State of Oregon
Department of Environmental Quality Memorandum

Date: March 5, 2014

To: Environmental Quality Commission

From: Dick Pedersen, Director

Subject: Agenda item D, Informational item: Agency and commission information technology needs and projects
March 19-20, 2014, EQC meeting

Purpose of item This item will inform the commission about the projects in-process and planned for state, agency and commission-specific information technology improvements. This item was requested at the December 2013 meeting, and the commission may also discuss its IT needs as part of item G, the work session.

Background Staff will present information about information technology, governance and development projects at state level, through the new Chief Information Officer's work, DEQ's IT governance system and technology plan and commission-specific technology and support ideas.

Oregon's Chief Information Officer position was established in 2013 and that office is organizing state resources to make better use of IT systems at all state agencies through standardized best practices, information technology governance policies and strategic planning and investment. DEQ operates an agency-wide information technology governance group, known as the DEQ Advisory Information Technology Managers, or DAITM, and developed a formal strategic plan for IT projects. That plan, attached to this report, includes implementation priorities and a five-year vision for IT at DEQ. The commissioners' request for technology-based improvements and support at and outside of meetings will also be discussed during this item.

Attachments A. DEQ Information Technology Strategic Plan

Report prepared by Stephanie Caldera from information provided by DEQ staff

DEQ Information Technology Strategic Plan 2013-2017

Submitted to: Executive Management Team

By: DEQ's Advisory Information Technology Manager Group

December 2012

State of Oregon
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Environmental
Quality

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

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DEQ Information Technology Strategic Plan 2013-2017

Executive Summary

This plan outlines priority and secondary goals for DEQ's information technology system for the next five years. It also describes the current state of information technology at DEQ, including budgetary challenges, and provides a vision and guiding principles for the agency as it addresses its many information technology needs.

DEQ's information technology supports all of DEQ's work, from central support services such as accounting to air and water quality permitting. This plan provides an agency-wide vision and guidance for applying agency resources to information technology to support DEQ's business priorities. This document also describes how DEQ will choose and implement technology solutions in the future, and how DEQ will manage and update its strategic information technology plan in the future.

DEQ will track implementation of this plan quarterly through measures described in section 8 of this document as part of DEQ's outcome-based management system, which includes measuring agency success.

DEQ's information technology needs to support the agency's mission, vision, strategic priorities and core work. This plan describes how DEQ's information technology goals support the agency's business direction. Planned direction for information technology at DEQ is defined by primary and secondary goals. The highest-priority goal is to implement an enterprise-oriented, standards-based information system strategy that fosters integration across division lines. Achieving this goal will result in an increased level of information technology governance, improved and integrated information systems, a full understanding of agency business processes and clearly defined information technology standards. Other priority goals include implementing a records management system, continued support of ongoing information technology efforts, and improving employee use of available information technology tools. Secondary goals include expanding the use of geospatial data, implementing tools to make scientific data more useful, investing in more e-government and e-commerce, and expanding the use of mobile technology for employees.

Achieving the four top-priority goals outlined in this plan should be the focus of all DEQ information technology investments during the next five years:

- Implementing a standards-based information system strategy that facilitates integration across division lines
- Developing electronic records management
- Supporting ongoing information technology efforts
- Improving employee use of available information technology tools

To achieve these goals, this report recommends that the DEQ Advisory Information Technology Manager group review all information technology projects within DEQ and not just those that are implemented agency-wide in order to maintain focus on achieving technology plan goals.

1. Introduction

1.1 Background

DEQ's information technology supports all of DEQ's work, from central support services like accounting to air and water quality permitting. Technology functions as the agency's central nervous system – the software and infrastructure connects services to internal and external customers and all agency functions.

This plan provides agency-wide vision and guidelines for applying agency resources to information technology to support DEQ's business priorities. Our path, as envisioned in this document, will allow DEQ to develop an integrated information technology program based on agency priorities that will better serve both internal and external customers and make better use of limited resources.

This document also describes how DEQ will choose and implement technology solutions in the future, and how DEQ will manage and update its strategic information technology plan in the future. This plan is defined through its vision, guiding principles, goals, strategies, objectives and measures.

- Vision – the future state that information technology at DEQ hopes to attain to best support DEQ's core work
- Guiding principles – a policy framework to promote a standard approach to operating and delivering information technology
- Goals – results that DEQ wants to achieve to support its core work. The goals specify agency-wide information technology priorities.
- Strategies – approaches to accomplishing a goal
- Objectives – what DEQ must accomplish to reach its goals. Objectives are grouped under strategies.
- Measures – how well DEQ delivers products and services

This strategic plan draws on, and supplements, past plans and planning efforts:

- Outcome-based management
- Draft Information Technology Vision: 2011-2015
- Information Management Assessment Project (IMAP)
- DEQ Business Continuity Plan
- Security incident response policy
- 2010 Information Systems Risk Assessment Report
- 2012 Agency-Wide Risk Assessment

1.2 Information technology strategic planning process

In developing this strategic plan, DEQ's executive management team appointed a team comprised of DEQ's executive management team members, members of DEQ's Advisory Information Technology Manager Group, a representative from the Oregon Department of Administrative Services, and additional staff and managers with experience in project management, strategic planning and information technology. The charter for this project is in Appendix K. The team reviewed internal and external information to identify DEQ's information technology strengths, weaknesses, opportunities and

challenges. Information used in developing the plan includes the following (see appendices for more information):

a) Planning document review. DEQ reviewed 34 internal planning documents, with the help of agency program management teams, to identify common areas of need and opportunity. The summary of this review will serve as the primary resource for understanding DEQ's business needs. For more information, see Appendix I.
b) Internal DEQ employee survey. (Appendix C)
c) Focus groups at DEQ:
   - Information technology employees. (Appendix D)
   - Accounting and budget employees. (Appendix E)
d) External survey. (Appendix F)
e) External forces and trends affecting technology. (Appendix G)
f) External interviews. (Appendix H)

The strategic planning team prioritized information technology needs and developed priority goals, strategies and objectives using all compiled and reviewed information. The team worked closely with members of DEQ's DAITM group to develop guiding principles for DEQ to use when prioritizing information technology project, as well as top priority goals. For more details on DEQ's planning process, see Appendix B.

This plan evolved from DEQ's core work map that includes "Providing Information Infrastructure," which is a core responsibility of DEQ and the EMT. In addition, it's a logical extension of the Draft Information Technology Vision 2011-2015 which EMT supported and helped develop. EMT is the "owner" of this plan, with responsibility given specifically to the "Providing Information Infrastructure" lead (currently Greg Aldrich) on the core work map. EMT didn't provide direct guidance on what the plan should include but guided its development with participation from DAITM, previous members of the Draft Information Technology Vision 2011-2015, and several additional representatives. EMT approved this plan after vetting it through DAITM. This plan references financial commitments including staffing resources as well as development timelines. EMT is committed to finding ways to implement this plan over time. Additional financial and staffing resources needed for implementation may come from a combination of new funding as well as reallocating existing funding within DEQ. Depending on future resource availability, implementation efforts and timelines may be adjusted. This will occur as part of the annual technology implementation plan developed under the guidance of DAITM.

1.3 Future strategic planning

DEQ recognizes that its vision will change over time and that prioritizing information technology needs is a continuing challenge. Rapidly changing technology, legislative mandates, statewide policies or standards, shared services studies, information security threats, changes in the economy and changes in the agency's budget can affect DEQ's information technology vision and plans. Figure 1 on page 3 illustrates main components of DEQ's information technology planning process.

1.3.1 Measuring success

DEQ will track the implementation of this strategic plan quarterly through measures described in Section 8 of this document as part of DEQ's outcome-based management system, which includes measuring agency success.

1.3.2 Evaluating and updating the plan

DAITM will evaluate plan implementation and, if needed, update the plan. For a major plan revision, DAITM could charter a team.

- **As-needed updates.** Since the information technology strategic plan is a dynamic document, DAITM will need to adjust the plan and information technology priorities based on performance measure reviews and changes in DEQ's business needs.

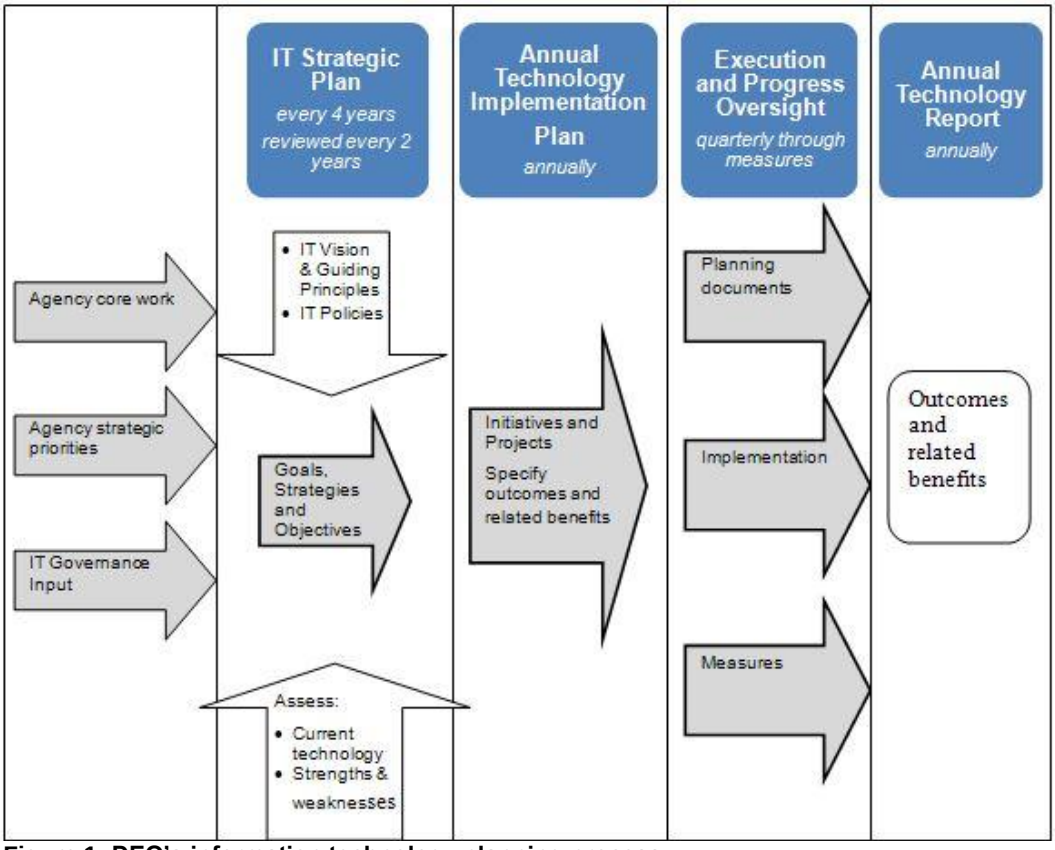

Figure 1: DEQ's information technology planning process

- **Biannual updates**. DAITM will evaluate and update the strategic plan on odd-numbered years beginning in August 2013, completing the first review and update by Jan. 1, 2014. The timing is tied to the legislative and budget process. Updates need to be completed by January of even-numbered years in order to prepare for the legislative sessions in odd-numbered years. When evaluating changes to the plan, DAITM should consider:
    - Rapidly changing technology
    - Legislative mandates
    - Statewide policies or standards
    - Environmental Protection Agency policies or standards
    - New security threats
    - Changes in the economy and the agency's budget
    - Unexpected changes in DEQ staffing
    - Performance measures listed in Section 8
    - Progress in plan implementation
    - Changes in DEQ's strategic priorities
    - Institutionalization of strategic plan goals
    - Ability of the information technology strategic plan to communicate the intended message

- Additional quarterly performance measures such as meeting public information technology needs; measures tracking change in institutional maturity (capacity to reliably and reproducibly deliver and use IT support) over time, such as a simplified capability maturity model; measures tracking the agency's use and ability to use data for environmental and management decision making; measures tracking alignment of IT resource consumption with the agency's business needs, and measures tracking efficiency of DEQ's IT/Business Services Development processes relative to other, similar agencies and accepted industry standards.

1.3.3 Strategic technology planning

Every four years DAITM will complete a new information technology strategic plan and consider using the process described in section 1.2 and Appendix B of this document or a similar process. The process will include an analysis to determine the gap between the vision outlined in the previous plan and the current state of information technology at DEQ. Development of the next IT strategic plan should begin in August 2017 and conclude by January 2018. Some of the longer-term strategies will take longer than five years to implement.

1.3.4 Annual technology implementation plan

DAITM also develops an annual technology plan for approval by DEQ's executive management team based on the information technology strategic plan. The annual plan provides details for the upcoming year and specifies projects, financial and staff resource needs, plus timelines for accomplishing strategic goals and objectives. The annual plan will be completed by June 30 each year and may include high-level information for multi-year efforts and detailed information for the current year. The annual plan must consider information technology solutions at the statewide enterprise level and agency-wide level.

DAITM prioritizes information technology projects based on:

- Information technology vision and guiding principles in this strategic plan
- Cost-benefit estimate
- Contribution to business needs and the agency mission, vision and strategic priorities

DAITM will also author an annual technology report summarizing outcomes and benefits from DEQ's technology projects. This report may be combined with the annual technology plan.

1.4 Assumptions

DEQ made certain assumptions about current and future conditions outside its control. These include:

- Information technology will be increasingly more important to DEQ operations in the future
- DEQ can't keep up with the rapid rate of technology evolution and therefore must carefully plan technology upgrades
- DEQ will need to balance any investment in information technology resources even though overall budgets may decrease
- Frequent changes in DEQ business require a systematic approach to maintaining and updating business systems

2. DEQ Information Technology Vision and Guiding Principles

An overarching vision and several guiding principles define DEQ's strategic technology direction, unite DEQ's employees, provide continuing direction and define the agency's future in terms of information technology structure, use and functions.

Guiding principles, along with the vision, will help determine DEQ's information technology projects and investments. These principles are important to:

- **DEQ decision makers.** DAITM uses them to make recommendations to DEQ's executive management team. EMT uses them to determine which recommendations to approve.
- **DEQ employees**, who will use these principles to prepare projects or to understand the basis for a decision.

2.1 Vision

DEQ's information technology supports people's needs and the agency's mission by effectively, efficiently and securely delivering quality information.

2.2 Guiding principles

DEQ's information technology:

1. Supports agency priority work
2. Is planned and delivered agency-wide to leverage development efforts, reduce duplicative costs and ensure compatibility of systems
3. Aligns information assets and systems with business needs
4. Supports informed decision making
5. Is user-friendly and receives, generates and stores high-quality data and information
6. Promotes flexibility and forward-focused planning
7. Uses established data, development and operational standards
8. Is secure, reliable and adapts to changing technology

The team used the vision and guiding principles to develop DEQ's information technology goals, strategies and objectives described in sections 6 and 7 on page 13. Figure 2 on page 20 describes how the vision and guiding principles lead to the top priority goals and strategies.

3. Business Direction

3.1 Business direction summary

The planning document review process described in section 1.2 and Appendix I describe DEQ's business direction based on a review of 34 agency planning documents. The strategic plan team discussed the top 40 recommendations resulting from the planning document review (See Appendix I). DEQ's business direction, resulting from this review, is directly related to DEQ's information technology guiding principles, goals and strategies. DEQ:

- Implements federal laws through delegated programs
- Monitors and assesses environmental conditions
- Develops and implements solutions to environmental problems

- Determines and implements the best control strategies
- Prevents exposure to toxics
- Restores the environment where contaminants have been released
- Promotes waste prevention and recycling
- Ensures compliance with environmental regulations

In addition, Oregon DEQ is renovating its approach to providing services and doing business with a focus on results and measurable outcomes. The agency's streamlining efforts through outcome-based management increase transparency and will improve a variety of operational processes including:

- Permitting
- Enforcement service delivery
- Rulewriting
- Developing environmental solutions

All employees will be engaged in process improvements and accountable for measuring outcomes. The business model also includes goals for public engagement to ensure a collective involvement of Oregonians in environmental problem solving.

For more information on DEQ's business direction, see Appendix I.

3.2 Primary business services

Based on information assembled from all sources (planning document review, internal and external surveys, internal focus groups, external interviews, and the external forces and trends analysis) DEQ's information technology must help the agency:

- Transition to outcome-based management, including data collection and management for performance measures
- Meet relevant legal requirements for business processes
- Support priority systems and program data over time
- Facilitate information-based decision-making
- Increase DEQ's ability to handle and use scientific information, including using geographic information systems
- Deliver excellent service to internal and external customers, including DEQ's offering of online information and services
- Manage information resources efficiently
- Develop tools and systems to make DEQ more efficient, including tools for collaboration and electronic records management

DEQ needs to create better links between data and improve accessibility to existing information. DEQ also needs to build the culture, systems and practices that allow it to take full advantage of its information.

4. Future Direction of Information Systems

4.1 Future direction

Information technology direction at DEQ includes primary and secondary goals. The highest priority is to implement an enterprise-oriented, standards-based information system strategy that encourages integration across air, land and water division lines. Achieving this goal will result in an increased role of information technology governance, improved and integrated information systems, a full understanding of agency business processes, and clearly defined information technology standards. Other top-priority goals include implementing a records management system, continued support of information technology efforts, and improving employee use of available information technology tools. Secondary goals include expanding use of geospatial data, implementing tools to make scientific data more useful, investing in more e-government and e-commerce systems, and expanding use of mobile technology for employees. To implement DEQ's top- priority information technology goals and meet the agency's business needs in an integrated fashion, managers and programs will need to relinquish autonomy in information management.

The future direction of DEQ's information technology needs to align with the state of Oregon. The *Governor's Regulatory Streamlining And Simplification Project* report discusses the importance of "… a common, fully integrated IT system affording "one-stop" permitting and licensing across various agencies and governments, performance metrics calibrated to assure accountability, and outcomes that work to preserve and enhance the ideals of public safety and a sustainable environment in which Oregon's native ecosystems are healthy and resilient." DEQ's top-priority goals and strategies move DEQ information technology in this direction.

4.2 Implementing the information technology strategic plan

DEQ's information technology strategic plan requires a number of new strategies and projects that will guide the agency's implementation of information infrastructure improvements, including the goal to fully integrate the many individual technologies and information systems into a standardized agency information infrastructure. This goal builds on current projects like the Agency Compliance and Enforcement and Central Entity Management systems and the recently implemented complaints tracking system. The agency would continue to consolidate and replace, as necessary, individual information systems such as permitting systems (such as TRAACS, WQSIS), invoicing, records management and others into comprehensive, integrated solutions.

Governance and standardization are necessary to achieve DEQ's top-priority information technology strategic goals. Governance is critical to successful plan implementation and must ensure that all new technology improvements follow agency-wide standards. Governance will also provide necessary oversight to other DEQ systems and will promote combined agency goals and strategies. (For a definition of governance, section 9 on page 21.) Governance must also be flexible enough to address emerging issues or changes in direction or priorities. Currently, governance includes DAITM as a review and recommendation body, and EMT as the final decision maker. DEQ will review the effectiveness of this current governance structure, determine if any modifications need to be made, and implement needed changes as described in Goal 1 on page 13. Standardization is a significant effort that will take many years to achieve, and this long-term time frame is reflected in the strategic plan. Standardization will be addressed as needed to implement DEQ's top-priority information technology strategic goals.

4.3 Resources for implementation

To implement its information technology vision, DEQ must change the way it allocates information technology staff and funding resources. The agency may also need to identify new resources or find ways to align funding sources with agency needs and priorities. DEQ also needs resources for DAITM to develop the annual technology implementation plan. Minimally this would include a project manager and a team.

In addition to new resources to develop the annual technology implementation plan, staff and funding will be needed to implement strategies and objectives. More details on needed resources will be in the annual technology implementation plans. Once the strategic plan and annual technology plan are accepted, the EMT will need to discuss finding new funding and/or making a realignment of resources.

5. Current Information Systems Situation

This section summarizes DEQ's information technology strengths and weaknesses, external threats and opportunities in relation to the agency's capacity to meet business goals.

5.1 DEQ's technology challenges

DEQ's information technology efforts have faced a number of challenges over the years. This, along with other underlying issues, is why DEQ's IT infrastructure isn't where we'd like it to be today.

- Disinvestment in infrastructure. For many years, DEQ disinvested in its information technology, to the agency's detriment. The agency continually put off investing in infrastructure, diverting money for other purposes. DEQ now uses aging systems that require excessive maintenance and can't be easily upgraded to new technology. (Goal 3, strategies 3.1 through 3.5 address this challenge.)

- Lack of business process documentation. Most DEQ business systems have inadequately defined and undocumented business practices. This is mostly due to a business culture that favors immediate results in systems development over time-consuming efforts to fully identify business processes before development. This has resulted in systems that don't accurately meet business needs or don't cover all business areas. Lack of process documentation means additional time is needed to maintain and enhance business systems in order to confirm and identify business practices. (Goal 1, strategy 1.3 addresses this challenge.)

- Lack of a well-thought-out environmental data stream. DEQ's environmental data stream (collection, management and user accessibility/reporting) isn't well planned, seriously impeding science-driven environmental decision making and causing time-consuming data analysis for DEQ's core work. (Goal 1, strategies 1.1 through 1.6, and goals 5 and 6 address this.)

- Lack of tools to make environmental data more useful. DEQ has no universal requirement for data to be geo-referenced, and no single portal through which to access all geospatially referenced data, causing:

- Repetition of work
- Decisions made on incomplete data
- Inability to make information available to external users.

(Goal 1, strategy 1.6, and goals 5 and 6 address this challenge.)

- Lack of a geographic information systems library function. DEQ has no data library function (to receive, store, retrieve data) for GIS layers or for miscellaneous data such as FLIR and satellite imaging. This results in:
  - Repetition of work
  - Decisions made on incomplete data
  - Inability to make information available to external users.

  (Goal 1, strategy 1.5, and goal 5 address this issue.)

- Unidentified system owners. DEQ developed several data systems over the years without immediately identifying an "owner" to upgrade or maintain them. These include Facility Profiler and the Location Improvement Tool. Without identified process owners, there's no specific person who:
  - Determines funding and other resources for maintenance, enhancement and future development
  - Determines program and section needs, makes recommendations or makes strategic decisions for and prioritizing processes and systems
  - Documents, manages, updates and improves business rules and requirements
  - Has subject matter expertise related to a process or system

  (Goal 1, strategy 1.4 address this.)

- Resources consumed by system upgrades. In the past, DEQ heavily invested in technology tools that were state of the art at the time. As technology evolves and business needs change, however, organizations must decide to invest in technology upgrades or replacements. For example, DEQ's decentralized information technology community has focused on converting and migrating all existing Sequent-based databases and applications into corresponding Microsoft-based applications for more than 10 years. This significant effort largely consumed the agency's information technology resources for that period of time. (Goal 1 addresses this.)

- Lack of an infrastructure upgrade plan. For many years, DEQ didn't have a structured technology upgrade plan for development platforms and applications and did not analyze system life cycles. Instead, the agency operated, and continues to operate, with underperforming systems and outdated architectures that barely support key business processes. (Goal 3, strategy 3.1 address this.)

- Maintaining old technology. DEQ's lack of an infrastructure upgrade plan means the agency maintains its old technology, which presents further challenges. Maintaining older, non-integrated systems requires additional resources, including using highly skilled staff to maintain outdated programs or equipment, rather than working on advancing DEQ's technology. The cost of maintaining current systems will continue to grow until DEQ retires the systems and replaces them with more sustainable solutions. (Addressed in Goal 1, strategy 1.4)

5.2 DEQ's current technology status

Despite its many challenges, DEQ has many information technology successes that must continue in the future vision. Following is DEQ's current technology status, including some activities the agency conducted or plans to complete during the 2011-13 biennium.

- Minimal down time. Despite struggles to maintain aging infrastructure, DEQ information systems have 99 percent availability during DEQ's primary business hours and 95 percent availability during evenings and weekends.

- Relatively current operating systems and desktop applications. DEQ is migrating existing workstations to Windows 7 throughout the 2011-13 biennium. DEQ is currently running Microsoft Office 2007 on all desktops.

- Systematically upgraded desktops. DEQ's technology replacement plan includes replacing 25 percent of the agency's desktop computers each year, or 50 percent of them per biennium. The agency's divisions support this replacement plan by identifying funding for new computers in their budgets. (See Appendix A: Information Technology Lifecycle Replacement Strategy).

- ACES and CEM. DEQ started the Agency-wide Compliance and Enforcement System project to standardize and improve the agency's compliance and enforcement processes and to develop a shared application to manage data about these processes. In order for ACES and other core processes to succeed, an integrated set of facility and person data (commonly referred to as Central Entity Management or CEM) was necessary. CEM is chartered to define and develop governance and processes to integrate data about entities and individuals regulated by DEQ and to ensure that data quality and integrity remain high. The agency is building the CEM application to integrate and manage this data at the same time it's building ACES, which uses the data in CEM.

- SharePoint migration. DEQ has completed a commonly-shared SharePoint environment for agency internal collaboration. This project involves consolidating information from two separate SharePoint installations.

- Licensing conversion. DEQ is replacing its existing licensing management software and integrating a new solution to allow online access for licensing application, renewal and payment. The goal is to streamline the licensing processes. This software will also support future e-payment options such as Vehicle Inspection Program clean air certificate payment options.

- LIMS Replacement. DEQ is replacing its current Laboratory Information Management system due to the system's age, the changing nature of the analytical work, and the need for increased accountability for environmental data. The goal is to decrease the time it takes data from samples submitted for analysis to be reported to DEQ clients. This software will also allow DEQ's lab to better measure both turnaround time and capacity.

5.3 Major information technology players within DEQ

Various internal stakeholders participate in the agency's information technology decisions and work.

- Executive Management Team. EMT is comprised of the agency's director, deputy director, all division administrators (air, water and land quality program, lab, regional and Management Services Division administrators), and managers of the offices of Compliance and Enforcement and Communications and Outreach. EMT's role is to set strategic direction, direct funding to high-priority projects and review and determine which DAITM recommendations to approve.

- DEQ Advisory Information Technology Manager Group. DAITM – DEQ's information technology governance group – reviews, prioritizes and recommends information system projects to EMT, which makes a final decision on project prioritization and resource allocation. DAITM also creates agency information technology standards and makes technology investment recommendations for EMT consideration and approval.

- Information Technology Section. Located organizationally within the Management Services Division, this section develops, enhances and maintains DEQ's technology "backbone" that allows the agency to run information technology applications and communicate electronically both internally and externally. One manager and 12 FTE provide central technology and computer services such as email system administration; electronic communications support; database administration; network server support and maintenance; network security; hardware and software purchasing and inventory management; standardizing employee computers and software; and agency headquarters computer support center.

- Business Systems Development Section. BSD, also within the Management Services Division, develops and maintains software applications that allow DEQ to do business electronically and deliver data internally and externally. The section also has an important role in information system project planning. BSD currently supports 85 program-specific applications ranging from simple desktop applications to fully integrated permit processing and specialized accounting applications (for example, cost recovery management). BSD provides agency-wide support for geographic information systems and web infrastructure, establishes data standards and exchange protocols and system architecture. BSD has 12.5 FTE budgeted under agency management and supervises an additional 7.5 FTE budgeted in the Air Quality, Land Quality, Water Quality programs and cross program.

- Desktop Management and Configuration Standard Committee. This group meets monthly and consists of members from DEQ's 10 local area network administrators, the information technology section and BSD to provide the agency with a stable, secure desktop operating system and all essential, computer-based tools required to conduct DEQ's everyday business.

- Local area network administrators. DEQ's 10 LAN administrators support and manage DEQ's local area networks, including network maintenance, computer support via DEQ's help desks, overseeing upgrades and maintaining backup systems. LAN administrators also implement software upgrades, install new software and fix network issues. LAN administrators are in each region and at headquarters, the lab and Vehicle Inspection Program's technical center.

- Program information technology staff. Each of DEQ's programs has staff who perform a variety of information management tasks. Some of these positions are within the information systems specialist series and focus on information technology-related work such as project management, business analysis, programming and data management. Others are non-ISS staff positions with fewer information technology-related duties such as analyzing data, providing subject matter expertise and serving as data stewards. Program managers serve as data system owners.

5.4 Budget summary

- Currently, DEQ invests about $250,000 per biennium in information technology infrastructure improvements and maintenance upgrades of core servers and back-office systems.

- Most information technology positions are organizationally located within the Management Services Division and supported through indirect funding. With Oregon's current budget challenges, the agency has lost general fund, lottery fund and other fund (fees) dollars. As that happens, MSD receives less indirect funding from the agency's other programs. Additionally, the agency could see further budget reductions for the 2013-15 biennium, which would further hinder MSD funding. Less funding could affect the number and type of information technology positions the agency can afford to fill and the type of projects the agency wants to undertake.

- Other information technology positions are supported directly by the DEQ's water, air and land quality divisions. As budget reductions affect those divisions, they may need to eliminate part or whole positions, which could further affect what the agency can do to improve its information technology.

- An additional challenge is finding money to support more public web services. Although DEQ implements its core systems to provide services 24 hours a day, seven days a week, the reality is that DEQ only funds staff support of internally supported systems during primary business hours.

- In general, the majority of DEQ's information technology project funding comes from the programs that are the main requestors and users of a project's products and processes. Subsequent project improvements, process re-engineering or other enhancements and maintenance also are program-funded. Indirect funds are used when the project benefits the entire agency. See information technology Project Funding for more information.

6. Goals

6.1 Prioritization

In order to prioritize goals, the strategic plan team held a visioning session, organized around information collected from the planning document review, internal and external surveys, internal focus groups, external forces and trends analysis and external interviews. The team rated recommendations from each information source by importance (either by the number of responses in the case of the surveys, interviews and planning document review or through voting in the case of the focus groups). Then, recommendations from all groups were combined in one initial ranked recommendation list. In this list, some recommendations rose to the top because all sources of information rated them high. In other cases, recommendations had a high rating because one group ranked that recommendation as very important. See Appendix J for more information.

The team used the initial ranked recommendation list and individual rankings from each information source to discuss why each of the information sources ranked the recommendation the way they did, and how important the recommendation is to achieving DEQ's business goals. From this, the team developed top priority and secondary priority goals.

The team recognizes that all goals won't be accomplished within the strategic plan timeframe. But this plan includes all primary and secondary goals to provide a long-term framework for action.

The vision, guiding principles, goals and strategies represent the strategic level of planning, the highest level, identifying DEQ's overall direction. The EMT owns items at the strategic level. Objectives represent the tactical level of planning. This is a lower level of planning owned by DAITM and program

managers to develop plans for implementing the strategic level goals. The project level represents actual projects performed by staff to implement the goals, strategies and objectives.

An example of planning levels:

- **Strategic level (Vision, guiding principles, goals and strategies)**: DEQ's information technology is planned and delivered agency wide to leverage development efforts, reduce duplicative costs and ensure the compatibility of systems. (EMT)
- **Tactical level (Objectives)**: EMT charters a team overseen by DAITM by the end of February 2013 to develop the first annual technology plan. (Managers / DAITM)
- **Project level (Individual projects recommended by DAITM and approved by EMT)**: Individual project implemented as identified in the annual technology plan.

6.2 Top and Secondary Priority Goals

Top priority

Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines. See Definitions on page 21for a definition of "enterprise-oriented."
Goal 2: Improve DEQ's electronic records management
Goal 3: Support ongoing information technology efforts
Goal 4: Improve employee use of available information technology tools

Secondary priority

Goal 5: Geographic information systems training and software
Goal 6: Tools to make scientific data more useful
Goal 7: E-government and commerce
Goal 8: Mobile technology

7. Strategies and Objectives

Top priorities

The top-priority goals reflect the strategic plan's vision and guiding principles. Meeting the top priority goals will be the focus of all information technology investments during the next five years. Each top priority goal is assigned to an owner. DAITM makes recommendations. EMT then approves recommendations and makes allocations for budgets and staffs them as is feasible. The owner makes sure the goal is implemented, and raises any related issues with DAITM and EMT. The annual technology implementation plan will specify a timeline for each strategy that DEQ will work on in the upcoming year.

1. **Goal: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines.**

   Owner: BSD Manager.

1.1. **Strategy:** Information technology governance. DAITM reviews all information technology projects (DAITM currently focuses on agency-wide information technology projects).

1.1.1. **Objective**: Determine if current DAITM governance structure and membership is correct given the change in agency expectations and strategic planning effort. Change structure and membership as needed and reflect changes in the DAITM charter. Develop and document processes for updating the strategic plan, annual technology implementation plan and for making information technology recommendations to EMT.

1.1.2. **Objective**: Create policy for all information technology projects to go through DAITM beginning April 2013, including defining what a technology project is.

1.1.3. **Objective**: Put procedures and policies into place so that agency information technology resources, application ownership, project plans and information technology solutions at the statewide enterprise level and agency-wide level are considered in the evaluation of all projects.

1.1.4. **Objective**: EMT charters a team overseen by DAITM by the end of February 2013 to develop first the annual technology plan by June 30, 2013.

1.2. **Strategy:** Form a team to integrate priority systems.

1.2.1. **Objective**: Identify integration opportunities and needs.

1.2.2. **Objective**: Prioritize integration opportunities and needs.

1.2.3. **Objective**: Plan the integration of priority systems, including analysis of business needs outlined in strategy 1.3.

1.2.4. **Objective**: Implement integration of priority systems.

1.3. Strategy: Improve analysis of business needs.

1.3.1. **Objective**: Put procedures and policies into place so that business analysis results in a full understanding of business needs prior to upgrading or replacing existing data systems.

1.3.2. **Objective**: Put procedures and policies into place so that standardization and documentation of business process occurs before upgrading or replacing existing data systems.

1.3.3. **Objective**: Institutionalize the consideration of information technology needs and information technology system interaction in all program rulemaking, environmental solution development, review of program implementation, legislative and budget concepts, and process improvement efforts.

1.3.4. **Objective**: Establish training and resources to document, map and streamline business process.

1.4. Strategy: Improve and upgrade existing data systems.

1.4.1. **Objective**: Put procedures and policies into place so that data systems meet the operational needs.

1.4.2. **Objective**: Put procedures and policies into place so that data systems are developed using current technology that is compatible for agency-wide systems integration.

1.4.3. **Objective**: Put procedures and policies into place so that data system ownership is determined and lifecycle is considered.

1.4.4. **Objective**: Put procedures and policies into place so that data systems are designed in a way that facilitates data integration and the ability to add new systems or components that plug into existing systems and are immediately integrated rather than new systems that stand alone and require additional work for integration.

1.5. Strategy: Improve and standardize project portfolio management within DEQ.

1.5.1. **Objective**: Increase funding for information technology project management positions.

1.5.2. **Objective**: Define and authorize a project portfolio management group (Previously this group was commissioned by and reported to DAITM.) PPM activities need to be included in work agreements.

1.5.3. **Objective**: Develop and implement an agency-wide project portfolio management plan.

1.6. Strategy: Form a team to update or develop priority information technology standards for the agency as identified to support the business needs for top priority goals.

1.6.1. **Objective**: Identify which standards are needed to implement top-priority goals.

1.6.2. **Objective**: Develop and implement data standards (including data geo-referencing standards).

1.6.3. **Objective**: Develop and implement information mobile device standards.

1.6.4. **Objective**: Develop and implement information technology training standards.

1.6.5. **Objective**: Develop and implement information technology project management standards.

1.6.6. **Objective**: Develop and implement information technology development standards.

2. **Goal: Improve DEQ's electronic records management.**

Owner: Agency Records Officer

2.1. **Strategy:** Form a team to define and implement a records management software solution.

2.1.1. **Objective**: Work with DEQ's Records Management Governance team to define requirements for a software solution, building from objectives created by the December 2010 LEAN Kaizen recommendation.

2.1.2. **Objective**: Automate retention and destruction schedules.

2.1.3. **Objective**: Manage and resolve electronic information retention issues (including electronic correspondence, documents and datasets).

2.2. **Strategy:** Form a team to define and implement a document management solution to integrate with new and existing agency applications for document storage.

2.2.1. **Objective**: Build a common storage location for documents needed by integrated DEQ applications.

2.2.2. **Objective**: Evaluate all existing application document management solutions for consolidation.

2.2.3. **Objective**: Put procedures and policies into place so that regulatory information received electronically is stored and processed according to legal requirements.

2.2.4. **Objective**: Meet application legal document requirements.

2.2.5. **Objective**: Put procedures and policies into place so that the public has easy access to necessary documents.

3. **Goal: Support ongoing information technology efforts.**

Owner: Information Technology Section Manager

3.1. **Strategy:** The basics - keeping computers and software up to date

3.1.1. **Objective**: Upgrade the consolidated help desk software system to track problems and metrics in our current environment.

3.1.2. **Objective**: Ensure that DEQ stays within two major release versions of vendor-supported releases for all agency-wide desktop operating systems and office productivity platforms through the Desktop Management and Configuration Standards committee.

3.1.3. **Objective**: Develop an upgrade plan so DEQ stays within two major release versions of vendor-supported releases for all agency-wide server operating systems and core server application software platforms.

3.1.4. **Objective**: Ensure that DEQ stays up to date with security patches on all major agency-wide software through implementation of a central patching utility.

3.1.5. **Objective**: Budget for, implement and update DEQ's Lifecycle Replacement Plan for hardware and software (Appendix A).

3.2. **Strategy:** Support outcome-based management efforts.

3.2.1. **Objective**: Put information technology infrastructure in place to support data collection for measures (business analytics) required by DEQ's outcome-based management effort.

3.2.2. **Objective**: Provide information technology infrastructure needed to implement DEQ's breakthrough team recommendations.

3.2.3. **Objective**: Provide information technology infrastructure needed to implement DEQ's problem-solving team recommendations.

3.3. **Strategy:** Security

3.3.1. **Objective**: Implement an integrated identity authentication and authorization platform for technology systems.

3.3.2. **Objective**: Maintain and implement solutions to meet State of Oregon Enterprise Security Office ESO statewide information security standards (Appendix A).

3.4. **Strategy:** Improve use of automated workflow (electronic interfaces among systems).

3.4.1. **Objective**: Catalog existing tools for automated workflow.

3.5. **Strategy:** Website improvements

3.5.1. **Objective:** Migrate DEQ externally facing static web pages to the statewide platform.

3.5.2. **Objective:** Evaluate DEQ externally facing web applications for migration or upgrades

3.5.3. **Objective:** Migrate QNet functionality to SharePoint

3.6. **Strategy:** Coordinate more closely with external stakeholders on information needs.

3.6.1. **Objective**: Ensure that data DEQ reports electronically to the federal government (EPA) meets federal requirements.

3.6.2. **Objective**: Ensure that governmental and private organizations can electronically receive needed information from DEQ.

4. Goal: Improve employee use of available information technology tools.

Owner: Information Technology Section Manager

4.1. **Strategy:** Develop and fund a function within the help desk structure to identify training needs and conduct training.

4.1.1. **Objective:** Establish a knowledge base for common problems for DEQ staff use.

4.1.2. **Objective:** Put procedures and policies into place so that DEQ employees share data effectively with internal and external customers **(.**ftp and govspace).

4.1.3. **Objective:** Put procedures and policies into place so that DEQ employees collaborate effectively with internal customers using SharePoint, and with external customers using govspace.

4.1.4. **Objective:** Ensure that DEQ employees communicate effectively and reduce pollution by using existing web conferencing solutions (AT&T and iLinc) for audio and video conferencing. Evaluate hardware upgrades needed for video conferencing.

4.1.5. **Objective:** Develop and implement a training plan so that DEQ employees use software effectively. Provide adequate training on updates to existing software or new software, including the use of new functionality.

Secondary priorities

Secondary priority goals represent important recommendations to be addressed after top priority goals are met. However, DEQ may implement components of secondary goals as part of top priority goals if this can be done with little or no additional cost. Before starting any new work on these secondary goals, DAITM and EMT would need to fully discuss resources (people and funding) and standardization and integration of systems agency-wide.

5. **Goal: Geographic information systems training and software**

5.1. **Strategy:** Develop a plan for geographic information systems training and software, a data library function for GIS layers and miscellaneous data such as FLIR and satellite imaging, and a single portal through which to access all geospatially referenced data.

6. Goal: Tools to make scientific data more useful

6.1. **Strategy:** Develop a plan to put information in a more accessible, usable form.
6.2. **Strategy:** Increase capacity for data analysis (i.e., turn numbers into actionable information).

7. Goal: E-government and commerce

7.1. **Strategy:** Make more information available on website.
7.2. **Strategy:** Put procedures and policies into place so that online payments are available
7.3. **Strategy:** Put procedures and policies into place so that online reporting and permitting are available.

8. Goal: Mobile technology

8.1. **Strategy:** Develop a plan for mobile technology support for DEQ-built applications.
8.2. **Strategy:** Develop a plan for providing DEQ access to DEQ core tools from mobile devices.

8. Relationship of Guiding Principles to DEQ's IT Goals

DEQ's information technology goals and strategies are directly related to this strategic plan's vision and guiding principles described in section 2 on page 4. Figure 2 on page 20 describes the relationship of DEQ's information technology guiding principles to DEQ's top priority information technology goals and strategies.

Guiding Principles	Top Priority IT Goals and Strategies
1. Supports agency priority work	**Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines** 1.2. Form a team to integrate priority systems 1.3. Improve analysis of business needs 1.4. Improve and upgrade existing data systems 1.5. Improve and standardize project portfolio management **Goal 2: Electronic records management** 2.1. Form a team to define and implement a records management solution 2.2. Form a team to define and implement a document management solution **Goal 3: Support ongoing information technology efforts** 3.2: Support outcome-based management efforts 3.3 Improve use of automated workflow **Goal 4: Improve employee use of available information technology tools** 4.1. Develop a function within the help desk structure to identify training needs and conduct training
2. Planned and delivered agency wide to leverage development efforts, reduce duplicative costs and ensure compatibility of systems	**Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines** 1.1 Information technology governance by DAITM 1.2. Form a team to integrate priority systems 1.5. Improve and standardize project portfolio management **Goal 2: Electronic records management** 2.1. Form a team to define and implement a records management solution 2.2. Form a team to define and implement a document management solution **Goal 4: Improve employee use of available information technology tools** 4.1. Develop a function within the help desk structure to identify training needs and conduct training
3. Aligns information assets and systems with business needs	**Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines** 1.1 Information technology governance by DAITM 1.3. Improve analysis of business needs 1.4. Improve and upgrade existing data systems 1.5. Improve and standardize project portfolio management **Goal 3: Support ongoing information technology efforts** 3.3 Improve use of automated workflow
4. Supports informed decision making	**Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines** 1.1: Information technology governance by DAITM 1.2. Form a team to integrate priority systems
5. User friendly and receives, generates and stores high quality data and information	**Goal 3: Support ongoing information technology efforts** 3.2: Support outcome-based management efforts 3.3 Improve use of automated workflow 3.4. Website improvements
6. Promotes flexibility and forward-focused planning	**Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines** 1.1: Information technology governance by DAITM 1.2. Form a team to integrate priority systems **Goal 3: Support ongoing information technology efforts** 3.5. Coordinate more closely with external stakeholders on information needs
7. Uses established data, development and operational standards	**Goal 1: Implement an enterprise-oriented, standards-based information system strategy that facilitates integration across division lines** 1.6. Form a team to update or develop priority information technology standards
8. Secure, reliable and adapts to changing technology	**Goal 3: Support ongoing information technology efforts** 3.1. The basics: keeping computers and software up to date 3.2. Security

Figure 2: Relationship between DEQ's IT guiding principles and top priority goals and strategies

9. Measures

DEQ has implemented an outcome-based management system that sets goals for the agency's core work, or day-to-day work, and relies on performance measures to indicate whether DEQ is meeting those goals. DEQ will use the performance measure data to determine how and when to improve services and environmental results, to communicate successes, and explain why some processes are not resulting in the desired performance level.

DEQ's executive management team meets quarterly to review outcomes of the agency's performance measures. To prepare for these quarterly performance measure reviews, DEQ collects and analyzes data for each measure. DEQ analyzes the data against targets set for each measure to assess how close we are to meeting our goals.

These initial measures can be supplemented as the strategic plan matures. As described in section 1.3, future plan updates should consider additional measures as needed to track progress on strategic plan implementation.

Measure	Target range	Measure owner
1. Percent of annual implementation technology plan project milestones on target -- data collected from all current projects from project managers.	Green: 0-40% Yellow: 40-59% Red: 60-100%	Greg Aldrich
2. Annual technology plan and report completed on time	Green:<1month late Yellow: 1 to 2 months late Red: >2 months late	Greg Aldrich
3. Percent of projects chartered through DAITM that include business process analysis	Green: 100% Yellow: 90-100% Red: less than 90%	DAITM chair
4. Percent of new, enhanced or upgraded system projects completed that include lifecycle plans	Green: 100% Yellow: 90-100% Red: less than 90%	DAITM chair
5. Percent of systems integrated ("integrated" will need definition by the team that forms under Goal 1, Strategy 1.2)	Needs to be on hold until "integrated" is defined	BSD manager

Figure 3: Proposed outcome-based management measures for information technology goals.

10. Definitions

Please also refer to the DAITM glossary

Business case analysis – Describes the reason for starting a project or task. Expending resources or efforts should result in strengthening a specific business need. A business case summarizes proven and unproven features of a proposed project.

DEQ's Advisory Information Technology Manager Group (DAITM) – DEQ's information technology governance group reviews, prioritizes and recommends information system projects to DEQ's executive management team, which makes final decisions on project prioritization and resource allocation. DAITM also creates agency information technology standards and makes technology investment recommendations for consideration and approval by DEQ's executive management team.

Enterprise-oriented - Agency-wide as well as fitting into the framework of state-wide efforts

Goals – The result DEQ attempts to achieve to support its core work. Goals specify agency-wide information technology priorities.

Governance – Putting structure around how organizations align information technology strategy with business strategy, ensuring that DEQ stays on track to achieve agency mission and goals, and implementing good ways to measure information technology's performance. Governance makes sure that all stakeholders' interests are taken into account and that processes provide measurable results.

Guiding principle – A policy framework to promote a standard approach to operating and delivering information technology.

Information system – Computers, hardware, software, storage media, networks, operational procedures and processes used in the collection, processing, storage, sharing or distribution of information within, or with an access beyond ordinary public access to, the state's shared computing and network infrastructure.

Information technology – Development, maintenance, management and use of computer-based information systems and applications. Includes, but is not limited to, all present and future forms of computer hardware, software and related services for data processing, office automation and telecommunications.

Lifecycle – The period of time during which information technology hardware and software remains useful. Technology lifecycle is comprised of broad phases such as conception, definition, design, testing, implementation, maintenance, modification or upgrading, and retirement or replacement.

Measures –Numeric indications of how well DEQ delivers products and services.

Objectives – Specific statements indicating what DEQ must accomplish to reach its goal, with objectives grouped under strategies.

Strategic planning – An organization's process of defining its future direction and strategies, and making decisions on allocating its resources to pursue this direction.

Strategies – An approach to accomplishing a goal.

Vision – The future state that information technology at DEQ hopes to attain to best support its core work.

Links to Appendices

Appendix A: List of DEQ established data, development and operational standards

Appendix B: Information technology strategic planning process description

Appendix C: Internal DEQ employee survey

Appendix D: DEQ information technology employee focus group results:

Appendix E: DEQ accounting and budget focus group results

Appendix F: External survey

Appendix G: External forces and trends affecting technology

Appendix H: External interviews

Appendix I: Planning document review: DEQ's business direction

Appendix J: Initial prioritization of recommendations

Appendix K: DAITM Charter