standards and Network technologies are applied to these problems.

NPAT considered various alternative structures to address these issues; the proposal in this Business Plan is to integrate data standards leadership and management into a newly created Exchange Network Leadership Council.

Recent experience also suggests a convergence of another set of Network tools. The two current technical subgroups of the NSB (Operations, Technology, and Security and Technical Resource Group) are experiencing a convergence and overlap of issues, especially as guidelines and standards are implemented across flows. Historically, these technical groups separated their areas of responsibility into two domains: issues associated with moving (transport) of data — the node/Operations, Technology, and Security group — and issues associated with the structure and meaning of the data payload — the Technical Resource

Group. This distinction made sense when the Network began, because these two issue areas could evolve independently but in parallel. As XML continues to develop, there are more intimate linkages between the format and structure of the payloads and how payloads are transported. To address this convergence, NPAT proposes the functional integration of the Operations, Technology, and Security group and the Technical Resource Group into a single group. During the drafting of NPAT, the Technical Resource Group itself developed a similar proposal. Note that, while related, the integration of the Environmental Data Standards Council /NSB functions and Operations, Technology, and Security/Technical Resource Group functions are occurring at two different governance levels. Standards leadership is being integrated "at the top" in the Exchange Network Leadership Council. Integration of the Technical Resource Group and Operations, Technology, and Security is proposed at the working group level, similar to their current positions.

In summary, the aforementioned new governance requirements necessitate changes to the current governance. As explicitly described in subsections 6.3 through 6.5 below, the governance model proposed here makes three key changes from the current practice:

1. Establishes a new senior group (the Exchange Network Leadership Council), that will focus on leadership and management for the Network. Reflecting the growth and momentum of Network projects, NPAT recognizes that the activity level and time investment on the part of members (particularly the co-chairs) will necessarily be beyond that of the current NSB and Environmental Data Standards Council. EPA proposes to co-chair this group with a senior manager with direct responsibility for key Network activities (such as CDX, registries, and the grant program), and states propose to staff the co-chair position with a senior state manager with salary support by Network resources (if necessary/appropriate). It is anticipated that the time commitment for the co-chair would be in the range of at least a quarter to one-third time. For EPA, this staffing establishes a direct linkage from the decisions of the Exchange Network Leadership Council to EPA managers with the direct authority to implement them. For states, it establishes and supports a new level of senior management engagement in governance.

2. Establishes a new, single, executive-level staff position, called the "Exchange Network Executive Coordinator." Unlike current Network staff positions, this will explicitly NOT be designed to represent "state" or "EPA" positions, but those positions of the Network as an enterprise. All Network projects — from electronic reporting to national system exchanges to regional data sharing consortia — would all be on equal footing within this Exchange Network Executive Coordinator's scope.

3. Establishes a new operations-focused oversight group. Like the Exchange Network Leadership Council, EPA staffing of this group would include line managers with authority over their respective Network activities. Likewise, the state members would be authorized (through the administrative mechanisms described below) to directly implement group decisions/direction.

Taken together, the Exchange Network Leadership Council (lead by its co-chairs) and the position of Exchange Network Executive Coordinator represent a new investment and focusing of joint authority. This reflects NPAT's judgment that to capitalize on the Network infrastructure and investments now underway, we must take the next steps in strengthening the connections between our efforts. As our experience to date suggests, exercising this authority will be awkward, especially given the competing priorities and jurisdictions of partners, but we must try.

NPAT is aware of no alternative as to how this collection of partners can manage their collaboration to build one Network.

## 6.3   Revised Network Governance Functions

Based on the vision, Network components, and governance findings/requirements identified above, NPAT established a revised set of Network governance functions. The governance functions were the primary tool NPAT used to establish the organizational structure. NPAT has developed an organizational structure (using the current structure as its point of departure) that would best organize partners and their resources to implement these functions. The functions are:

- Providing leadership and direction towards the common vision of the Network and its components.

- Working with partner communities of interest (program area, functional, or geographic) to establish and document clear objectives, opportunities, and plans for using the Network to achieve specific goals.

- Providing planning and coordination of major Network implementation projects/flows; in some cases this will include direct funding and management of priority projects/flows.

- Identifying and developing needed data standards, specifications, guidance, and best practices guides.

- Overseeing and managing the shared Network infrastructure, including the Web site, security services, registry/clearinghouses and other resources that may be developed.

- Informing, influencing, and coordinating joint and individual partner Network planning and implementation efforts to ensure the highest practical level of interoperability.

- Communication and outreach to the Network community and targeted potential partners.

- Identifying current and possible future funding sources and opportunities for the long-term sustainability and growth of the Network.

## 6.4   Governance Structure

The proposed governance structure will serve three related but different functions: Network leadership, Network governance, and Network administration. Network leadership is the ability to articulate a compelling vision for the Network and make credible policy decisions that advance toward that vision. Network governance includes structures and processes that support leadership by providing operational decisions, management, and coordination of the joint and individual projects of partners. Network administration oversees the operation and maintenance of policy, organizational, and technical infrastructure needed to operate the Network. These three concepts are distinct but interrelated.

NPAT proposes integrating the Environmental Data Standards Council and the NSB functions and structures into a new organizational structure for the Network. This structure would have the following components:

- State/EPA Information Management Working Group (IMWG) — which would be retained as a venue for airing state-EPA information management issues, but not as a decision-making body.

- Exchange Network Leadership Council — which would have primary responsibility for policy and strategic planning.

- Network Operations Board — which would have primary responsibility for Network operations and would report to the Exchange Network Leadership Council.

- An Exchange Network Executive Coordinator.

NPAT's proposal for organizational structure stops short of proposing subgroups to the Exchange Network Leadership Council and Network Operations Board. The Exchange Network Leadership Council and Network Operations Board, once constituted, will be in an improved position to identify appropriate subgroups. However, as a recommendation, NPAT has described and identified potential standing subgroups to the Network Operations Board. At a minimum, the recommendation of subgroups provides a plausible organization to accomplish a subset of the Network Operations Board work. These subgroups are:

- Network Technology Group (NTG): a sub-group of the Network Operations Board (reporting to the Network Operations Board), responsible for the day-to-day operations and technology of the Network

- Network Partnership and Resources Group (NPRG): a sub-group of the Network Operations Board (reporting to the Network Operations Board), responsible for policy and resource planning, such as the grant alignment activity discussed in Section 5.

- Data Standards Teams.

Each feature of the proposed governance structure is detailed below and graphically depicted in Figure 12.

For the higher-level governance entities (IMWG, Exchange Network Leadership Council, and Network Operations Board), part of the following discussion describes their scope. The environmental domain is very broad and Network partners are engaged in many diverse activities that in some way involve information. The discussion of scope identifies the reach of these entities within this broader domain. Scope definitions are not intended as rigid boundaries. Rather, they are a means of identifying which forums should be used for what partner purposes and to provide essential focus to each group by explicitly identifying areas inside and outside of their purviews.

Because this proposal does not recommend major changes to the organizational or administrative hosting of the governance entities, the basic mechanisms by which these entities direct and manage resources remain as they are now. They operate by making joint recommendations to EPA or the Network's administrative agent (or both) on needed investments. The Environmental Council of the States is the current administrative agent administering the set-aside funds from the Exchange Network Grant Program on behalf of the Network.

# Proposed Network Organizational Structure
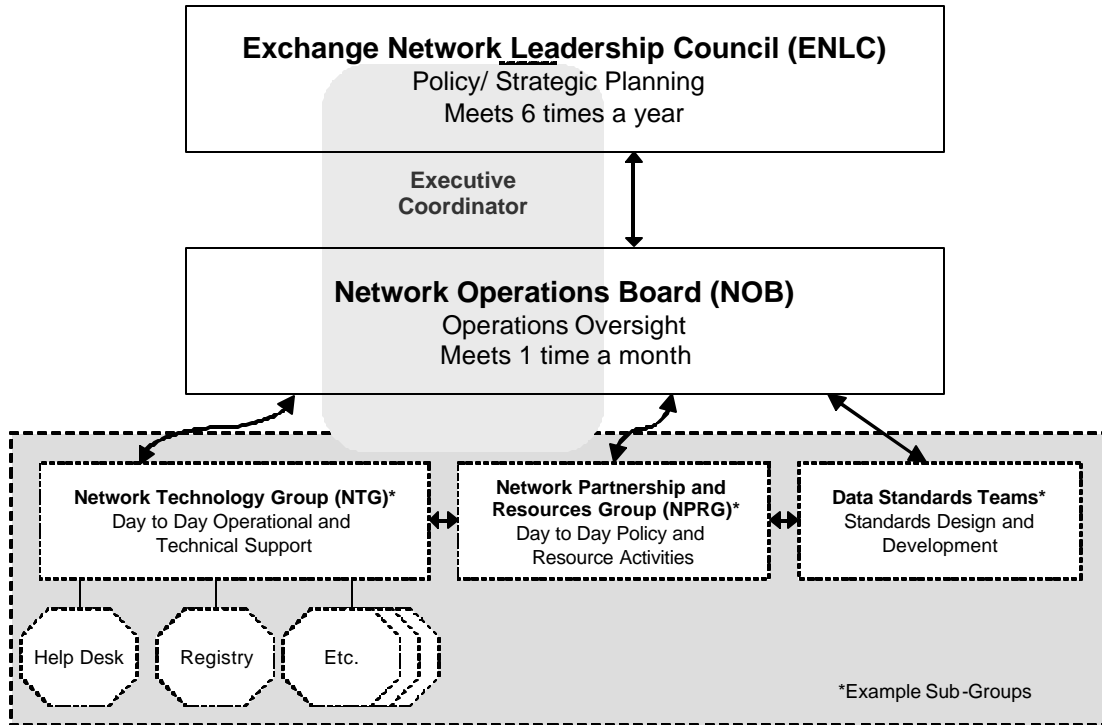


**Figure 12.  Proposed Organizational Structure**

## 6.4.1   State/EPA Information Management Workgroup (IMWG)

Under the NPAT proposal, the plenary IMWG would no longer be a decision-making body, but would act as a broad venue for state-EPA information management issues. As the Network moves to an operational stance, it is no longer appropriate that the IMWG maintain an oversight role, as it is not structured to provide timely operational guidance. The IMWG will be a venue where informal political support of the Network can and should be established.

The scope of the IMWG will continue to be very broad. It will act as a forum for all issues of environmental information management, including, but not limited to, information exchange.

This includes broader topics of environmental and public health, uses and analysis of environmental data, and broader issues of federal and state relationships around environmental data.

## 6.4.2   Exchange Network Leadership Council

The Exchange Network Leadership Council is the leadership of the Network and is responsible for the Network's overall policies and strategic direction. The scope of the Exchange Network Leadership Council is broad, but not as broad as that of the IMWG. The Exchange Network

Leadership Council will focus on partner issues and opportunities that directly use or bear on the Network components identified in this report, even where those components are not (yet) strictly linked to a given Network flow. For example, providing leadership and support to joint data standards development efforts would be within the scope of the Exchange Network Leadership Council, even if the specific Network applications for those standards have not yet been identified. The following issues, although related to the Exchange Network Leadership Council's work, would be outside of its scope:

- Issues covered by other IMWG chartered action teams

- Information issues without a significant exchange, access, or sharing aspect

- Bilateral disputes or debates over the need for data (e.g., whether EPA needs particular data from a state) or conditions of TPAs as they are developed between participants

- Internal management of individual Network partners' infrastructure, nodes, and information management systems, except as those issues bear on partner commitments or Network impacts

As described below, the scope of the Exchange Network Leadership Council is broader than that of the Network Operations Board. That is, the Exchange Network Leadership Council may establish ad hoc groups focused on topics related to exchange (e.g., some broader aspects of intergovernmental security) but not yet connected to the Network. Composition and membership of the Exchange Network Leadership Council is described in subsection 6.6.

## 6.4.3 Network Operations Board

The Network Operations Board will oversee operation of Network shared infrastructure and will identify, prioritize, and resolve Network operations issues. The Network Operations Board's primary responsibilities are to:

- Act as clearinghouse and final arbiter for all Network operations issues

- Direct the operational evolution of the Network

- Implement Exchange Network Leadership Council priorities and policies

- Operate as the policy body on Network security

- Maintain and update Network technical guidance documentation

- Identify evolving technologies and evaluate their impact on future Network operations

- Track and coordinate with flow implementation efforts

- Oversee Network infrastructure (e.g., registry)

- Assure adequate technical assistance to implementers

- Oversee Network revenue and resource issues

- Maintain the Network Web site

The scope of the Network Operations Board is defined as issues bearing directly on the use of the multiple Network components for recognized Network flows. This scope is narrower than that of the Exchange Network Leadership Council; it will focus on ensuring the availability,

reliability, and responsiveness of Network components (especially shared services and infrastructure) to flow partners. The Network Operations Board will have to have some subgroups comprised of the "doers" who identify issues and bring them to the Network Operations Board. NPAT has identified two possible standing workgroups: the Network Technology Group (NTG) and the Network Partnership and Resources Group (NPRG). Members of these groups are the Network implementers with the relevant technical or policy skills. Composition and membership of the Network Operations Board, as well as the function of these subgroups, is described in subsection 6.6.

## 6.4.4   Exchange Network Executive Coordinator

NPAT proposes the creation of an Exchange Network Executive Coordinator position to provide a single integrated point of coordination for the Network. The IMWG originally created the dual state and federal coordinators as a means of establishing better coordination among the various EPA, state, and joint activities needed to put the Network on the path to operational reality. Establishing the Exchange Network Executive Coordinator to provide unified coordination is the next logical step in further strengthening the identification and implementation of the full range of actions and policies needed to complete the "stand up" of the Network. This position will report to and draw its authority from the highest level of Network governance, the Exchange Network Leadership Council. The Exchange Network Executive Coordinator will be the central link to the other committees (such as the Network Operations Board) and to activities that will collectively be taking the Network to the next level of service, utility, and operational reliability.

Specifically, the Exchange Network Executive Coordinator will:

- Work with the Exchange Network Leadership Council and Network Operations Board to create and maintain an Exchange Network Project Plan. The Exchange Network Project Plan will be the primary planning, management, and internal communications mechanism for the Exchange Network Executive Coordinator, Exchange Network Leadership Council, and Network Operations Board.

- Support the Exchange Network Leadership Council and Network Operations Board by working with the co-chairs on agenda development, meeting convening, decision documentation, and implementation follow-up.

- Identify, track, and coordinate Network partner activities and assist partners to link their activities with the Exchange Network Project Plan; issues this could cover include major flow development and implementation, as well as the development and operation of core Network infrastructure.

- Identify and report to the Exchange Network Leadership Council and the Network Operations Board on Exchange Network Project Plan progress, including the needs of partners and any barriers to success that are within the scope of these respective groups.

- Compile, track, and report resource requirements, allocations, and expenditures on the core activities identified in the Exchange Network Project Plan.

The Exchange Network Executive Coordinator's primary role in all of these functions will be to coordinate, enable, and report on implementation and operation of the Network to the Exchange Network Leadership Council. The position will not have direct management or resource

allocation responsibilities. The Exchange Network Executive Coordinator will likely need at least one full-time support staff.

The Exchange Network Leadership Council will not be a legal entity — the administrative mechanism used to hire the Exchange Network Executive Coordinator is dependent on the individual selected for the position and would, therefore, be an administrative mechanism of one of the partners. The selection of the Exchange Network Executive Coordinator involves identifying the Exchange Network Leadership Council co-chairs and those co-chairs working with the IMWG co-chairs to select a candidate. Once a preferred candidate is selected, the Exchange Network Leadership Council co-chairs will work with Network partners to identify the most appropriate mechanism to hire the Exchange Network Executive Coordinator and establish an agreement with the Network partner hiring the Exchange Network Executive Coordinator.

# 6.5   How the Revised Network Governance Functions Are Partitioned Among These Groups

This section develops each of the revised governance functions identified above and describes how they are partitioned between the Exchange Network Leadership Council and Network Operations Board.

## 6.5.1   Providing Leadership and Direction Towards the Common Vision Of the Network and Its Components

The governance structure must provide leadership and direction towards the common vision of the Network and its components. The Exchange Network Leadership Council must establish and prioritize major Network investments and activities, and delegate work to action teams, the Network Operations Board, and/or contractors/others. The Exchange Network Leadership Council and other governance structures must represent partners by making the decisions needed to advance the Network and present decisions of governance in the context of the Network shared vision. The Exchange Network Leadership Council and Network Operations Board will establish, track, and use a framework of management/performance measures for each major Network component and activity area. The Exchange Network Leadership Council and Network Operations Board must periodically assess the "sense" of the Network teams/community for issues on direction, progress, and barriers. Part of the responsibility of Exchange Network Leadership Council members will be to adequately represent their constituents — this is of particular importance for the state representatives. Inherent in providing leadership and direction will be the Exchange Network Leadership Council discussing issues that are not solely Network in nature.

## 6.5.2 Working with Partner Communities of Interest (Program Area, Functional, or Geographic) to Establish and Document Clear Objectives, Opportunities, and Plans for Using the Network to Achieve Specific Goals

To be successful, the Network governance must work with partner communities of interest (program area, functional, or geographic) to establish and document clear objectives, opportunities, and plans for using the Network to achieve specific goals. The Exchange Network Leadership Council must track, assess, and engage communities of interest in establishing clear "business area strategies" for their areas. The Exchange Network Leadership Council should provide convening and support functions. It is expected that the Exchange Network Leadership Council will make and/or encourage investments for those areas with clear objectives, and steer investments away from those without them.

## 6.5.3 Providing Planning and Coordination of Major Network Implementation Projects/Flows; In Some Cases, This Will Include Direct Funding and Management of Priority Projects/Flows

The Network governance will provide planning and coordination of major Network implementation projects and flows; in some cases, this will include direct funding and management of priority projects and flows. The core aspect of this function will be the creation, maintenance, and use of an Exchange Network Project Plan. The Exchange Network Project Plan will incorporate the outputs from the Network Data Area Strategies, the Network priorities list (derived from prioritizing the outputs from the Network Data Area Strategies), the information collected and tracked by the Exchange Network Executive Coordinator, and information collected from the Network Operations Board and subgroups to plan, track, coordinate and/or manage Network projects and flows.

As discussed in Section 4, the Exchange Network Leadership Council will be responsible for prioritizing support to Network projects and flows. As a starting point, the Exchange Network Leadership Council can prioritize projects by assessing the broad applicability of the project for Network partners, the degree to which the project uses/extends the Network components, and the relative importance of the project to individual communities of interest.

### 6.5.3.1 Integrated Project Teams

To date, the design and implementation of flows has been the responsibility of flow partners. Several Integrated Project Teams have been established over the past three years and, for the most part, these Integrated Project Teams have worked on regulatory data flows. The teams have been comprised of state and EPA (OEI and program office and/or regional) staff, support contractors, and technology vendors. Teams were also created for several "non-regulatory" grant-funded flows, these were termed Integrated Project Teams by some as well. Across and within these domains, the teams varied widely in their resources, activity levels, participation, and success. They also varied widely in the clarity and degree of consensus on their specific

goals for using the Network. While discussed at multiple IMWG and NSB meetings, no significant overarching joint management process for Integrated Project Teams (or flow teams in general) was ever developed. Although the NSB has become incrementally more engaged with the management of individual Integrated Project Teams (in some cases directly sponsoring portions of their work), there has been concern about its ability and its propriety in going further.

As described in Section 4 and discussed above, the Network's expanded list of functions now includes planning and coordination of flows; integral to this function is the support and coordination of the Integrated Project Teams. NPAT proposes that the new governance body focus renewed attention on ways to improve the effectiveness of the Integrated Project Teams, beginning with an evaluation of where they are needed and the support they require. At a minimum, the new governance should track, influence, and coordinate with all of the Integrated Project Teams that are represented as priority projects or flows. Further, it is likely that support to the highest priority Integrated Project Teams will be in the form of resources (e.g., support contractors) and the Integrated Project Teams receiving significant resources will be managed by and report to the new governance.

## 6.5.4   Identifying and Developing Needed Data Standards, Specifications, Guidance, and Best Practices Guides

As was done by the NSB and Environmental Data Standards Council, the Network governance will identify and develop needed data standards, specifications, guidance, and best practices guides. The primary responsibility of the Exchange Network Leadership Council will be to identify and commission the work of standards, specifications, and guidance. Development work will occur at the Network Technology Group, Network Partnership and Resources Group, or other action teams, and will be managed and approved by the Network Operations Board. The Network Operations Board will be responsible for managing the standards comment and review processes.

## 6.5.5   Overseeing and Managing the Shared Network Infrastructure, Including the Web site, Security Services, Registry/Clearinghouses, and Other Resources That May Be Developed

A core function of supporting the Network components is to oversee and manage the shared Network infrastructure, including the Web site, security services, registry/clearinghouses, and other resources that may be developed. The Exchange Network Leadership Council will work with the Network Operations Board to establish high-level budget and reporting measures, while the Network Operations Board will be responsible for all aspects of planning, implementation, and operation and maintenance of the Network shared infrastructure.

## 6.5.6   Informing, Influencing, and Coordinating Joint and Individual Partner Network Planning and Implementation Efforts to Ensure the Highest Practical Level of Interoperability

The Exchange Network Leadership Council is responsible for tracking and publishing joint and individual partner implementation efforts. The Exchange Network Leadership Council, in conjunction with the Network Operations Board and Network Partnership and Resources Group, will be the public venue where recommendations on how to strengthen and improve the Exchange Network Grant Program will occur. Any technical issues that are impeding flow implementation or interoperability are the responsibility of Network Operations Board.

## 6.5.7   Communication and Outreach to the Network Community and Targeted Potential Partners

The Exchange Network Leadership Council will work with the Network Operations Board and Network Partnership and Resources Group to develop and maintain an outreach and communications strategy and plan. The Exchange Network Leadership Council will be responsible for executive-level outreach and providing political support of Network projects when necessary.

## 6.5.8   Identify Current and Possible Future Funding Sources and Opportunities for the Long-Term Sustainability and Growth of the Network

The Exchange Network Leadership Council will need to provide recommendations to EPA on how other grant programs could support and be supported by the Network. The Exchange Network Leadership Council must also refine and validate the cost projections for the "network build-out" scenario identified in Section 5, subsection 5.1. Last, the Exchange Network Leadership Council should commission targeted return on investment (ROI) case studies.

## 6.6   Composition and Membership of the Exchange Network Leadership Council and Network Operations Board

The NPAT experience reinforces the notion that many Network builders have come to understand — to build the Network in a sustainable way, a mix of dedicated and part-time resources is necessary, but the relative mix of these resources must shift to a higher level of dedicated state, EPA, and contractor staff. Both the magnitude of the Network's benefits and the scale of investment demand such a change. The organizational composition and membership described below reflects this.

The Exchange Network Leadership Council will have 11 members: five members from EPA, five from state/territory environmental or health agencies, and one tribal representative. The

Exchange Network Leadership Council quorum is seven members with no less then three EPA and three state representatives. One EPA and one state representative will serve in the capacity of co-chairs. The Exchange Network Leadership Council co-chairs must be senior management and must possess an enterprise-wide perspective. From EPA, the Exchange Network Leadership Council co-chair should be a senior representative from EPA OEI; from the states, the co-chair should be an agency chief intelligence officer, deputy commissioner, or commissioner-level. Other Exchange Network Leadership Council members must also be senior-level representatives. The Exchange Network Leadership Council will meet at least six times a year and at least two of those times in person. One of the face-to-face meetings should coincide with a face-to-face meeting of the Network Operations Board. Council delegates are expected to attend at least four of the six meetings. Should a delegate miss more than two meetings per year, the Exchange Network Leadership Council delegate will be replaced at the discretion of the co-chairs. The Exchange Network Leadership Council meetings will be scheduled at a minimum of four months in advance. The following table identifies Exchange Network Leadership Council positions and tenure.

*Table 6-1.  Council Positions and Tenure*

| Council Position (Background) | Tenure |
|---|---|
| EPA Co-Chair (OEI) | Specific position within OEI, no specified tenure and term limit |
| State Co-Chair | 3 year term, two term limit |
| EPA At-Large (Regional Representative) | 2 year term, one term limit from EPA Lead Region |
| EPA At-Large (Program) | 2 year term, two term limit |
| EPA At-Large (Program) | 2 year term, two term limit |
| EPA At-Large (Program) | 2 year term, two term limit |
| State At-Large | 2 year term, two term limit |
| State At-Large | 2 year term, two term limit |
| State At-Large | 2 year term, two term limit |
| State At-Large | 2 year term, two term limit |
| Tribal At-Large | 1 year term, four term limit |

## 6.6.1   Exchange Network Leadership Council EPA Member Selection

The EPA delegation is structured to assure program and regional participation. The EPA regional representative should be a senior manager from the EPA lead region. The EPA regional delegate should begin his or her tenure one year before his or her region is scheduled to become the lead region and relinquish the board position one year before the lead region changes. The remaining three at-large Exchange Network Leadership Council representatives should be from programs with an emphasis placed on diverse representation from Air, Water, Waste, and Enforcement. Initial Exchange Network Leadership Council delegates may be asked to serve slightly modified term limits to assure council stability. Representatives are expected to be SES-level employees.

## 6.6.2  Exchange Network Leadership Council State and Territory Member Selection

State member representation must reflect the heterogeneity of the constituency. The four state at-large Exchange Network Leadership Council positions should be filled with a primary emphasis on geographic representation. One representative should be selected from each of the following subsections of the United States:

1. Regions 1, 2, 3 (ME, NH, VT, MA, MD, DE, RI, CT, NY, NJ, VA, PA, WV, DC, PR, VI)

2. Regions 4 and 6 (KY, NC, SC, TN, MS, AL, GA, FL, OK, AK, LA, TX, NM)

3. Regions 5 and 7 (MN, WI, MI, IL, IN, OH, IA, MO, NE, KS)

4. Regions 8, 9, 10 (ND, SD, MT, UT, WY, CO, NV, CA, ID, WA, OR, AK, HI, AZ, 4 territories)

While an emphasis is placed on geographic diversity, the member selection must balance technical diversity and programmatic diversity. As mentioned above, the state co-chair should have enterprise-level perspective — such as an agency chief intelligence officer, deputy administrator, or administrator — and can be from any region in the country. In addition to the responsibilities associated with Exchange Network Leadership Council membership, the state members will be responsible for representing the interests of their constituency.

## 6.6.3  Network Operations Board

The Network Operations Board consists of ten members: four EPA members, four state members, and two rotating at-large members. The Network Operations Board will have one EPA and one state co-chair. The co-chairs should be directors or managers and will be expected to devote significant time. The Exchange Network Leadership Council must consider supporting the salary of the co-chairs, particularly the state co-chair, to support the projected time commitment.

The Network Operations Board should have some of it members directly overlap with subgroups. This empowers the subgroups and provides a direct line of authority and decision-making. If the NPAT recommendation to constitute the Network Technology Group and Network Partnership and Resources Group were accepted, of the remaining three EPA members, one EPA representative would be the co-chair from the Network Technology Group and one EPA representative would be the co-chair from the Network Partnership and Resources Group. The remaining at-large EPA representative must possess business area expertise (e.g., knowledge about data structures or standards). For states, of the three remaining positions, one would be the state co-chair from the Network Technology Group and one the state co-chair from the Network Partnership and Resources Group. The remaining state representative must possess business area expertise (e.g., knowledge about data structures or standards). If the NPAT recommendation to constitute the Network Technology Group and Network Partnership and Resources Group is not accepted, then the Exchange Network Leadership Council will have to clarify the Network Operations Board membership.

The Network Operations Board will also have two at-large positions for rotating technical experts. The intention is to be able to annually evaluate the strategic direction of the Network Operations Board and assure adequate expertise from members. Nominations for at-large

members are submitted to the Network Operations Board co-chairs, who select recommended candidates. The permanent members and standing at-large members vote whether to ratify the co-chair recommendations, and at least five of the eight members must approve any appointment to the at-large position.

The Network Operations Board quorum is seven with a minimum of two state and two EPA members. The Network Operations Board will meet on average monthly with at least two face-to-face meetings. It will provide direct oversight to at least two subgroups who are ostensibly responsible for carrying out the work of the Network Operations Board.

*Table 6-2. Network Operations Board Positions and Tenure*

| Network Operations Board Position (Background) | Tenure |
|---|---|
| EPA Co-Chair (Manager) | 2 year term, no term limit |
| State Co-Chair (Manager) | 2 year term, no term limit |
| EPA NTG Co-chair (CDX) | no term limit |
| EPA NPRG Co-chair | no term limit |
| State NTG Co-chair | no term limit |
| State NPRG Co-chair | no term limit |
| State At-Large (Business Area Specialist) | no term limit |
| EPA At-Large (Business Area Specialist) | no term limit |
| At-Large (Rotating Technical Expert) | 1 year term, two term limit |
| At-Large (Rotating Technical Expert) | 1 year term, two term limit |

## 6.6.4 Network Technology Group and Network Partnership and Resources Group

The Network Operations Board is the engine of the Network but the Network Technology Group and Network Partnership and Resources Group are the oil and gas (and ostensibly the Exchange Network Leadership Council the driver). The recommended organizational structure places significant responsibilities on the co-chairs of the Network Technology Group and Network Partnership and Resources Group; these co-chairs must concurrently manage their workgroups while also participating on the Network Operations Board. This organizational feature is imperative to assure vertical coordination as well as offering the implementers a direct voice in the arbitration of operations issues.

It is premature for NPAT to further prescribe the structure and membership of the Network Technology Group and Network Partnership and Resources Group; the structure outlined here is intended as a starting point. The structure and membership of this group should be determined by the Network Operations Board and the respective co-chairs of the Network Technology Group and Network Partnership and Resources Group. The NPAT can, however, identify what the primary responsibilities are for each group, what represents ideal co-chairs of each group, and the general description of membership. In general, members of the Network Technology Group and Network Partnership and Resources Group are the "doers" of the Network. The individuals are those representatives in partner agencies whose primary responsibilities are Network-related. It is not necessary to have equal representation from EPA

and states in subgroups, rather the most qualified individuals, regardless of organization, should be selected. Organization representation occurs at the Exchange Network Leadership Council and Network Operations Board.

The Network Technology Group and Network Partnership and Resources Group should have two fundamentally different relationships to the Network Operations Board and the Exchange Network Leadership Council. The Network Technology Group should identify, deliberate, and bring to the Network Operations Board operation/technical issues for arbitration, discussion, and clarification. The Network Partnership and Resources Group, on the other hand, will more often act in the capacity of staff to the Network Operations Board. The Network Operations Board will identify work that needs to be accomplished, for instance around Network Data Area Strategies, and task the subgroup with completing said work.

## 6.6.5   Network Technology Group

The Network Technology Group should be the workgroup responsible for all technical issues on the Network. It is the technical advisory group to the Network Operations Board. In the current governance organization, these responsibilities are split between the Operations, Technology, and Security Group and the Technical Resource Group.

The Network Technology Group EPA co-chair must represent CDX. CDX's unique relationship to other Network partners and CDX's technical leadership on many issues, such as security, necessitate a prominent role on the Network Technology Group. The state co-chair should be a state node manager. The state co-chair must be familiar with the Network technical specifications and familiar with the problems generally experienced by node implementers and users.

## 6.6.6   Network Partnership and Resources Group

The Network Partnership and Resources Group is responsible for analyzing and tracking the Exchange Network Grant Program; emerging funding sources, including work on grant alignment; network communications, outreach, and education; and managing the Network data area strategies. The duties of the Network Partnership and Resources Group are new to the Network governance, and direction and scope surrounding the Network Partnership and Resources Group's activities must be carefully considered by both the Exchange Network Leadership Council and the Network Operations Board.

Network Partnership and Resources Group membership should be non-technical. The EPA co-chair should be from the EPA Information Exchange and Partnership Branch, and a state co-chair will be needed with expertise in either state funding issues or expertise with several data areas. The Network Partnership and Resources Group will meet at least once a month.

# 6.7   Summary of Section 6 Proposals

## 6.7.1   Governance Structure, Functions, Composition, and Membership

- Adopt the governance structure as articulated in this plan, including the articulated purpose, scope, and composition of each of the following entities:

  − State/EPA Information Management Working Group (IMWG) — would be retained as a venue for airing state-EPA information management issues.

  − Exchange Network Leadership Council — would have primary responsibility for policy and strategic planning

  − Network Operations Board — would have primary responsibility for Network operations and would report to the Exchange Network Leadership Council

  − An Exchange Network Executive Coordinator

- Consider the recommendation to create the following subgroups of the Network Operations Board, along with their articulated purpose, scope, and composition:

  − Network Technology Group (NTG) — would be responsible for the day-to-day operations and technology of the Network

  − Network Partnership and Resources Group (NPRG) — would be responsible for technical policy and planning.

## 6.7.2   Specific Proposals for New Governance Entities

- Create and maintain an Exchange Network Project Plan, which will be the primary planning, management, and internal communications mechanism for Network governance (Exchange Network Executive Coordinator, Exchange Network Leadership Council, Network Operations Board).

- Establish, track, and use a framework of management and performance measures for each major Network component and activity area (Exchange Network Leadership Council, Network Operations Board).

- Track, assess, and engage communities of interest in establishing clear "business area strategies" for their areas (Exchange Network Leadership Council).

- Complete an exercise of prioritizing Network projects and flows (Exchange Network Leadership Council).

- Focus renewed attention on ways to improve the effectiveness of the Integrated Project Teams, beginning with an evaluation of which such teams are needed; and track, influence, and coordinate with all of the Integrated Project Teams that are represented as priority projects or flows (Network governance).

- Identify and develop needed data standards, specifications, guidance, and best practices guides (Exchange Network Leadership Council, Network Operations Board).

- Establish high-level budget and reporting measures (Exchange Network Leadership Council, Network Operations Board).

- Develop and maintain an outreach and communications strategy and plan (Exchange Network Leadership Council, Network Operations Board, Network Partnership and Resources Group).

- Commission targeted return on investment case studies (Exchange Network Leadership Council).

- Provide recommendations to EPA on how grants programs could support and be supported by the Network (Exchange Network Leadership Council).

- Refine and validate the cost projections for the "network build-out" scenario identified in Section 5, subsection 5.1 (Exchange Network Leadership Council).

# Appendix A.   Timeline for the Network Planning Action Team

The Information Management Workgroup (IMWG) chartered the Network Planning Action Team (NPAT) in May 2004. The IMWG called for the NPAT to define a strategic plan for the next 3–5 years through the drafting of an Exchange Network Business Plan. In order to complete this charge, NPAT created a list of existing issue areas for the Exchange Network and conversed with people knowledgeable of those issue areas. The resulting information from these conversations was used during the NPAT meeting on August 25-26, 2004 to devise the structure and content of this Business Plan.

The following people provided input on the issue areas:

1.  Jeffrey Bryan, EPA SDWIS

2.  Dennis Burling, NE DEQ

3.  Chris Clark, EPA OEI CDX

4.  Bill Dew, EPA Region 5 Tribal Coordinator

5.  Dave Emme, NV DEP

6.  Patrick Garvey, EPA OEI

7.  Barbara Kennedy, FL DEP

8.  Ken Klewins, EPA GLNPO

9.  Ed Lui, US EPA American Indian Environmental Office (AIEO), Information and Analysis Workgroup

10. Nick Mangus, EPA AQS

11. Randy McIntosh, Northwest Indian Fisheries Commission

12. Betsey Metcalf, EPA AFS System Manager

13. Greg Nudd, TX CEQ

14. Molly O'Neill, ECOS

15. Guy Outred, Windsor Solutions

16. Lucy Reed, ICIS System Manager

17. Eric Schwarz, EPA RCRAinfo

18. Mitch West, OR DEQ

# Appendix B. Definitions

| Term | Definition |
| --- | --- |
| Automated Flows | Flows that involve automation of routine and batch transactions to enable other business processes . |
| Blueprint for a National Environmental Information Exchange Network | Document written in June of 2001 which provides a conceptual basis for the Exchange Network. |
| Central Data Exchange | See "EPA Central Data Exchange" |
| Challenge Grants | Exchange Network grants that support the planning, development, and implementation of collaborative, innovative projects that demonstrate the value of the Exchange Network. |
| Data publishing | Partners making data available as Web services in order to enable dynamic access to data and dynamic integration of data into local applications. |
| Data standards | Documented agreements among partners on the terms, definitions, and formats for data . |
| Electronic Discharge Monitoring Reports (eDMR) | Electronic versions of Discharge Monitoring Reports, which are submitted to EPA under the Clean Water Act. |
| Electronic reporting | Electronic submission of data. |
| Environmental Data Standards Council | Council that develops environmental data standards to promote the exchange of information among States, native American tribes , and EPA. The Council identifies those areas of information for which having standards will render the most value in achieving environmental results, prioritizes the areas, and pursues the development of data standards. |
| EPA Central Data Exchange | A centralized electronic report receiving system that will serve as EPA's enterprise-wide portal to the Exchange Network. |
| Exchange Network Administration Grants | Exchange Network grants to fund shared activities. |
| Exchange Network Management Review | Management review of the Exchange Network written by Scott Johnstone of Stone Environmental, Inc., also known as the "Johnstone Report" |
| Exchange Network Partners | Participants in the Exchange Network. Network partners can be States, U.S. Territories, tribes , and EPA or other organizations that share data over the Network. |
| Flow | A documented grouping of related data, their defined format, and the requests and responses, as defined by the Network Exchange Protocol and Network Node Functional Specification. |
| Flow Configuration Documents | Documents that provide a detailed description of a Flow and define the processes that will be used to exchange information. |
| Implementation Grants | Exchange Network grants that support the development of Exchange Network Nodes, clients, data flows, data standards, eXtensible Markup Language (XML) schema, and Web |

| | services. |
|---|---|
| Implementation Plan for the National Environmental Information Exchange Network | Exchange Network document written in February of 2002 that describes a strategy for effectively implementing the Network. |
| Information Management Workgroup | See "State/EPA Information Management Workgroup" |
| Interoperability | The ability of software and hardware to communicate between multiple machines from multiple vendors/partners. |
| Johnstone Report | See "Exchange Network Management Review" |
| National system flows | Flows that exchange national regulatory information between States and EPA. |
| Network administration costs | Shared costs to support the Network governance. |
| Network Client | A component or an application that can initiate data requests or data submissions to Nodes. Network Client applications cannot directly interact with other clients; a Node "listening" for Network Client requests is required for an information exchange. |
| Network community | Participants and stakeholders in the Exchange Network. Network community does not include regulated entities doing electronic reporting but does include the people who offer that service. |
| Network components | Products and ideas necessary to achieve the Exchange Network's goals and objectives. |
| Network Data Area Strategies | Living documents, maintained by respective communities of interest, which would be supported and coordinated by the Network. They will provide a minimum basic programmatic or business context with which to identify projects and opportunities where the Network could add value. |
| Network effect | The benefit provided to all Network participants by a new Network participant. |
| Network Planning Action Team | Action team commissioned by the IMWG to develop the Exchange Network Business Plan. |
| Network Registry | A website that serves as the official record and location for the Network's Data Exchange Templates and Trading Partner Agreements. |
| Network use | Two or more partners using multiple Exchange Network components to satisfy a business need. |
| Node | A Web Service provider which can correctly respond to all legitimate requests as described in the Specification and Protocol. |
| Operations and Maintenance costs | Ongoing costs of supporting Nodes, flows, and other Network infrastructure. |
| Partners | See "Exchange Network Partners" |
| Readiness grants | Exchange Network grants that supports the development of information management and technology (IM/IT) capabilities needed to participate in the Exchange Network. |

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| Registry | See "Network Registry" |
| Regulatory Flows | See "National system flows" |
| Schema | Format which defines the structure and content of a given XML document. |
| Shared formats | Common exchange structures used by partners. |
| Shared services and shared infrastructure | Those tools and services that partners need to assure operational reliability on the Network. |
| Shared strategy for environmental Web services | A clear articulation of how the Network community, collectively, expects the Exchange Network to influence existing and sought after information exchanges. |
| State/EPA Information Management Workgroup | Workgroup composed of senior leaders from EPA and State environmental agencies. The IMWG has initiated an approach to address joint information management in the form of the Exchange Network. |
| Trading Partner Agreements | Documented agreements and commitments between and/or among partners on the requirements of a specific Network flow. |
| Tribal Information Management System | System that uses geo-based extraction from the national systems to make data available to tribes. |
| Web services | Automated resources accessed via the Internet. They communicate with other Web services through standards-based technologies that can be accessed by trading partners independent of hardware, operation system, or programming environment. |

# Appendix C.  Comments/Resolutions Received on the Draft Exchange Network Business Plan

| Comment | Action |
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| *Page 20, Security Services:* I am not aware of NSB plans to fund such a pilot.  I'd love to see it, but I thought that idea did not pan out. | Changes were made to the Business Plan to address this issue. |
| *Page 21, first bullet:* I would think that regulatory flows will still have to be defined in regulations. | Changes were made to the Business Plan to address this issue. |
| The Preamble should begin with a problem statement:  Why do we need a network? Before a Vision and a strategy are addressed, this section should state the reason a network is needed and what problem(s) will be solved…The new vision statement provides many of the clues…Some of them are: Need to see holistic picture; Unless data means the same thing, it cannot be used or shared; Many problems are cross jurisdictional and create a need for sharing data; Data is needed to plan for and address issues with maximum efficiency; A better informed stakeholder makes better decisions…(e.g., local government, the public, regulated parties, interest groups); Diminishing resources requires shared services where appropriate. | Changes were made to the Business Plan to address this issue. |
| The original Vision and Operating Principles needs to be re-affirmed and the commitment to them re-articulated. This will avoid confusion about overall objectives and provide the proper context for understanding that the "vision" in the NPAT report is more about implementation of the Exchange Network which is only a piece of the VOP. Further, the stewardship role of states is currently missing and it has been an essential recognition for many. | Changes were made to the Business Plan to address this issue. |
| *Page 4, Section F., sentence beginning "The IMWG…":*  As discussed, I recommend that here, and elsewhere throughout the document, the words "with respect to the network..." be added. | Changes were made to the Business Plan to address this issue. |
| Do all the variations on data exchange scenarios imply high cost, complexity, and risk? | Changes were made to the Business Plan to address this issue. |
| Why don't the exchange scenarios mention that the generic batch update process will eventually be eliminated? | Changes were made to the Business Plan to address this issue. |
| *Page 22, figure 2:* If you want to get the reader to pay attention to this, there needs to be some explanation for why it's important. | Changes were made to the Business Plan to address this issue. |
| Can the exchange scenarios graphic be clarified/ reworked? | Changes were made to the Business Plan to address this issue. |
| *Page 22, Figure 2: A*s corrected in DC, Arrow B from client to CDX web should not exist--should go to CDX Node.  Arrow H should go through a client--not from electronic reporting to node. | Changes were made to the Business Plan to address this issue. |
| Is electronic reporting really a part of the Network? | Changes were made to the Business Plan to address this issue. |

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| *Page 2, Section B, Common Business Practices:* As discussed in DC, I think this unduly expands the scope of "what is network". I would prefer to see something that discusses the role of the network in projects such as electronic reporting. For example: Connections to other business initiatives: This component includes identification of those initiatives such a electronic reporting, which may produce new opportunities to use the network. While electronic reporting is not a network activity (unless it uses network protocols), recipients of electronic reports may use the network to reduce burden in other ways or improve data timeliness and quality. (Applies to page 18 as well) | Changes were made to the Business Plan to address this issue. |
| *Page 14--Figure:* Figure is confusing. Also, as noted in DC, Box 3 now says "Partner submitting..."as a client cannot by definition publish. Also as noted, websites and end user applications cannot access a node—they must use a client of some type. The client may be contained in the web server or application, but it is necessary. (upper right and lower left corners) | Changes were made to the Business Plan to address this issue. |
| *Page 16--Data Standards and shared formats:* The discussion of the Blueprint and the EDSC is fine, but I'd like to see recognition that the standards process is a collaborative and time-consuming process—the cost of getting it right. This restructuring will help, but standards setting will not proceed at "project pace". Data standards need to be more universal than a single application to a schema. | Changes were made to the Business Plan to address this issue. |
| Who will be involved in the NDAS and how will they be encouraged to participate? | Changes were made to the Business Plan to address this issue. |
| Can you clarify the following areas of NDAS: who organizes them, who interacts with them, and exactly how a participant creates them? | Changes were made to the Business Plan to address this issue. |
| *Page 17, common Exchange and Access tools, 3rd paragraph*: The sentence that reads "Network clients follow a subscription/publication model is either confusing or wrong (clients cannot publish, or "subscribe", as those two actions suggest a continuous presence on the network). Proposed wording: Network clients allow ad hoc data submittal or retrieval to facilitate data exchange or access. | Changes were made to the Business Plan to address this issue. |
| *Page 33, Trading Partner Agreements:* I recommend deleting the words "and the technical details..." to the end of the sentence. These are now included in an FCD instead. | Changes were made to the Business Plan to address this issue. |
| *Page 56 IMWG:* The second sentence of the first paragraph (The original function...) in particular is problematic, since the IMWG worked through many issues before the concept of the network began to emerge. I would simply say "As the Network moves to an operational stance, it is no longer appropriate that the IMWG maintain an oversight role, as that body is not structured to provide timely operational guidance." With regard to the Network, the IMWG would have no official role under this proposal." that leaves to the IMWG to decide what to do in the bigger picture. | Changes were made to the Business Plan to address this issue. |
| *Page 53, Paragraph beginning " Recent Experience...":* 3rd line from last, EDSC/TRG should read EDSC/NSB | Changes were made to the Business Plan to address this issue. |
| Expand/ add section on implications and implementation of NDAS on Network governance and Network use | Changes were made to the Business Plan to address this issue. |
| Clarify NDAS relationship to IPTs | Changes were made to the Business Plan to address this issue. |

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| The expectations, descriptions and utilities for Network Data Action Strategies need to be significantly amplified. During the discussions in December in Washington the opportunities in this area were much more clearly presented. Following the high level directive for their creation anticipated previously we need to be prepared to engage with program offices in state agencies, regional offices and at HQ. | Changes were made to the Business Plan to address this issue. |
| Clarify that shared services have to support a data exchange | Changes were made to the Business Plan to address this issue. |
| Electronic reporting is part of the Network where it is an inherent part of the lifecycle of getting data onto the Network | Changes were made to the Business Plan to address this issue. |
| Correct the graphic and corresponding text: 1. The diagram is to distinguish the many different modes of Network use. 2. To establish and clarify where there are candidate flows we expect to retire. | Changes were made to the Business Plan to address this issue. |
| Maintaining the IMWG as a body with no decision-making authority or responsibility will be the death knoll for that group! Why would it ever waste the time and resources to meet at the CIO level or her respective EPA program counter parts to say nothing of the State representatives? The ECOS States sub-committee should be the driving group to make information input to EPA. | Changes were made to the Business Plan to address this issue. |
| There should be a utility that is widely available to permit discovery of data that is "published" on nodes. | Changes were made to the Business Plan to address this issue. |
| A better definition of the "Exchange Network" enterprise should be provided so that roles and responsibilities can be properly evaluated. In some quarters there is view of the EN that is limited to nodes, schema, web services and data standards which is essentially a technology definition. In other quarters there is a view of the EN as more of a "community of practice" where technology has a part but there is also more of a role for the business interests or other partners and the services they need. The former definition is obviously more narrow and focused, the latter is more strategic in my view for long term viability. The NPAT Report is ambivalent in this area. | Changes were made to the Business Plan to address this issue. |
| Authority and accountability for keeping the business interests engaged must be addressed by designating individuals who can drive activities that are needed to meet program objectives. For example this would include the ability to require Network Data Action Strategies. This should also capture the activities of other groups, like the Quality Information Council, who have some influence/authority over independent investments. | The NPAT determined that this issue should be addressed by the new governance structure. |
| Why isn't the catalogue of published data sources part of shared services? | The NPAT determined that this issue should be addressed by the new governance structure. |
| Why haven't analytical tools been included (as a part of shared services)? | The NPAT determined that this issue should be addressed by the new governance structure. |
| Exactly what Web services will we coordinate? What types of Web services do we care most about? | The NPAT determined that this issue should be addressed by the new governance structure. |
| Can we rename "common access tools"? | The NPAT determined that this issue should be addressed by the new governance structure. |

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| *Page 19:* Preliminary goals for common business practices: I feel that this is out of scope for the network, and should be reworked completely, addressing how the inherently network elements of such projects are to be addresses. E.g. Get outbound CDX flows for TRI and others working to help with burden reduction. | The NPAT determined that this issue should be addressed by the new governance structure. |
| I like the idea of "communities of interest" but I don't know how easy it will be to make them happen, i.e. how to move beyond just the IT people. | The NPAT determined that this issue should be addressed by the new governance structure. |
| If grant funding ends, will States continue to use the Network, or will they revert back to the "old" way of doing business? | The NPAT determined that this issue should be addressed by the new governance structure. |
| *Page 41, Section A, first paragraph, first sentence:* This continues to be a critical need to defend and keep the grant program – and convince additional states to participate. | The NPAT determined that this issue should be addressed by the new governance structure. |
| *Page 43, Stable Network Governance/Administration, last sentence:* Is this a real FTE increase? Or would people be shifted from the old way of doing business? | The NPAT determined that this issue should be addressed by the new governance structure. |
| Does using the Network save money? | The NPAT determined that this issue should be addressed by the new governance structure. |
| *Linking the network to programmatic issues:* As the report says, the network is a supporting tool to help the programs and in the end the environment improve. It is critical that this link be made. I am thinking that the network leadership must engage the program people at both state and federal level and agree on emphasis for strategic and annual work plans. Then each part can build their efforts into their work plans and grants can be given to build out those parts of the network. It seems like many program areas have already started, but perhaps a little focus and program specific engagement would help. | This issue is addressed in the ENLC/NOB charter. |
| Measuring and communicating the positive impact of the Exchange seems particularly important to me in light of the NPAT report's discussion on the requirement for external funding for O&M. I interpreted (misinterpreted?) this as implying that Exchange partners may not experience over the next five years sufficient return-on-investment for direct, internal financial support from benefiting partners. I wholeheartedly support external funding in the early developmental stage to get things off the ground, but I believe a 5-year time horizon provides sufficient footing plan for a gradual change in the funding model -- building upon success. Shouldn't shared funding based on proven benefits be our business plan objective in a 5-year period? Conversely, if we aren't achieving the vision (or not communicating its achievement or cost-benefits via metrics to decision-makers) then even external funding could be problematic as time passes. The NPAT business plan would be stronger if it set out a goal --like a new-start business does --to achieve internal financial stability rather than dictate the necessity of "external funding." | The NPAT determined that this issue should be addressed by the new governance structure. |

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| *A sustainable funding model: Recognizing current state funding problems, the network should strive to demonstrate that the network is more efficient and cost beneficial than current practices both for the partners and the stakeholders. This is critical to gain support to continue funding. The ENLC should be constantly reviewing current practices to see if there is some way to reduce burden, redundancy or to provide better service to stakeholders. This needs to be documented. Communication about opportunities and success must be made so that the word gets out about how the network delivers a better bottom line in terms of $ and results. A clear effort as outlined in the report to define and document benefits is critical. In addition, there will always be a need for a governing board and administrative costs to run the network…This needs to be integrated into funding programs as part of the programs themselves. A way to do this should be foremost on the agenda.* | The NPAT determined that this issue should be addressed by the new governance structure. |
| Should cost effectiveness be an explicit objective of the refined vision? | The NPAT determined that this issue should be addressed by the new governance structure. |
| Why doesn't the vision include technology as well as partnership references? | The NPAT determined that this issue should be addressed by the new governance structure. |
| The Vision Statement as written "The Exchange Network is a partnership to support better environmental decisions through improved access to, and exchange of, improved environmental information" misses the point of what the Exchange Network is. A marriage is a partnership. A contract can create a partnership. The Exchange Network (EN) is actually something tangible. It would be like saying the Internet is a partnership without describing what makes up the "Net". The Exchange Network is an Extranet. An Extranet has defined parts. I don't think that the EN as described as a partnership helps people to understand what we are building and why we are doing it. The rest of the vision describes the goals of the EN. Even the written "Vision" of: "The Exchange Network is a secure internet of trusted partnership to support better environmental decisions through improved access to, and exchange of, improved environmental information" has more meat to the Vision than the EN being a partnership. | The NPAT determined that this issue should be addressed by the new governance structure. |
| How and when will we get the tribal breakthrough? | The NPAT determined that this issue should be addressed by the new governance structure. |
| Who will commission and oversee development of a formal assessment of the benefits, costs, and costs avoided for the Exchange Network as an enterprise? Can participants volunteer to be involved? | The NPAT determined that this issue should be addressed by the new governance structure. |
| The presentation of the new governance structure should include an initial offering of so-called "shared services" that could be available. Coming out of the May 2004 IMWG Meeting there was commitment to further define what is possible in this area. Since that time we've seen one round of network grant awards and another request for grant proposals while we remain silent in our guidance to network partners on what they might expect. I believe the silence is due in part to the absence of understanding as to what "shared services' means. For some today it can simply mean sharing the funding costs. This does not properly recognize other ways of providing services that can be done by partners taking on different roles. | The NPAT determined that this issue should be addressed by the new governance structure. |

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| The word "improved" appears twice in the refined Network Vision. | The NPAT determined that this issue should be addressed by the new governance structure. |
| A business plan (that comports with generally accepted preparation practices for a business) for the Exchange Network should be prepared within six but no later than nine months and presented to the States (through ECOS) and EPA for ratification. The business plan would layout our collective plans to "grow" the EN carefully along with well-articulated needs/services and practicable funding options. Any endorsement of the new governance structure should stipulate such a requirement as an early measure of accountability. | The NPAT determined that this issue should be addressed by the new governance structure. |
| A high level commitment to a national service oriented architecture for environmental information exchange should be part of the "package" for a new governance structure. The SOA should be presented in a generalized fashion along with the roles and responsibilities. The commitment should come from the Administrator and the senior leadership for the states possibly in a manner similar to the original agreement to create NEPPS. | The NPAT determined that this issue should be addressed by the new governance structure. |
| Where does the Business Plan describe managing external partners' strategy (federal agencies, standards bodies like ISO and ANSI, other large information domains like human health and ecological data)? | The NPAT determined that this issue should be addressed by the new governance structure. |
| It is very unclear of the working relationship of the IMLC with the NOB. It is not very smart or operationally viable to separate policy and planning from operations on an enterprise level such as a secure extranet. The EN will evolve as the partnership matures and the market place adopts inter-operable solutions. Neither the IMLC nor the NOB will actually do much outside the individual members or trading partners to move technology or create policy that will substantially move the EN. The Network Grant Program, with its vast resources, will make more policy and create more planning than any other group, which is an important area NOT addressed by NPAT. It would have been valuable to have a discussion from a Business Plan perspective to see if the Network Grant program should stay " Competitive" or should it move to a new model as EPA and States now try to make the EN nation-wide, to ensure the partnership " turns off " old, expensive , inefficient data management processes. Ensure that " No State is left behind" would have seemed to have been an important concept that a Business Plan should have addressed but appears not to have. | The NPAT determined that this issue should be addressed by the new governance structure. |
| Scott Johnstone's report anticipated a significant interest in quality assurance and analytical tools (decision support systems). These have a direct bearing on the value proposition for the EN and we should position ourselves very soon to show how they are key components. | The NPAT determined that this issue should be addressed by the new governance structure. |
| Exactly what Web services will we coordinate? What types of Web services do we care most about? | The NPAT determined that this issue should be addressed by the new governance structure. |
| I think a business plan needs to have performance metrics and a plan for periodic evaluation against the metrics. The draft vision sets out good outcomes -- support better environmental decisions through improved access to, and exchange of, improved environmental information-- but it isn't clear who/when/how progress toward those goals is going to be evaluated and reported back to the Exchange partners. I support the NPAT report's proposal for the IMLC (newly-named ENLC) to initiate a cost-benefit study to more fully explore and develop this. | The NPAT determined that this issue should be addressed by the new governance structure. |

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| *"Respectful use":* This was a major ECOS concern when the IMWG was initially established - with all this talk of web services and data exchange, there is no mention of the respectful use issue in the document, other than a slight reference for tribal data - does that mean respectful use is no longer a concern or is there the potential for the issue to resurface as data becomes more accessible | The NPAT determined that this issue should be addressed by the new governance structure. |
| The vision of the Exchange Network as a new way of doing business needs to be part of PPA's to facilitate Agency Program involvement. | The NPAT determined that this issue should be addressed by the new governance structure. |
| Is this document a business plan or a white paper? | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| How does the Business Plan address barriers to using the Network? | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| Can we rework "using the Network" because it downplays reporting to national systems too much? | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| The fate of the Exchange Network should not rest with the fate of the grants program. A full funding picture should be presented that includes federal investments. In some respects the grants program has been a distraction from some of the original objectives for common or centrally provided services and for EPA to assume a much different role than its historical one. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| *Page 45, last paragraph:* Are the program people in the States on board with this? | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| With respect to the funding issues, I continue to think the use of programmatic grants to support the network operations is more problematic (with the State air people) than the authors indicate | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| Can the names of the new governance groups be made less confusing? | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| It is hard to image a decision that would rise to the IMLC from the NOB. As it is hard to define what direction or issues that the IMLC would pass down to the NOB which would not grow out of natural evolution of the maturity of the EN. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| There should be a broadly understood way for States and EPA to come together on environmental information issues that would be "out of bounds" for the EN enterprise. This could provide an avenue to escalate issues that may arise in the future and that have not been anticipated as part of this review. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| Although it doesn't need to be addressed in this document, somewhere down the road, the role of the IMWG needs to be addressed. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |

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| The NPAT report does seem like a report of chapters which had very little contiguity between each other.  It is hard to read the NPAT as a Business Plan, since many areas were deferred and many concepts both theoretical and operational were addressed, or at least appeared to be addressed.  The Business Plan does not set much strategic direction as a Business Plan should.  It gives very little attention to the whole area of Data Standards and its valuable and important role in quality data exchange, data access and data re-use.  The report focuses mainly on the Exchange Network, which frankly is not broken, still in its infancy, and is not the problem of promoting State/ EPA relations and partnerships.  The report is very light on EPA Program involvements as a key and on critical elements of engagement in data exchange, and data standards. The Plan is light on ensuring the incentives to having ALL States and Tribes being part of data exchange and data standards.  The Plan is very premature in changing the "organizational governance" when NPAT did not first use an assessment of the current organizational operational effectiveness.  The current Network Steering Board and the Environmental Data Standards Council are just now beginning to understand their critical interaction points.  These areas are being addressed in membership, activities and management.  NPAT destroys that progress and simply re-organizes without "fixing" the undefined problems. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| Keep in mind that NPAT is not a wasted report.  But don't think it is a Business Plan.  It is far from that.  Don't think that NPAT offers viable solutions when the "problems" are not yet fully defined or understood.  Government re-organization seldom actually fixes early operational growing pains.  It often creates more problems than they solve while re-work and delay are often the product of them.  Take the NPAT report.  Give it to the respected current "governance bodies" and let rational and thoughtful solutions and planning come from those thoughtful, knowledgeable deliberations. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| *Acknowledgements Section:* May need to explain why no tribal contact is listed | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| The IMWG should be unchanged with respect to data gaps, "what data", environmental health, data quality, respectful use, and other such issues. | The NPAT did not feel a change in the Business Plan was appropriate/ necessary. |
| Doesn't the true driver of data standards (policy and program needs) get lost by defining them as being driven by technology? | This comment was unclear and could not be addressed. |
| Can we fund both existing flows and new flows? | This comment was unclear and could not be addressed. |
| Add emphasis about how the Network corresponds with intended use. | This comment was unclear and could not be addressed. |
| *Exchange Network Executive Coordinator Position:* Needs more justification and clarification it's not clear what problem it is solving and why it is needed now. | This issue forwarded to the Transition Planning Group. |
| I have some concerns that without some type of reporting arrangement between the ENLC and the IMWG (or similar organization) that the Exchange Network communication and related activities will evolve to an exclusive group because of the interest in keeping ENLC small to make it a more effective decision making body.  I agree with this approach but there is some danger in losing the more broad-based collaboration and communication that has been occurring through the IMWG.  I'd like to see some type of cooperative arrangement between the two groups.  Can the IMWG play a role in not losing the State collective voice? | This issue forwarded to the Transition Planning Group. |
| The IMWG, or some similar organization, needs to exist to facilitate information exchange between State Environmental agencies on IT initiatives that go beyond the Exchange Network.  This has been extremely valuable role of the IMWG | This issue forwarded to the Transition Planning Group. |

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| It's not clear to me where ECOS fits in down the road with the proposed governance structure. I may be a little biased but I feel like I've received great support and information from ECOS and I would hate to see ENLC lose that relationship with ECOS. | This issue forwarded to the Transition Planning Group. |
| One of the new governance organizations is the Network Operations Board. The Business Plan establishes that the EPA side of this NOB would "…include the line managers with authority over their respective Network activities", in other words, the Branch Chiefs in the Division that manages the Central Data Exchange. With the Division Director, and the two Branch Chiefs making up most of the Board, it is far too OIC-centric in its EPA makeup. First, the conflict of Branch Chiefs and their Division Director as voting members will put objective strain on such a voting body. Also, monthly meetings appear to be excessive. Second, if this is a Business Plan, this document should try to strategically state the direction of the business. The organizational structure was not the issue to be addressed but it appears to have crept in and certainly was part of this "Plan". Thus, a fatal error in the NPAT write up on organization appears without much thought to the actual operations of the NOB. | This issue forwarded to the Transition Planning Group. |
| A clearer definition of the roles, responsibilities and logistical/administrative arrangements for the ENLC, NOB, Executive Coordinator, associated other staff and any successors to the IMWG or DMWG needs to be presented. For example who will the employ the Ex. Coordinator and other staff? How will performance evaluations/accountability be accomplished? Under what structure will performance be recognized and compensated? | This issue forwarded to the Transition Planning Group. |
| It's difficult to operationally think of this group having bi-monthly meetings for the EPA membership. EPA has been hard pressed to have frequent meetings with high and consistent program office attendance for areas that OEI manages. (take note of the attendance of the NPM annual program meeting, program level attendance at OEI National meetings, or EPA membership rank on the QIC-EN Subcommittee as actual evidence.) The lack of defined functional responsibilities for the IMLC will make it very difficult to ensure consistent EPA attention by senior managers. For example, the EPA QIC-Exchange Network Subcommittee has struggled with holding a consistence meeting and having consistent senior program office attendees over the last two years of its non-operational existence. | This issue forwarded to the Transition Planning Group. |
| After a year of experience, the NSB had come to the conclusion that further investment in people was necessary from the 2 Staff persons who support the Exchange Network to manage and coordinate the many functions to support the Board itself and activities of the partners of the EN. Now to go back to a concept of an Executive Coordinator seems to be the wrong move. EPA has created an entire Branch of 6-7 staff to support the EN. ECOS now has 2 full time Staff in support with further contractor support. The NPAT should instead be thinking about a Staff Office to support the EN. Just like the Internet, the EN is much more than its individual parts. Having a single face of who is in charge is the absolute wrong approach in managing, coordinating, and growing the EN. Who is the face of the World Wide Web? Of the Internet? No one! And it works just fine. To create and place a position of Executive Coordinator is a step back to small thinking and wrong approach to encourage a growing partnership. If the position is a tracking & monitoring position, then that is a staff office workload. The 10 plus major projects of the Board, and the 160 projects of the Network Grant program are far too many for a single individual. | This issue forwarded to the Transition Planning Group. |
| The Business Plan should have thought about a Staff Office of 4-8 staff (The combination of the ECOS and EPA FTE supporting the EN). | This issue forwarded to the Transition Planning Group. |
| Does the new governance structure lead to fragmentation of thinking and execution? | This issue forwarded to the Transition Planning Group. |

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| Don't put a single face to a partnership organization. That is certainly the wrong approach and model. The EN is not baseball in need of a Commissioner. It does not need a founder of the Internet as Al Gore wanted to lay claim. Partnerships should have flexible points of interaction and multiple faces to the diverse stakeholder community. The Co-Chairs of an ENLC and NOB certainly can communicate with one another if there actually needs to be two organizations (which I point out is probably not even necessary). An executive office staff is better suited to provide wide tracking monitoring and support. The EN Partnership certainly would NOT want an Executive Coordinator talking about projects when the actual project managers, as we have seen over the last two years , are much more creditable and capable to speak for themselves. The position, while not even appropriate, has not been defined well enough to move forward in operational support. | This issue forwarded to the Transition Planning Group. |
| The new governance structure proposes that the NOB encompasses the NSB and EDSC. I'm concerned that we are going to lose the name recognition of EDSC. Data standards are critical and are finally catching on. I think that EDSC has done a good job of branding their group and website so that it's starting to have some name recognition in States. The repository around national data standards on the Web is important and is being used --> My agency has been educating other agencies pointing them to this web site as a starting point for data standards. | This issue forwarded to the Transition Planning Group. |
| In implementing any new structure, it is critical that there be a plan that talks about how to move forward, identifies clear roles and responsibilities, makes a transition from the old structure and has clear objectives, strategies, and measures. While the NPAT does a good job outlining issues and recommendations on a higher level, we need a more specific business plan with details for how to make the transition and keep this effort moving forward. | This issue forwarded to the Transition Planning Group. |
| I agree with the synopsis of what has transpired, changed, and the need for a different mechanism of oversight. I seriously question the level of success that can be achieved if the co leads of the new IMLC are not people who can significantly influence the member partners. | This issue forwarded to the Transition Planning Group. |
| For EPA , it would be best if the Administrator could create a vision about the need to effectively communicate across the Agency, with states and local government, and other interested parties. The ideas mentioned in the preamble part could be used to support the vision. The Administrator should provide a directive to all programs in EPA that this is a priority and will be part of their annual work plans to implement. The Administrator would then link the network to these plans as a key mechanism to implement their vision and charge all programs with supporting this endeavor. They would then appoint someone to lead this effort for EPA who reports directly to the Administrator to be the co leader of the IMLC. | This issue forwarded to the Transition Planning Group. |
| If this network represents the "best chance to build a partnership" that both EPA and its partners really use and support, it must be driven from the top. It must supersede sub system objectives so that the higher goals of the partnership are attained. This can only happen if it is driven from a place that has the whole system view and goals as a priority. | This issue forwarded to the Transition Planning Group. |

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| For the states co chair, it should be either a commissioner or someone who the ECOS executive committee designates as their point person. This matter it too critical to expect that someone who does not have the authority and accountability to ensure mission critical elements take place will be able to succeed. I recognize that ECOS does not have control over its individual members but if the person was dedicated to ensuring the network success, and named by the Executive committee, they would have a close ear and connection with ECOS leadership. | This issue forwarded to the Transition Planning Group. |
| Too many initiatives fail because executive leadership does not lead and demand execution. This network would be in peril without this level of leadership. | This issue forwarded to the Transition Planning Group. |
| How accurate are the proposed time commitments for the ENLC and NOB co-chairs? | This issue is addressed in the ENLC/NOB charter. |
| Another organization created by the NPAT is the Information Management Leadership Council (IMLC or the ENLC).   This is a group for policy and strategic planning of senior managers.  However, the lack of a list of duties or functions (Only " the leadership and support to joint data standards development efforts would be within the scope of the IMLC ") certainly indicates that this group will not meet monthly as designed and will have a charter that over laps with the NOB (since in much of information management and technology, policy and operations go hand in hand).   The NPAT report writes in detail what is not in the IMLC scope, while short changing in detail what is within the scope of its purview. In the end, it can be predicted that the membership in the IMLC from EPA will not be senior managers. | This issue is addressed in the ENLC/NOB charter. |
| There needs to be clear seat(s) at the table for other partners. Initially it may take awhile to fill them but our uncertainty in identifying an entity or person needn't be a reason to defer such an overt statement of intent. | This issue is addressed in the ENLC/NOB charter. |
| What is the rationale for some IMLC and NOB members having limited terms and others unlimited terms? | This issue is addressed in the ENLC/NOB charter. |
| Recruitment of other partners to participate in the Exchange Network with milestones for "growing" the EN. | This issue is addressed in the ENLC/NOB charter. |
| We must not neglect the our collective workforce needs. There must be a deliberate strategy for building capacity. | This issue is addressed in the ENLC/NOB charter. |
| Clear measures for success need to be applied to an annual work plan and all parts of the system need to be given objectives to carry out.   A monthly progress report should be prepared by the new network coordinator and provided to the Administrator and ECOS executive council. The best way to keep things moving is to measure them and act on issues as soon as they come up. | This issue is addressed in the Executive Coordinator position description. |
| *Page37, Data Sharing:* This is an issue that needs to be addressed so that there is an understanding up front on the expectations of "data sharing" and the Network. | The NPAT determined that this issue should be addressed by the new governance structure. |

# Appendix D.   Abbreviations and Acronyms

| | |
|---|---|
| AFS | AIRS Facility Subsystem |
| AIEO | EPA American Indian Environmental Office |
| AIRNow | Air Quality Index |
| AIRS | Aerometric Information Retrieval System |
| AQS | Air Quality System |
| ASDWA | Association of State Drinking Water Administrators |
| ASTSWMO | Association of State and Territorial Solid Waste Management Officials |
| BEACHES | Subset of STORET pertaining to beach closure data |
| BIA | Bureau of Indian Affairs |
| BLM | Bureau of Land Management |
| BRS | Biennial Reporting System |
| CDX | Central Data Exchange |
| CPU | Central processing unit |
| DET | Data Exchange Template |
| DNC (software) | Demonstrated Node Configuration (software) |
| ECOS | Environmental Council of the States |
| EDSC | Environmental Data Standards Council |
| EIS | Environmental Impact Statement |
| ENEC | Exchange Network Executive Coordinator |
| EPA | Environmental Protection Agency |
| FCD | Flow Configuration Document |
| FOIA | Freedom of Information Act |
| FRS | Facility Registry System |
| IC | Institutional Controls |
| ICIS- NPDES | Integrated Compliance Information System/ National Pollutant Discharge Elimination System |
| ENLC | Exchange Network Leadership Council |
| IMWG | Information Management Workgroup |
| INSG | Interim Network Steering Group |
| IPT | Integrated Project Team |
| IT | Information Technology |
| NDAS | Network Data Area Strategies |
| NEI | National Emissions Inventory |

| NOB | Network Operations Board |
|---|---|
| NPAT | Network Planning Action Team |
| NPDES | National Pollutant Discharge Elimination System |
| NPRG | Network Partnership and Resource Group |
| NSB | Network Steering Board |
| NTG | Network Technology Group |
| O&M | Operations and maintenance |
| OAQPS | EPA Office of Air Quality Planning and Standards |
| OAR | EPA Office of Air and Radiation |
| OEI | EPA Office of Environmental Information |
| OSWER | EPA Office of Solid Waste and Emergency Response |
| OTS | Operations, Technology, and Security |
| OW | EPA Office of Water |
| PNW WQDX | Pacific Northwest Water Quality Data Exchange |
| PPA | Performance Partnership Agreements |
| PPG | Performance Partnership Grants |
| RCRA | Resource Conservation and Recovery Act |
| RCRAInfo | Resource Conservation and Recovery Act Information |
| ROI | Return on Investment |
| SDWIS | Safe Drinking Water Information System |
| SDWIS/FED | Safe Drinking Water Information System/ Federal |
| SES | Senior Executive Service |
| SSHIAP | Salmon and Steelhead Habitat Inventory and Assessment Program |
| STAG | State and Tribal Assistance Grants |
| STORET | Storage and Retrieval |
| TIMS | Tribal Information Management System |
| TPA | Trading Partner Agreement |
| TRG | Technical Resource Group |
| TRI | Toxics Release Inventory |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| UST | Underground Storage Tanks |
| XML | eXtensible markup language |