Enhancing Parking Compliance and Urban Mobility Through License Plate Recognition (LPR): The City of Calgary Experience

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Enhancing Parking Compliance and Urban Mobility Through LPR

PURPOSE

- Share Calgary's Enforcement Journey
- 100% Manual → Predominantly LPR-Driven
- Explain the operational model behind the transformation
- Highlight challenges to further expansion

OUTCOME

- Demonstrate the benefits of Calgary's approach
- Encourage municipalities to consider LPR & post-processing
- Create broader demand for innovative enforcement technology



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Calgary's Modes of Parking Enforcement

1. Mobile Patrol Enforcement

- Officers conduct enforcement directly in the field.
- A parking tag is **handwritten or printed and placed on the vehicle** at the time of enforcement.

2. LPR Enforcement

LPR enforcement is conducted through **two coordinated groups of officers**:

- **Field Officers** – collect licence plate information and vehicle images using LPR technology.
- **Back-Office Officers** – process and review the observations collected in the field and take the appropriate enforcement action.

The combination forms what we call **Post-Processing**

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Post Processing

- Calgary's time-tested LPR enforcement model
- Made possible by the ability to mail tags under both bylaws that are enforceable through LPR
    - Calgary Parking Bylaw (41M2002), Section 10(1), and Calgary Traffic Bylaw (26M96), Section 55(1), permit tags to be sent to the registered owner by ordinary maill
- In use for 18+ years
- Has enabled **>95%** compliance in all parking zones that are enforceable through LPR
- Has enabled collection of vast amount of parking/occupancy data that can be used for both enforcement and transportation planning.

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Calgary's LPR enforcement background

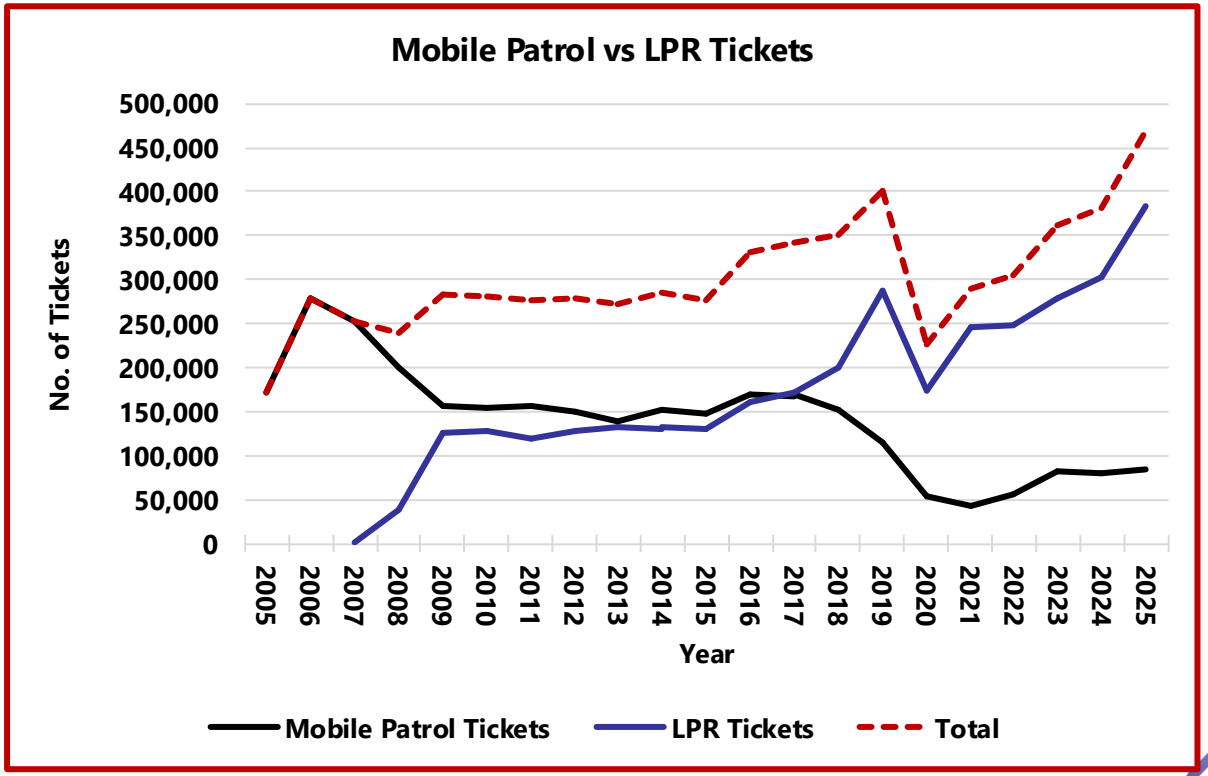
LPR Pilot Program: Completed in 2007, Enforcement began in 2008

- Expansion: Use of LPR significantly expanded in 2019
- Impact: Over 3.3 million infractions have been issued using LPR alone since it started
- LPR is used to enforce:
    - Payment Required Zones: Both on-street and off-street
    - Time-restricted zones
    - Residential Parking Permit (RPP) zones
- Operational Benefit:
    - LPR allowed more officers to be reassigned to handle resident and commercial submitted complaints, which improved overall service responsiveness

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Mobile Patrol vs LPR

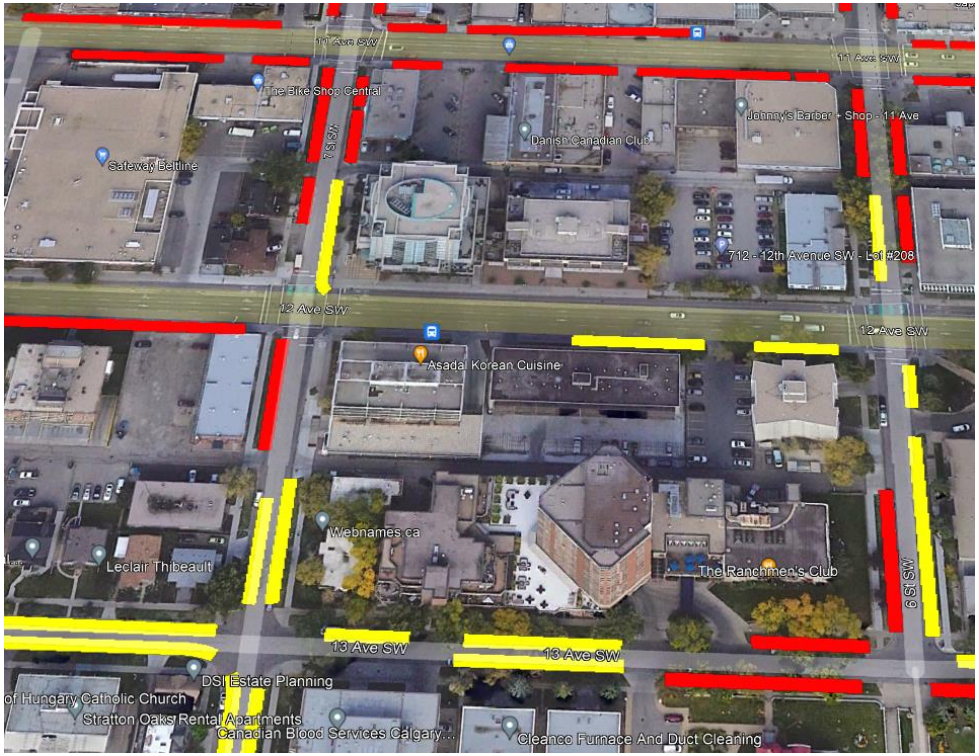


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Mapping

- All Enforceable zones are mapped, each zone with its distinct and configurable property
- We have total of 9005 map layers for 1654 Payment Zones and 80 RPP Zones



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Types of Zones Enforced

- On-Street payment zones
- RPP zones
- RPP Overtime zones
- Surface lots
- Transit lots
- Private properties
- No Stopping
- No Parking
- School zones
- Parkades
- Downtown Loading Zones



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LPR Enforcement – Data Collection

- Data Collected through three primary sources.
  - Vehicle Mounted Mobile Camera Units
  - Fixed Camera installations at parking garages
  - Handheld Mobile Devices
- Officers operating the LPR units remain in the vehicles except only to address extraordinary circumstances or safety related infractions
- ~12M license plate observations collected annually, 6M+ observations collected by Mobile LPR Units and Handheld Mobile devices



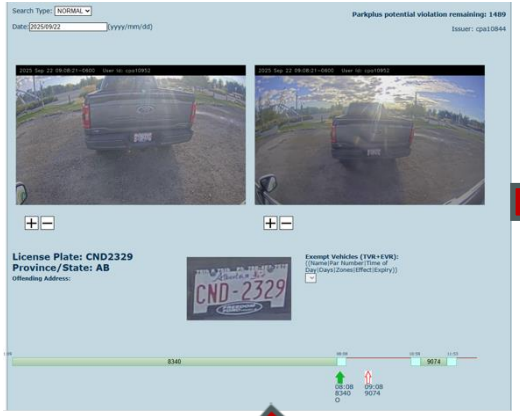
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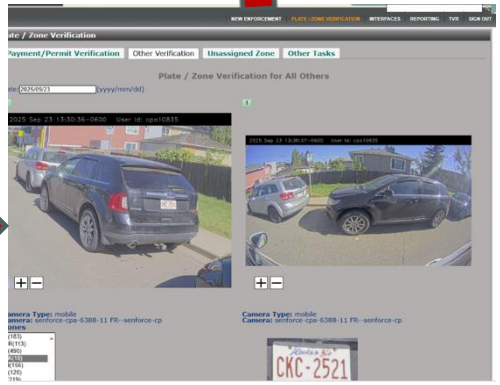
LPR Enforcement - Plate Verification and enforcement

- 5,000 unique plate observations undergo daily verification.
- Legislative Requirement: All infractions must be manually verified before issuance.
  - Tags cannot be issued before an enforcement officer verifies the infraction.







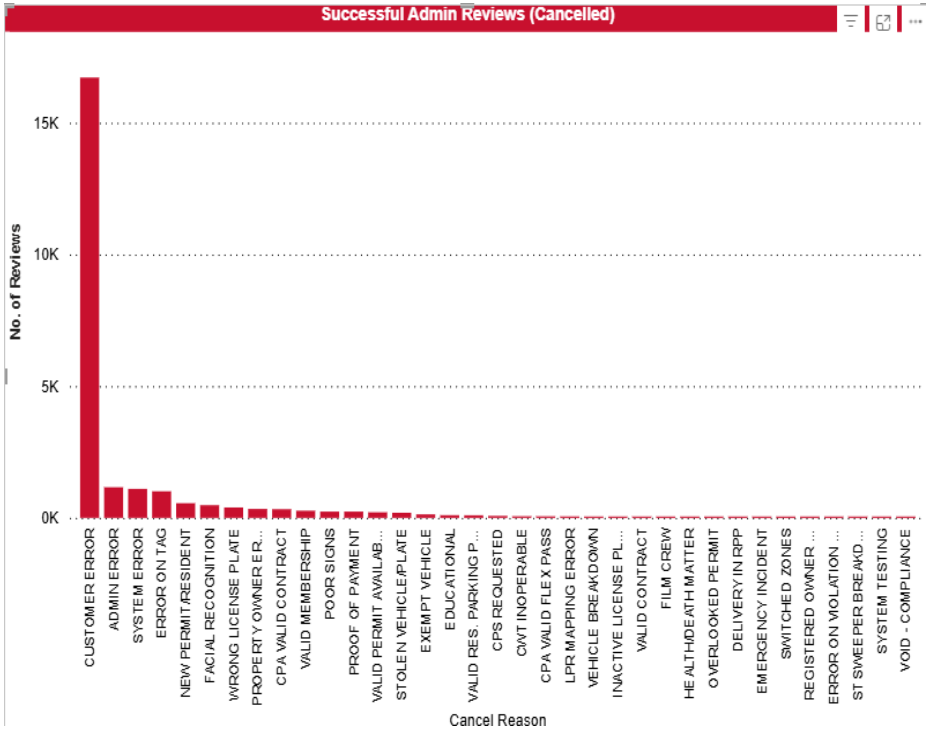


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Resulting Citizen Complaint & Administrative Appeal

- ~40,000 admin review requests received annually
- Most cancellations are user error (e.g., wrong plate entered)
- Mitigating circumstances rarely considered by Calgary Parking and such matters are typically resolved in Traffic Court



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Expanded LPR Enforcement

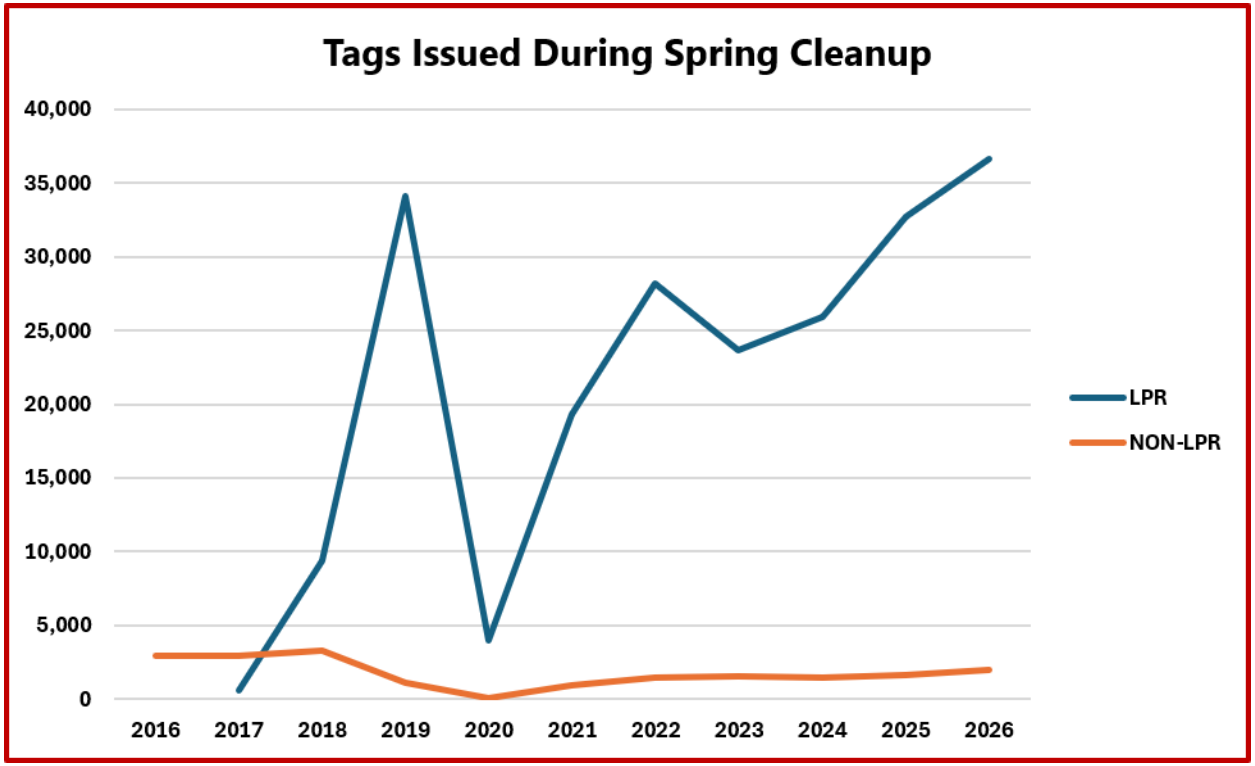
- Support to Street Maintenance Operation – Annual spring clean up (street sweeping)
    - CP supports Mobility BU by enforcing parking bans
    - Before 2018 → only Mobile Patrol Officers were used to support the operation
    - 2018 → limited LPR use introduced
    - Post-2019 → Significant enforcement support by LPR
    - Reduced the number of Mobile Patrol Officers needed to support the operation



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- Support to Street Maintenance Operation – Annual spring clean up (street sweeping)



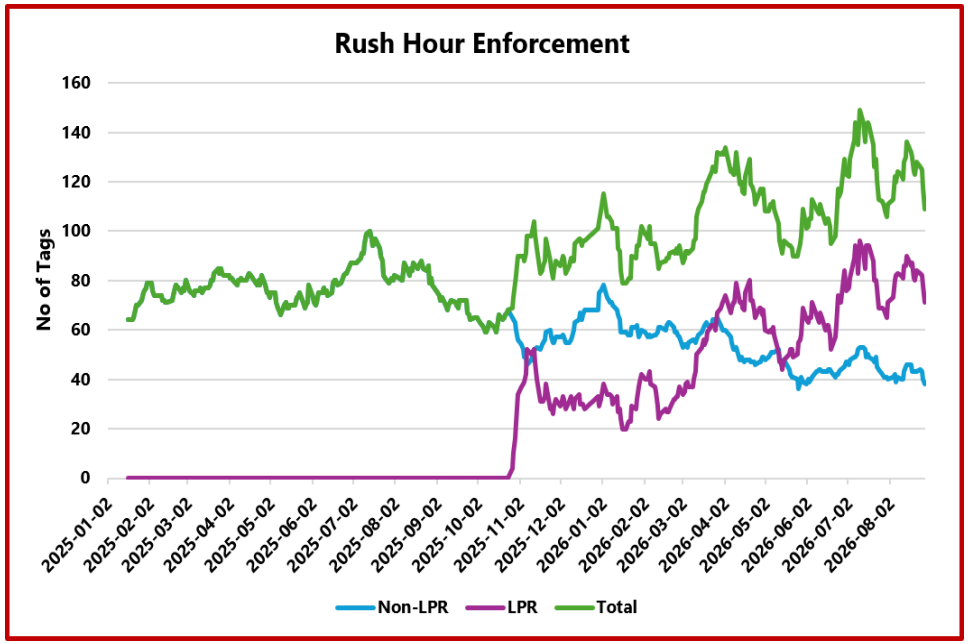
Year	LPR	NON-LPR
2016		2,946
2017	610	2,896
2018	9,387	3,302
2019	34,133	1,124
2020	3,979	46
2021	19,311	917
2022	28,157	1,441
2023	23,689	1,546
2024	25,922	1,471
2025	32,681	1,591
2026	36,592	2,020
Grand Total	**214,461**	**19,300**

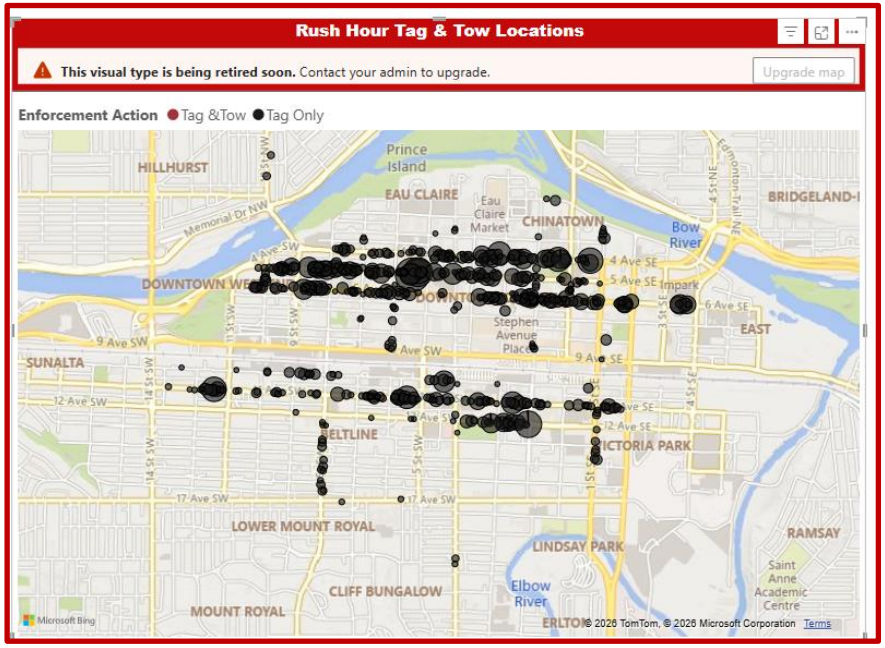
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Expanded LPR Enforcement contd.

- Rush Hour Enforcement



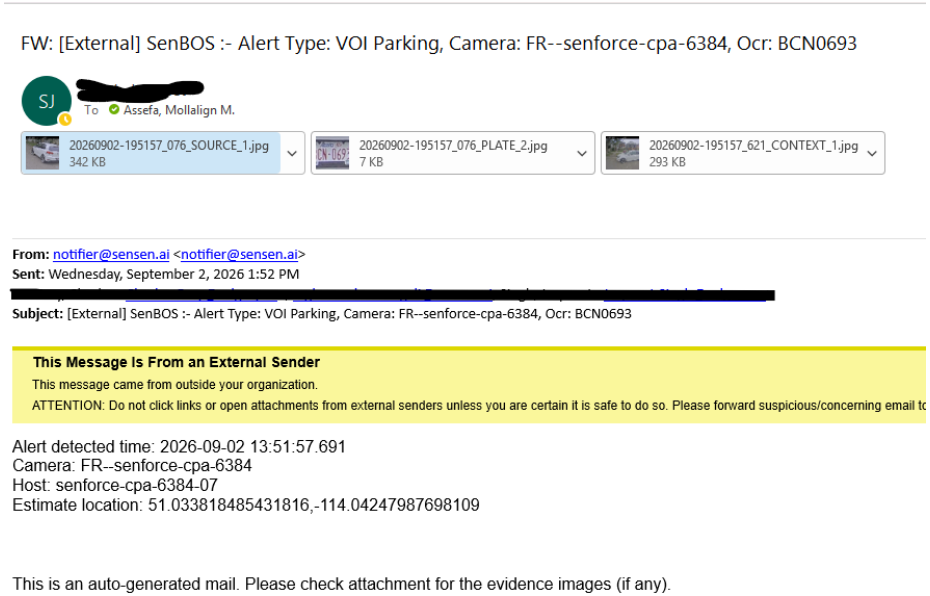


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Expanded LPR Enforcement contd.

- Identifying Vehicles of interest Enforcement
  - Flexible definition of a vehicle of interest
  - Alert generation to initiate enforcement action
  - Officer dispatched
  - If infraction confirmed,
    - Tag and Tow
  - We are only limited by the number officers we have to address and impound lot capacity



FW: [External] SenBOS :- Alert Type: VOI Parking, Camera: FR--senforce-cpa-6384, Ocr: BCN0693

SJ [redacted]
To Assefa, Mollalign M.

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20260902-195157_076_PLATE_2.jpg 7 KB
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Sent: Wednesday, September 2, 2026 1:52 PM
[redacted]
Subject: [External] SenBOS :- Alert Type: VOI Parking, Camera: FR--senforce-cpa-6384, Ocr: BCN0693

This Message Is From an External Sender
This message came from outside your organization.
ATTENTION: Do not click links or open attachments from external senders unless you are certain it is safe to do so. Please forward suspicious/concerning email to

Alert detected time: 2026-09-02 13:51:57.691
Camera: FR--senforce-cpa-6384
Host: senforce-cpa-6384-07
Estimate location: 51.033818485431816,-114.04247987698109

This is an auto-generated mail. Please check attachment for the evidence images (if any).

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Future Implementations

- Expanding Data Analytics
  - Route Planning, Occupancy Studies
- Supporting events using new LPR technology
  - Event parking monitoring using cameras mounted on portable structures
- Downtown Bus zone enforcement

Financial Impacts

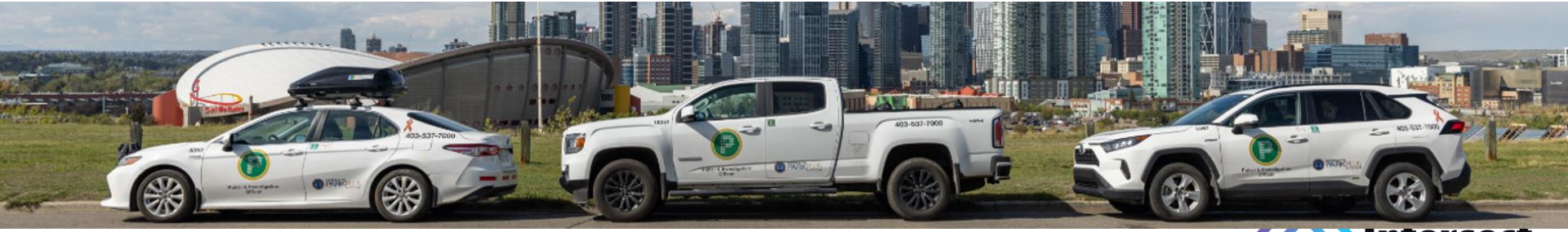
- Revenue Reinvestment
  - 100% of net revenue from parking enforcement is returned to The City of Calgary.
- Direct Community Impact
  - The returned funds are used to support a range of social programs that benefit Calgary residents.

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Summary of Benefits - LPR Enforcement Coupled with Postprocessing

- Operational efficiency
  - Doing a lot more with a lot less
- Achieve high compliance
- Improved mobility in high traffic areas
- High return in investment
- Increased investment into city programs that benefit residents



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What has been achieved

- Improved operational efficiency
  - Service that was used to be delivered by 200+ officers is now managed with only 90 officers.
- Deliver better customer service
  - LPR allowed more officers to be reassigned to handle resident and commercial submitted complaints, which improved overall service responsiveness
- Improved curbside management
- Improved Compliance
  - Overall compliance: 96%
    - Parkades: 97%
    - Surface lots: 96%
    - On-street parking: 94%

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Key Challenges & Opportunity

Technology Gap

- Limited technology solutions currently support post-processing enforcement.
- Few vendors have post-processing capabilities on their product roadmaps.

Why?

- Post-processing is used by relatively few municipalities, limiting market demand and vendor investment.

Opportunity

- Demonstrate Calgary's 18+ years of experience and the operational benefits of post-processing.
- Encourage other municipalities to consider the model.
- Build broader demand that may encourage technology providers to develop supporting solutions.



Thank you!