Table of Contents

Appendix I | Infrastructure Services

Infrastructure Services

Dan Lohrmann
Director
Infrastructure Services

Foundational Framework

Shared Services:

DTMB is leveraging services enterprise-wide for ease of access, savings and efficiencies.

Service Delivery:

DTMB provides coordinated application, infrastructure and service delivery enterprise-wide.

Organizational Drivers:

DTMB embraces the guiding policies and principles in the 2010-2014 Michigan ICT Strategic Plan.

Information Technology Infrastructure Library:

DTMB is implementing and refining processes for incident, change, problem configuration and release management.

Virtualization:

We will embrace virtualization across all of infrastructure by using a "virtual first" policy.

Cloud:

DTMB will develop a flexible government cloud infrastructure with the performance and reliability needed to run enterprise applications.

Enterprise Architecture and Security:

DTMB provides the tools, processes and standards to translate business needs into ICT solutions securely, efficiently and effectively.

The 2010-2014 Infrastructure Services (IS) Strategic Plan offers an expanded vision for shared technology services that includes new partnerships with city and local governments. In addition, we are setting the stage for a remarkable second decade of innovative progress with expanded opportunities for our state agency clients. Michigan's economic difficulties offer exciting new opportunities for cross-boundary thinking as well as the challenge of implementing government infrastructure projects to maximize benefit to citizens.

Over the past fours years, Michigan has consistently offered agency partners a better technical solution to business problems at a lower price. We have deployed new wireless networks, state-of-the-art desktop and laptop PCs, broadband network connections and more, while improving customer service. At the same time, we have supported deployment of numerous new business applications that replaced legacy mainframe environments. We will continue to provide new infrastructure offerings that are more cost effective to maintain and offer better lifecycle value.

What does this mean in real terms? The state's investment in data-center consolidation and virtualization has positioned Michigan to take advantage of cloud technology. Michigan is turning consolidated hosting centers into a flexible government cloud infrastructure with the performance and reliability needed to run our government enterprise applications. Michigan's vision for cloud architectures will allow users to access virtual pools of state resources—from computing to network to storage—when they need them and achieve shared efficiency and agility. We will leverage existing assets and applications while offering self-service deployment and provisioning through Michigan's MI Cloud. At the same time, more self-service will be offered to clients who seek cloud storage or other infrastructure offerings at a lower cost.

The cloud will reduce power use and free ICT staff from administrative tasks, allowing them to focus on innovative solutions to Michigan's changing business needs. The state is piloting a private storage cloud infrastructure with the goal of providing a lower-cost self-service storage offering for nonsensitive data housed within MI Cloud. The future direction is to increase collaboration with local government entities with this offering. In the next six to 12 months, this initiative will offer a similar service for computing needs using the existing VM infrastructure.

Michigan's government cloud addresses traditional and emerging risks in a comprehensive and holistic manner; however, the stability of our traditional service offerings will still be paramount. As many clients start migrating information and services into the cloud, we will ensure that information and answers are available during that transition. Just as the migration from mainframes to client-server architectures required comprehensive planning and execution, the migration of services and information to MI Cloud will be performed with operational excellence.

It is our goal to be the provider of choice for state and local government technology infrastructure needs throughout this second decade of the 21st century. Our future green data center will make this vision a reality for state and local governments as well as our education partners.

Appendix I

Infrastructure Services

Michigan has a rich history in technology infrastructure. Ours was the first state to appoint a chief information officer (CIO) and to complete telecommunications and mainframe consolidations. We found ways to make progress with the tightest budget conditions in our state's history and recently delivered on our promise to consolidate 36 data centers in the Lansing area.

Michigan's ICT infrastructure is managed by five teams: Telecommunications, Data Center Operations, Office Automation Services, Field Services and Technical Services. These teams are the face of ICT services in Michigan. They respond to an average 29,000 calls every month and serve the state's 55,000 employees. IS directors are responsible for an annual budget of more than $160 million and provide connectivity to more than 1,200 locations throughout the state. Every state function, from prison operations to park reservations, is supported and enabled by these five groups.

Planning for the Future

Infrastructure planning cannot be successful if critical work is performed in separate silos. A data center plan is limited in its effect if the telecommunications network is not available to support it. Likewise, dramatic advancements in PC technology and capability are lost if the teams supporting end users are not equipped with the necessary skills or tools.

Recognizing this, Infrastructure Services brought together leaders from across the organization and developed a common vision. Looking at the customer needs defined in our strategic plan, studying industry best practices and taking input from staff, they developed a plan to build the infrastructure today that will meet the needs of tomorrow.

Michigan's employees, businesses and citizens are becoming more mobile. They require immediate access to services and demand higher levels of service than ever before. Meeting those needs head on, IS developed its mission. It contains long-range plans and tactical initiatives that range from virtualization and green ICT to statewide office automation, disaster recovery and remote -worker capabilities.

We invite you to read through this document and experience firsthand Michigan's infrastructure strategic plan.

IS Mission:
We are entrusted with our citizens' services 24 hours a day, 365 days a year.

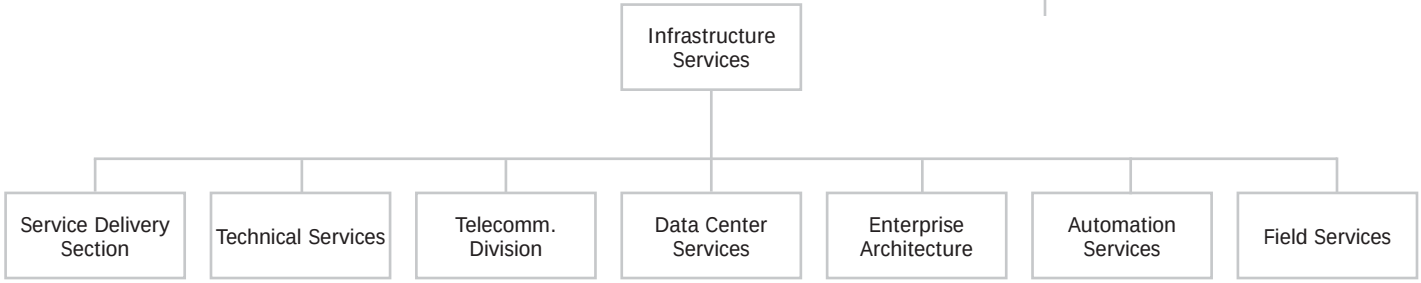
We are expected to forecast the changing landscape of technology and deliver value with every project.

We are called to partnerships that make government more effective and energize our staff.

We lay the foundation of Michigan's future through technology.

We are DTMB Infrastructure Services.

IS Vision:
United in Service
Dedicated to Excellence



Infrastructure Services

Technical Services

DTMB's Technical Services Division serves as the state's application system administrator. Its staff support and maintain the infrastructure for more than 2,300 of Michigan's most critical servers. This team keeps legacy systems running and provides innovative ways to deliver shared technology services across all state agencies. The division is responsible for the state's massive storage of 4.4 petabytes – 4.4 quadrillion bytes – and backup and recovery of centralized data.

Its mission is providing best-of-breed technologies for the operating environment, ensuring mission-critical applications data requirements are met in a timely and cost-effective manner.

Scope of Services

From the first piece of hardware needed to the last delivery of release code, Technical Services' 110 employees play a critical role in every software development launch. In partnership with Agency Services application development, this team delivers on the milestones of all DTMB's major projects, including Bridges, BAM, CHAMPS, Business One Stop, cloud computing, MBT and server/storage virtualization. From shared services such as the thin-client center of excellence to standardizing the state's call center environment, Technical Services makes Michigan's technology work securely and efficiently every hour of every day. Technical Services is organized into the following groups:

- Application Server Support
- Enterprise Centers of Excellence
- Enterprise Storage
- Enterprise Backup and Disaster Recovery
- Enterprise Security Compliance

Top Initiatives

Technical Services will engage in efforts to continuously improve operational efficiencies, support special technologies and provide processes, controls and tools for virtual server environments. These initiatives and their milestones include:

Top Initiatives	Milestones	
Continuous improvement of Technical Services' operational efficiencies Providing patch management, administrative account cleanup, end-to-end restore testing, Citrix CoE governance model, capacity cleanup and optimization	2010	Consolidate disparate Citrix environments in an enterprise-rated offering using an ELA
	2011	Establish policies, procedures and training for technical services
	2011	Establish server security compliance reporting and quality assurance
	2010	Provide backup de-duplication
	2011	Expand data archiving
	2011	Provide LDAP-based authentication for UNIX servers
	2010	Establish end-to-end restore testing readiness
	2010	Implement new audit compliance tools to improve security on a real-time basis
	2011	Deploy compliance tools for critical applications server infrastructure
	2012	Expand deployment of compliance tools for remainder of the production applications servers
	2011	Enhance DR Lab capabilities and processes for testing critical applications and the plan
	2010	Establish schedules and conduct DR testing for all critical applications

Appendix I

Infrastructure Services

Top Initiatives	Milestones	
Emerging/specialized area technology support Support processes for specialized technologies	2010	Implement Infrastructure as a Service for private internal storage cloud
	2011	Implement Computing as a Service for private VM servers cloud
	2011	Establish metro cluster across hosting centers
Virtualization – server and storage with green IT Providing process, tools and controls for virtual server environments with aging and end-of-life computing equipment and establishing a virtualization center of excellence	2010	Provide physical to virtual server migration/ consolidation
	2011	Provide storage virtualization and consolidation
	2011	Migrate 70 percent of end-of-life servers to virtualized infrastructure
	2010	Consolidate storage arrays to reduce storage and backup physical footprint
	2011	Expand migration of physical servers to virtualized infrastructure for energy and cost savings
	2011	Reduce storage and backup footprint migrating all data to virtualization capable storage infrastructure
	2011	Deploy de-duplication technology for further reduction of data from primary storage and backups

Key Drivers and Actions

- Consolidation: Michigan has consolidated its staff, data centers, information and telecommunications into a comprehensive and holistic environment that supports the state's essential functions. These enhancements have saved hundreds of millions of dollars for the State of Michigan. This consolidation program set a new standard for ensuring that end-to-end government technology is reliable despite unprecedented change. From 13 terabytes of storage in 2001 to 4.4 petabytes and Storage as a Service in 2010, our consolidation of data has expanded our storage and backup infrastructure at exponential rates. Information became the central asset of our government infrastructure. People continue to send e-mail, blog, and post photos and videos. The Technical Services team employs state-of-the-art solutions, maturing our support and allocation methods to keep up with this demand.
- Server Virtualization: Our consolidated infrastructure allowed Michigan to embrace virtualization technologies as the next step in our journey. Michigan consolidated legacy VM Ware infrastructure into an enterprise agreement, saving clients 25 percent and reducing physical server hardware at a ratio of 20:1. By using a "virtual first" policy during initial design process, Michigan has been able to grow this virtualization platform for a majority of refreshes and new projects. Michigan is not just virtualizing servers. We are implementing virtualization features in our storage, mainframe and backup environments as well.
- Storage and Backup Virtualization: Michigan offers a multitier storage service for all state government, amounting to more than 4.4 petabytes spread across three hosting centers. Recent projects are actively consolidating seven storage arrays into two, reducing the data center footprint and maintenance costs and adding the storage virtualization options to gain further efficiency in data access. Storage virtualization optimized our storage operations and critical infrastructure, allowing Michigan to move data without disruption to the right tier of storage while applications remain online. Michigan's hosted storage is backed up by an enterprise backup environment with virtual tape libraries and disks for fast backups and restores. Newer technologies such as de-duplication are being evaluated to reduce backup volumes. This effort will save money for clients and reduce footprints. Efforts are

Infrastructure Services

also underway in Data Center Operations to move mainframe tape environment to a VTL environment in 2010.

- Security Enhancements: With attacks on the rise, standardized environments are critical for the security of the state's data and systems. Technical Services leads DTMB's effort. Staff have developed standards for all new UNIX and Windows servers. The team is also examining standard processes and practices for existing systems, implementing best-practice settings across all environments and removing unnecessary access. To maintain compliance for audits, PCI and other entities, Technical Services is implementing a reporting tool that will alert the proper staff when a possible change needs investigation. Additionally, single sign-on and encryption technologies are expanding to secure access and protect data.
- Business Continuity and Disaster Recovery: Technical Services is responsible for implementing back-end solutions to meet business needs for critical applications. To meet these requirements, Technical Services has provided redundancies in all supported areas such as selecting hardware with redundant components, clustering servers, replicating data to alternate hosting centers and maintaining off-site backups.

Initiatives

These initiatives will be developed and implemented over the next five years:

- Expansion of the disaster recovery test lab to enable regular restore testing of data for critical applications: This initiative will increase dependence on backups when needed in a disaster.
- Security enhancements: These include patch management, operating system baselining, event-log handling, administrative access control and implementation of separation of duties. Technical Services plans to use an industry tool set for reports and alerts.
- Centers of excellence: Centers support Citrix, virtualization and server support for call centers, identity management, database servers and other emerging technologies.
- Define career path and staff development: Improving Civil Service classifications will align with industry classifications, provide up-to-date technical training and engage in succession planning.
- MiDEAL: Negotiated discount levels for storage solutions and servers will be extended to local units of government.
- Testing lab modernization: Staff will provide patches, upgrades, restores and emerging ICT research.
- LDAP authentication for UNIX server access for securing server administration.

Partners in Delivery

In carrying out these plans, resources will be drawn from across and beyond the infrastructure organization. The teams involved include:

- Office Automation
- Office of Enterprise Security
- Enterprise Architecture
- DTMB functional areas

Appendix I

Infrastructure Services

Telecommunications

DTMB Telecommunications (Telecom) acts as the Internet service provider and telephone company for State of Michigan executive branch agencies. By providing high-speed data communications and telephone services in support of the executive branch agency operations, Telecom enables government's successes and connects Michigan with secure, reliable services.

Telecommunications' challenge is the creation of a nimble, responsive and cost-effective telecommunications framework that meets the short- and long-term needs of the state's employees and citizens. Governor Granholm's administration has set Michigan on the path of reinventing itself as a more efficient and effective government. This is reflected in Goal 3 of this ICT strategic plan: Manage technology to provide better service and secure faster delivery. Telecom plays one of the most vital roles in meeting these ICT priorities.

Scope of Services

With 90 employees, Telecom currently connects 55,000 state employees across 1,200 locations. Telecom plans, designs, engineers, installs, manages and supports the network infrastructure that provides secure connectivity for government operations throughout the state. Telecom supports tomorrow's strategic priorities and current agency business drivers. Its spectrum of services includes:

- Statewide IP network design and operations
- Secure wireless IP network design and operations
- Internet access design and operations
- Remote access to state network applications
- Statewide telephone and voice-messaging design and operations
- Call center telephone support
- Network security design and operations
- State telephone operators
- Cable and fiber between and within state office buildings – design and operations
- Video, audio and Web conferencing management
- Telecommunications services contract management

Top Initiatives

Telecommunications will engage in efforts to provide enhancements, share network solutions and expand services. Initiatives and milestones include:

Top Initiatives	Milestones	
Hosting Center enhancements Added bandwidth, virtual hosting center support, enhanced security	2010	Increased security for Internet applications
	2010	Network support for virtual environments (green initiative)
Managed LAN services	2012	Upgraded and centralized management of all state LAN infrastructure
Shared network solutions	2011	Research, analysis, economic evaluation of opportunities for shared public infrastructure opportunities

DTMB Telecommunications:

What people say about us

"Very prompt response. When the phone support person could not make the change remotely, she passed on the service request to another level. He came to my office today, made the fix quickly, and watched to make sure it worked properly when I logged back on. Both staff were cordial and professional. Very pleased!"

– DNRE

Appendix I

Infrastructure Services

Top Initiatives	Milestones	
Michigan Health Information Network	2011	Support and analysis of State of Michigan network requirements
Fiber plant enhancement Increase fiber-supported locations	2010	Additional Lansing area fiber installations Increase number of fiber co-locations with major telecoms
Voice services	2010	Expand Voice over IP services
	2010	PBX maintenance RFP award
	2011	PBX parts and professional service RFP award
	2010	Upgrade voice mail systems
	2010	Session Initiated Protocol Voice over IP trunking
	2011	E-911 compliance
	2012	Legacy PBX consolidations
Unified communications	2013	Integrated communications and presence
	2012	Conversion of 25 percent of state employees currently using TDM phone service to the enterprise VoIP system
	2014	All state employees will be converted to the enterprise VoIP system

Key Drivers and Actions

- Unified communications: Increasingly, voice and data communications are converging into a single service. VoIP phones replace plain old telephone service (POTS) lines with IP-based models that use the state's data network as their backbone. This has a dramatic impact on the state's communications strategy. Demand is rising as the legacy voice network infrastructure ages and agencies search for low-cost alternatives for providing the service. Telecommunications must balance this cost-cutting demand with the loss of the high reliability that exists in voice services. Our engineering teams are developing services that can offer clients the best of both worlds. The trend toward convergence has already driven efficiencies such as PBX consolidation. It will ultimately result in telephony-based applications that are increasing in scope, complexity and value.
- The remote worker: Access from anywhere at anytime is the hallmark of DTMB's strategic plan. Whether it's enabling the mobile worker or meeting the imperative of pandemic planning, Telecommunications plays a pivotal role.
- Wireless: The State of Michigan's NASCIO award-winning wireless services are being rolled out statewide.
- Service management: As a service organization, DTMB is coordinating its use of back-office service-management applications and monitoring tools. As these tools mature and their use expands, Telecommunications processes will be affected. As a critical step in delivering value to citizens, internal processes must be rework to increase the efficiency of all our teams.
- Security, capacity and network design: The state's enterprise network is continuously evolving. Every year, applications and agencies require more bandwidth to do their jobs. Engineers are continually securing, re-working, optimizing and designing for increased

Infrastructure Services

demands. These demands can come from large-scale development initiatives, changes in user needs (streaming video, etc.) or security threats. Telecommunications works in partnership with the rest of Infrastructure Services and the Office of Enterprise Security to stay ahead of demand.

Initiatives for the 2010-2014 planning cycle are as follows:

- Internet expansion: Expand Internet bandwidth and management for multimedia use and business services
- Bandwidth upgrade: Increase overall bandwidth in the wide-area network as well as large metropolitan networks
- E-911: Provide planned support of pending E-911 requirement legislation
- Unified communication and collaboration: Leverage Internet Protocol Telephony installations and standards to enhance Michigan's voice and voice mail applications
- Voice consolidation and centralization: Upgrade and consolidate legacy Private Branch eXchange (PBX) infrastructure to save costs and increase agility
- Enterprise-managed LAN migration: Standardize local area network infrastructure
- IP video: Enhance multimedia capability of State of Michigan networks for training, video on demand and videoconferencing
- Unified Communications Strategy, Phase 2: Integrate to wireless communications and presence-aware communications systems

Partners in Delivery

In carrying out these activities, resources will be used across and beyond the Infrastructure Services organization. The teams involved include:

- Technical Services
- Agency Services
- Field Services
- Office Automation
- Data Center Operations
- Enterprise Architecture
- Enterprise Security
- Local governments
- Office of Shared Solutions

DTMB Telecommunications has the mission to actively enable Michigan's state government transformation by providing innovative solutions and exceptional service. Our goals are to provide high-availability voice, data and video network services, consistent network architectures, centralized management, stable and competitive rates, exceptional customer service and secure networks.

- We serve more than 50,000 customers inside and outside state government.
- There are more than 37,000 desktop phones within our system.
- There are more than 1,300 networks and subnetworks within our system.
- We serve more customers than Jackson, East Lansing or Battle Creek.
- Our 90 Telecommunications staff manage the various state voice and data systems and services.
- By January 2012, 50 percent of our customers will be utilizing VoIP.
- By 2013, 50 percent of our customers will be utilizing unified desktop communications.

Infrastructure Services

Field Services

The Field Services Division (FS) provides the department's onsite contact with clients, including frontline services for end users throughout the state. We strive for minimal user downtime, excellent customer service and the most efficient use of state resources. Field Services often has direct impact on consumer safety, statewide liability and customer satisfaction.

Scope of Services

Field Services includes 185 people who meet the service needs of 55,000 state employees across Michigan. We provide support to resolve client problems and install new equipment. In 2009, Field Services staff performed 47,491 repairs and installed 28,888 items. We provide a steady flow of experienced field technicians to the Client Service Center, improving the response time for initial calls. We work closely with the Office Automation Team on server assessments, installing servers, switches and routers.

Field Services is defined by several flexible teams ready to meet customer needs throughout the Upper and Lower Peninsulas. Its nine service areas across the state are based on geography. Staff are divided among 13 teams that provide service whenever and wherever it is needed.

Field Services is a matrix organization that offers cross-functional knowledge and support, growth of individual staff and managers, a team concept to meet the needs of our clients and the ability to leverage resources to meet changing needs.

Top Initiatives

Field Services will engage in efforts to improve service, standardize desktops and provide opportunities for staff development. Initiatives and milestones include:

Top Initiatives	Milestones	
Service improvements Define mobile worker support scheme. Regionally locate multiperson cubes in state office buildings, providing the mobile worker with a workspace, access to conference rooms, network connection, parking and electronic equipment recharging capacity.	2011	Establish mobile worker support centers in eight regions. The CSC may route overflow calls to Field Services analysts and technicians at these centers.
	2010	Provide onsite server support to all DHS and MDOS outstate office locations—dynamic assignments from DTMB partners
	2010	Update all ICT training materials, checklists and partnering efforts
	2010	Migrate MDOC to M/1 standard desktop environment
Desktop standardization Incorporate desktop consolidation success to drive efficiency in daily work	2010	Migrate MDOC to M/1 standard desktop environment
	2011	Review all FS procedures, communication patterns and policies
	2010	Implement mobile worker procedures for FS technical staff to limit footprint in state-owned buildings. Foster "start from home, end at home" procedures.
Staff development Develop, reward and train staff. Incorporate agency empowerment training.	2010	Establish statewide office hours at mobile worker support centers
	2012	Support desktop virtualization pilots in targeted business areas
	2014	Implement full-scale statewide virtualization for desktops

Field Services in Action

M/1 standardization in progress

When it comes to standardizing state government's computing environment, the Field Services Division is moving Michigan forward at a fast clip. The M/1 Adopt initiative is a statewide push to consolidate 19 different computing environments into a standard enterprise framework.

By reducing the number of systems supporting basic enterprise computing functions such as directory services and file, print and desktop environments, costs are reduced and service levels improved. To date, 30,000 workstations have been standardized.

Infrastructure Services

Key Drivers and Actions

- Remote Worker: Demands for wireless offices and increased use of mobile devices will expand the role of the Field Services technician. As these devices become common in the technical landscape of our remote offices, Field Services will need to support multiple channels of accessing the state's applications. Training programs and formal support guidelines will be developed.
- Remote Support Enhancements: As DTMB defines its new service management approach, Field Services will be able to provide technicians with complete service history, technical reference and dynamic troubleshooting guides. By adopting advancements in the tools available, diagnostic processes can be enhanced significantly, remote office inventories updated and the time to resolve problems decreased.

Initiatives

Initiatives for the 2010-2014 planning cycle are as follows:

- Improve problem resolution processes: Improve response time to outages, equipment failures and virus attacks
- Increase coordination with the Client Service Center: Diagnose and repair issues during the client's initial call, saving a trip to the worksite
- Increase transparency: Provide agency representatives with the ability to view and influence Field Services' project assignments, allowing new priority needs to rearrange existing plans.

Partners in Delivery

In carrying out these activities, resources will be incorporated from across and beyond the infrastructure organization. The teams involved include:

- Office Automation
- Agency representatives

Supporting Our Customers

"Nothing is more integral or personal to state employees' work environment than their desktop or laptop. Field Services is on the ground every day making sure that our users are up and running. Their commitment and customer service set the tone for the rest of Infrastructure Services."

Kirt Berwald, DTMB Information Officer

Infrastructure Services

Office Automation Services

DTMB's Office of Automation Services (OAS) brings Michigan government onto a common technology playing field. With more than 58,000 desktops and 900 applications in operation, OAS is charged with transforming and simplifying the state's technology architecture and creating a centrally supported, enterprise-wide common office.

Standardization and shared tools are driving themes for OAS in its efforts to move Michigan closer to the consolidation finish line.

Scope of Services

With 195 employees, OAS's reach extends across the spectrum of state government and includes its ongoing push to provide a single desktop environment that supports all the business needs of the different state agencies and departments. As the voice of DTMB, they are responsible for the consolidated ICT Client Service Center. Pairing customer service with the organization responsible for delivery of remote support tools ensures that the service center receives the latest tools in its quest to increase first-call resolution.

Services include in-depth engineering, which created, designed and updated the automated provisioning environment that allows in-demand monitoring, distributing, patching and upgrading desktop software anywhere in the state. In addition, OAS provides:

- development and support of wireless solutions.
- engineering for the state's consolidated e-mail systems.
- technical training.
- an inventory depot for the most effective tracking and delivery of equipment.

The organization is comprised of the following units:

- Administrative Applications
- Client Service Center
- Computer Help and Training
- Depot Maintenance and Logistics
- Design and Delivery
- Messaging
- MIPRINT Services
- IT Asset Management
- Technical Training
- Wireless Support

Top Initiatives

Office Automation Services will provide customer service improvements, implement technology solutions, expand support to mobile workers and unify communications, among other initiatives. Initiatives and milestones include:

Top Initiatives	Milestones	
Remote/mobile workers Expand support and infrastructure to enable Michigan's mobile workers	2010	Implement the third release of next generation laptop software
	2010	Offer Windows 7 on netbooks and notebooks
	2011	Provide data encryption for all 12,000 notebook users
	2012	Provide CCM Internet support

Appendix I

Infrastructure Services

Top Initiatives	Milestones	
Client Service Center Implemented new call center phone system	2011	Implement a new automated call center phone system
Design and delivery	2010	Implement an automated e-mail solution
M/1 ADOPT Standardize State of Michigan's office infrastructure	2011	Migrate the Department of Corrections
	2011	Migrate 40,000 desktops
	2011	Migrate the Department of Transportation
	2012	Migrate all agencies to M/1
Customer service improvement Increase help desk first-call resolution to 75 percent and implement automated password reset	2010	Implement an e-mail response management system
	2010	Implement back off support at CSC
	2011	Implement central dispatch statewide
	2011	Establish self-service portal for ICT support issues
	2012	Add new channels for access such as web chat
	2012	Implement knowledge base
	2012	Implement self-service portal
	2013	Implement call center workforce management
Unified Communications	2011	Pilot integrated e-mail and instant messaging as first phase of UC
	2013	Move all agencies to a consolidated messaging platform
M/2 Desktop Technologies Leverage technologies such as desktop virtualization to manage the state's desktops, realize additional cost savings and support efficiencies	2011	Conduct desktop virtualization solutions assessment and pilot
	2012	Conduct initial rollout of desktop virtualization in specific business areas
	2013	Implement desktop virtualization
	2014	Complete statewide virtualization for desktop and mobile devices
	2014	Pilot software virtualization/software as a service
	2011	Expand integration of mobile and smart devices to deliver services

Key Drivers and Actions

- Remote Worker: The state must plan for threats such as pandemic flu. In these budget conditions, every effort must be made to reduce travel and allow our workforce to complete work while in the field. The demand for mobile applications delivered on cell phones and BlackBerries is rising. State police use BlackBerries to conduct background checks. These needs have prompted OAS architects to develop new solutions for the mobile worker. OAS is working with the Office of Enterprise Security and Telecommunications to develop a model that takes the state office on the road and provides our workforce with the flexibility it needs.
- E-discovery: Across the nation, the legal demand for immediate access to electronic mail, stored documents, data and systems output has never been greater. In this business

Infrastructure Services

From the Honorable Jennifer M. Granholm Governor of the State of Michigan

"Our vision in Michigan is creating a consolidated technical environment with standard desktops and laptops. The power of 55,000 employees working on the same equipment and using the same software is tremendous. It will help create efficiencies that will save money while improving services to citizens."

environment, the stakes are high for getting e-discovery right. OAS engineers and our Agency Services partners are developing solutions to allow ICT and legal organizations to search and retrieve content instantly, transforming manual processes into an enterprise asset that lowers discovery costs, improves litigation and supports and enables internal investigations.

- Security: Stories of identities stolen from a lost or stolen PC or laptop are reported regularly by the media. Well-meaning state employees have introduce viruses into the network from remote equipment brought back from the field. OAS has worked with the Office of Enterprise Security to develop a comprehensive program of standardization and endpoint and encryption solutions to protect against hackers, malware, protocol attacks and more, keeping security invisible to the end user. This offering is available in the mobile environment.
- Standardization: All the drivers listed above lead to an inevitable conclusion: To deliver the services Michigan needs, the state office must be standardized, streamlined and highly controlled. To respond to business needs, OAS staff must understand every component of the solution. The MI/1 ADOPT project is achieving this level of service. OAS is moving rapidly through the state, consolidating and standardizing file and print services, the desktop itself and security solutions for every state worker.
- Desktop Virtualization: The state is positioned to leverage ICT consolidation, standardization and automation to drive operational and support efficiencies that will reduce costs and improve customer service. Michigan is ready to drive the next phase of its award-winning standardized office infrastructure by expanding its solution base into desktop virtualization and thin-client technologies. The goal is to maximize desktop management efficiencies, drive costs down and expand green ICT initiatives in the state.

Initiatives

Initiatives for the 2010-2014 planning cycle include:

- Endpoint security: Implement secure solutions for mobile devices
- Asset management: Improve infrastructure asset inventory capability
- Data consolidation to M/1 Windows cluster: Enhance and complete file and data migration to a centralized solution
- E-mail archiving: Implement an e-mail archiving solution
- Call center improvements: Institute a new call center phone system
- Identity management: Create user provisioning at the help desk
- E-mail security enhancements: Provide virus protection within the e-mail system enterprise-wide

Partners in Delivery

In carrying out these activities, resources will be utilized from across and beyond the Infrastructure organization. The teams involved include:

- Office of Enterprise Security
- Agency Services
- Other Infrastructure Services groups
- Enterprise Architecture
- Local government partners

Appendix I

Infrastructure Services

Data Center Operations

Data Center Operations (DCO) provides centralized hosting services for all state agencies. Staff install hardware and software and provide operational and technical support for a variety of mainframes, enterprise services and more than 3,881 servers. DCO monitors device and critical application performance and recommends improvements to achieve the highest levels of security, performance and responsiveness.

With an Information Technology Infrastructure Library-based service delivery organization, employees are trained and organized into groups centered around the following areas:

- Service Management Center, which manages incident, problem, configuration and change processes and provides 7x24 operation, monitoring and support for all hosted applications
- Enterprise Monitoring and Platform Support, with responsibility for 7x24 support of the Unisys Mainframe, Enterprise Data Warehouse and Data Exchange Gateway platform environments and enterprise monitoring of all critical applications and hosted environments
- Configuration Management, which plans and facilitates installation of newly purchased or redeployed equipment and decommissions obsolete equipment in hosting centers and other critical ICT facilities. This area maintains the state's comprehensive configuration management data base.
- Facilities Management, which oversees and maintains hosting center facilities
- Scheduling and Data Entry, which provides centralized job scheduling and data entry services
- Disaster Recovery Services, which provides centralized systems and support for disaster recovery and business continuity planning services for all state government

Data Center Operations is proud of its excellent customer service. In April 2009, staff received the Customer Service Award from the department's Agency Services area. We have tailored our services to deliver value and efficiency and to take a "greener" approach. We have consistently incorporated efficiency and effectiveness in our services, and we continue to strive for this excellence, ensuring our customer's needs come first.

Scope of Services Direction for the Next Three to Five Years

DCO strives for consistency and works toward consolidation whenever possible. Our skilled staff manage and maximize the power of technology and processes to provide cost-effective ICT. DCO manages the Information Technology Infrastructure Library, which contains incident, change, configuration and release-management processes as well as enterprise monitoring, media library, mainframe, enterprise technical and disaster recovery services.

Our services are shared across government. Clients include all state agencies, Michigan's judicial branch, the Social Security Administration and the federal government. We are proud of our efforts to balance client needs with operational efficiency, and we continue to work to become the government hosting provider of choice in Michigan.

The state is exploring a public-private partnership to form the Great Lakes Information and Technology Center. This shared data center will deliver long-term data center sustainability and improved operations. In spring 2010, more than 60 vendors expressed interest in a request for information that sought partners in the project. A request for qualification and a request for proposals will follow in 2010 and 2011.

As Michigan moves forward with new technology, DCO will continue to bridge yesterday's technology to meet today's needs through its service management strategy and operations. This ensures sustained service – all day, every day – across state government.

Top Initiatives

Data Center Operations will provide enterprise monitoring, platforms and configuration management. DCO will implement continuous quality improvement recommendations, work toward implementing a disaster recovery process and green ICT efforts, and establish a data center to meet Michigan's future needs. Top initiatives and milestones include:

Appendix I

Infrastructure Services

Top Initiatives	Milestones	
Enterprise monitoring/ configuration management Tool rollout/consolidation of tools and staff	2010	Enhance the CMDB
	2010	Enterprise monitoring consolidation/STD
Enterprise platforms Legacy platform management	2010	Retirement of legacy Bull and Assist mainframes (completed 2010)
	2010	Develop data warehouse strategy for the future
Implement continuous quality improvement recommendation	2010	Develop service catalog
	2011	Develop ITIL problem management processes
	2012	Automate change management processes
Disaster recovery process Build disaster recovery process for critical applications	2010	Identify process, staffing and funding
	2011	Complete assessment of red-card critical applications
	2010	Implement tools, identify critical applications (completed 2010)
	2011	Gather and enhance application portfolio information in CMDB
Green ICT Optimize existing hosting center power requirements	2012	Data center power enhancement request (completed 2009)

Key Drivers and Action

- Green ICT: As follow-up to the department's successful consolidation efforts, ICT discussions have gone beyond cost savings to address energy efficiency. Data Center Operations staff are exploring ways to optimize energy use in the state's computing environment. Consistent improvement that drives updated equipment standards helps facilitate best practices. These efforts continue to evolve as new solutions are developed.
- Disaster Recovery Planning: DCO's hosting centers house 60 applications used to perform the state's most critical business functions. Agency Services and DCO teams are mapping critical systems functions, ranging from law enforcement systems to those that keep the food supply safe. The critical nature of these systems demands a full analysis of our ability to recover from an outage and ongoing commitment to maintaining capabilities.
- Monitoring and Control: Today we face a complex network of disparate monitoring tools and capabilities. DCO has taken the lead, working with Enterprise Architecture and Infrastructure Services to develop solutions that unify our service management strategy and give technical support staff a clear view of daily operations.
- Information Technology Infrastructure Library Maturation: DCO is organized and trained around ITIL components: incident, problem, change, release and configuration management practices. Today's challenge is to mature and extend the reach of ITIL practices to all Infrastructure Services and to integrate these processes with the SUITE framework across DTMB.

Appendix I

Infrastructure Services

Initiatives

- Transformation of current data centers: Improve, upgrade and expand capabilities of Michigan's hosting centers to make them more agile, flexible, adjustable and green. DCO's 14 computer room air conditioning units at Lake Superior were put into operation in 1994. To pursue green energy initiatives, DCO will replace these end-of-life units with efficient chilled-water units by the end of FY 2010. The new units will use chilled water from the State Energy Center, reducing power consumption up to 90 percent. The project will also allow return of a portable 375 kw diesel generator on loan from DTMB Facilities Operations. Implementation of this $2.38 million project will provide more efficient and cost-effective operations within our most critical hosting center.
- Realignment of data center staff: Meet client business requirements better and implement changes to legacy technology environments.
- DCO recognizes the industry trend toward service management and away from computer operations. This places focus on delivery and support services, performance monitoring and management of cross-organizational work. Elimination of the Bull and Assist mainframe and implementation of new technology decreased the need for legacy scheduling services for Department of Community Health, Department of Human Services and the Michigan State Police. In reviewing future staffing requirements and weighing the impact of possible retirement legislation, the DCO management team announced a plan to expand and enhance the Service Management Center. This effort will enhance service coverage as well as offer new opportunities for staff. These changes should eliminate the need for on-call supervision, reduce overtime and enhance service to meet client needs.
- Information Technology Infrastructure Library implementation: Implement and refine processes for incident, change, problem and release management and document processes department-wide. DCO has established ITIL incident and change management and is working through continual service improvements. Upcoming implementation of problem management processes will enhance the department's service management framework. This project will train DTMB staff in the steps and documentation used in the problem management process and will establish the role of task manager. Implementation of problem management will ensure consistent problem handling and empower staff to drive problems to a swift, cost-effective resolution. These continuous service improvements help the agency mature in ICT best-practice service-management strategies and ensure efficient and effective performance by ICT staff.
- Disaster recovery: Finalize implementation of infrastructure and services to support disaster recovery planning and business continuity management across state government. This effort highlights cooperative efforts between DTMB and Continuity of Operations/Continuity of Government (COOP/COG) and buy-in from all Michigan government agencies toward this Continuity of Government – Disaster Recovery planning project. Michigan has consolidated data centers, information and telecommunications into a significant government cloud that supports all the state's essential functions. These enhancements have saved hundreds of millions of dollars, but risks have increased, creating the potential for a "perfect storm" to disrupt critical business operations. The Government Cloud Protection Program–Disaster Recovery project addresses both traditional and emerging risks in a comprehensive and holistic manner. This program sets a new standard for ensuring that end-to-end government technology is reliable despite unprecedented change. The State of Michigan can't control how the organization may be affected by a natural disaster, power outage, terrorist attack or other unplanned incident. ICT staff, however, are working to ensure government is prepared to recover with minimal impact and data loss. With the close integration of technology and business operations, the software has the potential to increase efficiency, power new service models and enhance agility through ICT for Michigan's government cloud. This information has allowed us to make better use of technology by sharing systems, applications and hardware in a cloud infrastructure.

Hosting Center Facts

The popularity of the Hosting Centers has grown over the last few years. In 2004, DCO hosted just more than 800 servers. Today, it hosts more than 2,849 servers serving all of state government.

The state's hosting centers store about 1.8 petabytes (PB) of data. For perspective, two PB is sufficient to store the information contained in all academic research libraries in the United States.

Today, the state's data centers include more than 30,000 square feet of raised-floor environment.

Infrastructure Services

- Legacy platform management: Decommission two legacy platforms to improve and integrate Michigan's remaining mainframe and enterprise technologies for the future. The installation, testing and implementation of the new Unisys Mainframe and virtual tape environment will be completed by the end of FY 2010. The mainframe platforms provide around-the-clock critical business application support for seven state departments. Use of this platform continues to rise, making it essential that this service evolves with technology changes and ensures critical service levels for clients. These systems use StorageTek Powderhorn tape silos for automated tape handling. A project is underway to refresh the production mainframe with a Unisys Libra 690 and replace the mechanical tape silos with virtual tape library technology. Benefits of this strategy include but are not limited to:
  - Cost savings: The state projects savings of $2.8 million over the next three years.
  - Greater efficiency: Newer technology and faster processors provide significantly higher performance, lowering cost to agencies. Lower power and cooling costs result in a smaller footprint.
  - Improved reliability: Virtual tape technology is replacing aging tape equipment.

Partners in Delivery

Carrying out these activities will require resources from across the infrastructure organization and beyond. The teams involved include:

- Agency Services
- Office of Enterprise Security
- Telecommunications
- Technical Service
- Office Automation
- All state agencies for DR/business continuity

These efforts will eliminate mechanical components and improve reliability significantly.

Infrastructure Services Alignment

In Infrastructure Services, we believe strategic planning is a holistic activity. Every project is an opportunity to move the state one step closer to its goals and lay one more brick in tomorrow's technical foundation. Each plan is developed with a purpose, aimed at a long-range objective for the state. These objectives are articulated in the DTMB ICT Strategic Plan and serve as the basis for all infrastructure planning. The following pages show the alignment of initiatives outlined in the plan.

To develop the plan and enable this alignment, IS managers conduct quarterly off-site workshops to look at the issues, challenges and solutions through the eyes of customer agencies. These workshops challenge us to look at leadership in new ways and enhance communication, especially involving the critical issues of innovation, process and management.

Appendix I

Infrastructure Services

Goal One: Access

- Green ICT
- Internet expansion
- Data Center CRAC refresh

Goal Two: Service

- Centers of Excellence
- LDAP authentication
- Unified communications
- E-mail archiving solution
- Identity management
- Information technology
- Legacy platform management

Goal Three: ICT Management and Infrastructure

- Expansion of the Disaster Recovery Test Lab
- Security enhancements
- Testing Lab modernization
- Bandwidth upgrade
- Voice consolidation and centralization
- Enhance managed LAN migration
- End point security
- Asset management upgrade
- Enhanced e-mail security
- Infrastructure Technology Library Implementation

Goal Four: Great Workplace

- Define career path and staff development
- IP video
- Re-alignment of Data Center staff

Goal Five: Cross Boundary Solutions

- MiDeal
- E-911
- Disaster recovery

Goal Six: Innovation and Transformation

- Transformation of current data centers

Michigan 2008-2010 Strategic Goals

Goal One : Access

Provide exceptional services to Michigan citizens and businesses anytime, anywhere

Goal Two: Service

Deliver efficient and effective technology services and shared solutions

Goal Three: ICT Management and Infrastructure

Strengthen operations and security through statewide solutions and universal standards

Goal Four: Great Workplace

Supporting a talented and engaged workforce

Goal Five: Cross Boundary Solutions

Accelerate partnerships across and beyond state government

Goal Six: Innovation and Transformation

Drive innovation and technology to transform Michigan government

Infrastructure Services

History in the Making: A Shared Infrastructure

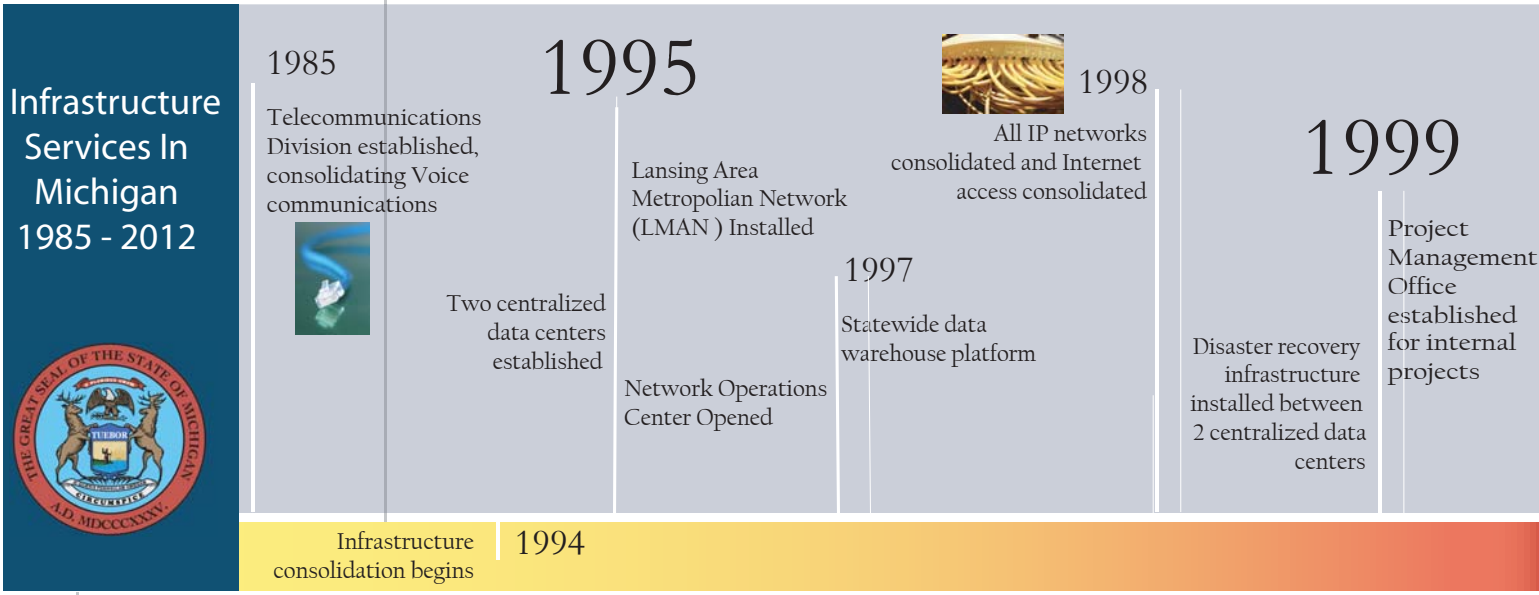
Standardizing technology is a daunting task, to say the least. Michigan took on that challenge in the 1980s when the state ambitiously targeted shared technology across government.

The complexity of the environment was incredible. Data within the state were stored on myriad devices in numerous formats, across so many data centers that no one could get an accurate count. With support at the gubernatorial level, the first generation of consolidation began to take shape around the state's network. Once success was achieved in the communications arena, the focus shifted to mainframe centralization.

In 2001, the Michigan Department of Information Technology was created by Executive Order, centralizing the state's ICT resources in an enterprise-managed department. More than 1,600 ICT employees were reassigned from the agencies in which they worked and whose business they knew into this new department.

Business was to change, but no roadmap was provided. Customers and employees were not shown how their needs would be met or which measurable benefits this new department would achieve. A huge cultural change was required for this enterprise approach, but the organization was not defined. Roles and responsibilities were not articulated and operations continued to function in a decentralized manner. During the initial days of the consolidation, the state's employees continued to get the job done in spite of the many unanswered organizational questions. Working (and sometimes stumbling) together, the vision for MDIT rapidly took shape, strategic plans were developed that aligned with the governor's Cabinet Action Plan, and progress began to come in waves.

Michigan successfully consolidated 70 e-mail versions to two and merged 700 state e-mail servers to 70 centrally hosted and maintained servers. By the end of 2007, data were moved from 29 hosting locations to three state-of-the-art secure data centers where massive amounts of data are now stored, utilized and monitored. In telecommunications, Michigan took a monumental step forward with the successful implementation of VoIP within the Department of Human Services, where 7,000 lines were converted to VoIP technology at more than 80 locations.



Appendix I

Infrastructure Services

Infrastructure Services teams are proud stewards of the legacy left by our predecessors. Each generation has added building blocks for the next and established a heritage of excellence spanning nearly three decades. Our chapter in this story will reach further and dig deeper than ever before. This is truly a defining moment for ICT in Michigan. It is no accident that today we stand so close to the finish line. Every project, process improvement and difficult decision has brought us to this point. It has been a long road, and our teams have made mistakes along the way, but the commitment to learn from them and to create a better future has always prevailed. We did not make the promises of consolidation, but we will be the team to deliver them.

Our consolidation journey has taught us about the barriers that lie ahead. In Michigan, our strategic next steps are clear – to expand beyond the traditional borders of government and lead the way toward true partnership with our businesses, local governments and fellow states. More than ever before, we stand on the cusp of realizing the true promises of e-government.

Commonly held myths were dispelled:

Myth #1: Consolidation costs too much

The need to reduce costs has been the primary reason our consolidations were successful. Our teams have found ways to make progress within the tightest budget constraints in our state's history.

Myth #2: There are too many federal and legal requirements

Our consolidated services and hosting centers have met every technical and legal requirement facing them. The rated service models developed for our IS organization have passed federal guidelines and created a financially viable structure based on business demand.

The barriers of the past can be overcome, but we face additional hurdles as we continue to strive for cross-boundary collaboration and government transformation. They center on two issues: trust and fear of losing control.

There are no quick fixes to deal with these issues effectively. Infrastructure Services must first prove that our teams have instituted operational excellence. We have come a long way, but we have to go much further. If the State of Michigan is to be the catalyst for collaboration among cities, counties and municipalities, our organization must be the model of disciplined, uniform and repeatable excellence. Our challenge is to answer our critics with credible facts, objective metrics and unprecedented customer service. We must face the fear of the unknown.