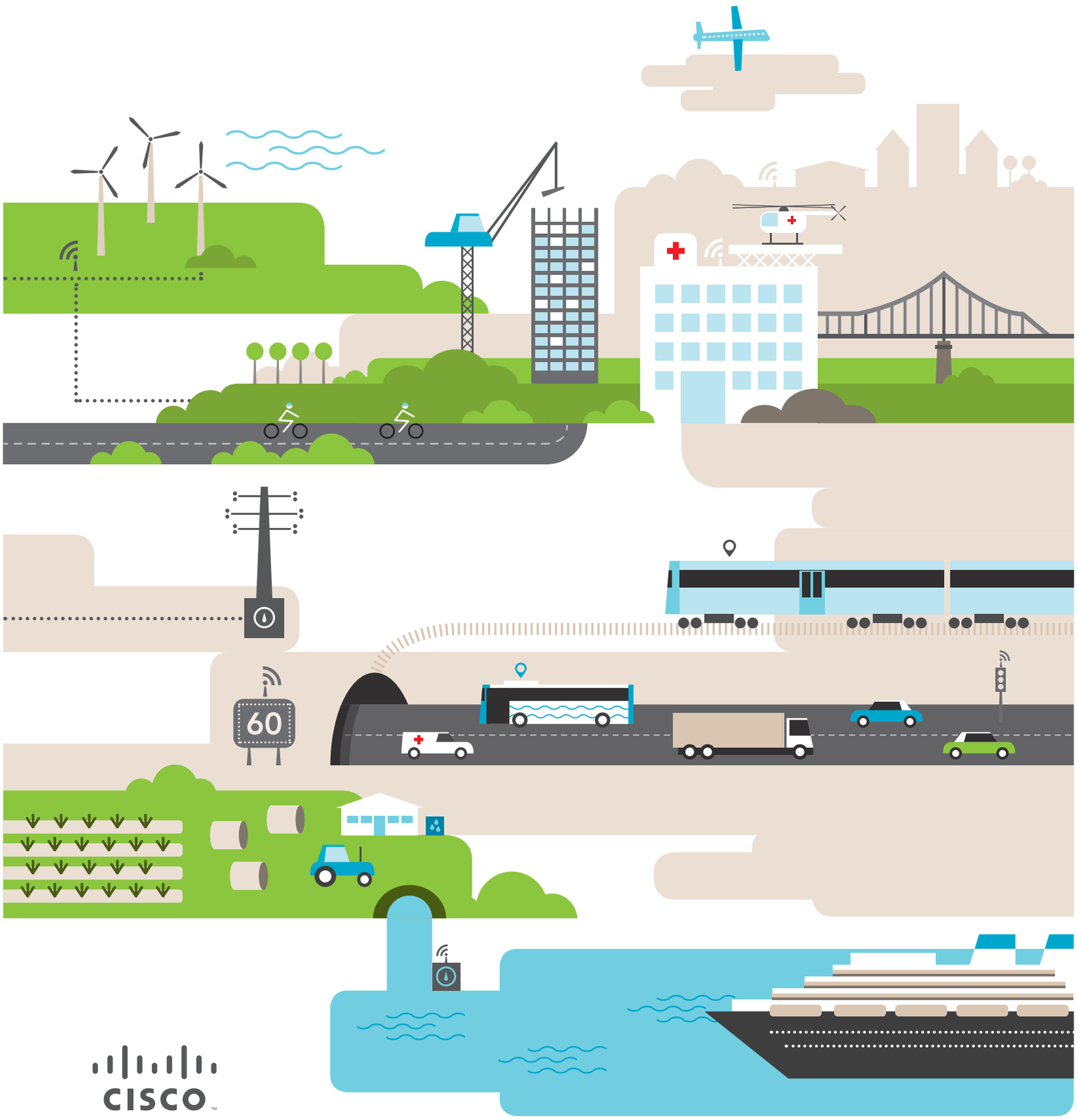
South East Queensland:
A Smart Region



CISCO

In the last 10 years, the South East Queensland region's population growth has been consistent, with a cumulative increase of almost 25%.

In the next decade, South East Queensland is projected to grow even further, requiring a potential large investment in infrastructure by state, federal and local governments to support this growth.

1 in 7
Australians live in South East Queensland.

$182.4B
contributed to the Australian economy by South East Queensland.

What is a Smart Region?

Smart Regions use digital technology and real-time data to improve public services irrespective of political, economic or geographic boundaries.

Some smart cities have accumulated impressive outcomes

50% reduction in water consumption.

3.5 tonnes decrease in Carbon dioxide levels.

57% reduction in energy costs.

In the last decade the world has seen more cities embracing 'smart' solutions. Being a 'Smart City' means maximising the use of real-time information to solve problems in a productive, cost-effective, creative and environmentally sensitive way.

By using such concepts, some cities have successfully lowered the cost of living and improved the quality of life for their citizens by reducing the cost of public transport and making that system more responsive, creating employment opportunities within the private sector and lowering the cost of government services resulting in lower taxes and rates for citizens.

Through 'smart' initiatives, some cities have accumulated some impressive and compelling outcomes for their citizens: a 57% decrease in energy costs, a 3.5 tonne decrease in Carbon dioxide levels[1], and a 50% reduction in water consumption[2]. The associated cost savings can then be passed on to residents or re-invested in better social infrastructure such as parks and tourist activities.

City authorities themselves have also benefited; it has been shown that organisations that use data effectively to drive decision-making out-perform their competitors by a margin of 5 to 6%[3].

Smart cities have been successful in attracting new, skilled residents who contribute to the local economy through innovation and typically bring with them the next generation of students who will develop this new industry to its $1.5 trillion industry potential by 2020[4].

But while those cities have been reasonably successful in providing better services to their residents, it is increasingly understood the problems which affect residents the most don't stop at political boundaries, and in some cases the causes of a problem are geographically removed from the effects.

A smart region brings together multiple cities and governments at all levels to provide better outcomes for citizens than a smart city can. A Smart Region allows the optimisation of an entire ecosystem, regardless of where a resident lives, works or studies.

Approaching this concept at a regional scale benefits the everyday lives of residents across work, life and business. Regions enable the achievement of economies of scale, and yet regional problems are met with targeted local solutions. Integrated public services can improve the ability of citizens to move around more effectively, interact with their environment and enable them to be more resilient in the face of a disaster event.

Importantly, the smart region concept allows every part of the region to play to its strengths and contribute to a cohesive strategy that can bring benefits to all councils and to all residents.

1. The City of Eindhoven, Netherlands.
2. The City of San Francisco, United States
3. F. Provost and T. Fawcett, "Data Science and its Relationship to Big Data and Data-Driven Decision Making," Big Data, Vol. 1, No. 1, pp. 51–59, Mar. 2013.
4. The World Bank, Connecting & Financing Cities-Now, Priorities for City Leaders. 2013, p. 132.

1. Farmland

Securing agricultural supply chains and using sensors to optimise farming operations.

2. Parks

More time to spend with friends and family.

With savings in other areas Councils can use funds to upgrade public places.

3. Water

Reduced water use.

Citizens able to see and contribute to water quality testing.

4. Air quality

Reduced carbon dioxide emissions as a result of less power used.

Commuters choose efficient and reliable public transport.

5. Major events

Quicker access to major events on public transport.

6. Road transport

Reduced traffic congestion.

More time with family.

Targeted, smaller investments in road infrastructure.

7. Public transport

Cheaper, more frequent public transport services.

Real time information for commuters.

Better commuter journey planning.

More resilient public transport with fewer delays.

8. Power

Up to 57% reduction in a city's energy costs.

Savings in managing an electricity network passed on to consumers.

9. Health

Decrease in ambulance response times.

10. Resilience

Better management of storm water.

Essential services learn from the last emergency.

Effective and targeted evacuations based on real-time data.

11. Logistics

Allowing goods and services to transport more efficiently round the region.

More efficient waste management.

12. Big buildings

Better access to high traffic areas.

Stimulating business growth.

Starting new industries.

13. Council Chambers

Reduction in the cost of providing core services.

Freeing up funds to target unemployment, encourage tourism or implement an economic development plan.

Why the South East?

South East Queensland now has an opportunity to embrace smart city concepts and apply them at a regional level.

South East Queensland's growth and increased international reputation comes at a time when federal, state and local government budgets are stretched by a decline in revenue and an increase in the cost of providing core services. To fulfil the region's ambitions without increasing the taxation of residents, political leaders will have to find better, smarter solutions. This will ensure the next generation of infrastructure supports a clean, green, accessible and inclusive region for their residents, underpinned by creativity and innovation.

As a result of this need, South East Queensland now has an opportunity to embrace smart city concepts to ensure the entire region's residents experience better access to public transport, more reliable core Council services, faster access to emergency services and more effective methods for getting goods to market.

The existing shared infrastructure of the region demonstrates how an integrated approach can not only produce real, on the ground solutions to shared problems across a large geographical area, but also how business and government can achieve economies of scale in delivering better roads, transport, utilities and other services to consumers.

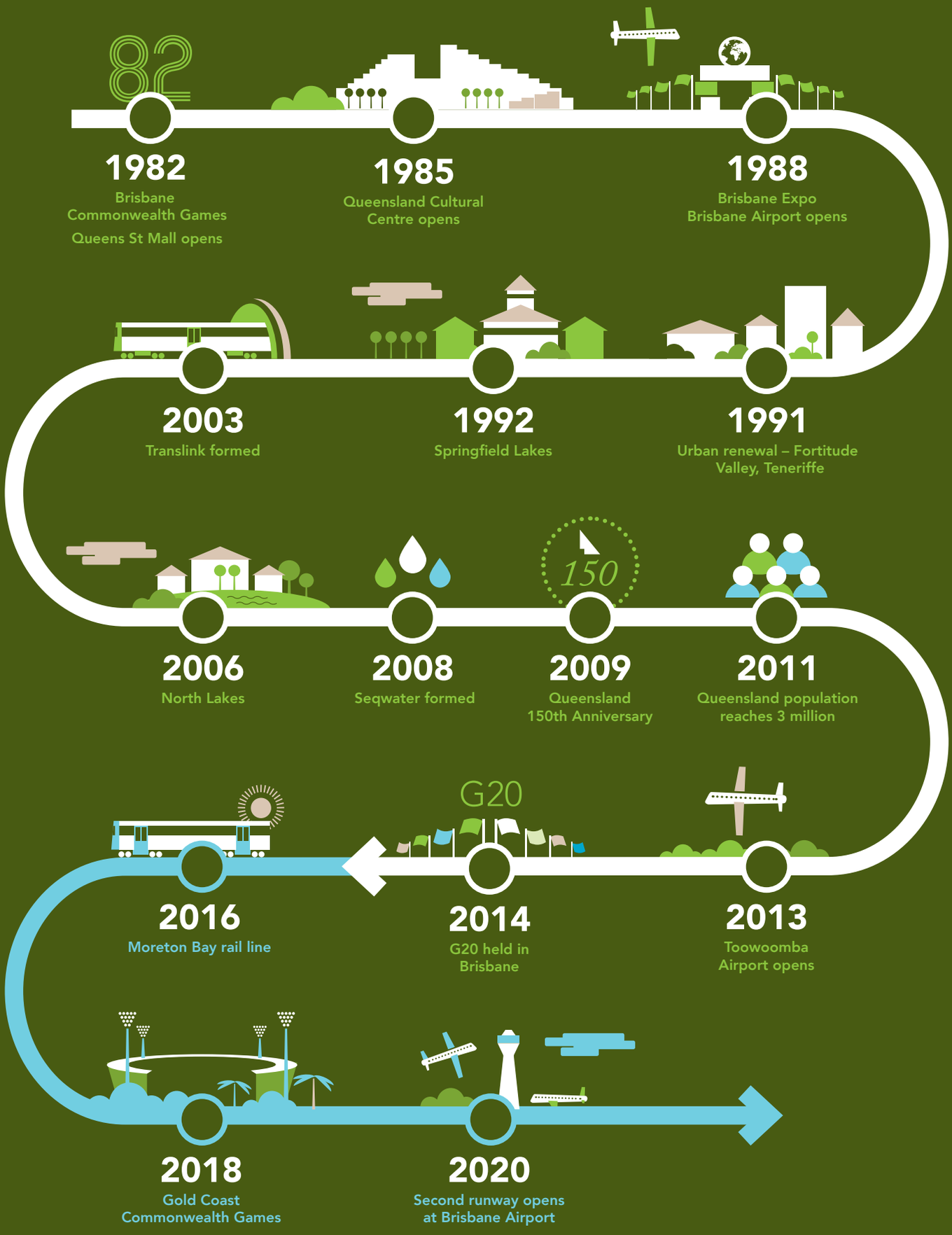
After surveying over 1,000 residents within the region and consulting with major organisations, it is evident that the community has considerable appetite for the ability to access and use relevant information to guide their choices, and for real-time data to enable delivery of more efficient, responsive public services.

The residents and businesses consulted identified the need for smart solutions which enable more efficient public transport, more resilient roads and infrastructure and the improved management of disasters.
Those residents also identified many potential solutions which would increase the economic productivity of South East Queensland, including the provision of relevant, time sensitive information to drive investment business cases and create new industries. This would allow customers to access business places more efficiently, shortening supply chains and creating employment opportunities in different, and new industries.

Additionally, those surveyed identified the potential for these concepts, and the underlying technology, to provide cheaper, more sustainable and efficient services to communities through the use of smart solutions like intelligent lighting, automated water and power metering. Adding further efficiency to these fundamental services will free up funds to be reinvested for the benefit of the community.

Residents across the South East have also recognised that undertaking such a project in a piecemeal city-by-city, suburb-by-suburb manner would not be as successful as undertaking a whole-of-region plan.

This report outlines the impact that smart region projects could potentially have on South East Queensland, the level of community support and how their implementation could not only contribute to building the world's first smart region but also benefit residents and businesses, and enable Governments to deliver better services for their communities.


82
1982
Brisbane Commonwealth Games
Queens St Mall opens
1985
Queensland Cultural Centre opens
1988
Brisbane Expo
Brisbane Airport opens
2003
Translink formed
1992
Springfield Lakes
1991
Urban renewal – Fortitude Valley, Teneriffe
2006
North Lakes
2008
Seqwater formed
150
2009
Queensland 150th Anniversary
2011
Queensland population reaches 3 million
G20
2016
Moreton Bay rail line
2014
G20 held in Brisbane
2013
Toowoomba Airport opens
2018
Gold Coast Commonwealth Games
2020
Second runway opens at Brisbane Airport


NOOSA SHIRE COUNCIL
SUNSHINE COAST REGIONAL COUNCIL
SOMERSET REGIONAL COUNCIL
MORETON BAY REGIONAL COUNCIL
BRISBANE CITY COUNCIL
REDLAND CITY COUNCIL
TOOWOOMBA REGIONAL COUNCIL
LOCKYER VALLEY REGIONAL COUNCIL
IPSWICH CITY COUNCIL
LOGAN CITY COUNCIL
GOLD COAST CITY COUNCIL
SCENIC RIM REGIONAL COUNCIL

The South East Queensland Region

South East Queensland covers more than 35,000 square kilometres and includes the local government areas of Brisbane, Gold Coast, Ipswich, Logan, Lockyer Valley, Moreton Bay, Redland, Scenic Rim, Somerset, Sunshine Coast, Noosa and Toowoomba.

The region contains a microcosm of every Australian demographic - from high density, inner-city suburbs to vast tracts of some of the world's most fertile agricultural land. South East Queensland includes the tourism capital the Gold Coast, industrial and manufacturing cities, and everything in between.

Buoyed by its beauty and productivity, the region is now home to one in seven Australians and contributes $182.4B to the Australian economy[5].

The region itself has grown and matured significantly in the last 35 years. From hosting the Commonwealth Games in 1982, to building a world class cultural precinct to welcome Expo '88, celebrating the 150th anniversary of Queensland in 2009, and capturing the world's attention during the G20 Leaders' Summit in 2014, the region has celebrated many major milestones.

As a result, South East Queensland is now recognised on the international stage as a sub-tropical, uniquely Australian region with a vibrant arts, entertainment and tourism culture, as a productive agricultural region, an international centre of education and one of the most liveable regions in the world. This reputation has brought significant population and visitor growth and the aspiration to continue to grow and seek opportunities to host to major events.

In the last 10 years, the South East Queensland region's population growth has been consistent, with a cumulative increase of almost 25%.

In the next decade, South East Queensland is projected to grow even further, requiring a potential large investment in infrastructure by state, federal and local governments to support this growth.

In addition to natural growth the region attracts major events including the recent G20 Summit and the upcoming 2018 Gold Coast Commonwealth Games. The growth that comes with these major events will test South East Queensland's infrastructure, which is already strained by population growth.

5. National Institute of Economic and industry Research, 2014

Better services to the community

The core benefits identified by community, business and peak bodies in transitioning towards an integrated smart region have primarily focused on the better delivery of services by governments to their citizens, and the economic and social benefits to the community.

The focus is primarily on more effective use of public assets which would enable a better quality of life for those in South East Queensland. More efficient, regular public transport; better and more resilient roads and infrastructure; effective disaster management and the management of major events were amongst the most recognised benefits by the South East Queensland community.

Real-time information for public transport

"Fabulous Idea! Wish I had this when I lived in Sydney and was continually waiting for buses and never knew if I missed one or if it was late or full." – Gold Coast Resident

Public transport remains a popular way for South East Queensland residents to get around the region with over four million passenger trips each week.

The latest customer satisfaction survey released by Translink in March 2015 indicates that the residents of South East Queensland are largely satisfied by the network. Almost 7 out of 10 customers identified they were happy with the overall service of public transport, while close to 80% indicated the service was easy to use and accessible. However, over half of customers (51%) identified affordability as a problem with the public transport network. Reliability and frequency were also identified as issues as commuters feel that information surrounding the service could be more readily available.

With the base level of satisfaction with public transport services already reasonably high, those consulted focused on increasing the accessibility of information around the service, ensuring reliability and putting downward pressure on the costs of running the service.

One of the key frustrations identified through public consultation has been the lack of usable real-time information around public transport. Real-time information becomes usable when it relates to the entire system, and commuters are able to rely on the information to plan multiple trip segments, across different transport options.

In May 2015, Translink began releasing real-time data in the bus network allowing passengers to better plan their journeys. While the data does not yet exist as to whether this measure will increase the satisfaction of the service (in particular passengers' concerns about the lack of information), South East Queensland businesses and communities have identified this as only the first in a series of measures which would increase the usability of public transport services.

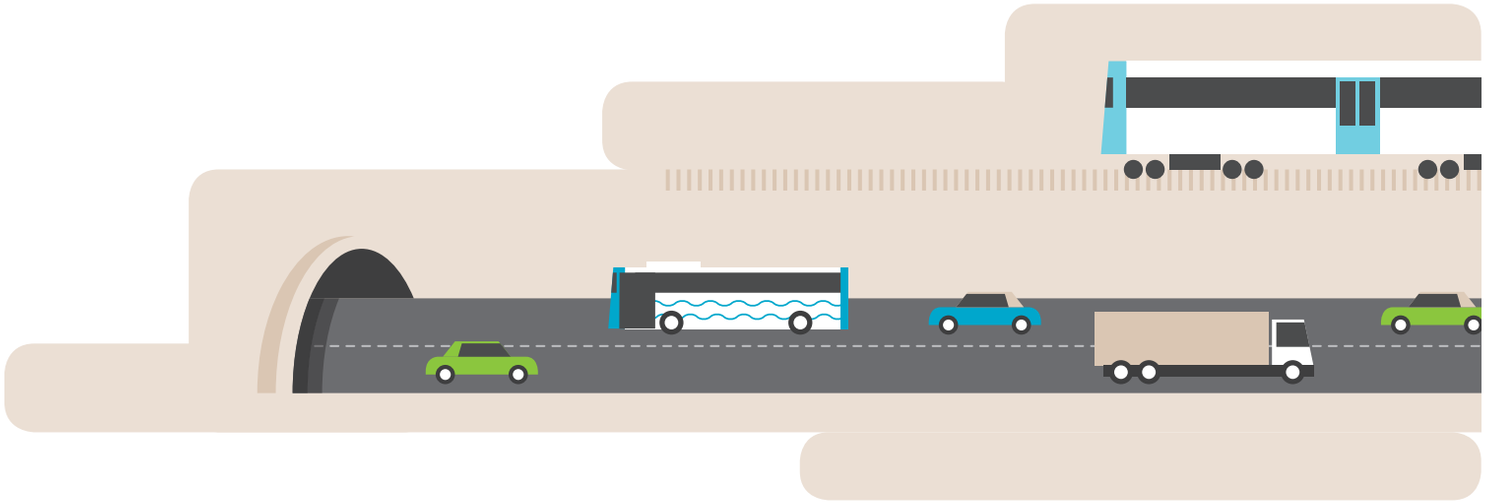
Robert Dow, of public transport lobby group, Rail Back on Track believes real-time data will not only allow the more efficient management of the public transport system but will also give commuters more confidence in the system. "If you are at the bus stop and the bus is late, you don't know what to do, but if you can see the bus is five minutes down the road it makes a big difference in terms of using a service. Where this information is really valuable is when you go further out, where frequency drops, transfers become really difficult to manage."

More generally, South East Queenslanders also believe real-time information is valuable with 75% saying that this information was either important or extremely important to their lives. Residents have identified the significant benefits of real-time information as, a reduction in commuter frustration, an improvement in commuter planning and allowing commuters to respond to incidents by choosing alternative travel options.

A number of commuters consulted pointed out that the less doubt about public transport there is, the more inclined people are to use it, and that they would welcome increased accountability on transport operators.

A Moreton Bay commuter encapsulates the problem "it's a major frustration for commuters to feel 'forgotten' at their stops and be unaware of what's going on." Another respondent from the Gold Coast has experienced the benefits first hand: "*On Saturday my last bus home was running 30 minutes late due to its previous run to Coolie Rocks On. By using real-time I was able to see where the bus was and that it was still coming otherwise I would have taken alternate route and had a 65 minute walk home. Best app ever.*"

There is overwhelming support for increasing and extending the use of real-time data for public transport so South East Queenslanders can experience the benefits of accurate, timely, real-time data including the ability to find the quickest and easiest way home at the time when it is most convenient to leave, regardless of the mode of transport.



Current challenge

The use of public transport is highest in circumstances where commuters feel that it is fast, convenient, reliable and provides value for money. Commuters also need confidence that the transport will deliver them to their destination on time. Despite the level of service integration, public transport in South East Queensland is currently perceived as unreliable and expensive, reducing the potential number of residents using it on a regular basis and increasing the number of cars on congested roads.

Potential 'Smart Region' outcome

Using smart public transport concepts a commuter living in North Lakes may be able to wake up and check their smartphone to see when they are best to leave home for their commute to Toowong and the best way of getting there that morning. After showering and getting ready, they could receive a notification that, the train they were expecting to catch is expected to be full by the time it reaches Petrie from Caboolture and that if they wanted to stay at home for an extra ten minutes they would be able to catch the next train in comfort and still arrive before they needed to be at work.

Community outcomes

- A reduction in commuter frustration
- An increase in commuter comfort
- Empowering commuters to choose alternatives that achieve similar outcomes

Business outcomes

- Increased productivity as a result of fewer staff being impacted by public transport delays
- Easier transportation for goods and staff on the road as a result of more commuters taking public transport

Government outcomes

- Improvements in commuter route planning and decision-making
- Increased reliability of the public transport network
- Increased patronage and load optimisation

Optimum loading of trains

"The more information the customer has, the more likely they are to use public transport." – Brisbane resident

A key frustration of commuters, particularly regarding train travel, has been the uneven loading of train carriages. Some carriages, typically the middle section of the train, generally hold a larger number of people, with the carriages at either end less utilised. This is reported more frequently on the longer-haul corridors such as the Gold Coast and Sunshine Coast lines.

The cause of this problem appears to be a large number of people entering via a small number of train doors and then travelling between carriages in the hope of finding a seat, causing frustration and a higher degree of commuter disturbance than is required.

Dutch railroad company Nederlandse Spoorwegen (NS) identified a similar issue on their network. They solved the issue by providing a 180m-long LED display suspended directly above the train. The strip shows where the doors will be once the train stops; where first and second class, the quiet zone and bicycle storage will be; and how crowded the various carriages are (as measured by infrared sensors on board.) The real-time information is also provided to a mobile application so passengers can check where they are more likely to get a seat even when they have a tight transfer.

While the difference in satisfaction levels has not been specifically measured in the Netherlands, the measure has won a people's choice design award and anecdotally the system appears to have resulted in a decrease in the time commuters are taking to board trains and find seats.

Robert Dow from Rail Back on Track considers this idea "…a no brainer. You can look at your smart phone and say, I've got to go to carriage five because there is seats available there, but there's none in three, four, or two."

A commuter from Moreton Bay was particularly enthusiastic, "I think the idea regarding carriage seating is brilliant - I'm disabled with chronic pain and can't stand for long, so seeing where I can get a seat is fantastic."

Mr Dow and the Moreton Bay commuter are amongst the 52% of survey respondents who place substantial importance on this idea. 76% of respondents believed such a measure would reduce commuter frustration, while 68% believed it would improve planning.

Current challenge

South East Queensland Transport is mostly utilised during the peak transport hours, prior to and after work. Unfortunately crowding and slow loading during those hours results in a longer time services spend dwelling at stations and the uncertainty about whether a commuter will be able to get a seat, particularly on long-haul trips, adds to frustration and decreases the chance that commuters will use public transport.

Potential 'Smart Region' outcome

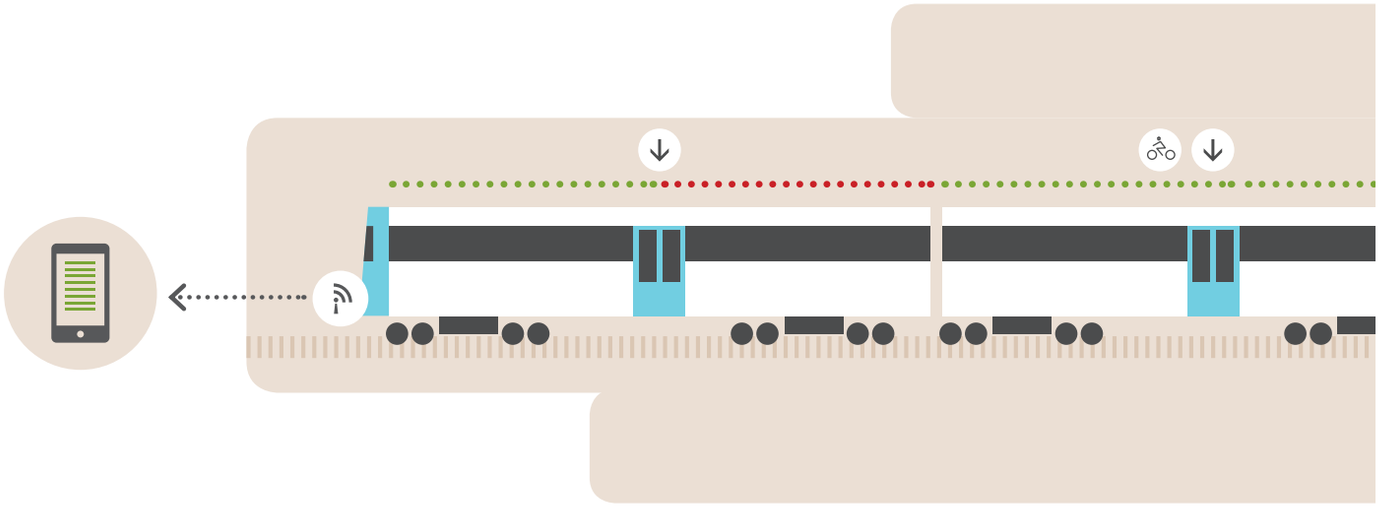
A Coomera-based rail commuter has a broken leg and needs a seat in her trip from Milton to home. Before leaving work she can check on her work computer the status of the Milton to Roma Street and the Roma Street to Coomera services to find out how full the services are expected to be on the basis of the real time data before deciding to go to the train station. Once at the station, she can line up in the platform area which she knows as being aligned to relatively empty carriages, and while she is on her way to the Roma Street station she not only knows which platform to go to, but how long she has to transfer between the services and which carriage is most likely to have a vacant seat on the Coomera service.

Community outcomes

- A reduction in commuter frustration (e.g. 'If I wait for the next train, I'll get a seat)
- Empowering commuters to choose alternatives that achieve similar outcomes

Government outcomes

- Increased patronage of public transport and load optimisation
- Decreased funds being spent on roads and other transport infrastructure



Helping reduce impacts of major public transport incidents

"A reliable public transport system would reduce the volume of CBD parkers." – Lockyer Valley resident

Through published satisfaction ratings, passengers have identified the reliability of the public transport network is a problem. While the number of major incidents on the South East Queensland public transport system appear to be in a downward trajectory, Translink's Independent Audit into the reliability of Queensland Rail's South East Queensland network following two catastrophic events in 2012 states that the severity of the failures are increasing[6].

The audit report also states that network issues (including signal failure, problems with getting electricity to the trains, and errors with the physical tracks) constitute 35% of all reasons for delay. A further 6% of delays were caused by corridor security and trespass issues, while 15% of delays were caused by issues with the trains themselves.

Britain's Network Rail Telecom (NRT) has deployed thousands of sensors to monitor things such as air and track temperatures and stress gauges. Instead of linesmen inspecting the integrity of signals, electricity infrastructure and the tracks themselves, the information is automatically relayed to a single system allowing manpower to be used more effectively in preventative maintenance, rather than in conducting regular routine checks. A similar solution is also used by New Zealand rail infrastructure and transport services company, KiwiRail.

In the case of the British system, other sensors owned by organisations other than NRT provide data to the central NRT system on matters which may affect the transport network. For instance, data measuring ground moisture in areas surrounding the tracks is fed into the system to automatically analyse the risk of a water-related problem.

Such an integrated systems approach may assist with mitigating some of the issues causing delays within Queensland's public transport system. While some respondents believed this would be of more benefit to the operators than to commuters, the majority of respondents believed a similar system could improve network safety (59%), reduce incidents (58%) and result in fewer network delays (56%).

6. http://www.tmr.qld.gov.au/~/media/Travelandtransport/Rail/Rail%20audit/IndependentrailauditFinalreport.pdf

Current challenge

The perceived lack of reliability of public transport is a key reason South East Queensland commuters choose cars over public transport.

Potential 'Smart Region' outcome

Automating the monitoring of physical network infrastructure and reallocating human resources to preventative maintenance could increase the reliability of train services, mitigate the effects of major incidents and result in a more reliable transport system.

A Dinmore resident needs to get to a job at Bowen Hills and is deciding whether to drive or take a train, taking public transport will allow her to relax but she is concerned about potential delays, meaning that she won't get to her employment on time. As a result of a decrease in incidents over the last 6 months, that resident decides that she is able to relax on the train with confidence she will get to her work with time to spare.

Community outcomes

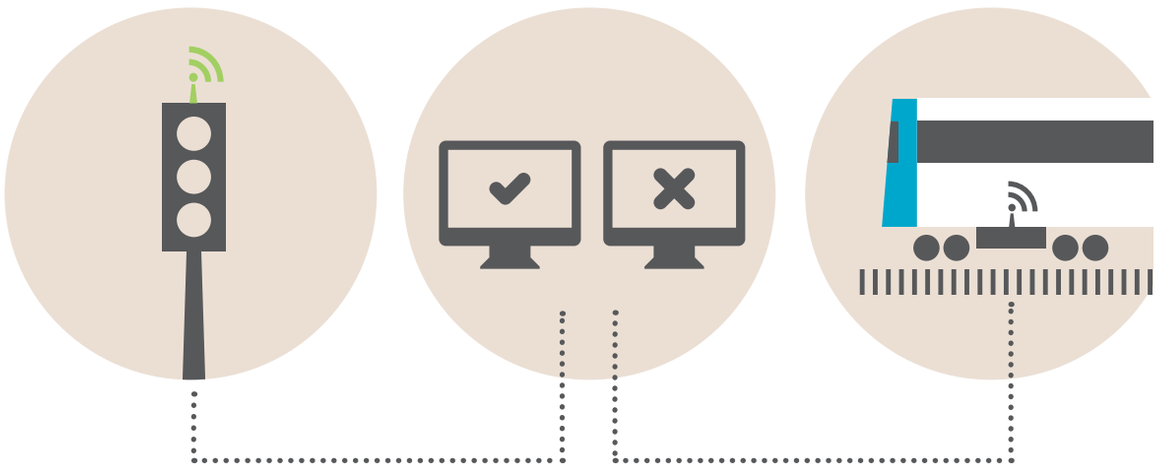
- Improvements to network safety
- Fewer rail network infrastructure faults and service delays and disruptions

Business outcomes

- Decreased staff time and other resources spent on managing and remediating public transport delays.

Government outcomes

- A reduction in public transport interruptions
- Improvements to network safety



Efficiency of the train system

"With an improved signalling system you can easily increase train frequency by another 25%."
– Robert Dow

There are a number of commercially available rail management systems which are currently utilising sensor technology to mitigate the need for physical signals and maximise the efficiency of a rail system.

These rail management systems are allowing trains to travel closer together on an optimised system, allowing increased frequency of trains without an investment in new tracks. According to Robert Dow, "With an improved signalling system you can easily increase train frequency by another 25%." This type of system, along with a targeted investment in new track-work informed by smart infrastructure monitoring, could reduce resident time spent commuting significantly.

While the rail management system was seen as an operator issue, rather than a commuter issue, a Moreton Bay resident reported that his public transport usage would increase if public transport was "cheap and timely." Such a rail management system could be investigated to determine if it was a good investment to increase the frequency of trains and decrease the cost of travelling for commuters.

"I can get to work in 50 minutes in a car, or an hour and twenty on the train - I'd rather catch the train, but which do you think I choose?"
– Gold Coast resident

Current challenge

The current train management system comes with a cap on the frequency of the train services and extends long train trips as a result of a requirement to keep a minimum distance between services. This results in a longer commute and potentially fewer services.

Potential 'Smart Region' outcome

A young family is deciding where to live, they have family, support and childcare at Mudgeeraba on the Gold Coast but they both work in the Brisbane CBD. The commute from work to Robina train station would be an hour and a half, meaning that even if both parents worked part-time one would miss dinner and bath-time every night. With a train management system which allows trains to travel closer together and optimises the train's journey that family could decide to relocate to the Gold Coast hinterland and still allow both parents to be home in time for their children's bedtime.

Customer outcomes

- More frequent services
- Shorter commute times, particularly on longer trips

Government outcomes

- Increased patronage of the train network
- Increased customer satisfaction

Roads and infrastructure

"People won't make unnecessary outings if they are aware of how bad the traffic is at certain times, or when there's an accident."
– Brisbane resident

The Royal Automobile Club of Queensland's (RACQ) fact sheet on road congestion in South East Queensland states that over the next decade Brisbane was expected to have the highest congestion growth rate of any Australian capital city. While the introduction of new infrastructure like CLEM7 and other infrastructure has abated some of the expected congestion, there is still likely to be significant increases in congestion on South East Queensland roads.

This is in part due to the growth within the region and can cause slow driving speeds, longer commute times, reduced travel time reliability, and increased queuing and delays. As Paul Turner, Executive General Manger, Advocacy at RACQ says, "there's no doubt the biggest issue we face as a city is not choking to death."

This congestion can cause productivity decline for businesses. In a survey released by the Chamber of Commerce and Industry Queensland (CCIQ) in 2011, 48.3% of Queensland businesses believed that an efficient and reliable transport network was of high or critical importance to the success of their business, and 41.1% believed that Queensland's road network was inadequate.

The Bureau of Infrastructure, Transport and Regional Economics (BITRE) predicts that the excess, or avoidable, national costs of traffic congestion in Australian cities will exceed $20 billion per annum by 2020. In addition to the economic cost there is also a lifestyle cost as time spent in traffic can't be spent with family or friends.

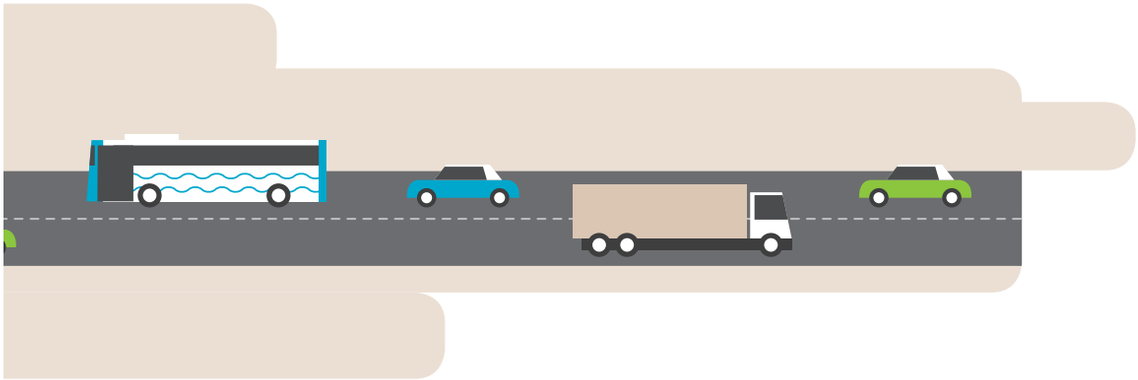
In the CCIQ survey, businesses reported increased costs, decreased efficiency and productivity, delayed deliveries, negative impacts on staff retention and decreased customer satisfaction as the by-products of congestion.

South East Queensland Councils, the Queensland Government and the federal government are all cognisant of the need for action and have supported a number of congestion-targeting infrastructure projects including the Second Range Crossing, a cross-river tunnel and various local projects.

While improved and additional infrastructure capacity is part of the puzzle, the cost of providing roads and transport infrastructure is significant. According to an Ernst & Young report in 2011, the cost of building a road in Queensland was approximately $5 million per kilometre.

To manage the existing and expected growth, and to manage the influx of both tourists and those attending major events, we will need not only increased infrastructure in South East Queensland, but will need to manage the existing infrastructure more efficiently.

Queensland was the first state in Australia to introduce an Intelligent Transport System (ITS) in 1969. The Transmax STREAM system, developed in Queensland and used now by Victoria, South Australia and Tasmania, collates and uses real-time data to determine road and traffic conditions across Queensland motorways by utilising traffic signal management, incident management, motorway management, vehicle priority, traveller information and parking guidance within a single integrated system.



Paul Turner from RACQ says that Integrated Transport Systems have "proved very successful in terms of bang for your buck, it's a relatively inexpensive way to have a big impact on traffic flows." While Queensland has been at the vanguard of this technology in Australia, other cities and road systems are adding an extra source of information to the mix – machine-generated data.

The United Kingdom's Department of Transport has commenced a pilot project on the A14 motorway, connecting Felixstowe, the largest container port in the United Kingdom, to the industrial city of Birmingham. The pilot program has seen a large number of internet-connected sensors on the motorway allowing for more accurate geographical diagnosis of problems on the road, real-time speed adjustments based on the maximisation of traffic flow and direct communication with drivers to alert of issues and potential re-routing.

While a number of South East Queenslanders surveyed were concerned about the possibility of distracting drivers, and others believing radio was the best medium for imparting this information, one third of respondents believed this idea was extremely important with a further 53% believing it was considerably important. 84% of respondents believe that making real-time data on congestion available and using that data to manage traffic will increase traffic flow, 76% believe it will enable commuters to choose alternative routes and a significant percentage believe it will reduce road rage incidents.

Current challenge

Traffic congestion can be not only frustrating for commuters but also decreases the productivity of business, increases car emissions and adversely affects quality of life as residents spend more time on the road and less with friends and family.

Potential 'Smart Region' outcome

Each morning when a commuter's alarm goes off, a mobile phone application can tell them if they leave home at 7:45am they shouldn't take the South East Freeway, there's been a crash. If they take the Gateway they'll get to work in 12 minutes, rather than 72 minutes.

Customer outcomes

- Improvements in traffic flow
- Enabling commuters to choose alternate routes
- Reducing road rage

Government outcomes

- Reduced spending on roads

Transport infrastructure, enabled by better data

"Capture of data indicating high traffic on a route may not mean, for example an upgrade /widening is needed; it may indicate that public transport is inadequate. The data needs to be interpreted in context." – Brisbane resident

Data arising from these sensors and other sensors could be used to support business cases for new roads and other infrastructure.

Drivers have identified a persistent congestion issue with the junction of the M1 and M3 at Springwood in Logan. Having real-time data on the congestion rates, as well as where the traffic is heading may allow a traffic engineer to determine that a slip lane, or the re-routing of trucks during congestion, may help abate these problems for relatively little cost, reducing the need for an expensive building project and conserving valuable public funds.

Similarly, road engineers could benefit by measuring the effect on traffic congestion of short term, temporary infrastructure, to learn the best way to manage and mitigate the effects of maintenance or improvement works on traffic in the future.

One respondent believed that it "takes the guess work out of things that can accurately be measured", while another agreed that it would make authorities "aware of issues they had not considered". A Gold Coast commuter believes this information could be used "to show (if there is) a problem with a design of road".

Paul Turner from RACQ agreed, "We aren't relying on people to tell us where the money should be spent, we'll see it." For RACQ it's not just about road infrastructure "A smart city involves how do we get more people walking, how do we get more people riding?"

Current challenge

Infrastructure is extremely expensive and both governments and residents want to ensure that they receive the best value for money after examining all of the evidence.

Potential 'Smart Region' outcome

A traffic engineer in Logan could look at all of the evidence, including knowing how many people are using different entry and exit points on major roads as well as the availability and utilisation of alternative options, like public transport, cycle lanes and walkways to determine how best to fix the whole problem, rather than just treat the short term effects. This will result in Logan residents getting the most effective piece of new road infrastructure, not the one which masks the problem in the short term.

Customer outcomes

- Roads, public transport, walkways and cycle ways which are based on evidence and maximise the benefits to residents.

Government outcomes

- Better targeted new infrastructure
- Time savings as data to inform planning will be already captured
- Money savings, as data will already be captured for planning purposes.

Emergency services attendance

"Anything that will help an emergency vehicle respond quicker to an accident is beneficial." – Brisbane resident

By linking traffic-light controls with mass transit and emergency vehicles, priority could be safely given to emergency vehicles and buses with traffic signals changing as they approach intersections.

While these types of systems, particularly in giving way to emergency vehicles, have been with various success in Queensland in the past, a recent study by Transmax on the Gold Coast demonstrated that giving emergency vehicles priority at traffic-lights through such a system resulted in a 10 to 18% shorter response times.

Perhaps unsurprisingly, this was the most popular measure surveyed with 86% of respondents believing this was important, with a large number of people identifying that it will save lives. Others also identified the benefits to ambulance drivers, with one Toowoomba resident noting that they had "seen too many near misses for ambulances negotiating traffic lights to get to an emergency."

This measure had near universal support with 99% of respondents believing that this idea was somewhat important or higher.

Current challenge

In an emergency every second counts, that's why time spent navigating traffic by emergency services is wasted.

Potential 'Smart Region' outcome

A 48 year old man from Sheldon is experiencing chest pains and calls an ambulance. Using priority traffic light control an ambulance is able to get to him in a matter of minutes to discover that it's likely that he is having a mild heart-attack. The paramedics are able to administer preliminary assistance while using real time data to determine that due to road works at Kessels Road, it is faster (although further) to get to Greenslopes Private Hospital, rather than QEII. The priority light control means that a 22 minute trip was reduced to a 15 minute trip allowing emergency doctors to assist the man sooner, maximising the chance that he will make a full recovery

Customer outcomes

- More efficient and effective emergency services

Government outcomes

- Enabling emergency vehicles to respond more quickly
- Improving traffic management during major events
- Improving road safety during traffic incidents

Bus prioritisation

"I'm stunned this isn't being done already."
– Gold Coast resident

By extending Transmax's system to mass transit vehicles, such as buses, there is also the possibility of decreasing the amount of time it takes to get to work, home or to an event.

Particularly in the circumstances of a major event, busses carrying participants or spectators may be able to get to the venue quicker, or alternatively a venue which may have been ruled out as a result of being too far away may be used as a result of the travel time saving.

Rail Back on Track believes the arguments are sound, "if you want people to use public transport if you prioritise it, it then becomes an advantage to use it."

Robert Dow also believes that creating and using this data could benefit network planning. "From a smart cities approach you'd look at the traffic, congestion management of the road system and how that influences the bus system particularly. How you would alter the bus systems to factor in road congestion in a smart way using the real-time data and subsequently adjust the bus timetables."

A Gold Coast resident saw the particular use of prioritisation of bus transport for major events like the V8 Supercars, saying that the spectators and other people using the roads could really benefit from the technology.

Current challenge

Major events can pose difficulties for transport networks. Such events necessitate a large number of people trying to get to a geographically limited area at the same time. While public transport is the most efficient way to achieve this, the perception is often that taking a car is more efficient.

Potential 'Smart Region' outcome

The third game of State of Origin is being held at Suncorp Stadium and a Bardon resident is keen to get home in order to see kick-off with his three kids. As a result of decreased travel times through priority lane access for buses, many more people have taken public transport this year, rather than having friends and family drive into the precinct to drop them off. As a result, the congestion the Bardon resident usually experiences around major events is much less and he's no longer stuck on Given Terrace, and can make it home in time for kick-off.

Customer outcomes

- Less commuter frustration
- Increased quality of life and time spent with friends and family

Government outcomes

- Improving traffic management during major events
- Business outcomes
- Reduced business disruption for businesses in entertainment or sporting precincts

Managing extreme weather events

As a sub-tropical region South East Queensland is the subject of a number of extreme weather events, from floods to cyclones and bushfires. It is during these events that real-time, high quality information is key to saving both life and property.

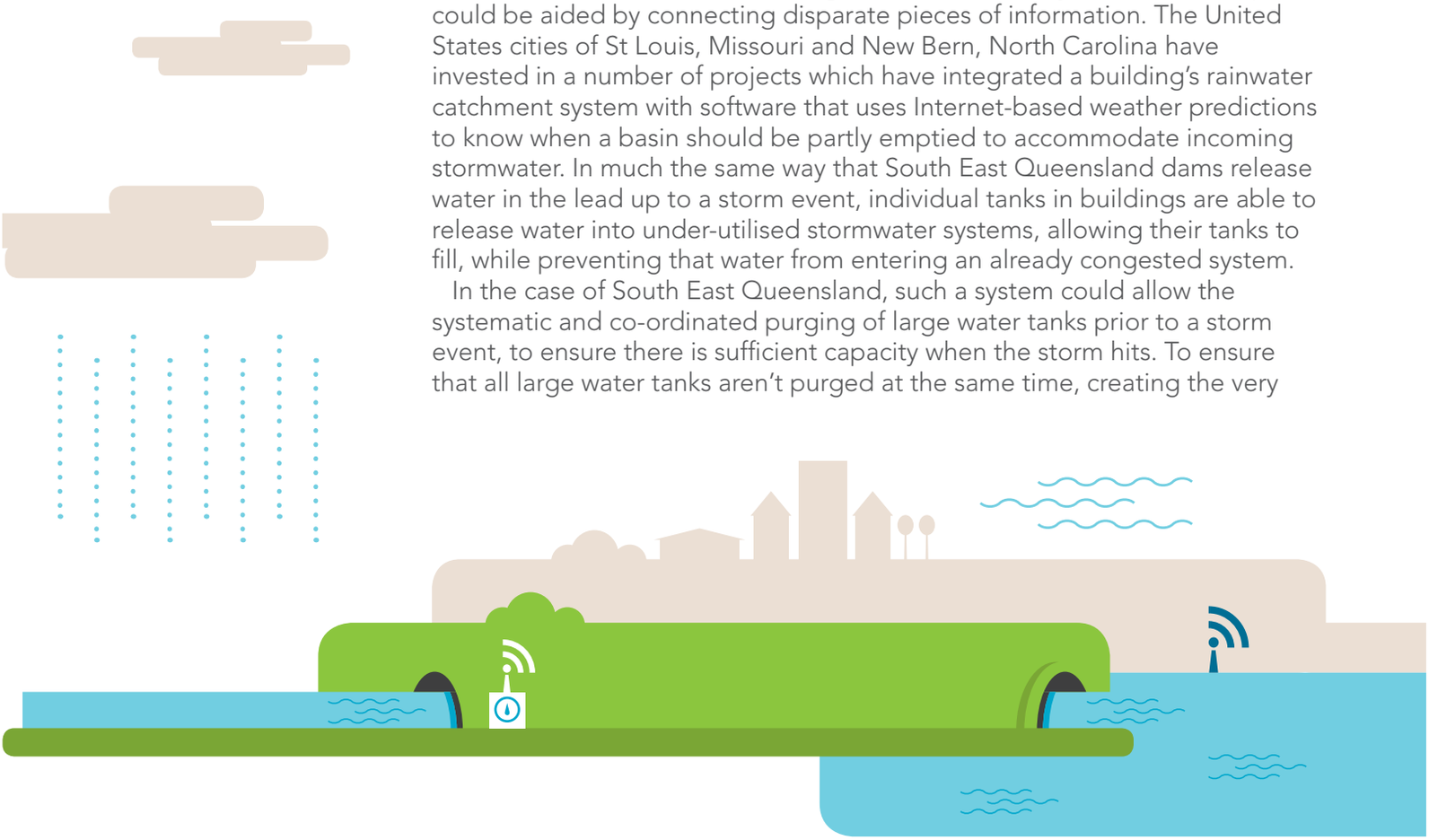
In the last decade alone, the region has been hit by two major floods, 2010-11 and 2012. The 2010-11 floods caused the evacuation of thousands, the death of 47 people and a significant financial disruption to the region with $2.38 billion in damages and an estimated $40 billion decrease in Australia's GDP.

The region has also more recently been hit by a supercell, centred on The Gap, causing approximately $500 million in damages and a recent system of thunderstorms bearing hail up to 8cm in diameter hit the Brisbane CBD, as well as parts of Logan and the Scenic Rim.

The Queensland Floods Commission of Inquiry, commissioned after the 2010-11 Floods and chaired by Commissioner Catherine Holmes, identified sewerage, stormwater, electrical infrastructure, telecommunications infrastructure and roads and rail as essential services during the 2010/2011 floods. Cities around the world have increasingly looked to smart solutions to optimise these systems during normal operations and add a layer of resiliency in the event of an emergency.

South East Queensland's sewerage and stormwater systems, for example, could be aided by connecting disparate pieces of information. The United States cities of St Louis, Missouri and New Bern, North Carolina have invested in a number of projects which have integrated a building's rainwater catchment system with software that uses Internet-based weather predictions to know when a basin should be partly emptied to accommodate incoming stormwater. In much the same way that South East Queensland dams release water in the lead up to a storm event, individual tanks in buildings are able to release water into under-utilised stormwater systems, allowing their tanks to fill, while preventing that water from entering an already congested system.

In the case of South East Queensland, such a system could allow the systematic and co-ordinated purging of large water tanks prior to a storm event, to ensure there is sufficient capacity when the storm hits. To ensure that all large water tanks aren't purged at the same time, creating the very



82% of respondents felt real-time data would provide an improved understanding of developments and changes across the stormwater system.

problem of overcapacity in the stormwater system and returning large amounts of stormwater to the Brisbane, Logan, Pine, Albert and other rivers, would require a number of sensors to be placed in the stormwater system as well as sensors in those rivers to ensure that the purging occurs in a staged and ordered way.

More than 70% of respondents across the South East felt that there were multiple benefits of using real-time data to plan purging of water storage across the storm water network to minimise downstream impacts. A number of Moreton Bay residents were particularly interested in this idea with one responder believing "this is MUCH NEEDED! Looking back on flooding events in the last few years, this would be an excellent method to try and predict and manage our water resources during these flooding events."

These sensors would also provide a large amount of real-time data on how a stormwater system reacts in a flooding emergency. This data can be used to better understand the limitations of the system, as well as pinpointing problems and mitigating them to ensure that damage is minimised in the event of a flood.

82% of respondents felt real-time data would provide an improved understanding of developments and changes across the stormwater system.

There was, however a concern that generating this data would only benefit communities if it was analysed and acted upon promptly. One Moreton Bay resident called for more information, "data should include (the) state of storm water drains to assist locals in knowing when to prepare to be flooded, as happened to family recently."

Like stormwater systems, a smart electricity grid could also assist in an emergency. For instance Florida Power & Light (FPL) has spent more than 20 years working on a distribution system that extends from the smart meter to a performance and diagnostic centre. That system collects and leverages detailed information on previous outages – from momentary disruptions to trees falling on power lines – to understand and anticipate what is wrong in a current situation, and to respond automatically to imminent or current outages.

With the connected sensors diagnosing and providing data on these essential infrastructure and services, it is vital to ensure a resilient telecommunications network underpins the sensors to maximise availability of data.

While these solutions would require an initial capital investment, the federal government's response to the Australian National Audit Office (ANAO) report into national recovery funding arrangements indicates the Commonwealth government is likely to fundamentally change the way they fund natural disaster recovery efforts. Instead of primarily providing funds to assist in recovery, the federal government will shift the balance towards funding pre-emptive projects to mitigate potential future damage.

This change may create a key opportunity for South East Queensland to invest in this type of mitigation technology prior to the next natural disaster event.

"It gives people a fighting chance."
– Scenic Rim resident

Current challenge

South East Queensland, as a major population centre in the sub-tropics, is particularly prone to natural disasters, whether they be flooding events, large destructive storms or bushfires. During those natural disasters some of the core underpinning services, including stormwater and electricity, can either underperform or stop working as a result of massive demand or a service interruption.

Potential 'Smart Region' outcome

A family in a low lying area of Ipswich receives some unwelcome news, after two weeks of steady rain, a major storm is on the way. The major water storage and flood mitigation dams have started to release some of their water holdings to make room for the storm water to come and major water tanks, in electronic communication with each other, the operators of the dams and after ensuring that the storm water system is able to handle more water have also began to release their tanks to ensure that they don't overflow during the storm and capture as much water as possible when the storm water system is under the most strain.

As a result of these measures the damage to property is mitigated and the stormwater system is not overloaded, causing localised flooding.

Customer outcomes

- Quicker responses to power outages
- More information to inform responses in an emergency situation

Business outcomes

- Reduced disruption of business during a disaster

Government outcomes

- Minimising downstream impacts through effective timing of purging
- Preventing emptying/purging when the storm water system is 'congested'
- Making water storage available for predicted rain events to minimise downstream impacts.
- A more efficient power grid

Emergency evacuations

"Any plan that increases the safety margin for persons affected by natural disasters and the emergency responders can only be a good thing."
– Gold Coast resident

The 2010-11 South East Queensland floods resulted in the forced evacuations of thousands of residents across the region.

National ICT Australia (NICTA) devised a system to ensure the most efficient, effective way for citizens who live in a particular area to evacuate.

The system, which has been trialled in the Hawkesbury/Nepean region in New South Wales, specifies which areas need to be evacuated and at what time, and when roads will be flooded in an emergency flood situation.

Key elements of this system is knowing where people are, the level of floodwaters at particular points, the rate at which stormwater and runoff is feeding the floodwaters and the points at which particular roads are likely to become impassable.

If all of this information was being delivered in real-time to an emergency evacuation centre, the NICTA system could identify the order in which people need to be evacuated to ensure those in most immediate need get priority assistance from emergency services.

Much of the South East, particularly in the Moreton Region, is relatively low lying and is therefore subject to localised flooding; such a system would be invaluable to save both life and property. In a poll of South East Queenslanders this potential solution was rated most highly, with 44% of respondents declaring this solution 'extremely important,' and identifying the possibility of improved pre-warnings, timely evacuations and more efficient evacuation procedures as key benefits, with each benefit selected by more than 80% of respondents.

A Gold Coast resident responded that "any plan which increases the safety margin for people affected by natural disasters and emergency responders can only be a good thing." A Moreton Bay resident said they thought it was a fantastic idea as they did not wish to see another Black Saturday disaster.

Current challenge

Evacuations are complex and difficult operations and often require emergency services personnel and volunteers to go door-to-door to ensure that the most vulnerable in our community have been given the assistance they need.

Potential 'Smart Region' outcome

SES volunteers are in the process of evacuating residents an area which is expected to be flooded between midnight and 2am, using an evidence based plan to prioritise those areas which are likely to be flooded before midnight and those with high numbers of vulnerable members of the community and working their way into areas which will flood later. In this way they are able to maximise their time and ensure that as many people possible are safe.

Customer outcomes

- More efficient evacuation procedures
- Timely evacuation of homes
- Government outcomes
- Improved pre-warning to residents about potential evacuations

Information to feed business

"It is vitally important that Queensland small businesses confidently utilise data to innovate and successfully exploit the global digital economy."
– Stephen Tait, CCIQ

Making some of the information generated by machines and sensors publicly available could assist businesses to grow, innovate and diversify.

According to Stephen Tait, CEO of the Chamber of Commerce and Industry Queensland (CCIQ), "informed decision making by small business through the availability of real time data is crucial to boosting productivity, connectivity and the economic well-being of our proud State." Further, McKinsey and Company estimate that these types of initiatives could unlock more than $US3 trillion of economic value through stimulation of innovation and improvements in decision making.

For instance, a company could decide the optimal placement for their facility based on how easy it is for their clients and staff to access it using public transport during peak hour. A business may also offer differential pricing for deliveries at particular times reflecting the increased cost of transporting their goods at peak congestion times.

Stephen Tait agrees with this approach: "it is vitally important that Queensland businesses have the capability to access data to better take advantage of new and emerging opportunities both domestically and in global supply chains."

As well as allowing traditional businesses to operate more effectively there is also the ability for start-up businesses to benefit, with the McKinsey report predicting the formation of a new industry around crafting and personalising insights drawn from these data sources.

Current challenge

South East Queensland businesses are increasingly competing with businesses around the world. This will require businesses to decrease the cost of producing their goods and services, find and define new niches and to efficiently get their products to market.

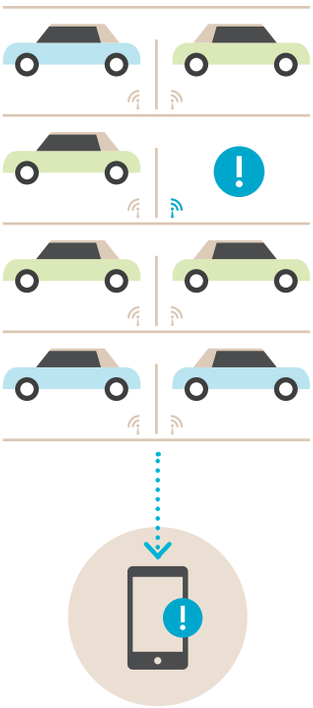
Potential 'Smart Region' outcome

A Scenic Rim based family has been discussing the next step in growing their business. Rather than just relying on intuition or talking to their customers and suppliers they are also able to rely on targeted, relevant and timely information from a variety of sources in plotting their expansion, and invest resources in areas which have maximum potential returns.

Business outcomes

– Timely relevant information on which business decisions can be based

Enabling better access to business centres



Problems with parking in high trafficked areas are well articulated by the Deputy Mayor of Brisbane, Cr Adrian Schrinner:

International studies indicate that up to 30% of traffic congestion in business districts is caused by motorists circulating streets looking for parking. In other words, overstaying the limit by 10 minutes will force another motorist to cruise the block for a further 10 minutes, adding to congestion, burning extra fuel and generating considerable frustration. And that's not all. The nearby small businesses that rely on regular turnover of parking spaces also suffer the opportunity cost of lost business every time a motorist overstays. This so-called "victimless crime" of "overstaying" is not only adding to congestion, CO2 emissions and road rage, it is also hurting small businesses. – Deputy Mayor Adrian Schrinner (August 5, 2014)

Trevor Evans, CEO of the National Retailers Association agrees, "The disadvantage with CBDs, and Brisbane is no different, is that there are higher costs or difficulties in terms of access."

While respondents were quite supportive of smart solutions to parking in heavily trafficked areas, there was an underlying concern that this could be seen as a revenue generating activity, allowing Councils to know when and where to fine someone.

With that possibility mitigated, respondents believed it would be beneficial and would make it quicker to find a park (78%), making it easier to find alternative parking (68%) and would reduce the number of vehicles searching for parking (67%).

This problem has been approached in a number of ways by different cities and regions around the world, including the introduction of an application called Mobypark by the city of Amsterdam. Mobypark acts as a part of the sharing economy with unused carparks being offered for rent and reservation on the one platform. Those excess carparks, whether they are owned by council, a hospital, a parking company, or an individual are all available to reserve through the one application.

Other solutions rely on the interaction between sensors and smartphone applications to determine where empty carparks are, or are likely to be, at the point where a driver will require them and give a parking inspector a real-time view of where cars have been occupying parks for longer than they are allowed. Such a system would also allow flexible and responsive pricing with the price of carparks rising when there is excess demand and falling when demand abates.

A Somerset resident said it would be "great to go straight to a park that you have previously booked… [it would cause] less stress about worrying where you will find a park." Trevor Evans, CEO of the National Retailers Association agrees that this solution is valid, stating "that type of technology will really drive ease and convenience."

These problems with parking are not only apparent in Brisbane's CBD; across the region in cities, towns and even villages there are localised problems with parking management.

"There needs to be more creative ways to handle traffic so that those who need to drive and park are able to."
– Brisbane resident

Current challenge

The lack of information about the availability of car parks in heavily trafficked areas causes commuters to spend time searching for a park, increased pollution, consumer frustration and businesses in those areas to potentially loose trade.

Potential 'Smart Region' outcome

A Raby Bay resident is travelling to the Brisbane CBD for lunch with friends. Before leaving he is able to determine the cheapest and most efficient way to get to Eagle Street Pier from Raby Bay that day is to drive to the end of Kangaroo Point and park in a carpark, taking a ferry across the river from the Holman Street ferry stop to Eagle Street Pier rather than driving directly into the city and finding a carpark there. As he approaches Kangaroo Point he is directed to a vacant carpark and advised that the next ferry is two minutes away.

Customer outcomes

- Making it quicker for drivers to find a space
- Enabling drivers to seek alternative parking if street parking is unavailable
- Reducing the number of vehicles circulating city streets searching for parking.

Government outcomes

- Less congestion in heavily trafficked areas
- Business benefits
- Businesses in heavily trafficked areas could see an increase in their trade as it becomes easier to get to their business.

Better logistics, getting goods to market

According to SEQ Catchments, rural areas make up about 1.9 million hectares or 85% of South East Queensland. Some 51% of the land area is used by graziers, while horticulture and intensive animal production use a further 8%. Toowoomba Regional Council, Scenic Rim, Somerset and parts of all other councils are similarly recognised as key primary production areas. The Lockyer Valley has been described as one of the top 10 fertile land areas in the world, and is known as Australia's "salad bowl", generating $250 million for the South East Queensland economy.

Various parts of the South East, however, have a path to market which includes a number of roads and bridges subject to seasonal and localised flooding.

In cases of flood where water covers the road, closures are necessary until the water has receded. Once the flood water retreats, the Department of Transport and Main Roads inspects affected roads, bridges and culverts to make sure they are safe before being re-opened to traffic and certifying that the bridges in particular can take loads of various sizes.

As a result of a flood event, where supply lines from agricultural regions are necessarily interrupted due to water over the road, there is often a lag before the supply line can recommence. Many respondents acknowledged the problem including a Brisbane resident who has family in agribusiness, "transport is a serious issue and risk. It's important to maintain safe transportation options."

By using smart bridges equipped with sensors measuring the structural integrity of bridges which have been underwater the necessity to physically inspect all bridges would be reduced. These bridges are already in place in Greece, South Korea, the United Kingdom and the United States. By placing those on bridges occasionally affected by floodwater, engineers may be able to re-open vital supply lines sooner and provide an extra layer of resilience to the supply chain.

80% of people surveyed across the South East saw that this measure was either extremely important or somewhat important. 73% saw that it would enable drivers to seek alternate routes, while a majority saw that it would enable back up planning, would enable roads to reopen quickly and would allow a faster response to road closures.

A resident of the Lockyer Valley believed this technology "could be of benefit in minor situations, but in major events roads and bridges still need to be inspected by a qualified human."

In addition, adding sensors on roadways prone to flooding, a team of engineers would have a much better understanding of the likely down-stream effects of localised flooding and would be able to pinpoint the areas which are in need of raising to ensure the supply line is not unnecessarily cut.

By providing all of the information on road closures in real-time to both drivers and those involved in the supply chain logistics, people would be able to make the smartest decision on how to manage the supply chain challenges.

"Can help to alleviate extra costs involved when roads are damaged for primary producers getting product to markets."
– Somerset resident

The identification of strategic priority routes, for instance the routes most likely to service food, medicine, evacuations and emergency services assistance, would allow the smallest number of sensors with the largest impact.

South East Queenslanders appear quite interested in the sensors automatically informing relevant people that a bridge or roadway is impassable and trust sensors to advise officers in minor flooding situations.

Current challenge

Primary producers across the region need to get their fresh fruit, vegetables and cattle to market as quickly and as cheaply as possible, it isn't always possible when there is flooding over vital supply lines.

Potential 'Smart Region' outcome

A family based market gardening business located near Mount Sylvia needs to get their lettuces to their customer to fulfil a contract. Unfortunately a low level flood on Tenthill Creek has covered the road on either side of their property. Rather than closing off the road and compromising the quality of the produce while the inspector ensures that the bridge is structurally sound, an engineer is able to remotely examine the stress the bridges have been under as a result of being submerged and determined that the bridge on the way to Gatton was not affected and can re-open while the bridge closer to Woodbine will require an engineer to inspect it prior to opening.

Customer outcomes

- Reopening priority roads and bridges for agribusiness food supply following a disaster
- Ensuing delivery for fresh foods
- Allowing flooded communities to receive goods and services quicker.

Business outcomes

- Agribusinesses and those in their supply chain will have greater certainty over their business

Local Government Authorities

Local governments across South East Queensland are facing dual issues of rising expenditure and declining revenues. Those councils are under pressure to maintain service levels and assets, and invest in community infrastructure while operating on restricted budgets.

Increases to the cost of delivering core responsibilities like road maintenance have added financial pressure to councils' budgets while major disasters have not only impacted on the bottom line, but also limited a number of councils' ability to maintain and improve their asset base. These problems have come at the same time as the stagnation of rates revenue and a decline in state and federal government funding of local governments as a result of structural problems with their own budgets.

Ruling out a significant rise in rates or sharply decreasing the services councils provide to their communities results in only one solution: increasing the efficiency and productivity of councils. This solution has the benefit of allowing councils to better their bottom line, without negatively impacting their residents.

Smart and innovative solutions must be explored by councils to create future prosperity for South East Queensland and enable sustainable living in the region's cities. Cities across the globe are implementing smart solutions to help them overcome regional challenges and maintain economic sustainability.

Smart initiatives have the potential to provide South East Queensland councils with outcomes that contribute to the economic sustainability of the region including reduced costs, improved productivity, targeted services, predictive maintenance and capturing lost revenue.

Many Smart Cities around the world are already realising the benefits of these innovative solutions.

The City of Santander in Spain has reduced waste management costs by 20% through the implementation of sensors in rubbish bins that alert the council when bins are full.

Waste management

The City of Santander in Spain has reduced waste management costs by 20% through the implementation of sensors in rubbish bins that alert the council when bins are full. This enables targeted waste collection that optimises the use of council's resources, reduces traffic congestion and vehicle emissions by eliminating unnecessary trips to rubbish receptacles. It also increases the productivity of council resources as more waste can be collected in a reduced amount of time as collectors do not have to check receptacles for fullness.

To reflect the realities of South East Queensland weather, an additional sensor identifying odour could also be added to ensure that council collects a bin before it is full and before it starts to smell.

Surveyed residents were also quite supportive of the idea with some residents suggesting that it would result in fewer vermin, a decline in scavenger birds, like ibis, and fewer unnecessary trips taken.

However, there was a concern that public bins may be on an optimised schedule and being reactive to the fullness of the bins may be less efficient.

A Logan resident also believed that "more bins are needed… there are hardly any bins in areas that need them the most." The resident suggested the fullness of the bins could allow council to determine where the best placement of new bins.

City of Eindhoven has saved 57% in energy costs, also reducing carbon dioxide levels by 3.5 tonnes by installing sensors that turn lights on and off depending on street traffic.

Smart lighting

Through the implementation of smart lighting, the City of Eindhoven in The Netherlands has saved 57% in energy costs, also reducing carbon dioxide levels by 3.5 tonnes by installing sensors that turn lights on and off depending on street traffic, with no safety implications.

This smart lighting solution involves the fitting of sensors to existing street lighting infrastructure to detect movement of cars, bikes and pedestrians. The sensors are used to detect the street usage and can be automatically dimmed or turned off and on depending on whether they are being used.

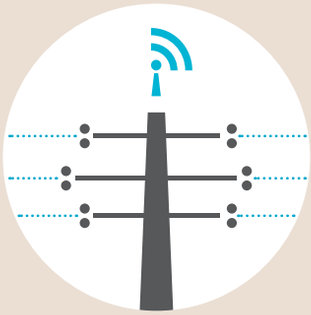
Councils that have implemented smart lighting initiatives experience significant savings on energy costs compared to regular street lights, though the up-front cost is more.

While 59% of people surveyed believed this idea was important or somewhat important there were a number of recurring concerns. Residents worried that the lights may have a limited scope, with only a small area lit up. One resident, for instance, would support the move if "the range was wide enough that I'd be able to see the whole street…otherwise I wouldn't feel safe."

Other South East Queenslanders surveyed had concerns about the amenity of people who lived in suburban streets, with lights at different levels of brightness.

If the lights were targeted to areas where it's unlikely that they would affect the liveability of homes, such as on main roads, and were timed to allow a person to see a long distance ahead this idea seems to have quite broad support.

A Brisbane resident has suggested the trialling of the lights in an area prior to a wide adoption.



This Hunter Region initiative enabled savings of up to $360 a year to be passed on to consumers.

Smart power

Smart power or smart grid initiatives match energy supply with demand through the use of broadband powerline technology to transmit consumption and supply data. Energy supplies can then be adjusted so it is consumed where and when it is available. The supply and consumption data can help lower the cost to the consumer as it maximises variable tariffs.

While some saw this as an opportunity to react more to manage electricity loads and making more use of the available resources, there was a concern that the information could be used to increase the cost of power at a time when people are unavoidably using more coupled with a concern that any savings would be kept by electricity retailers, rather than passed on to consumers.

It seems that there is quite broad support for voluntary metering, with one Moreton Bay resident saying that they "would love to have more information on their production and usage and which devices are using more and when."

If South East Queenslanders decided to take up smart power metering there could be significant savings to the household budget.

A broad trial of smart grid technologies in the Hunter Region of New South Wales, for instance, has shown that a possible $28 billion in economic benefits could flow to Australia over the next 20 years. The Smart Grid Smart City project ran trials of a range of 'smart' technologies for households and with electricity suppliers. More than 17,000 houses monitored energy use with smart meters and other technology to test usage patterns and enable greater energy efficiency. Analysis of the project showed that smart grid technologies could save consumers hundreds of dollars a year through reduced energy usage.

The City of San Francisco has reduced its water usage to almost 50% that of other Californian cities through the implementation of smart water meters and an online portal that provides real-time water usage data to consumers.

Smart water meters

Smart water meters transmit real-time water usage information to utilities and consumers who can then proactively manage their water usage. This initiative enables consumers to take control of their water use by monitoring real-time water usage online. It also enables utility providers to quickly detect leaks where unusual water usage activities occur and automates the water meter reading process.

Of the identified benefits, South East Queensland residents were particularly interested in the benefits of faster detection of leaks and water cost savings for users. 69% of respondents were very supportive of the installation of smart water meters. Some renters were particularly interested saying that while they don't pay water bills, they "definitely want to know if there's a leak or some other issue so that (their) landlords aren't unduly charged.

An Ipswich resident echoed the sentiment in saying "at the moment your water usage data is about three months behind-you can't remember what you were doing and therefore you can't change what you're doing to improve water storage."

The City of San Francisco has identified similar problems and is currently using smart water metering to curb water usage through the implementation of a public web portal which allows customers to view their daily water usage and abnormal water usage alerts. The alerts enable the utilities provider to quickly catch abnormal usage levels, with high water use patterns lasting three days prompting the water utility to make a phone call and send out a postcard to inform the water customer about the potential leak.

A Brisbane resident had "a major leak under the house and wasn't aware of it until three months later by Queensland Urban Utilities… It's our most precious resource so monitoring usage would be very handy."

Freeing up funds to spend on tourism and other productive and social infrastructure

"There is only so much disposable income people have and it's being eroded away each week by increasing fees on everything."
– Brisbane resident

While funds remain tight, councils cannot spend funds on discretionary matters, such as upgrading a park or playground, promoting their region nationally or internationally or updating a public place.

By embracing smarter solutions and reducing the cost of providing core services to ratepayers, councils will be able to undertake these types of projects while keeping rates at their current level or even reducing them.

This could allow a South East council to provide an economic development plan for an underdeveloped area or a suburb in need of renewal, encourage business growth, target unemployment or introduce a new tourism plan without the need for a bed tax.

Current challenge

Councils, Governments and South East Queenslanders have limited funds and resources to do everything they need to do.

Potential 'Smart Region' outcome

A Caloundra family which owns a roofing company is concerned about making ends meet after a series of wet weeks that have resulted in a number of jobs being cancelled. Their rates, water and electricity bills are all due in the next three weeks. As a result of the efficient collection of bins and smart lighting on main roads their rates are lower this year. A few months ago they began monitoring their electricity usage on a smart phone application and have discovered that an old beer fridge they barely use is chewing through electricity. Having turned it off, their electricity bill is much lower than it was last quarter. A few weeks ago a water pipe burst at their house, and the family was alerted by their water provider within a day of excessive water use. As a result their water bill was the same as last quarter.

Customer outcomes

- A decline in the cost of living
- Potential declines in rates for the community
- Government outcomes
- A decline in carbon dioxide emissions
- The saving of water

Conclusion

A shared vision for a smarter region will change the way we live and the attractiveness of the entire South East for generations.

For councils it is about investing in technology that will create efficiencies and reduce waste, for business it is about opportunities to broaden the economy, and for the public it is about using technology to improve their lifestyle.

There is broad and deep support from business owners and residents of the South East for the implementation of these changes with no potential uses of real-time data that were perceived to have overall little or no value. The initiative with the least value of importance overall – efficient public bin waste management – was still perceived as having at least some level of importance by 92% of respondents.

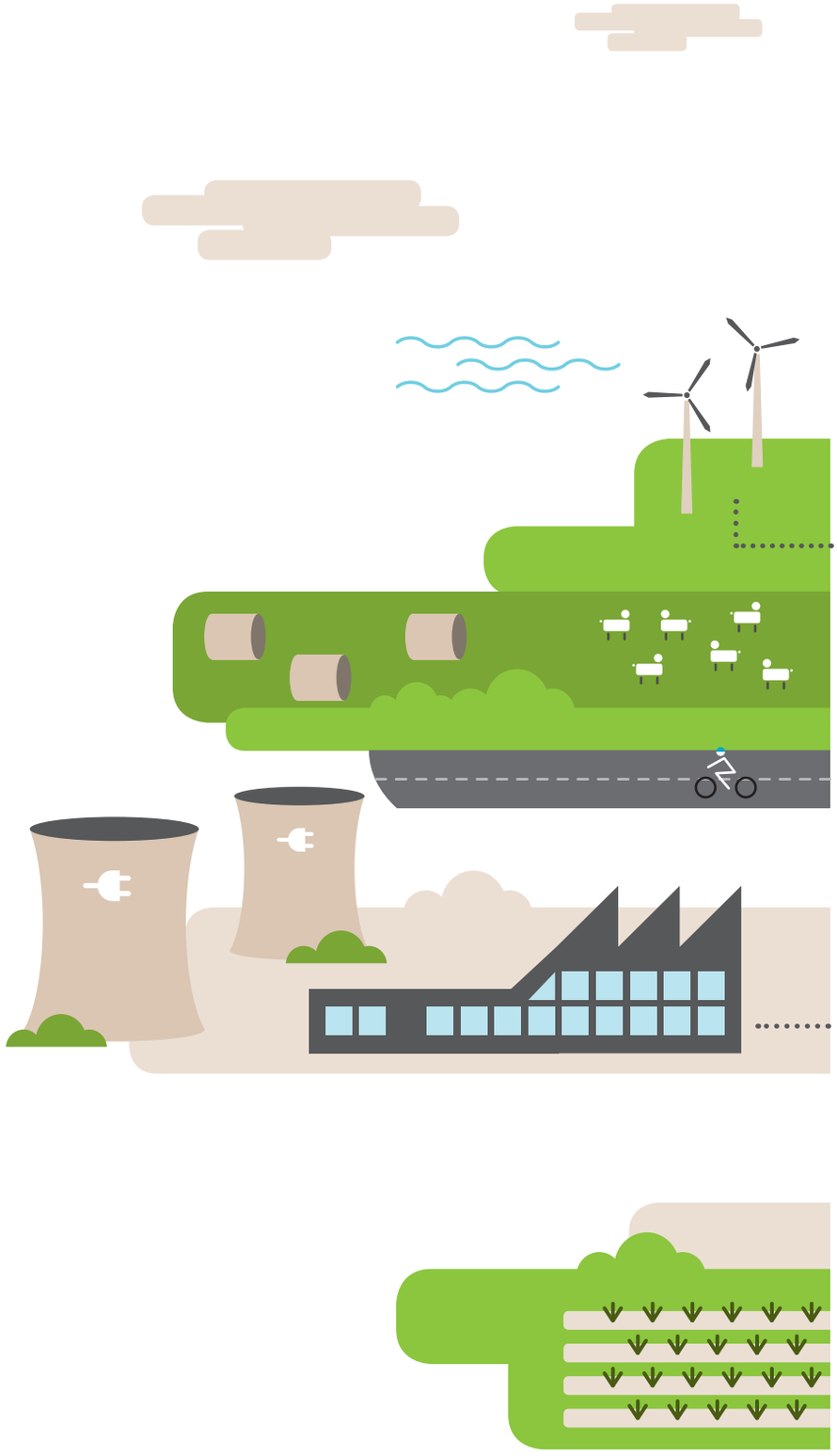
These results suggest that South East Queensland residents generally understand and welcome the benefits that the use of data can bring to communities in the region.

General themes emerging from individual comments were focused on how the initiatives could benefit their communities in the future and were quite insistent that councils needed to be prepared to invest now for long-term future benefit.

They were however concerned about the cost of the measures and would like to ensure that they constitute good value for money and have some reservation that data could be used 'against' residents by suppliers and councils (for example CBD parking data could be used to increase the number of fines and utility suppliers may seek to charge more based on peak loads).

In specific circumstances residents were concerned about the flow-on effects of some measures, with concern that using data to determine when bins are emptied could be less efficient and unease that smart lighting enabled by sensors may not be appropriate in suburban streets due to the loss of amenity associated with occasional bright lights.

If these concerns are remedied and the measures are backed by solid business cases with a focus on the outcomes for residents of the South East, the business community, community groups and residents are extremely supportive of a plan to create Australia's first smart region.



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