

**BOARD OF SUPERVISORS  
FINANCE/GOVERNMENT OPERATIONS AND  
ECONOMIC DEVELOPMENT COMMITTEE  
INFORMATION ITEM**

**SUBJECT:** **FY 2018 Budget Development - Land Management Information System Replacement**

**ELECTION DISTRICT:** Countywide

**STAFF CONTACTS:** Erin McLellan, Management and Budget  
Kenny Young, County Administration  
Michael Seigfried, Building and Development  
Ricky Barker, Planning and Zoning  
Buddy Rizer, Economic Development  
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**PURPOSE:** The purpose of this item is to present significant community development department technology needs that will be proposed for review in the Six-Year Capital Improvement Program budget development process.

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**BACKGROUND:** This item is one of a series of service level discussions being brought before the Board of Supervisors (Board) as part of the FY 2018 budget development process and is meant to provide additional information regarding issues that need to be considered in advance of the Proposed Budget development process. Each item is being prepared so that they might be fully reviewed and so that the Board has time to engage in meaningful discussions at a time when distinct action is not required. There are areas in which staff has identified issues that are affecting current or required service levels. This item will present issues associated with the technology needs of the Community Development Departments and nine other County Departments utilizing the County's current Land Management Information System (LMIS).

*Background on the Current Technology:*

The County's current Land Management Information System is *LMIS/WEBLmis*. The *LMIS* application is a system initially developed 20 years ago through a collaborative partnership between the Community Development departments and the Department of Information Technology (DIT). In 2015, the previous version of LMIS was updated to a Web enabled version. Several County departments, as well as Town departments, utilize the system for information or to support land application referrals. The system captures and manages the data for the County land development activities from land use applications to permitting and inspections. Currently, there are 547 staff users in nine departments utilizing the *WEBLmis* system. Public users of land

development activities also interface with the system as they conduct land development business transactions with the County. These public users include homeowners, developers, private engineering firms, commercial and residential builders, and contractors.

A team of DIT analysts/programmers currently support the application. In addition to the basic *WEBLmis* functions, several add-on programs have been developed. These include the following:

- *WAIRS* – Web Based Inspections Request Submission and Status Lookup
- *LOLA* – Land Application Submission and Status Lookup
- *E-Permits* –Online permit submission application
- *RIPE* – Erosion and Sediment Control Field Inspection Reporting

The current system supports approximately 640,000 land development transactions per year that generate an estimated \$18,900,000 in land development fee revenues across all departments. On average this equates to supporting 3,840 residential unit building permits per year and 1,365 commercial permits that generate approximately 4.7 million square feet of new commercial space and 6.8 million square feet of alterations and additions to commercial space.

#### *Business Need Discovery & Analysis Process*

Although the existing system has been supporting the Community Development departments for the past 20 years, staff has identified significant limitations with the system that has resulted in inefficiencies in providing the necessary service level for the growing needs in the departments that support Community Development activities. In the fall of 2015, the Community Development Departments (Building and Development, Planning and Zoning, Economic Development, and Health) conducted a 10-month functional needs analysis that included a review of land management processes and public requirements for data and transactions. Included in this review was a request from Loudoun building industry customers for the County to explore the possibility of implementing an electronic plan review software solution to eliminate the amount of paper transactions required for land development activities.

Staff working groups from the following County departments participated throughout the analysis period: Building and Development, Planning and Zoning, Health, Economic Development, Information Technology, Office of Mapping and Geographic Information, Transportation and Capital Infrastructure, Clerk of the Circuit Court, Office of the Commissioner of the Revenue, Fire and Rescue, Parks, Recreation and Community Services, General Services, Office of the County Attorney and Loudoun County Public Schools. In addition, partners in the land development management process from other organizations participated and provided recommendations: Residential Builders Group established by Building and Development and comprised of members of the local home building industry, Loudoun Chapter of Northern Virginia Building Industry Association (NVBIA), Loudoun's Chapter of the National Association for Industrial and Office Parks (NAIOP), Town of Leesburg, Town of Middleburg, Town of Purcellville, Virginia Department of Transportation (VDOT), Loudoun Water and various

representatives from private engineering firms.

During this discovery process, the Community Development team did a high level comparative analysis of the capabilities provided by the current *WEBLmis* system and select leading land management systems and electronic plan review systems utilized by other jurisdictions throughout the United States. Vendors presented demonstrations to illustrate current functionality in support of land development business activities. The staff working group also gathered information from other Virginia jurisdictions who have recently replaced or are in the process of replacing their land management systems to include electronic plan review systems. These jurisdictions included Arlington County, Fairfax County, Henrico County, Chesterfield County, City of Chesapeake, City of Virginia Beach and Stafford County. These jurisdictions are transitioning to cloud based systems and phasing out hosting the systems at the local level.

#### Summary of Findings Impacting Current Service Levels

Over the years, a significant amount of time and effort has been expended by the Community Development Departments and DIT in support of *WEBLmis*. However, as demand for system improvements have increased to meet changing data requirements or work process changes, the ability to keep pace with these requests has become increasingly difficult to manage utilizing in-house support staff. Specific examples discovered in the analysis that highlight the limitations of the current system included:

#### Business Process Support

- The need for continuous upgrades, patches and improvement in technology places a significant strain on the technical support team as well as the functional testing team. There are currently over 160 work orders for system improvements or fixes requested from operational departments that on average are 2-3 years old impeding operations. A Commercial off the Shelf (COTS) software provider will have sufficient development and testing staff dedicated to their product and will be better positioned to develop, test and package up these patches and upgrades for quick release to their customers.
- The ongoing, day to day work demands of the functional team limit their capability to focus time and effort on developing clear and concise system requirements to ensure that new functionality is developed in a timely manner resulting in negative impacts to service level for field operations staff. It took 3-years to specify requirements, develop, test and convert *LMIS* to a web-based *LMIS* as well as to implement (1) new business requirement for the Building and Development's Erosion and Sediment Control Program.
- The current system does not have the appropriate amount of training materials nor staff designated to provide ongoing training to ensure that new and existing users are able to fully utilize the system; this has resulted in service inefficiencies.
- The current system is not efficient for Reporting, Business Analytics, Data Extracts, and Self-Sufficiency of Research.
- The functional and technical teams have not been able to develop concise requirements for the development of a public portal.

- The current system does not allow for business area configurations at the operating staff level thus requiring a DIT programmer/analyst to edit or modify configurations versus the use of newer technologies, such as flex fields, that can be managed at the operating user staff level.

#### Current Hardware/Software Infrastructure

- The current *LMIS* system has been identified by the Department of Information Technology as a Tier5 system for disaster recovery. This means that in the event of a disaster, the system would not be returned to full operation for 8-14 days. The Community Development departments have identified the need to have an enterprise land management system that has both high availability and disaster recovery with a return to business in a minimal amount of time; 8-14 days is no longer acceptable. This new hardware/software requirement will be discussed during the requirements analysis development process.
- *LMIS* has been customized and modified many times over the past 20 years resulting in an overly complex system in less than optimal condition for adding data fields or changing business logic in the system.
- The management of the current land data within the County is hampered by the fact that 25+ separate custom applications are used to manage various aspects of the business processes. The ongoing, day to day work demands of the functional team limit their capability to focus time and effort on developing clear and concise system requirements to implement and utilize an Electronic Plan Review Module interface or integration to the Land Management back end system (*WEBLmis*).

#### Summary of Discovery Results for the Recommendation to Develop Requirements for the Purchase of a New Land Management and Electronic Plan Review Systems:

The team conducted research to determine the land management systems most utilized by local governments nationally. An invitation to the leading land management system and electronic plan review providers was extended to provide software demonstrations of their current technologies. The invitation indicated Loudoun was in a discovery phase regarding technology functionality and was not in a procurement phase. Several leading industry firms agreed to provide technology demonstrations to assist the team in assessing newer technology.

All the providers demonstrated standard out-of-the box system functionality to support all existing County land development activities except Proffer Management. Proffer Management would require some level of customization to meet Virginia and County requirements. In addition, the demonstrations identified potential gaps between *LMIS*, as currently configured, versus the more state-of-the-art land management systems.

Specific examples of functionality for Land Management Systems included:

#### Public Portals to Access Data, Transact Business and Determine Status of Work

- All provide web-based public portals with civic engagement tools, including the ability to submit applications, pay fees, and report community concerns online 24/7. These portals provide access to land management data and reporting functions that put reporting and

research tools in the hands of the public.

- Standardization of work flow processes and tracking are built in and configurable at the user staff level. This functionality enables the public to see, in real time, the status of their land development submissions to the County and who to contact with questions. The newer systems allow functional changes to be made at the business level. The work flow technology contains standardized processing times that notify supervisors when work is past due.

#### Data Field Management and Navigation

- There is no limit to field generation, file naming structures, and business process structures the system can support. In addition, no programmer is required to add a field, make a business process change, or develop and run a report. The tools to make changes are provided to the functional business users to utilize within the parameters established by the Application Administrator.
- Navigation tools and prompts are programmable to assist in the training of new staff.

#### Mobile Applications for Field Work Activities

- Mobile Applications are included in the systems that enable the processing of data, reporting and notifications over smart devices. All field inspection activities could be managed electronically to include work scheduling, reassignment of work to support completion of daily activities, data collection, and real time inspection results reported electronically to the home owner, builder or trade sub-contractor.
- Ability to collect data that provides work load metrics for field work. The system tracks travel and inspection times and would enable departments to evaluate the performance metrics for field land development activities.

#### Reporting

- Systems provide easy to use report generators with prompts to enable public and staff to analyze and report on system data.
- Systems provide configurable visual information dashboards that enable users to subscribe to a report and see it on an established schedule. Data is configured to specific analysis needs of each user.

#### Interface Capabilities with Other Systems

- The modern data structures in the programs facilitate integrations with other third party systems. The national market served by these systems requires providers be prepared to integrate with other third party systems. The systems integrate with third party providers of Electronic Plan Submission and Review Systems. The Electronic Plan system providers also indicated they partner with and interface to specific Land Management Information system providers. Electronic Plan review integrated into the Land Management System work flows enable real time tracking and collaboration. Also printing and delivery costs will be reduced as plans would be submitted digitally on-line for review and processing.

#### Authentication

- The systems support electronic signature and engineer stamp authentication.

### Technical Support and System Improvements

- All system providers depend upon user feedback to make improvements in their systems. The benefit of a national customer base, regional user groups, and local support networks keeps the product growing with the customer's changing needs.

### Storage and Recovery Plans

- All the systems that provided demos host their customer's data in redundant data center locations with operating recovery plans to ensure operating continuity. Service Level agreements are also provided by the vendors to ensure that they are meeting the customer's requirements for availability and recoverability. These costs would be included in the DIT's ongoing operating budget as annual Maintenance and Technical support fees. The County owns its data in perpetuity.

### Work Group Recommendation following Discovery Process

At the conclusion of the discovery analysis and review, a consensus recommendation was reached by the Community Development departments. The recommendation was to develop and submit a FY 2018 Capital Improvement Resource Request to replace the County's Land Management Information System (*WEBLmis*) with a new Commercial Off the Shelf (COTS) land management system that preferably is cloud hosted and that includes an integrated electronic plan submission and review component. The staff work group has developed a Draft Project Charter and Requirements Document which will need to be validated. This validation process will likely result in the development of detailed functional and technical requirements and a Request for Proposal (RFP) to replace the County's Land Management Information System.

### Benefits of a New System

A new system will include functional support of all current land development activities with the ability to track in real time the status of submittals within the County's land development processes. The desired solution will greatly improve the ability of Community Development Departments (Building and Development, Planning and Zoning, Health, and Economic Development) and other County departments to share information across departments. The public and development community will have 24/7 access to land development activity data and be able to track work submitted to the County for review and the progress being made to application approval and/or project completion. The desired solution will provide built-in, best practice processes and business work flow tools while allowing the County to consolidate existing custom database applications currently in use. It is anticipated that the system, when implemented, will result in increased capacity for staff and provide a much more transparent process for the public.

The Electronic Plan review component will enable plans to be submitted in digital form on-line to be reviewed and approved. This functionality will greatly reduce time and cost for plan submitters to run to the government center to deliver paper plan submittals and reduce printing costs for submitters. In addition, Loudoun Water and VDOT have agreed to participate in electronic plan submission and review. This is a significant new partnership in streamlining plan review processes with the County. A major goal of implementing the new system is to streamline and accelerate services through efficient work flow, on-line access and mobile solutions with real-time results. This service approach will provide enhanced public access to data and services in a real-

time environment. During the migration to a new land management system, the transition plan would maintain *WEBLmis* for business activities only with no new programming or development activity beyond code fixes and data correction initiatives.

Finally, to maintain Loudoun's current service levels in land development activities, the business processes and applications supporting those processes must be modernized to meet the service demands of the County departments, citizens and business community. The intent of this project is to select the technology solutions, expertise, and on-going support that will provide a state-of-the industry ***Land Development & Management System*** for Loudoun County. Other Northern Virginia jurisdictions currently migrating to updated technology are Arlington County, Fairfax County and Stafford County.

**OPTIONS:** The Community Development Departments work group does not believe that the existing *LMIS* will meet the long term needs of the organization, without significant upgrades to the existing system. Cost estimates for the options provided were developed in consultation with Virginia jurisdictions who recently procured and awarded contracts for new Land Management Systems. Therefore the following options have been prepared for Committee and Board consideration:

1. If there is FY 2017 fund balance available, the Board could consider funding a portion of the project in FY 2017. Funding could be provided to hire a consultant to validate the findings of the Community Development workgroup as well as to develop detailed functional and technical business requirements that will likely result in a RFP for a fully integrated land management and electronic plan review system. This consultant would also be retained as Project Manager to implement the new system. The projected cost for these services is estimated to be \$500,000. Staff's preferred option is to replace existing *WEBLmis* with a third party, land management system with an integrated electronic plan review component. Procurement and full implementation of a new land management information system is projected to take 24 months. The projected cost is \$6,000,000 (Cloud Based Software Purchase with Electronic Plan Component and Project Contingency \$4,000,000, 3<sup>rd</sup> party Contract Project Manager \$500,000 (Only required if no funding in FY 2017 as recommended above), Back-Fill Staffing for Project Team \$500,000, Hardware Upgrades for E-Plans \$800,000, and Project Contingency \$200,000.
2. Replace existing *WEBLmis* with a third party, land management system without an electronic plan review component. Procurement and full implementation of a new land management information system is estimated to take 18-24 months. The projected cost is \$4,400,000 (Software Purchase with Project Contingency \$3,400,000, 3<sup>rd</sup> party Contract Project Manager \$500,000 and Back-Fill Staffing for Project Team \$500,000. Procurement of an Electronic Plan Review system would be deferred in this option.

3. Phased Acquisition Option (The projected cost is \$6,500,000). In a phased acquisition of software solutions the acquisition of the Land Management Information System needs to occur first. Acquiring an Electronic Plan Review System (EPRS) first runs the risk of limiting the future Land Management System choice due to interface/integration issues. To implement a successful EPRC process, it needs to interface with the Land Management System work flow business processes. The choice of the Land Management System will guide the appropriate third party EPRS selection. Depending upon the timing of the phased acquisition, it is estimated that inflation and professional service costs to implement a second integration could add \$500,000 to the cost of the project, depending upon the timing of the acquisition and implementation.
4. Upgrade the existing *WebLMIS* and move the hosting of the existing system to a cloud hosting provider (the projected cost is \$2,518,000). This would include utilizing consulting services and on site staff to upgrade current system functionality to better align with the business needs of the Community Development departments. This option also includes the estimated costs associated with migrating the current system to a cloud hosted environment to improve disaster recoverability of the system. The upgrade functionality is limited and would not be equivalent to a third-party land management system. In addition, a consultant would need to determine the time frame it would take to accomplish this option.
5. Upgrade the existing *WebLMIS* on premise (the projected cost is \$1,518,000). This option includes all of the above improvements to current system functionality and addresses possible improvements to system availability and recovery but does not move the system to a cloud hosted environment. The upgrade functionality is limited and would not be equivalent to a third-party land management system. In addition, a consultant would need to determine the time frame it would take to accomplish this option.
6. Continue to utilize the current system as is and invest programming time to complete the current outstanding work orders, develop a reliable back-up system for operations and develop a recovery plan in the event the system becomes inoperable. This approach will be a maintenance of current service provisions.

**ISSUES:** The following issues have been identified for review within the Six-Year Capital Improvement Program (CIP) budget deliberation process.

1. Debt Financing Capacity in the Capital Improvement Program:

The system replacement is proposed as a major computer system replacement project ideally in FY 2018 at a cost of \$6,000,000. The inclusion of this replacement project in the six-year CIP will require a review of debt issuance capacity and the County's debt ratios to determine the viability of funding this project in FY 2018, or another year in the six-year CIP timeframe.

2. Project Phasing:

The Land Management Information System and Electronic Plan Review System could be procured separately and implemented separately distributing costs in phases. This approach is not recommended by staff because the procurement of one system at one time and another system later could create integration, implementation issues and increased project costs. The estimated cost of an integrated project is \$6,000,000. In addition, critical to work status tracking is to have electronic plan review integrated with the work flow processes of the land management information system. The estimated cost of a phased project if procured within 2 years of each other is estimated to cost \$6,500,000. The additional \$500,000 is due to inflation and professional service costs for system integration.

3. Project Implementation Timing:

The implementation of an integrated system is estimated to be a 24-month or 2-year process for full implementation following a contract award through the procurement process. This estimate is based on a survey of other jurisdictions converting their systems reporting implementation schedules of 18-24 months. During the two-year period, modules within the system will be phased to provide some immediate return on investment. As an example, within the first year the electronic plan review component could be integrated with work flow processing and be fully implemented.

**FISCAL IMPACT:** The estimated cost of the technology capital project is \$6,000,000. The current Adopted CIP does not have sufficient debt issuance capacity until FY 2021 unless revisions are made to the CIP to accommodate this funding request. Capital Budget Staff is analyzing options to fund this program in the six-year CIP timeframe that will comply with the County's debt issuance limits and debt ratios. The ongoing annual operating costs in the Department of Information Technology budget for system maintenance and technical support costs are estimated, based on information from other jurisdictions and software vendor preliminary estimates, to be in the range of \$325,000 to \$450,000.

**ATTACHMENT:** Land Management System Replacement Power Point Presentation



# Land Management Information System Replacement

FY 2018 Budget Development

November 15, 2016

## Board's Vision & Strategic Focus Areas

**Economic Development** – Stay the course on economic development progress achieved over the past four years by leveraging the economic development potential of Metro Rail in the County, improving the rural economy in a way that maintains the quality of life for current residents, diversifying the County's commercial/industry base, and continuing to increase job opportunities.

- Establish a broader use of metrics when making economic decisions, assess progress on sector development, and measure results of economic development strategies
- Provide adequate resources to the Department of Economic Development to sustain progress

**Growth Management** – Embrace a comprehensive, holistic, and proactive approach to managing the County's growth and its impact on schools, roads, traffic, parks and recreation, and public safety

# Purpose of System

- 640,000 land development business transactions per year.
- \$18,900,000 in land development fee revenues collected.
- 3,840 residential unit building permits per year
- 1,365 commercial permits per year
- 4.7 million square feet of new commercial space
- 6.8 million square feet of alterations and additions to commercial space.
- Supports over 547 active users.

# Key Challenges: Current System

- Limited Public Self-Serve Data Access and Transactions.
- “Work-Around” Databases and Manual Processes
  - System Controls the business processes.
- Limited business continuity measures due to current hardware & software platform.
- Data integrity issues due to integration complexities with newer systems.
- Paper Based Plans Review Process

# Key Opportunities: New System

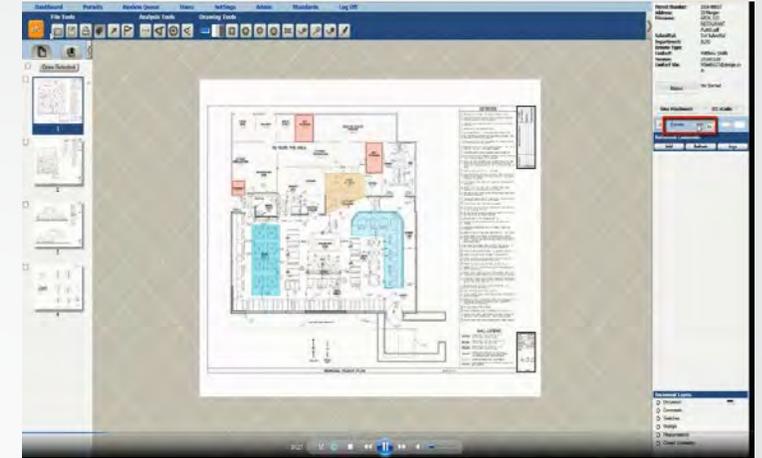
- **Public Portal with 24/7 access to data & transactions.**
- **Centralized system consolidates “Work-Around” Databases and automates business processes.**
- **Business continuity provided by fault tolerant infrastructure.**
- **Data quality through integration with recently acquired County systems.**
- **Integration of Electronic plan review.**

# Benefits of Electronic Plan Review

## Proposed System

### ➤ Electronic Plans Submission and Collaboration

- Reduced Paper
- Reduced Trips
- Simultaneous Views
- Visible Plan Set Changes
- Process Transparency
- Digital Storage



# Building & Development Department

## Customer Service Benefits of a new system

- An average of 240,000 inspections results reported real time.
- On average 55,000 customer trips would be eliminated to the Government.
- An average of 19,500 construction plans would no longer have to be hand delivered in paper sets (58,000 paper sets) for plan review.



# Planning & Zoning Department

## Customer Service Benefits of a new system

- An average of 1,200 land development and zoning transactions would be processed electronically per year.
- An average of 500 annual referral review comment transactions can be tracked and entered concurrently directly on plans.
- Electronic document reviews eliminate trips to the Government Center. Enhanced transparency provided with real time status reporting of land legislative processes.

# Economic Development



**LOUDOUN  
VIRGINIA**  
ECONOMIC DEVELOPMENT

## Customer Service Benefits of a new system

- Electronic work flow technology creates a key advantage to our business recruitment and expansion efforts.
- Electronic Plan submittal and review saves businesses time and money. Reduces copying costs, paper retention and storage costs.
- Transparency to the County processes and timelines to ensure Fast Track project success.

Imagine having a Land Management Information System that enables you to click on a Loudoun County parcel and you are able to see all the past and current land development activities for that parcel....

The new Technology makes that possible . . . . Example:

➤ Seattle, WA





Options	System	Cost Estimate
1	New System w/EPR	\$6,000,000
2	New System w/o EPR	\$4,400,000
3	Phased System/EPR	\$6,500,000
4	WebLMIS Upgrade Cloud Hosted	\$2,518,000
5	WebLMIS Upgrade LC Hosted	\$1,518,000
6	WebLMIS As Is	

# Final Comments:

- Why are we proposing this now?
  - Constituent demands of Staff, Citizens and Building Community
  - Business critical to resolve current system limitations
  - Jurisdictional Peers have already completed or are involved with modernization
  - Staff Retirements pose loss of key business institutional knowledge and support skills
  - 3<sup>rd</sup> Party Land Development Software Systems have matured

# FY 2018 Capital Technology Resource Recommendation

- Program funds in the 6-year Capital Improvement Program to replace the 20-year old homegrown Land Management System (*WebLmis*).
- Fund and purchase a new Community Development Land Management System with an integrated electronic plan submission and review component.

