



# BARRIE-SIMCOE EMERGENCY SERVICES CAMPUS

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## VALIDATION REPORT





'Barrie is on the cusp of significant population growth as development begins in the new lands in the south end and to respond to this we must find new ways to deliver services. Working in partnership with the County of Simcoe and Barrie Police to combine emergency services under one roof will maximize cost-effectiveness and service efficiency for our community. Emergency services are a key component of building and supporting diverse and safe neighbourhoods. With benefits like better inter-agency coordination and communication, improved training facilities and reduced building and maintenance costs, this campus model presents a unique opportunity to rethink and redefine how these essential services are delivered to citizens at the best possible value. I commend the team of staff from both the City of Barrie and the County of Simcoe who have worked collaboratively to develop this plan and look forward to continuing to work in partnership with the County of Simcoe to deliver exceptional emergency services.'

- **Carla Ladd**  
Chief Administrative Officer  
City of Barrie

'Every day, the County of Simcoe provides essential services to residents and visitors throughout this region in partnership with our municipalities. We are guided strategically by a dedicated County Council who continually strive for superior services, with a focus on value, delivered by an equally dedicated team of professional staff.'

This emergency services campus continues on this path of improved services and long term value for our residents. We have collectively recognized – as County and City Councillors and staff – that this emergency services campus is a partnership which will ensure delivery of the highest calibre of life and property saving services to Barrie residents but also our entire region. County of Simcoe Paramedic Services meet and exceed high professional and industry standards in their significant and varied efforts. Our Paramedics are phenomenal, making our service recognized nationally and internationally. With this new campus, Paramedics will bring this essential care closer to our patients, it will strengthen our partnerships with our critical emergency responders in police and fire, and it will ensure more effective and co-ordinated care on scene. It will also provide cost savings to our local ratepayers in the coordinated construction of the facilities and ongoing operations, and it will allow us to achieve our long term strategy that will see the County move closer to an optimum model for paramedic stations, posts and service logistics. This modern and highly effective system will ultimately lead to higher quality emergency medical services for our residents and the region.'

- **Mark Aitken**  
Chief Administrative Officer  
County of Simcoe

## PURPOSE OF VALIDATION

TO BE ABLE TO STATE WITH CONFIDENCE  
WE CAN BUILD THIS BUILDING,  
THAT DOES THESE THINGS,  
FOR THIS MUCH MONEY,  
IN THIS MUCH TIME.



ARCHITECTS INC.



'The Barrie Police Service is eagerly looking forward to occupying a common space which fulfills the needs of all our members, our first responder partners and that of the community into the foreseeable future.

The realization of a new centralized police facility will create efficiencies, which will ensure that the Barrie Police Service can accomplish our core functions in carrying out our mission to provide professional, accountable and sustainable police services. The Barrie Police Service along with Barrie Fire and Emergency Service and Simcoe County Paramedic Services, will work in unison to provide programming and services to our community with efficiency while being economically responsible.

This facility is a testament to the vision and collaboration of all first responders in the City of Barrie and Country of Simcoe, as well as to the Integrated Project Delivery team.'

- Chief Kimberley Greenwood

'On behalf of the Barrie Fire and Emergency Service, I believe the IPD process has allowed our department to leverage the knowledge and expertise of our corporate and emergency response partners along with the design team to recommend an efficient facility. We are very proud to take part in this progressive approach that will ultimately enhance our ability to provide the highest level fire and emergency services possible.'

- Chief Bill Boyes

'Our goal is the continual improvement of superior service for residents and the County of Simcoe portion of the emergency services campus allows our Paramedic Services to establish a key component of our strategic facility plan. This better positions us to meet service demand and support delivery of services across the entire region. The partnership with the City of Barrie makes this development significantly more cost effective and supports greater access to allied agencies and joint facilities.'

- Chief Andrew Robert

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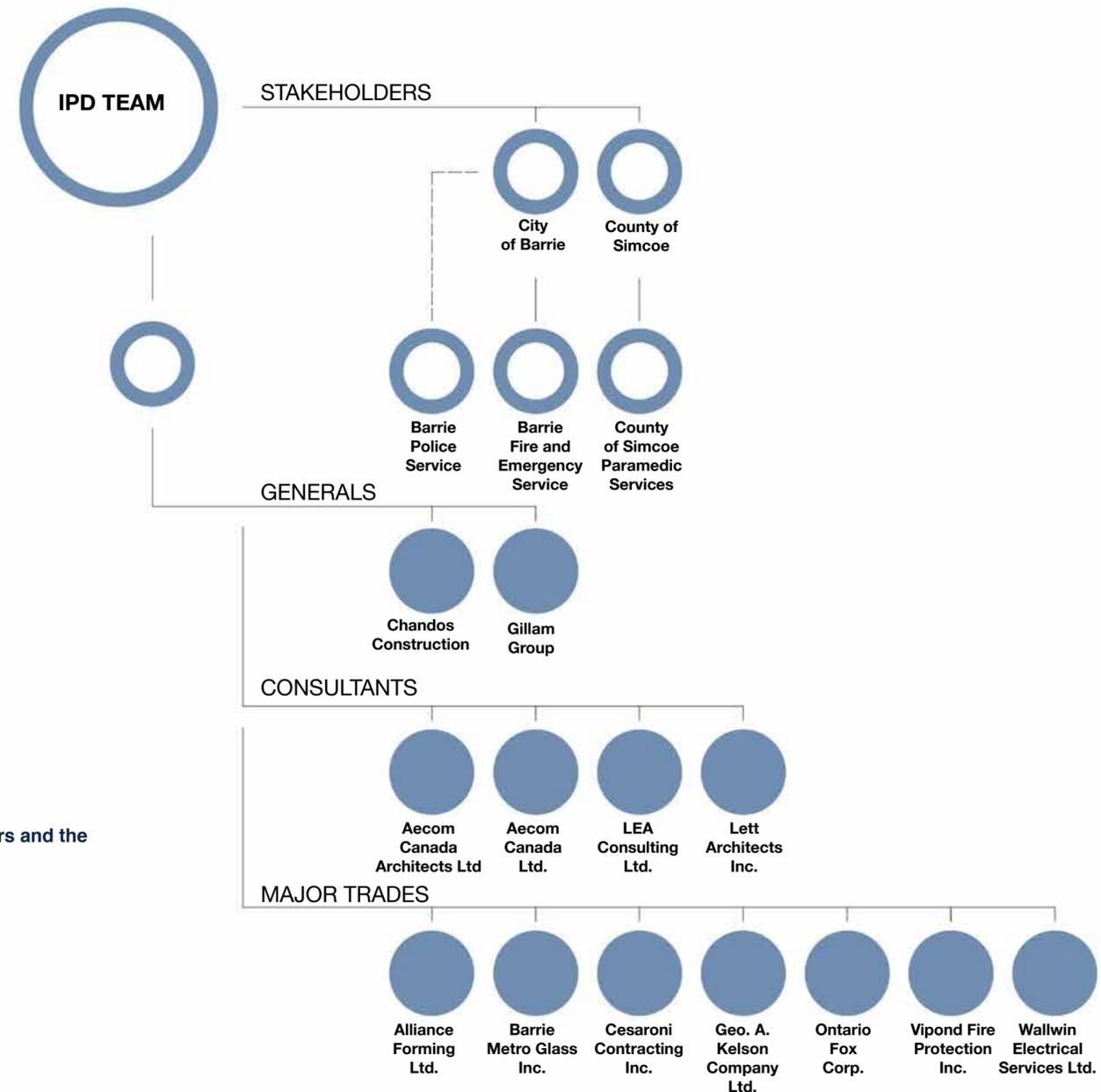
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**PROJECT TEAM MATRIX**

The above matrix illustrates the IPD partners and the organizational structure of the team.

**INTRODUCTION**

**Overview**

This Validation Report is a culmination of efforts from the Integrated Project Delivery (IPD) team to state with confidence that we can build this building, that does these things, for this much money, in this much time. Over the course of several months, the IPD team met weekly to distill a design that met the goals and requirements of all of the key stakeholders. The team reviewed all opportunities to take advantage of shared space within the Barrie-Simcoe Emergency Services Campus. The team also reviewed future growth projections of all users to create a detailed phasing and future growth strategy for the campus.

The work summarized in this Validation Report captures all decisions and assumptions made by the team during the course of Validation, but also informs the appropriate boards and councils of the project details, seeking approval to proceed into the Target Value Design phase of the IPD process. This team collectively supports the information and assumptions in this report, and will commit to the Total Construction Value of \$101.9M and construction completion / phased occupancy move-in procedures beginning December 2019 with a Total Project Budget of \$109M.

**The Team**

The team is a multi-disciplinary team for this project, as outlined in the project team matrix to the left. We would like to thank the leadership of the following key team members with whom we worked most closely for their vision and dedication to the project:

**City of Barrie:**

Rick Pews, Lindsay Worton and Jessica Lief

**County of Simcoe:**

Jane Sinclair, Dawn Hipwell

**Barrie Police Service (BPS):**

Kimberley Greenwood, Bruce Carlson, Peter Dewsnap and Bryan Daley

**County of Simcoe Paramedic Services (CSPS):**

Andrew Robert and Shane Smith

**Barrie Fire and Emergency Service (BFES):**

Bill Boyes, Cory Mainprize and Sue Dawson

**Chandos Construction:**

Mike Coyne, Markku Allison, Jen Hancock, Mike Dolling, Nicholas Darling, Eben Hamilton and Tony Jones

**Gilliam Group Inc:**

Marcus Gilliam, Joel Parke, Benjamin Valliquette, Dominic Lambo, David Schauer and Bill Major

**Lett Architects Inc:**

Bill Lett, Michael Gallant, Amanda Motyer and Dylon Feyen

**LEA Consulting Inc:**

John Ford and Shahe Sagharian

**Aecom Canada Ltd:**

Jim Flanigan, Julia Sacher, John Sheridan, Amir Ghaly, Jay Leasa, Rick Bogaert, Sam Ghazal, Winston Hung and Andrew Cheng

**Aecom Canada Architects Ltd:**

Laurence Cudlip, Roy Turner, Andrew Dietrich, Steve Loomis, and Michaela Bahm

**Alliance Forming Ltd:**

Dario Favot, Joseph Bone, Andrew Clarke and Joe Mazzuca

**Barrie Metro Glass Inc:**

Dave Jefferies, Craig Gatehouse, Mandy Porter, Tomas Dela Cruz and Peter Beckett

**Cesaroni Contracting Inc:**

Eric Orsi, Peter Koropisz and Trevor Ainley

**Geo. A. Kelson:**

Josh Kelson, David Campbell, Claire Sorley and John Will

**Ontario Fox Corp.:**

Emilio Pompilio, Franco Carlucci, Marc Drabble, Justin Michelin and Sean Teevins

**Vipond Fire Protection Inc.:**

Jake Meder and Mike Powell

**Wallwin Electric Services Ltd:**

Kevin Sweeney, Joe Southorn, John Holloway and Tim Southorn



# 2

## PROJECT OVERVIEW

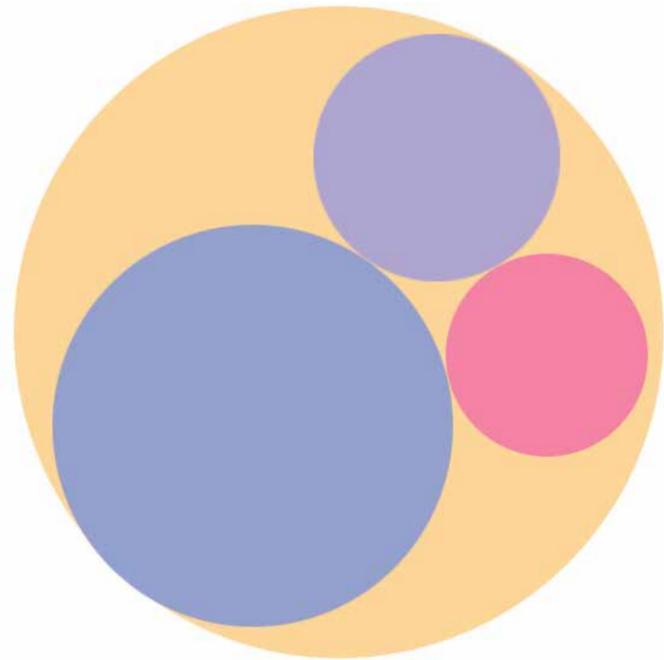
Why Co-Locate as a Campus?

What is the Barrie - Simcoe Emergency Services Campus?

What are the Project Values?

What is Integrated Project Delivery (IPD)?

Why IPD for this Project?



## WHY CO-LOCATE AS A CAMPUS?

### COMMUNITY BENEFITS

The Barrie-Simcoe Emergency Services Campus will leverage both capital and operational efficiencies through a partnership that will foster innovative, collaborative, and sustainable values to support community growth, safety, care, and satisfaction. The campus concept provides a centralized platform from which our first responders can develop and implement programs that best meet the current and future needs of the community. Modernized facilities will result in greater efficiencies between the first responder partners as well as within each individual organization. By leveraging the latest technologies, this facility will enhance service delivery while maintaining responsible capital and operating costs. The proposed centralized location of the campus will greatly improve the first responder partners ability to respond to population growth and serve as a source of pride for years to come.

The Barrie-Simcoe Emergency Services Campus benefits the community by:

- Fostering collaborative partnerships that utilize finances in the most efficient and responsible manner possible to serve our residents
- Providing strengthened emergency responders partnerships to ensure more effective and coordinated care during emergency response

- Improving opportunities for collaboration and mutual co-operation for first responder agencies
- Providing smaller overall facility footprint (when compared to stand alone facilities for each stakeholder) that will ensure both capital costs savings as well as operations and maintenance efficiencies
- Locating the campus centrally, this will better meet the demands of a growing community and provide greater access for all citizens to the campus
- Giving citizens centralized access to campus programs such as accident reporting, community room, and public counters, all of which are adjacent to the common public entrance and lobby in the campus
- Creating opportunities for joint training will improve service and response to large scale incidents that require multi-partner coordination
- Generating redundancy for Fire and Police emergency services radio infrastructure
- Allowing for potential income generating partnerships within surrounding municipal public safety services, private training and educational institutions
- Creating access to an indoor, climate controlled environment will provide year round adequate instruction and practical training that will allow partners to provide the highest level of service to our citizens

### SHARED OPPORTUNITIES

For many years the emergency service partners of the City of Barrie and the County of Simcoe have ensured the safety of their residents and contributed to the overall resilience of these communities. The three services have partnered on such projects as tactical emergency medical service, chemical, biological, radiological, nuclear and explosives team and continue to collaborate in joint training exercises ranging from active shooter situations to large scale emergencies.

The validation process has leveraged the benefits of co-location and shared space to enhance the already existing partnerships and improve the response to the community. It is expected that once occupancy of the building occurs, further opportunities for partnerships will be realized, as all three partners interact in a shared facility and site.

### CAPITAL COST SAVINGS

- Building space savings through sharing – The total area required under a combined building scenario is less than that required for individual buildings for each partner. Through sharing each partner has access to spaces that would be costly to provide in individual buildings.
- Mechanical and Electrical spaces and equipment – Through provision of central plant, space and plant cost efficiencies can be realized. Large, high-efficiency units can be located in a central mechanical room serving the entire facility (with certain exceptions, such as the firearms range)
- Shared data centre (server room) – By locating the data centre and servers for each partner in secured areas of a combined space, a single cooling system, fire suppression system and UPS bank can be used instead of multiple separate units.
- More efficient use of parking space – Instead of providing parking to meet the peak needs of each partner separately, having a shared/common area allows the provision of fewer designated spaces under this scenario compared to separate sites.
- Common/shared municipal services instead of separate – A necessary part of the construction cost for separate buildings is the provision of electrical, gas, water, storm, sanitary, and communications connections. In a combined building scenario

the costs can be significantly less than for individual separate buildings and sites.

- Construction costs – Building a shared campus facility will reduce individual general condition and resource costs that would have to be carried in each construction contract. Shared resources and Lean Construction approach will add additional value and efficiencies. Using an IPD approach offers increased certainty related to project scope, schedule, and costs, with robust risk mitigation strategies. Cost efficiencies will also be found due to the scale of the construction and sheer amount of materials required.
- Project design, administration and project management costs – The costs to engage design and other consultants, and to administer and manage the project will be less for a single construction contract than for separate contracts.
- More robust redundancies for mechanical and electrical systems, and communications (e.g. multiple air handling units, chillers, cooling tower, modular integrated generator banks, more feasible dual feeds for electric service, water and communications lines) and other services required in the design of post-disaster recovery facilities become more cost effective.



## WHY CO-LOCATE AS A CAMPUS? - CONTINUED

### OPERATIONAL BENEFITS

- Improved inter-agency communication and co-operation
- Space efficiencies through access to common training facilities that would not be possible under standalone scenarios
- Increased ability to conduct multi-agency training
- Decreased travel time between departments (currently in separate facilities)
- Decreased travel time to get to training activities
- Ability to host training sessions or large meetings with potential associated cost savings
- Access to efficient vehicle maintenance facilities and specialized equipment
- Robust redundancies for mechanical and electrical systems, and communications (e.g. multiple air handling units, chillers, cooling tower, modular integrated generator bank, more feasible dual feeds for electric service, water and communications lines)
- More flexible use of parking for visitors and training attendees

### OPERATIONAL COST SAVINGS

- Energy cost savings – By using more efficient mechanical equipment in a combined building, energy costs will be reduced. There is also a potential to have less exterior wall surface and a more compact building configuration.
- Building/facility maintenance – Costs for maintaining building elements located on a common campus are less than those for buildings on individual sites.
- Grounds maintenance – Costs for grounds maintenance and snow removal are expected to be less for a single location than for individual sites.
- Barrie Police Service and Barrie Fire and Emergency Service will achieve further operational savings by leveraging their shared components of the facility to avoid individual operating expenses, including joint use of a Dispatch and Communications space and a shared Training Facility.
- Decrease cost of maintaining mandated proficiency standards as significant costs

## WHAT IS THE BARRIE-SIMCOE EMERGENCY SERVICES CAMPUS?

### OVERVIEW

The concept for the Barrie-Simcoe Emergency Services Campus is to bring together the Barrie Police Service, Barrie Fire and Emergency Service and Simcoe County Paramedic Services together on a shared campus in a partnership arrangement where each party will benefit. Through shared space and staff amenities, each partner will have access to more efficient and improved facilities as compared to what would be feasible or affordable in separate standalone buildings.

The Barrie-Simcoe Emergency Services Campus prime objective is a fully integrated and multifaceted campus that is anticipated to be comprised of the following three major partners: Barrie Police Service, Simcoe County Paramedic Services and Barrie Fire and Emergency Service.

### BARRIE POLICE SERVICE

To meet the policing service delivery requirements of a growing community an expanded, amalgamated, and centralized police facility is integral to the future success of Barrie Police Service. At present, Barrie Police Service is dispersed among three buildings. Operational effectiveness is hindered by Divisions being separated, with approximately 90,000 usable square feet of inefficient and fragmented space which is inadequate for the current and future projected strength of the force, and population of the City of Barrie.

The current geographic location of police facilities, in the northeast area of the City, is also a hindrance to optimizing the community connectedness and response of Barrie Police Service. The campus' centralized location will forge a unified and more accessible presence, adaptable and flexible to future growth in the City.

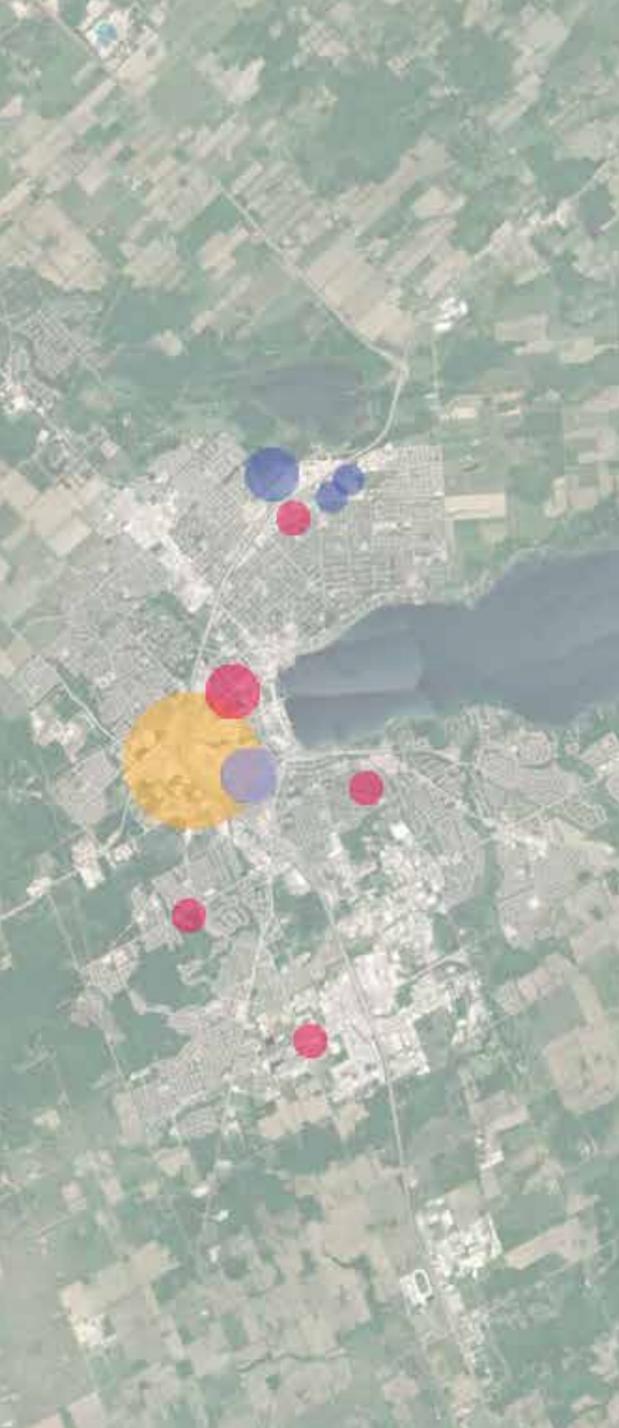
As identified in the City's Growth Management Strategy, Barrie will continue to experience substantial population growth and expansion. In December 2009 the City of Barrie annexed an additional 2,293 hectares of land for development. The majority of urban expansion has pushed toward the south and away from the historical centre of the City. Existing municipal services

concentrated in the centre and towards the north end of the City are stretched to provide adequate servicing to all municipal areas.

In addition to the benefits of a single, centralized facility, the components within Building B – Indoor Training Facility will tremendously improve efficiencies, accessibility, and effectiveness of training activity for Barrie Police Service, as well as allow inter-partner training and collaboration to increase significantly. The indoor firearms range will provide Barrie Police Service with unobstructed access to a dedicated, flexible, rugged, year-round space to carry out provincially-mandated firearms, tactical, and scenario-based training activity that is currently conducted at an outdoor property outside the City, where limited access, unpredictable weather conditions, an uncertain future and operating travel and salary costs have impacted the efficiency and effectiveness of training for years.

Furthermore, the indoor, multi-purpose training space and supporting classrooms and ancillary spaces shared with Barrie Fire and Emergency Service within the training building, provide limitless opportunity to considerably enhance the training opportunities for Barrie Police Service.

Amalgamating the three existing buildings and sharing space with other first responders allows the City to take advantage of cost savings during design and construction as well as realized operational, administrative, and energy-related efficiencies. The Barrie Police Service, Barrie Fire and Emergency Service, and Simcoe County Paramedic Services will be positioned in the new campus to collaborate more freely and develop stronger partnerships that will benefit the community through emergency preparedness, response and training.



### COUNTY OF SIMCOE PARAMEDIC SERVICES

The County of Simcoe Paramedic Services engaged Deloitte Consulting several years ago to assist in the development of a facility model to improve response times and maximize efficiencies. One of the recommended Principles established within the model was the use of hub/post facilities. The Barrie Simcoe Emergency Services Campus is the “hub” described in the hub/post model.

In a hub and post configuration, Paramedic staff report to a central location which serves as the operations “hub”. The hub incorporates staff reporting facilities such as lockers, large equipment and supply stores, multiple vehicle bays and staff parking facilities. At the beginning of a duty period, Paramedics would report to the hub, check their vehicles and equipment, restock supplies, and undertake other activities as needed. Paramedics would then deploy into the field and respond to calls. They would travel to, and many times locate at, a fixed post. The post is located in an area in consideration of call demand. The post is a smaller facility with one vehicle bay, washroom, kitchenette and computer room. The post will not require staff facilities such as locker rooms or supplies, as the hub will provide these necessities. The post represents a small footprint within high demand areas. The use of a hub and post configuration is very scalable to support growing communities and is in place in other Ontario municipalities. These posts will

be located closer to more neighbourhoods resulting in reduced response times across the coverage area. This approach is best utilized in larger areas of higher call demand. In addition to providing report to work facilities, the hub will also serve as a response station in coordination with the posts.

### BARRIE FIRE AND EMERGENCY SERVICE

The Barrie-Simcoe Emergency Services Campus will be the primary site for Barrie Fire and Emergency Service training. With the exception of water rescue, training in every area of service delivery can be accomplished at one location within City limits. Even aerial ladder truck operations can be undertaken indoors as the building's ceiling is 80 feet high. The indoor training facility contains a Self Contained Breathing Apparatus (SCBA) and respirator fit testing area, and search and rescue maze. In addition, firefighters can be challenged in simulated apartment units with a moveable wall system, theatrical effects and smoke. The facility is operated 24 hours a day, seven days a week, year round.

The large indoor training facility will have a four-storey apartment building in addition to locker rooms, a SCBA compressor room, kitchen/common room, classrooms, apparatus storage with in-floor exhaust extraction. This building will contain indoor space that can support a variety of indoor training needs, including auto extrication, medical training and all other classroom related instruction. Close access to a classroom during practical training is essential in a fire service learning environment as firefighters continuously learn evolving public safety best practices that are increasingly complex.

The ability to train year round is critical for today's fire service. An increase in legislative requirements and industry standards across the Fire service delivery areas require training year round. Much of the fire training is difficult to accomplish without access to a controlled environment.

It is prudent from an employee health and safety perspective along with a corporate financial perspective to reconsider the training environments. The cost of presumptive legislation claims due to cancer-related illnesses can exceed \$1M per claim and therefore exposure needs to be minimized to the greatest extent possible. Modern fire service training facilities are moving towards the indoor model and the use of clean training environments. The traditional six story burn tower is unnecessary, inefficient, and results in increased and unnecessary exposures to harmful carcinogens. The required training can be accomplished in a smaller one-storey outside training prop. for live fires and additional training elements such as search and rescue and Rapid Intervention Training can be done in clean environments.

The operational time requirements will be reduced in an indoor climate controlled facility as training evolutions can be left set up for extended durations and equipment maintenance can be reduced as the equipment is not exposed to environmental elements. Flexible indoor training space is highly sought after: in addition to being shared with the other first responders on

campus, it can also present opportunities for revenue generation through the rental of the facility to external agencies.

## WHAT ARE THE PROJECT VALUES?

These project values were established by the IPD team as a cornerstone of the Barrie-Simcoe Emergency Services Campus project. By adopting a broad range of mutually established and jointly defined values, the team has a greater range of success factors through which to look at the project. When any major decisions are made, considering the impact on each of the project values aligns the team and increases likelihood of optimized and balanced outcomes.



**Safety**  
 Maintain an integrated culture of safety throughout validation and design. Maintain safe construction site with no injuries or incidents resulting in WSIB claims.



**Community Satisfaction and Engagement**  
 An inviting community focused site and building that promotes community participation and creates a sense of pride.



**Sustainability and Longevity**  
 Choice of systems, products and processes that consider the life-cycle of the building, healthy working conditions, and environmental stewardship. Flexible design, adaptable to growth and changing needs. Anticipates future technology.



**Fit for Purpose and User Satisfaction**  
 The building meets the requirements of the functional program and provides efficiencies of operations. End user input in the project results in a great environment to work in that is safe, accessible and exceeds expectations.



**Learning and Growth**  
 Team members acquire leading edge learning skills, processes and technologies and are able to share that legacy.



**Collaboration and Relationships**  
 A collaborative team built on trust, transparency and communication that results in an enjoyable process that forges lasting relationships and a sense of pride.



**Efficiency and Innovation**  
 Leverage the IPD process to generate cutting edge ideas and to implement an effective decision making process. Efficiently prioritize choices and inform product and system selections.



**Aesthetics**  
 The building is visually and architecturally appealing. The building design is of the highest aesthetic quality.

## TRADITIONAL VS. IPD COMPARISON CHART

TRADITIONAL DELIVERY		INTEGRATED PROJECT DELIVERY
Fragmented, assembled or 'just-as-needed' or 'minimum-necessary' basis, strongly hierarchical, controlled	TEAMS	An integrated team entity composed of all project stakeholders, assembled early in the process, open, collaborative
Linear, distinct, segregated; knowledge gathered "just-as-needed"; information hoarded	PROCESS	Concurrent, multi-level, integrated; early contributions of knowledge and expertise; information openly shared
Individually managed, transferred to the greatest extent possible	RISK	Collectively managed, appropriately shared
Individually pursued; minimum effort for maximum return; (usually) first-cost based	COMPENSATION / REWARD	Team success tied to project success; value-based
Paper-based, 2 dimensional; analog	COMMUNICATION / TECHNOLOGY	Digitally based, virtual, 5 or 6 dimensional; Building Information Modeling
Minimum effort for maximum return; minimize or transfer risk; don't share	AGREEMENTS	Encourage, foster, promote and support open sharing and collaboration, full integration

## WHAT IS INTEGRATED PROJECT DELIVERY (IPD)?

IPD is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize the project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction. Key features of IPD include:

- Early involvement of key participants;
- Shared risk and reward based on project outcome;
- Joint project control;
- Reduced liability exposure; and
- Jointly developed and validated targets.

At the core of an IPD project are collaborative, integrated, and productive teams composed of all project stakeholders. Building upon early contributions of individual expertise, these teams are guided by principles of collaboration, open information sharing, team success tied to project success, shared risk and reward, value-based decision making, and utilization of full technological capabilities and support. The outcome of IPD is the opportunity to design, build, and operate as efficiently as possible. Consider the comparisons between the traditional delivery method and IPD as presented on the adjacent page.

### WHAT ARE THE BENEFITS OF IPD?

IPD establishes a platform where cost and schedule is much more certain in addition to the attainment of much broader metrics of success. On an IPD project, the team establishes a set of common values, goals, and objectives that are arrived at through a process that begins with every stakeholder answering the question "What is important to me to consider this project a success?" The resulting goals and values roll up and build to commonly held conditions of satisfaction, which guide and inform the decisions and actions of the team, and almost always include things on team dynamics, user satisfaction, community satisfaction, collaboration, sustainability and performance, etc., in addition to cost, schedule, quality. Having a broader set of metrics for success helps the team move in a balanced and informed fashion toward the desired outcomes.

All project stakeholders are brought on board early in the process, where the ability to leverage experience and expertise yields high return in terms of positive impact to the project while costs are low.

IPD removes the traditional contractual boundaries between project stakeholders, placing instead a single contractual boundary around the entire design and construction project. This removal of internal contractual boundaries incentivizes the team to focus on optimizing the whole, and not just the piece.

IPD's shared risk and reward model based on project outcomes furthers the creation of a "best for project" environment. It's in everyone's best interest that the project be successful, not just their part. This encourages team members to collaborate rather than compete, actively seeking opportunities to support one another and, ultimately, the project.

Industry research supports this, and is well documented in case studies and industry reports. ([www.ipda.ca](http://www.ipda.ca))



## WHY IPD FOR THIS PROJECT?

The prime objective is to create a highly efficient emergency services campus that combines police, fire, and paramedic services in one facility.

To create a highly efficient facility requires a highly efficient process. IPD, a promising delivery method emerging in the marketplace, squarely fits that bill. Industry research suggests that most if not all IPD projects are high performers, delivering outcomes on or under budget, on or ahead of schedule, and most importantly, with owners expressing high satisfaction with overall value delivered.

With the complexities of a multi-stakeholder facility, tight budgets, and a high-profile project in the eyes of the public, IPD represented an optimal path to best align expectations and outcomes across every possible dimension of the Barrie-Simcoe Emergency Services Campus project. It further offered the opportunity for the City of Barrie and the County of Simcoe to demonstrate leadership not only in the creation of a unique building type (the shared facility), but to the industry in terms of its delivery process.

Benefits over a traditional method:

1 - IPD offers the best use of expert resources and time up front providing a high level of detail and scrutiny on design process to avoid costly change orders later in the process and reduce potential for delays that result in increased escalation.

2 - High risk and high cost contractors for the construction team have already been secured through a public competitive bid process (mechanical, electrical, structural etc), which ensures cost certainty in the early stages of the project.

3 - Multi party agreement with incentives for all parties to find efficiencies that result in shared benefits for owners and the construction team. This ensures that all IPD team members are actively seeking ways to discover efficiencies through all stages of the project.

4 - Multiple quotes and market comparators used for all pricing to ensure all costs (labour, materials, cost psf) are within industry standards and consistent with our experience with similar facilities.



# 3

## PROJECT DESIGN

Architectural Overview

Building Design and Flow

Construction Approach and Materials

Building Elevations

Response to Site

Sustainability Features

Building Systems

## SITE PLAN OVERVIEW

**BUILDING A**  
ADMINISTRATION / OPERATIONS FACILITY

**BUILDING B**  
TRAINING FACILITY

**BUILDING C**  
POLICE VEHICLE REPAIR



## ARCHITECTURAL OVERVIEW

The design of the Barrie-Simcoe Emergency Services Campus stems from an understanding of stakeholder needs and requirements. To best address these requirements, the campus has been designed with three distinct and separate structures with an overall building area of 235,480 sq.ft.

**Building A** is a three-storey (four level), 179,208 sq.ft. post-disaster building (a post-disaster building is defined as one that is essential to the provision of services in the event of a disaster) that is the heart of the campus. The majority of the building is comprised of the administrative and operational functions for the Barrie Police Service and the County of Simcoe Paramedic Services. It also houses a number of shared programs, including the three-party shared lunch room, fitness centre and all mechanical and electrical spaces. This building is the public face of the campus, featuring a main public lobby and community space.

Building A has been purposely designed as a simple, thin rectangular volume oriented along 'Road A'. Its envelope design is highlighted by a series of strong vertical cuts that emphasize window openings. The strategic spacing of vertical windows has allowed the building to achieve only 21% glazing – resulting in a highly efficient building envelope. The building is long and narrow to ensure natural daylight can penetrate into the centre areas of the floor plate, but also a clearly defined circulation corridor can easily accommodate densification, future growth and phasing.

The interior of the building is centred around a shared vertical circulation atrium. Central meeting rooms, elevators and washrooms are stacked along this vertical spine through the four different floor levels for distribution efficiency and simple way-finding. The office areas have been designed with an open flexible grid, so that the layout of the office areas can adapt and change over time without any fundamental reconfiguration of the building.

Finishes within the building are purposely kept simple and durable with concrete and tile flooring in heavy circulation areas, and carpet tile flooring in office areas. The exterior finishes are proposed to be a combination of masonry at the base of the building in heavy use areas and metal siding in an undulating profile at the upper floor levels and lighter use areas.

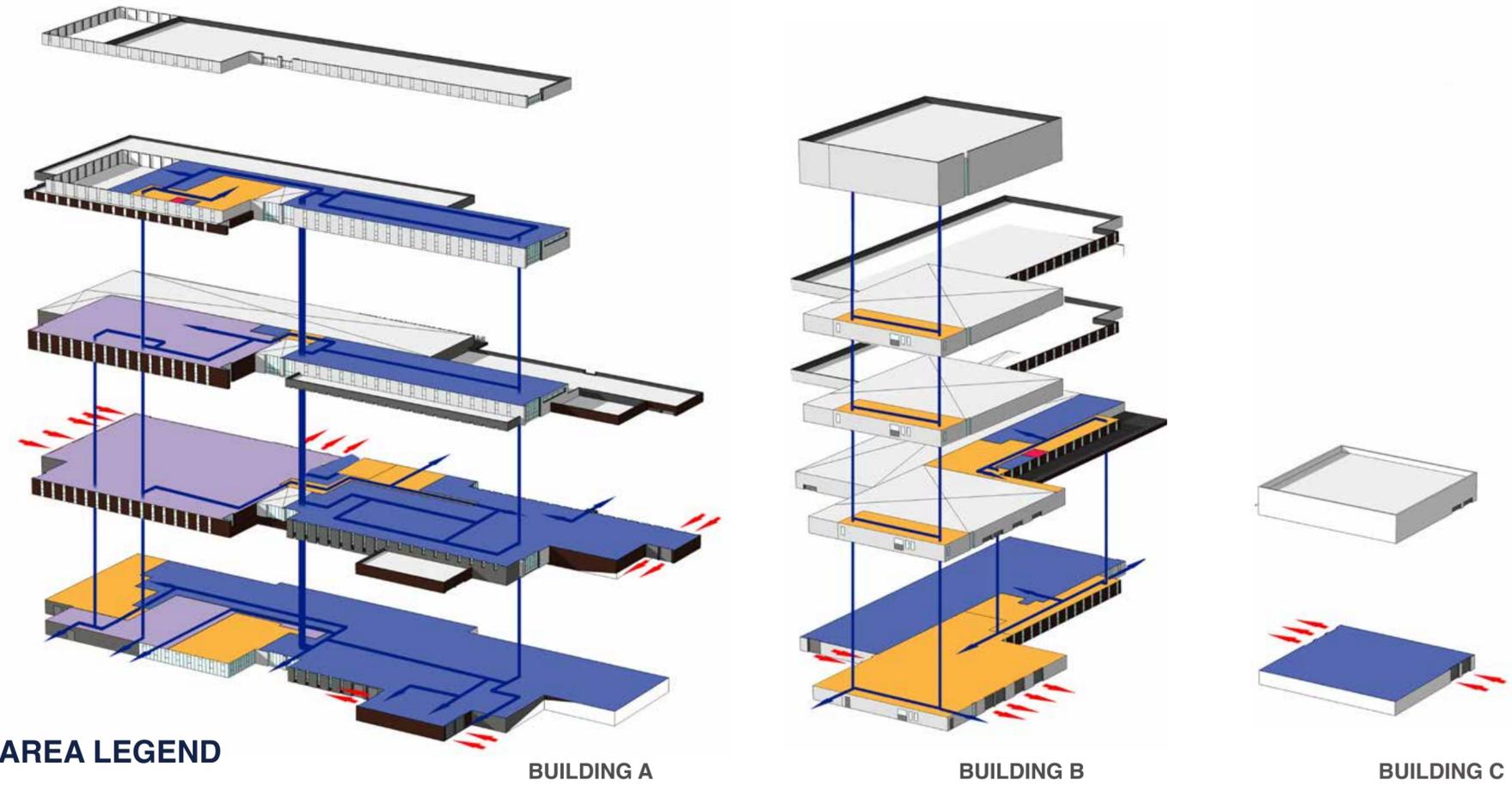
**Building B** is a 48,500 sq.ft. building which houses the training facilities for Barrie Police Service and Barrie Fire and Emergency Service. The building includes a twelve lane firearms range and a five-storey indoor training space. The building also houses a number of other training support spaces and training administration offices.

Building B is proposed as a separate building for a number of reasons. It does not require the added costs of being designated as a post-disaster facility. Given the use within the building, the separation and location of the building ensures that the noise and activity within the training facility will not impact the operations and administrative functions of Building

A, or neighbouring properties. Finally, due to the height of the five-storey training space, Building B will require additional fire protection requirements under the Ontario Building Code, such as a standpipe system. The separation therefore also aids in lowering the overall cost of the project.

**Building C**, is a single-storey, 7,772 sq.ft. structure that houses vehicle maintenance for the Barrie Police Service. The building also includes a small number of staff spaces, as well as a significant storage area for tires and parts. Due to the access requirements of the vehicles, Building C lends itself well to being a separate structure to accommodate the required number of vehicle entrances and drive-through bays. By separating Building C, it is also exempt from stringent fire protection requirements under the Ontario Building Code, as well as post-disaster requirements, which would add cost to the overall project if it were to be included within Building A or Building B.

The design anticipates future growth for all users and incorporates space allocation for expansion on the site. Through consultation with all users, the site plan has been developed to anticipate where future growth will occur, and to ensure that when growth does occur, it can be developed with minimal impact or interruption to regular activity or operations. Similarly, the circulation within the building has been developed in alignment with where future growth or expansion is expected to occur. This alignment is intended to avoid significant building modifications if and when the expansion occurs.



**PROGRAM AREA LEGEND**

- BARRIE POLICE SERVICE (BPS)
- COUNTY OF SIMCOE PARAMEDIC SERVICES (CSPS)
- BARRIE FIRE AND EMERGENCY SERVICE (BFES)
- SHARED SPACE

**BUILDING DESIGN AND FLOW**

A shared Barrie-Simcoe Emergency Services Campus creates efficiencies in terms of shared space, however, it also creates a number of challenges in terms of security and access requirements. The design of the campus and the flow of circulation for each individual user is paramount in ensuring a safe and successful campus project.

From the designated public parking area, the public can access both the main lobby of the Barrie-Simcoe Emergency Services Campus, as well as a separate Accident Reporting entrance. The main lobby features tall ceilings and a glazed western frontage allowing daylight to fill the space. Directly off of the lobby is a shared community room and public washrooms that are shared by all users on the campus. Also off this corridor are the main Police service counter and records counter. The public lobby space is secured from the rest of the building, however, the design is configured to allow invited access to a 'shared secure' area that would allow public guided access to other specific areas of the building. The 'shared secure' space includes an elevator and exit stair that would lead invited visitors to other programs within the building without interrupting or conflicting with the regular circulation or activity of any of the campus users.

All campus users – the Barrie Police Service, County of Simcoe Paramedic Services, and Barrie Fire and Emergency Service – enter the site through secured gates at the north or south

ends of the campus property. From these entrances, users are guided down to a series of secured parking areas at the lower east side of the property. From the shared parking areas, users can gain access to any of the three buildings on the campus.

Building A includes three separate and secure staff entrances at Level One: one dedicated for Police, one for Paramedics and one shared entrance. All entrances are within proximity to one another and are centred around a four-storey interconnected floor space, a shared lunch room, and a shared fitness centre. This is the heart of the building for all the users on the campus. From Level One, Police have dedicated and secure access to a set of elevators and a feature open stair within the interconnected floor space that leads staff to all four levels within the building. From Level One, the County of Simcoe Paramedics also have dedicated and secure access to an elevator and interior circulation stair that leads staff to Levels Two and Three. In addition to the dedicated access, there is also access for all users to a shared stair and elevator that is used to guide escorted visitors through 'shared secure' spaces within the building. All circulation within Building A is centred by the shared spaces and the interconnected floor space, which includes generous amounts of glazing to bring in natural daylight, and the opportunity for public art.

Building B includes a shared entrance for both the Barrie Police Service and Barrie Fire and Emergency Service. All of

the circulation within this building is shared between these two users, including corridors, elevator and stairs. All dedicated program spaces are then secured individually off of the shared circulation routes. All amenity spaces such as washrooms, meeting rooms, classrooms and staff touch-down spaces are shared and accessed off of this same circulation. The multi-purpose indoor training space offers the opportunity for inter-partner collaboration in a mutually beneficial shared space.

Building C is solely dedicated to Police vehicle maintenance and staff. This is a single-storey building, with secure entrances and access points dedicated for the Barrie Police Service.



BUILDING A - SECTION THROUGH INTERCONNECTED CIRCULATION SPACE



BUILDING A - MIRRORED SECTION THROUGH INTERCONNECTED CIRCULATION

## CONSTRUCTION APPROACH AND MATERIALS

All buildings within the shared Barrie-Simcoe Emergency Services Campus have been designed and developed to balance function, durability, flexibility and overall cost effectiveness. The buildings are designed with a clean palette of materials. The palette consists of a dark iron-spot brick masonry that is featured around major entrances and in locations where durability is a requirement. The brick is contrasted by a light metal profile siding and tinted glass assembly, which wraps all other areas of the building. The metal profile siding is a cost-effective material, but also provides a low-maintenance and sustainable solution to the overall envelope design.

All of the users who occupy the Barrie-Simcoe Emergency Services Campus provide essential services to the community and therefore the building is required to be designed as a post-disaster facility, as per the 2012 Ontario Building Code (OBC). Building B and Building C house programs that are not considered post-disaster occupancies and will therefore be designed as Normal Importance Buildings. All the buildings will be supported on conventional cast-in-place concrete spread and strip footings founded on native soils. The construction of the lowest floor within the buildings will be conventional cast-in-place slab-on-grade supported on compacted granular fill and the underlying native soils. Thresholds and aprons at vehicle doors will also be constructed of conventional slabs-on-grade.

Building A will be a four level, three storey structure constructed

into the natural grading of the site. Level 1 will be a walk-out to the lower grade on the secure east side of the building. The other three sides of the building will have walkouts to the higher grade at Level 2. This will require a cast-in-place concrete basement wall on three sides that will retain soil. The majority of the floor and roof slabs for Building A will be constructed of two-way cast-in-place concrete flat slabs. Drop panels will be formed into the slabs at the concrete columns that will be positioned generally on a regular 9m x 9m grid. This grid was developed as this typically lends itself to be the most cost effective and flexible structural grid. The low roofs over the Ambulance bays and the Police Vehicle bays will be constructed of steel deck supported by structural steel joists, beams and columns. Lateral loads due to wind, earthquake, and earth pressures will be resisted by moderately ductile cast-in-place concrete shear walls.

Building B houses three main uses: the five-storey Training Facility, the two-storey shared Police and Fire support training spaces and the single storey, double height Police firearms range. Typically the construction will consist of structural steel elements. Steel roof deck will be supported by structural steel joists, beams and columns. Floors will be constructed using concrete on steel deck, supported by composite steel beams and steel columns. The firearms range roof will vary with concrete cast on steel deck, supported by structural steel joists. The steel joists will be supported by concrete walls that form the perimeter on all four sides. Concrete walls were

used in the firearms range for a number of reasons; acoustics, durability, and the most economical material to accommodate the required clear spans. The Training Facility is a large five-storey indoor multi-use space that is column-free volume that results in heavier structural steel sections than is typical. The buildings will resist lateral loads due to wind and earthquake by conventional structural steel braced frames and for the firearms range, conventional concrete shear walls.

Building C will be a single storey structural steel building that houses the Police vehicle maintenance program. The roof will be constructed of steel deck supported by structural steel joists, beams and columns. The roof structure will be designed to support additional hanging loads, as required for vehicle maintenance. Lateral loads due to wind and earthquake will be resisted by conventional structural steel braced frames. Steel is appropriate for this structure as it allows the most cost effective solution to the program requirements.



WEST ELEVATION - BUILDING A AND MAIN PUBLIC ENTRANCE



EAST ELEVATION - BUILDING A AND MAIN STAFF ENTRANCE



**NORTH ELEVATION - BUILDING A AND BUILDING B**



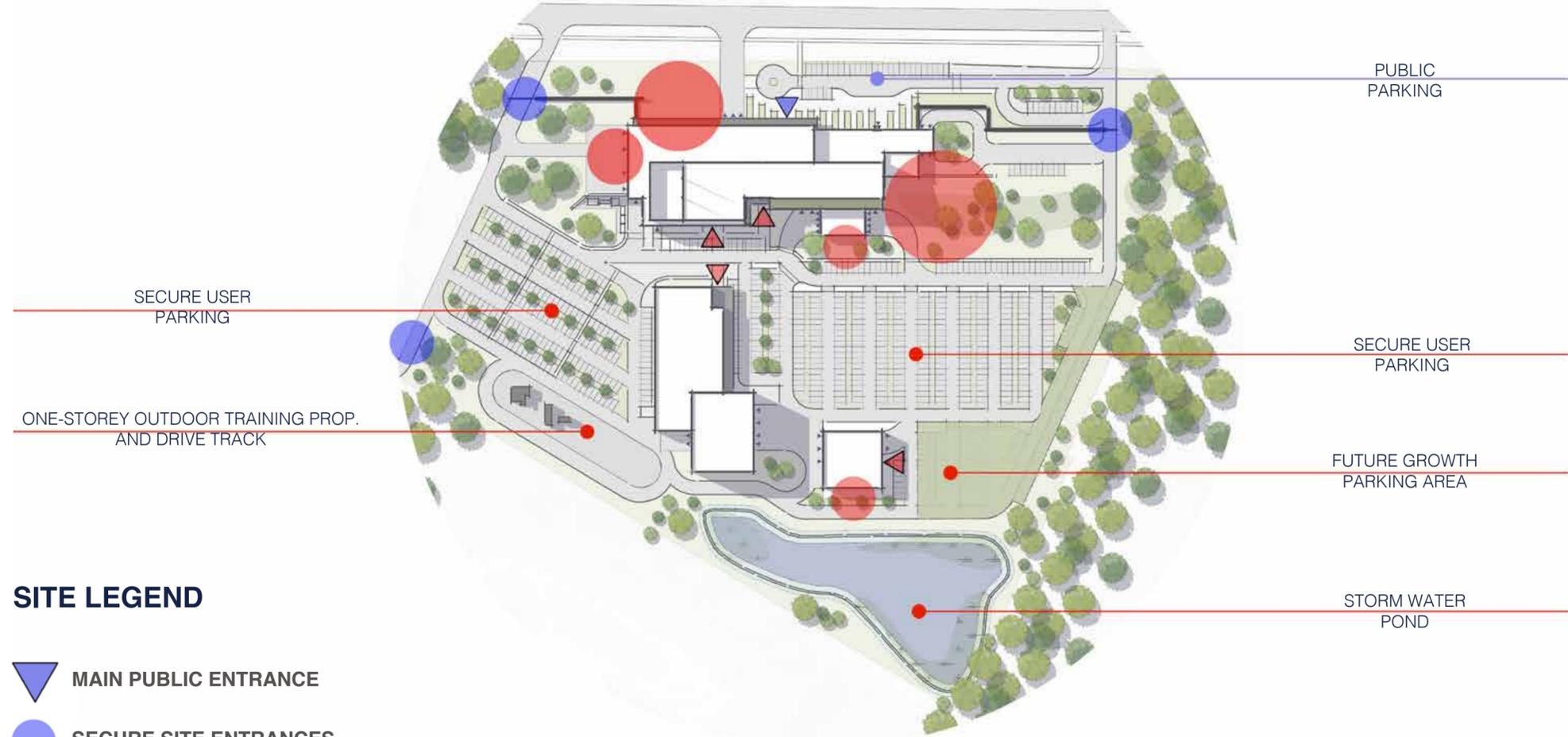
**EAST ELEVATION - BUILDING A, BUILDING B AND BUILDING C**



**SOUTH ELEVATION - BUILDING A AND BUILDING B**



**WEST ELEVATION - BUILDING B AND BUILDING C**



**SITE LEGEND**

-  MAIN PUBLIC ENTRANCE
-  SECURE SITE ENTRANCES
-  MAIN STAFF ENTRANCES
-  DESIGNATED AREA FOR BUILDING EXPANSION AND FUTURE GROWTH

**RESPONSE TO SITE**

The site for the project is centrally located within the City of Barrie, visible from a major arterial road. It offers suitable GIS response times and is large enough to support future growth. The primary goal for the Barrie-Simcoe Emergency Services Campus is to meet the current and future needs of the various user groups through the creation of a safe, secure and functional site plan, while promoting sustainability and the comfort of campus users.

Careful consideration has been taken in siting all buildings and site element components within the campus. The one-storey outdoor training prop. building for example has been located in the most south-eastern point of the site to take advantage of the natural prevailing winds and to create space between this element and the residential neighbours nearby. Building A's siting provides a strong community street presence and simple entry way-finding for the community and project prominence with proximity to a major artillery road. By centrally locating all buildings within the site as well as designing landscaping features along the perimeter of the site a significant natural and physical buffer has been created between the campus buildings, site activities and the surrounding neighbours.

Priority is given to pedestrian circulation and the safe and convenient movement of all staff and visitors within and around the site. Of prime importance will be the linkage between Building A and Building B, as this corridor will be a hub of staff movement within the campus. Exterior occupant spaces will

also be provided in the form of patios, walkways and seating areas.

The Barrie-Simcoe Emergency Services Campus will incorporate natural environments within the boundaries of the site using native species and species that require low maintenance and are hardy to given site conditions. Plantings will serve four basic functions within the site design: screening, ornament, temporary cover, and storm-water management.

The safe and convenient movement of service and delivery vehicles throughout the site is a prime importance. Service, delivery and maintenance vehicle movement will be reduced through high-traffic pedestrian corridors, limiting unnecessary vehicular-pedestrian conflicts. All parking areas and drive aisles will contain crosswalks where pedestrians are required to cross vehicular routes.

The site is naturally graded west to east, which allows the design to take advantage of the existing topography and permits entrances at both lower Level One from the east and Level Two from the north, west, and south. The site will then slope around Building A to the east at a grade of 1 % to 2%.

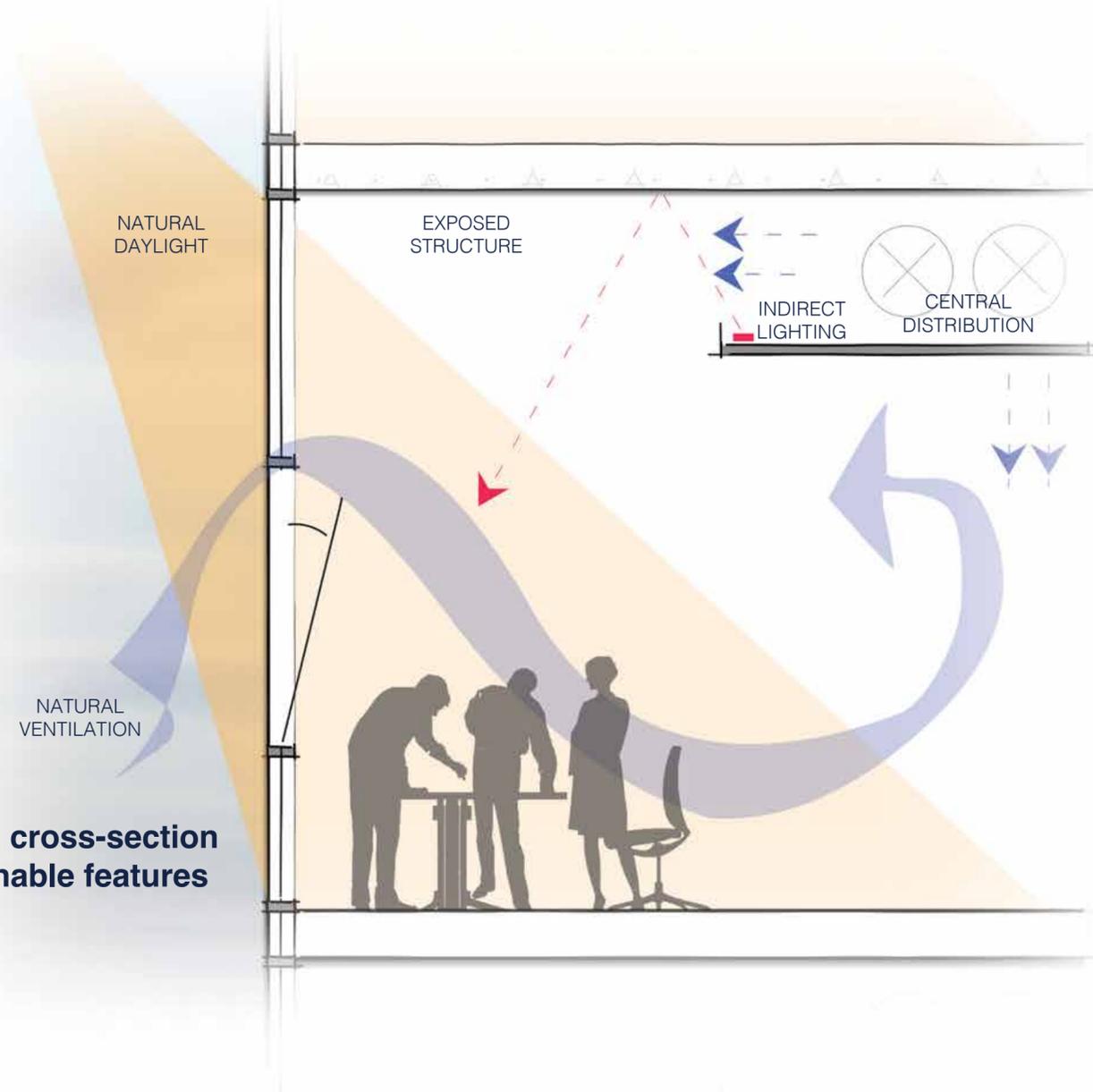
The storm drainage system will convey storm drainage flows picked up from roof drains, catch-basins and bioswales and will convey them to a storm-water management pond to be

constructed on site. The storm drainage system will also convey flows for an existing storm-water management pond to the west side of 'Road A'.

The servicing design for the campus will provide sanitary sewage disposal, storm drainage and water supply for both potable and firefighting requirements. The pipe system has been design to convey flows for the ultimate condition. A sanitary drainage system is provided to convey sewage flows from the three buildings to the existing municipal system. The sanitary system has been designed such that pumping will only be required from the elevator sump pit in Building A.

Allowances have been made on the site to accommodate future growth: to the northeast and southwest of Building A for phased growth of Paramedic and Police administrative space and Paramedic vehicle bays, and to the east of Building A and Building C for future Police fleet and maintenance vehicle bays. Additional Police parking has also been identified on the site to support the growth mentioned above. Provisions to support a future shared refueling station and vehicle car wash facility have been incorporated into the overall campus site plan to minimize future site disturbances and costs.

**BUILDING 'A' –  
Typical building cross-section  
showing sustainable features**



## SUSTAINABILITY FEATURES

The Barrie-Simcoe Emergency Services Campus incorporates an extensive number of sustainable features both in the design of the site and the buildings themselves with a target of LEED Silver designation. It is anticipated that the cost premium for a LEED Silver designation is in the range of 5% of overall construction cost value with a payback of 10-15 years depending on utility rates. There are many benefits that offset this premium including; healthy and long-term wellness for the daily activities of the occupants, reduce operating costs, limit impact on the environment and lessen GHG output as compared to traditional building solutions.

The site is centrally located within the service areas of the user groups, which reduces the distance traveled for vehicles on patrol or responding to calls. The building is also within proximity to public transit and includes bicycle facilities for those who may use an alternative means of transportation when traveling to the site.

While the site requires parking to support both personal vehicles and the fleet vehicles used by the three services, the parking footprint has been reduced by analyzing the shift changes of each user and confirming the actual numbers required. Premium parking will be dedicated for "green" vehicles and "carpooling". This leaves more of the site available for undeveloped natural space. Drought-tolerant plant species have been used in

the landscape design in order to reduce outdoor water use. A low-impact storm-water management strategy has been implemented, with runoff from the parking areas and the building roofs being collected in a storm-water pond.

The building has been right-sized through extensive discussions with the user groups. Designing more open-concept work spaces where possible resulted in significant reductions in square footage, which in turn reduces the impact of the campus on the environment, reduces operational costs, as well as creating a more cost-efficient project overall.

The intent is to use as many local materials as possible for the building finishes. For sustainability purposes, a "local" material is one that is produced within an 800km radius of the project site. For example, the buildings include a large amount of metal siding, which is a locally sourced material.

The exterior building envelope of Building A includes 21% glazing. Having a larger percentage of solid wall area with an R-value (thermal rating) of 25 means a higher continuous insulation value, and therefore a much more energy-efficient building. The efficient and strategic allocation of glazing ensures that natural daylight is maximized within the building footprint. Windows are also operable, allowing the building's occupants to also access fresh air when desired.

Other sustainability features that also reduce operational costs have been incorporated into the building services: low-flow plumbing fixtures, energy-efficient LED lighting fixtures, daylight and occupancy sensors for interior lighting, and an innovative mechanical design that features ice storage tanks to support the chiller plant for increased energy efficiency.

The above mentioned sustainable strategies have been evaluated to provide the best solutions for the largest return on investment throughout the building's life-cycle.



## BUILDING SYSTEMS

Quality equipment from reputable manufacturers will be specified to improved system longevity. Equipment will be located in accessible space for ease of maintenance. Equipment and installations located outdoor will be weather and corrosion resistance to improve life expectancy. Equipment lifetimes can often be extended significantly through robust maintenance programs that go beyond the norm, and many facilities currently have functioning equipment older than the expected lifetimes. Where possible, strong consideration will be given to choose vendors that have “evergreen” policies, where all previous versions are supported in newer hardware / software to allow increased longevity.

### PLUMBING

Standard plumbing system provided with cold water distribution, hot water generation in various hot water heaters for various areas of the building to suit local demand and layout. Plumbing fixtures have been selected for function and design; including low flow fixtures to meet sustainable targets. High efficiency hot water production will contribute to operational energy savings.

### FIRE PROTECTION

Buildings A and B will be protected throughout with automatic fire sprinkler systems. Building B will also be equipped with standpipe system. System design and selection is based on building occupancy and hazards with consideration for areas that are sensitive to potential property damage. Additionally, a supplemental clean agent extinguishing system has been included for the Server Room/ Data Centre Room of Building A to minimize the potential impact of a fire scenario on the operation of this critical space.

### HVAC

The ventilation systems support the function of the space. High outside air airflow areas will be equipped with Heat Recovery Units with integral heat wheels, and administrative areas will be served by fancoil units with fresh air ducted from a central air handler. Each fancoil zone will be provided with a thermostat for occupant thermal control and comfort.

The heating system consists of a central heating plant with boilers and distribution which serves the entire campus from Building A. Hot water is provided to all heating coils in all air handlers, to fancoil units, cabinet heaters, as well as in-floor heating in the various vehicle bays.

Cooling to the buildings will be provided by a series of outdoor air-cooled chillers and corresponding distribution pumps. An additional component to the plant is an ice storage system which permits the plant to be downsized by operating at high capacity during periods of low load and favourable outdoor conditions (i.e. at night). Ice will be melted during high load and periods of peak electricity rates, to save on operational costs. The heating, ventilating and air conditioning system employs a number of energy saving measures such as heat recovery strategies, premium efficiency and modulating equipment, and controls strategies for optimal equipment operation.

### ELECTRICAL

The electrical systems for the Barrie-Simcoe Emergency Service Campus will provide power and communications for the facility. A new electrical service will be provided by Alectra Utilities (formerly Powerstream) from the pole line on Road A. Spare capacity will be included for future expansion. Since it is classified as a post disaster facility, multiple synchronized generators will provide Building A with back-up power to maintain essential services during a power outage. Building A and B emergency lighting will be provided by local inverter systems with battery backup. Lighting fixtures connected to the emergency circuit will also be used as ‘night light’. Standard battery packs and remote heads will be utilized for Building C.

Building A will be also equipped with a UPS to provide seamless back-up power to the data centre equipment, radio equipment, the dispatch centre and cell block video monitors. A generator will provide extended back-up power with on-site diesel fuel storage for at least 24 hours.

All lighting will be provided with switch control appropriate for the type of space served to aid in energy conservation. Lighting fixtures will be selected to complement the architectural features and meet or exceed the OBC requirements for maximum lighting power density allowed for the type of building occupancies. Exterior lighting will employ LED fixtures complete with full cut-

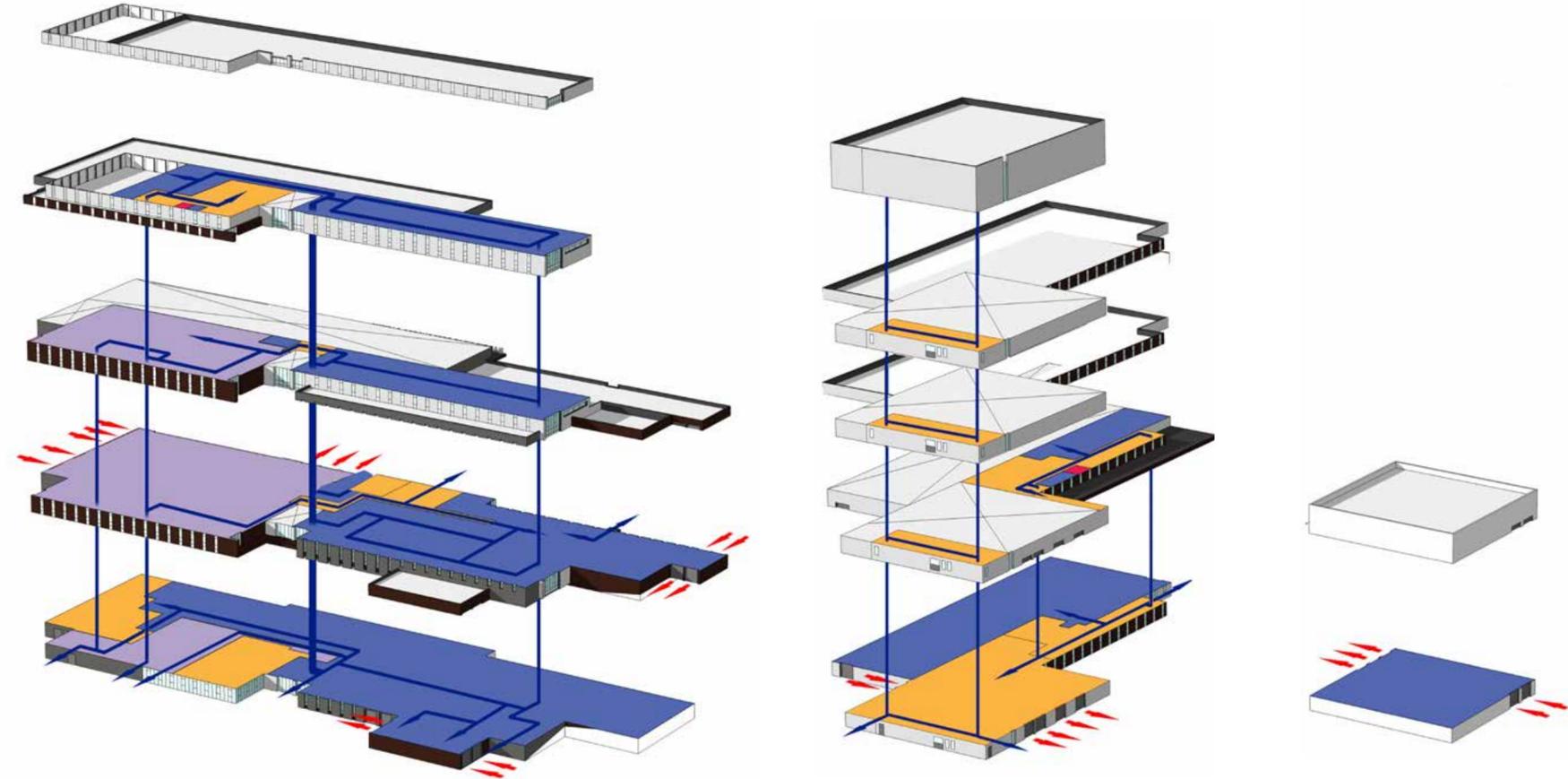
off optics meeting “Dark Sky” criteria providing uniform light distribution and glare control throughout the property with minimal light trespass beyond the property line.



# 4

## PROJECT DATA

- Building Statistics
- Program Areas and Shared Space
- Project Schedule
- Project Cost Summary



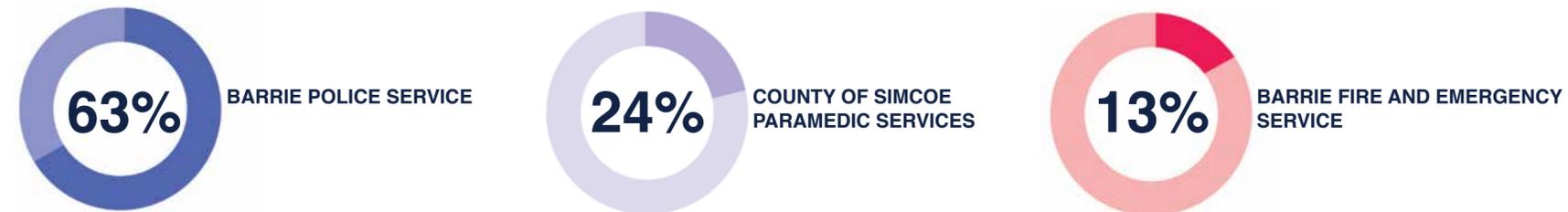
BUILDING A

BUILDING B

BUILDING C

**BUILDING AREA**

Of the total program area, the break-out of space allocated to each stakeholder is shown below. Shared space is included in these percentages and split between stakeholders based on an agreed utilization of area.



**BUILDING STATISTICS**

Building A is 179,208 sq.ft. in area, of which 114,994 sq.ft. (64%) is dedicated to Barrie Police Service, 57,287 sq.ft. (32%) is dedicated to County of Simcoe Paramedic Services, 6,927 sq.ft. (4%) is dedicated to Barrie Fire and Emergency Service. Of the total area included in Building A, 24,294 sq.ft. (14%) is shared space.

Building B is 48,500 sq.ft. in area, of which 24,600 sq.ft. (51%) is dedicated to Barrie Police Service, and 23,900 sq.ft. (49%) is dedicated to Barrie Fire and Emergency Service. Of the total area included in Building B, 27,400 sq.ft. (56%) is shared by Barrie Police Service and Barrie Fire and Emergency Service.

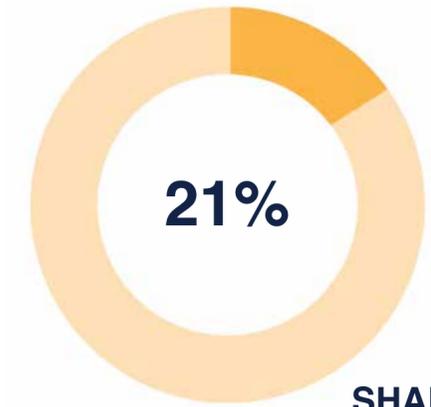
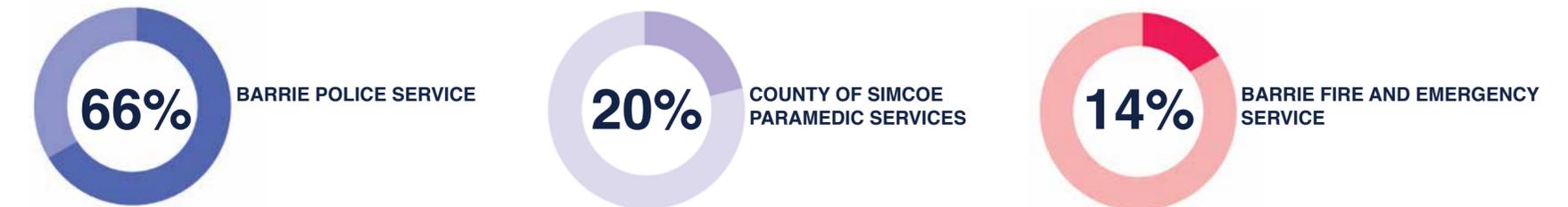
Building C is 7,772 sq.ft. in area, of which 100% is dedicated to Barrie Police.

The site includes 627 parking spaces, with space allowance for an additional 44 parking spaces to accommodate future growth. The site plan also anticipates the future growth of the building and has maintained green space for when that expansion is required.

The site includes two large training props: a 240 meters driving track to be shared between the Barrie Police Service and Barrie Fire and Emergency Service for driver training, and a one-storey outside training prop. that can be used for training scenarios involving live fires.

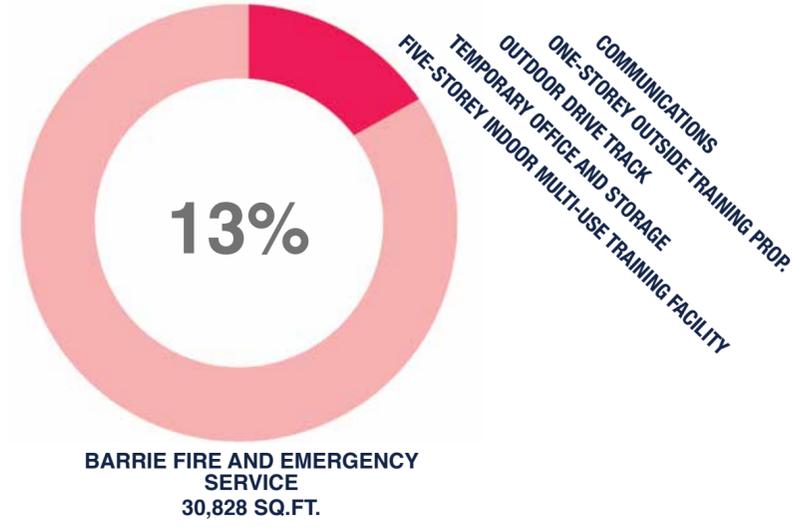
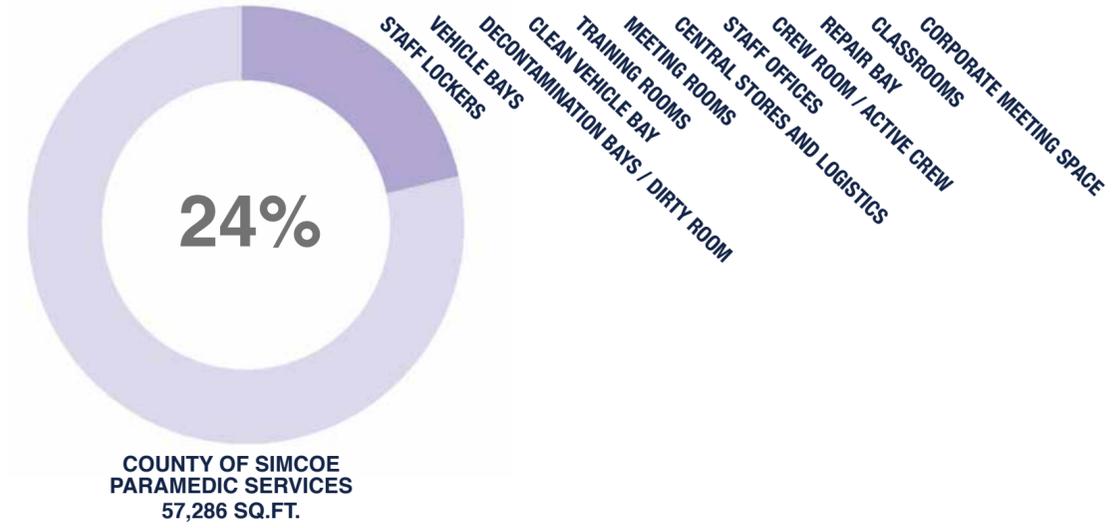
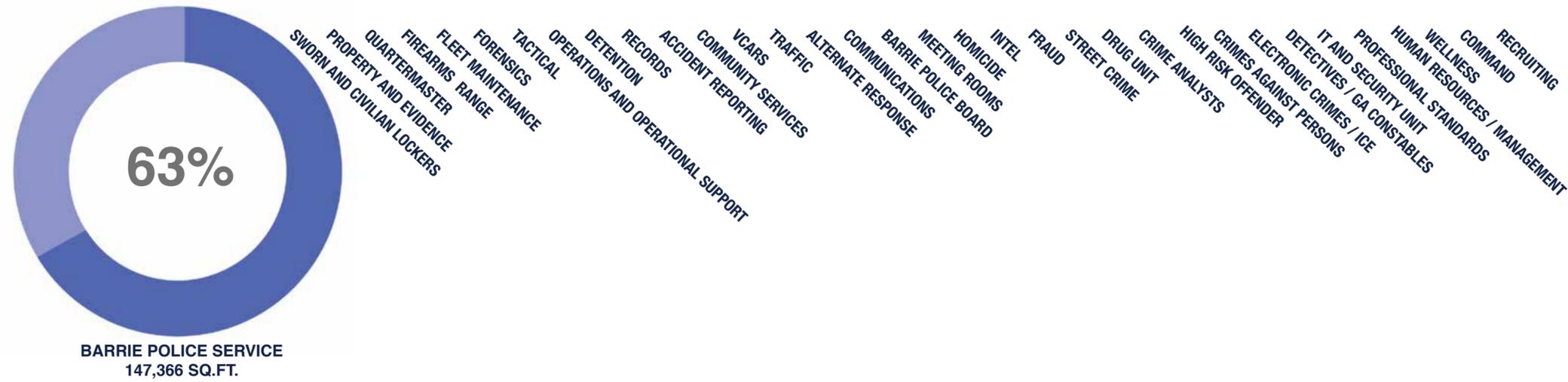
**SITE AREA**

Of the total site area, the break-out of space allocated to each stakeholder is shown below. Shared space is included in these percentages and split between stakeholders based on an agreed utilization of area.



**SHARED SPACE**

Of the total program area, the break-out of space allocated to shared space is shown above.



### PROGRAM AREAS AND SHARED SPACE

A key advantage to co-locating is the opportunity for shared spaces that would simply not exist in a scenario where the user groups are housed independently. During the course of Validation, the project team dedicated several weeks to exploring and evaluating opportunities for sharing space. The outcome of that process was that there were two key areas that would be shared between all three user groups, plus a number of other opportunities to share certain spaces between two of the user groups.

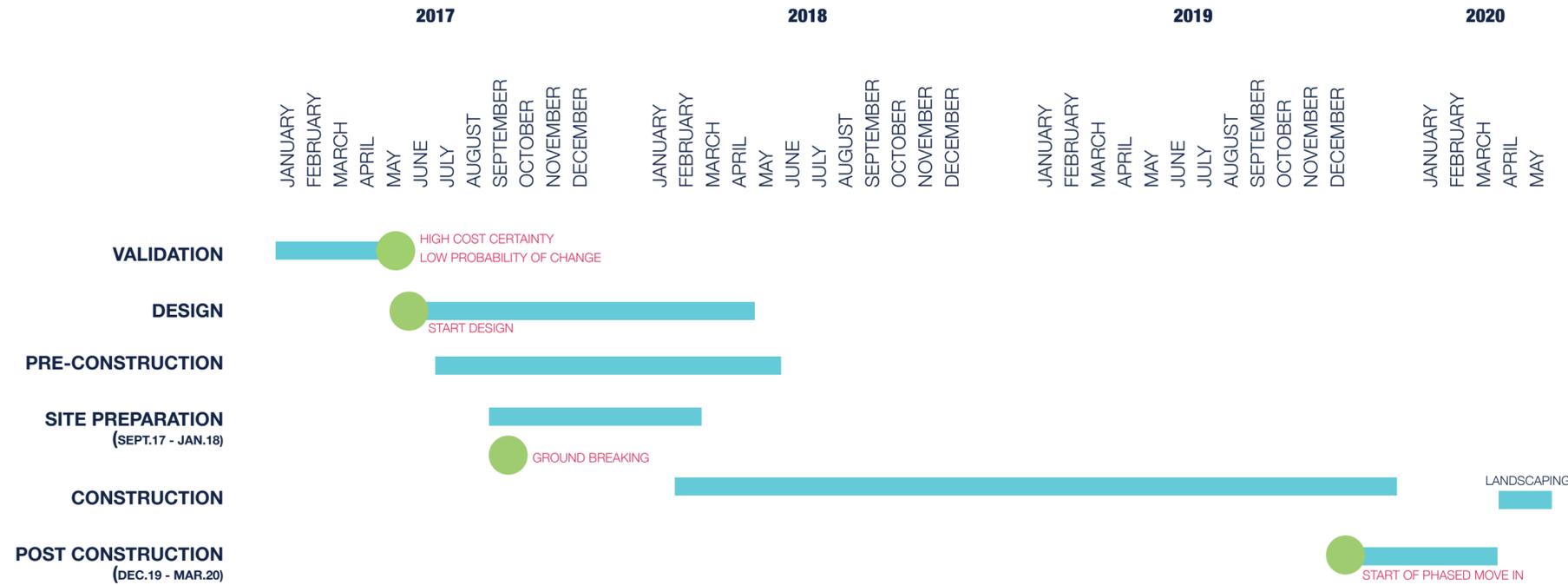
The dispatch area will be shared between the Barrie Police Service and Barrie Fire and Emergency Service. Currently, the two services operate separate dispatches, but they will be amalgamated in the Barrie-Simcoe Emergency Services Campus, which will allow for operational efficiencies and synergies between the two groups and provide redundancy for emergency services radio infrastructure.

Building B is shared between Barrie Fire and Emergency Service and Barrie Police Service. Meeting spaces and classrooms within this building are all shared, as is the five-storey indoor multi-use training facility that could be used by either service for training scenarios.

The site also provides opportunities for sharing between the user groups. The driving track was a training prop requested by Barrie Fire and Emergency Service, that will also be easily accessible for the Barrie Police Service and County of Simcoe Paramedic Services thanks to co-location.



## PROJECT SCHEDULE



## PROJECT SCHEDULE

### SCHEDULE METHODOLOGY

The project team has successfully implemented a powerful schedule management technique, called the Last Planner System, on previous projects. This technique will be expressly used for this project. Pull Planning, a key component of the system, involves harnessing the collective input of the project team to identify barriers and constraints affecting the schedule. The project team can then effectively work together to overcome those identified barriers. The project team has also used pull planning throughout validation and we have realized considerable benefits in terms of schedule impact and completing validation below budget, while supporting several more design concept iterations than anticipated under the original schedule. This method is based upon lean planning principles and individual accountability of all team members.

In true Integrated Project Delivery fashion, the entire team works in a partnership structure with each other to achieve optimal process flow on the job site. This can be accomplished because the team makes reliable promises and commitments to each other, which are rigorously tracked and measured using Planned Percent Complete (PPC) metrics. This further enables the team to identify root causes of delayed tasks so that the project team can work collaboratively to remove those roadblocks. The philosophy of continuous improvement, collaboration, identifying root causes, and removing roadblocks

for the team on- site makes our project delivery system the best in the industry for this project.

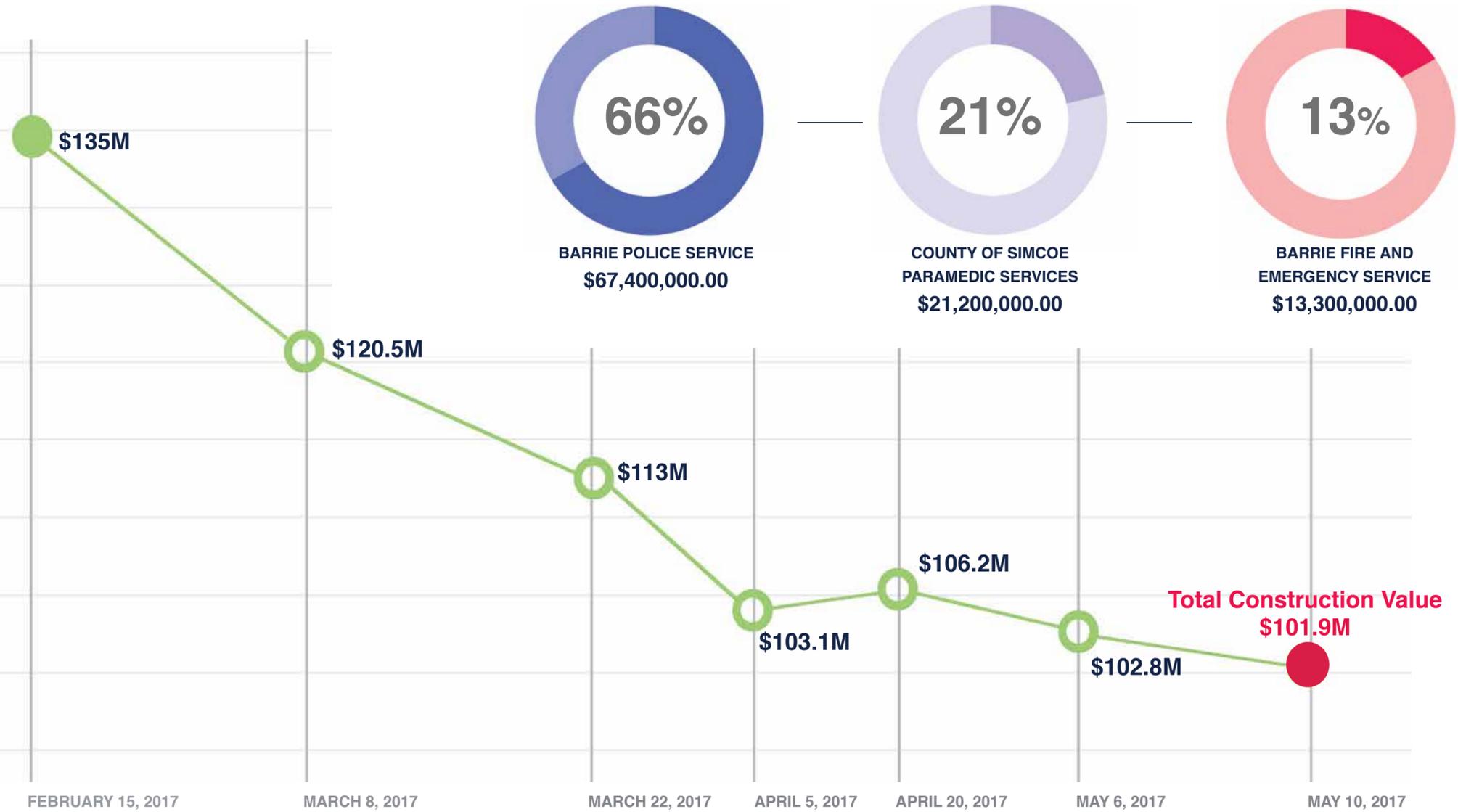
Other important scheduling/planning tools the team will utilize include, but are not limited to: look-ahead planning, weekly work plans, critical path scheduling, pre-fabrication and modularization, early and sequential material procurement, just-in-time delivery, 4D scheduling, Building Information Modelling (BIM) and other valuable lean planning principles.

Another advantage the IPD framework offers, is the ability to share resources such as equipment, materials, and labour. On a traditional project, multiple sub-trade teams will have scissor lifts, for example, that sit idle while their project counterparts go and rent a similar piece of equipment for their own use. On this project the team will realize efficiencies by renting and/or purchasing equipment as a unit to share across the project, in addition to sharing labour and material. All trades involved in the project will have a forum to communicate their needs and usage of shared resources, and to identify what their expectations are for the resource. Overall this approach provides best value to the project, and the project stakeholders.

### SCHEDULE IMPLEMENTATION

Scheduling is a key component to the successful delivery of the Barrie-Simcoe Emergency Services Campus project. There will be a dedicated scheduler assigned to the project

to work through both the design and construction phases to guarantee the successful delivery of the project by December 2019. The project team is currently mobilized and is positioned to continue seamlessly into the detailed design phase. This will enable the design team to focus on critical items such as civil and foundation works. The construction team will leverage this efficiency by starting the site preparation works in Fall 2017 – this includes site clearing, temporary offices, parking, and storm water management. The project team will apply for the foundation permit early and will be ready to start structural footings in February 2018. This is the optimal time for this project to start foundations, and will reduce the number of winters the construction team will be exposed to. By installing the superstructure and building envelope simultaneously the construction team will have the building enclosed by January 2019. This will result in significant cost savings associated with winter conditions. Further efficiencies such as overlapping building envelope, interior rough-ins, and interior framing will provide additional time savings. To maximize a steady workflow the construction crews will transition from Building A to Buildings B and C, this will also allow all three buildings to be constructed in parallel. The building construction phase will last 23 months, and the client will be able to start moving into the campus by December 2019. Some minor final site works and landscaping will follow into the Spring 2020 which will allow the vegetation to be planted.



**PROJECT COST HISTORY**

**PROJECT COST SUMMARY**

**ACHIEVING TOTAL CONSTRUCTION VALUE**

The team initiated the program requirements collection in January 2017. During the initial block and stack exercise it was evident that the program requirements demanded more square footage than anticipated at the outset. By February 15th the project concept design total construction value was tracking at \$135M, far more than an acceptable project total construction value.

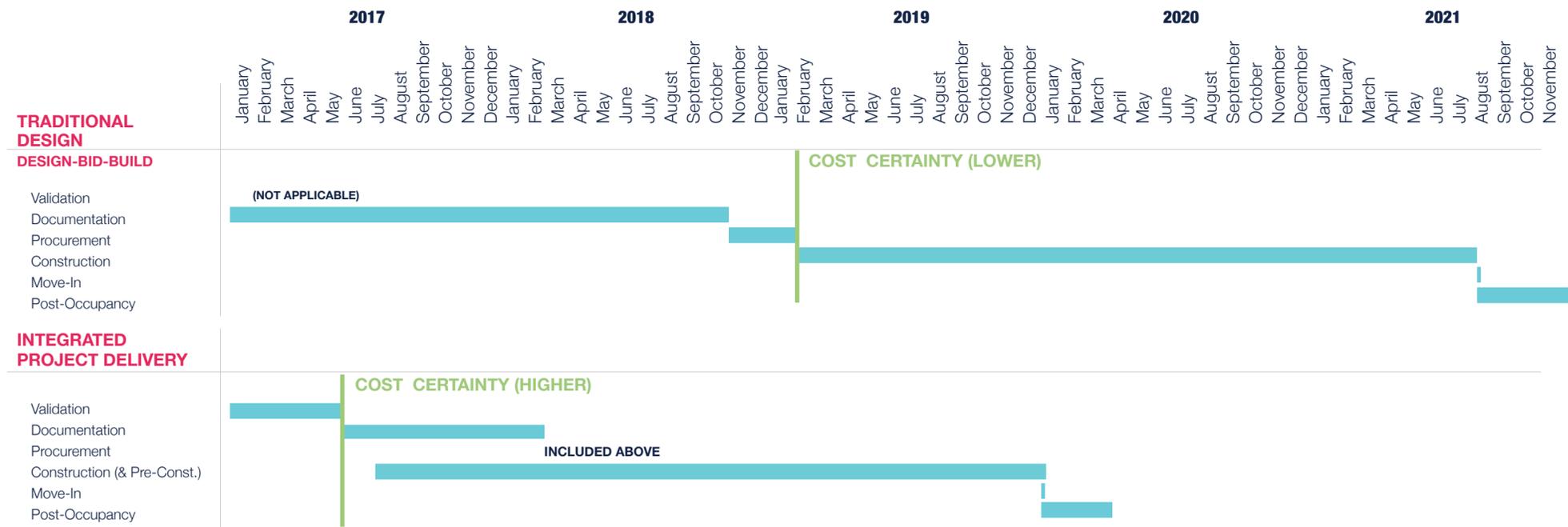
At this juncture, the team engaged in exploring multiple campus designs including housing all the program in a single building. These concepts were explored for cost, schedule and program satisfaction as well achieved our project values. Based on our analysis we moved to a three-building campus to reduce overall construction value to \$120.5M by March 8th.

Our team then undertook an extensive program “right-sizing” effort to explore all opportunities to share space amongst the three stakeholders. Barrie Police Service, County of Simcoe Paramedic Services and especially the Barrie Fire and Emergency Service, collaborated on ways to share meeting, training and general purpose spaces so that we could “right-size” the entire campus. Our team also evaluated the campus design for materiality, construction scheduling, sharing resources during construction, prefabrication and systems integration. Based on

this analysis we reduced the overall total construction value to \$113M on March 22nd.

Continued collaborative discussions from April through May 10th regarding program sharing, systems selection and project construction schedule enhancements reduced the construction duration to twenty-two months and an overall total construction value of \$101.9M.





	INTEGRATED PROJECT DELIVERY		TRADITIONAL DESIGN DESIGN-BID-BUILD	
	MONTHS	COSTS	MONTHS	COSTS
<b>Validation Study not included in Contract Total</b>				
<b>VALIDATION STUDY PROJECT</b>				
Validation Study	4	\$1,200,000.00	N/A	N/A
<b>Total Validation Study Project</b>	<b>4</b>	<b>\$1,200,000.00</b>	<b>N/A</b>	<b>N/A</b>
<b>BSESC PROJECT</b>				
Design and Implementation Documents	10	\$7,100,000.00	22	\$8,100,000.00
Contract Procurement	(Included Above)		3	\$1,100,000.00
Construction	26	\$74,300,000.00	30	\$75,600,000.00
Post Occupancy	3	\$2,600,000.00	4	\$3,400,000.00
Risk Register / Contingency	5.77%	\$5,900,000.00	10%	\$11,000,000.00
Construction Soft Costs		\$12,000,000.00		\$12,000,000.00
Cost of Changes	N/A	N/A	5%	\$5,200,000.00
Escalation Costs (3%)	N/A	N/A	16	\$4,700,000.00
<b>Total Construction Contract Value</b>	<b>47</b>	<b>\$101,900,000.00</b>	<b>59</b>	<b>\$121,100,000.00</b>
Total Owner Expenses (project soft costs)		\$7,100,000.00		\$7,500,000.00
<b>Total Project Budget</b>		<b>\$109,000,000.00</b>		<b>\$128,600,000.00</b>

## SUMMARY

### THE VALUE OF IPD FOR BSESC

Under traditional delivery methods, as originally anticipated in previous studies and reports, the campus development would have expected to cost \$121,100,000 and be completed by Summer 2021.

By selecting the IPD method of delivery the program can be delivered with a building designed for 50 years plus, incorporating both expansion and flexibility. The phased occupancy move-in can begin by the end of 2019 with total project completion by spring 2020, and with a total construction value of \$101,900,000.

Not only does this route give the certainty of cost and schedule, but earlier delivery reduces both operational costs and operational impacts for all three stakeholders but also provides earlier opportunities for future inter-departmental cooperation.

### COST CERTAINTY IN IPD

In a traditional design-bid-build project, the first time the owner has any significant degree of cost certainty is when the bids come back from tender. And as any owner knows, the low bid number rarely is the final cost: conflicts are discovered in the field, errors and omissions are discovered in the documents, changes are requested, mistakes in construction are made that need to be corrected...the list goes on. Risks are addressed as they are discovered and costs are covered through some form of contingency, or are handled through owner tradeoffs, or are passed along through contentious negotiation to one of the contracted parties.

Contrast this with cost certainty on an IPD project. During the validation phase, a multi-stakeholder team studies the building in many dimensions. High level budgets are established which increase in detail as the design matures, allowing the team to design to a detailed estimate instead of estimating a detailed design. Discussions of program, systems, materials, quantities, processes, and labor are all considered as the design evolves and estimates are updated simultaneously. Risks are identified in a detailed risk register and are assigned both numeric scope and likelihood of coming to pass, and are included in discussions of cost.

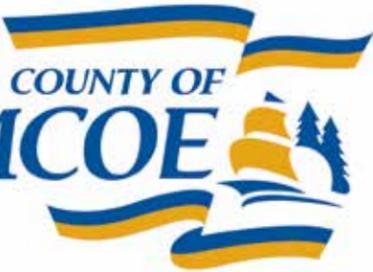
Target cost is committed to at the end of validation collectively by the team (including the owner). This commitment represents a higher degree of certainty than a hard tender project: the project has been considered robustly across many dimensions and through the eyes of a broad range of stakeholders invested in project success. Risks are identified proactively rather than reactively, resulting in a lower probability of significant change. For all of these reasons and more, owners on IPD projects can feel more confident in costs than on traditionally tendered work.

### BENEFITS OF IPD FOR BSESC

The diagram and chart at left clearly illustrate many of the benefits that accrue to the Barrie-Simcoe Emergency Services Campus project through IPD, including:

- Overall anticipated cost savings of more than \$19M
- 4 months to achieve higher degree of cost certainty vs 22 months in traditional
- \$980K to higher degree of cost certainty vs \$8M in traditional
- 5.77% allocation to risk vs 10% in traditional
- More accurate assessment of risk
- Almost zero likelihood of changes adding cost or time
- 43 months overall time to completion vs 59 months

*The City of*  
**BARRIE** **SIMCOE**



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