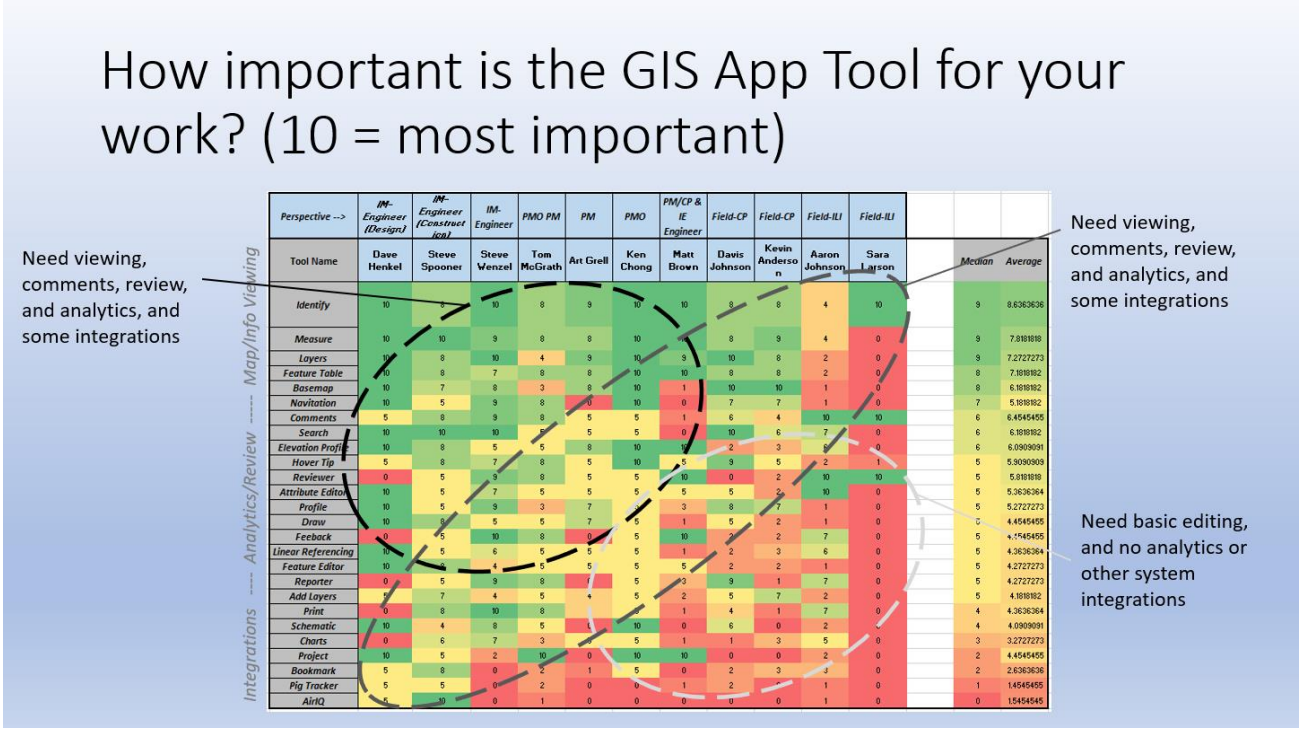
GIS Feasibility Study Executive Summary

OVERVIEW

In the winter of 2018 the GIS Group in Design Services, Kim Sundeen, GIS Developer, performed a GIS Feasibility Study of project leads representing processes and services provided by Integrity Management and Integrity Engineering. This study focused on documenting current workflows, processes, and tools by using an online survey and in-person/conference call interviews with project leads. Kim Sundeen interviewed key personnel in LSC's Integrated Engineering and Integrity Management for perspectives from project managers, engineers, schedulers, field crew, and in-office staff. The **outcome of this Feasibility Study is process improvement, which translates into cutting costs and generating new or repeat business.** The results of this Feasibility Study provide a strategy for automating tasks and developing new applications and tools to improve efficiency and reduce cost and time in staff's activities and ensure quality work delivered to clients.

The core service LSC delivers to clients is quality, reliability, and expertise in integrity management of asset inspection, construction, and maintenance. The online survey provided useful feedback on the usefulness of GIS App tools and which obstacles staff faced. To provide these services, those staff interviewed revealed the pattern where project managers and engineers need all the tools in the GIS App including map viewing, analytics, and integrations with management software. On the other hand, field crew only need map viewing and data review. Figure 1 describes the usage pattern for user perspectives.



Perspective -->	IM-Engineer (Design)	IM-Engineer (Construction)	IM-Engineer	PMO PM	PM	PMO	PM/CP & IE Engineer	Field-CP	Field-CP	Field-ILI	Field-ILI		
Tool Name	Dave Henkel	Steve Spooner	Steve Wenzel	Tom McGrath	Art Grell	Ken Chong	Matt Brown	Davis Johnson	Kevin Anderson	Aaron Johnson	Sara Larson	Median	Average
Identify	10	9	10	8	9	10	10	9	8	4	10	9	8.6363636
Measure	10	10	9	8	8	10	10	8	9	4	0	9	7.8181818
Layers	10	8	10	4	9	10	9	10	8	2	0	9	7.2727273
Feature Table	10	8	7	8	8	10	10	8	8	2	0	8	7.1818182
Basemap	10	7	8	3	8	10	1	10	10	1	0	8	6.1818182
Navitation	10	5	9	8	0	10	0	7	7	1	0	7	5.1818182
Comments	5	8	9	8	5	5	1	6	4	10	10	6	6.4545455
Search	10	10	10	5	5	5	0	10	6	7	0	6	6.1818182
Elevation Profile	10	8	5	5	8	10	10	2	3	8	0	6	6.0909091
Hover Tip	5	8	7	8	5	10	5	9	5	2	1	5	5.9090909
Reviewer	0	5	9	8	5	5	10	0	2	10	10	5	5.8181818
Attribute Editor	10	5	7	5	5	5	5	5	2	10	0	5	5.3636364
Profile	10	5	9	3	7	5	3	8	7	1	0	5	5.2727273
Draw	10	8	5	5	7	5	1	5	2	1	0	5	4.4545455
Feeback	0	5	10	8	0	5	10	2	2	7	0	5	4.4545455
Linear Referencing	10	5	6	5	5	5	1	2	3	6	0	5	4.3636364
Feature Editor	10	8	4	5	5	5	5	2	2	1	0	5	4.2727273
Reporter	0	5	9	8	7	5	3	9	1	7	0	5	4.2727273
Add Layers	1	7	4	5	4	5	2	5	7	2	0	5	4.1818182
Print	0	8	10	8	0	5	1	4	1	7	0	4	4.3636364
Schematic	10	4	8	5	1	10	0	6	0	2	0	4	4.0909091
Charts	0	6	7	3	0	5	1	1	3	5	0	3	3.2727273
Project	10	5	2	10	0	10	10	0	0	2	0	2	4.5454545
Bookmark	5	8	0	2	1	5	0	2	3	3	0	2	2.6363636
Pig Tracker	5	5	0	2	0	0	1	2	1	1	0	1	1.4545455
AirIQ	5	10	0	1	0	0	0	0	0	1	0	0	1.5454545

Figure 1. Heatmap of user-rated importance of GIS App tools to complete their work where 10 = most important (green) and 0 = least important (red).

Implementing the use of GIS services and tools by the LSC team is limited because of these main obstacles of lacking GIS knowledge (#1) and what to ask, how to quickly convert data (#2), and how to integrate their project data together with existing datasets (#3).

1. LACK OF GIS KNOWLEDGE: Staff lack knowledge for what options are for using GIS services, making GIS requests to the GIS department, viewing successful implementations of past GIS projects, or developing new business use cases for mapping internal or client data.
2. DATA CONVERSION AND FORMATTING: Staff receive, create, or convert numerous data formats with spatial coordinates, but may not know all the options for converting the data into a centralized location or format.
3. INCONSISTENT DATA INTEGRATION AND CENTRALIZATION: Like #2, staff store data with spatial coordinates of differing file types and view the spatial data using varied software. Because of the varying spatial coordinate data, formats, and software staff have disparate datasets that are not integrated using a centralized location for documents, apps, or software.

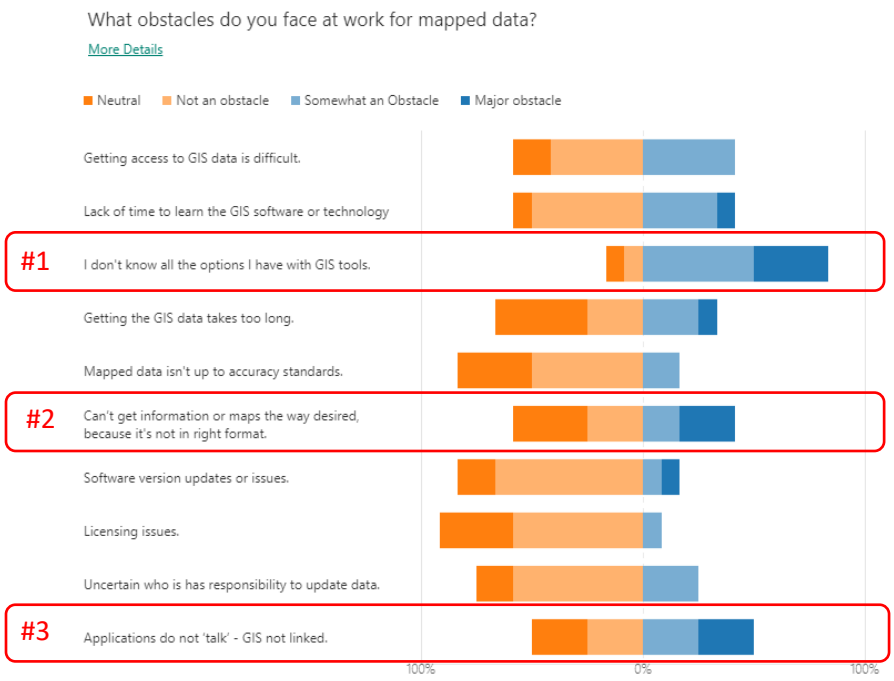


Figure 2. Ranked obstacles that users face when using mapped data for their daily work. Blue values represent a major obstacle, while orange values represent not an obstacle.

RECOMMENDED SOLUTIONS

The solutions to resolve the obstacles while also improving efficiency, saving money and resources, and generating new business centers on these three goals:

Goal 1. Staff Engagement & Education: *Increase access, knowledge of, and inclusion of GIS services in billable projects by educating and engaging internal staff in GIS tools and services.*

Goal 2. Integrated Processes: *Develop integrated processes to improve information-flow, sharing, and review across departments to reduce information loss, centralize data systems, and clarify projects to team members.*

Goal 3. Collaborative Tools: *Develop collaborative tools to improve the project planning and review process.*

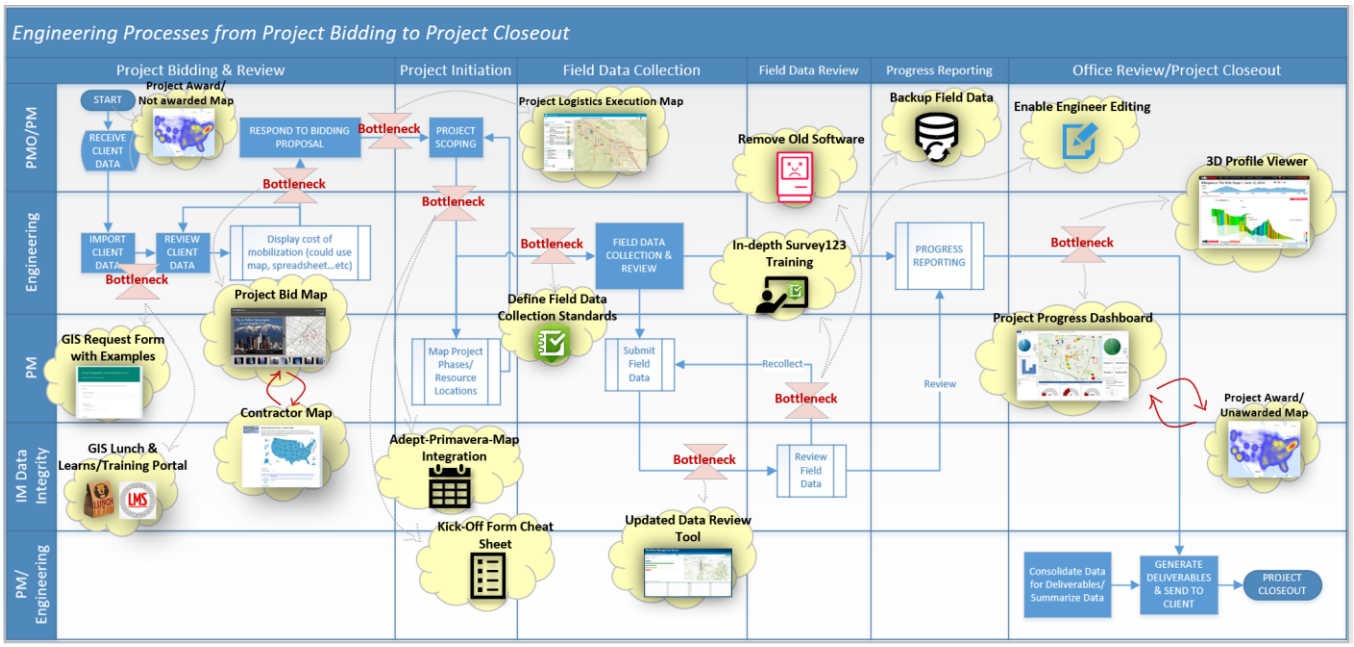
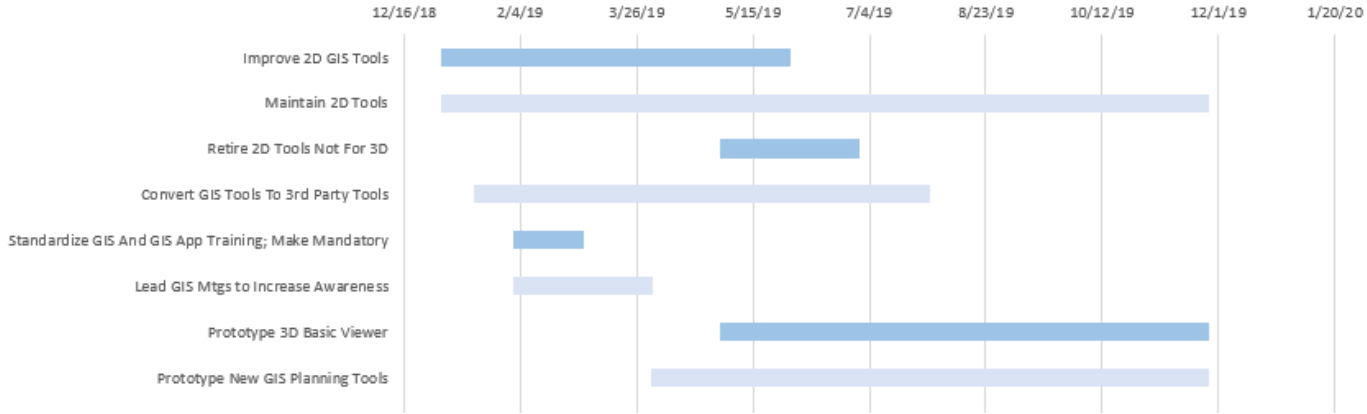


Figure 3. Graphic showing the existing project lifecycle and projects, tools, and processes to implement to resolve those obstacles.

RECOMMENDED TIMELINE

The following timeline illustrates a generic roadmap for implementing work:

Year Planning for Epics (Projects)					DURATION (days)
START DATE	END DATE	DESCRIPTION	BENEFITS TO LSC	GOAL MET (#1, #2, #3)	
1/1/19	8/1/19	Improve 2D GIS Tools	Improve usage and reliability of current GIS tools.	2: Integrated Processes	150
1/1/19	12/1/19	Maintain 2D Tools	Continue providing support to current tools and make minimal	2: Integrated Processes	330
5/1/19	7/1/19	Retire 2D Tools Not For 3D	Decide which tools are unused. Could clean up codebase and	2: Integrated Processes	60
1/15/19	8/1/19	Convert GIS Tools To 3rd Party Tools	Get better workflow and charting tools faster to the user.	2: Integrated Processes	196
2/1/19	4/1/19	Standardize GIS And GIS App Training; Make Mandatory	LSC staff will have mandatory trainings before starting a	1: Staff Engagement & Education	30
2/1/19	5/1/19	Lead GIS Mtgs to Increase Awareness	Increase visibility and utilization for GIS tools before projects start.	1: Staff Engagement & Education	60
5/1/19	12/1/19	Prototype 3D Basic Viewer	Test out functionality and create demos for usage.	2: Integrated Processes	210
4/1/19	12/1/19	Prototype New GIS Planning Tools	Improve visibility of project successes and help assign	3: Planner Tools	240



APPENDIX I.

Feasibility Study Process:

Order Completed	Feasibility Study Component	Process	Outcome of Component
1	GIS App User Needs and New Mapping Tools online survey	Sent online 10-20 minute survey of questions on how maps, spatial data, and the current GIS application is used in user's workflows to 15 users, with a return of 12 responses.	To identify which GIS App tools users use, and what obstacles users encounter regarding collecting, reviewing, and editing mapped data, specifically they use the GIS App.
2	In person/conference call interviews of workflow process documentation and new tool idea generation.	Held 1-hour in-person meeting with 1-3 individuals to describe current workflow process, obstacles, new ideas for where workflow could be improved.	To create Visio workflow diagrams that illustrate processes in each project phase by roles/responsibilities for: 1) Current process, 2) Improved process with new tools/improved tools To outline recommendations for developing new tools/improving tools as Team Foundation Server (TFS) "user stories" for immediate work by development team.
3	Google Analytics reporting and summaries	Configured Google Analytics to capture user interaction data (i.e., clicks, webpage visits…etc.) and analyze on website and GIS App Tool metrics.	To summarize how users interact with the GIS App, including: • When users visit which webpages? • Which tools do uses use most often in each GIS App? • How often do users visit each GIS App? Configured Google Analytics dashboards for GIS apps to see total webpage views, where users reside, and which tools are used.
4	New Tool/Improved tool research.	Reviewed results of GIS interviews, online survey, and Google Analytics reports to summarize a report of new ideas/projects as solutions to resolve major obstacles that interviewed staff face with their work and incorporating GIS.	List of projects for future work to help managers decide on priorities and business needs for projects.
5	Long-Range Planning	Review items #1-4 and determine when current GIS App tools need to upgraded, which new projects should be completed, and what resources are needed (staff, software, time).	Roadmap of resources, tools, and staff needed to implement a GIS App that meets the GIS needs of engineers, project managers, schedulers, and field techs, and managers.