Geospatial Maturity Assessment and Roadmap

November 30, 2021

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Executive Summary

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The Town of Parry Sound hired Perry Group to review its GIS maturity and set out recommendations to improve it. This follows a similar assessment that was completed in 2014.

The results of the assessment indicate that maturity since 2014 has marginally improved from 1.9 out of 5 to 2.3. In some areas, progress has been made, but in others, the Town has fallen backward (particularly in the areas of GIS governance and resourcing).

There are many opportunities ahead identified by business units to utilize GIS more broadly, but also some frustrations exist around:

- *"We don't know what we don't know"* – there are clearly lots of opportunities for staff to learn more about GIS and how it to use it to make their jobs easier.

- *"Why do we have to use two (or more) GIS systems?"* – there are some questions as to why there is different data on the West Parry Sound Geography Network (WPSGN)/Parry Sound GIS solutions and why multiple systems are needed – staff want to go to one place.

- GIS solutions' performance and usability, particularly on mobile devices; and

- Confusion about where asset and related data should be stored and what the future holds – e.g. ███████████████████████████, GIS, Work Management, Finance or Asset Management system?

There are also some risks that the consulting team observed.

- There is a significant dependency on WPSGN (for technology, data, GIS solutions and hosting) but there is no formal governance or operating model for WPSGN, and the service is currently not as reliable as it needs to be.

- The level of GIS resourcing (0.6 FTE) allocated at the Town is lower than it should be which results in an ever-growing list of opportunities that cannot be addressed and leaves the Town treading water with GIS rather than advancing.

We have identified five foundational internal issues that we believe are inhibiting the Town's GIS maturity/growth.

1. **GIS Governance** – Stronger, formalized GIS governance is required. Increased involvement of Senior Leadership Team (SLT) in GIS Governance, the development of an annual work plan and a GIS Community of Practice is recommended to align and focus work efforts on the highest value initiatives.

2. **GIS Technology Delivery** – A decision is needed about whether the Town should run its own GIS technology or use WPSGN technology.

3. **GIS Staffing** – The Town would benefit from allocating more resources to GIS. Options include fully allocating existing management time to GIS and IT, re-distributing GIS data work from GIS specialist staff, adding a student/intern program, or adding new staff to be either dedicated to Parry Sound or shared with WPSGN.

4. **Asset and Work Management** – A shared and agreed strategy for Asset and Work Management systems must be set. Jointly (Finance, PW, IT, GIS) set out the Asset, Work Management and GIS systems data and workflow integration and implementation strategy.

5. **Property Centric Systems** – A shared and agreed strategy for Property Centric systems must be set. Jointly set out and implement a similar strategy for property-centric systems and processes and GIS and data integration.

However, at the centre of and intertwined in all of these, is the relationship with, governance of, and services that the Town receives from WPSGN. The consulting team believes the partnership with WPSGN is a tremendous model that should be preserved and bolstered. We have made a collection of suggestions related to WPSGN, even though this is not part of the scope of this review. We suggest that the Town work with its partners in WPSGN to:

1. Conduct a review of the WPSGN Governance and Operating model.
2. Conduct a review of WPSGN capacity and future resourcing needs.
3. Conduct a review of the WPSGN technology and hosting strategy.
4. Prepare an agreed set of GIS solutions that can be built once and shared amongst all partners.

This will require more senior attention and investment of time from Parry Sound and other partners and likely increased investment.

While the Town improves the situation internally, we urge the Town to carefully avoid any moves that might undermine or weaken the WPSGN value proposition.

Introduction and Background

1.0 Introduction and Background

1.1 The Importance of Location-Based Services

There is a growing need for location-based services and insights that help organizations make data-informed decisions, create operational efficiencies, and provide situational awareness.

These functions are being driven by location as a system of record, a system of insight and a system of engagement. The industry is experiencing a rapid convergence of traditional silos (location intelligence and business intelligence) into an integrated intelligent enterprise.

This roadmap is designed to help the Town of Parry Sound adapt to this new model, endeavouring to transform its operations by creating a clear understanding of the capabilities required to operate in this new model. A geospatial roadmap has an underlying strategy to unite traditional lines of business around location data and to lay the groundwork required to support a digital shifting of tasks to the business units through engagement and empowerment.

1.2 A New Way of Thinking

The transformation to an integrated intelligent enterprise requires a focus on data management and the integration of business data and business systems with location data to support insight and drive innovation. More importantly, these changes require new ways of thinking, learning and working that are supported by governance and corporate culture of collaboration and innovation.

This requires a shift from more traditional siloed approaches to systems and data management, to a shared, customer-centric model focused on business outcomes and solving problems in ways that will take full advantage of an organization's existing and new investments in location data and platforms.

1.3 Project Purpose

The work conducted in this engagement was not to build a multi-year GIS strategy.

The purpose of the discovery and planning activities associated with this project is to provide a practical, logical direction and set of actions for overcoming operational challenges while making foundational changes that will support the Town of Parry Sound's 2022 and future enterprise GIS maturity efforts.

The roadmap is designed to be a living document, the success and performance of which can be measured annually using the maturity model. Using the model tools and online interactive Google Data Studio report as a measurement framework allows for a regular review of the ongoing performance of the Town's efforts and of the roadmap itself.

1.4 Approach and Methodology

The roadmap was developed in three phases:

1. Discovery.
2. Strategize.

3. Plan.

1.4.1   Discovery

A capability model assessment was performed to assess the organization's current GIS state, followed by a series of interviews with key stakeholders. The results of the discovery and the maturity assessment were shared and reviewed with Town staff.

1.4.2   Strategize

The consultants used the results of the Discovery phase (the maturity assessment) to identify key areas requiring focus, developed a series of options that could help the organization overcome key challenges and barriers and develop strategies and tactical approaches to make in-roads or improvements in these areas which will, in turn, improve GIS maturity.

1.4.3   Plan

With agreement around the key areas and approaches to improving GIS maturity, the consulting team set out a high-level 2022+ roadmap consisting of a series of decisions, objectives and measurable key results.

Following this plan will allow the Town to pursue those initiatives that will have the most impact on GIS maturity, and we believe it will have a significant impact on the Town's ability to optimize its use of GIS and GIS resources.

1.5   Participation

The following people participated in the Discovery phase of the GIS maturity study.

1. Town of Parry Sound CAO (Clayton Harris).
2. Town of Parry Sound GIS Technical Staff (Jamie McLeod, Forrest Pengra).
3. West Parry Sound Geography Network GIS Technical Staff (Joe Villeneuve and Chris Mahon).
4. Water and Wastewater Front Line Supervisors (Kyle Hall, Jamie O'Donnell).
5. Public Works and Operations Management (Mike Kearns, Vinni Bonazza, April McNamara).
6. Building and Planning Services Staff (Mark Vandermeer, Taylor Elgie).
7. Finance and Asset Management Leads (Stephanie Phillips, Suzanne Diller).

Thanks to all for their open participation.

The Current State

2.0   Discovery – Current State

2.1   An Overview of the Current GIS Delivery Model

GIS at the Town of Parry Sound is delivered through a combination of WPSGN and Parry Sound-specific technology, data, and solutions.

Although not intended to be a comprehensive commentary on GIS at Parry Sound, through the discovery process the consulting team has determined the following pertinent points about how GIS at the Town operates:

- Parry Sound shares a GIS Technician with the WPSGN. The GIS Technician works at Parry Sound for a portion of the week (Mon-Wed) as the equivalent of a 0.5 FTE, ███████████████████████████████████

- The Manager, Infrastructure and Technology currently spends less than 10% of their time on GIS and has limited to no involvement in the operation of WPSGN.

- WPSGN technology, hosted on infrastructure at and managed by the Township of the Archipelago, hosts solutions and data that provides GIS services to area municipalities, including the Town of Parry Sound.

- Core data – including address, streets, parcels, and aerial photography – is maintained, hosted, and served by WPSGN to Parry Sound systems. Address data is edited by Parry Sound staff, using WPSGN solutions, and the data is stored in the WPSGN database.

- WPSGN acts as a licensing and data clearinghouse, securing reduced pricing through shared purchases on behalf of the partners, from which Parry Sound benefits.

- Parry Sound has established its own GIS technology environment (database, application server) at the Town of Parry Sound.

- All Parry Sound-created data (e.g., storm, sewer, water), except for address data, is hosted in the Parry Sound GIS environment.

- Infrastructure/asset data and solutions for other members are hosted by WPSGN.

- All Parry Sound apps and services combine data hosted and served by WPSGN with data hosted and served by Parry Sound so there is a strong dependency for Parry Sound on WPSGN services.

- Parry Sound GIS users currently rely on GIS solutions provided by both WPSGN and Parry Sound.

With this context set, let's turn attention to GIS maturity.

2.2   Slim GIM: A Model for GIS Best Practices

Organizations that are successful with GIS demonstrate common behaviours and approaches that can be replicated by those seeking similar outcomes. These successful patterns have been developed into best practice models that can inform strategic planning by identifying areas for improvement.

The Slim GIM Enterprise GIS "model best practice" is broadly adopted by organizations at various levels to benchmark their GIS programs. Slim GIM is actively used to drive strategic improvement initiatives in several organizations including:

- The City of Hamilton.

- Region of Peel.

- Agriculture Canada, and

- Ireland Department of Housing, Planning and Local Government.

Variants of the model have been developed for the U.S. Federal and state departments of transportation, for higher education (U.S. universities and colleges), for enterprise data and analytics (in the oil and gas industry) and have recently been translated into Arabic for use by Palestinian local authorities.

Slim GIM is a capability maturity index that represents a best-of-breed approach to GIS. Research of the most relevant factors of success in enterprise systems and GIS were used to develop an effective and practical enterprise model. A Slim GIM assessment reviews 51 key factors distributed across six categories of enterprise GIS success.

These categories are:

1. Organizational Structure and Leadership.

2. Corporate Culture.

3. Process Orientation.

4. Organizational Capacity and Capability.

5. Enterprise GIS Sustainability.

6. Foundational Data and Technologies.

These categories are organized top-down to incorporate soft factors (which evaluate the presence and impact of people in the organization) and hard factors (which are tangible and can be formalized and implemented).

Four main reasons for using a capability maturity model as the basis for a roadmap assessment include:

1. To create a shared understanding by providing a model that helps everyone see and talk about the same picture.

2. To help users keep the big picture in mind while focusing specifically on improvement.

3. To provide guidance and assist with identifying the next major developmental steps that take the organization forward.

4. To facilitate comparisons by benchmarking against other, similar organizations.

The model and maturity roadmap provide the framework for regularly measuring and gauging the performance of the organization's improvement effort and the impact of the roadmap itself.

An example of how other organizations use the Slim GIM model and methods to improve their location intelligence program can be viewed on the Salt Lake Municipal Services District GIS Roadmap site (https://tech-gslmsd.hub.arcgis.com/).

2.3   How Was Maturity/Capability Assessed?

The assessment was undertaken by working through a set of questions with the organization's GIS Lead in 2014 and again in 2021. For each of the 51 GIS success factors, a maturity level was assigned using the following five levels of maturity/capability:

- Level 1 – Ad Hoc / Individual or None.
- Level 2 – Planned Early Stage/Departmental.
- Level 3 – Partially Implemented, Corporately but not Consistently.
- Level 4 – Implemented Corporately and Consistently.
- Level 5 – Optimized Corporately.

Next, for each factor, a likelihood value is assigned representing how likely the organization is able to improve the enterprise success factor score by the end of 2022. This value represents a change potential and helps focus efforts on what factors are more likely to improve.

The rating system is:

- 5 – Extremely likely.
- 4 – Likely.
- 3 – Neutral.
- 2 – Unlikely.
- 1 – Extremely Unlikely.

After Maturity and Likelihood were scored, discussions focused on identifying those factors that could be considered drivers, strengths, weaknesses, opportunities and threats. Analysis of these results in hand – with observations from Discovery sessions – were then used to inform the development of the 2022 Town of Parry Sound GIS Maturity Roadmap.

2.4   Maturity Assessment Results Summary

The current level of maturity at the Town is 2.3 which is between "Level 2 – Planned Early Stage" and "Level 3 – Corporate/Partially Implemented". The enterprise level best practice (target) is shown to be at 4.0 maturity for both "GIS Maturity" and "Likelihood to Improve".

The current level of "GIS Maturity" is indicated at 2.3 and was 1.9 in 2014.

The current level of "Likelihood to Improve" is noted at 3.3 (it was not measured in 2014) and so the change effort looks promising.

Figure 1: Current Levels of the Town's GIS Maturity and Likelihood to Improve

Overall, maturity has improved slightly (0.4) since 2014.

The following figure illustrates the current level of maturity for the six categories of GIS success.
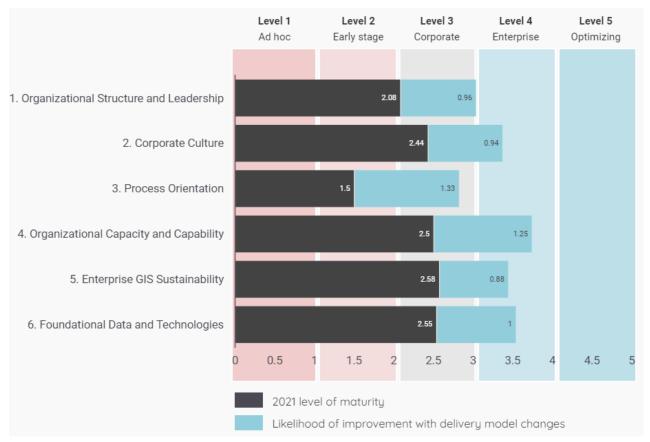

Figure 2: Current Level of Maturity for the Six Categories of GIS Success

A copy of the detailed breakdown of the 2021 Parry Sound Capability Maturity Assessment is available in Appendix A – 2014 and 2021 Maturity Assessment Results.

2.4.1   Maturity Improvements

Since the 2014 assessment, the Town of Parry Sound has managed to make improvements in 20 key enterprise GIS maturity factors.

The following table highlights factors that matured since the original baseline.

#	Factor	Maturity from Baseline
1.1	GIS Manager or coordinator role exists.	+1.00
1.2	GIS data promoted as authoritative.	**+1.50**
1.6	Benefits of GIS are tracked and measured.	+0.50
1.8	Corporate commitment to spatial competency and capacity.	+0.50
2.1	Business units have active Enterprise GIS (EGIS) participation.	+1.00
2.2	Environment of the organization fosters innovation.	**+2.00**
2.3	Staff accept EGIS as a reliable data source.	+0.50
3.2	EGIS process and goals shared across silos.	+1.00
3.5	Process documentation standardized and central.	+0.50
3.6	Data maintenance embedded in business workflow.	**+1.50**
4.2	GIS data interoperability exists.	**+2.00**
4.3	Corporate-wide spatial competency.	+0.50
5.1	Long-term corporate budget commitment.	+1.00
5.5	Mechanism to maintain business unit participation.	**+1.50**
5.8	Spatial data is core and mission-critical.	**+1.75**
6.2	Production and published database of reliable data.	+1.00
6.3	System architecture current.	+0.50
6.5	Data common and available for integration.	**+3.00**
6.6	Redundancy of information management reduced.	+0.50
6.7	All foundation datasets modelled and centralized.	+1.00

2.4.2   GIS Maturity Declines Since 2014

Unfortunately, these improvements were tempered by nine factors, detailed in the table below, that saw an overall decline in maturity since the original assessment in 2014.

#	Factor	Declination Since 2014
1.3	Formal GIS governance established.	**-1.50**
1.5	Have GIS vision, comprehensive use and innovation.	-0.50
1.7	Senior management learning benefits and use of GIS.	-0.50
1.10	Adaptable hierarchy aligns with the change.	**-2.00**
1.12	Broad strategic use of GIS by senior management.	-0.50
4.1	EGIS led by appropriate and sufficient staff.	**-1.50**
4.4	GIS "operators" no longer carto/map-focused.	-1.00
5.3	End users well-supported.	-0.50
6.1	Business unit data owners and stewards controlled.	-1.00

2.4.3   Enterprise GIS Maturity Opportunities

Factors where the assessment indicates there is room for improvement and where the likelihood of improvement were high, were identified as follows:

Organizational Structure and Leadership

1.4 Resource allocation support GIS.

1.6 Benefits of GIS are tracked and measured.

Corporate Culture

2.1 Business units have active Enterprise GIS participation.

2.3 Staff accept Enterprise GIS as a reliable data source.

2.4 Open cross-unit cooperation and information-sharing.

2.8 Employees at all levels encouraged to use GIS.

Process Orientation

3.2 Enterprise GIS process and goals shared across silos.

3.4 Plan to improve and align process to strategic plan.

3.5 Process documentation standardized and central.

Organizational Capacity and Capability

4.2 GIS data interoperability exists.

4.3 Corporate-wide spatial competency.

4.4 GIS "operators" no longer carto/map-focused.

Enterprise GIS Sustainability

5.5 Mechanism to maintain business unit participation.

5.6 External support utilized (to fill gaps and accelerate).

5.8 Spatial data is core and mission-critical.

Foundational Data and Technology

6.1 Business unit data owners and stewards controlled.

6.2 Production and published database of reliable data.

6.4 Formal QA/QC process.

6.10 Technical infrastructure sufficient to meet GIS need.

2.5   What the GIS Maturity Assessment Tells Us

The transformation of the organization with location intelligence is currently being affected by nine weak factors and ten threats.

The identified challenges (common to many organizations tackling digital transformation with location data) are primary factors related to:

1. GIS clarity, vision, governance and alignment.
2. Corporate-wide workforce capabilities.
3. Data management, process and integration.

We'll discuss each of these in more detail below.

2.5.1   #1 – GIS Clarity, Vision, Governance and Alignment

Issues related to the following GIS success factors are affecting the program's success and growth:

Factor 1.3   Formal GIS governance established.

Factor 1.5   Have GIS vision, comprehensive use and innovation.

Factor 1.11   GIS projects align with enterprise vision.

Factor 2.7   GIS-related communication is frequent and guided by plans.

Although having made gains in establishing GIS governance in 2014, the assessment reveals that the organization no longer has a formal governance structure in which senior management is provided with clarity of and can set direction related to GIS projects.

There continues to be confusion regarding the Town and the WPSGN roles and products.

A clear vision for GIS is not stated or understood. As a result, GIS projects are not clearly aligned to corporate priorities.

Ad hoc infrequent communication of GIS priorities, projects, accomplishments, successes, and lessons learned is not effective in keeping employees aware, engaged, and aligned to Enterprise GIS initiatives and improvement efforts.

2.5.2   #2 – Corporate-Wide Workforce Capabilities

Issues related to the following GIS success factors are also affecting the program's success and growth:

Factor 1.1   GIS Manager or Coordinator role exists.

Factor 1.8   Corporate commitment to spatial competency and capacity.

Factor 1.10   Adaptable hierarchy aligns with the change.

Factor 2.6   Core spatial competency improved with training plans.

Factor 3.3   GIS operation aligns with performance management.

Factor 4.1   EGIS led by appropriate and sufficient staff.

Factor 5.2   Balance of tech resources and data admin.

Factor 5.7   Long-term competency and training plans followed.

Although there is a GIS function in the IT Division, the Manager, Infrastructure and Technology role includes duties that have grown to include managing IT and infrastructure projects, as well as the Climate Change portfolio that isn't directly related to sustaining and improving an Enterprise GIS level of service. This is a common challenge of having to do more with less in small organizations – where staff must wear multiple hats.

A decrease in maturity since 2014 reflects the fact that the program has seen changes in responsibilities beyond a core set that would normally focus on moving the organization toward an enterprise-level of GIS capability maturity.

The adoption of platform GIS technologies should facilitate a shift of duties – those that were once the responsibility of specialized GIS staff – to functional experts in the business units through ubiquitous access to web GIS and self-service functions.

However, this shift continues to be a challenge as the organization hasn't implemented technical solutions to security concerns, nor has it built the core geospatial competencies of end users.

Having accessible GIS technology is important but having a workforce that is capable of using it effectively and is learning how to support its growth is critical to advancing GIS maturity. Supporting and sustaining a growing need to improve and provide more GIS services continues to be a challenge.

2.5.3   #3 – Data Management, Process and Integration

Finally, issues related to the following GIS success factors are affecting the program's success and growth:

Factor 1.9   Inter-department cooperation emphasized.

Factor 3.1   Staff are "process-minded" – value and adhere to process.

Factor 3.6   Data maintenance embedded in business workflow.

Factor 5.3   End users well-supported.

Factor 6.8   Direct integration to business systems.

Factor 6.11   Foundational and sec data (where appropriate).

Since the initial assessment in 2014, significant improvements were realized through the organization's efforts in mapping and centralizing their infrastructure data in a central GIS. Work went beyond mapping to ensure foundational data sets are available for integration to other business data and systems. Since the time of the original assessment, process improvements have been effective in reducing the redundancy of data management in some areas.

Currently, the Town is challenged with leveraging this foundational work appropriately, including the streamlining of processes involved in the collection and use of this data, the shifting of data management into business-managed workflows, and in establishing real-time integration of this critical, authoritative spatial data directly into other core business systems (Work Management, Planning and Permitting systems).

Since 2014, the addition of new datasets into GIS and integration has slowed while end users appear to be experiencing a decline in support, education and training. The result is frustration among end users.

2.6   Learnings from Interviews with GIS Users

In addition to the formal Slim GIM maturity assessment, management and staff directly involved in managing GIS services, collecting GIS data, and using GIS data and solutions were asked a series of questions related to their experiences and of the opportunities, challenges and pain points related to their current GIS use.

These discussions resulted in the following insights, which help to contextualize and characterize the state of GIS in the Town:

- Both Parry Sound and WPSGN solutions provide access to different data. Users are unclear about which GIS solutions (WPSGN and Parry Sound) to use, and when to use them. This creates frustration. There is an overarching sentiment that it would be beneficial to have "one spot to go to".

- Performance problems (believed to be related to WPSGN technology challenges) and interaction inconsistencies between solutions have been recently impacting the usability of GIS solutions; the performance of GIS solutions on mobile devices is particularly slow.

- Public Works – water, wastewater, stormwater, and roads, as well as building services, are heavily reliant on GIS today to access information about lot lines, ownership, underground infrastructure and other asset data. Parks and recreation are not yet using GIS in any meaningful way.

- Asset data (and Asset Management at large) is a priority for the organization and significant work has been recently undertaken by Finance and GIS staff on restructuring the General Ledger (GL) and asset coding scheme to align GIS and asset tracking systems. This is a smart move and an area/opportunity in which to continue to build.

- Staff who we talked to are aware of GIS and know about capabilities but want more out of GIS but often have little time to figure out how GIS could help them – they need more help if they are to take advantage of GIS more effectively.

- Interviewees frequently indicated, *"I don't know what I don't know"*, suggesting that more training, education and showcasing of GIS solutions would be worthwhile.

- There is some hesitation around data quality and willingness to rely on the GIS data with staff often falling back to paper copies to verify data accuracy. This creates unnecessary work and is an indicator of a need to work on data quality – accuracy and timeliness.

- There are some gaps in GIS solutions that are available at the Town, which is put down to a lack of time in the GIS Team. For instance, there is no mailing labels app which is strange, as this is typically one of the first GIS solutions organizations put in place. This means that preparing a planning consultation (which is a 15-minute task in organizations with a good mailing label app) takes *"hours and hours"*.

- The GIS Team is learning that each GIS app created by GIS staff creates a new burden for support and thus, the continued addition of GIS apps may be unsustainable in the long term.

- The Town's GIS Technician is actively involved in a data maintenance activity (e.g., zoning updates), which would be more suitable to distribute to staff in departments. In some cases, staff in business units want to use the GIS to input and update data that they are responsible for directly, however, technical limitations (security access concerns to the Town's GIS environment) prevent direct editing.

- In some departments, staff are understandably too busy to take on data maintenance work. Across the organization we note that staff turnover and interchange is significant between municipalities in the area. This has clearly impacted progress on some GIS initiatives and the handover of data maintenance activities to departmental staff – which should be a priority.

- A lack of documented processes and workflow documentation often causes disruption when key people leave the organization and undermines continuity in projects in which they're involved.

- Demand for GIS has definitely grown and is overwhelming GIS staff; the GIS Team needs help to determine which priorities to focus on.

2.7   Identified GIS "Needs"

As part of discussions with key users of GIS, many potential GIS capabilities, new datasets, and GIS solutions were identified as future needs.

The following table presents these potential initiatives. The list is presented here to illustrate the GIS opportunities that exist – and potential work ahead to realize these opportunities.

At this point, the list is presented as-is, unfiltered and unprioritized.

ID	Issue / Item	GIS Requirement	New / Enhance
1	Pipe segment managed differently between systems (GIS, Citywide).	Data	Enhance
2	Some asset ID issues to resolve (i.e., Hydrant ID).	Data	Enhance
3	"Street scan" approach in AMP/asset ID misalignment.	Data	Enhance
4	CCTV contractors are not recording against asset ID.	Data	Enhance
5	Location accuracy, completeness of water services and cleanouts.	Data	Enhance
6	Storm system gaps in data and accuracy.	Data	Enhance
7	Add flow direction to gravity systems (wastewater, storm, etc.).	Data	Enhance
8	Sidewalk, inspections, and defect locations.	Data	Enhance
9	Out-of-service hydrants (availability to Fire services, etc.).	Data	New
10	Add restoration data and links to related information.	Data	New
11	Water pressure zones layer.	Data	New
12	Chlorine residual layer.	Data	New
13	Add Parks and Recreation data including playground equipment.	Data	New
14	Town-owned tree inventory and data management.	Data	New
15	Projects layer (capital projects, development, subdivision, etc.).	Data	New
16	Facility mapping related asset records (for asset management).	Data	New
17	Digitize the Official Plan in GIS.	Data	New
18	Culvert inventory, key attributes, and condition assessment.	Data	New

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ID	Issue / Item	GIS Requirement	New / Enhance
19	Location of Town-owned lights and associated power feed.	Data	New
20	Traffic and street signs inventory.	Data	New
21	Easements.	Data	New
22	Pull sewer/water capacity data from reports for use in GIS.	Data	New
23	Town-owned trees, attributes, and locations.	Data	New
24	Water services/laterals.	Data	New
25	Inflow/infiltration problem areas.	Data	New
26	Septic systems.	Data	New
27	Building footprints.	Data	New
28	Propane operators.	Data	New
29	Planning applications and variances.	Data	New
30	Topographic / elevation data	Data	New
31	Catchment areas.	Data	New
32	Make linkages to Town file drives (unstructured content) to reduce reliance on manual work.	Data/systems	Enhance
33	CCTV videos network storage limitations (using Dropbox).	Data/systems	Enhance
34	Link CCTV data/files to pipes in GIS.	Data/systems	New
35	Create a generic activity layer for work requests, repairs, etc. and link to address.	Data/systems	New
36	Planning records (files/documents/drawings) linkages from GIS viewers for ease of access.	Data/systems	New
37	Synchronize Cloud data (ArcGIS Online/Collector/Survey 123) with on-premise database (address security concerns).	Systems	Enhance
38	Address map viewer performance issues (render, pan, zoom).	Systems	Enhance
39	Optimize min/max visibility, etc. to improve viewer performance.	Systems	Enhance

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ID	Issue / Item	GIS Requirement	New / Enhance
40	Utility Locates solution.	Systems	New
41	Mobile-specific viewer optimized for field staff.	Systems	New
42	Real-time activity dashboard (valve turning, flushing, etc.).	Systems	New
43	Viewer for W/WW incorporating proposed layers/existing layers.	Systems	New
44	Playground inspections solution.	Systems	New
45	Build operational views of current/past work performed.	Systems	New
46	Work Management/work tracking/multiple asset databases.	Systems (architecture, integration and systems consolidation)	New
47	Make building permits visible to GIS.	Systems (Cloudpermit/GIS integration)	Enhance
48	Incorporate Trimble Vitals valve data with GIS.	Systems (Trimble Valve, ArcGIS Enterprise)	Enhance
49	Digital redline solution/process to track asset and map changes in field and office.	Systems and Process	New

Clearly, there are many opportunities ahead to use GIS to simplify and streamline work at the Town for various teams. And we can take this as evidence that demand for GIS solutions and data continues to grow significantly. It appears that with the limited resources that the Town currently directs to GIS, demand is currently outstripping supply.

And this list likely only represents the tip of the iceberg. The most common phrase we heard in our conversations was *"we don't know what we don't know"* – as more people in the Town are exposed to the capabilities of GIS, the more they will come up with new ideas around how to apply it to their work.

So, this list represents the currently known areas that the Town's GIS resources *could* be directed to. Understandably, the list is somewhat overwhelming for GIS staff, given the limited resources available. Selecting which ones to focus on requires leadership/management discussion around corporate priorities and points to the need for a governance framework to help direct GIS effort toward the highest priorities of the Town.

2.8 Current Risks

A couple of important risks are worth flagging at this point. These point to important questions about the future sustainability of GIS services at Parry Sound.

2.8.1   Dependency on WPSGN Technology

Because of the dependency of Parry Sound GIS on the WPSGN technology, any interruptions occurring to WPSGN services means an interruption to the Parry Sound GIS.

Put simply, if WPSGN GIS services are down, then Parry Sound GIS services are down too.

Reliability has, we understand, been an issue with WPSGN over the past 12 months for a variety of reasons (e.g., ageing equipment, lack of available storage capacity, limited IT support available at Archipelago). Should the Town continue to rely on WPSGN GIS services, there is a risk of continued unsatisfactory GIS solution performance without some action.

If Parry Sound is to continue with the current shared approach – or if it decides to become more dependent on WPSGN technology and solutions – then it should only do so if assurances and commitments can be made by WPSGN that the services will be highly reliable and robust which should be backed up by agreed-upon service levels/targets.

2.8.2   GIS Staff Capacity

The current equivalent of 0.6 FTE (50% GIS Technician, 10% IT and Infrastructure Manager) is dedicated to GIS at Parry Sound. This is less than the Town allocated with the original hire of a GIS Lead which, over time, has become the Manager of Infrastructure and Technology role.

This appears to be insufficient to make significant headway in maturing the use of GIS (evidenced by the limited maturity improvement since 2014) and it will be challenging with this resource level to move forward against the many opportunities that have been identified.

Clearly, opportunities and thus demand for GIS solutions and services is high, but the current resource levels appear to see the Town treading water, rather than actively making progress which makes for a frustrating situation for the team and those needing GIS services.

We think these issues make the current GIS situation somewhat precarious and unsustainable going forward.

2.9   Key Foundational Issues – Five Areas to Focus On

With all the inputs – and alongside the maturity factors discussed above – we see five major foundational issues that must be addressed and resolved if the Town is to make meaningful progress in the GIS domain and improve its maturity.

These are areas where there is currently a lack of clarity or where uncertainty around the future clouds the Town's ability to move forward. Of course, several of these issues are deeply intertwined with the West Parry Sound Geography Network situation.

If the Town can tackle and address these areas, then they would be able to move forward with greater certainty, focus on the right things and make good progress.

2.9.1   #1 – GIS Governance

There is no formal internal GIS governance within the Town, and no regular reporting to SLT on GIS work plans or progress against targets. Thus, SLT is more disconnected from the work and progress than it should be. Priorities are hard to set. Demand is difficult to manage. Progress is not monitored as closely as it should be.

A more effective and ongoing process – for the Town's GIS leader to work with SLT on setting GIS priorities and monitoring progress against the workplan – would be beneficial.

2.9.2   #2 – GIS Technology Delivery Model

There are clearly questions around the need for Parry Sound to maintain its own GIS infrastructure alongside that of WPSGN – do both organizations need to maintain GIS technology?

The dual GIS setup appears to be creating confusion for users – along with management and administrative overheads – with limited upsides. However, this question is further complicated by recent performance issues that have impacted the reliability of WPSGN services.

Furthermore, because the Town's GIS is not exposed to the internet ███████████████ ███ this means that all field-based data collection work is done in ArcGIS Online with a disconnected copy of the data. Changes made to data in the field must be reconciled into the Town's data environment by a GIS Specialist – creating overhead and delays.

This is perceived as staff are restricted from making direct edits to GIS datasets which is limiting the ability to distribute data editing responsibilities. Addressing this issue with a suitable security solution that enables distributed editing will be key to democratizing the collection and management of GIS data.

So, a decision is needed – does the Town:

   a. Share technology with WPSGN with a sustainable support model and necessary assurances and controls to ensure that WPSGN services meet the Town's needs? or

   b. Does the Town continue to build out its own GIS solutions infrastructure with less dependence on WPSGN?

2.9.3   #3 – GIS Resourcing

Given the observations around GIS resourcing levels, and the evidence of limited improvements to GIS maturity, the Town's leadership has a decision to make: Does it wish to devote more resources to GIS, or continue as is? Can it justify increased investment in GIS resources?

If yes, what is the best approach to achieving this – either by reallocating existing workloads (e.g., increasing available time for the IT and Infrastructure Manager to devote to GIS) to free up existing GIS/IT staff, increasing the current GIS Analyst allocation from 0.5 FTE to 1.0 FTE, or by creating a new 0.5 or 1.0 FTE GIS position to augment existing resources (either a full time or student position, and either shared or not with WPSGN)?

All options come with attendant tradeoffs and compromises and a need to shift/reallocate responsibilities.

2.9.4   #4 – Asset and Work Order Management Processes GIS and Data Integration

Town staff expressed the need for a consistent method to record work against assets, to retrieve work history about assets, to capture photos, to access and attach new drawings, to record and access historical inspections.

There are various ways to approach this – GIS can do it, various Work Management systems can do it – but the important decision is around defining *which* system does what – which system will be used to fulfill what function.

While significant work (in the field and in the office) has been underway on building up-to-date asset inventories and structuring them appropriately, at this time, the future of Asset and Work Management systems, the interdependence between and integration with GIS of those Work Management systems, and the data flows between systems is not yet defined, as is the future for standalone solutions like HIPPO.

Work is planned in the near term to address this and a funding application is with the province for Round 3 of the MMP.

We suggest that this is not just about selecting a work management solution but about designing the data model, processes, workflows, and integration between Work Management, GIS, Finance, and File Management systems.

Jointly (Finance, PW, IT/GIS) should work on figuring out the strategy and architecture of the future GIS/Work Management/Asset Management solution (and associated people and process impacts) because this will be critical in aligning efforts, ensuring that GIS solutions fill gaps and not overlap with future solutions, and to ensure that data is not duplicated and efforts to maintain data not wasted.

2.9.5   #5 – Property-Centric (Planning and Permitting Systems) Processes and GIS and Data Integration

A significant portion of the Town's data relates to properties and parcels. Being able to find out a property history (development and ownership history, planning applications, permits, complaints, property notes) is an extremely valuable tool for any municipality.

Similar to the discussion above, the interdependence between and integration with GIS solutions like CloudPermit has not yet been defined.

Establishing a common way of linking documents, studies, reports, drawings and cases to a property/location so that staff (and the public) can see all the Town knows about a location is a powerful GIS capability that would be valuable for the Town.

Therefore, defining and implementing a consistent and common framework for linking structured and unstructured content and associated processes to the GIS will be an important next step in expanding the use and usefulness of the GIS from one-off solutions to an integrated, enterprise solution.

If the Town can tackle these questions and determine its strategy in these five foundational areas, we believe the Town of Parry Sound would be well-positioned to expand the usefulness and value of GIS to the organization and increase its overall GIS maturity.

West Parry Sound Geography Network

While this project was not scoped to look at the WPSGN, from the discussion above it should be clear that the Town of Parry Sound's GIS situation is deeply intertwined with the WPSGN. We would be remiss if we were not to comment on the situation.

First, before commenting on anything else, it is important to note that we think that WPSGN is quite brilliant. Brilliant in concept, and a beacon of real collaboration across the municipal and broader public sector for the greater good, which is clearly demonstrating value for the community.

Nonetheless, nothing is so brilliant that improvements cannot be made – and the team involved in running WPSGN appears to be acutely aware of the opportunities – but suffers from having little time to action them.

The consulting team suggests that four areas for improvement be considered:

1. WPSGN Governance

Currently, governance and decision-making around the WPSGN are informal. There is no collaboration or governance forum, no roadmap or agreed priorities.

A more structured governance model (CAOs or delegates and GIS leads in each participating organization) with a shared approach to planning and decision-making – involving representatives from each partner in regular meetings – is worth considering.

Revisiting WPSGN agreements, funding models, and service levels would also be worth considering as a step toward strengthening the partnership.

A bi-annual update to CAOs of the partner municipalities could also be worthwhile.

2. WPSGN Capacity

Those who have championed and been actively involved in launching and running the GN have taken on additional responsibilities and now can devote less time to running and operating the service.

WPSGN may wish to review the available capacity to lead and drive the program to determine the appropriate model.

3. WPSGN Technology/Hosting

The GIS technology (software, servers, database) that runs the WPSGN solutions and services is currently hosted by the Township of the Archipelago.

As noted above, we understand that for various reasons – ageing hardware, limited storage capacity, no dedicated IT support – the performance of the WPSGN GIS solutions has been impacted and in some cases, some data (historical air photos) have been removed from the service.

This may be a good opportunity for WPSGN to work with the governance body (proposed in WPSGN Governance above) to conduct a review of the hosting options (considering whether to continue hosting at Archipelago, moving to another municipal host, moving to a managed service or perhaps moving to the Cloud) and determine the most suitable path forward.

4. Focus on Shared Solutions

Each of the municipalities in the WPSGN has common needs, e.g., field data collection and verification tools, mailing labels, self-service mapping, inspection solutions, playground inspections, sidewalk inspections, etc.

Building a pipeline that can deliver simple, shared solutions that can be used by all members of WPSGN could be an area where WPSGN could add more value to its partners. Pursuing a common data model (the Canadian Local Government Data Model) and a solutions philosophy that re-uses out-of-the-box Esri solutions templates with limited customization (where possible) would be valuable in speeding solution provisioning and adoption.

In the consulting team's view, there is strong value in WPSGN and that no recommendations that we make related to improving GIS maturity at Parry Sound should negatively impact WPSGN.

The Future State

3.0 The Future State

3.1 Drivers for Change

Considering the issues and challenges identified, the key drivers for change are.

1. A need to create alignment and focus of the Town's GIS program through formal GIS governance, engaging SLT in decision-making around GIS to set priorities and monitor progress at Parry Sound.

2. A need to evaluate and improve the Town's and WPSGN's operating model and determine the best approach to increasing resource allocation to GIS.

3. A need to set a GIS technology strategy and execute a chosen plan, ensuring that GIS services will be robust and reliable, simple for users to navigate and use, and to enable distributed editing.

4. A need to set key business systems and data strategy around asset and work management, property-centric systems and how they integrate with the GIS.

5. A need to distribute data management activities into business units and a need to improve data collection, accuracy, workflow methods and practices.

6. A need to focus on developing new and enhancing existing datasets.

7. Taking the opportunity to increase GIS adoption and understanding through promoting awareness, engagement, and workforce development opportunities.

3.2 Driving Change by Addressing Foundational Issues

Based on these drivers, the following suggestions/recommendations are made by the consulting team on addressing the specific foundational issues identified.

3.2.1 GIS Governance

Formalize a Town of Parry Sound GIS Steering Committee

We recommend that SLT operate as the formalized GIS Governance Board, receiving bi-monthly or quarterly updates from the GIS Lead at the Town and providing input to work planning and priority setting.

How might this work in practice?

The Manager of Infrastructure and Technology would establish 4 - 6 meetings per year with SLT, separate and apart from regular SLT meetings. SLT's role would be to provide oversight of the GIS program – helping determine priorities and focus areas for the program (based on recommendations from GIS leads) and monitoring delivery of projects and initiatives and ensuring that the program is meeting the needs of the organization. The Manager of Infrastructure and Technology continues to be responsible for management of the GIS service – but with continuous oversight to ensure that resources and effort are directed to the right priorities. At the meetings, the Manager of Infrastructure and Technology would bring forward proposals, recommendations, and reports to provide insight into the progress and operation of the GIS program and to consistently adjust and align the GIS program to meet

the organization's needs and priorities. Annually, a proposed work plan for the forthcoming year would be brought forward, refined, and agreed. Progress updates against the workplan would be reported at each of the meetings. Note that the same arrangement could also be used for IT oversight in a similar manner.

Formalize Town of Parry Sound GIS Working Group/Community of Practice

We suggest that an open invite be extended to all GIS stakeholders and users at the Town to meet regularly (perhaps monthly or every six weeks), and to be connected through digital channels to chat, ask questions, share updates and announcements, etc.

Essentially creating a shared community that can be used to share and promote new GIS abilities and capabilities, to showcase new and clever uses of GIS, identify opportunities for improvement, to learn from each other, to work collaboratively on projects and initiatives, and to act as a communication and sounding board around GIS ideas and issues.

3.2.2   GIS Technology

Evaluate Parry Sound GIS Technology Approach

There are various options around how the Town of Parry Sound's GIS technology solutions needs could be met in future – each with its own pros and cons – as well as requirements that would need to be in place to be successful.

Options could include:

1. Do nothing – proceed as is, with shared WPSGN and Parry Sound GIS technology.
2. Proceed as is and separate from WPSGN.
3. Consolidate Parry Sound technology into WPSGN with continued hosting at Archipelago.
4. Consolidate Parry Sound technology and WPSGN into hosting at Parry Sound.
5. Move WPSGN and Parry Sound technology to a shared hosted/Cloud-based environment.

We suggest that the Town consider that a single GIS solutions environment would be a better fit than the current dual solution (WPSGN and Parry Sound). However, pursuing this option would be dependent upon robust, reliable and secure services that are fit for purpose from WPSGN and that meet the needs of the Town.

Working with the Town's GIS Steering Committee, and with WPSGN governance, the Town's GIS Lead could facilitate an evaluation of options.

Establish Future for WPSGN GIS Technology Hosting

Because of the dependency on WPSGN and in the context of the Town's evaluation above, it would make sense for the Town to work with WPSGN to determine a common/shared path forward that meets the needs of WPSGN *and* the Town.

Thus, through WPSGN (and the revamped governance model proposed earlier), there should also be an evaluation of how the WPSGN technology should be operated/hosted.

Determine and Execute Migration Plan

Depending on the outcome of both reviews noted above, we assume there will be some change necessary to achieve the chosen path forward.

Parry Sound SLT (acting as the GIS Steering Committee) – working in coordination with the Town of Archipelago and the WPSGN – should decide on the future path for the Town's GIS environment, based on recommendations from the Manager, Infrastructure and Technology.

Once determined, there will be implementation work required to achieve a consolidation of the technology environment and, with that, there should be clarity around future roles and responsibilities, capabilities and needs.

3.2.3   GIS Resourcing

There are various strategies and tactics for managing GIS capacity in the Town.

The challenge of "too much to do" is an issue of supply and demand. If we can better balance supply and demand, then the feeling of overwhelm of "too much to do" can be tackled. There are two levers: supply (additional resources to meet demand) and demand (reduce/control demand to the level of available supply).

On the **demand** side, the Town can:

Focus on Fewer Agreed Priorities

By working with SLT to agree on priorities, we can focus GIS resources on fewer initiatives at a time. This way, the Town can better balance supply and demand, GIS staff can focus on the highest value activities, and we can approach an equilibrium.

On the other hand, the Town could increase available **supply** by:

Contracting for Data

There are various organizations and service providers that can digitize data for the Town. So, where there are gaps in data (e.g., catchment areas or pressure zones), the Town can always contract with a service provider to digitize the data on their behalf.

This comes at a cost – but can be a way to accelerate digitization of datasets that staff won't have time to get to otherwise. Note that some organizations we have worked with – anticipating budget under-spends at the end of the year – often have some data projects ready to roll if budget becomes available.

Reviewing Manager Infrastructure and Technology Role Scope

We recognize that the Manager Infrastructure and Technology role as it stands encompasses a broader portfolio than just GIS and IT – there are other responsibilities related to Climate Change and Infrastructure projects.

We believe that the GIS and technology portfolio demands full time attention which the role is currently not able to provide due to other duties that are assigned.

We suggest that the Town consider whether it wants to focus the current Manager role purely onto technology and GIS, and if so, determine whether Climate Change and Infrastructure project responsibilities could be reallocated elsewhere. If on the other hand, the Town

continues with the status quo – recalibrating expectations around a lower level of output (demand delivery) would be appropriate.

If the Town choses to focus the role on GIS and IT, the Town may also wish to consider whether the position is more suitably positioned as a corporate resource, rather than part of one department.

Considering Adding Additional GIS Capacity

In addition to the other options, if the Town does decide to allocate more resources toward GIS, we suggest that the Town consider the following options for expanding GIS capacity:

- Add a GIS student/intern program to augment current GIS capacity.

- Expand the current 0.5 FTE allocation of the existing shared GIS Technician.

- Add a new 0.5 or 1 FTE GIS Technician/GIS Analyst role (either at Parry Sound or at WPSGN).

Some combination of one, some or all of these approaches could be pursued to create a more sustainable and balanced approach.

3.2.4 Asset and Work Management Systems (Including GIS Integration)

Set Strategy

Establish a joint Working Group, with leads and staff from Public Works, IT/GIS, Finance/Asset Management to work together to evaluate options and set out strategy for an integrated solutions set for work and asset management. This should clearly define:

- How GIS/work/asset management/document and drawing solutions will interact.

- The data workflows between systems and who will be responsible for data edits and updates at the asset and attribute level.

- Future strategies and/or decommissioning plans for existing solutions, such as HIPPO (including considering any necessary data migration).

- What GIS solutions should be used for and what asset and work management solutions should be used for (e.g., what tool should be used to add new asset data, record inspections done by staff or by contractors, field data edits or redline changes).

Execute Strategy

A cross-functional project team needs to be established to implement the chosen set of work and asset management solutions and data integrations in a coordinated manner. Dedicated staff time needs to be carved out to allow staff to work on a key project such as this.

3.2.5 Property-Centric (Planning and Permitting Systems) Processes and GIS and Data Integration

Set Strategy

Establish a joint Working Group, with leads and staff from IT/GIS, Public Works, Development, Fire, etc. to work together to determine the solutions needs for planning, permitting and integrated GIS solutions.

This should clearly define:

- How GIS/permits/planning/document management solutions will interact.
- How to effectively link drawings and unstructured content to property/parcel records.
- The data workflows between systems and who will be responsible for data edits and updates.

Execute Strategy

A cross-functional project team needs to be established to implement the chosen set of work and asset management solutions and data integrations in a coordinated manner. Dedicated staff time needs to be carved out to allow staff to work on a key project such as this.

3.3 Driving Change Through Enterprise GIS Maturity Improvement Initiatives

With foundational decisions and changes being made to the way the Town of Parry Sound manages and governs GIS, then maturity capability improvement initiatives can be considered.

3.3.1 Maturity Through Awareness and Engagement

Through 2022, it is suggested that efforts need to be undertaken that:

- Work through GIS governance and the GIS Working Group to develop a clear and shared vision for GIS at Parry Sound.
- Secure commitment to an agreed roadmap of GIS activities.
- Communicate and promote the agreed vision and roadmap for GIS.
- Increase communication with and foster the participation of stakeholders in GIS priority-setting and governance activities.
- Provide and promote GIS learning opportunities for staff, as well as provide ongoing tips and tricks to users.
- Showcase good examples of GIS use and how GIS has delivered value.

3.4 Maturity Through Collaboration

Through 2022, maturity efforts need to be undertaken that:

- Establish and maintain GIS governance.
- Establish a GIS Working Group/Community of Practice with regular activities and reporting.
- Work collaboratively with WPSGN to determine future operating/technology model.
- Collaboratively set direction for asset and work order management improvements.
- Identify short-term requirements for land, property and permitting management.
- Prioritize existing and new datasets, data collection and associated solutions.

3.4.1　Maturity Through Workforce Development

Through 2022, maturity efforts need to be undertaken that:

- Set and execute an agreed Town GIS resourcing/staffing strategy.

- Develop a high-level learning plan for users and resources for new employees.

- Distribute data editing responsibilities into business units.

- Provide self-service GIS tools that enable staff in business units to carry out GIS functions.

- Improve the organization's overall understanding and proficiency in GIS use and tools.

- Include stakeholders in activities that help users learn to provide feedback for improvement.

3.4.2　Maturity Through Data Management

Through 2022, maturity efforts need to be undertaken that:

- Lay out an agreed 2022 work plan for data projects.

- Execute new data projects.

- Execute data enhancement projects.

- Execute data integration/data workflow projects to support Asset and Work Management systems implementation.

- Identify a solution strategy that empowers business unit staff to directly collect and edit data in the field.

- Establish GIS data quality control procedures for field collected/corrected data, including business unit data owners.

3.4.3　Maturity Through Optimization

Through 2022, maturity efforts need to be undertaken that:

- Determine a GIS technology solution strategy.

- Plan and upgrade infrastructure to keep pace with software and technology changes.

- Start development of a metadata policy for discoverable hosted map and data services.

The Work Plan

4.0 The Workplan

The following identifies the recommended actions from the GIS review.

ID	Description	Est. Cost	Outcomes / Benefits
1	Setup and operate GIS governance	0	The Town has functional and strategic oversight for the GIS program and focus on work that directly supports corporate priorities.
2	Develop shared GIS vision	0	The Town has a clearly agreed vision for the role of GIS and goals for GIS development – that everyone in the organization can get behind.
3	Confirm 2022 GIS Roadmap	0	The Town has an SLT agreed set of GIS initiatives and projects that will be completed during 2022.
4	Execute, monitor, and report on GIS roadmap	0	SLT receives reporting and monitoring of progress against agreed 2022 GIS priorities.
5	Confirm 2023 GIS roadmap	0	The Town has an SLT agreed set of GIS initiatives and projects that will be completed during 2023.
6	Setup and operate GIS community of practice	0	The Town sees increased awareness, knowledge and sharing of GIS emerging practices and use and application of GIS across Parry Sound teams increases.
7	Review WPSGN operating and governance model	0	The Town has clarity around WPSGN capabilities, operating model, services and service levels, which will allow Parry Sound to determine its own future path. Forum for identifying opportunities and improvements to the WPSGN service.
8	Adopt resultant WPSGN governance model	0	The Town has improved involvement in the oversight and strategic direction setting for WPSGN.

ID	Description	Est. Cost	Outcomes / Benefits
9	Set WPSGN roadmap	0	The Town has a clear understanding of the agreed (among all WPSGN partners) WPSGN roadmap and agreed future work activities for WPSGN for the near term – and thus can augment / build around that roadmap for Parry Sound specific work.
10	Set WPSGN technology / hosting strategy	TBC (may require assistance)	GIS solutions and services from WPSGN and PS are more reliable, robust, capable, scalable and highly-performant. Parry Sound can make well informed decisions about its own technology environment.
11	Implement GIS shared solutions	TBC (may require professional services)	Agreement between WPSGN parties around the development of GIS solutions that can be built once and shared between parties (e.g. mailing labels app). This should lead to an increase in available GIS solutions.
12	Confirm Parry Sound GIS Technology solutions	0	With WPSGN future technology directions set – Parry Sound can confirm their own technology strategy (decommission, continue to use).
13	Parry Sound GIS technology migration / update / alignment	TBC (may require professional services)	With a decision made on the future GIS technology for Parry Sound, the optimal GIS technology environment can be established that is clearer / easier to understand and use GIS.
14	Enable direct / distributed field-based editing	TBC (may or may not require DMZ and professional services)	Through the implementation of task # 13 or through the implementation of permitter security, field workers will be given the ability to directly edit GIS data in the field / update records in the GIS database remotely.
15	Enhanced GIS viewers	0	The Town will see improvements to GIS viewers to eliminate need to visit multiple GIS solutions (WPSGN vs. PS), to improve mobile performance and to expand access to data.

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ID	Description	Est. Cost	Outcomes / Benefits
16	Browser based data editing	0	The Town will see the ability for users to edit GIS data without complex software and extensive training. Also this will enable moving data editing from GIS specialists to the general staff population.
17	Updated desktops / software	0	Updates will ensure supported systems and access to new features and functions.
18	Review GIS resourcing options and select approach	0	SLT have determined what GIS resourcing strategies to pursue and will have a clear path forward with GIS resourcing.
20	Set budget for future GIS resources (if necessary)	TBD (dependent on options $0 – 75,000)	If required, budget will be secured to support selected GIS resource changes.
19	Implement GIS resource changes (if necessary)	TBD	Implementation of GIS resourcing changes (adds, reallocations) has been executed leading to additional capacity to increase GIS throughput (projects and services).
21	Set integrated Asset / work management / GIS systems strategy	0	The Town has established a clear / shared understanding how the various components / systems will 'fit' together and what it means for each of them.
22	Map and design data lifecycle processes	TBC (may require assistance)	Processes, tools and roles and responsibilities for asset data maintenance at the attribute level will be clearly defined.
23	Procure AM / WMS solution(s)	0	The Town has purchased a robust and integrate-able asset and work management system.
24	Implement AM / WMS solution(s)	TBC (AM budget / funding established)	The Town has an operational work and asset management system that fully integrates GIS / Finance / and asset and work management processes and data.

ID	Description	Est. Cost	Outcomes / Benefits
25	Design property centric GIS model and solution set	0	The Town has designed a data model, alongside processes, procedures and solutions that enable data related to property to be easily attached and accessed (to access a complete property history)
26	Implement / operationalize property centric GIS solutions	TBC	The Town has built out the design from action #25
27	Identify and prioritize data projects	0	A set of priority data projects for 2022 have been defined and prioritized by SLT, and work is underway on dealing with them one-by-one.
28	Execute and report on data projects (asset management as a priority)	0	New GIS datasets have been developed and brought on stream to support the Asset Management program. SLT receives regular reports on new datasets available in the GIS program.
29	Contract for data (sample project)	10 - 20k	The Town has completed at minimum one project which has outsourced the data collection process to a third-party data specialist.
30	Design field-based data collection and edit processes and protocols	0	The Town has implemented processes, solutions and protocols, along with data QA methods to enable field-based data collection and editing.
31	Implement metadata capture model protocols	0	The Town has established metadata model and updated metadata is available for the Town's data catalog – making it easier to search and find the right data.
32	Communicate vision and 2022 roadmap	0	GIS leads have socialized the GIS vision and roadmap so that staff across the Town are aware of what to expect from the GIS program in 2022

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ID	Description	Est. Cost	Outcomes / Benefits
33	GIS showcase program	0	GIS staff have led numerous GIS showcase sessions showing how people are using GIS inside and outside the organization. Awareness of what's possible with GIS is growing in the organization.
34	Develop Annual GIS learning plan	0	GIS leads have developed a GIS learning plan, and SLT have approved the plan.
35	Execute GIS learning plan	0	GIS leads have executed the GIS learning plan – resulting in improved awareness and GIS capacity in teams across the Town.
36	OKR / Plan monitoring	0	GIS leads use the OKR's (identified in Appendix B) and this workplan to monitor and report on GIS program progress to SLT.
37	2023 maturity assessment	15k	GIS leads and SLT have conducted an external validation of the GIS maturity assessment to determine whether progress has been made.
38	Prepare annual GIS progress report	0	GIS leads prepare an annual report to showcase and highlight progress and to share next years priorities.

Again, the inter-connectedness of the Towns and the WPSGN futures imply a necessary sequencing of work. The chart below maps out a proposed timeline and sequencing for the work ahead.

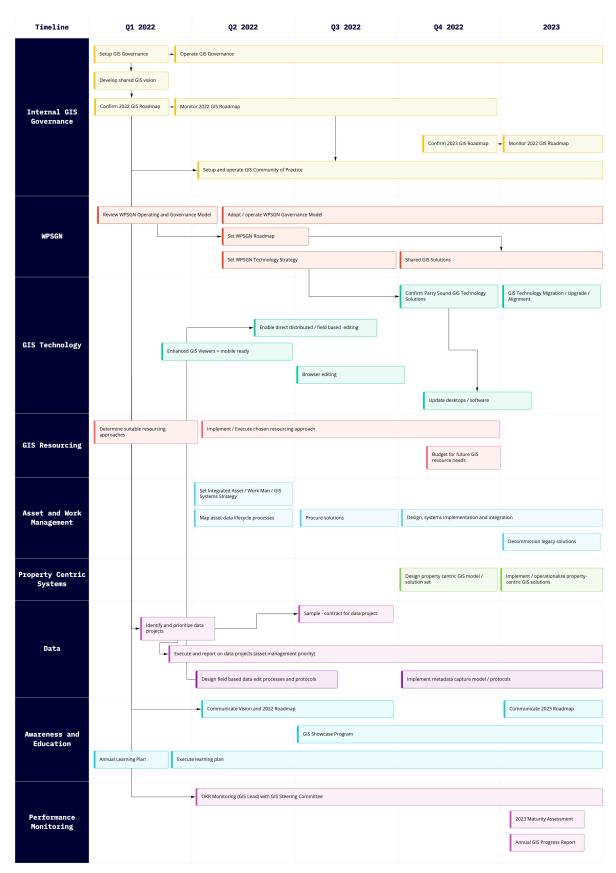| Timeline	Q1 2022	Q2 2022	Q3 2022	Q4 2022	2023
Internal GIS Governance	Setup GIS Governance; Develop shared GIS vision; Confirm 2022 GIS Roadmap	Operate GIS Governance; Monitor 2022 GIS Roadmap; Setup and operate GIS Community of Practice		Confirm 2023 GIS Roadmap	Monitor 2022 GIS Roadmap
WPSGN	Review WPSGN Operating and Governance Model	Adopt / operate WPSGN Governance Model; Set WPSGN Roadmap; Set WPSGN Technology Strategy		Shared GIS Solutions	
GIS Technology		Enhanced GIS Viewers = mobile ready; Enable direct distributed / field based editing	Browser editing	Confirm Parry Sound GIS Technology Solutions; Update desktops / software	GIS Technology Migration / Upgrade / Alignment
GIS Resourcing	Determine suitable resourcing approaches	Implement / Execute chosen resourcing approach		Budget for future GIS resource needs	
Asset and Work Management		Set Integrated Asset / Work Man / GIS Systems Strategy; Map asset data lifecycle processes	Procure solutions	Design, systems Implementation and integration; Decommission legacy solutions	
Property Centric Systems				Design property centric GIS model / solution set	Implement / operationalize property-centric GIS solutions
Data	Identify and prioritize data projects	Sample - contract for data project; Execute and report on data projects (asset management priority); Design field based data edit processes and protocols		Implement metadata capture model / protocols	
Awareness and Education	Annual Learning Plan	Communicate Vision and 2022 Roadmap; GIS Showcase Program; Execute learning plan			Communicate 2023 Roadmap
Performance Monitoring		OKR Monitoring (GIS Lead) with GIS Steering Committee		2023 Maturity Assessment; Annual GIS Progress Report	

Figure 3: Map of the Sequencing of Work Ahead

Appendix A – 2014 and 2021 Maturity Assessment Results

1. Organizational Structure & Leadership

Slimgim success factors	Δ	'14	'21
1.1 GIS manager or coordinator role exists	1	2.0	3.0
1.2 GIS data promoted as authoritative	1.5	3.0	4.5
1.3 Formal GIS governance established	-1.5	3.0	1.5
1.4 Resource allocation support GIS	0	1.0	1.0
1.5 Have GIS vision, comprehensive use & innovation	-0.5	2.5	2.0
1.6 Benefits of GIS are tracked & measured	0.5	1.0	1.5
1.7 Senior management learning benefits & use of GIS	-0.5	3.0	2.5
1.8 Corp commitment to spatial competency & capacity	0.5	1.0	1.5
1.9 Inter-department cooperation emphasized	0	2.0	2.0
1.10 Adaptable hierarchy aligns with change	-2	3.0	1.0
1.11 GIS Projects align with enterprise vision	0	2.0	2.0
1.12 Broad strategic use of GIS by senior management	-0.5	3.0	2.5

2. Corporate Culture

Slimgim success factors	Δ	'14	'21
2.1 Business units have active EGIS participation	1	1.0	2.0
2.2 Environment of the organization fosters innovation	2	1.0	3.0
2.3 Staff accept EGIS as a reliable data source	0.5	3.0	3.5
2.4 Open cross-unit cooperation & information sharing	0	3.0	3.0
2.5 Adaptable hiring practices ensure modern skills	-	-	4.0
2.6 Core spatial competency improved with training plans	0	1.0	1.0
2.7 GIS related communication is frequent & guided by pla...	-	-	1.0
2.8 Employees at all levels encouraged to use GIS	0	2.0	2.0

3. Process Orientation

Slimgim success factors	Δ	'14	'21
3.1 Staff are "process-minded" - value & adhere to process	0	1.0	1.0
3.2 EGIS process & goals shared across silos	1	1.0	2.0
3.3 GIS operation align with performance management	0	1.0	1.0
3.4 Plan to improve & align process to strategic plan	0	1.0	1.0
3.5 Process documentation standardized & central	0.5	1.0	1.5
3.6 Data maintenance embedded in business workflow	1.5	1.0	2.5

4. Organizational Capacity & Capability

Slimgim success factors	Δ	'14	'21
4.1 EGIS led by appropriate and sufficient staff	-1.5	4.0	2.5
4.2 GIS data interoperatibility exists	2	1.0	3.0
4.3 Corporate-wide spatial competency	0.5	2.0	2.5
4.4 GIS 'operators' no longer carto/map focused	-1	3.0	2.0

5. Enterprise GIS Sustainability

Slimgim success factors	Δ	'14	'21
5.1 Long term corporate budget commitment	1	3.0	4.0
5.2 Balance of tech resources & data admin	0	2.0	2.0
5.3 End-users well supported	-0.5	2.0	1.5
5.4 Blending of IT, analysis, visualization & GIS	-	-	3.0
5.5 Mechanism to maintain business unit participation	1.5	1.0	2.5
5.6 External support utilized (to fill gaps & accelerate)	0	2.0	2.0
5.7 Long term competency & training plans followed	0	1.0	1.0
5.8 Spatial data is core & mission-critical	1.8	1.0	2.8
5.9 Ubiquitous access to web self-service maps	0	3.0	3.0
5.10 Data and application backups	-	-	4.0

6. Foundational Data & Technologies

Slimgim success factors	Δ	'14	'21
6.1 Business unit data owners & stewards controlled	-1	3.0	2.0
6.2 Production & published database of reliable data	1	2.0	3.0
6.3 System architecture current	0.5	3.0	3.5
6.4 Formal QA/QC process	0	1.0	1.0
6.5 Data common & available for integration	3	1.0	4.0
6.6 Redundancy of information management reduced	0.5	3.0	3.5
6.7 All foundation datasets modeled & centralized	1	3.0	4.0
6.8 Direct integration to business systems	0	1.0	1.0
6.9 Metadata	-	-	1.0
6.10 Technical Infrastructure sufficient to meet GIS need	-	-	3.0
6.11 Foundational & Sec Data (where appropriate)	-	-	2.0

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Appendix B – Objectives and Key Results

To action and measure the progress of the improvements in this roadmap, Objectives and Key Results (OKRs) are used. It is a collaborative goal-setting methodology used by teams and individuals to set challenging, ambitious goals with measurable results. OKRs are used to track progress, create alignment, and encourage engagement around measurable goals.

OKRs can be read as a statement – "We will (Objective) as measured by (Key Results)"[1].

4.1 Phase 1 Foundational Operational Issues

Address these issues before dealing with core issues and set conditions for maturity improvement.

Objective 1 – Improve Governance of WPSGN

- Key Result 1 – Develop WPSGN committee and charter with one rep from each member.
- Key Result 2 – Update agreement, objectives and supporting Service Level Agreement (SLA) to meet members' GIS data/tech needs.
- Key Result 3 – Document project list and agree to annual workplan.
- Key Result 4 – Identify and procure funding for additional resources (Coop, NOHFC, etc.).
- Key Result 5 – Meet quarterly to review progress and resolve issues.
- Key Result 6 – Provide bi-annual report/update to WPS CAOs.

Objective 2 – Initiate GIS Governance at the Town of Parry Sound

- Key Result 1 – Operationalize SLT as the GIS Steering Committee.
- Key Result 2 – GIS Steering Committee to meet at minimum quarterly to receive reports on progress.
- Key Result 3 – Review/adjust/approve 2022 roadmap OKRs.
- Key Result 4 – Approve annual workplan based on project priority and align to maturity.

Objective 3 – Establish a GIS Working Group at the Town of Parry Sound

- Key Result 1 – Establish GIS Working Group/Community of Practice.
- Key Result 2 – Meet monthly to discuss and review GIS progress and resolve issues.
- Key Result 3 – Support quarterly progress reporting to the executive.
- Key Result 4 – Create a mechanism to add projects to the annual workplan.

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[1] https://www.whatmatters.com/faqs/okr-meaning-definition-example/

Objective 4 – Determine and Execute GIS Technology Strategy

- Key Result 1 – (Working in the context of WPSGN) define options, evaluate, and confirm technology go-forward plan.

- Key Result 2 – Execute/implement go-forward GIS technology plan.

Objective 5 – Determine and Execute Suitable GIS Resourcing Approach

- Key Result 1 – SLT to evaluate suitable options and determine go-forward plan.

- Key Result 2 – Implement selected GIS capacity increases.

- Key Result 3 – Implement GIS project controls to ensure that fewer GIS projects are underway at one time.

Objective 6 – Set Asset and Work Management Systems Strategy

- Key Result 1 – Set up a joint working team for Asset and Work Management systems.

- Key Result 2 – Jointly set an agreed and integrated strategy for Asset and Work Management systems.

- Key Result 3 – Map processes for maintaining asset lifecycle data across systems.

- Key Result 4 – RFP / Procure Asset and Work Management systems technology.

- Key Result 5 – Implement for linear assets.

- Key Result 6 – Implement for plant-based assets.

- Key Result 7 – Implement for rolling assets.

- Key Result 8 – Decommission current/legacy solutions.

Objective 7 – Set Property-Centric Systems Strategy

- Key Result 1 – Set up a joint working team for property-centric systems.

- Key Result 2 – Jointly set agreed and integrated strategy for property-centric management systems.

- Key Result 3 – Implement solution(s) for GIS to unstructured content (files, documents, drawings) solutions.

- Key Result 4 – Implement solution(s) for GIS property history (permits, development, complaint, property notes) solutions.

4.2   Phase II – Enterprise GIS Maturity Improvements

4.2.1   Awareness and Engagement Initiatives

Objective 1 – Create Clarity of the Current GIS State and Vision for GIS (2022)

- Key Result 1 – Work with SLT to develop a GIS vision.

- Key Result 2 – Socialize vision and deliver roadmap information session to all staff.

Objective 2 – Communicate and Share the Value of GIS

- Key Result 1 – Develop a high-level communication and engagement schedule.

- Key Result 2 – Regularly communicate roadmap achievements, learning opportunities, tips and tricks.

Objective 3 – Track Progress Against Roadmap

- Key Result 1 – GIS Lead to report quarterly on OKR progress to SLT and GIS Working Group.

4.2.2   Collaboration Initiatives (Through Governance and Working Groups)

Objective 1 – Prioritize and Identify New Datasets to Collect and Manage

- Key Result 1 – GIS Lead to work with GIS Working Group to prioritize work on new datasets.

- Key Result 2 – GIS Steering Committee to approve work plan and agree on a method for adjusting work plan if new requirements emerge.

- Key Result 3 – GIS Lead to provide monthly updates to GIS Working Group and quarterly updates to SLT on progress against the work plan.

4.2.3   Workforce Development Initiative

Objective 1 – Foster Corporate-Wide Geo-Literacy Improvements

- Key Result 1 – Identify functional users and schedule learning opportunities.

- Key Result 2 – Deliver "Using GIS and collecting data in the field" session.

- Key Result 3 – Deliver "Using GIS and collecting data in the office" session.

- Key Result 4 – Provide guidance on users' roles and mechanism to improve GIS.

Objective 2 – Involve GIS Working Group in Learning Through Web Viewer Improvement Efforts

- Key Result 1 – Build a proof of concept to improve on existing GIS viewers.

- Key Result 2 – Create purpose-built viewers for mobile responsiveness.

- Key Result 3 – Develop a mechanism to request viewer add-ons and improvement.

4.2.4   Data Management Initiatives

Objective 1 – Improve Data Accuracy and Completeness With Mobile and Web GIS

- Key Result 1 – Identify and implement a mechanism for Cloud/on-premise sync.

- Key Result 2 – Implement accurate field data collection for critical assets.

- Key Result 3 – Implement browser editing for an additional dataset.

- Key Result 4 – Establish business unit data owners and quality checks document.

- Key Result 5 – Set monthly data quality audits for new/updated records.

4.2.5 Optimization Initiatives

Objective 1 – IT and GIS Infrastructure Improvements

- Key Result 1 – Update ArcGIS desktops, server and geodatabases.
- Key Result 2 – Identify and implement Microsoft server licensing improvement.

Objective 2 – Improve Understanding and Accessibility of Discoverable Data

- Key Result 1 – Determine metadata needs for use in a future roadmap cycle.

4.2.6 Annual Maturity Reassessment and Performance Review

Objective 1 – Gauge 2022 Roadmap Performance Openly and Transparently

- Key Result 1 – Reassess maturity with core GIS Team.
- Key Result 2 – Prepare an executive summary of performance and lessons learned.
- Key Result 3 – Schedule GIS Working Group to set OKRs 2023 Roadmap.
- Key Result 4 – Deliver 2022 Year In Review Report to GIS Governance Committee.
- Key Result 5 – Deliver 2022 Year In Review Report to report to CAO.