

Council Orientation 2018

Vancouver Fire and Rescue Services and Office of Emergency Management

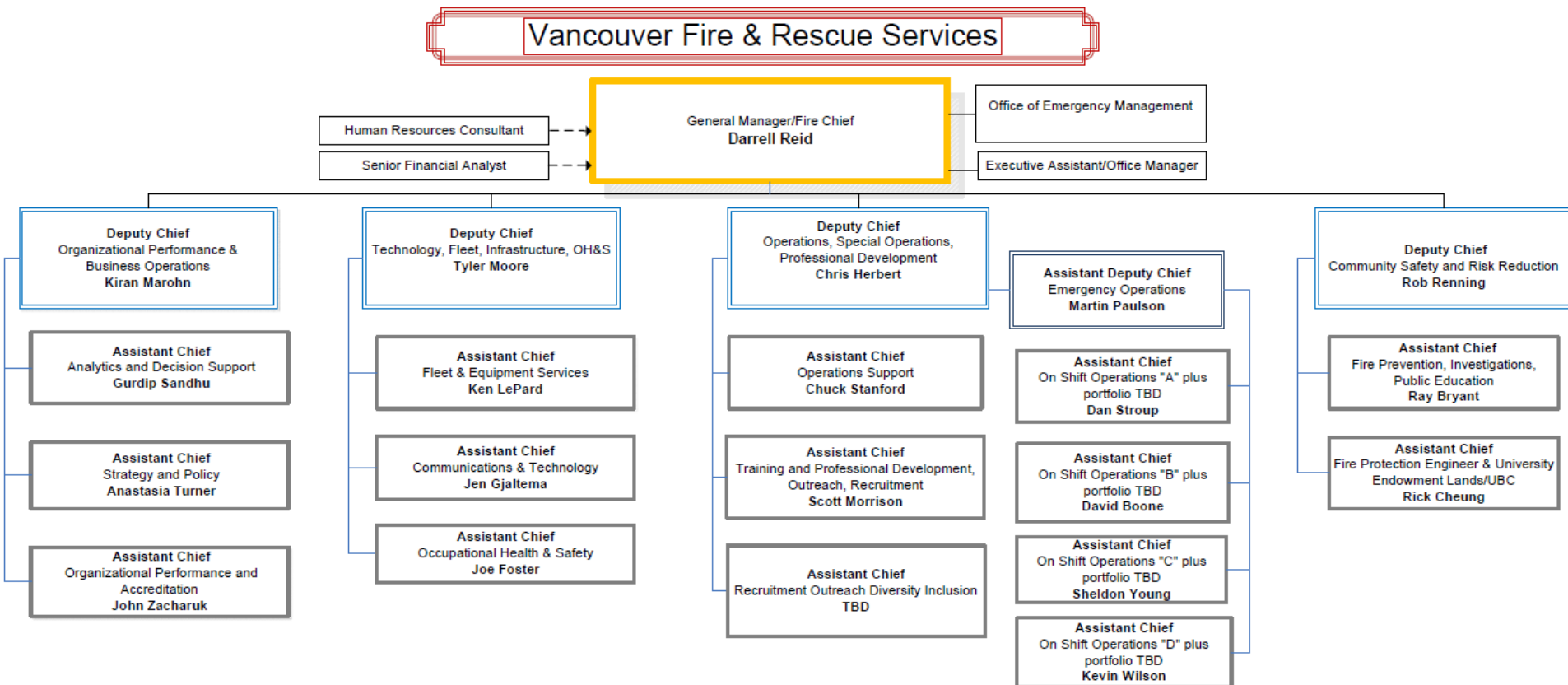


Vancouver Fire and Rescue Services (VF&RS) and the Office of Emergency Management (OEM) are two distinct business units under the oversight of the General Manager of VF&RS and OEM, Chief Darrell Reid.



- VF&RS provides emergency response to incidents, as well as Community Safety programs and a framework for disaster resilience in the city.
- VF&RS also leads the Heavy Urban Search and Rescue (HUSAR) team.
- OEM is the organization established to manage the City's responsibilities under the Emergency Program Act, and to coordinate other emergency management activities across the organization.

Service group structure



Fire Prevention and Public Education



Service Description



Inspecting business and residential properties to ensure and enforce compliance with the fire code and associated bylaws. Offering fire and life safety education to the community.

2018 Key Accomplishments

Building safety through initiative on locking standpipe caps in buildings

Reassessed and expanded risk-based inspections

Rapid Damage Assessment Inspectors **Training**

2019 Key Priorities

Bylaw updates to align with Building Bylaw and BC Fire Code changes

In-depth review of all programs associated with fire and life safety education

Use data analytics to implement a targeted evidence-based approach

Fire Prevention and Public Education

Fire and Life Safety House



Fire Extinguisher Program

Fire Prevention and Comm. Risk Reduction



**Wood Frame
Buildings**



**Mental Health
Related Fires**

SROs

New Canadians
(click for kitchen fire video)

Fire Suppression, Rescue & Special Teams



Service Description



Supporting public safety by providing an all-hazards response service, including structure fires, hazardous material (haz-mat) incidents, technical and confined spaces, structural collapses, trench rescues, auto extrications, and wildland and marine firefighting responses.

2018 Key Accomplishments

Commenced work on **Multi-year strategic plan**

Completed initial **training** of all senior staff in pursuit of **fire service accreditation**

Improved **Response/ Turnout times**

2019 Key Priorities

Implement and complete the objectives and goals in the **Strategic Plan**

Pursue accreditation

Optimize performance — Improve turnout times

Fire Suppression, Rescue & Special Teams

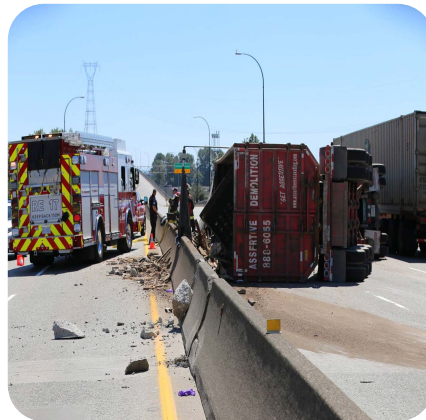


Vehicle
Rescue



Tech Rescue

Hazmat



Rehab/
Decon



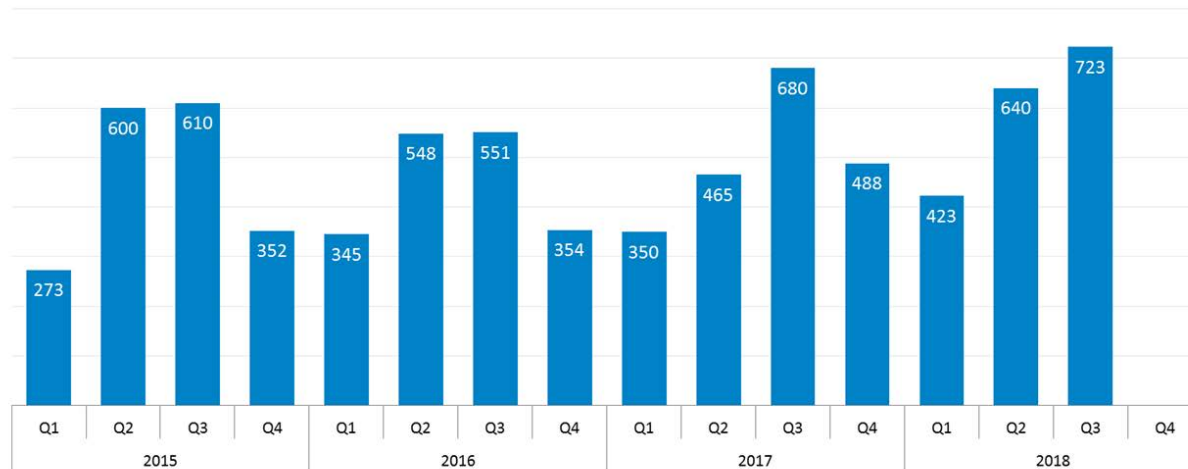
Fire Suppression, Rescue & Special Teams

Wild Land



PSU and
Active Deadly
Threat

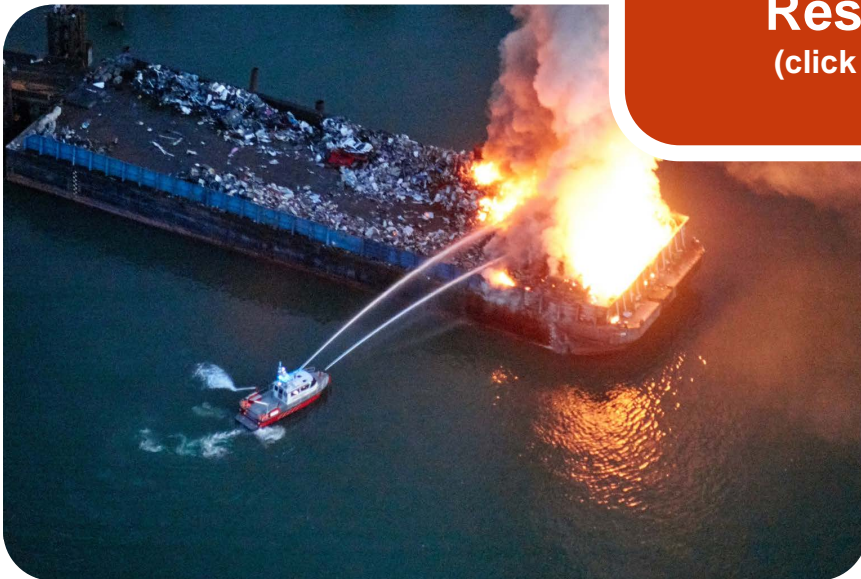
Fire Suppression & Special Teams:
of all fires with damage



Fire Suppression, Rescue & Special Teams



**Marine
Emergency
Response**
(click for video)



Fire Suppression, Rescue & Special Teams

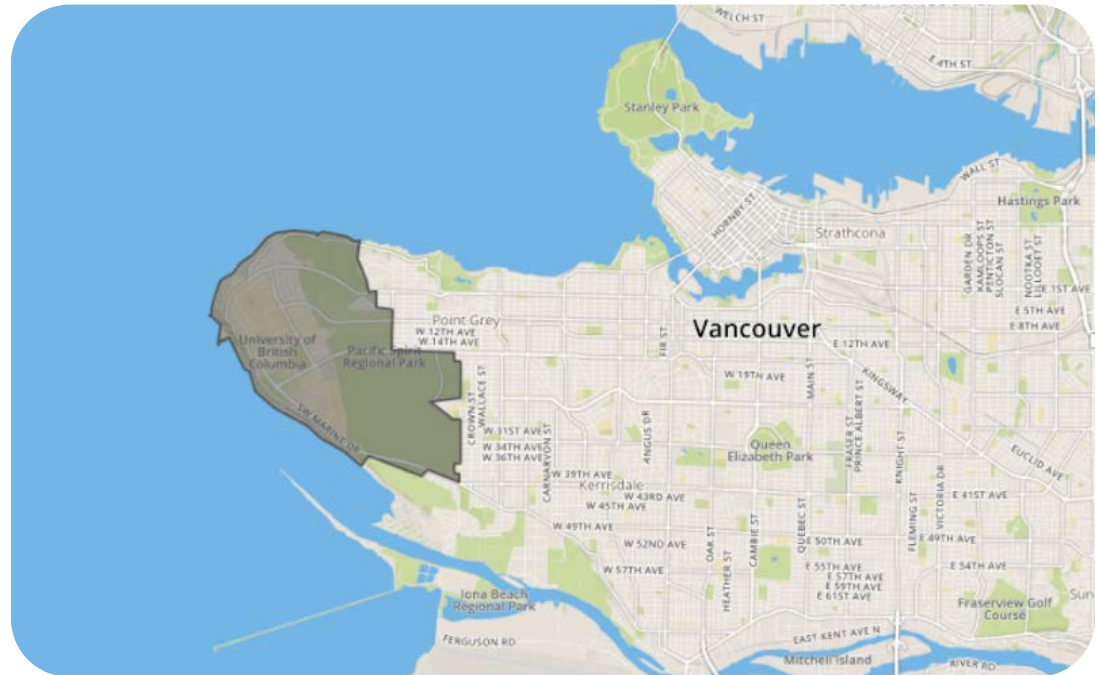


HUSAR
CAN-TF1



Fire Suppression, Rescue & Special Teams

UEL – Fire Services Agreement



Fire Suppression, Rescue & Special Teams



Mutual Aid Wildfire Support



Social Media Presence

Facebook:

<https://www.facebook.com/VancouverFireRescueServices>

Twitter:

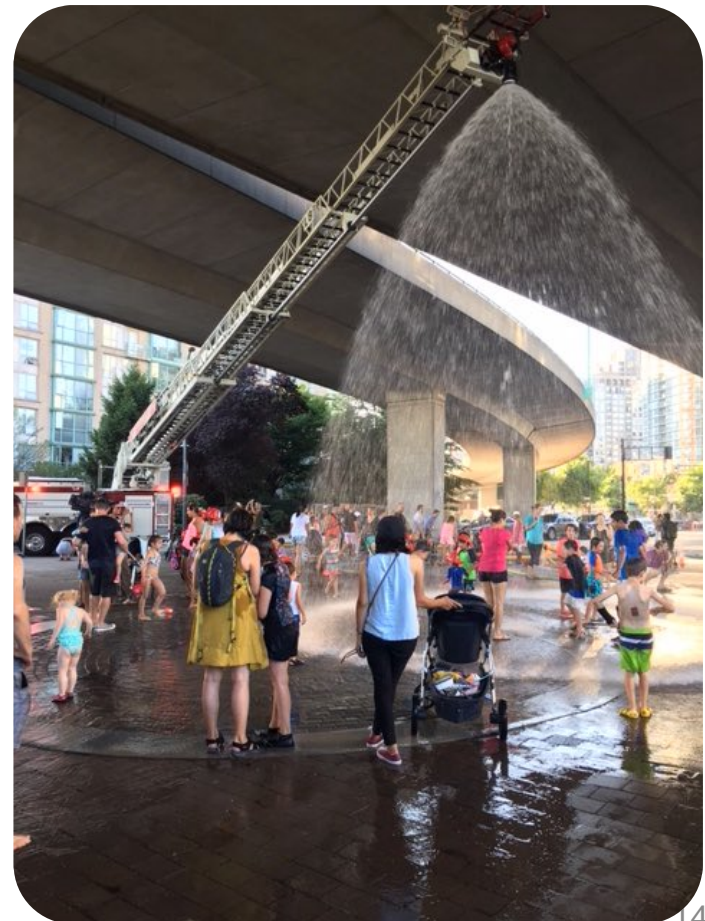
<https://twitter.com/VanFireRescue>

<https://twitter.com/FireChiefReid>

<https://twitter.com/IAFF18>

Charities:

<https://twitter.com/VanFireCharity>



Medical Response

Service Description



Providing pre-hospital care services to citizens as a layered first responder emergency medical service with the BC Ambulance Service.

2018 Key Accomplishments

Worked with external stakeholders to **optimize medical response**

Analyzed data and educated staff on medical response trends

2019 Key Priorities

Coordinate medical call information with BCEHS to enable accurate in-depth patient analysis

Set targets for turnout time for medical response for 2019 and achieve those times



Opioid Crisis



Emergency Management

Service Description



Building readiness to respond to emergencies within the City of Vancouver, fostering community resilience, and supporting the management and coordination of emergencies through the duty officer and activation of the emergency operations centre.

2018 Key Accomplishments

Deployed a
**new
emergency
manage-
ment
information
system**

Conducted
**planning for
a full-scale
earthquake
exercise** in
2019

Supported
departments
in **updating
their
emergency
plans and
procedures**

2019 Key Priorities

**Execute full-
scale
earthquake
exercise**

**Develop and
begin
implementat
ion on post-
exercise
corrective
actions**

**Provide
Disaster
Assistance
Team
volunteers
mobile
updates**

Needs Assessment Study performed for VF&RS by Darkhorse Analytics.

- Understand risk and resource requirements (current and future)
- Inform the Strategic Plan developed in 2018



Phase 1: Current State Analysis

Generated 1300 ideas from 74 internal and external stakeholders through interviews and workshops



Phase 2: Benchmarking

Compared Vancouver to 45 cities going deeper on 6 peers, and reviewed readiness to begin CPSE accreditation process



Phase 3: Diagnostic Analysis & Predictive Modelling

Analyzed trends and performance in 2015-2017 for 229,362 responses, forecasted future demand, and launched software suite for analysis and planning.



Phase 4: Needs Assessment

Recommendations to serve the needs of the community and align with industry standards

Themes

Resourcing



Training

**Health &
wellness**

**Optimism
around
leadership
team**



**Keen interest
in Data
Analytics**

**Improve
Coordination**

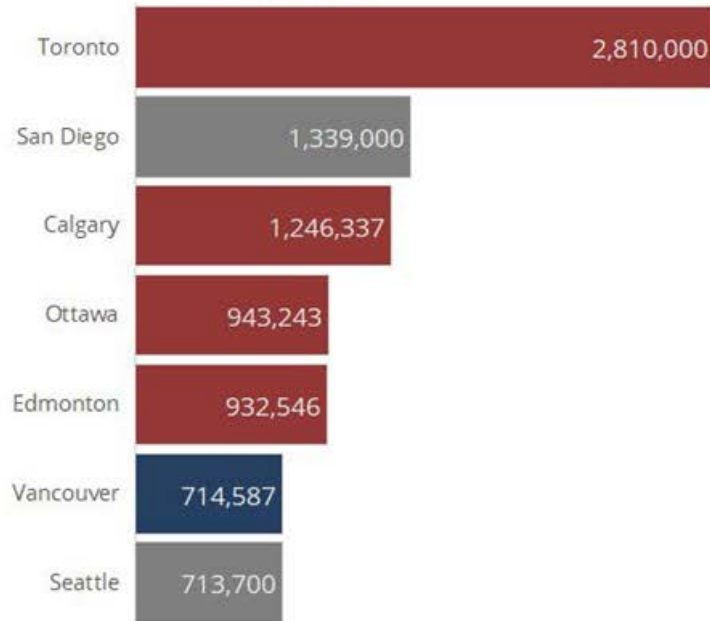
**Struggle to
attract a
diverse group
of candidates**

BENCHMARKING

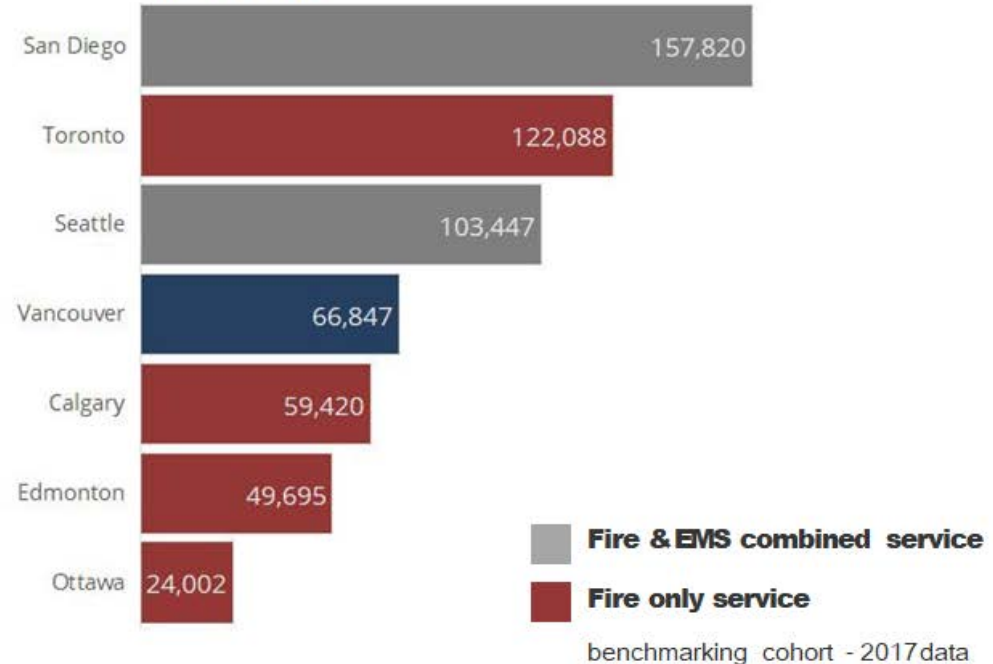
Peer Comparison

VFRS reached out to multiple services for an in depth benchmarking assessment. We received 6 quality responses.

Population

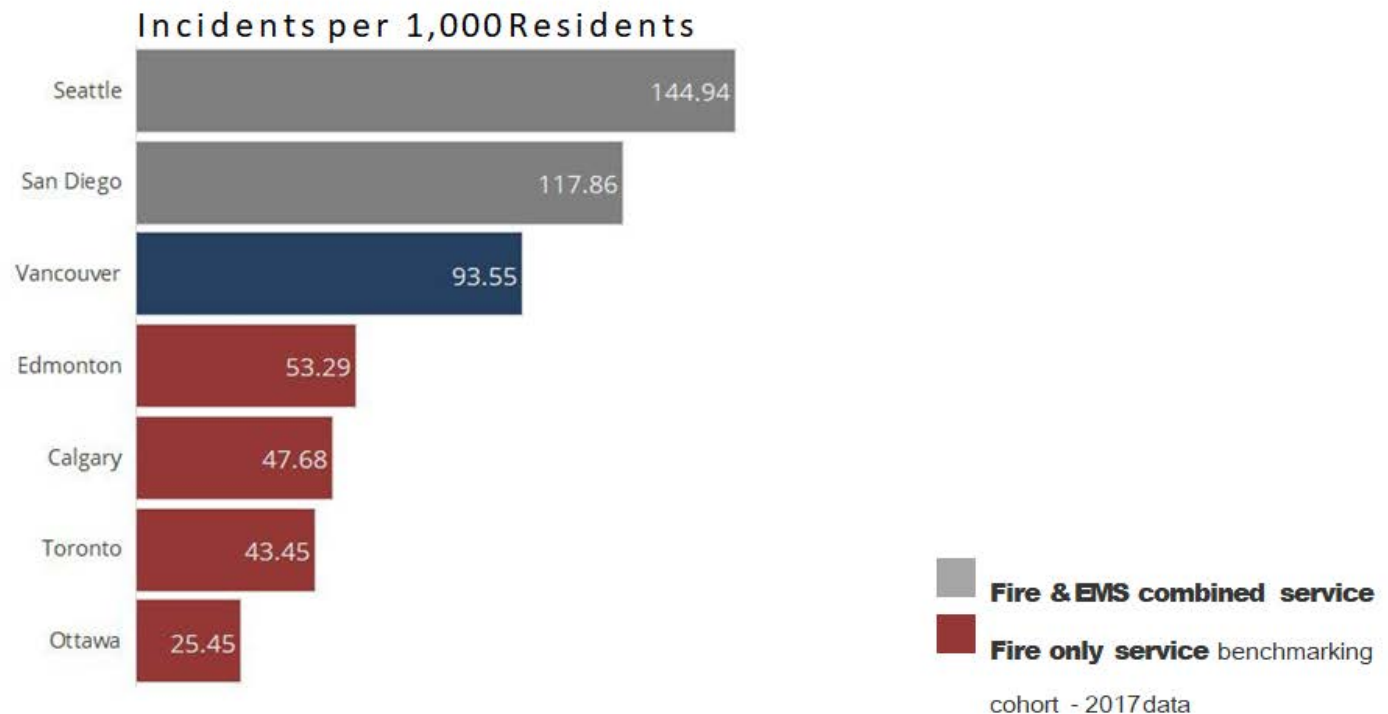


Incidents



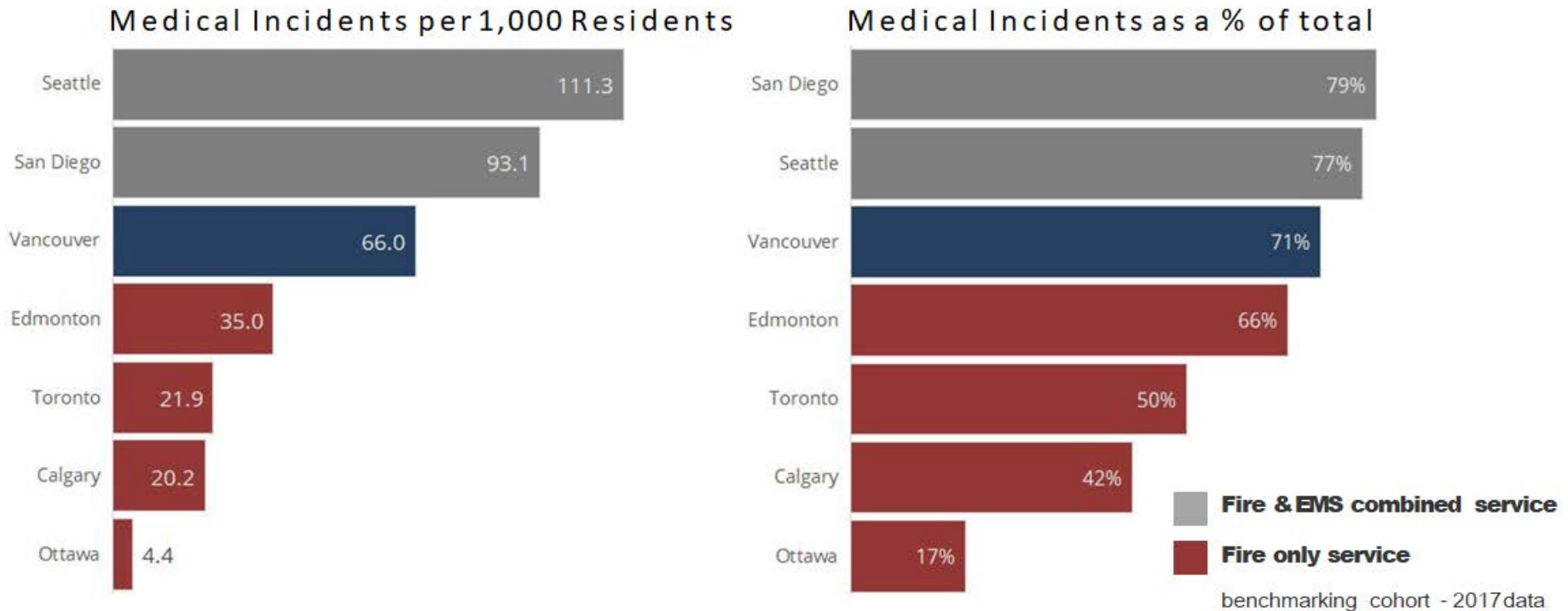
Incidents per Resident

More than double than the other Canadian Fire-only services



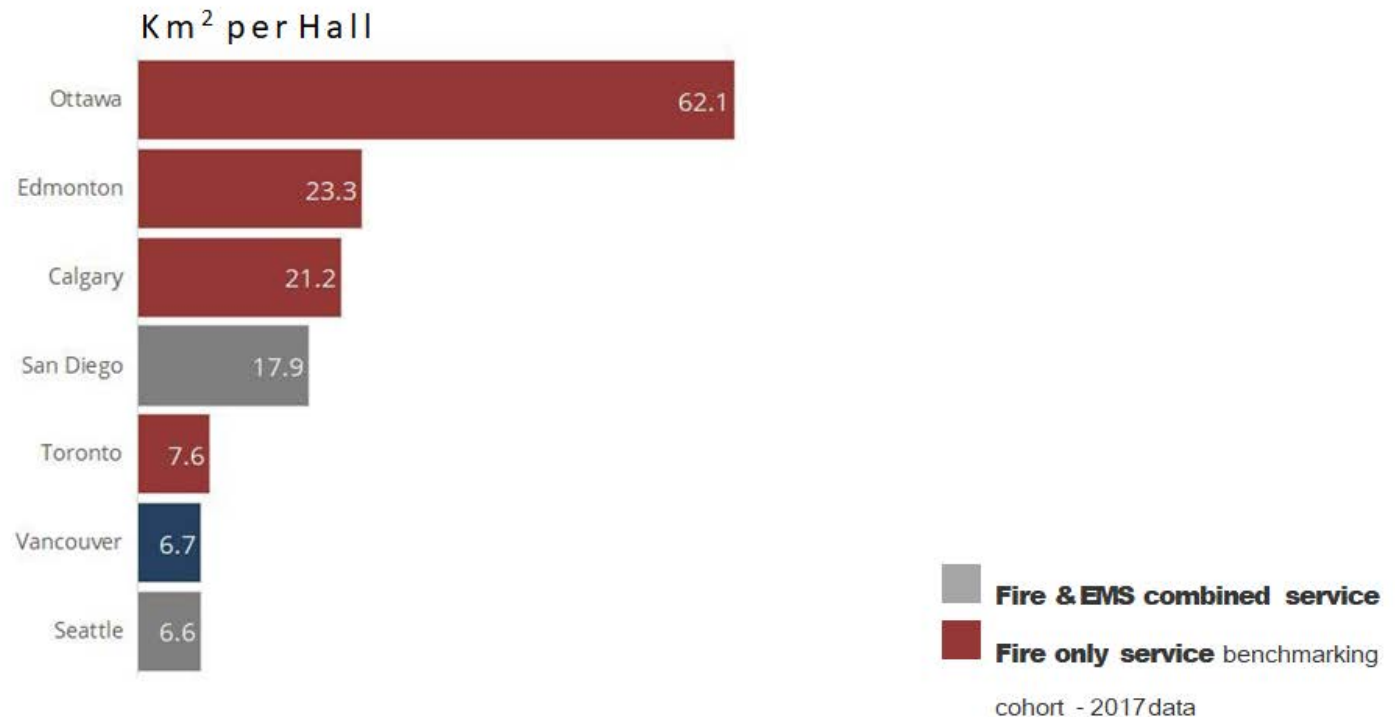
High volumes driven by medical calls

Making VFRS look like a combined Fire-EMS service.



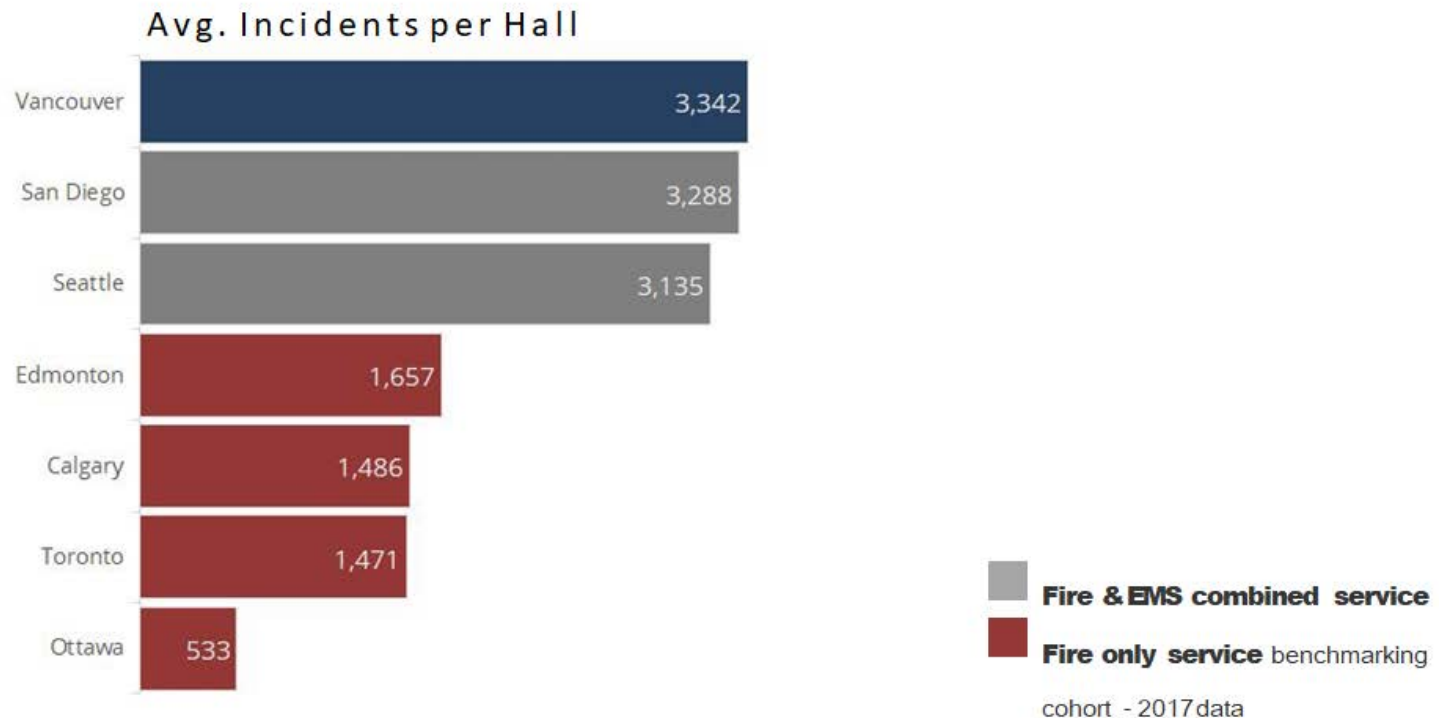
Coverage compared to peers

Station density is high, however, given the population density and the incident volume this is necessary.



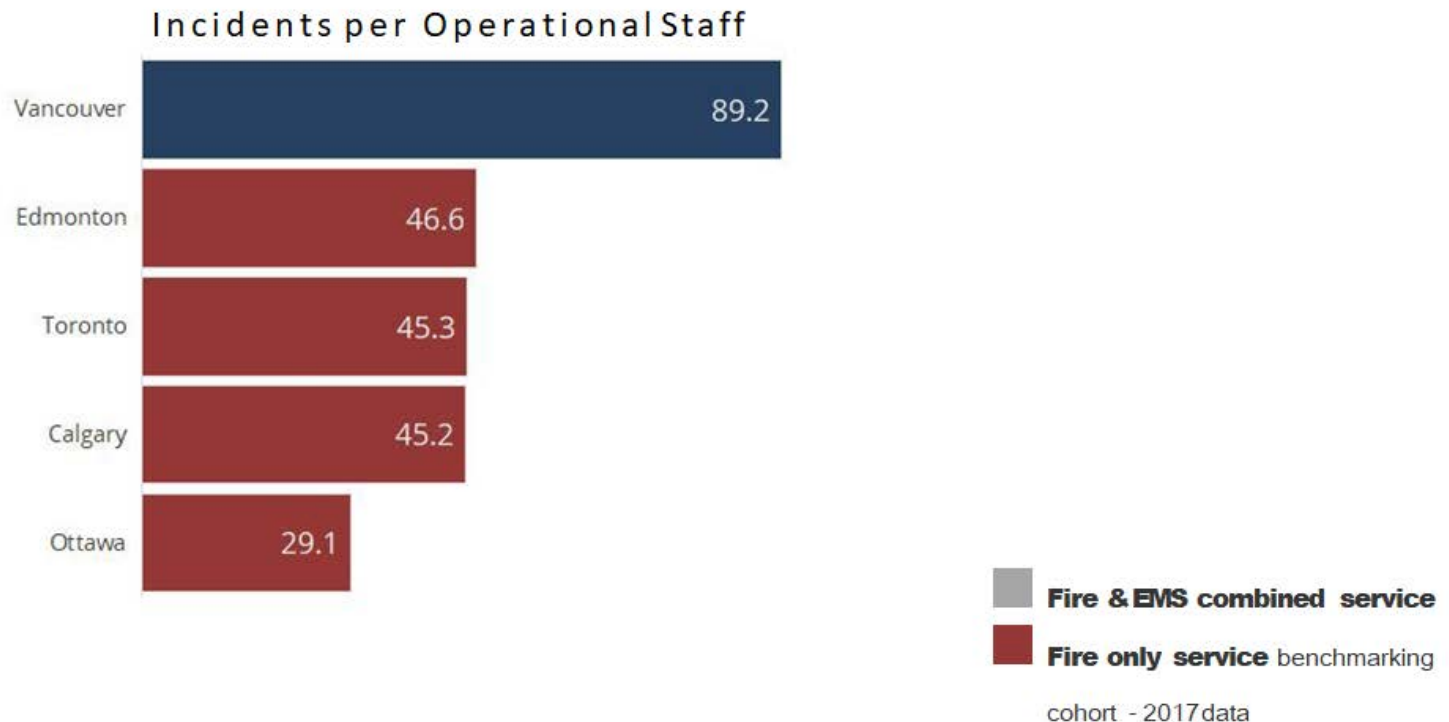
VFRS halls are the busiest (on average)

More than double that of the Canadian Fire-only cohort



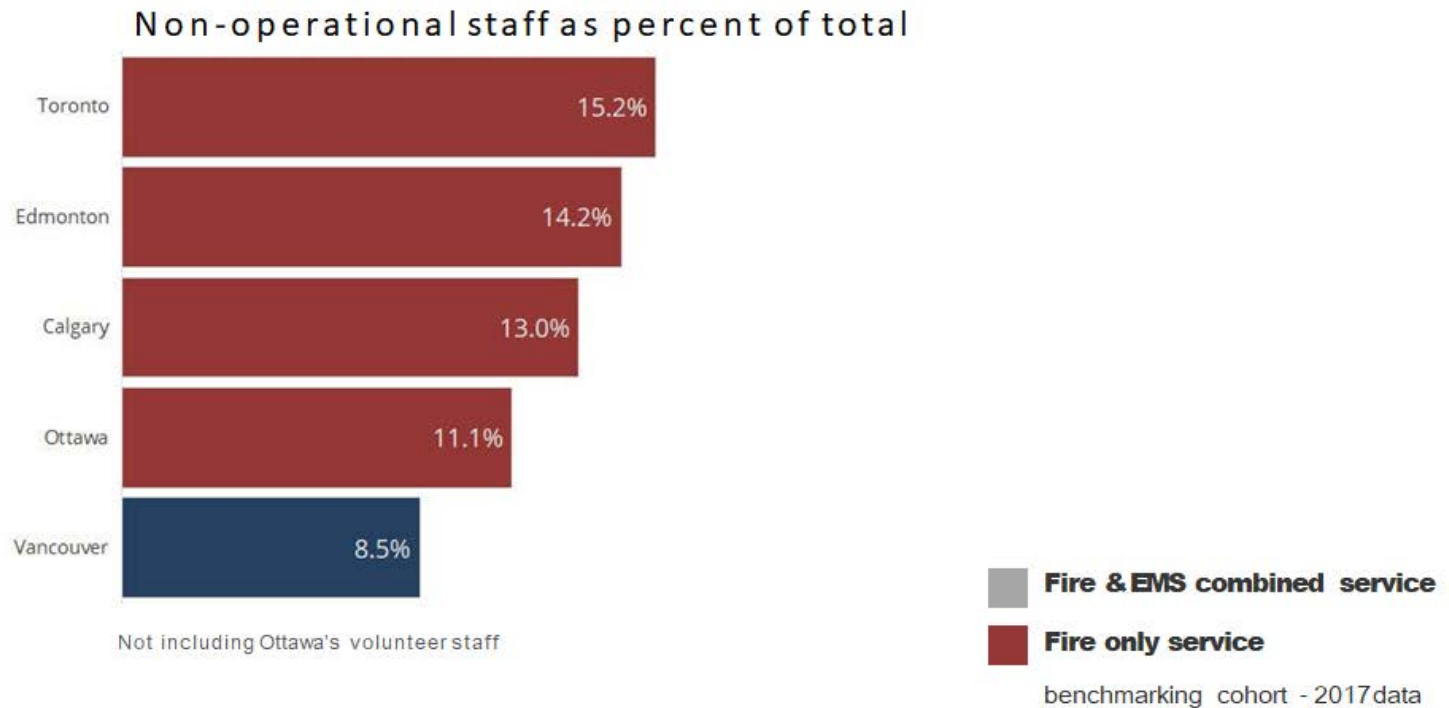
Vancouver is doing more with less

As expected, VFRS ops staff is much busier compared to the Fire-only service cohort

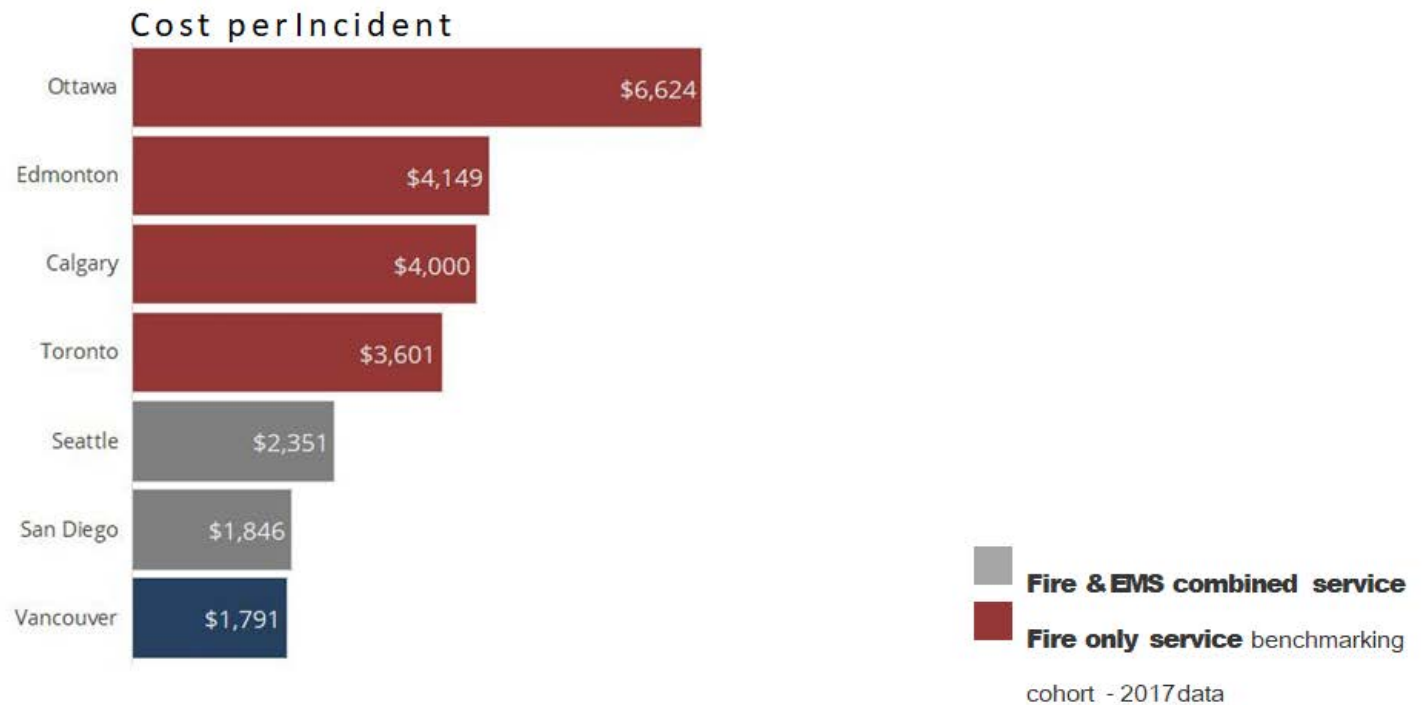


Relatively small non-operational staff

Lean management team, prevention team, training staff, etc

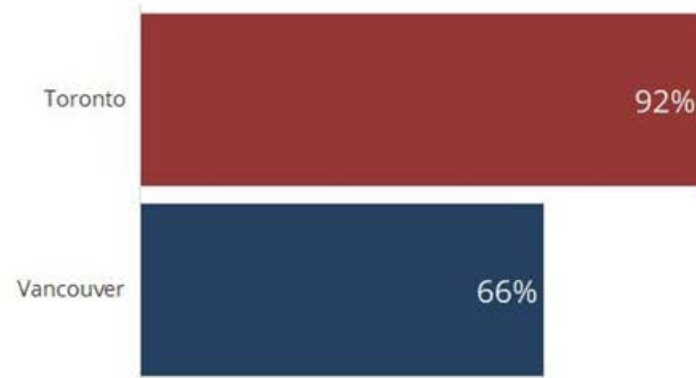


VFRS is low cost compared to peers



Comparison to Toronto South Command

First Due performance based on NFPA 1710

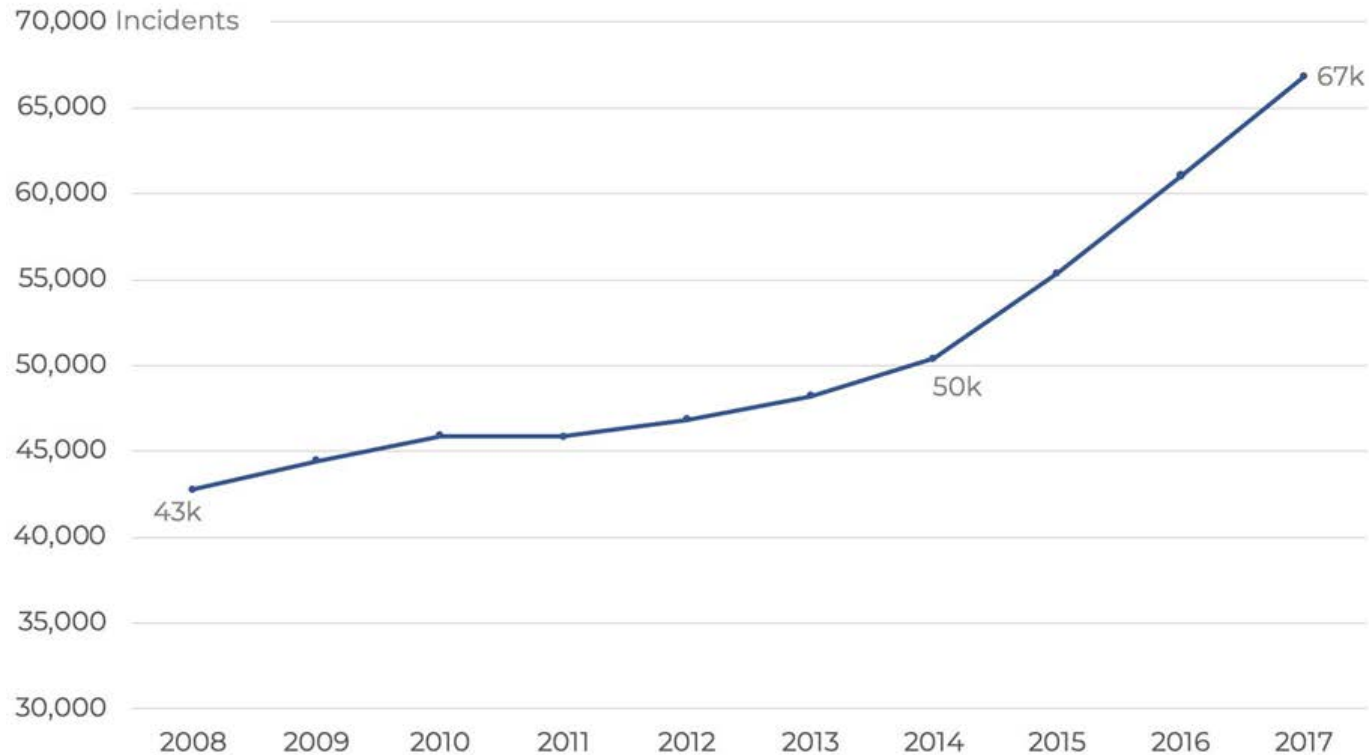


Department	Land Area - km2	Halls	Km2 / hall	Incidents / km2
Vancouver	133	20	6.7	503
Toronto - South Command	90	21	4.3	429

HISTORICAL CONTEXT

Incident volume has increased by 56%

in the last decade, and 10% annually since 2014

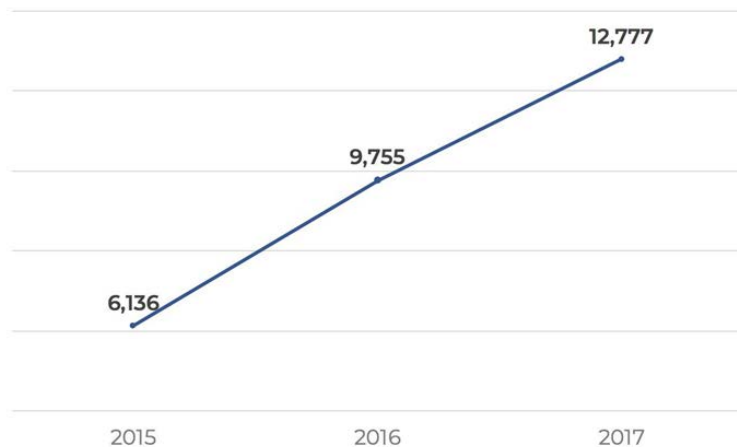


“Heading to a tipping point – One more thing is one less for the next call”

With the opioid crisis, staff have been stretched to the limit and have done really well, but this is not sustainable. Performance is slipping, and burnout is happening.

Operating in Crisis Mode

Medical Incidents responded to by Hall 2
have increased 108% increase since 2015



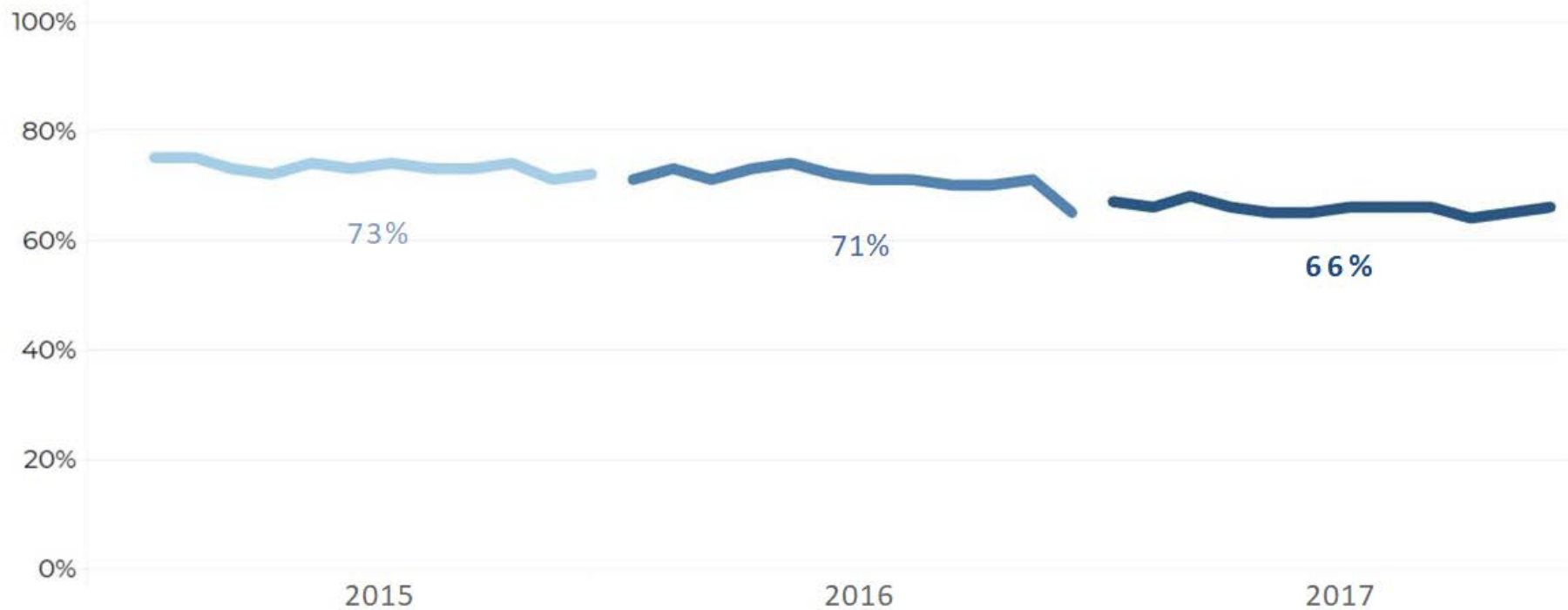
In Hall 2, we see the crisis at its extreme.

Overdose incidents by comparison



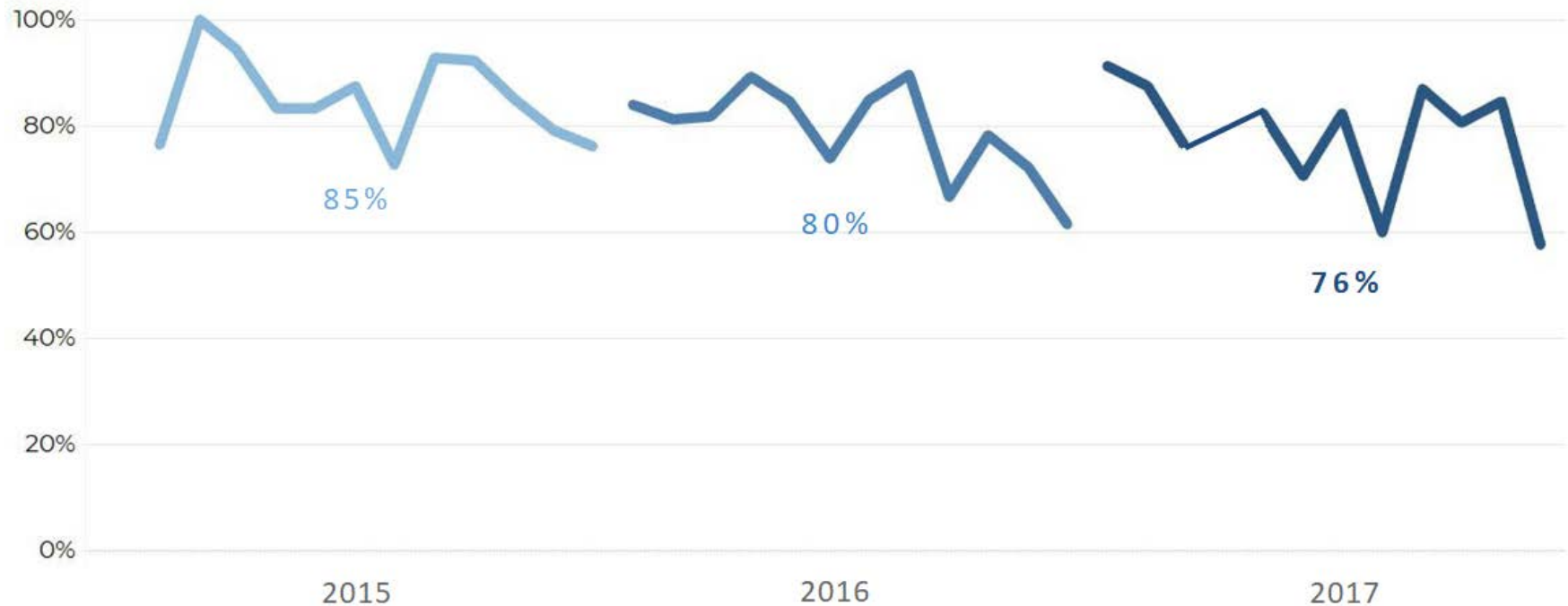
Compared to the only service from which we received data (San Diego), it is clear that Vancouver is still in the midst of and opioid crisis.

Resulting in declining first due performance



First unit on scene within 5m20s of being dispatched. Excludes non-emergency incidents and incidents with data quality issues.

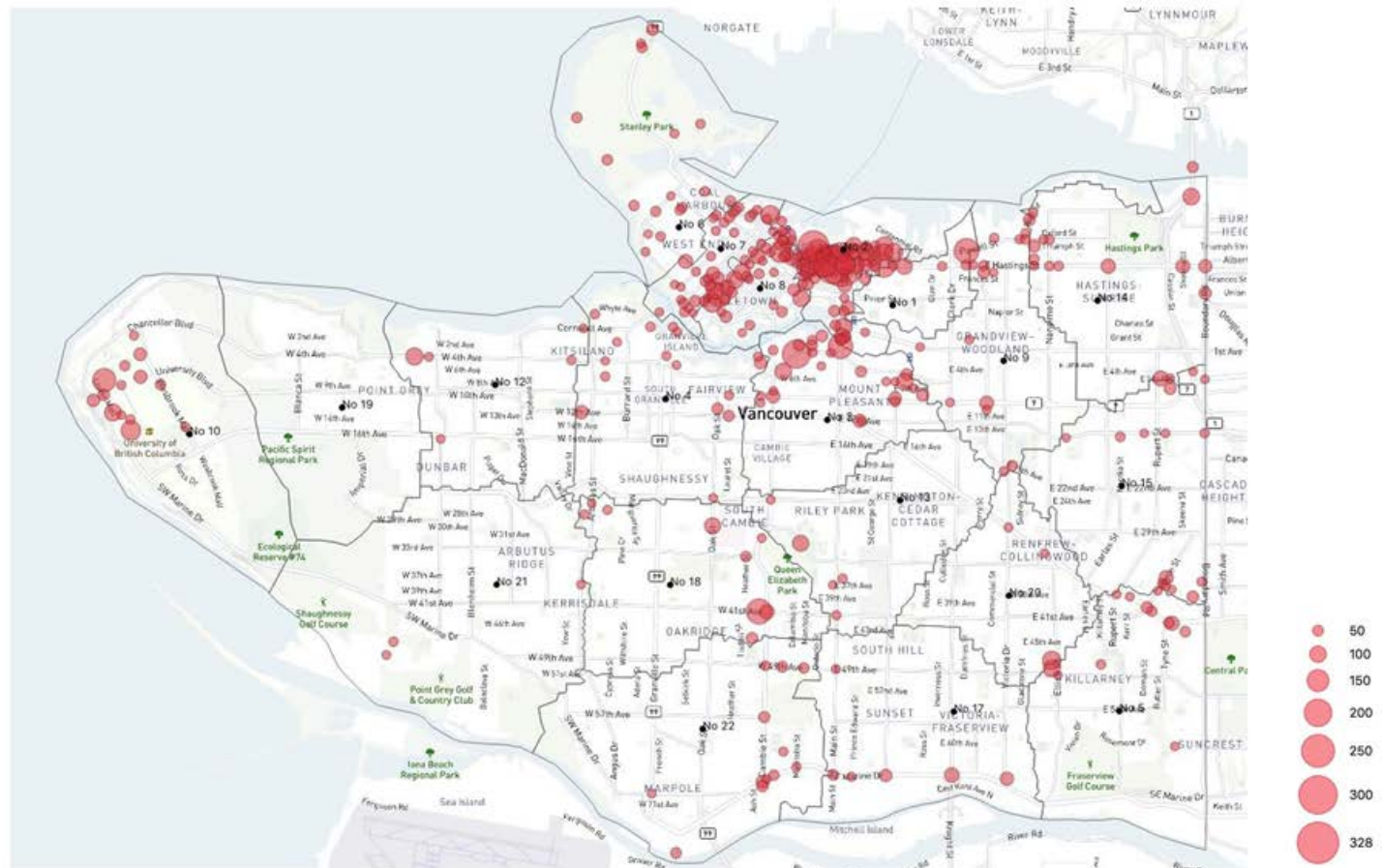
And declining ERF performance



Estimated by 4th fire suppression apparatus to arrive on scene within 10m24s from 911 call answered. Excludes incidents which were initially entered as a lesser call type and later upgraded, non-emergency incidents, incidents with less than the specified number of apparatus.

April 2017 was excluded from the line chart due to data quality issues.

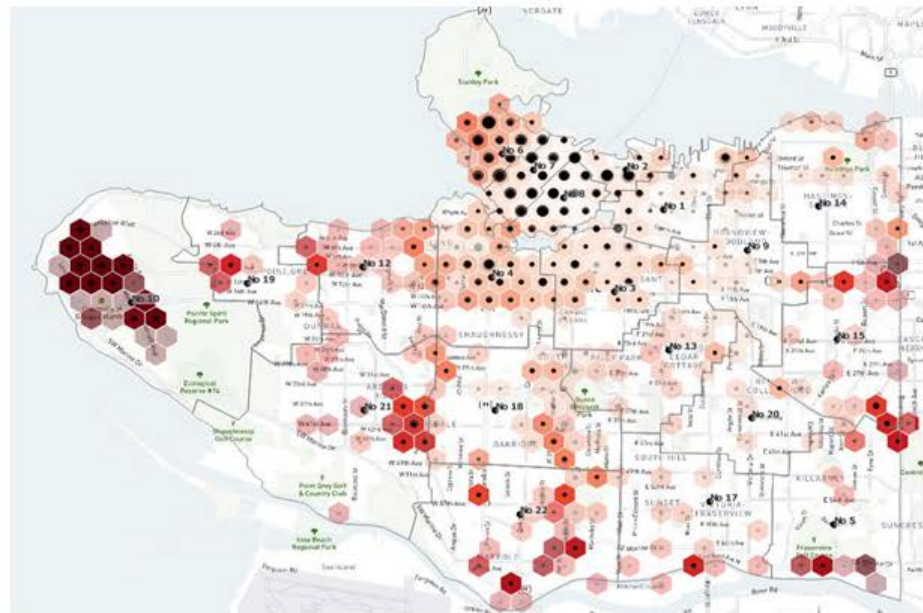
Struggle to deal with high downtown volumes



First due overgoal calls at locations with 25+ calls per year.

Acceptable Risk

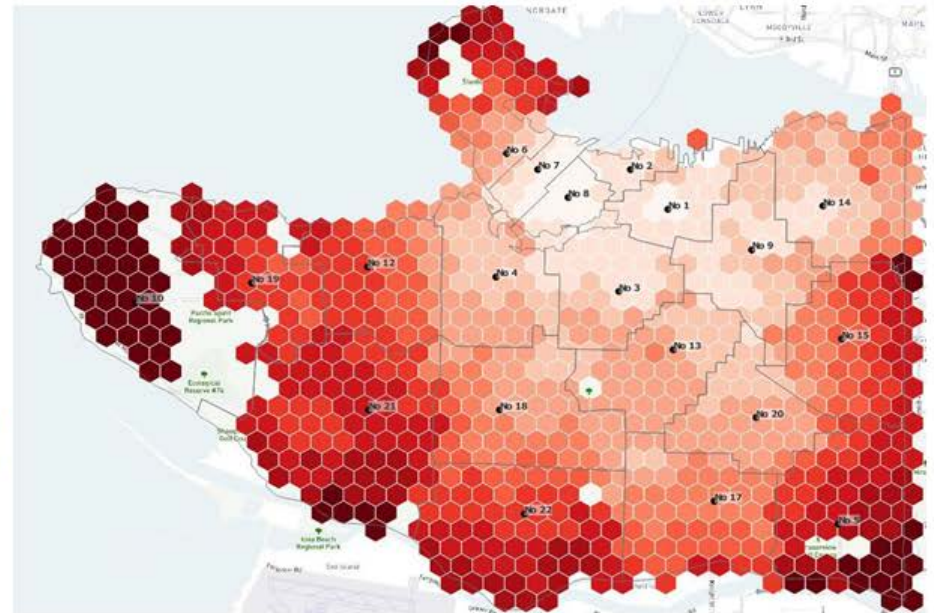
Expected coverage with 39 FF in 12 m 34s



Probability of Arrival
0% 100%

Occupancies
10 20 30

Known high-hazard occupancies
(by avail. data)



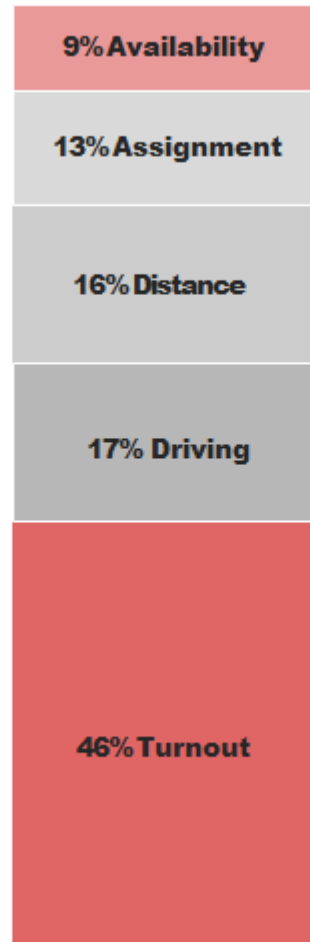
If high-hazards were placed anywhere in the city

The main issues are **turnout** and **availability**

First Due

First unit should arrive on scene to an emergency call within 6m24s of it being answered, 90% of the time.

Key metric for all call types, especially medical calls.

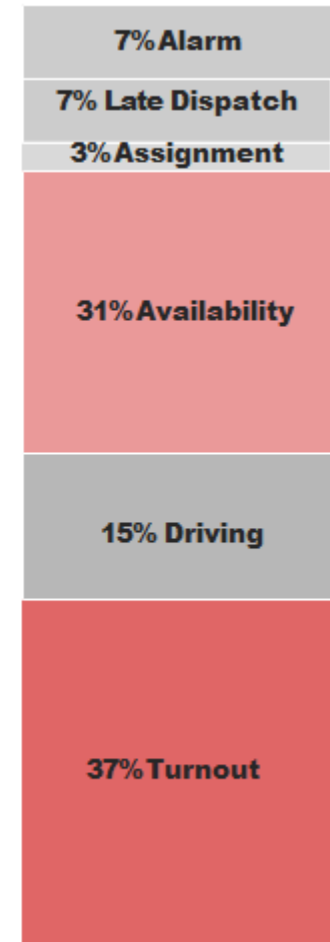


ERF

Effective Response Force is the minimum team of firefighters to effectively fight a structure fire.

Targets range from 15 firefighters within 10m24s on low hazard fires, to 39 firefighters within 12m34s for high hazards, 90% of the time.

VFRS does not currently track this, so we approximate performance using the 4th arriving fire suppression unit



Cost and Value of Performance

Scenario	First Due Performance	ERF Performance
Improve Alarm Handling time or Turnout time or Travel time	+1.0% per 3.5s improvement	+1.0% per 25s improvement
Add 1 Position	N/A	+0.4%
Add 1 Apparatus	+0.3%	+1.1%
Add 1 Hall	+0.2%	+0.5%
Move 1 Hall	+0.2%	
Reduce incidents	+1.0% per 5000 calls	

1% first-due performance improvement
equals
~500 fewer overgoal calls per year

1% ERF performance improvement
equals
~7 fewer overgoal fire incidents per year

Based on analysis of 2015-2017 incident data. Supporting data included in the appendix.
Because performance is calculated based on current demand, the value of adding a hall will change in the future due to the increase in call volume (+1.2% by 2042).

IMMEDIATE RECOMMENDATIONS

Immediate Recommendations

*Pursue CPSE
accreditation*

Develop a data-
driven culture



Improve
coordination with
BCEHS

Continue to build
culture and
diversity

Bolster physical
and mental
health, wellness
and safety

Continue to build
connections with
stakeholders



Complete
development of a
comprehensive
training program

1. Pursue CPSE accreditation

Create new position for Accreditation Manager (2019)
Determine how to integrate staff to support accreditation work.

The accreditation process will include:

- Adopting NFPA as a baseline for comparison
- Developing targets for Training, Prevention, Wellness, etc.
- Educating staff on the importance of accurate data capture
- Developing a continuous improvement model for data quality

2. Develop data-driven culture

Build an analytics team to manage data quality, reporting tools, and to provide predictive insights, championed by the newly hired Assistant Chief, Analytics & Decision Support:

- Create two analyst positions (2019) to perform data management, mathematical/statistical analysis, data visualization and automation
- Create administrative position (2022) to ensure data quality

Study how opioid crisis drives call volumes and possible demand mitigation strategies

Assess data quality and develop improvement plan

Educate wider team on how to use data and deliver using appropriate medium

3. Improve coordination with BCEHS

Working with mayor, city management and Ministry of Health:

- Streamline dispatch processes to ensure closest and most appropriate emergency response resources are used
- Streamline transfer of care / patient release
- Engage in discussions to better understand joint challenges and opportunities
- Identify options for engagement and planning

4. Continue to build connections with stakeholders

Develop a strong internal communications program

Increase collaboration with City departments on strategic and development planning, and integrate services such as building inspections

Clarify and communicate VFRS's mandate to staff and stakeholders, including mission, vision and strategic plan

5. Bolster physical and mental health, wellness and safety

Develop a health plan that addresses:

- Pre-cancer screening and physicals
- Confidential counseling and coaching
- Health program, similar to IAFC/IAFF Wellness Fitness Initiative (WFI) used in Edmonton and Calgary

Hire a mental health professional to be part of the mental health team (2019)

Address lost time injury levels by creating a Health, Wellness and Safety Officer position for each shift (2022)

Develop comprehensive decontamination policies and procedures

Implement strategy for action-ready, clean gear

6. Continue to build culture and diversity

Continue and expand efforts to attract and maintain a workforce that represents Vancouver

- create two positions for Community Outreach, Inclusion and Diversity (2019)

Explore opportunities to learn from other fire departments as well as partners such as VPD

Culture is perceived to be improving significantly due to increased communication and engagement.

Build on VFRS strengths such as community engagement, sense of pride, mentorship, teamwork, values.

7. Complete development of a comprehensive training program

Incorporate inter-agency training

Utilize accredited programs, certifications and live practice

Ensure strong competency management programs for all specialties

Monitor training effectiveness

MID-TERM RECOMMENDATIONS

Mid-Term Recommendations (2022)

Reduce turnout
times to 1m45s,
90% of the time

Achieve NFPA
alarm handling
targets



Bolster training
staff



Add firefighters
to improve
response
performance

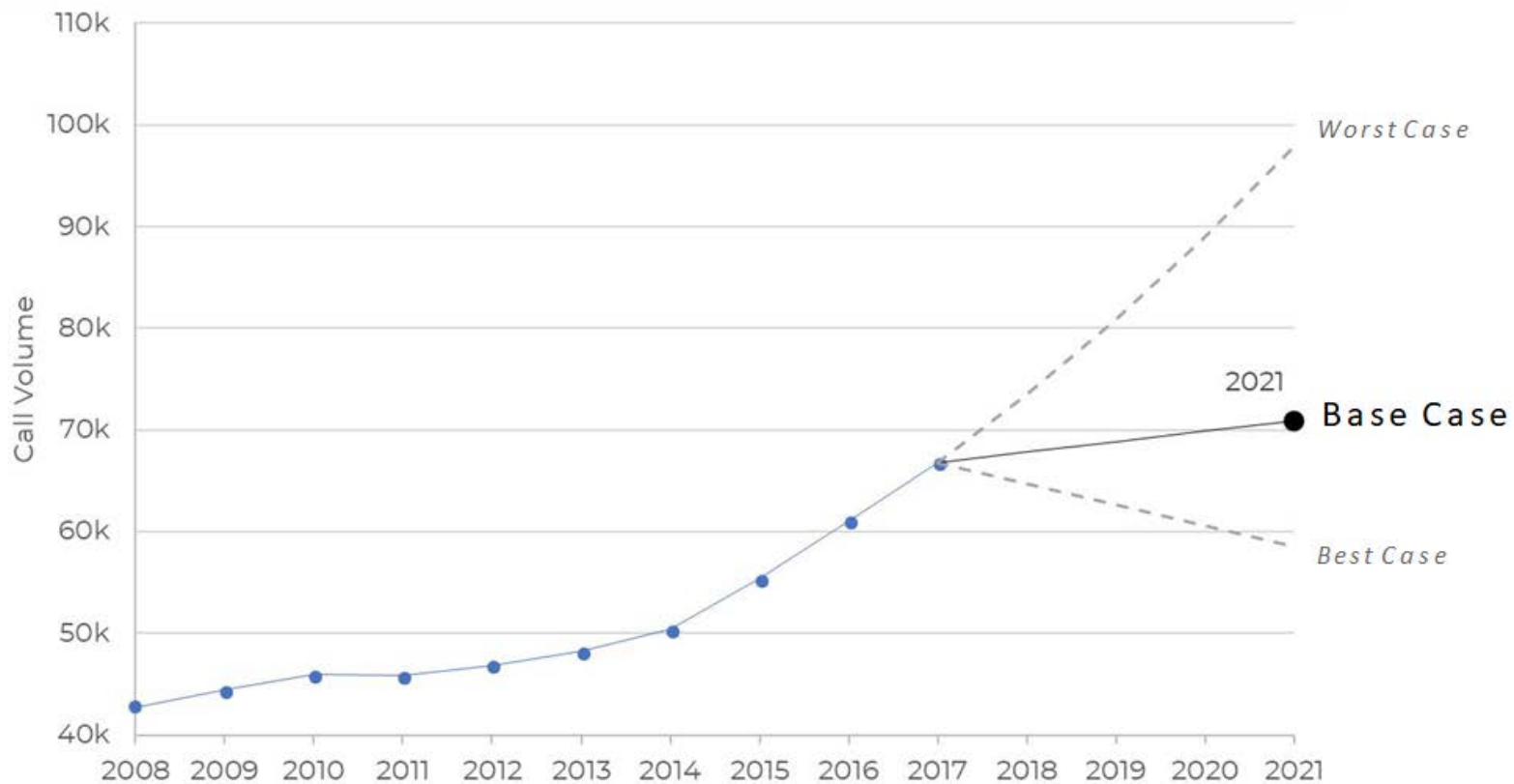


Add prevention
and public
education
resources

Develop station
plans for the long
term

Incident growth forecast

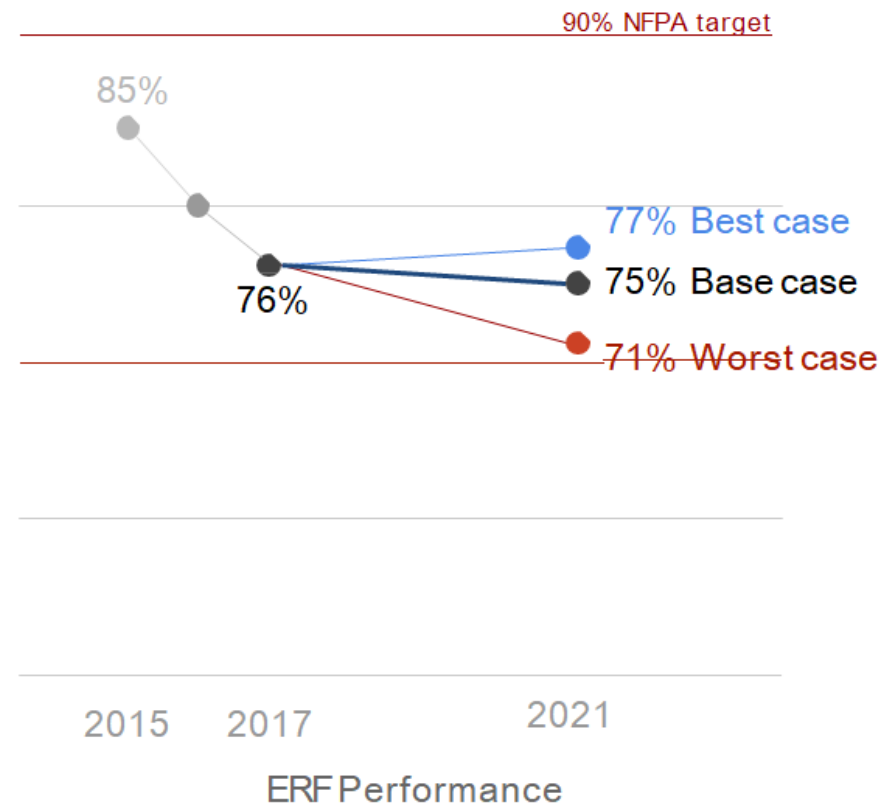
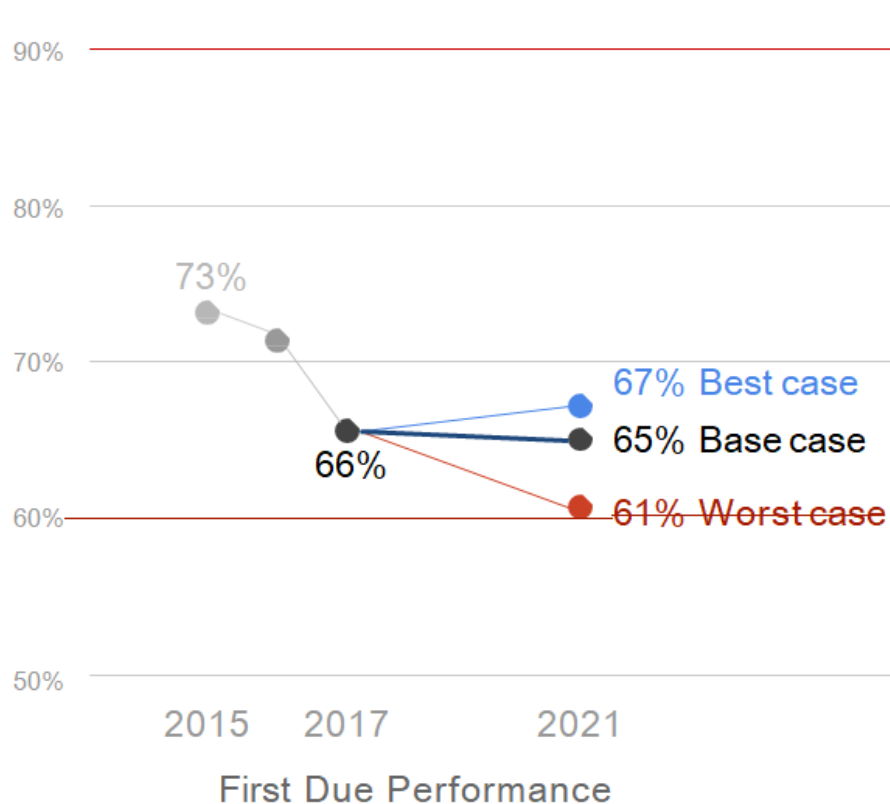
Incident growth forecast



Incident volume is predicted using projected population growth. Base Case assumes incidents per population continues at the 2017 rate. Worst Case assumes 10% annual demand growth until 2021. Best Case assumes that demand returns to a 2015 level by 2021.

What if we do nothing?

Performance drops with demand growth due to rising population



[Click for video on how fast a fire grows](#)

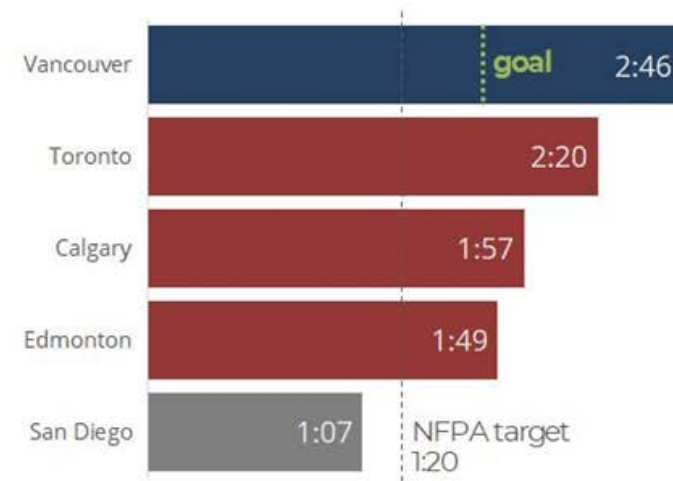
Time is very important when an unconscious person is not breathing. Permanent brain damage begins after only **4 minutes** without oxygen, and death can occur as soon as **4 to 6 minutes** later. Machines called automated external defibrillators (AEDs) can be found in many public places, and are available for home use

1. Reduce Turnout Times

Reduce turnout times to 1m45s, 90% of the time

Set realistic, hall-specific targets
recognizing unique hall layouts

Track performance at hall-shift level



Peer Comparison: First Due 90th percentile Turnout time

Improvement Metrics

First due

+8.0% performance
3,700 fewer overgoal calls per year

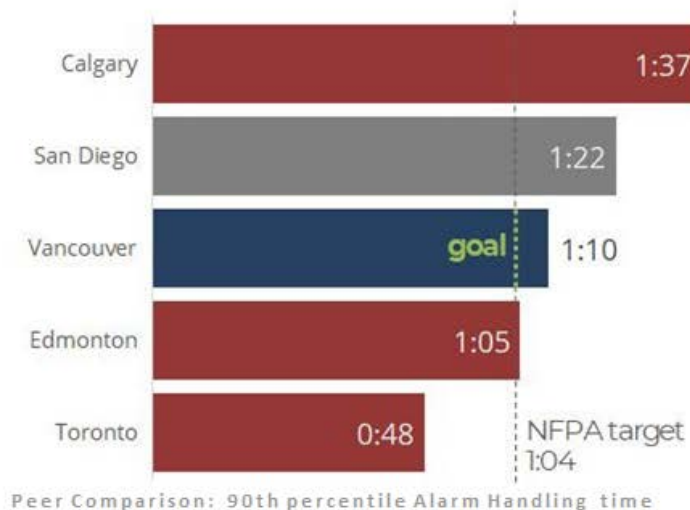
ERF

+3.4% performance
22 fewer overgoal fire incidents per year

2. Achieve NFPA alarm handling targets

1m4s for 90% of fire incidents

Acquire data from E-Comm and BCEHS to understand total alarm handling time for all incident types



Improvement Metrics

First due

+2.0%* performance
1,000 fewer overgoal calls per year

ERF

+1.2% performance
8 fewer overgoal fire incidents per year

Alarm handling for first due is not included in baseline performance due to data availability. +2% assumes this is added, and reduced by 7 seconds for all call types.

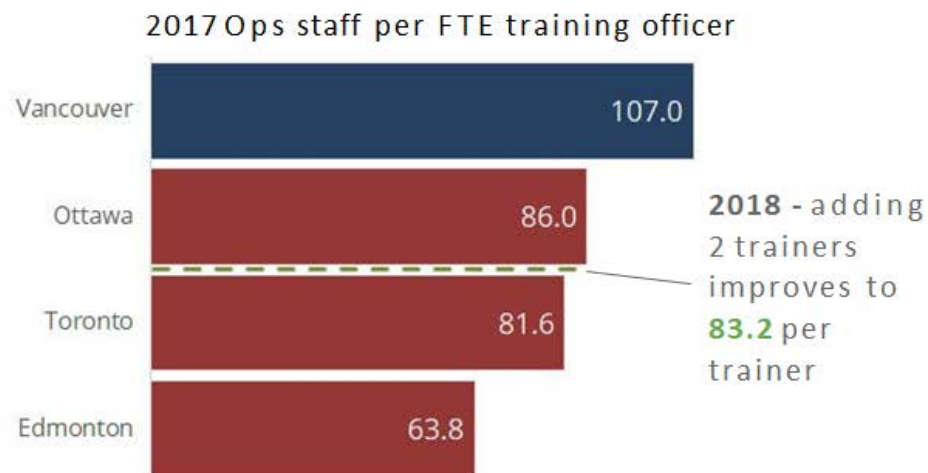
3. Bolster training staff

In addition to 2 staff planned for 2018, add 1 more in 2021

Training was identified as #2 priority by stakeholders

VFRS has the highest staff to trainer ratio of cohort

Lost time injuries are relatively high



2021 - adding 1 trainer improves to **74.9** if ops staff levels stayed the same

Eg: If 60 FF are added, adding 1 trainer improves to **80.9** ops staff per FTE trainer.

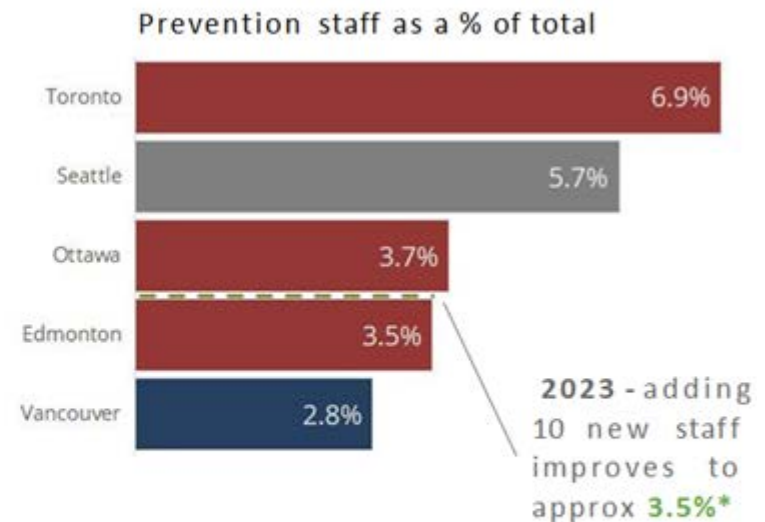
4. Prevention and Public Education Resources

Add 2 prevention staff every year for five years: 8 inspectors and 2 public education staff

Investigate targeted community risk reduction

With inspections, gather more data and monitor effectively
(use Portland example from benchmarks)

Key need identified in stakeholder interviews



*Assumes a total of 122 FTEs are added

5. Add 20 firefighter positions

Add 20 firefighter positions on shift 24/7 to reduce burnout and improve performance

Balance the needs of First-due and levels of ERF response

Add 3 to 5 firefighter positions per year over the next five years:

- Convert crossovers to fully-staffed medics in Halls 2, 3, 8 and 17
- Add personnel to existing units in Halls 4, 9 and 12
- Staff additional heavy unit at Hall 5

Improvement Metrics

First due

+1.2% performance
600 fewer overgoal calls per year

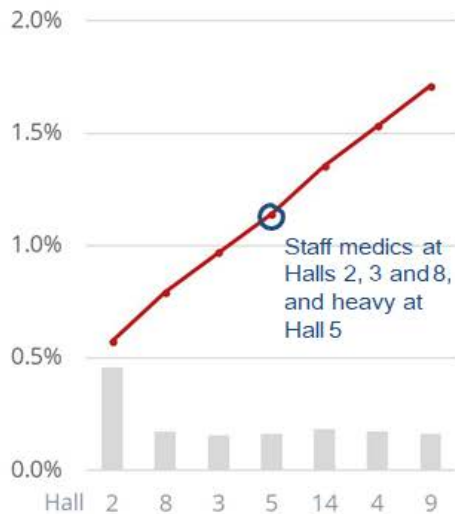
ERF

34 fewer overgoal fire incidents per year
+4.9% low,
+6.4% moderate,
+7.3% high hazard performance

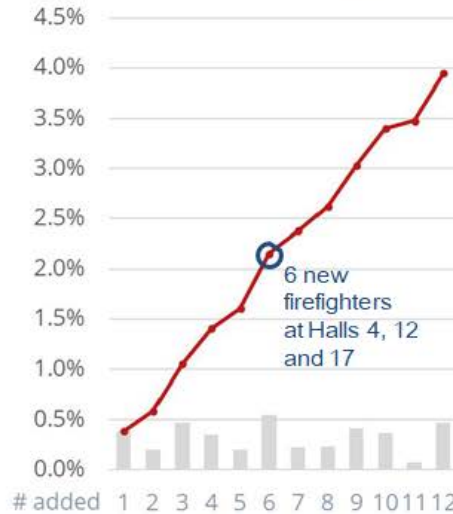
This balances benefits by targeting each metric

Many locations improve multiple objectives

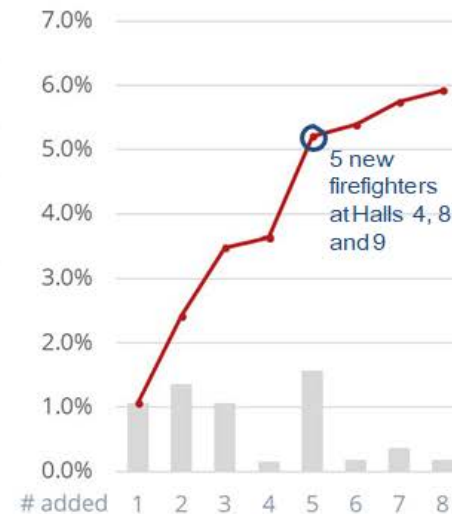
First-Due



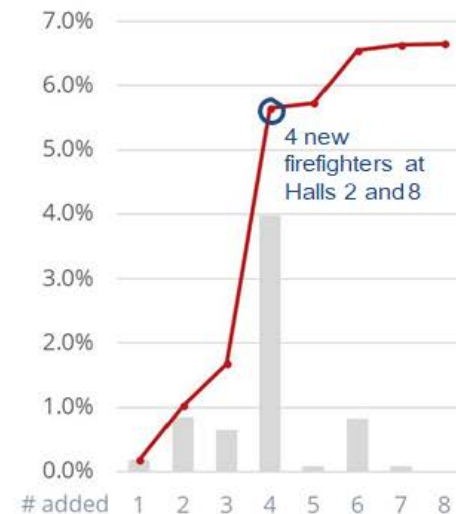
Low-Hazard ERF (15 FF)



Moderate ERF (26 FF)



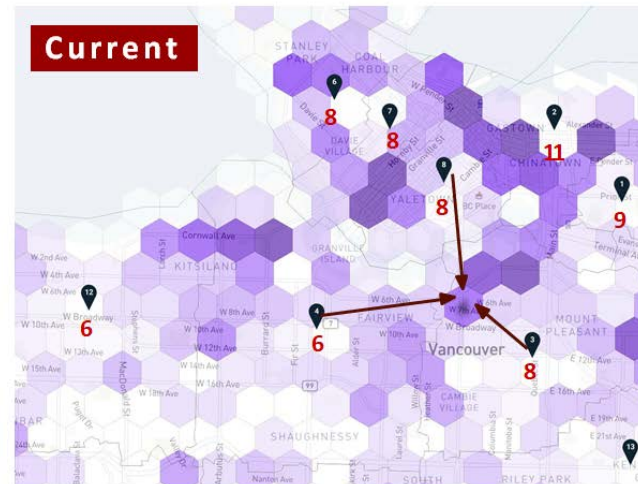
High ERF (39 FF)



Performance additions assume turnout goals will also be met. Only selected options shown; detailed recommendation and alternatives in Appendix.

Example 1: 3 person Medic in Hall 4 improves ERF response

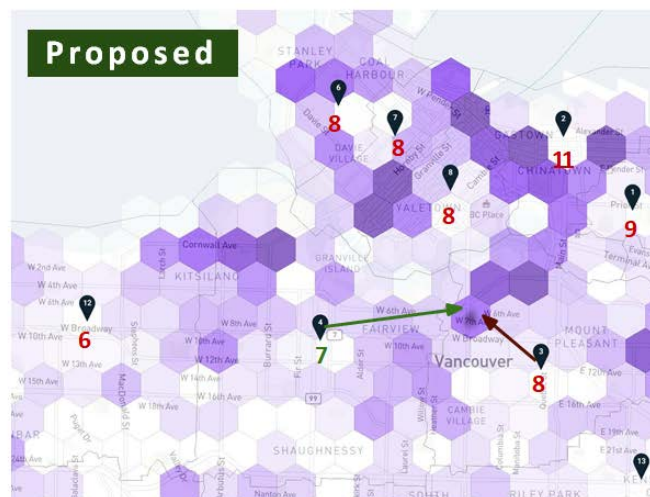
Hall 4 - responding with **Halls 3, 7, or 8** currently provides 14 members, requiring three halls to respond.



Map is coloured based on total call volume in each area -- darker purple means more calls.

One new position at **Hall 4** allows two halls to meet ERF target of 15

ERF Improvement:
0.4% (3 overgoal calls)



Example 2: Full-time Medic 2 reduces extreme workload

Convert crossover Medic 2 to be fully staffed with 3 firefighters to reduce responses from Halls 1 and 8.

First-due improvement:

0.5% (250 overgoal calls)

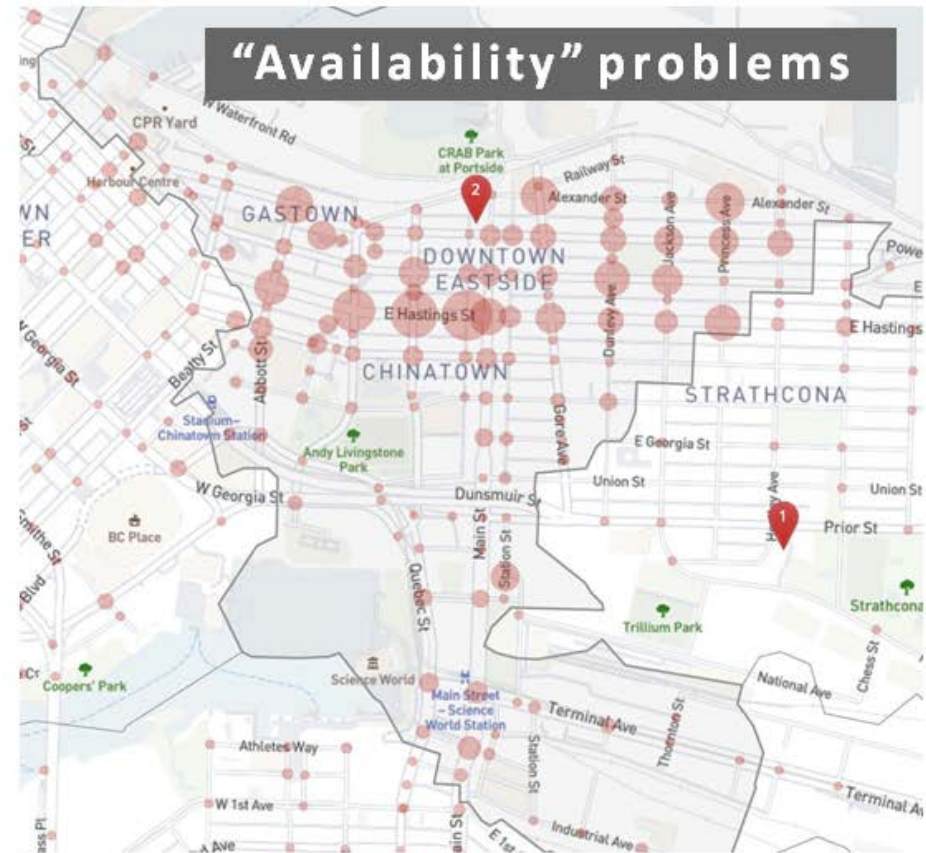
ERF Improvement:

(15 FF) **0.8%** (5 overgoal calls)

(26 FF) **2.3%***

(39 FF) **1.0%***

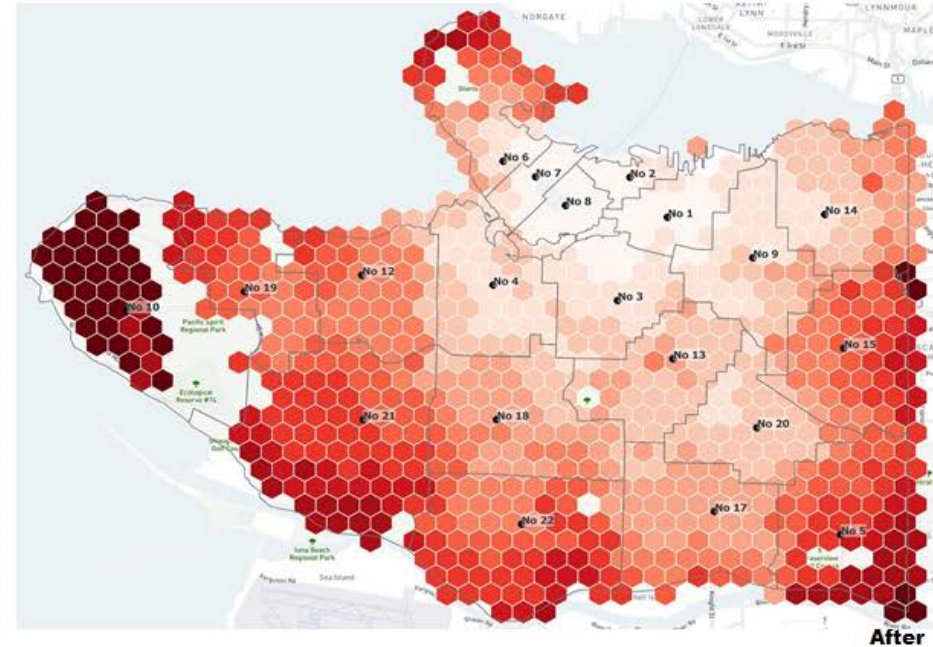
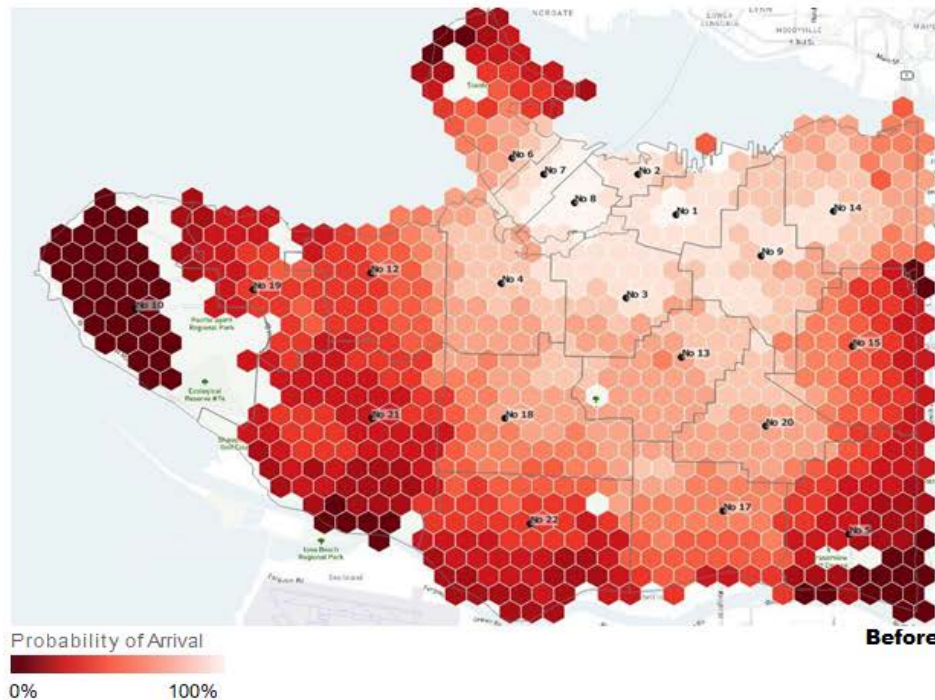
Daily responses per crew in Hall 2 drop from **15** to **11**



*Modelled probabilities.. Current actual moderate and high risk incidents do not have a full ERF assigned to them and are not tracked separately. Map bubbles show the number of overgoal calls where the root cause can be attributed to availability.

Improved high-hazard ERF coverage

39 firefighters in 12m 34s



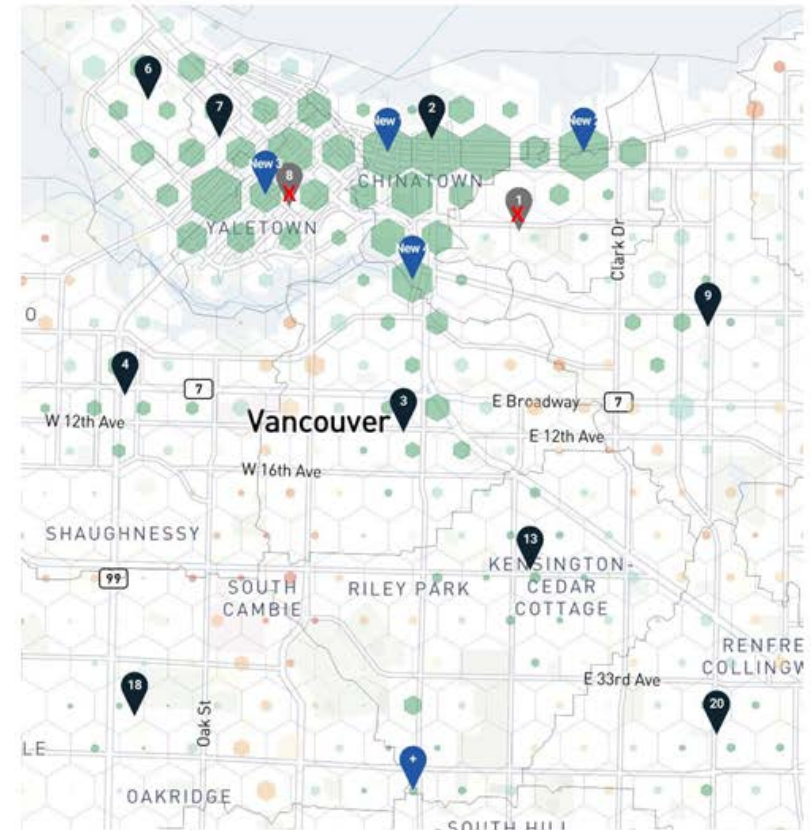
6. Develop station plans for long term

Continue firehall renewal capital plan

Incorporate growth forecasts

Replace poorly located halls

Sequence dependant on opportunity and timing of new developments



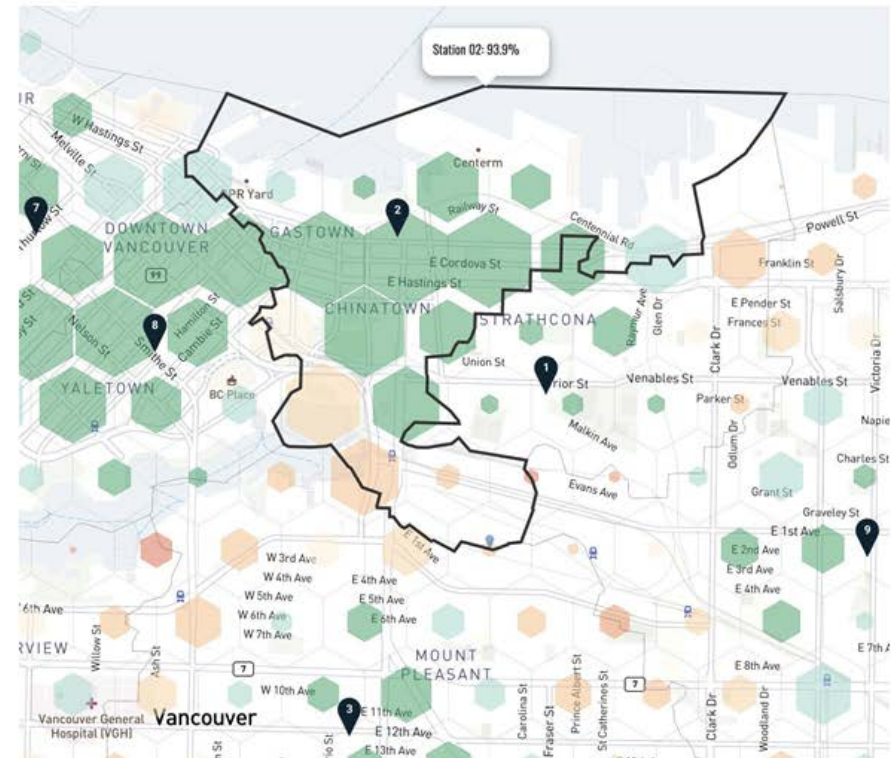
Map shows green for good performance, red for bad performance. Size of hex represents call volume.

LONG-TERM RECOMMENDATIONS

Hall 2 is ideally located, but too small

It covers its service area well, but is severely lacking capacity

Expand or rebuild at or near current site

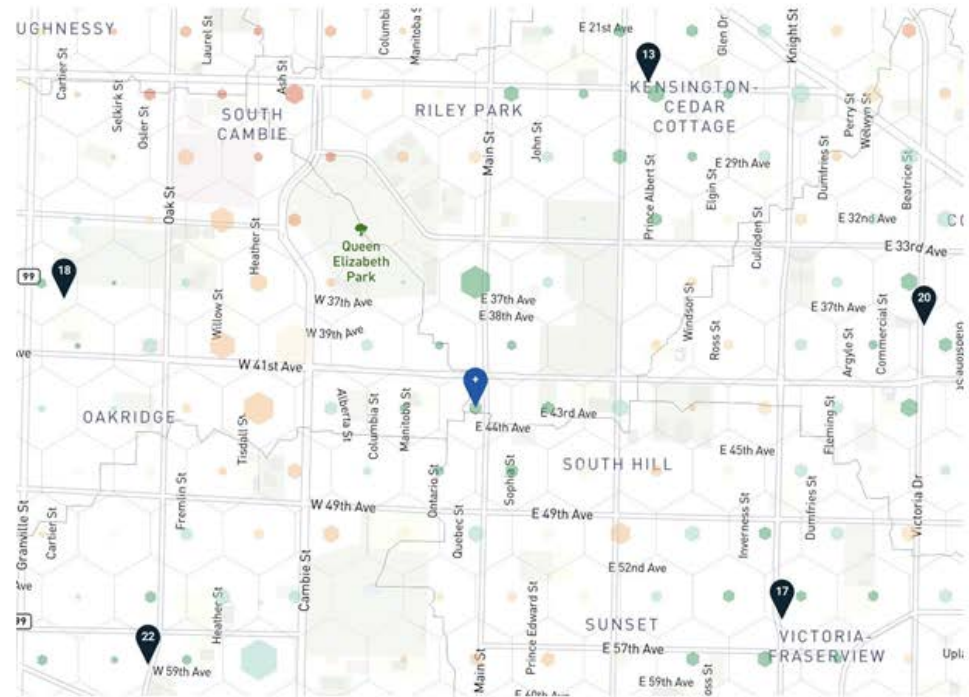


Hexagon size = call demand. Colour = expected first-due performance

New hall needed near Cambie corridor

Opportunity at Main
& 46 St is a good location

First-due performance
gain expected:
0.4%



Hexagon size = call demand. Colour = expected first-due performance

The ideal location, at Cambie & 41 Street, would offer 0.5%, however, it is unlikely that this land would become available.

Potential recommended state for Vancouver 2042

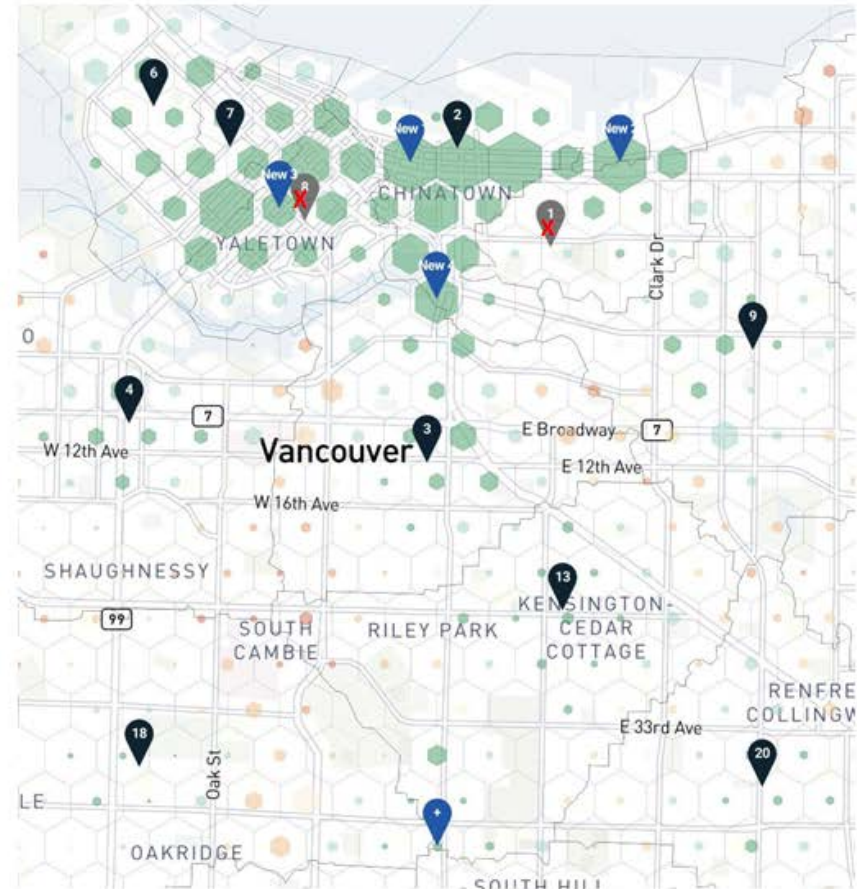
Net 3 new halls
(details in Appendix)

Net first-due performance gains in

2021: **1.9%**

2028: **2.1%**

2042: **3.2%**



Hexagon size = call demand. Colour = expected first-due performance

SUMMARY

Recommended Positions Summary

Position Type	# of Positions added					Total
	2019	2020	2021	2022	2023	
Firefighters	3 (x5) Hall 2	5 (x5) 2 in Hall 4 3 in Hall 8	4 (x5) 1 in Hall 12 3 in Hall 3	4 (x5) 1 in Hall 9 3 in Hall 17	4 (x5) Hall 5	100
Prevention and Public Education Staff	2	2	2	2	2	10
Community Outreach, Inclusion, and Diversity	1		1			2
Analytics Staff	2			1		3
FTETrainer			1			1
Safety Officer (Health and Wellness)				1 (x4)		4
Mental Health Professional (Health and Wellness)	1					1
Accreditation Manager (Management)	1					1
Total by Year	22	27	24	27	22	122

Reduce burnout and improve performance

Balance the needs of First-due and levels of ERF response

Add 3 to 5 firefighter positions per year over the next five years:

- Convert crossovers to fully-staffed medics in Halls 2, 3, 8 and 17
- Add personnel to existing units in Halls 4, 9 and 12
- Staff additional heavy unit at Hall 5

Improvement Metrics

First due

+1.2% performance
600 fewer overgoal calls per year

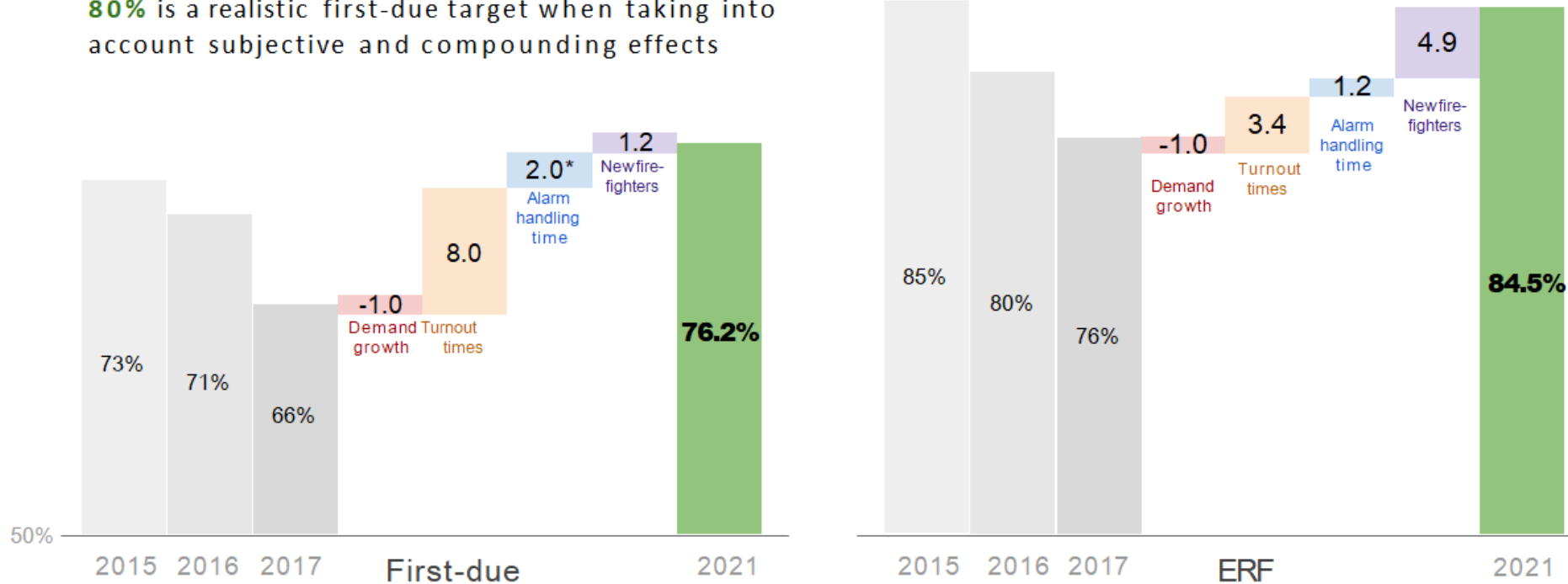
ERF

34 fewer overgoal fire incidents per year
+4.9% low,
+6.4% moderate,
+7.3% high hazard performance

Performance Improvement Summary

This view shows a conservative prediction:

80% is a realistic first-due target when taking into account subjective and compounding effects



*Alarm handling for first due is not included in baseline performance metric due to data availability

Benchmarking Revised

Based on total recommended positions, using 2017 as the baseline

Incidents per Operational Staff

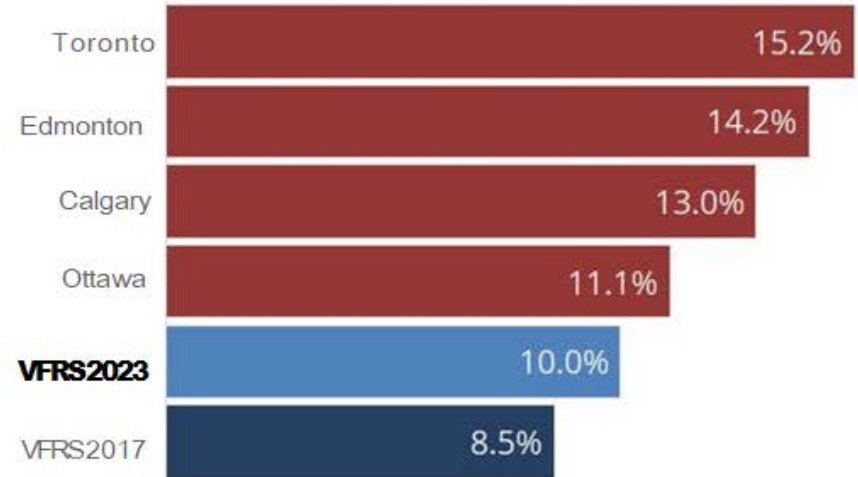
Now vs future



Based on 100 additional FF added over 5 years,
and a forecasted increase of 5,752 incidents

Non-operational staff as percent of total

Now vs future



Based on 122 additional positions added over 5 years

5 Year Growth Plan

5 Year Growth Plan						
Position Type	2019	2020	2021	2022	2023	Total
Firefighters	1FF (X5)	6FF (X5)	5FF (X5)	4FF (X5)	4FF (X5)	100
Prevention/Pub Ed	2	2	2	2	2	10
Outreach & Diversity			2			2
Analytics		1	1	1		3
Trainer				1		1
Safety Officer				1 (X4)		4
Mental Health Professional		1				1
Accreditation Manager		1				1
Total	7	35	30	28	22	122