

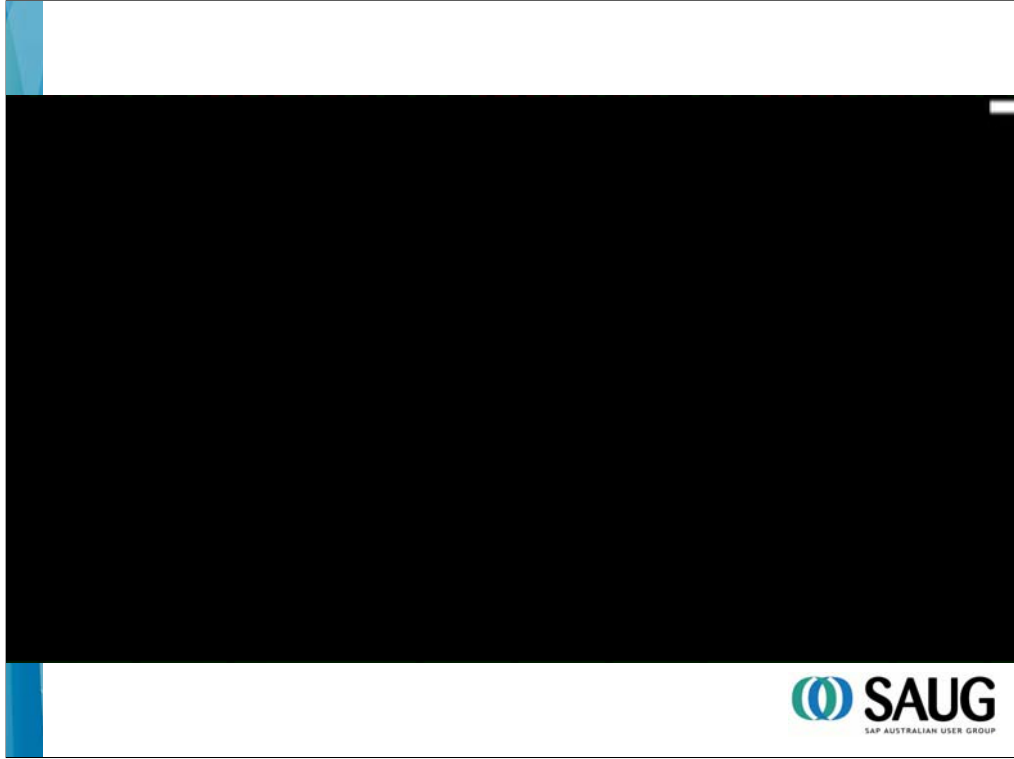
# Free-Flow Tolling Project



**Sue Caelers**  
Chief Information Officer

Queensland Motorways





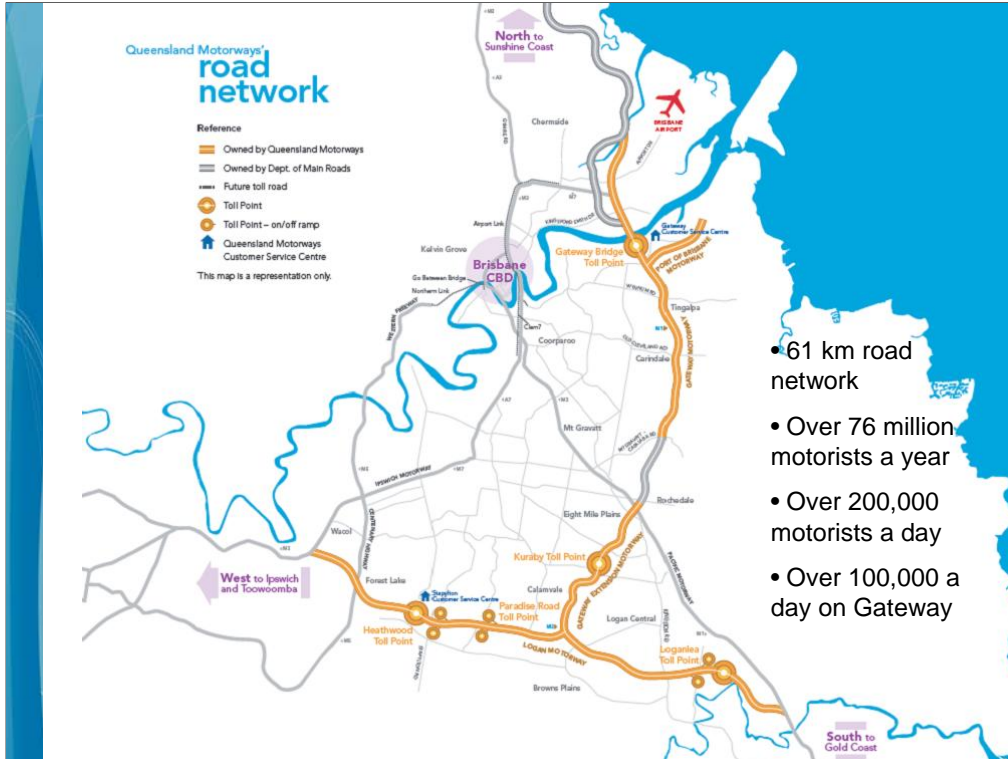
# Agenda

- Free-Flow Tolling Project overview
- Multi-phase approach
- Implementation approach
- Scope
- Challenges
- Lessons learned
- Benefits realisation



In 2009 :

- There were 74.8 million tolled trips across our road network
- We had a reduced lost time injury frequency rate
- We installed 13 free-flow tolling gantries across our network
- We opened seven kilometres of new motorway north of the Gateway bridges
- We successfully transitioned to a new free-flow tolling system on 22 July 2009
- We launched a new website and retailer network to ensure our customers had convenient and easy access to our go via payment options.



- 61 km road network
- Over 76 million motorists a year
- Over 200,000 motorists a day
- Over 100,000 a day on Gateway

## Our Projects



- 1986 – Gateway Bridge
- 1987 – Logan Mwy
- 1988 – Sunshine Mwy
- 1997 – Logan Mwy (upgrade)
  - Gateway Extension Mwy
- 2002 – Port of Brisbane Mwy
- 2007 – Paradise Road
- 2009 – Free-flow tolling
- 2010 – Opening of 2nd Gateway bridge
- 2011 – Expected completion GUP



# our future direction



2010 at Queensland Motorways will be an exciting time.

We have been advised that Queensland Motorways will be sold in the coming years and we have been working with the State Government's appointed commercial advisers to prepare for the sale.

We now have a dedicated Transport Technology Solutions division to further develop our sophisticated technology and systems and pursue projects beyond tolling.

Next year we are driven to deliver:

- Completion of the Gateway Upgrade Project on time and budget by 2011
- Plans for the implementation of ITS on the Logan and Gateway Extension motorways
- Rehabilitation of the Logan Motorway
- Investment in our people and customers to continue to keep them satisfied



Free-flow tolling was introduced on our road network on 1 July 2009.

Planning, systems development, infrastructure development has been underway for 2 years. This has been a challenging project – delivered 2 years earlier than its original 2011 target date.

The project has delivered

16 single-gantry free-flow tolling points at 5 tolling locations on our network (delivered by Thales & Vitronic), as well as a staging gantry over live traffic and a test gantry at a racetrack

A new central system – based on SAP plus custom tolling components and rating engines (delivered by IBM)

Various other integrated systems (delivered by other technology partners, eg VeCommerce voice recognition IVR system, EPay retail outlets)

Interchange upgrades at locations where removal of the cash toll plazas would create unsafe traffic conditions at highway speed (delivered through an alliance)

Demolition of cash toll plazas at our 5 tolling locations – to be completed in the next week or two

Significant business transformation with a new business model and processes, the removal of cash and the introduction of new products, payment options and channels for payment

Most importantly, what we've done through the free-flow tolling project is established technology, capability and a business platform for growth – we intentionally partnered with technology world leaders (IBM, Thales & Vitronic) and we intentionally resourced and trained our own people to work alongside our vendors.

As an experienced tolling operator that has been through the challenges of new systems implementations a number of times before, we have learned the hard way that being a passive and uninformed recipient of new systems does not deliver good

## ➤ FFT Project Objectives



- 'smart state'
- take advantage of future tolling business & ITS opportunities
- streamlined, efficient operations & processes
- efficient & safe customer experience



deliver a roadside tolling facility worthy of a 'smart state', with accurate vehicle identification & classification;

deliver systems that will allow QML to take advantage of future tolling business & ITS opportunities;

deliver streamlined & efficient operations and processes;

deliver a tolling solution that presents an efficient & safe customer experience

Our delivery strategy was very deliberate – to partner with world-class technology vendors

**Partnering** not only to deliver FFT, but for ongoing system development and support and leveraging of further opportunities

QML has no intention of being a bystander in the delivery of our systems – we have over 20 years of tolling experience – both in the business of tolling and the technology of tolling. We've developed a substantial body of knowledge and experience.

We co-located with our vendors – our project team is 50-strong, but the project office can have up to 100 staff in it on any one day

Over the past few years, we've intentionally developed and enhanced our technology capability – we've brought on board some very talented people and we're able to provide a very real contribution to the design and development of our new systems.

## Procurement

- EOI
- RFT
  - Roadside System
    - » Fixed price for the supply of equipment and systems
    - » Open book costing for civil works
  - Central System
    - » Capped time and materials Design Phase
    - » Fixed price Delivery Phase for Phases 1 and 2 (HR & Financials) and Capped Time and Materials for the Delivery Phase for Phase 3 (Core Tolling)



In developing the strategy of a two stage procurement process, it was determined that there was no particular preference for a single vendor providing an end to end solution as the delivery model. QML's primary objective was the achievement of a quality systems implementation to meet business needs within the project timeframe and to an agreed budget.

It was also key to select vendors with a high level of expertise and experience in their field and with whom QML could build a long-term partnering relationship.

# Technology Strategy

- Accurate vehicle detection, identification and classification
- Adaptable to changing tolling principles
- Service oriented architecture, open standards
- Single version of the truth
- Based on SOA – high degree of flexibility and modularity
- Not a proprietary turn-key solution from end to end



Accurate vehicle detection, identification and classification

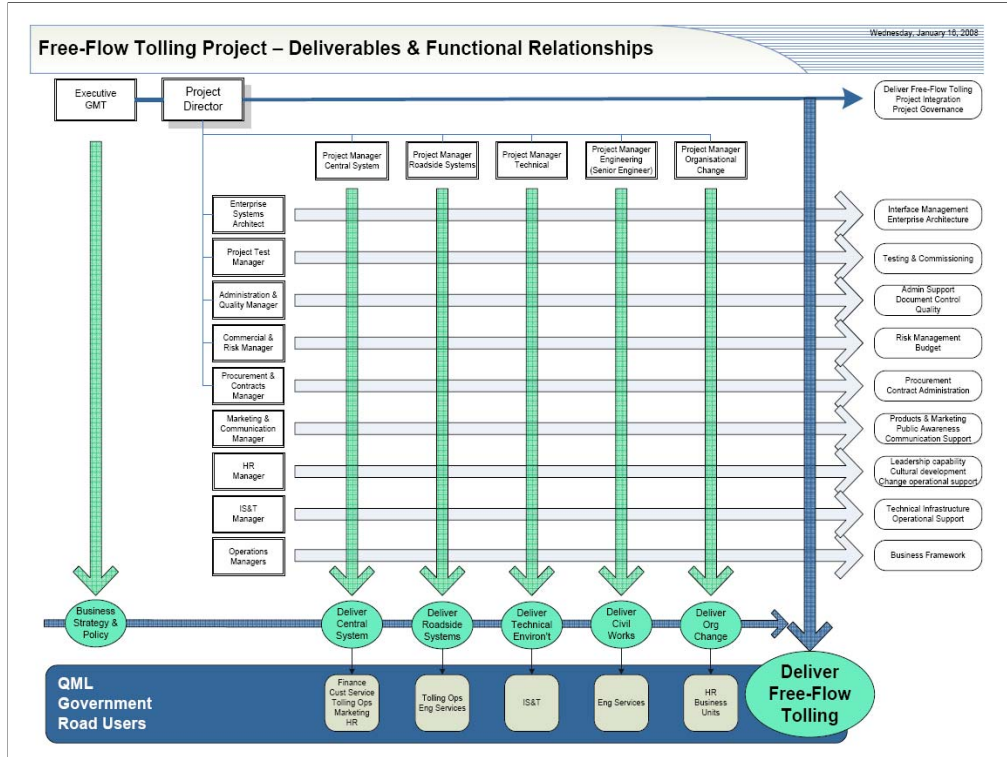
Adaptable to changing tolling principles – smart roadside technology, business rules in the central system

Service oriented architecture, open standards

Single point of truth

Based on SOA – high degree of flexibility and modularity

Not a proprietary turn-key solution from end to end



Project team used functional matrix to deliver



A new era in tolling began as we introduced no-stopping tolling, said farewell to our toll collectors, and removed all of our toll plazas.

The successful transition to free-flow tolling was only possible with the help of our partners including:

- IBM
- Thales
- VITRONIC
- LAJV
- BMD Constructions
- Kellogg, Brown and Root

We launched free-flow tolling from 1 July this year, including:

- Establishing Australia's first free-flow tolling test facility at Lakeside Park
- Implementing new central and roadside systems
- Introducing a new brand and toll payment options
- Developing new customer access channels, including the **go via** retailer network and a new website – [govia.com.au](http://govia.com.au) (if you haven't already got your **go via** tag this is the website to visit)

## ► Single gantry tolling points



Single gantry, modular design, minimise visual impact

Easily reconfigured for adaptation to reversal of traffic- the imaging design is essentially symmetrical

All sensor subsystems feature intrinsic redundancy, which means that even if a sensor fails, the subsystem continues operating and is able to make use of information from the adjacent sensors to compensate for the one that has failed.

All subsystems operate independently and the gantry controller is able to continue functioning even in the extremely unlikely case of a complete sub-system failure. In such a situation, the toll point will automatically adapt its transactional configuration to provide the central system with the best possible information (e.g., if the DSRC has stopped operating, the system will intelligently switch to 100% video tolling).

The roadside system is highly configurable, and easily managed by remote configuration

Open architecture interfaces – uses XML bi-directionally for data exchange

Single gantry, modular design, minimise visual impact

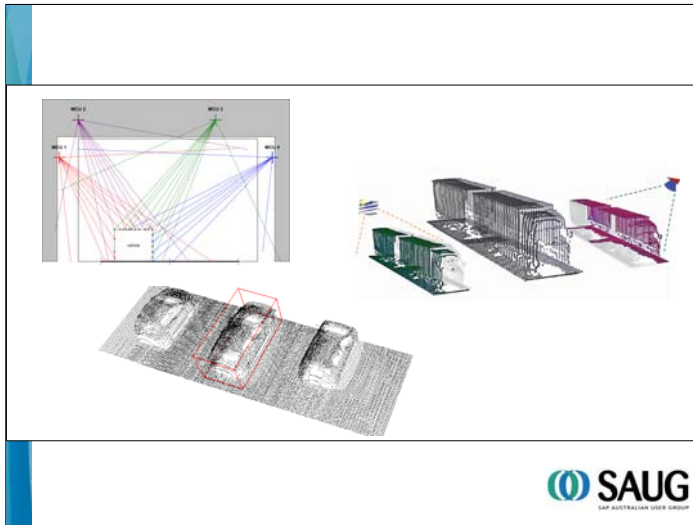
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Our roadside system intelligently integrates data from multiple and redundant sensors to create a passage report.

Classification is carried out by means of 3-D technology. Laser scanners create a three dimensional image which can classify vehicles with a high degree of granularity.

This Measurement & Classification Unit is a subsystem enabling differentiation of vehicle size and shape – can distinguish

Height

Width

Length

Trailers

Axles

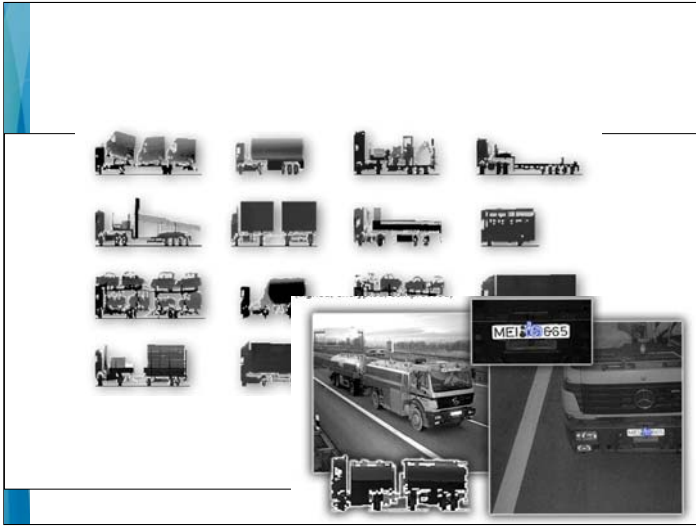
Non-intrusive, no in-road installation

Consists of a set of laser scanners and a processing unit that can be placed in a roadside cabinet.

All types of lane layout can be covered independent of number of lanes and width

The measurement and classification unit (MCU) is inherently redundant due to the consolidation of all data from all sensors into a single data set for the entire motorway.

In case of failure of a single sensor, the functionality can be maintained based on the data from the other sensors.



The 3-D image is converted to 2-D grayscale image for transmission to the Central System – too much bandwidth would be required to transmit the full 3-D image for every passage.

## > Central System scope

- HRIS

- Organisation Management
- Time Management & Recording
- ESS and MSS
- Personnel Administration
- Payroll
- Training
- Workplace Health and Safety
- HR Workflows

- Finance

- Accounts Payable
- Accounts Receivable
- Banking Processes
- BI
- Controlling
- Customer Management
- Fixed Assets
- General Ledger
- Global Enterprise Structure
- Logistics Invoice Verification
- Period End Processing
- Procurement
- Vendor management

## > Central System scope

- Core Tolling
  - Manage Customer Account
  - Customer Relationship Management
  - Tag Management
  - BI Reporting
  - FI-CA FI Integration
  - SAP Channel Management
  - FI-CA Manage Customer Account
  - Debt Collection
  - Payment and Returns
  - Master Data
  - Billing

## > Multi-phased delivery

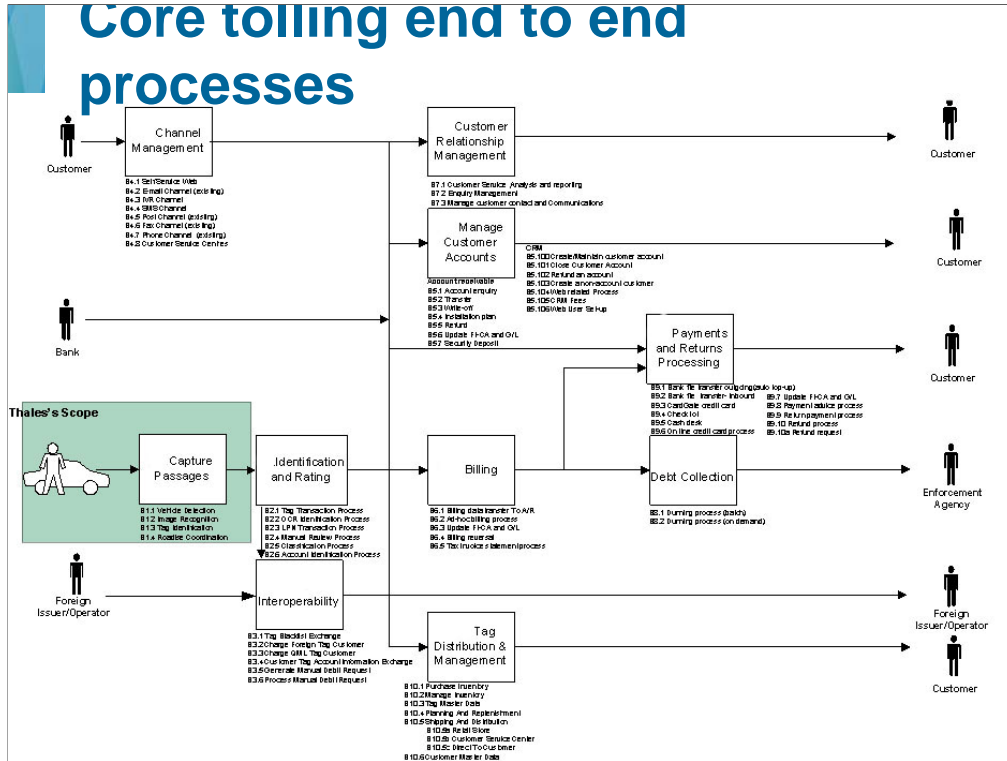
Stream	Area	Timeframe
1	HRIS	6 months
2	Infrastructure	6 months
3	Finance	12 months
4	Tolling	18 months

- SAP safeguarding at critical milestones and review of design phases



Central System – a combination of SAP and non-SAP applications

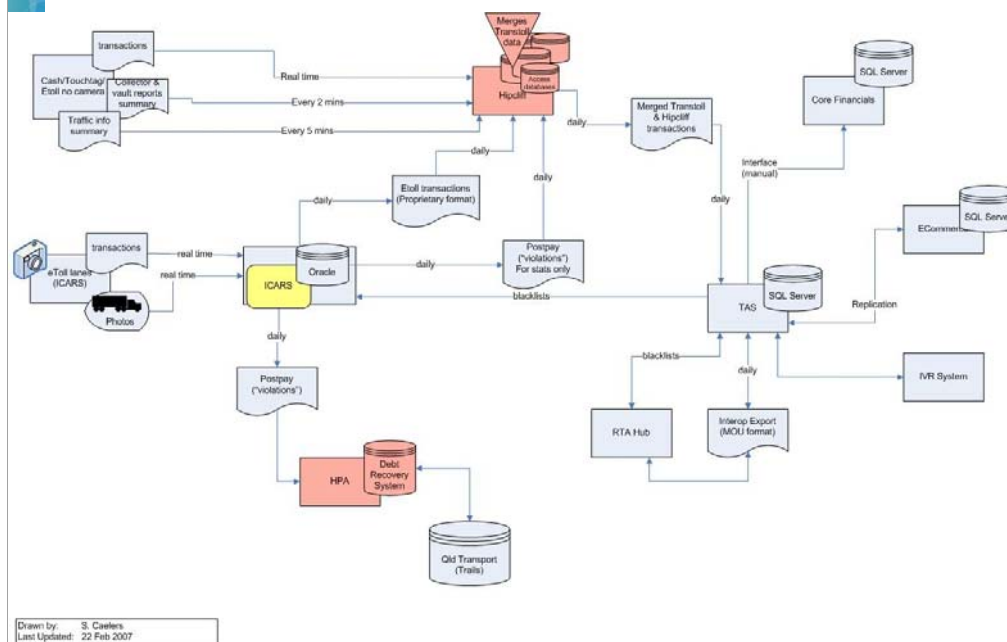
Multi phase delivery – wins on the board, learnings, avoid student syndrome



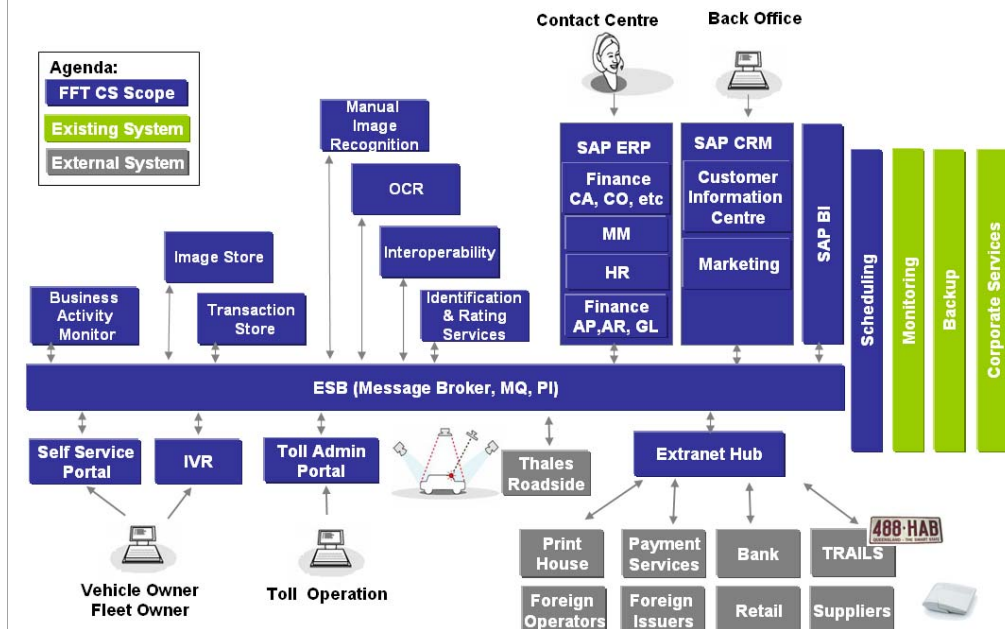
Now to concentrate a little on the delivery of the Central System, and specifically the implementation of SAP

This slide provides an overview of our end to end backoffice processes

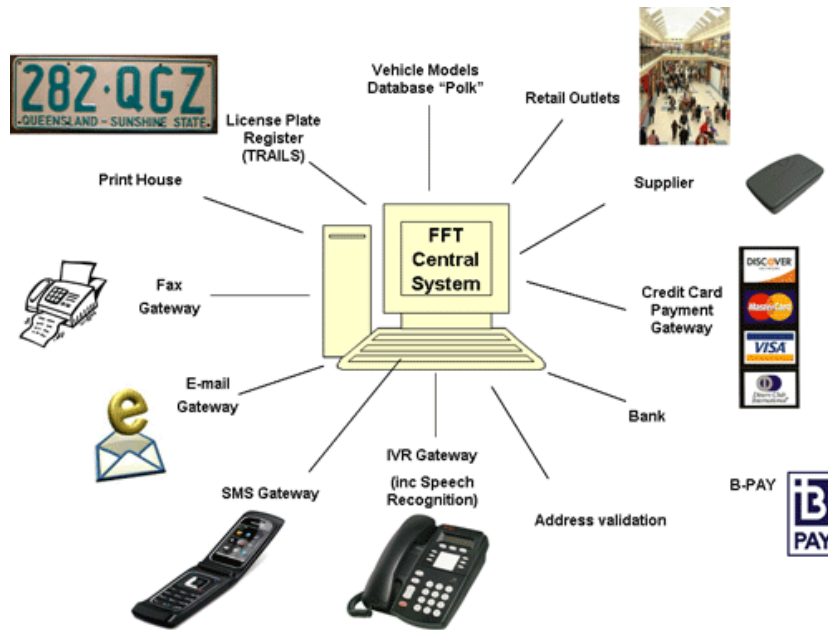
# Pre-free-flow tolling landscape



# Post-free-flow tolling landscape

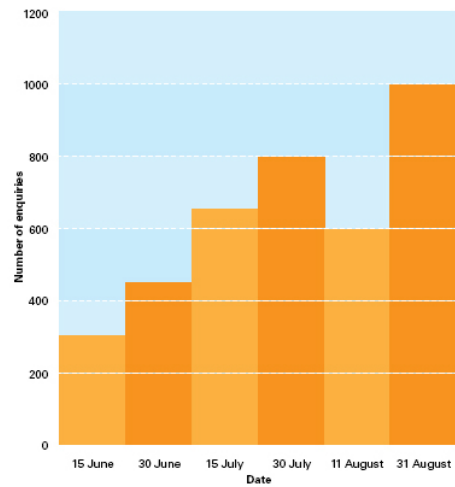


# Interfaces



## Growth at QML

- Increase in staff from 210 in 2005 to current levels of 400+ (- 130 Toll Collectors)
- Addition of Transport Technology Solutions, Customer Service Support
- Expansion to new premises at Clunies Ross Court
- Service Desk enquiries increased
- Support staff performing back office functions increased



The volume of enquiries received by the IS&T Service Desk has risen more than 300 per cent since the introduction of free-flow tolling

## > Challenges

- Highly visible and important to govt
- Organisational Change
- Data migration
  - over 7 million rows of data requiring identification, extraction, cleansing, mapping to the new system, migration, validation and testing
- Time to deliver
- Resourcing and backfilling roles

## > Lessons Learned

- Communication
- Organisational Change Management
- Meetings
- Testing
- Training/Knowledge Transfer
- Decision Making
- Reporting
- Resourcing



Workshops – lessons learned – what we did well, what could do better

## Testing/Training

- Load & performance testing
- Test case language  
Testing and training environments



## Communications

- Managing expectations
- Identification of stakeholder groups
- Level of detail and correct language for audience
- Objectives of communications

## Resourcing

- Demand on operational staff
- Enterprise architect
- Business Process Analysts
- Early engagement of staff for handover
- Strong team building amongst project teams, esp. with long term projects

## > Benefits Realisation

- Streamlined processes
- End to end management system – more accountability, more visibility with what is happening across the business
- More automation of processes, e.g. reconciliation in Finance
- Implemented testing methodology – SAP methodology
- Increased efficiency, e.g. tag management

## Benefits realisation cont...



- Roadside system performance criteria met
- High performance rating for Logan Alliance
- Excellent tag take-up by customers
- 10 minute trip time saving across network
- Less congestion
- Minimal disruption on the roads caused by FFTP

## > Release Strategy

- 6-month releases
- Prioritising business functionality – changes are across the whole business, not just impacting one department/area
- Improve components of the system to meet business requirements
- Minor changes or emergency fixes will be assessed on merit and deployed as needed



The release strategy is designed around 6-month phases.

The release system is based on the need to package business functionality to be used at a time when the business is ready for it and needs it. So, although a function might be “nice” to have, is it actually needed, and is it needed right now?

The changes in each release phase are across the business, incorporating areas such as HR, Finance, Tolling and Customer Service. It is not a case of doing one department or area at a time.

The things that will be included in each release are planned in advance, based on the needs of the business. It is expected to be proactive, not reactive.

The phases of each release will be the same as they were for the different phases of the Free Flow Tolling Project – design, build, test and implement. This ensures that future functionality changes meet the business’ needs, work as they were intended, and fit within the system that has already been built. Along with this will of course include any communications and training required for implementation.

## Questions?

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