

New

Ministry

Technology and Innovation

Describe: Basic Job Details

Position

Position ID

Position Name (30 characters)

Geospatial Solution Architect

Requested Class

Systems Analyst Level 3

Job Focus

Supervisory Level

Agency (ministry) code

Cost Centre

Program Code: (enter if required)

Employee

Employee Name (or Vacant)

Organizational Structure

Division, Branch/Unit

Current organizational chart attached?

Supervisor's Position ID

Supervisor's Position Name (30 characters)

Supervisor's Current Class

Design: Identify Job Duties and Value

Job Purpose and Organizational Context

Why the job exists:

The Business Technology Operations branch plans for, implements, operates, and supports the digital services foundation technologies and platforms hosting the digital systems and data that empower business partners' services across the Government of Alberta (GOA). The branch ensures that modern technologies, including both on-premise and cloud-based hosting environments, along with an operating framework are in place to support the GoA's digital and data strategies. The branch is also responsible for the implementation, operation, and support of corporate electronic content management services as well as legacy business applications in accordance with policies and standards.

The Geospatial Solution Architect designs, builds, and integrates GIS solutions across a complex GOA enterprise application landscape. The primary accountability is solution outcomes, not platform administration. This role translates difficult business and operational problems into spatial solutions that work reliably across multiple enterprise systems, including custom-built web applications, ServiceNow, APIs, and data platforms. Technology choices are made on the basis of fit, sustainability, and total cost of ownership: enterprise GIS platforms, open-source geospatial tooling, and custom code are all valid options, selected and combined based on what the solution actually requires

- Own the end-to-end technical quality of GIS solutions from the first design decision through production operation, including integrations with ServiceNow, enterprise data platforms, web portals, and custom applications.
- Design how spatial data and geospatial capabilities flow reliably between enterprise systems, defining interface

contracts, data models, and integration patterns that survive upstream changes.

- Develop full-stack custom GIS applications where configuration or low-code tools cannot meet requirements; apply engineering discipline to ensure solutions are maintainable, testable, and documented.
- Select the right tool for each solution, enterprise GIS platform, open-source stack, cloud-native services, or a combination based on capability fit, licensing cost, and long-term supportability.
- Produce formal solution designs that development teams can implement without reinterpreting intent; own the accuracy and completeness of those designs through delivery.
- Embed AI tooling as a practical accelerator in spatial data processing, integration automation, and solution delivery.
- Technically lead solution delivery initiatives; provide design direction and review for other developers working within the same solution boundary.
- Identify and manage technical debt in delivered solutions; propose and execute remediation without disrupting active consumers.

This position will work and provide direction to a combination of GoA staff, contractors and external service providers.

Responsibilities

Job outcomes (4-6 core results), and for each outcome, 4-6 corresponding activities:

- Design and deliver GIS solutions that integrate spatial capabilities into enterprise applications, including ServiceNow service portals, workflow engines, ERP platforms, and custom web applications; define and own the interface contracts between systems.
- Develop full-stack custom GIS web applications: spatial front-end components (interactive maps, spatial queries, location-aware UX), RESTful and event-driven APIs, backend processing services, and geodatabase integration.
- Architect spatial integrations with ServiceNow — including scripted REST integrations, embedded map components in forms and portals, location-triggered workflow automation, and asset or field-service spatial operations.
- Design and implement spatial data pipelines connecting multiple enterprise systems: define data contracts, transformation logic, coordinate system handling, error and exception management, versioning, and SLA compliance.
- Select and apply enterprise GIS platform (Esri ArcGIS Enterprise), open-source components (PostGIS, GeoServer, MapLibre, GDAL/OGR), and cloud-native spatial services as appropriate; justify selections with a documented total-cost-of-ownership analysis.
- Produce and maintain formal solution design artefacts for every delivered solution: high-level design, low-level design, architecture decision records, API specifications, data dictionaries, and interface control documents at a standard sufficient for implementation and audit.
- Build and maintain automated deployment pipelines, integration tests, and environment configurations for custom GIS applications and integration components; apply source control discipline across all custom code and configuration.
- Implement security controls within GIS solutions: authentication and authorization design, spatial data classification enforcement, attribute-level access control, audit logging, and remediation of OWASP-class vulnerabilities in APIs and web applications.
- Conduct time-boxed proofs of concept for emerging geospatial technologies, open-source alternatives, and AI tooling; produce documented go/no-go recommendations with evidence.
- Identify and remediate technical debt in long-lived GIS solutions — decaying data models, deprecated API dependencies, undocumented integrations — with plans that allow remediation without service disruption
- Contribute to GIS platform architecture enhancements
- Engages with stakeholders across the organization including departmental and functional area executives, key business unit managers, and GIS users, and application teams to capture requirements
- Mentor junior team members, provide peer review on technical work, and lead delivery projects from initiation through deployment
- Stays current with technological developments in software development, systems support, and user support practices

Problem Solving

Typical problems solved:

Problems this role resolves are primarily design-time and architectural — decisions made upstream that prevent expensive failures downstream. Operational and diagnostic problems are secondary but expected.

- Integration architecture design: Determines how enterprise systems with different owners, data models, update frequencies, and change cadences can exchange spatial data reliably — designing contracts, failure modes, and

versioning strategies before a line of code is written.

- Technology selection judgment: Evaluates build vs. configure vs. integrate vs. open-source for each solution requirement, weighing capability fit, licensing exposure, community viability, and 5-year maintenance cost — without defaulting to familiar or incumbent vendors.
- Requirement translation: Converts ambiguous business process descriptions into precise spatial data models, system interaction diagrams, and API contracts that development teams can implement without re-interpreting the original intent.
- Platform constraint navigation: Resolves conflicts between what a business workflow requires and what the enterprise GIS platform can deliver natively — designing minimal, targeted extensions or open-source substitutions rather than forcing a fit.
- Spatial data quality at integration boundaries: Diagnoses and resolves coordinate system mismatches, topology errors, attribute schema conflicts, and projection inconsistencies when spatial data crosses system boundaries — designing validation and correction into the pipeline rather than treating it as a manual cleanup task.
- Solutions that survive platform change: Designs GIS solutions with sufficient abstraction that Esri version upgrades, ServiceNow releases, or API deprecations do not require full rewrites — applying interface isolation, versioned contracts, and dependency inversion where appropriate.
- Spatial data exposure decisions: Determines which spatial datasets can be published to which systems and consumers under provincial data classification rules — translating policy constraints into technical access control design rather than escalating every decision.

Types of guidance available for problem solving:

- Service Owner direction on solution priorities, delivery commitments, stakeholder risk appetite, and escalation thresholds for decisions that affect multiple ministries.
- GOA enterprise architecture standards, data governance frameworks, and security classification policies that set mandatory constraints within which all solutions must operate.
- Established architecture decision records and solution design patterns from prior GIS solution delivery, available as precedent for recurring integration and design problems.
- Vendor technical support and product documentation for proprietary platforms (Esri, FME, ServiceNow) and open-source community documentation (PostGIS, GeoServer, GDAL, MapLibre) for defect and compatibility questions.
- Peer design review from senior technical staff for solutions with broad ministry impact or non-standard technology selections; formal architecture review board for solutions above defined risk thresholds.
- GOA Change Advisory Board process for changes to production systems; change risk classification guidance determines when formal approval is required versus delegated authority.
- OGC, ISO/TC 211, IETF, and OpenAPI standards documentation for geospatial interoperability, spatial data exchange formats, and API design questions.

Direct or indirect impacts of decisions:

- Integration contract design decisions establish the data exchange agreements relied upon by ministry applications and citizen-facing services; poorly designed or undocumented contracts cause cascading failures and expensive cross-team rework when upstream systems change.
- Technology selection choices. Proprietary vs. open-source vs. cloud-native determine 5–10 year licensing, maintenance, and skill dependency costs; incorrect selections made at solution design time compound over years and are difficult to reverse once systems are in production.
- Security design within GIS solutions directly governs access to sensitive provincial spatial data including

land titles, resource tenure, infrastructure locations, and personal location information; misconfigured access controls can trigger data breach notifications and regulatory consequences.

- Enterprise application integration designs affect the daily workflows of hundreds to thousands of government staff; poorly designed integrations — unreliable data, slow response, or broken spatial context — degrade operational productivity at scale.
- Build-vs-configure-vs-open-source decisions made at solution design set the technical debt trajectory for solutions maintained across multiple years and government administration changes; decisions without documented rationale create compounding maintenance risk.
- Data model decisions made in early solution design determine whether spatial data from this solution can be federated, compared, or published alongside data from other provincial systems; incompatible models create long-term data silo problems across government.
- AI tooling integration decisions set organizational precedent for how agentic and automated spatial workflows are governed in production; ungoverned AI integration introduces unpredictable behaviour into systems that affect public services.

Key Relationships

Major stakeholders and purpose of interactions:

- Service Owner: Receives delivery direction and solution priorities; reports on design decisions, risk, cost drivers, and delivery progress; escalates decisions that exceed defined authority or cross ministry boundaries.
- Business users and process owners: Conducts structured requirements discovery; translates operational workflows and business problems into spatial solution designs; validates designs and confirms acceptance criteria before build commences.
- Enterprise application owners, Program Managers (ServiceNow, ERP, data platform, API gateway teams, Applications etc.): Negotiates integration contracts and interface specifications; aligns on versioning and change notification processes; manages the impact of platform upgrades on delivered spatial integrations.
- GOA enterprise architecture and security teams: Submits solution designs for standards compliance review; obtains approval for non-standard technology selections; resolves conflicts between solution requirements and enterprise policy.
- Developers, QA engineers, and data analysts on the platform team: Provides technical designs sufficient for implementation without reinterpretation; conducts code and configuration review; accountable for the technical quality of work delivered within the solution boundary.
- Data governance and information management teams: Aligns spatial data models, classification labels, and retention rules with provincial data standards; confirms that integration designs comply with data-sharing agreements and privacy obligations.
- Vendor technical contacts and open-source community: Manages product defect escalation; validates upgrade and migration paths; assesses open-source project health and community roadmap as input to technology selection decisions.
- Business users and citizen service consumers (via product owners): Solution usability, data accuracy, and service reliability outcomes are the ultimate measure of success; user feedback from product owners drives prioritization of technical improvements.

Required Education, Experience and Technical Competencies

Education Level

Diploma (2 year)

Focus/Major

Other

2nd Major/Minor if applicable

Designation

If other, specify:

Computer related discipline

Job-specific experience, technical competencies, certification and/or training:

Experience:

- Minimum 7 years designing and delivering enterprise GIS solutions in a complex, multi-system production environment, with direct accountability for solution quality from requirements through post-release support.
- Minimum 5 years of full-stack custom GIS application development including server-side services, spatial APIs, and front-end mapping interfaces with end-to-end SDLC ownership including deployment and maintenance.
- Demonstrated experience integrating spatial capabilities into non-GIS enterprise platforms such as ServiceNow, ERP, CRM, or workflow and service management custom applications; must include designing the integration architecture, not only consuming existing APIs.
- Demonstrated experience designing spatial data integration architectures across 5 or more enterprise systems simultaneously including data contract definition, transformation pipeline design, error handling, and versioning under active change by multiple system owners.
- Hands-on production experience with both enterprise GIS platforms (Esri ArcGIS Enterprise required) and open-source geospatial stack. Must be able to evaluate and select between them, not just use a single stack.
- Experience producing formal solution design artefacts, high-level designs, low-level designs, architecture decision records, API specifications, interface control documents — used as the authoritative basis for implementation and audit.
- Experience evaluating and selecting geospatial technologies based on total cost of ownership, open-source community health, organizational skill fit, and long-term supportability; documented evidence of technology selection decisions preferred.
- Experience managing and remediating technical debt in long-lived GIS solutions without disrupting active consumers, including data model migrations, API versioning transitions, and integration contract renegotiation.
- Experience working in a provincially or federally regulated public-sector environment, or an equivalent enterprise with formal change management, data classification, privacy obligations, and security compliance requirements.
- Demonstrated application of AI or machine learning tooling in spatial data processing, geospatial workflow automation, or solution delivery acceleration in a production context.
- Experience in enterprise database development using Microsoft SQL Server or equivalent
- Ability to communicate effectively to staff with a varying degree of systems understanding (none to expert)
- The ability to work well in a team environment, take direction, mentor and support team members and work within deadlines is essential
- Critical thinking, problem-solving and decision-making skills
- Ability to prepare professional presentations and training materials and conduct training sessions

Technical Competencies:

- Full-stack GIS application development: Server-side development in Python, C#/.NET, or Java; RESTful and event-driven API design; spatial front-end development using Esri Apps, OpenLayers, Leaflet, MapLibre GL, or ArcGIS Maps SDK; geodatabase integration; unit and integration testing for spatial logic.
- Enterprise application integration: Designing and implementing spatial integrations with enterprise applications (scripted REST, embedded maps, location-triggered workflows, mobile field integrations); event-driven integration patterns (webhooks, pub/sub, message queues); API gateway configuration and versioning; OpenAPI specification authoring.
- Spatial data pipelines: FME or equivalent ETL tooling for complex spatial transformation and automated publication; OGC API design (Features, Tiles, Maps); real-time and streaming spatial data ingestion; validation and quality enforcement at integration boundaries
- Open-source geospatial stack: Installation, configuration, and performance tuning; ability to deploy and operate these tools as production-grade services, not just desktop use.
- Spatial data modelling: Geodatabase schema design, topological data models, coordinate reference system management, spatial indexing strategies, and cloud-optimized spatial formats.
- Solution design and documentation: Producing high-level designs, low-level designs, interface control documents, architecture decision records, and data dictionaries to a standard that is unambiguous, version-controlled, and sufficient for implementation, handover, and audit without further clarification.
- Application security: OAuth 2.0 integration; role-based and attribute-based access control for spatial data APIs;

data classification enforcement at API and service boundaries; Vulnerability identification and remediation in web applications and APIs; secrets management.

- DevOps and delivery engineering: Git-based version control and branching strategy; CI/CD pipeline design using GitHub Actions, Azure DevOps, or equivalent;
- AI and spatial automation: Knowledge or experience using large language model APIs and agentic frameworks for geospatial workflow automation; ML-assisted spatial data quality and classification; automated feature extraction and change detection; embedding AI into integration pipelines as a production capability.
- Technology economics: Evaluating licensing models (per-core, per-user, SaaS, open-source); assessing open-source project community health and long-term viability; estimating cloud spatial service consumption costs; quantifying total cost of ownership across build, operate, and maintain phases.

Certifications:

- Strongly Preferred: Esri Technical Certification — ArcGIS Enterprise Administration or ArcGIS Developer track.
- Strongly Preferred: FME Professional Certification or Desktop Certified Professional.
- Preferred: TOGAF 9 Foundation or Professional.
- Asset: ServiceNow Certified Application Developer or Certified Implementation Specialist for roles where ServiceNow integration is a primary delivery focus.
- Asset: Certified Geographic Information Professional (GISP) or equivalent recognized geospatial professional credential.

Behavioral Competencies

Pick 4-5 representative behavioral competencies and their level.

Competency	Level					Level Definition	Examples of how this level best represents the job
	A	B	C	D	E		
Systems Thinking	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<p>Takes a long-term view towards organization’s objectives and how to achieve them:</p> <ul style="list-style-type: none"> • Takes holistic long-term view of challenges and opportunities • Anticipates outcomes and potential impacts, seeks stakeholder perspectives • Works towards actions and plans aligned with APS values • Works with others to identify areas for collaboration 	<p>Evaluates potential solutions and considers implications</p> <p>Understands complex environments and can anticipate how each component could be impacted when making changes</p> <p>Understands broader impact to GoA and their clients</p>
Creative Problem Solving	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<p>Engages the community and resources at hand to address issues:</p> <ul style="list-style-type: none"> • Engages perspective to seek root causes • Finds ways to improve complex systems • Employs resources from other areas to solve problems • Engages others and encourages debate and idea generation to solve 	<p>Able to work independently or lead a team of analyst to resolve complex problems</p> <p>Pro-actively identifies and implements efficiencies</p> <p>Performs root cause analysis and identifies preventative measures</p>

		problems while addressing risks	
Develop Self and Others	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	Plans according to career goals and regular development: <ul style="list-style-type: none"> • Aligns personal goals with career goals • Leverages strengths; attempts stretch goals • Provides feedback and openly discusses team performance • Values team diversity, and supports personal development 	Identifies knowledge gaps and pro-actively seeks learning opportunities Provides leadership to team members and assists with identifying training needs
Agility	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	Identifies and manages required change and the associated risks: <ul style="list-style-type: none"> • Identifies alternative approaches and supports others to do the same • Proactively explains impact of changes • Anticipates and mitigates emotions of others • Anticipates obstacles and stays focused on goals • Makes decisions and takes action in uncertain situations and creates a backup plan 	Able to adapt approach to a situation in an environment where variable frequently change Able to make decisions and communicate under pressure Understands barriers and can innovate to overcome challenges Quickly assembles resources when complex cross-discipline teams are required
Drive for Results	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	Takes and delegates responsibility for outcomes: <ul style="list-style-type: none"> • Uses variety of resources to monitor own performance standards • Acknowledges even indirect responsibility • Commits to what is good for Albertans even if not immediately accepted • Reaches goals consistent with APS direction 	Encourages staff to be accountable for their actions and set realistic goals Identifies inefficiencies and implements solutions

Benchmarks