Fuel Drive-offs
Parliamentary Inquiry Response

July 15
## Contents

1. Document Properties ....................................................................................................................... 3  
2. Aim of this document ....................................................................................................................... 3  
3. From the author ............................................................................................................................... 3  
4. Definitions ........................................................................................................................................ 4  
5. Our understanding of the issue ........................................................................................................ 5  
6. Our current involvement in the Fuel Drive-off solution ................................................................. 6  
7. Solution ............................................................................................................................................ 7  
8. Challenges to the current solution ................................................................................................... 9  
   8.1 Price of the solution ................................................................................................................. 9  
   8.2 Obtaining critical mass ............................................................................................................. 9  
   8.3 Law Enforcement integration .................................................................................................. 9  
   8.4 False Positives ........................................................................................................................ 9  
9. Recommendations ......................................................................................................................... 10  
   9.1 Short Term ............................................................................................................................ 10  
   9.2 Medium Term ........................................................................................................................ 11  
   9.3 Long Term ............................................................................................................................. 11  
   9.4 Concerns Regarding Privacy ................................................................................................ 11  
10. Timeframes ................................................................................................................................... 12  
11. About Sensor Dynamics ............................................................................................................. 12  
   11.1 Contact Details ...................................................................................................................... 12
1 Document Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended Audience</td>
<td>Law Reform, Road and Community Safety Committee</td>
</tr>
<tr>
<td>Last Modified By</td>
<td>Shaun Mitchell</td>
</tr>
<tr>
<td>Last Saved</td>
<td>Sunday, 19 July 2015</td>
</tr>
<tr>
<td>Version</td>
<td>19</td>
</tr>
<tr>
<td>Filename</td>
<td>Victorian Parliamentary Inquiry Response - Drive-offs (2).docx</td>
</tr>
</tbody>
</table>

2 Aim of this document

To respond to the invitation from the Law Reform, Road and Community Safety Committee regarding Fuel related driver-offs at petrol stations / service stations around Victoria in particular Sensor Dynamic’s experience and knowledge in relation specific the specific terms of reference including:

f) analysis of regulatory, technological and other interventions that could be adopted by industry (including peak bodies), in concert with Victorian Government agencies, to support the availability and application of civil remedies to respond to fuel drive-offs and;

g) examine the feasibility of introducing co-regulatory approaches to enforcement, including use of technology such as CCTV, or practices such as pre-payment and pre-registration and implications of such approaches for privacy.

3 From the author

Dear Ms Yuki Simmonds,

I am pleased to provide this response to response the ‘Inquiry into Fuel Drive-offs’. Please do not hesitate to contact me or my team for any further information on this topic.

Yours sincerely

Shaun Mitchell
## 4 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANPR</td>
<td>Automatic Number Plate Recognition is a mass surveillance method that uses optical character recognition on images to read vehicle registration plates.</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software as a Service (SaaS) is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network, typically the Internet.</td>
</tr>
<tr>
<td>API</td>
<td>An Application Programming Interface (API) is a set of routines, protocols, and tools for building software applications. An API expresses a software component in terms of its operations, inputs, outputs, and underlying types.</td>
</tr>
<tr>
<td>HLI</td>
<td>High Level Interface - A programming interface (API) that provides more functionality within one command statement than a lower-level interface. High-level interfaces are designed to enable the programmer to write code in a shorter amount of time and to be less involved with the details of the software module or hardware device that is performing the required services.</td>
</tr>
<tr>
<td>Drive-offs</td>
<td>Also known as ‘fail-to-pay’ describing potential customers who fill their vehicle with fuel but fail to pay for the fuel.</td>
</tr>
<tr>
<td>Attendant</td>
<td>Petrol station personnel responsible for processing fuel and in-store payments.</td>
</tr>
<tr>
<td>CCTV cameras</td>
<td>Closed Circuit Television – designed for video surveillance.</td>
</tr>
<tr>
<td>LPR cameras</td>
<td>Licence Plate Recognition – specifically designed to capture very clear, still photos of licence plates in all conditions and have the capability to convert that photo into text.</td>
</tr>
<tr>
<td>Watchlist</td>
<td>A list of vehicle registrations grouped by a reason to be ‘watched’. An example might be the police having a watchlist of unregistered vehicles or a watchlist of stolen plates. No other identifying information is kept in this database other than the plate text.</td>
</tr>
<tr>
<td>VyperNET Sync</td>
<td>A Sensor Dynamics’ software application that synchronises watchlist information between retailers and/or government agencies.</td>
</tr>
</tbody>
</table>
5 Our understanding of the issue

For over 11 years Sensor Dynamics has been involved in providing a technology solution for the issue of Fuel Drive-offs. During this period the issue has been regularly in the media alongside our solutions.

Our understanding of the issue comes through the selling and implementation of anti-drive-off solutions during this period. Obtaining fuel theft statistics can be very challenging but we understand the issue to be in the 10’s of millions of dollars per year in Victoria alone.

From discussions with our existing client base, the magnitude of offences can vary dramatically across the state and from individual station to station. Key factors which seem to affect drive-off numbers would appear to include:

- **Access to major roads** or junctions making it difficult to follow alleged thieves. In particular our customers have reported higher value thefts in locations next to highways and freeways because commercial vehicles with larger tanks are more likely to be involved at these locations.

- **Socio-economics** where suburbs who have lower socio-economic indicators are more likely to experience high rates of fuel theft.

- **Lack of enforcement.** Our customers have noticed definite decreases in rates of theft when:
  - They implement our systems OR
  - The police conduct a blitz on vehicles in the area
6 Our current involvement in the Fuel Drive-off solution

Our solution is currently being used in 18 petrol stations in Victoria. The stations are a mix of franchise and company owned sites. In these installations we supply high definition Licence Plate Recognition (LPR) cameras (which are very different to CCTV cameras) along with processors to convert the image into text. Our systems then process the image text against a list of previously recorded suspect registration plates.

We consult, design, implement, test and maintain these sites.
Details on how the solution works can be found in this document under the heading: Solution
7 Solution

7.1. As vehicles enter a petrol station their licence plate is detected and recorded by the Sensor Dynamics ANPR system.

7.2. Offending vehicle’s such as drive-offs are unable to escape license plate recognition with accuracy rates of 95%+.

7.3. Specific details of infringing vehicles including vehicle colour, make, model and amount owing can be associated to a detected licence plate and added to watchlists by the operator.

7.4. Offending driver registration plate details can be securely distributed to other petrol stations on the same shared network instantaneously via VyperNET sync.
7.5. As a vehicle re-enters any client premises, licence plates are detected and recorded by the Sensor Dynamics ANPR system.

5.

7.6. If vehicle is on a watch-list, a specific alert is instantaneously displayed to operator including detailed information of previous offences.

7.7. To deter forecourt crime, a point of sale display shows live LPR reads as they occur.

6.

7.

7.8. Operator can respond to alert as they wish. For a previous vehicle drive off, the operator may choose to prevent petrol pump access to offending vehicle or follow up on money owing.

8.
8 Challenges to the current solution

8.1 Price of the solution

Site pricing is dependent on a number of factors relating to driveway width, number of driveways, and capture distance. As a guide a typical site could cost $30,000 to $40,000 for a 2 camera system with all hardware and labour to complete the project.

All systems require an ongoing support and maintenance agreement and software licencing to be included, this is to ensure that algorithms for all Australian number plates stay up to date and the cameras continue to read at high accuracy levels.

Sites that are losing in excess of $200 per week to fuel driver-offs, find that they there is an ROI of about 1 year or less, and are particularly opting for a financed solution to help spread the cost.

8.2 Obtaining critical mass

One of the challenges with the solution being applied to a relatively small number of stations that share watchlist information, is that those sites with the technology tend to be highly effective in removing the problem from their site. However, rather than stopping the problem, it can simply push the problem to another location that doesn’t have the technology installed.

A collaborative effort will mean that the more stations that have the technology, the more data will become available and in turn the more effective the system. Many of the major petrol station chains are considering the technology but have as yet, not taken it up. The added benefit of more sites taking up the technology would be a dramatic drop in price in implementing such systems through volume discounting.

8.3 Law Enforcement integration

Another challenge in attempting to identify vehicles using Licence Plate Recognition technology is stolen plates. Some level of integration with law enforcement data would be required to identify a vehicle using stolen plates.

8.4 False Positives

In many fail-to-pay scenarios, the driver has simply forgotten to pay rather than intentionally stolen fuel. This is an important distinction and one which requires careful consideration when designing the appropriate solution.
9 Recommendations

9.1 Short Term

1. Consider a mandatory reporting requirement for all service stations to ensure current statistical data can be reviewed by state government authorities tasked with reviewing the issue. This information could be used to produce a heat-map (see figure 1) for drive-off activity across each state but more importantly, to set benchmarks to measure the performance of any solution implemented.

2. Conduct a wider trial/study of the potential impact/benefit of having a technology solution such as Licence Plate Recognition across a series of localised Service Stations to understand:
   - Prior to the trial
     - How big was the problem prior to the trial? (Frequency & dollar value)
     - What characteristics were common to the worse affected sites?
       - i.e. Retailer type, Existing security, Brand, Road access type
     - What time of day did the theft typically occur?
   - Post-trial
     - By what percentage were driver-offs reduced?
     - Where was the biggest impact and why?
3. Investigate integration of the LPR system with law enforcement agencies.
   o With an application such as ours, there is an option to share information not only between retailers but also between law enforcement agencies and retailers.

9.2 Medium Term

9.2.1 Law Enforcement Integration
In the medium term, the aim would be to mitigate the challenge of stolen plates by linking the licence plate systems with police based watchlists. It is important to note that storing a list of stolen plates locally at each petrol station would not be secure or necessary.

It would be more preferable to have watchlists automatically imported into a highly secure cloud based solution. Petrol stations would then send their plates (just the text) to the cloud for processing. The plates sent would be checked against the police watchlist and any match would be sent as an alert back to the operator. See Figure 2 - Stolen Plate Management

9.3 Long Term

1. Link the network database with that of the national airports for increased threat prevention and national security
2. Link the system to Road Transport authorities such as VicRoads. Vehicle descriptions could then be provided which allow operators to confirm plates matched descriptions if required.
3. Watchlist matches could be stored and accessed by government agencies upon request. All other plate reads could be purged on a monthly basis.

9.4 Concerns Regarding Privacy
It is understandable that implementations of technologies such as Licence Plate Recognition, particularly at a national level, raise concerns about privacy and civil liberties. It is important to note, that the proposed model provides a number of protections to ensure that privacy remains protected. This is achieved by

1. Ensure no watchlist information is stored on end-user systems
2. Ensure that watchlists only contain a list of plates and no other linked information
3. Ensure that watchlists stored in the cloud are identified by a code unique to the relevant agency
4. Ensuring that each end user system only sends plate detail for checking to the secure cloud based application. No other identifying information is sent (including location).

5. Only if a plate sent is matched with a watchlist, will the other details associated with plate will be sent and stored.

6. All plates sent to the cloud application can be urged on a daily weekly basis.

10 Timeframes

Systems such as this typically take 8 weeks to implement and can be built into new Petrol Station infrastructure or retro-fitted into existing sites.

11 About Sensor Dynamics

Sensor Dynamics has been in operation since 2004. It provides a number of ‘vehicle identification and management’ solutions centred largely on licence plate recognition.

Current customers using this technology include:

![List of logos]

11.1 Contact Details

Sensor Dynamics is pleased to assist with this request for information and will be happy to assist further if required. Please direct all further enquiries to:

Shaun Mitchell - Managing Director

Phone: 03 8727 6000

Address: 24 / 49 Corporate Blvd, Bayswater, VIC, 3153
Figure 2 - Stolen Plate Management

Fuel Drive-offs