

STRATHCONA COUNTY EMERGENCY SERVICES

2023-2035 Master Plan



Strathcona County Emergency Services 2023-2035 Master Plan

Final Report, April 24, 2023 (Revised)



iStrategic Advisors Inc.
Involvement, Ideas and Innovation

How to Use this Document

This document, the Strathcona County Emergency Services 2023-2035 Master Plan, presents information in the following manner:

- Executive Summary – this provides an overview of the key messages in the Master Plan.
- Section 1: Introduction and Background – this provides the reader context for the Master Plan.
- Section 2: Community and Community Risk – this provides an introduction to Strathcona County and the concepts related to community risk assessment and community risk reduction.
- Section 3: Service Delivery – this is a summary of services provided by Strathcona County Emergency Services including the key performance measures.
- Section 4: Master Plan Goals – this presents the 2023-2035 Master Plan goals and desired results including those key initiatives supporting the achievement of the goals.
- Section 5: Implementation – this provides various activities aligned to the Five E's of Community Risk Reduction Framework. These activities build on the initiatives supporting the goals. There are some specific actions recommended in addition to the goals, initiatives, and Five E's activities.
- Appendices – this provides supporting information to the Master Plan.

It is important to note the 2022 Community Risk Assessment report and the 2023 Standards of Cover report provide additional information and analysis supporting this Master Plan.

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Executive Summary

Overview

Strathcona County Emergency Services (SCES) provides integrated fire, rescue, and emergency medical services (EMS) for urban and rural service areas of Strathcona County (County). These services are supported by 9-1-1 call answer and dispatch, fire prevention, fire inspections, fire investigations, public education, emergency management, and other specialty rescue services.

As an ambulance services provider, SCES provides services across the greater Edmonton metropolitan region, based on Alberta Health Services dispatching.

SCES has developed this 12-year (2023-2035) Master Plan to anticipate and navigate the future challenges and opportunities. This document considers community growth through a risk lens and looks to find a workable balance between service delivery, fiscal, and other realities for emergency services. Supporting this Master Plan are the 2023 Standards of Cover (SOC) and the 2022 Community Risk Assessment (CRA).

Where Are We?

The County has one of the most complex community-level risk profiles in Canada and possibly in all of North America. In a single day, SCES staff could respond to a retirement centre cardiac arrest, a high-rise fire, a heavy industry hazmat incident, a train derailment, and a forest fire.

In 2022, SCES responded ~12 thousand fire and EMS events, with some of these events requiring multiple apparatus and significant resources. The current call volume has doubled since 2012.

Where Are We Going?

At a population of 100 thousand, communities begin to see a significant number of multi-family dwellings, high rises, and other high-hazard developments. Strathcona County is no exception.

Future growth plans include a much broader, denser, and vertical community. In twenty years, the County is positioned to become one of the largest urban centres in the province, with a projected population over 130 thousand. Conservatively by 2044, SCES will be responding to ~16 thousand fire and EMS events.

Long range plans for the Cambrian and Bremner development areas will nearly double the urban footprint within the County and will present new challenges for the department. This changing nature of risk will require more complex mitigation and response strategies; and the demand for service is expected to double.

How Will We Get There?

Strathcona County is in transition. SCES must transform to meet the challenges of a growing community.

The Master Plan provides the framework within which the transformation will occur. It sets out the strategic goals, performance measures, and investments that will be needed through 2035 and beyond. The Master Plan lays out a blueprint for continuous improvement that will ensure that SCES, with the County as a whole, is prepared for whatever challenges they are presented with.

Building on recent investments and the positive efforts to date, SCES will fully embrace the 5E's framework of Community Risk Reduction (CRR) - Education, Engineering, Enforcement, Emergency Response, and Economic Incentives for this transformation.

This framework changes the focus from "emergency response" being the first line of defence to a more balanced suite of proactive, preventative, and mitigative activities.

The Community Risk Assessment embraces this approach, details the current and future risks, and establishes the basis for a Community Risk Reduction Plan (CRRP) to effectively mitigate community risk.

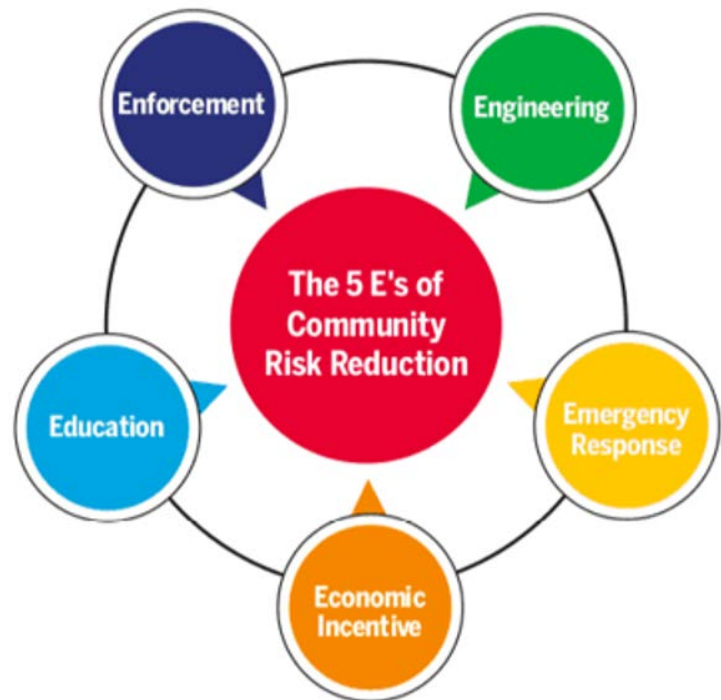


Figure ES1: 5E's of CRR

Supporting community risk reduction, SCES will develop performance dashboards to reflect community-wide performance and more detailed internal performance. Central to performance measurement and reporting will be a purposeful evolution to adopting more of the principles of National Fire Protection Association (NFPA) standards for emergency services.

These principles provide evidence-based guidance, identifying the standards and targets needed for effective and efficient emergency services delivery.

Implementation

Going forward the SCES 2023-2035 Master Plan goals are:



Figure ES2: 2023-2035 Master Plan Goals

These five goals will be the focus of this Master Plan through 2035 and will inform the priorities and initiatives within future department business plans. Initiatives will be based on the 5E's framework and support one or more of these goals in addition to corporate priorities. The Master Plan and the Department Business Plan will be aligned with the County strategic plans and Council priorities over the life of the Master Plan.

The implementation of the Master Plan and the service targets in the Standards of Cover will require investments. Some recommendations require minimal funding and have the potential to increase effectiveness and efficiency substantially. Other recommendations recognize that there will be a need for substantial investments to support community growth and an evolving community risk profile.

The following incorporates or consolidates recommendations contained within the Standards of Cover and Community Risk Assessment reports.

Near-Term

In the near term (1-2 years), the focus of recommendations will be initiatives target readily attainable opportunities while laying the foundation for the future. These recommendations are:

1. Develop and implement a Community Risk Reduction Plan (CRRP).
2. Conduct a comprehensive Fire Underwriters Survey (FUS).
3. Complete the update and then maintain the completeness and currency of related bylaws, mutual aid agreements, and service agreements.
4. Develop and implement a more comprehensive, integrated, and standardized performance dashboard with reporting of a) key community-level performance metrics, and b) detailed departmental-level performance metrics across all divisions based on industry-leading practices (e.g., NFPA, CPSE, ISO).

5. Enhance quality management by integrating select principles and criteria of the Centre of Public Safety Excellence (CPSE) and criteria from the Fire Underwriters Survey toward service excellence across SCES.
6. Enhance the understanding and use of data analytics and evidence-based decision-making.
7. Identify and implement improvements, where possible, to emergency response intervals for urban and rural service areas targeting a closer alignment with industry-leading practices including:
 - a. Reduce call handling and turnout times by 30 seconds each from 2022 actual performance (e.g., NFPA 1225 - Emergency Communications).
 - b. Add 24FF suppression positions, based on a 1.5 staffing ratio, to achieve one additional squad 24/7 (meaning 4 stations with 4FF) as soon as possible.
 - c. Add additional PSAP/ECC staff (e.g., permanent part-time or other) as soon as possible.
 - d. Increase first due performance % (NFPA 1710 - Urban Response and Deployment, NFPA 1720 - Rural Response and Deployment) by:
 - i. improving workforce management to maintain appropriate staffing levels in operations,
 - ii. optimizing fire zones and related dispatching protocol, and
 - iii. improving turn-out processes and/or mechanisms.
 - e. Increase effective response force performance % (NFPA 1710, NFPA 1720) by:
 - i. optimizing use of departmental resources, and
 - ii. appropriate use of regional resources.
8. Identify and implement improvements, where possible, for community safety through fire prevention, fire inspection, pre-incident planning, public education, and emergency management, that more closely align with industry-leading practices (e.g., NFPA 1500 - Occupational Health and Safety; NFPA 1300 - Community Risk Assessment; NFPA 1620 - Pre-Incident Planning; NFPA 1730 - Fire Prevention Enforcement; CSA Z1600 - Emergency Management).
9. Prepare to update the Community Risk Assessment.

Mid-Term

In the mid-term (3-5 years) SCES will begin investing in the additional resources and systems needed to address growth and a changing community risk. These recommendations are:

10. Identify the operational and financial strategies, using the 5E's framework for community risk reduction, that mitigate community risk, improve service performance, and enhance effectiveness of SCES including:
 - a. Conduct a rural response study designed to determine the role and contributions of the part-time stations and firefighters.
 - b. Conduct a comprehensive deployment modeling study.
 - c. Optimize on-duty training for operations and non-operations staff including options for an in-County training centre.
 - d. Increase operations capacity through the addition of new fire stations, apparatus, equipment, and firefighters including modeling optimal locations for future fire stations #7 and #8.
 - e. Expand the management, administration, community safety, and operations support (e.g., training staff) required for a larger department and increased operations.
11. Continue to identify and implement improvements, where possible, to emergency response intervals for urban and rural service areas targeting a closer alignment with industry-leading practices including:
 - a. Reduce call handling times by a further 20 seconds and reduce turnout times by a further 30 seconds (e.g., NFPA 1225).
 - b. First due performance % (NFPA 1710, 1720).
 - c. Effective response force performance % (NFPA 1710, 1720).
12. Continue to update the Fire Underwriters Survey.
13. Prepare to update the Standards of Cover.

Longer-Term

In the longer-term (6-12 years) SCES will continue investing in the resources and systems needed to address the growth and changing nature of the community. These recommendations are:

14. Implement the operational and financial strategies, using the 5E's framework for community risk reduction, that mitigate community risk, improve service performance, and enhance the effectiveness of SCES including:

- a. Optimize distribution and concentration of resources.
- b. Optimize emergency response intervals for front-line services for urban and rural service areas that more closely align with industry-leading practices (e.g., NFPA 1225, 1710, 1720).
- c. Optimize community safety through fire prevention, fire inspection, public education, and emergency management targeting a closer alignment with industry-leading practices (e.g., NFPA 1730, 1300, 1500; CSA 1600).
- d. Expand the delivery of timely, efficient, and effective on-duty training including opportunities with regional and industrial partners, thereby ensuring a ready and able workforce.
- e. Increase operations capacity including the addition of new fire stations, apparatus, equipment, and firefighters.
- f. Increase the management, administration, community safety, and operations support required for a larger department and increased service demand.
- g. Where appropriate adopt the principles of the Center for Public Safety Excellence (CPSE) accreditation framework.

15. Prepare to update the Master Plan.

The planning and budgeting related to all of the above recommendations should be based on a staffing ratio of 1.5 versus the current factor of 1.25. Staffing ration represents the demand for non-operational shifts on staff time due to planned and unplanned leave. To effectively and efficiently have 4FF on a single platoon, across four platoons 24 FF are required. This is increased from the current 20FF.

This adjustment is needed to address current workforce management realities, to ensure a ready and able workforce, and to facilitate a healthy organizational culture.

The execution of the above should be based on practical, realistic, and achievable investments that underwrite service excellence, collaborative partnerships, and a safe community – the desired outcomes and results.

Desired Future Results

The Master Plan anticipates significant changes will occur in the County by 2035. But more than simply keeping pace with the changes brought about by population growth and growth in business and industry, the execution of this plan SCES will transform as an organization.

Despite the risk exposure inherent in a larger, more mature community, citizens will know they are safe, firefighters will know that they are well-trained, and stakeholders will know that they have a world-class organization. This Master Plan establishes the path into the future to contribute toward the community being the safest in Canada.

Execution of this Master Plan will result in the following “future view” of stakeholder perspectives:

Citizens, through the SCES education and prevention efforts, will understand their role in community safety. They will feel invested in creating and maintaining a safe community and will recognize concrete things that they can do to support community safety.

Rural and urban stakeholders will have a clearer picture of the service level that they can expect and the investments that are necessary to support a safe community.

Industry stakeholders will continue to maintain and enhance deep connections to SCES.

Business stakeholders will continue to work closely with SCES, and will develop a broader perspective and understanding of their responsibilities in community risk reduction.

SCES staff will continue to be part of a strong and resilient team even as the makeup of the team changes to reflect the growing diversity of the community. Every SCES member, from the front-line firefighter to those providing support and direction behind the scenes, are proud of their deliberate decision to join the emergency services profession. SCES staff continually commit to the departmental vision, mission and values and use these instruments to guide their actions and decisions. All members of SCES are “Honored to Serve and Inspired to Lead.”

Section 1.0 Introduction and Background

Within this section, information is provided to set the context for the Strathcona County Emergency Services Master Plan, what it is, and how it was developed.



Introduction

Strathcona County Emergency Services (SCES) has developed this 12-year (2023-2035) Master Plan to anticipate and navigate the future challenges and opportunities. This document considers community growth through a risk lens and looks to find a workable balance between service delivery, fiscal, and other realities for emergency services. Supporting this Master Plan are the 2023 Standards of Cover (SOC) and the 2022 Community Risk Assessment (CRA).

SCES has a strong track record of strategic planning including an inaugural Master Plan and Standards of Cover in 2012. That initiative served to guide SCES for the last decade. In 2021, SCES engaged Darkhorse Analytics along with iStrategic Advisors to prepare this comprehensive Master Plan and supporting documents using a data-driven and stakeholder-informed approach.

Background

SCES has a well-deserved reputation of professionalism, innovation, generosity, and leadership. Whether responding to events in the community, aiding neighboring communities during major fire events, or providing support during major disasters, SCES has earned the respect of its peers and the Province.

Over the years, SCES has invested in technology and training to stay at the forefront of prevention, preparedness, response, and recovery. Citizens and businesses of Strathcona County (County) expect and receive a high level of service despite the challenges faced by the large and diverse community.

SCES also serves as a centre of excellence for leadership development and training. Its personnel have gone on to lead some of the largest fire and emergency services organizations across the country and overseas.

What is a Master Plan?

A Master Plan is an evidence-based, community risk-driven plan that guides the delivery of emergency services through the year 2035. It is supported by two more technically-oriented documents: the 2022 Community Risk Assessment (CRA) and the 2023 Standards of Cover (SOC).

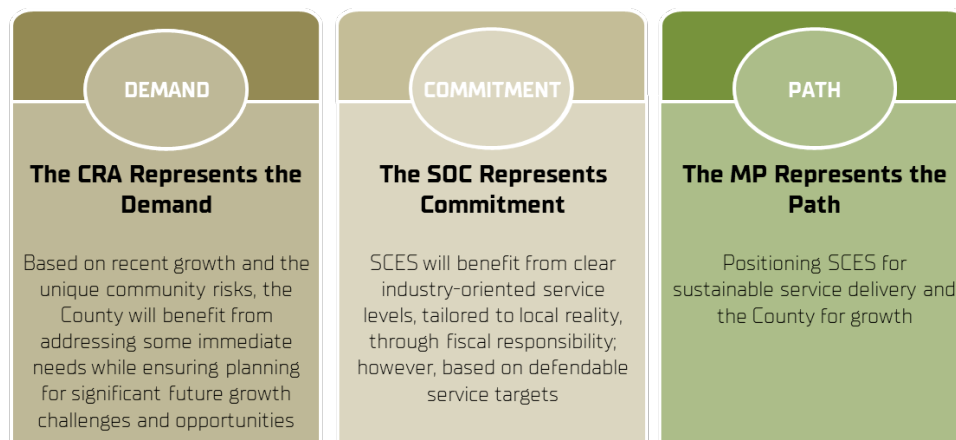


Figure 1.1: Demand, Commitment, Path Model

The CRA, the demand side of services, informs the SOC, the commitment side of services, and both are companion documents to the Master Plan which is the path forward.

Approach

The Master Plan is the culmination of a multifaceted effort including stakeholder contributions from Council, Executive, other County departments, community and industry partners, and SCES personnel. While this Master Plan did not include public engagement, the stakeholder contributions ensured community needs and interests were represented.

The project approach was based on the following Darkhorse/iStrategic iterative model:

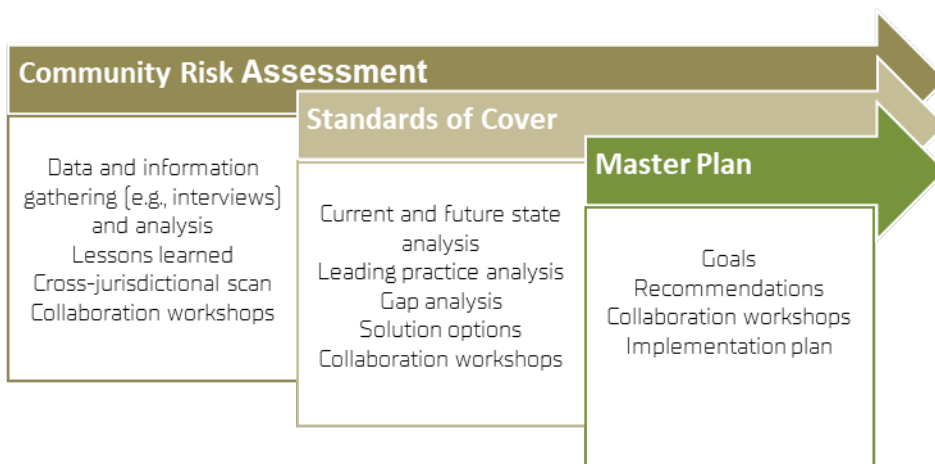


Figure 1.2: Darkhorse Analytics/iStrategic Advisors Project Approach

Strategic Alignment

Strathcona County’s 2023-2026 Strategic Plan is the organization’s core guiding document for governance, community development, infrastructure, and program and service delivery. It serves to keep the organizations vision, goals, priorities and performance indicators top of mind. It uses the mission and values as a lens by which strategic decisions are made.

The Strategic Plan forms the foundation for other key plans such as the corporate business plan, department business plans, budget plans and master plans. It acts as a compass for new ideas and initiatives for Council’s consideration and decision.

The development of the Strategic Plan as guided by:

The corporate vision:

- *“Becoming Canada's most livable community.”*

The corporate mission:

- *“Strathcona County is committed to working collaboratively, efficiently, and effectively to provide quality service delivery to citizens, business, and industry alike.”*

The corporate values are:

- *“Integrity, Respect, Safety, Fairness, Cooperation.”*

The SCES vision, mission, and values compliment the corporate vision, mission and values and are utilized to guide service delivery and department planning.

The SCES vision:

- *“We will lead our community to be the safest in Canada.”*

The SCES mission:

- *“To protect from risk the things that matter to those we serve.”*

The SCES values:

- *Respect, Synergy, Leadership, Community, Progress, Ownership, Integrity*

The SCES motto is “Honoured to Serve, Inspired to Lead.”

The SCES Master Plan has been developed to align with each of the strategic goals outlined in the corporate Strategic Plan. It seamlessly blends Strathcona County’s vision, mission and values with SCES’ vision, mission and values as it aims to make Strathcona County “Canada’s most livable community” by “leading our community to be the safest in Canada.”

The Master Plan focuses on quality service delivery and espouses the values of safety and cooperation.

Section 2.0 The Community

This section describes the community and community risk in Strathcona County. Community risk is viewed through current and future state lenses. The culmination of a community risk assessment is a community risk reduction plan.



The Community

Strathcona County, located in Alberta's industrial heartland, is a specialized municipality representing urban and rural areas. The County is a critical voice within the Edmonton Metropolitan Region.

The urban population resides mainly in Sherwood Park, while the rural population resides in a large rural area that includes eight hamlets (Antler Lake, Ardrossan, Collingwood Cove, Half Moon Lake, Hastings Lake, Josephsburg, North Cooking Lake, and South Cooking Lake).

The County is a diverse community with a population of 100,362 (2022 municipal census), the 4th highest in the province. Most of the population (>70%) resides in Sherwood Park.

The community encompasses 1,262 square kilometres (or 125,536 hectares) and is situated within a UNESCO biosphere called the Beaver Hills/Cooking Lake Moraine. The Moraine is the traditional territory of First Nations people. There are more than 87,000 hectares of land utilized for agricultural purposes.

The County May 2019 Community Profile describes the County as having "a rich cultural and economic history, with strong agricultural roots, a robust petrochemical sector, and high quality natural and recreational amenities and is situated within a world-renowned natural biosphere."

Community Risk

Current State

Strathcona County has one of the most complex community-level risk profiles in Canada and possibly in all of North America.

The County has a rapidly growing urban footprint, an expansive rural service area and an extensive heavy industrial presence. SCES staff are trained and equipped to respond to a wide variety of incidents - structure fire, medical, rescue, hazmat, automotive, industrial, and wildfire. The breadth of capabilities needed is unique for a community of this size.

Sherwood Park boasts spacious residential areas with a growing number of multi-family dwellings, various senior and assisted living facilities, numerous retail corridors, several areas with a high concentration of commercial complexes, and light industry supporting petrochemical operations and infrastructure in the area.

Sherwood Park also contains numerous parks, recreation and wooded areas, major roadways, railways and pipeline infrastructure. The urban structures, facilities, and population generate the majority of call volume and consequent demand for emergency services (e.g., fire, EMS).

Outside of the urban service area the County hosts a significant agricultural and heavy industrial presence along with a dense country residential population, particularly to the south and east of Sherwood Park.

Critical infrastructure (e.g., roads, rail, air) is typical of a large rural service area and includes one of the Trans Canada Highways (Highway 16), numerous provincial highways, several main rail lines, rail loading and shunting yards and two small public airports. This rural service area carries significant risk, not only from the population and infrastructure, but also from significant wildland interface exposure, all contributing to fire and EMS call demand.

A full analysis of risk looks not only at the impact of event or incident but at the likelihood of an incident occurring in the first place, and the location of the risks.

Together, these characteristics comprise a broad spectrum of community risks.

The map illustrates the results. When combining the various risks in the County in a single view, one can see that the potential impacts of major incidents are highest in Sherwood Park, followed by the Josephburg area, and finally, the country residential areas south and east of Sherwood Park.

The darker color hexes represent higher composite risk from the combination of demographic, building stock, hazards, economic, and past loss and event history risk.

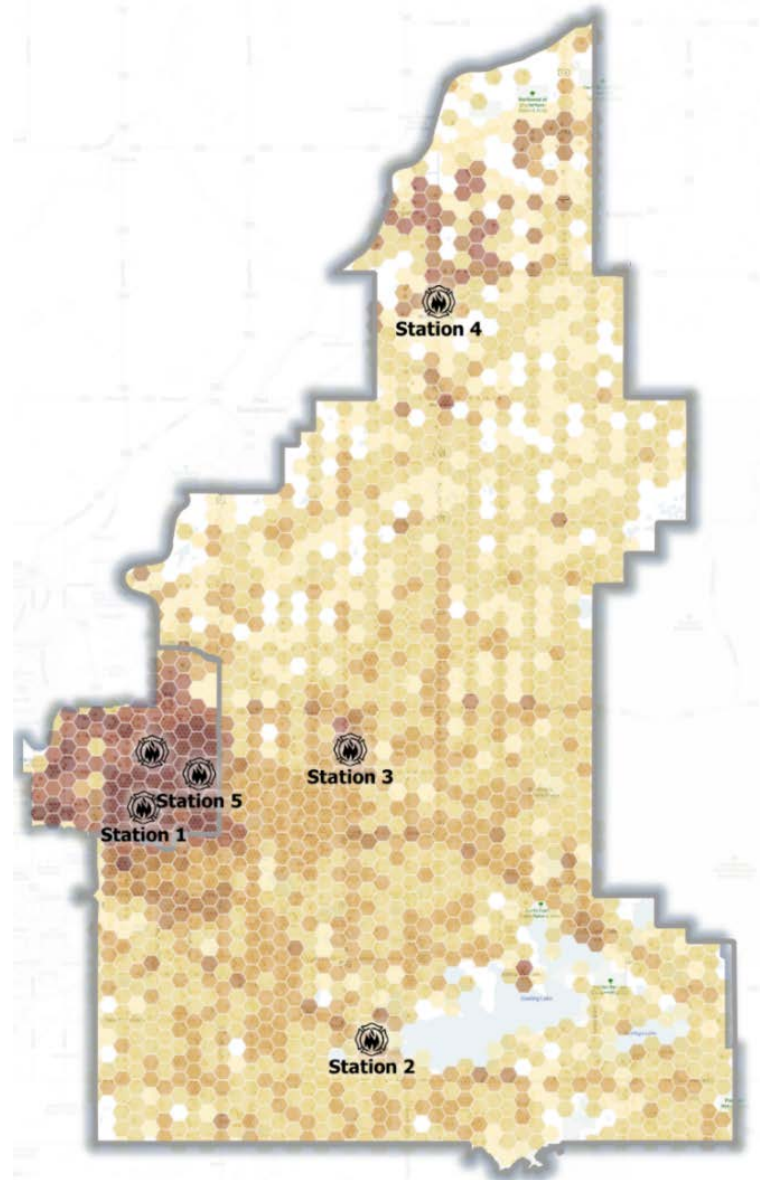
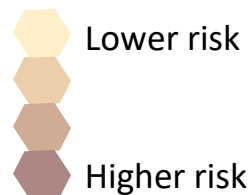


Figure 2.1: Current State of Community Risk

The community risk is described and analyzed in greater detail within the Community Risk Assessment document.

Future State

Today's community-level risk profile will look different in the future. One of the key characteristics of the County is its aggressive growth. Strathcona County is a community in transition.

Growth plans for the Cambrian and Bremner development areas will nearly double the urban footprint within the County and will present new challenges for SCES. Across Sherwood Park there will be many more multi-family and high-rise buildings with associated risks. In short, the development plan transforms the urban service area from a bedroom community to a major urban centre.

The changing nature of risk will require more complex mitigation and response, and the demand for service is expected to double. The industrial risk in the County represents one of the highest potential risks.

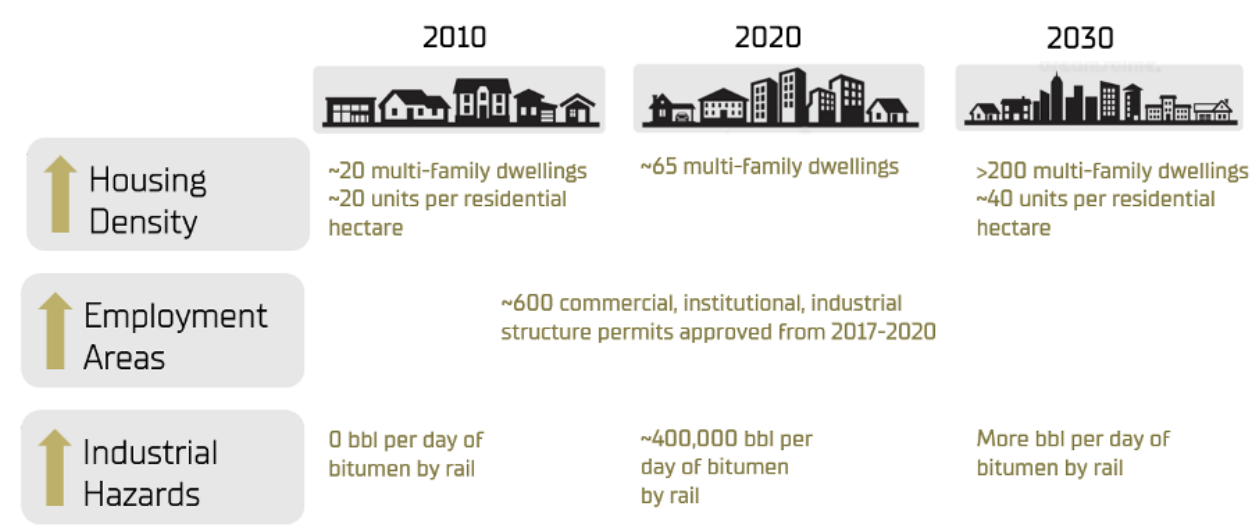


Figure 2.2: Future State of Community Risk

Changes in risk will impact the demand side for emergency services. SCES and the County as a whole must prepare for this future growth and changing risk through enhanced community risk reduction and changes in services and service levels.

Community Risk Reduction

Managing risk is more than emergency response.

Fire and emergency services, including SCES, have in recent years taken a broader view of their role in protecting their communities.

The focus of fire and emergency services has moved from emergency response being the first line of defence to a more balanced suite of prevention and mitigation activities.

The Five E's of the Community Risk Reduction framework is the culmination of this innovative thinking.

SCES has a history of Community Risk Reduction. The 2012 Master Plan was built on a series of past investments in education, enforcement, and emergency response.



Figure 2.3: Five E's of Community Risk Reduction

The Five E's of Community Risk Reduction activities are:

- **Education** – makes the public and stakeholders aware of risks and how to mitigate them.
- **Engineering** – provides an opportunity to work with local organizations and the government to promote new fire safety technologies in our community.
- **Enforcement** – identifies potential risks and non-compliance in local properties and teaches our community how fire safety codes protect them.
- **Economic incentives** – are useful to encourage individuals and businesses to make choices that reduce risk.
- **Emergency response** – protects our community and our firefighters by ensuring they have the equipment, apparatus, and training they need.

Community Risk Reduction (CRR) is not just the responsibility of SCES. Rather, it requires a whole of community approach. That means all County departments working with citizens, businesses, industry, and other community partners need to be involved in and contribute to community risk reduction. Further, those efforts need to result in a Community Risk Reduction Plan (CRRP) which provides for the preservation of life, property, and the environment, and contributes to the well-being of the community.

Section 3.0 Service Delivery

This section summarizes current services, resources, and service performance. Ultimately, this Master Plan will contribute to improved future service performance.



Services

The citizen-facing or citizen-centric services of SCES, based on their relative order of occurrence include:

- Fire prevention, inspections, and code enforcement
- Fire, EMS, and emergency management public education
- 9-1-1 call answer and fire dispatch
- Fire suppression
- Vehicle rescue
- Specialty rescue (e.g., swift water, technical rescue, drone)
- Medical first response
- Ambulance response and transport (e.g., Advanced Care and Primary Care Paramedics)
- Emergency management
- Fire investigation

Supporting SCES programs are activities critical to the achievement of the citizen-facing services including:

- Financial management (e.g., business and financial planning, accounting, and payroll)
- Fire protection engineering
- Communications and marketing
- Operational supports (e.g., training, occupational health and safety, materials management)
- Administrative supports
- Quality management

Additionally, SCES' ability to deliver these services and programs is dependent directly and indirectly on contributions and activities across the other County departments. Some examples are support for fire stations from Facility Services, support for fire and EMS apparatus from Fleet Services and support for staff from Human Resources.

Like community risk reduction, the provision of emergency services is a whole of community effort.

Management, Staff, and Firefighters

SCES is managed through four divisions led by the Fire Chief: Community Safety, Strategic Services, Operations, and Operations Support. SCES personnel include full-time, part-time, and hourly employees. The personnel are firefighters, classified staff, and management staff.

The following chart depicts the current organizational structure.

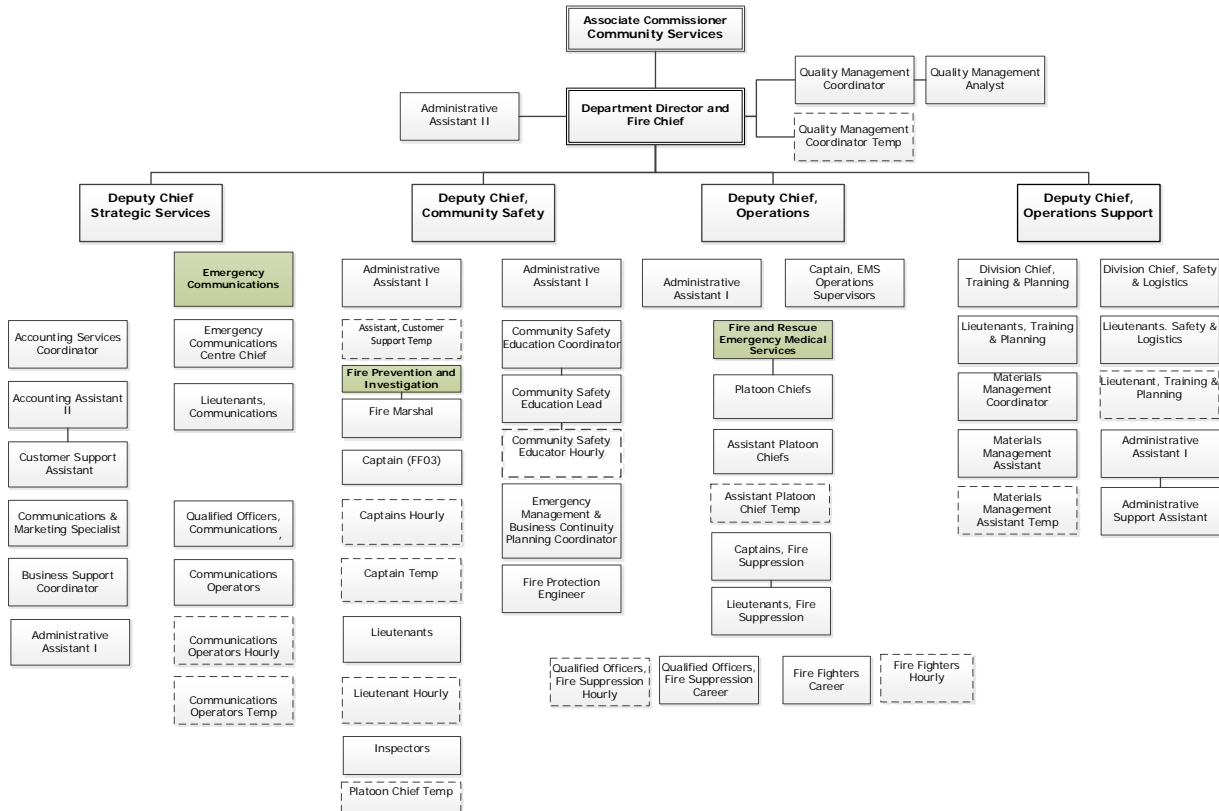


Figure 3.1: Organizational Structure (2023)

Fire Stations

Integral to the services provided by SCES are six fire stations:

- Three full-time stations located in the urban service area of Sherwood Park (Sherwood Drive, Bison Way, and Cloverbar Road)
- One full-time station located in the north (Heartland Hall in Josephburg) rural service area
- Two part-time stations located in the east (Ardrossan) and south (South Cooking Lake) rural service area

The illustration to the right illustrates the relative location of the fire stations and associated fire zones.

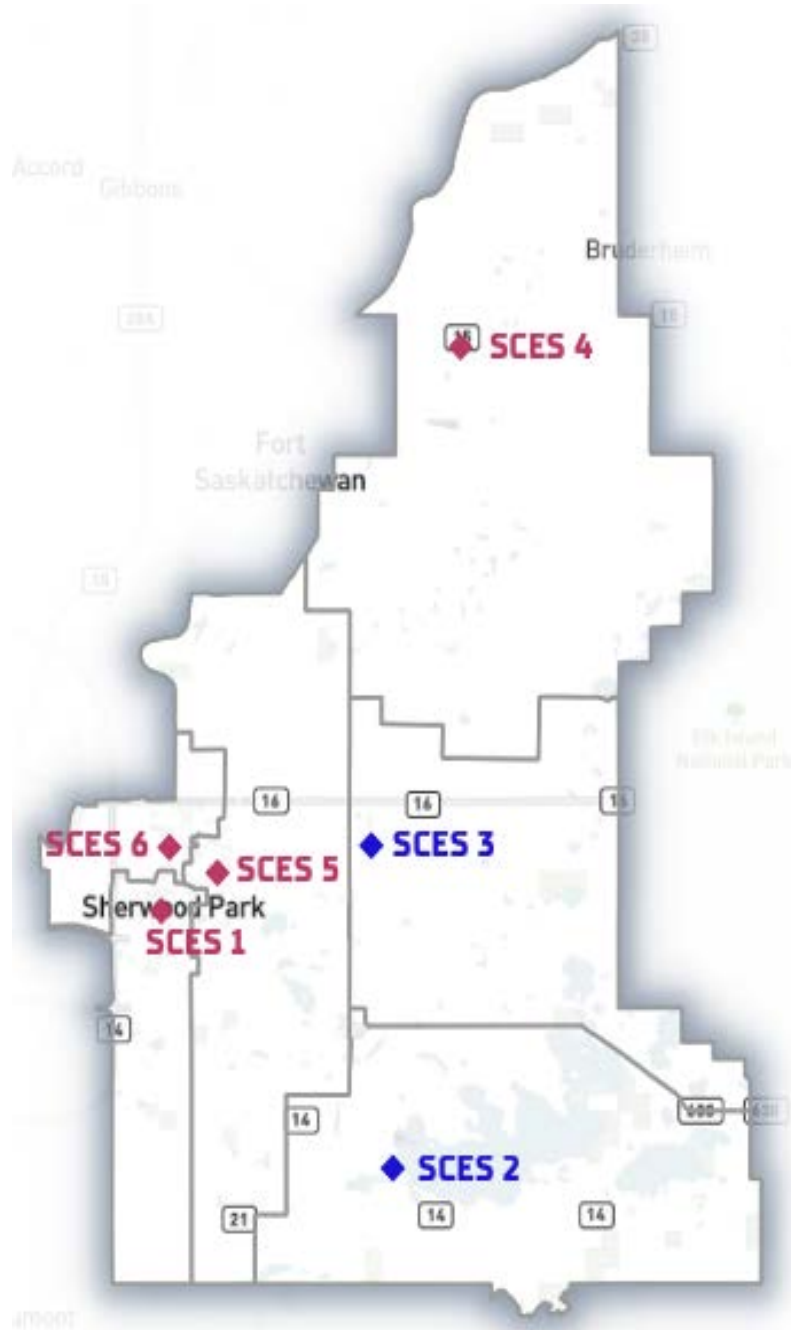


Figure 3.2: SCES Fire Station Locations

Apparatus and equipment include:

- Ambulances
- Community Response Units
- Squads (Engines)
- Towers (Aerial/ladder)
- Tankers (Tenders)
- Heavy rescue and other rescue units
- Brush units
- Specialty vehicles and support units



There are thousands of equipment items including fire interventions (e.g., hoses, rescue tools, cutters, hand tools) and medical response interventions (e.g., defibrillators, medical therapy)

Other infrastructure critical for the provision of services includes:

- Emergency Communications Centre
- Information technology
- Water system and hydrants

This infrastructure and assets have associated operating and capital budgets to purchase, maintain, and replace same.

Deployment of Resources

“Effectively managing a fire and emergency services department requires an understanding of and an ability to demonstrate how changes to resources will affect community outcomes. It is imperative that department leaders, as well as political decision-makers, know-how department resource deployment in their local community affects community outcomes in three important areas: firefighter injury and death; civilian injury and death; and property loss.”¹

The deployment of resources is described in the Standards of Cover document which defines those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization.

- Resource distribution is associated with the geography of the County and travel time to various emergencies. Distribution is typically measured by the percent of the County covered by the first-due units.
- Concentration is also about the geography and the arranging of multiple resources, spacing them so that an initial “effective response force” can arrive on scene within the time frames established by County expectations and emergency services leadership.

SCES operational performance is a function of three considerations: resource availability/reliability, department capability, and overall operational effectiveness. Before an emergency event, the structure and staffing of SCES are critical to the departmental capability and operational effectiveness.

The deployment of resources is described and analyzed in greater detail within the Standards of Cover document.

Performance Measurement

SCES has for decades used a broad set of measures to support understanding performance across the emergency services system. These metrics have informed Department Business Plans, Annual Reports, and presentations to the Executive and Council.

Performance measurement standards contribute to a municipality’s understanding and ability to give an emergency event a positive outcome. Some of that ability occurs before an emergency event and some relate to the actual response.

The National Fire Protection Association (NFPA) has defined a series of industry leading standards which cover the breadth of services offered by an emergency services organization. These standards have specific definitions and targets or metrics.

Through this Master Plan, SCES will adopt the principles of the NFPA standards to ensure:

- consistency in measurement and reporting

¹ Adapted from Fire Service Deployment: Assessing Community Vulnerability, 2021.

- common interpretations for cross-jurisdictional comparisons
- alignment with industry-leading standards
- increased positive outcomes

Current system performance needs to be understood in the context of many factors. These factors include changing service demands, unique situations and crises (e.g., pandemic) impacting services, and the ability to deliver services (e.g., budget, staffing).

The following graphic illustrates a continuously increasing demand for fire services and emergency medical services (EMS) in the County. This graphic demonstrates a significant increase in EMS calls in 2021 and 2022 largely driven by issues within the provincial EMS system, a situation largely out of the control of the County. EMS demand has had significant consequences on the services, the well-being of the workforce, and the culture.

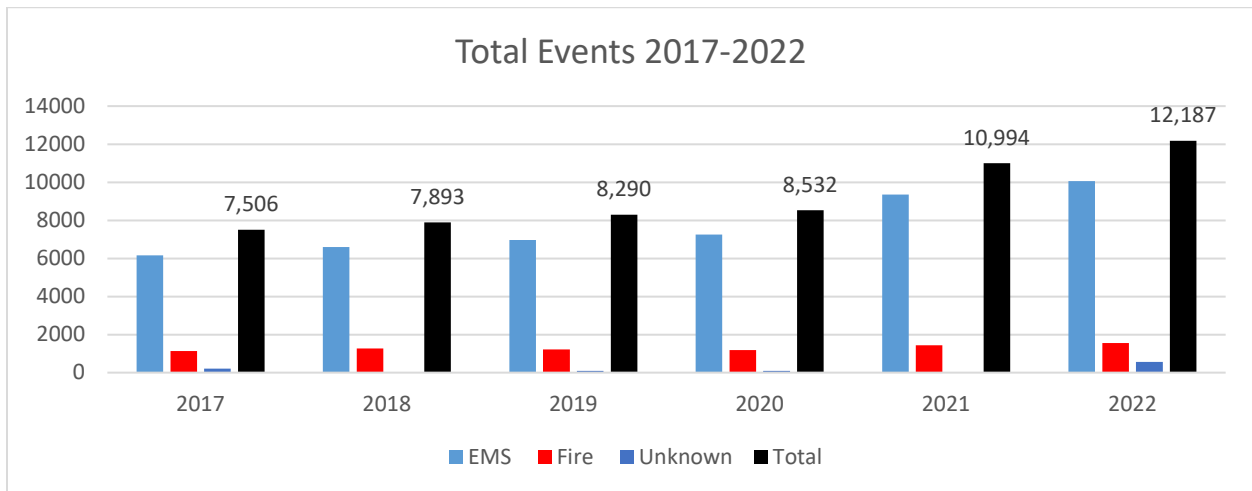


Figure 3.3: Total Fire/EMS Events

Before the response to the above events, there are a broad set of services and programs being delivered, many focused on prevention, inspection, investigation, education, quality management, and other initiatives. Each of these has associated key performance measures. A balanced system performance measurement approach based on all aspects of SCES is important, system performance is often reflected in emergency response to events.

Time is critical in mitigating emergencies and emergency events. Timely arrival to a fire event is integral to fire suppression and life safety. Timely arrival to medical events is integral to survival and reduced harm. Response times include various response increments including call handling, turnout, and travel times. Additionally, there is the time associated with intervention following the arrival of the first due unit on scene.

The following illustrates some of the response intervals with associated NFPA performance targets.



Note: The turnout time and total response time above is specific to a fire response.

Figure 3.4: NFPA 1710 First Due Targets

Call Handling Time

Call handling includes the first contact with citizens and businesses and provides call answer, call transfer, and dispatch functions. NFPA Call Handling performance is 15s (seconds) for call answer and 1m (minute) or 60s for call processing of emergent and high-priority calls; thus, the call handling performance is 1m15s or 75s to the 90th percentile.

Turnout Time

Turnout time is the reaction (e.g., equipment, apparatus) of firefighters within the fire station before responding from the station. NFPA turnout performance is 1m20s or 80s to the 90th percentile meaning 90% of the time for fire apparatus and 1m or 60s, 90% for EMS or ambulance apparatus.

First Due Unit Performance

First due unit is the time it takes following a 9-1-1 call answer for the first capable unit to arrive on scene. While there may be additional apparatus dispatched, this first due unit is often able to initiate some level of intervention or assessment. NFPA first due unit performance also known as total response time for the first arriving apparatus is 6m20s or 380s, 90% for urban service areas.

Historically, SCES has used an 8m or 480s, 90% urban performance target and a 17m or 1,020s, 90% for rural performance target. Associated with the first due response is travel time which has a 4m or 480s, 90% urban performance target. Rural travel time is understandably much longer.

Effective Response Force Performance

Effective response force (ERF) is the time it takes for the appropriate number of firefighters to arrive at the scene of a structure fire. Due to the nature of firefighting, a certain number of firefighters are required before engaging in active fire suppression or rescue. Without an effective response force, the risk to firefighters increases to unacceptable levels and the time to effective intervention may be increased.

Appropriately, NFPA effective response force has discreet performance targets for low, medium, and high-hazard building types of occupancies. Each of these hazard scenarios have major implications for time to intervention, firefighter safety, and critical tasking. Low-hazard (e.g., residential structure fire, no exposures, no basement) NFPA ERF performance is 17FF (firefighters) 10m10s or 610s, 90%.

Medium-hazard (e.g., commercial) occupancies require 28FF within the target and high-hazard (e.g., high-rise) occupancies require 43FF within the target.

It is important to state the data and related analysis in this report may be revised in the future based on clarification and validation of Telus and/or FDM data being captured and modeled in the Darkhorse Engine (DHE). Some of the current challenges should be addressed with the full implementation of the NG 9-1-1 system.

Future Performance

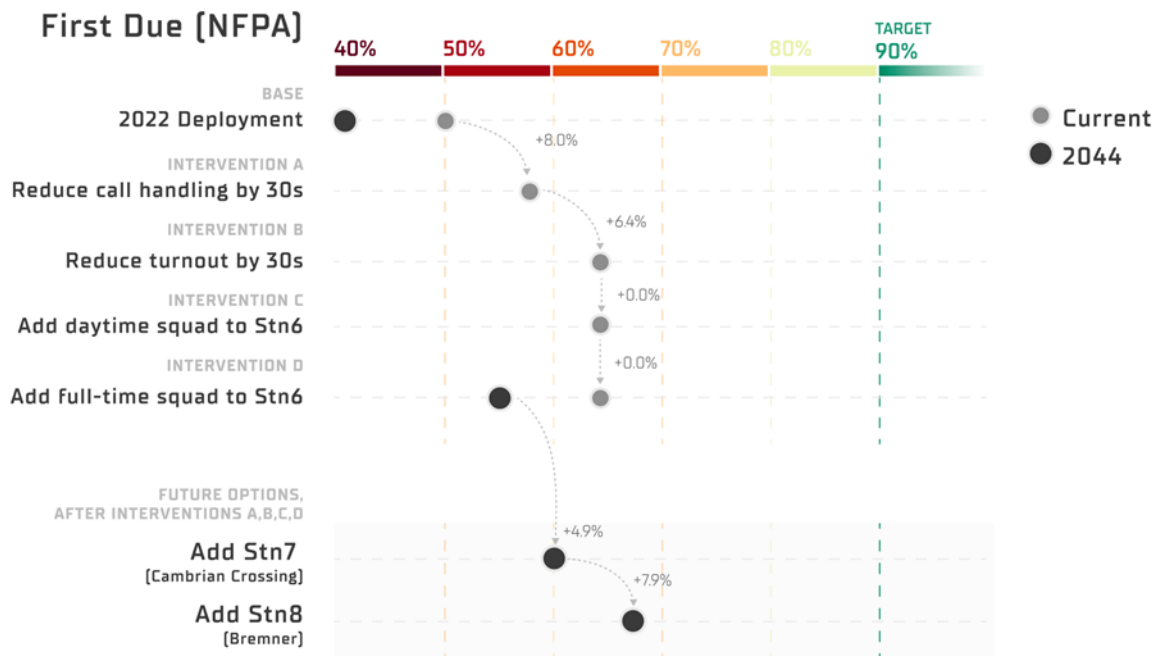
Scenario modeling is used to investigate possible strategies to increase First Due and Effective Response Force performance. The scenario considers interventions based on current and future call volume.

The overarching goal is to explore resource deployment options to increase response performance for both First Due and the Effective Response Force (specifically for low-hazard occupancies), towards attaining the targeted time 90% of the time.

For the scenarios, future event demand was derived from the 2044 population forecast.

The series of interventions represents our recommended scenario for 2044 and include interventions that may be made during the life of this Master Plan. It provides the best combination of performance improvement and risk reduction while respecting the fiscal realities facing the County.

The following illustrates current (2022) and forecast future (2044) first due performance and potential performance improvement with specific resource interventions.



Note: the above represents fire-only events.

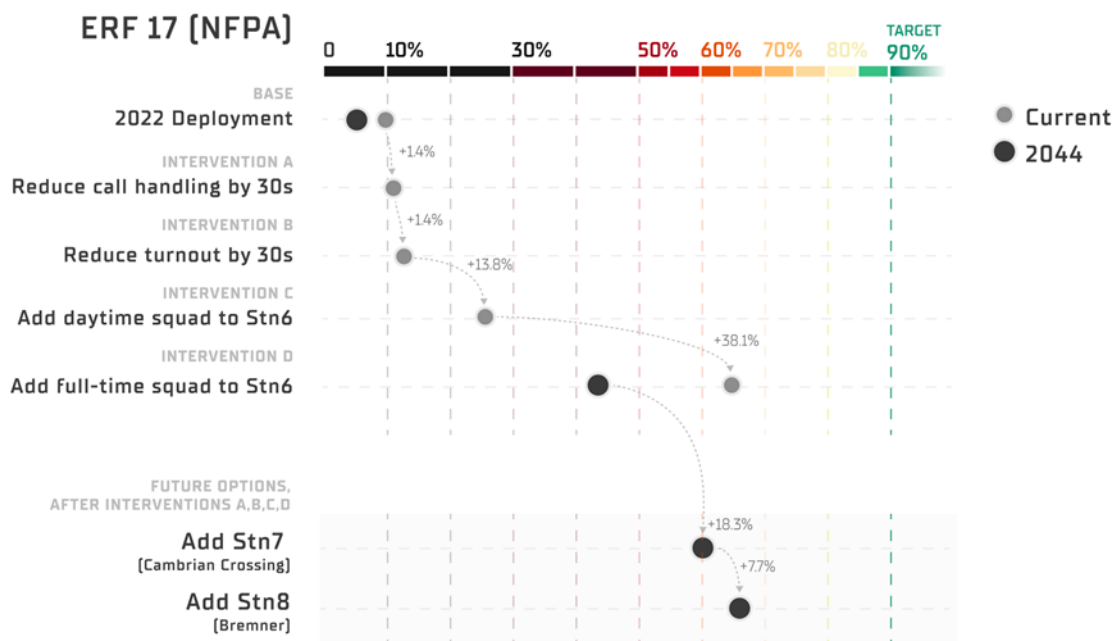
Figure 3.5: First Due Performance for Emergent and High-Priority Events

It should be noted that Intervention C above is only intended to be a proxy for modeling the use of extra staff per shift on fire apparatus (e.g., tankers, towers, brush trucks).

The above interventions illustrate that improvements to call processing (Intervention A) and turnout times (Intervention B) can have a significant positive impact on overall first due performance and provides a significant contribution to public value without the need for investment in “brick and mortar” stations, apparatus, and staffing.

These interventions would bring SCES in closer alignment to industry good practices for first due performance, now and in the future. While an ideal future is meeting the NFPA performance targets, this is not reasonable nor expected given fiscal realities. Rather, the targets set a clear path toward continuous improvement. These improvements will contribute to community risk reduction and a safer community.

The following illustrates current (2022) and forecast future (2044) effective response force performance and potential performance improvement with specific resource interventions.



Note: the above represents fire-only events (low-hazard structure fires) and does not include potential ambulance or community response unit (CRU) resources.

Figure 3.6: Effective Response Force Performance for Low-Hazard Structure Fires

It should be noted that Intervention C above is only intended to be a proxy for modeling the use of extra staff per shift on fire apparatus (e.g., tankers, towers, brush trucks).

While achieving a 90% target for Effective Response Force is a stretch for most emergency service organizations, SCES needs to assertively move up the scale over time especially for low-hazard occupancies, the majority of structure fires.

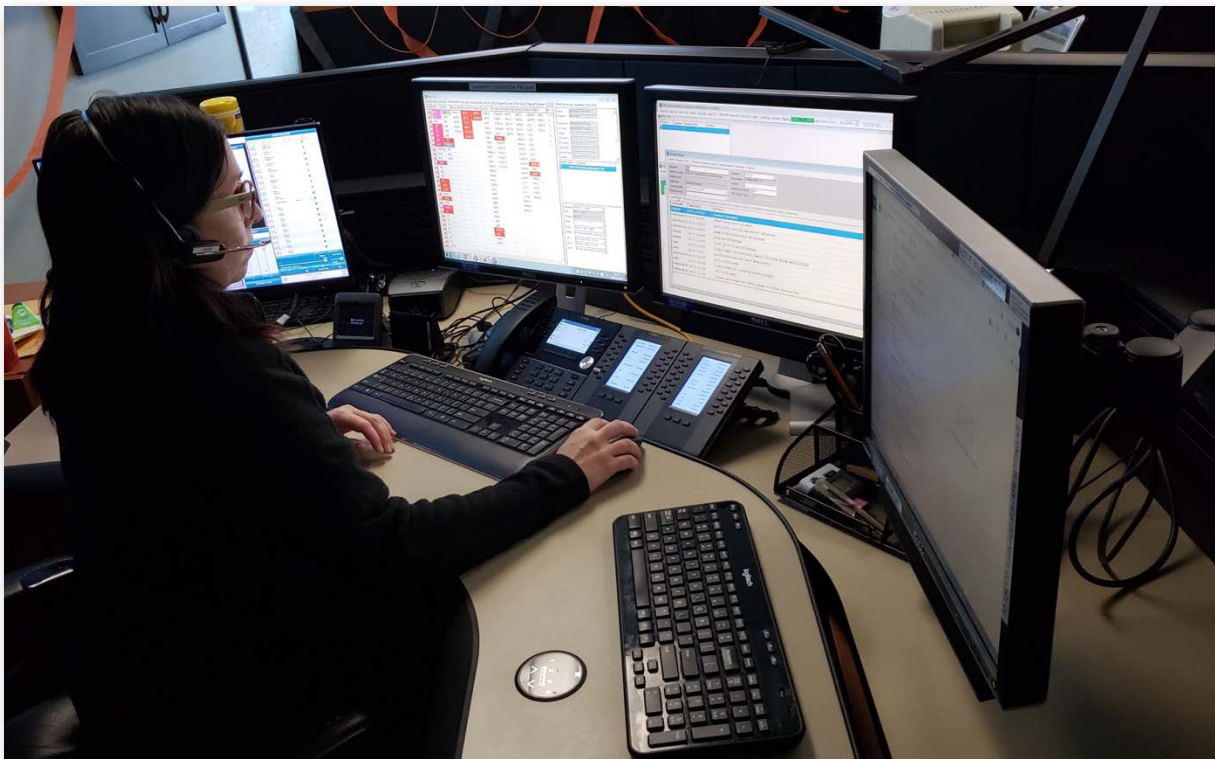
The above interventions illustrate that additional resources (Intervention C and D) can have a significant positive impact on effective response force performance and provides a contribution to public value without the need for investment in “brick and mortar” stations. While an ideal future would see an effective response force performance at the target level for low (17FF), medium (28FF), and high-hazard structure fires (43FF), unfortunately, few emergency services organizations have unlimited resources. SCES will need to be innovative while adopting the spirit of the NFPA targets. In the short-term and medium-term, continued use of staffing of tankers and towers, and cross-trained firefighters on ambulances, and Community Response Units can contribute to the capability to have the right capacity of firefighters at major fire events.

However, that being said growth will bring new challenges including increased call volumes, longer drive times, and changing risk. Eventually, the County needs to build new fire stations, with supporting apparatus, equipment, and staffing, an investment that is already recognized by senior decision-makers. These interventions would bring SCES in closer alignment with industry good practices for effective response force performance, now and in the future.

Thus, if improvements toward the target can be made, this will contribute to community risk reduction and a safer community.

Section 4.0 Master Plan Goals

This section provides the Master Plan Goals. Supporting these goals are a series of initiatives that support ongoing department business planning. Achievement of these goals will contribute to desired results.



Master Plan Goals

The SCES Master Plan 2023-2035 goals are:



Figure 4.1: Master Plan 2023-2035 Goals

These five goals will remain in place for the life of this master plan and will inform the priorities within future department business plans. Each of these strategic goals incorporate initiatives that reinforce the goals and desired outcomes across SCES, to the benefit of the community. These initiatives reflect industry trends, community risk reduction, and common organizational requirements.

The following initiatives support each of the Master Plan goals. Many of these initiatives are currently being pursued, others will need additional focus during this Master Plan.

Ready and Able Workforce

The growth of the County and the changing nature of risks that it faces will require new staff, processes, and technologies. This will be achieved through the following initiatives:

- Resource planning
- Staff recruitment and retention
- Workforce planning and diversity
- Training and education for frontline and part-time staff
- Fire officer and leadership certification
- Department staff training

Healthy Culture

This refers to the overall quality of the environment for staff. A healthy, safe, respectful workplace fosters self-development and involvement in decision-making resulting in retaining quality and high-performing team members. This will be achieved through the following initiatives:

- Program and individual goal setting
- Health and wellness strategies and programs that improve overall well-being and resilience

- Diversity and inclusiveness help the workforce better reflect the community it serves

Service Excellence:

SCES will continue to deliver services safely, efficiently, and effectively. This will be achieved through the following initiatives:

- Principles of industry-leading practices and standards of excellence
- Information and technology to support data analytics and decision-making
- Proactive, innovative, and data-driven culture
- Optimized resource deployment including stations, apparatus, and firefighters
- Transparent performance measurement and reporting
- Review and update bylaws as needed

Collaborative Partnerships

Strathcona County has worked within an ecosystem of interdependent emergency services and within a County and region where all participants have a stake in community safety. Improving these partnerships is achieved through the following initiatives:

- Review and update mutual aid and service agreements
- Interoperability with regional agencies and services
- Industry and business engagement
- Sharing of collected community data and information
- Public engagement
- Community/citizen feedback

Safe Community

This refers to the proactive assessment and action to mitigate changing risks and growth in urban and rural areas. This is achieved through:

- Regular updates of the Community Risk Assessment
- Community Risk Reduction Plan
- Community risk reduction education
- Pre-fire planning and engagement of operations in prevention and education effort
- Enhanced partnerships that focus on vulnerable populations
- Service improvements with a focus on patient and firefighter safety

Desired Future Results

The Master Plan anticipates significant growth and changes will occur in the County by 2035. More than simply keeping pace with the changes brought about by growth in the population and employment, the

execution of this plan will enhance the relationships that SCES has with its stakeholders. The following vignettes describe a “future view” by stakeholders.

Seniors

As a place to retire or age in place, the County has a lot to offer. Seniors know that no matter where they choose to live, they (or the people who take care of them) are educated and prepared to deal with an emergency.

Whether living in an active living 10-storey high rise in downtown Sherwood Park, a senior’s lodge in the country or the family home, seniors know that no matter where they live, SCES is well prepared for an emergency, should one arise.

Life-threatening medical events are handled in a timely manner. In addition to knowing what to expect in terms of how long it will take for emergency services to arrive, SCES has been very proactive in its public education and prevention efforts.

Accidental fires, which used to be in the news with some regularity, are now almost unheard of. And if an emergency does occur, people know exactly what to do to ensure that everyone can safely exit their places of residence, or remain safe until emergency responders arrive.

Rural Service Area

Living in rural Strathcona County provides citizens the opportunity to enjoy the great outdoors, be closer to nature, and be away from the urban core. However, this lifestyle comes with added risks if an emergency arises. Wildfires in the summer months are a very real possibility; longer response times for emergency services to arrive are reality.

To address these risks, the County has expanded and implemented new programs and practices specifically targeting its rural residents. Municipal grants have allowed for the installation of smoke detectors, residential sprinkler systems, and alarm monitoring systems. Unique educational programs developed and delivered by SCES provide residents with the knowledge to prevent fires or implement appropriate wildfire interface practices.

Regular visits from SCES have resulted in residents knowing that they are taking appropriate steps to “be prepared.” Rural living is both relaxing and safe.

Urban Service Area

Sherwood Park continues to grow. New subdivisions are being added. High rises are becoming more prevalent. Citizen expectations around services, especially emergency services, remain high. But this growth comes with challenges – challenges that the County is proactively tackling. Coordinated efforts between SCES and other County departments (for example, Planning and Development) have made sure that the new growth (be it up or out) is being done with full recognition of how to minimize risks, should an emergency arise.

Regular inspections ensure that all buildings and/or their fire systems are maintained to the levels required. Information sessions are provided to occupants to ensure everyone is aware what to do in the event of a fire.

Citizen expectations are being managed through up-to-date information about the benefits versus the costs associated with investing in preventative measures (e.g., education, inspections) versus adding

SCES staff, facilities, and equipment, which is balanced with the County's focus on managing risk through both proactive and reactive measures.

Residents of Sherwood Park are informed and comfortable that the investments in SCES are reasonable, appropriate, and balanced.

Industry

Strong partnerships between SCES and industry continue to ensure that risks associated with industrial incidents are minimized. Integrated training between SCES and industrial fire units ensure that when an incident occurs, the response is available in a timely manner and actions are integrated at all levels.

For those industries without response teams, SCES will continue to work with the industry to establish mutual-aid agreements to ensure that responses are coordinated.

These proactive approaches have applied systematic systems to measure the risk that maintains a consistent approach across the industry. It is now one of the safest petroleum industry areas in the country, one that is explored by many.

Businesses

Businesses in the County are thriving. Insurance rates are among the lowest in the province. The incidence of commercial fires has dropped significantly. The reason is at least in part due to the proactive approach the County takes to fire safety.

Fire safety inspections are welcomed. Businesses have come to understand the relationship between fire safety, reduced risk, and economic benefit. The County, also recognizing the economic benefit of businesses remaining operational, offers programs for businesses to invest in sprinklers while helping to offset the cost. It also knows that "success breeds success" – thriving businesses and low insurance rates due to fewer incidents of property damage due to fire attract more businesses to the community.

Staff and Their Families

Staff satisfaction levels among SCES are among the highest of County departments. Work-life balance is being achieved. Families feel supported and understand the resources available to them, their spouse, and their family. Opportunities for advancement are real. Staff has the necessary equipment, training, and skills to deal with the challenges that growth has created. Through an emphasis on public education, the number of fires in the community has declined. Fire injuries and fatalities have been reduced drastically.

When there is a significant fire, crews are arriving faster with the addition of the strategically located fire stations, and the additional crews that were added to the service allow an optimal effective response force to be on scene in a timely manner. This has provided critical tasks to be complete quicker and the health and safety of the fire fighters improved.

Residents in the County continue to hold SCES firefighters and support staff in high regard given their focus on education, enforcement, engineering, economic incentives, and emergency response – the 5Es of community risk reduction.

Section 5.0 Implementation

This section of the report describes the implementation of the Master Plan recommendations.



Recommendations

SCES has for decades pursued and achieved excellence in many areas of its services. SCES has been agile and innovative with strategies and tactics that get the most out of what has been and is now a challenging environment. Going forward those challenges will continue and will require SCES to be even more innovative in pursuing excellence and meeting the service needs and expectations of the community.

Integral to future success will be a ready and able workforce and healthy culture. These elements in addition to a more data analytics-driven and evidence-based performance measurement framework will be central to success.

Ultimately, this is about service excellence and a safe community which means safe for the public (i.e., residents, and businesses) and safe for the firefighters and staff. The increased emphasis on public safety will require a cross-departmental approach within the County and a whole of community approach toward community risk reduction.

The implementation of this Master Plan and the service targets in the Standards of Cover will require investments. Some recommendations require minimal funding but increase effectiveness and efficiency substantially. However, there will be a need for substantial investments to support community growth and a changing community risk profile, all driven by evidence-based data analytics.

The following incorporates or consolidates recommendations contained within the Standards of Cover and Community Risk Assessment reports.

Near-Term

In the near term (1-2 years), the focus of recommendations will be initiatives target readily attainable opportunities while laying the foundation for the future. These recommendations are:

1. Develop and implement a Community Risk Reduction Plan (CRRP).
2. Conduct a comprehensive Fire Underwriters Survey (FUS).
3. Complete the update and then maintain the completeness and currency of related bylaws, mutual aid agreements, and service agreements.
4. Develop and implement a more comprehensive, integrated, and standardized performance dashboard with reporting of a) key community-level performance metrics, and b) detailed departmental-level performance metrics across all divisions based on industry-leading practices (e.g., NFPA, CPSE, ISO).
5. Enhance quality management by integrating select principles and criteria of the Centre of Public Safety Excellence (CPSE) and criteria from the Fire Underwriters Survey toward service excellence across SCES.
6. Enhance the understanding and use of data analytics and evidence-based decision-making.

7. Identify and implement improvements, where possible, to emergency response intervals for urban and rural service areas targeting a closer alignment with industry-leading practices including:
 - a. Reduce call handling and turnout times by 30 seconds each from 2022 actual performance (e.g., NFPA 1225 - Emergency Communications).
 - b. Add 24FF suppression positions, based on a 1.5 staffing ratio, to achieve one additional squad 24/7 (meaning 4 stations with 4FF) as soon as possible.
 - c. Add additional PSAP/ECC staff (e.g., permanent part-time or other) as soon as possible.
 - d. Increase first due performance % (NFPA 1710 - Urban Response and Deployment, NFPA 1720 - Rural Response and Deployment) by:
 - i. improving workforce management to maintain appropriate staffing levels in operations,
 - ii. optimizing fire zones and related dispatching protocol, and
 - iii. improving turn-out processes and/or mechanisms.
 - e. Increase effective response force performance % (NFPA 1710, NFPA 1720) by:
 - i. optimizing use of departmental resources, and
 - ii. appropriate use of regional resources.
8. Identify and implement improvements, where possible, for community safety through fire prevention, fire inspection, pre-incident planning, public education, and emergency management, that more closely align with industry-leading practices (e.g., NFPA 1500 - Occupational Health and Safety; NFPA 1300 - Community Risk Assessment; NFPA 1620 - Pre-Incident Planning; NFPA 1730 - Fire Prevention Enforcement; CSA Z1600 - Emergency Management).
9. Prepare to update the Community Risk Assessment.

Mid-Term

In the mid-term (3-5 years) SCES will begin investing in the additional resources and systems needed to address growth and a changing community risk. These recommendations are:

10. Identify the operational and financial strategies, using the 5E's framework for community risk reduction, that mitigate community risk, improve service performance, and enhance effectiveness of SCES including:

- a. Conduct a rural response study designed to determine the role and contributions of the part-time stations and firefighters.
 - b. Conduct a comprehensive deployment modeling study.
 - c. Optimize on-duty training for operations and non-operations staff including options for an in-County training centre.
 - d. Increase operations capacity through the addition of new fire stations, apparatus, equipment, and firefighters including modeling optimal locations for future fire stations #7 and #8.
 - e. Expand the management, administration, community safety, and operations support (e.g., training staff) required for a larger department and increased operations.
11. Continue to identify and implement improvements, where possible, to emergency response intervals for urban and rural service areas targeting a closer alignment with industry-leading practices including:
- a. Reduce call handling times by a further 20 seconds and reduce turnout times by a further 30 seconds (e.g., NFPA 1225).
 - b. First due performance % (NFPA 1710, 1720).
 - c. Effective response force performance % (NFPA 1710, 1720).
12. Continue to update the Fire Underwriters Survey.
13. Prepare to update the Standards of Cover.

Longer-Term

In the longer-term (6-12 years) SCES will continue investing in the resources and systems needed to address the growth and changing nature of the community. These recommendations are:

14. Implement the operational and financial strategies, using the 5E's framework for community risk reduction, that mitigate community risk, improve service performance, and enhance the effectiveness of SCES including:
 - a. Optimize distribution and concentration of resources.
 - b. Optimize emergency response intervals for front-line services for urban and rural service areas that more closely align with industry-leading practices (e.g., NFPA 1225, 1710, 1720).

- c. Optimize community safety through fire prevention, fire inspection, public education, and emergency management targeting a closer alignment with industry-leading practices (e.g., NFPA 1730, 1300, 1500; CSA 1600).
- d. Expand the delivery of timely, efficient, and effective on-duty training including opportunities with regional and industrial partners, thereby ensuring a ready and able workforce.
- e. Increase operations capacity including the addition of new fire stations, apparatus, equipment, and firefighters.
- f. Increase the management, administration, community safety, and operations support required for a larger department and increased service demand.
- g. Where appropriate adopt the principles of the Center for Public Safety Excellence (CPSE) accreditation framework.

15. Prepare to update the Master Plan.

The planning and budgeting related to all of the above recommendations should be based on a staffing ratio of 1.5 versus the current factor of 1.25. Staffing ration represents the demand for non-operational shifts on staff time due to planned and unplanned leave. To effectively and efficiently have 4FF on a single platoon, across four platoons 24 FF are required. This is increased from the current 20FF. This adjustment is needed to address current workforce management realities, to ensure a ready and able workforce, and to facilitate a healthy organizational culture. The execution of the above should be based on practical, realistic, and achievable investments that underwrite service excellence, collaborative partnerships, and a safe community – the desired outcomes and results.



Appendix A: Acronyms

The following lists acronyms used in this report:

CPSE	Center for Public Safety Excellence
CRA	Community Risk Assessment
CRR	Community Risk Reduction
CRRP	Community Risk Reduction Plan
CRU	Community Response Unit
CSA	Canadian Standards Association
ERF	Effective Response Force
EMS	Emergency Medical Services
FUS	Fire Underwriter Survey
IAFF	International Association of Firefighters (Local 2461)
ISO	International Standards Organization
NFPA	National Fire Protection Association
SCES	Strathcona County Emergency Services
SOC	Standards of Cover

Appendix B: Acknowledgements

This Master Plan builds on decades of effort and commitment by firefighters, staff, management, and the community as a whole.

Of particular recognition is the amazing work done by the entire Strathcona County Emergency Services (SCES) team especially over the last many years through the parkade incident, the protracted COVID-19 pandemic journey, and the day-to-day demands on services.

It is further recognized the historical and most recent investments in SCES by the community have contributed to public and community safety.

The preparation of this Master Plan has involved many contributors which have represented the following stakeholders:

- Council
- Executive Team
- County departments
- SCES Management Team
- SCES leaders
- SCES frontline staff
- IAFF Executive
- Industry and businesses
- Community partners and agencies