

USING GEO-DEMOGRAPHIC SEGMENTATION TO ENCOURAGE A CUSTOMER CENTRIC FOCUS IN SERVICE DELIVERY

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ABSTRACT

The purpose of this paper is to discuss the implementation of geo-demographic customer segmentation within a government registration and licensing business. The discussion will focus on the approach, benefits and challenges of adopting customer segmentation within a public sector context. It will also present key findings of the segmentation model, along with future applications.

The Queensland Government's Department of Transport and Main Roads (TMR) has utilised customer segmentation to better understand its customer base and manage customer expectations regarding service delivery. Customer segmentation has been used in a government environment to contribute to objectives which focus on cost-effective service delivery and the provision of accessible and efficient customer services.

Through this analysis, the Department gained a deeper understanding of customer channel usage, identifying customers with the highest propensity to transition to electronic channels and the barriers which needed to be overcome in order to encourage customers to transact online with government agencies. Analysis has provided input into the development and evaluation of policies along with the development of targeted marketing strategies to specific customer segments. Additionally, exploring attitudes and values towards a range of topics allowed the Department to identify and improve service delivery channels to better meet customer expectations.

1. INTRODUCTION

1.1. Citizen Centric Service Delivery

In an environment with decreasing financial resources, it is critical that the public sector reassess its capability to respond to the ever increasing demand for delivery of government services. By developing an in-depth understanding of how citizens want to interact with government agencies, services and channels can be developed that best meet customer needs.

Queensland is the fastest growing state in Australia, with over 1500 people moving to the state per week, 1000 in the south east part of the state alone. This increase in population poses challenges for the Queensland Government, particularly TMR, in ensuring that citizens have appropriate access to products and services, and that these are delivered in a cost-effective and efficient manner. Understanding customers, their motivations and behaviour patterns in interacting with government will ensure that funds are spent effectively in areas of value, and that services are relevant and easy to use. Citizen centric service delivery is about designing and delivering services based on the needs and delivery preferences of citizens, rather than the structure and processes of individual agencies.

1.2. Geo-demographic Segmentation

To better understand the needs of its customer base, TMR has utilised geo-demographic segmentation to segment its customer base into distinct groups. Geo-demographic segmentation is a multivariate statistical classification technique for discovering whether the individuals of a population fall into different groups by making quantitative comparisons of multiple characteristics, with the assumption that the differences within any group should be less than the differences between groups. More simply put, it is the classification of small areas using a range of socio-economic data, such as demography, lifestyle and consumer behaviour. The basic premise of geo-demographic segmentation is that people tend to gravitate towards communities with other people of similar backgrounds, interests, and means.

1.3. Geo-demographic Segmentation within TMR

The initial need for customer segmentation arose through the introduction of online transactional services. The department had launched a range of vehicle registration and driver licensing services via the internet that had achieved strong customer migration in the first instance. After several years the take up of these services began to plateau and the department was keen to maximise the return on investment for developing these tools.

TMR has conventionally used traditional demographic measures such as age, gender, income or geographic measures (that is, city, suburb, region) to analyse and explain customer behaviour. Over time, it became apparent that these measures were not sufficient to explain significant variations in customer behaviour across channels. It was hoped that overlaying geo-demographic segments onto existing data sources would provide far more meaningful customer insights than had been previously possible.

The decision was taken to licence an existing third party geo-demographic classification system. Whilst the Department had a rich variety of data sources available with which to develop its own custom segmentation, there was neither the time nor the expertise available within the Department to develop a comprehensive segmentation system. The segmentation tool provided classified each address in Australia into 11 distinct categories.

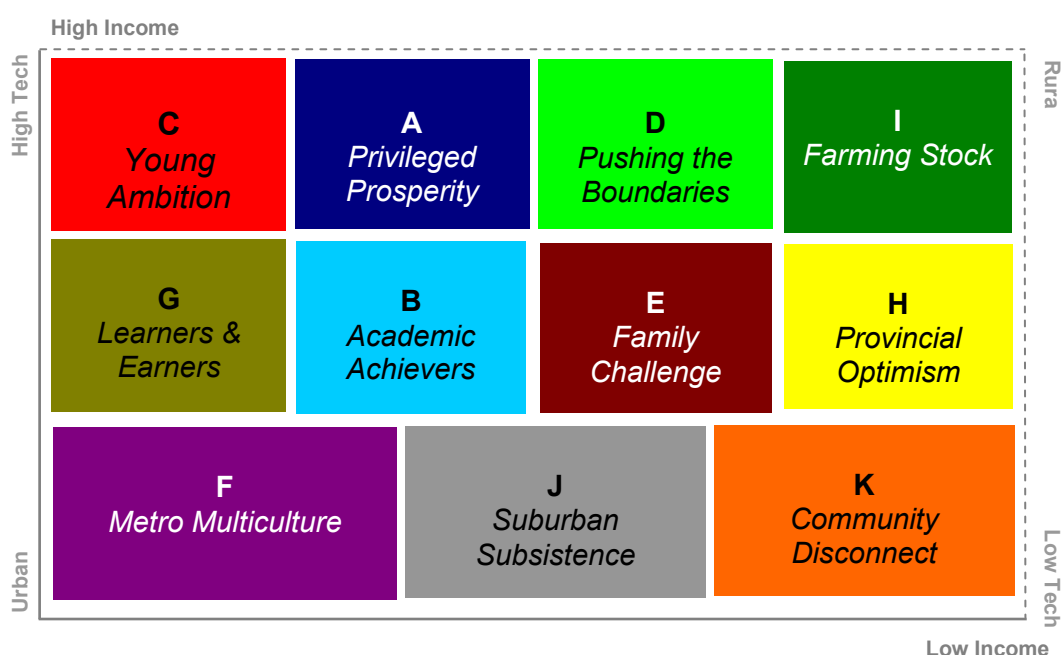










Figure 1 – Segment profiles

Figure 1 shows each of the geo-demographic segments illustrating the level of affluence they represent, their level of comfort with technology and whether they reflect more urban or rural dwellings. Table 1 highlights the segment profiles of these groups and types.

Table 1 – Customer segments utilised by TMR

Group	Description
<p> A</p>	<p><i>Privileged Prosperity: The most affluent families in the most desirable locations</i></p> <ul style="list-style-type: none"> • The wealthiest households in Australia • Various cultural backgrounds including Europe and Asia • Educated professional or managerial couples raising mature families • Most desirable suburbs in metropolitan and regional Australia • Houses are owned or being purchased • Incomes above \$160,000 per annum • The highest spending power of all groups • Active lifestyles and keen users of technology
<p> B</p>	<p><i>Academic Achievers: Wealthy areas of educated professional households</i></p> <ul style="list-style-type: none"> • Middle-aged, professional families with preschool and university-aged children • Successful professionals employed in finance, health and education • Located in family suburbs, with an over-representation of townhouses and terraces • Highest ranking neighbourhoods of people with Jewish backgrounds • High property prices regularly exceeding \$1m • Household incomes greater than \$130,000 per annum • Substantial home loan and rental payments and low credit risk • Enthusiasts of cultural and sporting events, food, wine and national newspapers
<p> C</p>	<p><i>Young Ambition: Educated and high-earning young singles and sharers in inner city suburbs</i></p> <ul style="list-style-type: none"> • Mainly singles, couples and sharers, aged 20-34 • 40 percent born outside Australia, often in Asia and Britain • Highly educated professionals and managers • Multi-dwelling units in the inner city attracting above average prices • Over 50 percent of properties are privately rented • High earnings are increased by shares and interest from savings • High rents and home loan repayments • Exercising, going out and technology are common interests
<p> D</p>	<p><i>Pushing the Boundaries: Young families living in recent developments on the fringes of major cities</i></p> <ul style="list-style-type: none"> • Young families with children attending preschool or primary school • Employed in blue-collar, clerical or administration roles in infrastructure and manufacturing • Located in fringe metropolitan suburbs on recently developed estates • Includes mining communities in very remote locations • 90 percent of properties are medium to large separate houses • Most likely Group to be purchasing their home • High-earning households in affordable housing with above average disposable incomes • Family focussed households whose activities revolve around the children

Group	Description
 E	<p><i>Family Challenge: Mixed family forms with stretched budgets in outer suburbs</i></p> <ul style="list-style-type: none"> • Family households with school age children • Largely monocultural, although people from Britain are relatively common • Blue-collar employment in the construction and manufacturing industries • Homes are medium-sized properties in the outer suburbs • Low-priced housing that is being purchased • Average household incomes and housing costs • The highest credit risk of all groups • Entertainment is home based, although gambling is popular
 F	<p><i>Metro Multiculture: Medium to high density areas with much cultural diversity</i></p> <ul style="list-style-type: none"> • Multi-cultural neighbourhoods of large extended families with non-dependent children • Long-term residents often working in the manufacturing and infrastructure industries • Represents the highest concentration of Catholic, Buddhist and Islamic communities • High-density metropolitan neighbourhoods located conveniently close to most facilities • Average priced separate homes, predominantly fully owned or being purchased • Housing stress and credit risk is below average • Rents and home loan repayments are above average • Highest local and community newspaper readership and gambling spend
 G	<p><i>Learners & Earners: Students and professionals living in high-density, lower cost suburbs</i></p> <ul style="list-style-type: none"> • Culturally diverse mix of young singles and homesharers aged 20-34 • Over a third of all students are attending university or TAFE • Educated professionals working in the finance, leisure, or technical industries • Apartments in the inner city and suburban centres • Least likely Group to own a vehicle • Students have little income, but workers earn an average wage • Rental values are around average, although home loans are high • Busy social lives, interest in world affairs and technology
 H	<p><i>Provincial Optimism: Anglo-Australian blue-collar families in provincial settlements</i></p> <ul style="list-style-type: none"> • Varied age and family profile with many school-age children • Majority of residents are Australian born • Employment in low skilled labouring, technical, or administrative roles • Prevalent in outer metropolitan suburbs, provincial towns and very remote areas • Low density separate housing surrounded by farmland and bush • Below average incomes and low housing costs • Low spend on health, education, eating out and credit • Very practical and family-oriented communities with traditional values

Group	Description
■ I	<p><i>Farming Stock: Rural landowners and workers in agricultural heartlands</i></p> <ul style="list-style-type: none"> Established Anglo-Australian families with parents aged 45-65 Employed in agriculture, many on their own farms Qualifications are low Neighbourhoods are in regional and remote locations Households are low priced detached houses Incomes are well below average Low housing repayments and rental expense Gardening, fishing and reading newspapers are common pastimes
■ J	<p><i>Suburban Subsistence: Low income, low-spending households in major regional/outer metro areas</i></p> <ul style="list-style-type: none"> Single adults and parents with a strong representation of older retirees High incidence of divorced, separated or widowed residents High unemployment and low qualifications Close to the coast in outer metropolitan and major regional suburbs Renters living in small blocks of units and aged care facilities Low incomes and rental costs and many experience housing stress Low disposable incomes limit discretionary spend Heavy commercial TV viewers and regular readers of regional newspapers
■ K	<p><i>Community Disconnect: Older blue-collar workers and retirees in country and coastal locations</i></p> <ul style="list-style-type: none"> Step families and singles with a high proportion of over 65s Long term Anglo-Australian residents Highest proportion of unemployed people and labourers Urban pockets and small town Australia, remote from major facilities Lowest access to the internet and relatively low car ownership Highest level of state rental, although most fully own their homes Low income earners with the lowest rent and loan repayments Household spending is limited to essentials

As can be seen in the table above, the segment profiles are significantly different. These segments not only provide an overview of demographic characteristics, but also provide a strong foundation for understanding customer values and attitudes.

2. DEVELOPING SERVICE PROFILES FOR TMR CUSTOMERS

The segmentation profiles were firstly applied to the vehicle registration and driver licensing customer base for the state of Queensland. Approximately four (4) million records were processed with the resulting segmentation shown in Table 2.

Table 2 – Segment profile for Queensland vehicle registration and licensing customers

Customer Segment	TMR Customer Base %	Queensland %	Pen %	Index
A – Privileged Prosperity	7.28	6.43	1.13	113
B – Academic Achievers	6.66	6.04	1.10	110
C – Young Ambition	3.51	2.93	1.20	120
D – Pushing the Boundaries	7.34	7.61	0.96	96

<i>Customer Segment</i>	<i>TMR Customer Base %</i>	<i>Queensland %</i>	<i>Pen %</i>	<i>Index</i>
E – Family Challenge	23.11	21.47	1.08	108
F – Metro Multiculture	1.37	1.20	1.15	115
G – Learners & Earners	5.74	4.85	1.18	118
H – Provincial Optimism	12.97	13.00	1.00	100
I – Farming Stock	7.72	12.46	0.62	62
J – Suburban Subsistence	14.17	13.80	1.03	103
K – Community Disconnect	10.12	10.20	0.99	99

The TMR segment profiles are compared to the expected profile of the Queensland population. The resultant index is greater than 100 if proportion of a segment within the TMR customer base is greater than the general population. Similarly, an index score of less than 100 indicates that a particular segment is underrepresented in the TMR customer base. Figure 2 shows that Group I (Farming Stock) are underrepresented with respect to take up of vehicle registration and driver licensing. This initial finding was consistent with past research which had identified high levels of unlicensed and unregistered driving in rural communities. All other segments are generally in the same proportions to the population of Queensland. The segmentation was then applied to a range of data sets within the Department to understand customer demand and preference for products and services.

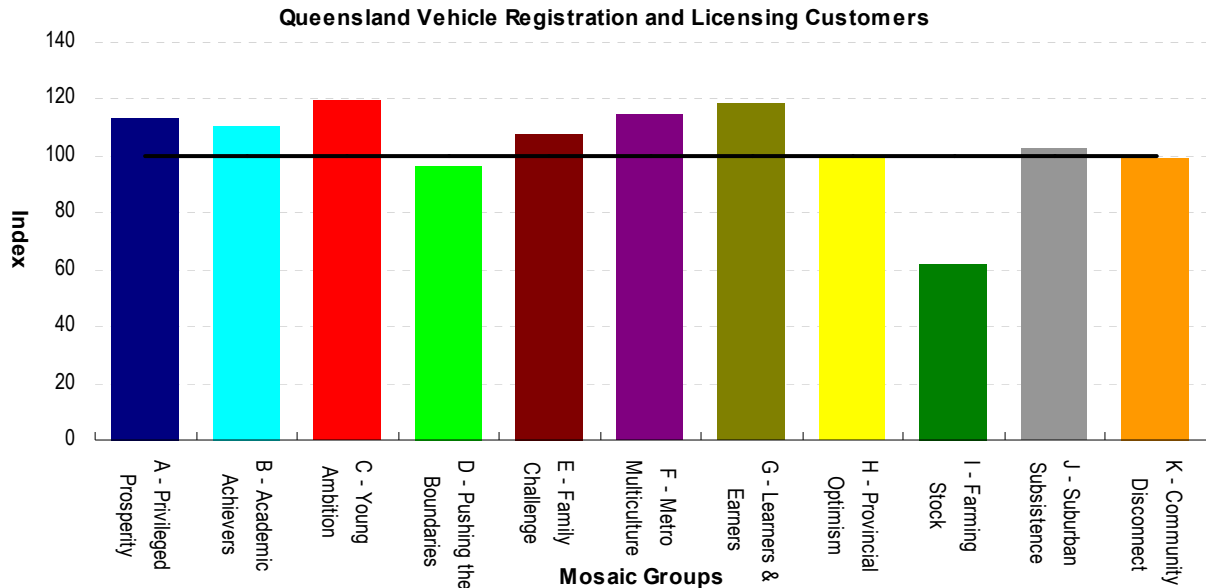


Figure 2 – Segmentation of Queensland vehicle registration and licensing customers

3. APPLICATION IN A ROADS AGENCY

3.1 Customer Channel Usage

The first application of geo-demographic segmentation was to understand customer transactional behaviour across various service delivery channels. The Department’s initial objective was to gain an in depth understanding of the take-up of electronic delivery

channels (that is, internet and phone). With only limited resources, the need to better direct funding toward initiatives that would deliver the biggest impact was a major challenge. The object was to understand whether to direct resources toward awareness and marketing campaigns to drive online take-up, develop new online services or enhance and improve the existing services available online. The results of this analysis would then form the basis of the Department’s Electronic Service Delivery strategy which would set business direction for the next three (3) to five (5) years.

Analysis of profiles showed a trend toward more affluent customers utilising online channels when available. Rural communities and lower socio-economic groups were significantly underrepresented as illustrated in Figure 3 and Figure 4 below. Groups characterised by higher affluence led the take-up of online services such as driver licence renewal and change of address indicating greater access to the internet, an acceptance of technology and comfort with providing credit card details online.

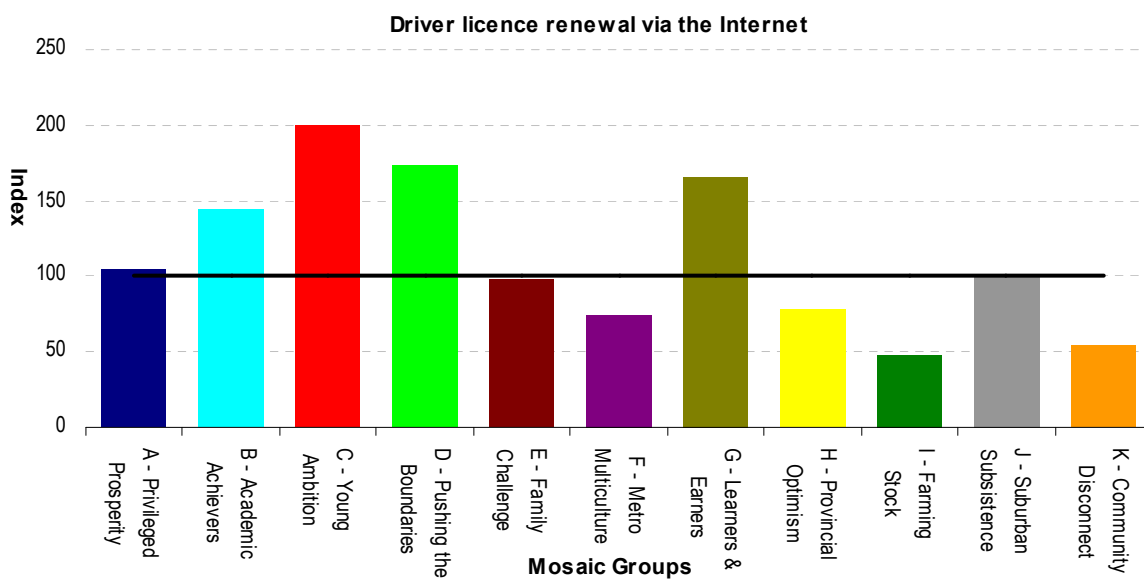


Figure 3 – Segmentation of driver licence renewal transaction via the Internet

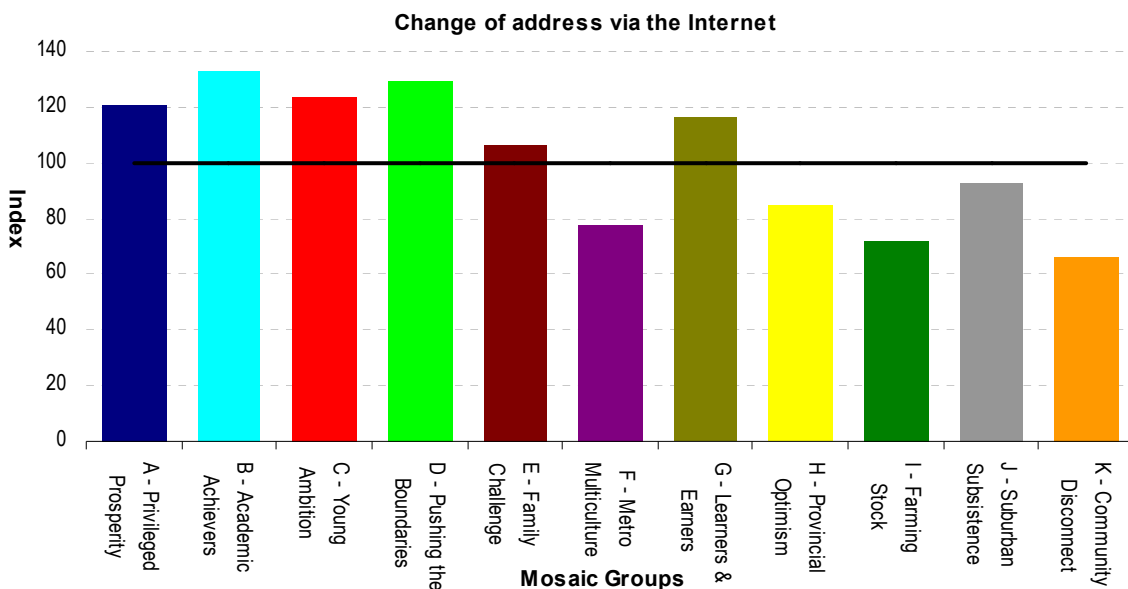


Figure 4 – Segmentation of change of address transaction via the Internet

In order to transition customers to online services, the use of payment options were analysed to identify those customers who preferred to pay by cash. As illustrated in Figure 5, groups closer to the lower socio-economic scale carry a preference for the use of cash to pay for products and services. Profiles for these groups indicate that this may be attributed to below average incomes, housing stress and high credit risk causing the need for budgeting. A customer's preference for cash also denotes a preference towards face to face service delivery options as these are the only channels where cash is accepted as a form of payment.

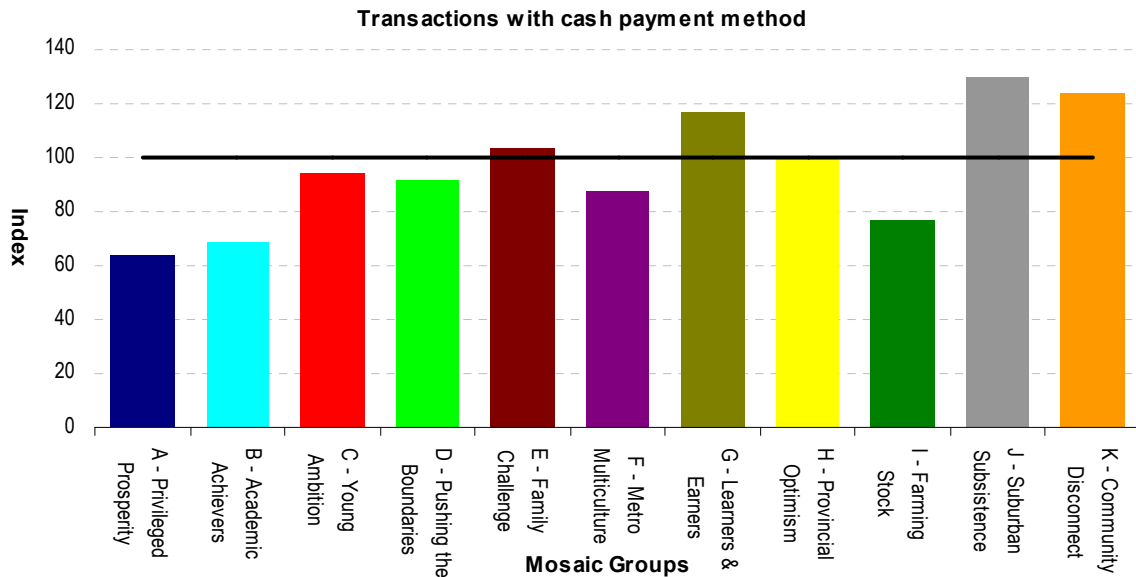


Figure 5 – Profile of customers who transacted with cash

To complement the cash analysis, Figure 6 shows the level of comfort in providing credit card details over the Internet by segment. It is evident that similar segments are apprehensive about transacting over the Internet leading to their preference for cash payments.

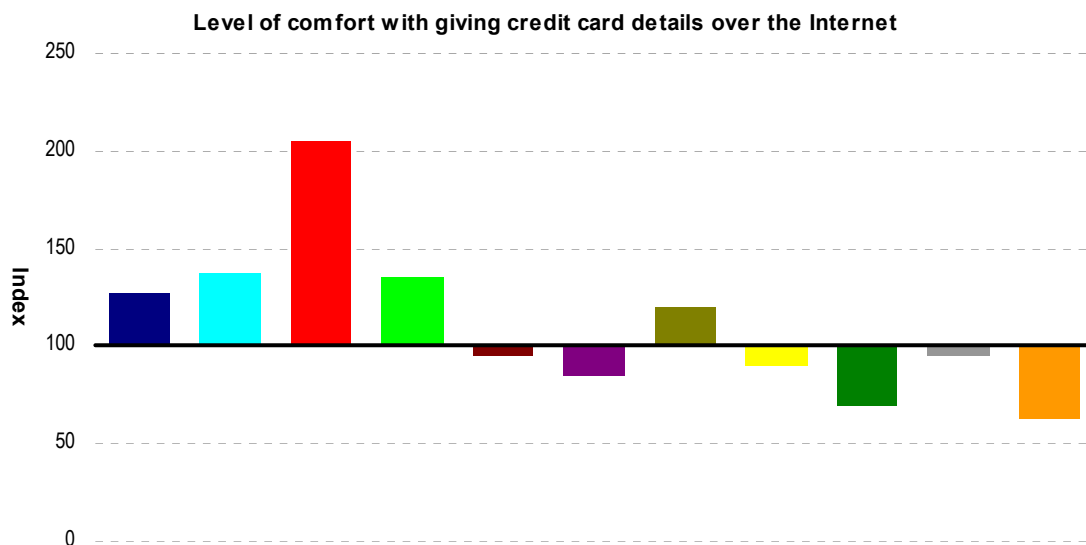


Figure 6 – Level of comfort giving credit card details over the Internet (by segment)

The segmentation of customer channel usage allowed TMR to tailor channel strategies towards three (3) distinct categories of segments as shown in Figure 7.

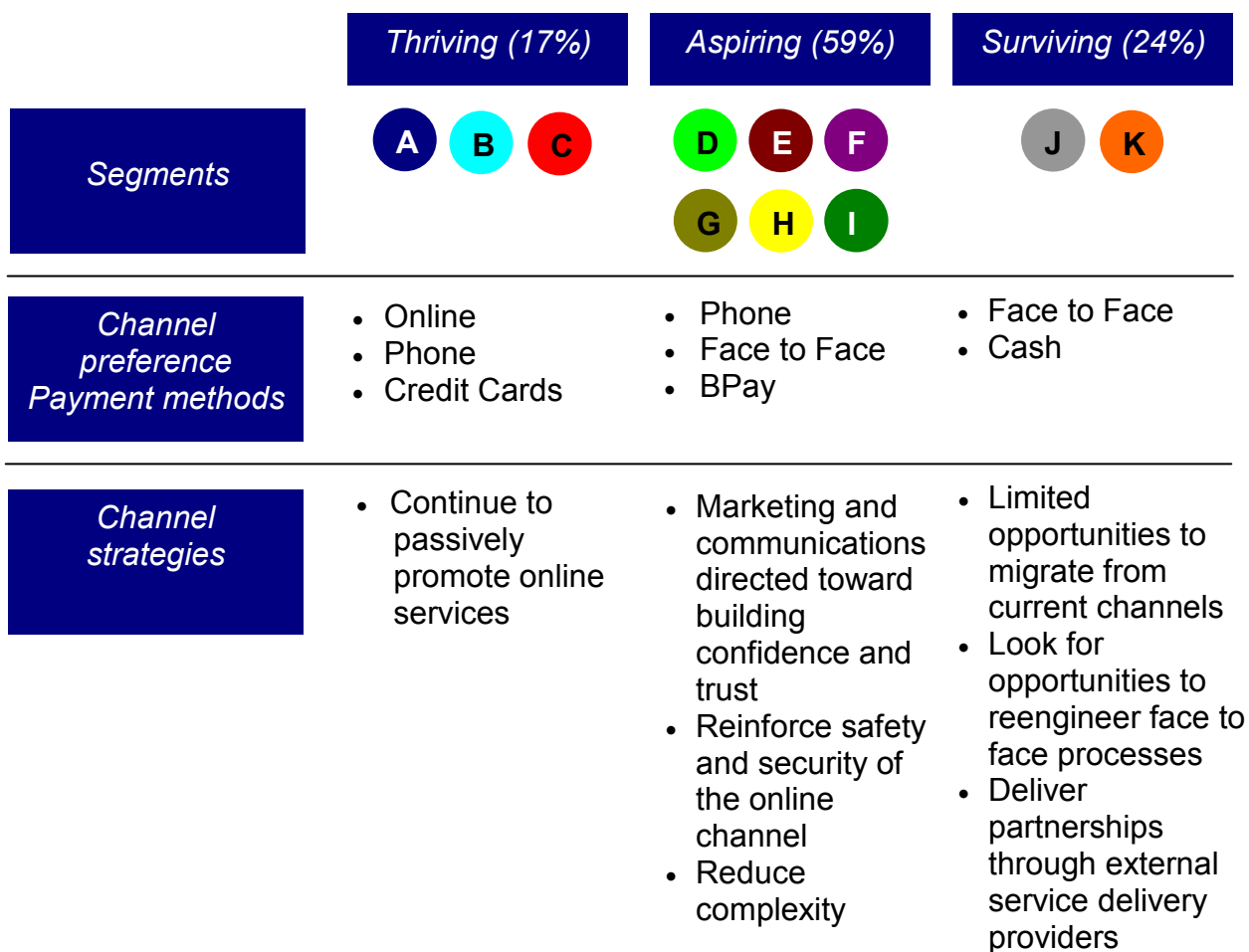


Figure 7 – Summary of segments, preferences, payment methods and strategies

It is evident that the ‘Aspiring’ category, which accounted for the majority of TMR customers, presented a high level of potential for migration to electronic channels such as the internet. Understanding the profiles of these customers enabled the creation of channel management strategies to drive this migration, centred on marketing tactics and the reengineering of business processes and ICT infrastructure.

3.2 Hazard Perception Test (HPT)

In order to enhance the safety of young drivers on Queensland roads, HPT was introduced as a feature of the state’s graduated licensing system, to ensure new road users were adequately equipped to handle varying road conditions. The HPT is an online computer based test which measures a driver’s ability to anticipate and respond to potentially dangerous situations while driving. Ability is measured using the duration taken to complete the test, with longer durations indicating a ‘fail’ result.

Segmentation was used in this case to identify attitudes toward technology with a specific focus on the usage of the HPT. Drivers under the age of 25 only are required to complete the test, providing TMR with a target age demographic. Figure 8 shows regardless of age, there is a significant proportion of customers who experience a level of confusion with technology. Prominent groups experiencing confusion were middle class and lower socio-economic segments, with profiles suggesting that these groups also experience issues with internet access and have little interest in learning about new technology. These groups also found the rapid change in technology difficult to manage and have little understanding of the internet.

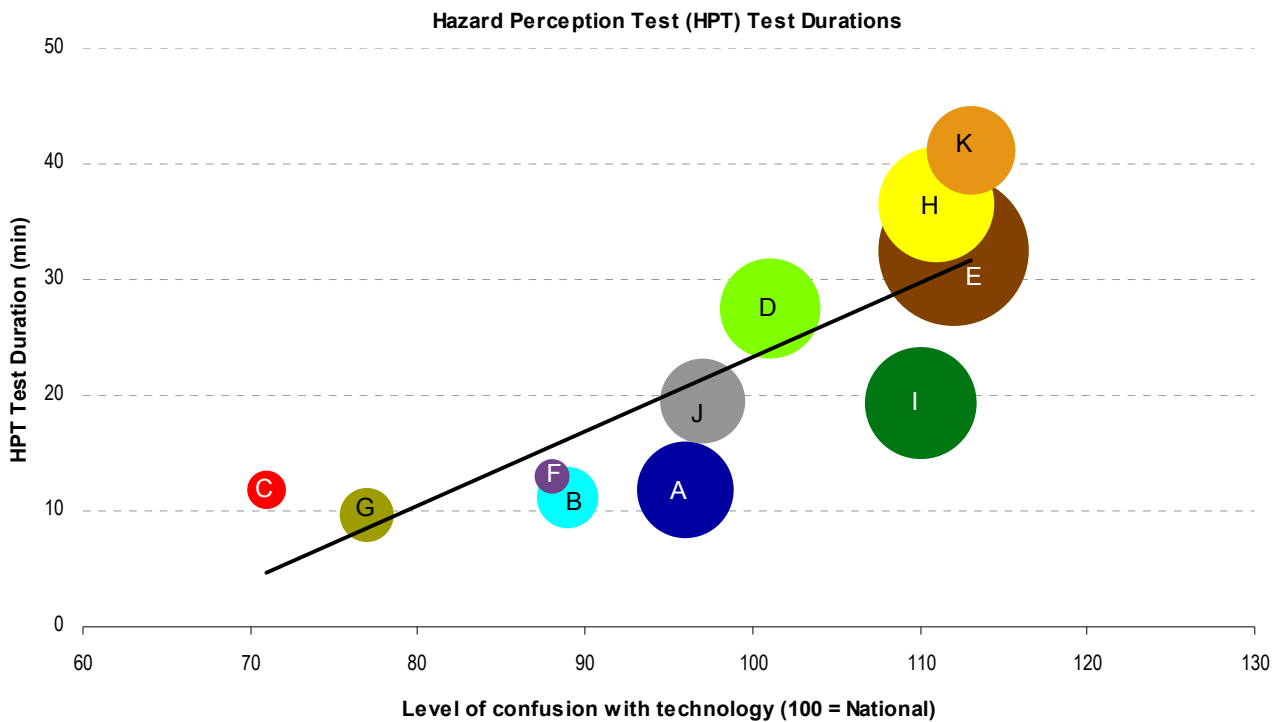


Figure 8 – Hazard Perception Test durations

In this case, segmentation provided a valuable insight into attitudes towards technology for a specific age demographic. The analysis proved to dispel common preconceptions about youth and technology, indicating that confusion with technology is not exclusively predicted age, and that socio-economic factors are also a significant contributor.

3.3 Hybrid and electric vehicle usage

Environmental factors have urged government agencies to look to new technology in an effort to provide a transport system which reduces impacts to the environment. The growth in hybrid and electric vehicle usage prompted TMR to conducted analysis into the geo-demographic characteristics of customers. Locality of customers was of particular importance as the use of electric vehicles causes the need for upgrades to the state's power grid, ensuring there is sufficient infrastructure to allow for the charging of vehicles.

Geo-demographic segmentation was successfully utilised to gain an insight into the likely impacts of mass produced electric vehicles, along with the likely socio-economic groups and the likely geographic distribution. As shown in Figure 10, the profile of current owners of hybrid and electric vehicles showed a clear overrepresentation in high-earning customers with inner city lifestyles. This result was not unexpected, however a number of other segments also showed strong adoption of hybrid and electric vehicles including Group J (Low income, low-spending households in major regional and outer metro areas).

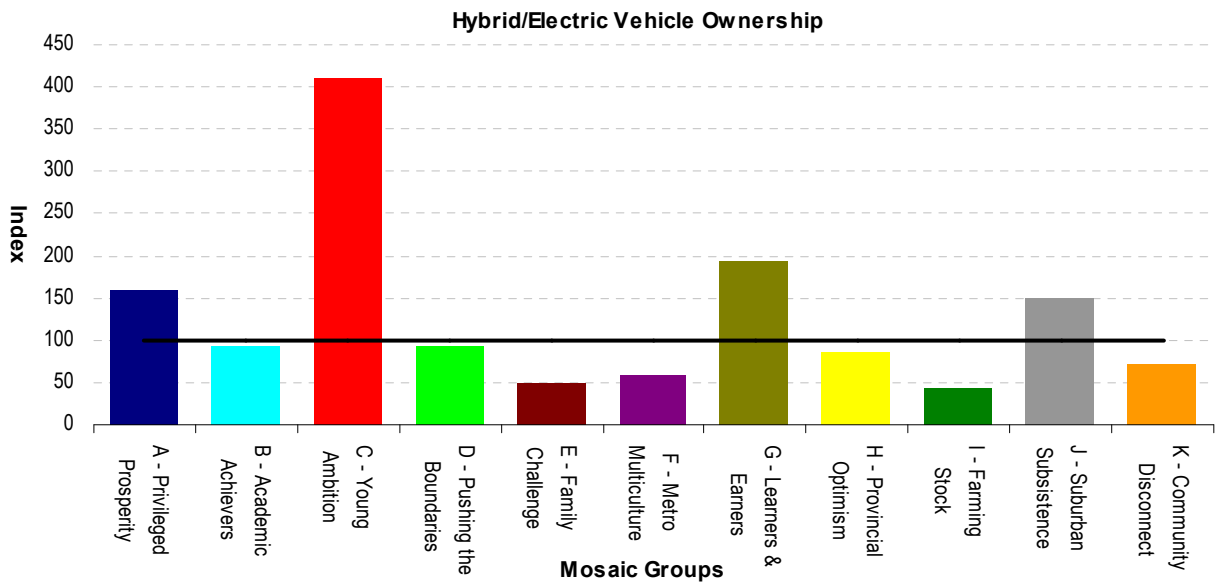


Figure 10 – Hybrid and Electric Vehicle Ownership

As show in Figure 11, this information was then combined with spatial analysis to provide detailed forecasts of the likely volume and geographic distribution of electric vehicles once they become available in the market.

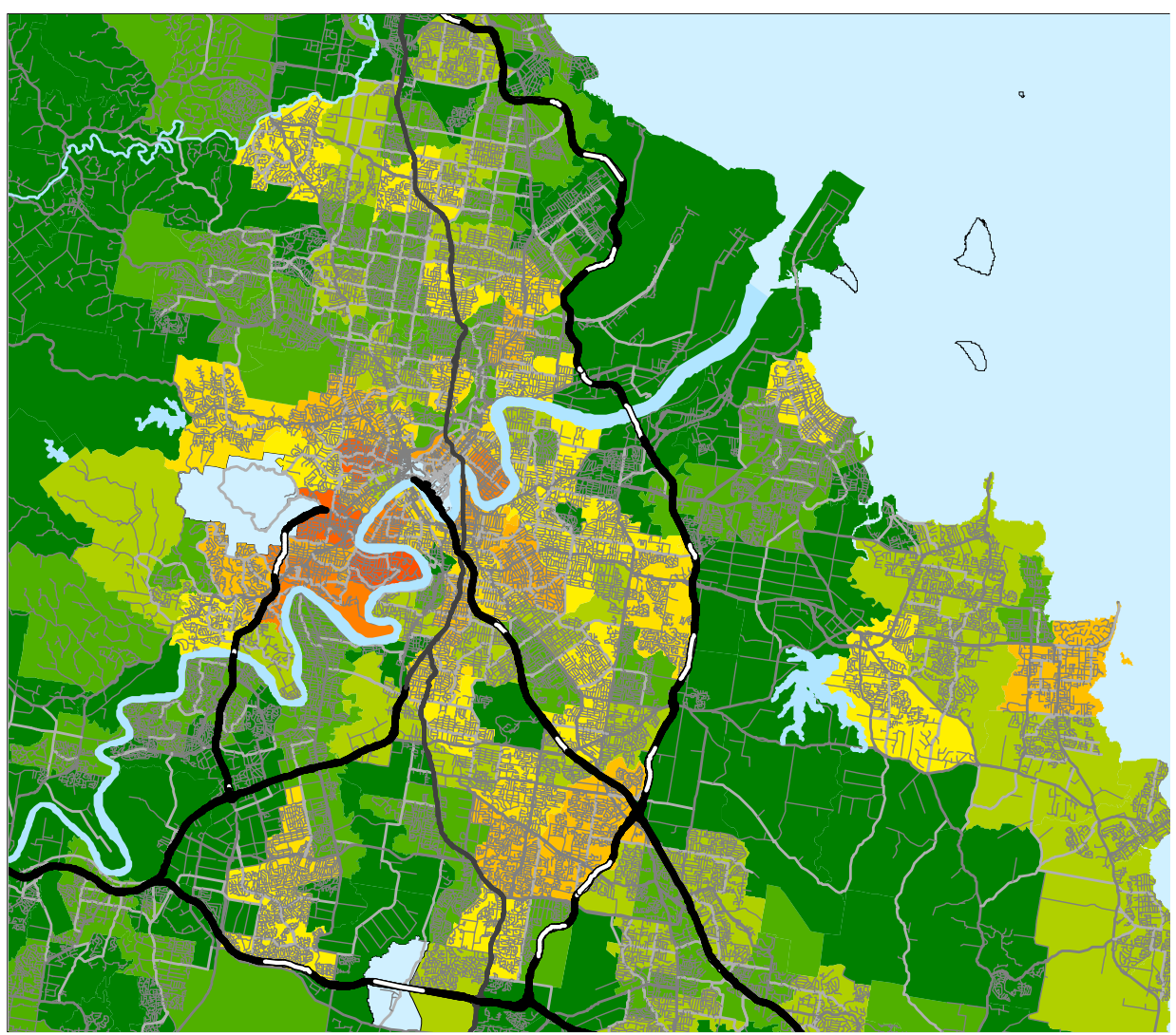


Figure 11 – Electric Vehicle Adoption Forecast

3.4 Traffic Offence Profiling

The application of geo-demographic segmentation to traffic offences data has provided valuable insight into the relationship between geo-demographic variables and customer road use behaviour. Whilst traffic offences are typically analysed by traditional demographic measures such as age and gender, analysis of a range of traffic offences has demonstrated a strong relationship between geo-demographic segments and different types of offences. For example, Figure 12 shows offences issued for driving with an unrestrained child. The segmentation shows a clear overrepresentation in Group K (Older blue-collar workers and retirees in country and coastal locations).

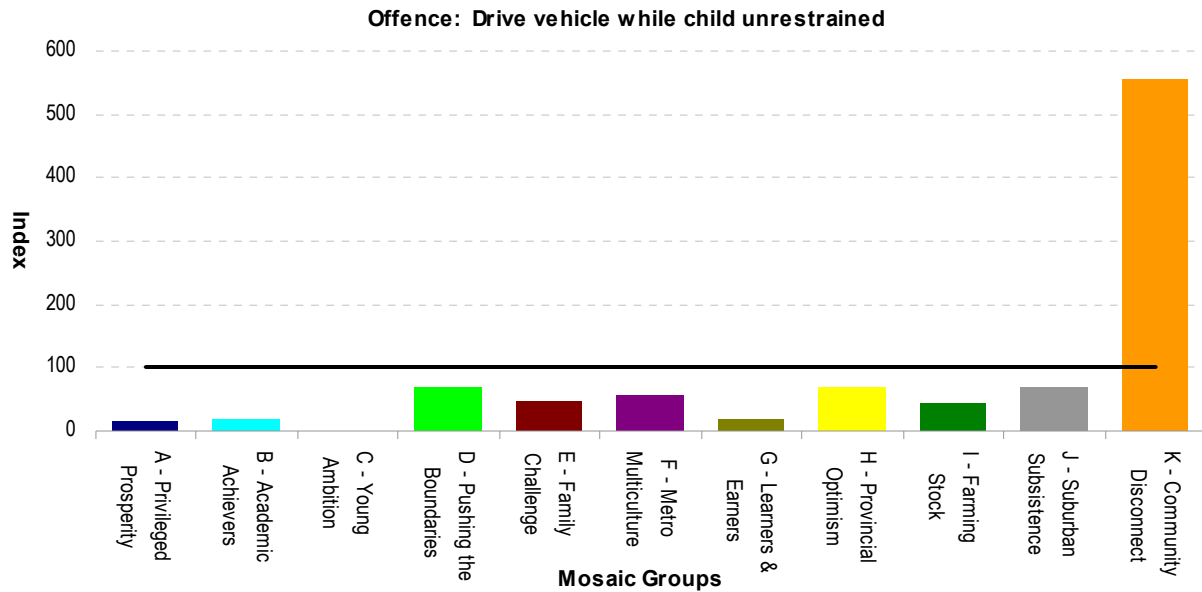


Figure 12 – Customers with a ‘Drive vehicle while child unrestrained’ offence

Conversely, the profile of citizens issued with traffic infringements for disobeying a ‘No Left Turn’ sign shows a significant overrepresentation of Group A (The most affluent families in the most desirable locations) and Group B (Wealthy areas of educated professional households).

The ability to apply segmentation analysis to traffic offence data has enabled the department to gain greater insight into the types of citizens committing particular offences, providing valuable guidance in the development of various marketing and communication campaigns aimed at curtailing unsafe road behaviours.

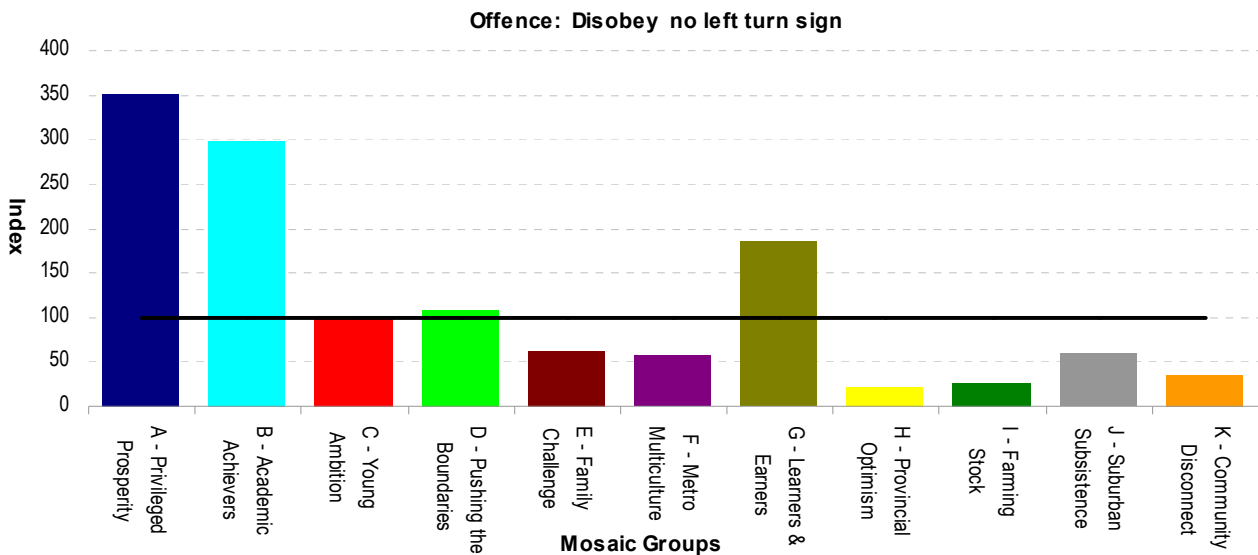


Figure 13 – Customers with a ‘Disobey no left turn sign’ offence

4. CHALLENGES

Using geo-demographic customer segmentation as a means of driving service delivery proved to be a strategy which not only presented successful results but also produced a set of challenges stemming from the public sector application of segmentation. Challenges were experienced in the initial stages of the process, particularly in tailoring segmentation methodology to a business focused on service delivery and customer satisfaction. Traditional government budget and finance cycles also dictated the timeframes in which to prove the value of the methodology. Additionally, customer information traditionally stored for other purposes was used to build segments, introducing privacy issues and confidentiality concerns.

4.1 Application of analytics in the public sector

The primary challenge in the application of customer segmentation in TMR was demonstrating the value of analytics in the public sector. The majority of successful examples of analytics and segmentation come from the private sector, where the focus is on customer retention, customer acquisition, maximising profit and cross selling. These objectives are generally irrelevant in a government context, where the primary goal is the provision of accessible products and services in a cost-efficient manner.

In order to meet this challenge, TMR conducted research into segmentation best practice and strategies adopted by other international agencies. The identification of successful applications of segmentation in other jurisdictions assisted in demonstrating the potential value that segmentation could bring to TMR’s service delivery challenges.

4.2 Limited timeframe to prove value

Time and budget constraints were a significant challenge for TMR. Funding was granted for one (1) financial year, with no commitment to provide funding for future years, meaning there was a limited timeframe to demonstrate the benefits of geo-demographic customer segmentation within a government agency. To meet this challenge, it was essential to begin analysis and start delivering tangible benefits immediately. For this reason, the decision was taken to licence a third party classification system to expedite the production of meaningful results and analysis. By taking this decision, TMR were able to obtain preliminary segmentation results and analysis within a few weeks of project commencement.

4.3 Privacy and Confidentiality

TMR's delivery of registration and licensing products and services results in a large repository of confidential customer data. The use of this data for segmentation needed to be managed in accordance with a range of privacy and confidentiality provisions. Strict data management protocols and procedures were put in place to manage the handling of customer information, and at no stage was personal customer information required to be released outside of the organisation.

5. LEARNINGS AND FUTURE APPLICATIONS

Future applications of segmentation lie in areas such as policy review and development. The increasing requirement for government to engage with the community when developing policy creates a need for understanding customer attitudes toward a range of issues including the environment, the economy, accessibility to services and preferred methods of communication. Identifying communication preferences is of particular importance as it provides an insight into the best methods of achieving positive interaction with the community. Segmentation will also enable TMR to identify those communities with an interest in contributing to policy decisions, enabling the development of targeted communication strategies.

Future work programs will explore the value of geo-demographic segmentation and its applications in better predicting road user behaviour. The use of geo-demographic segmentation alongside existing evaluation methods will enable the development of more meaningful customer insights.

TMR's responsibility expands across a range of portfolios, including but not limited to service delivery, maritime and roads infrastructure. Forming stakeholder relationships with the transport industry, other government agencies and the community are a significant part of TMR's ability to fulfil its portfolio responsibilities. Geo-demographic customer segmentation will be utilised to better identify stakeholder groups, and improve the methods in which these interaction take place.

TMR plays a primary role in road and marine safety initiatives across Queensland, ensuring road and waterway users are educated in safe practices. Segmentation and profiling of customers based on their usage of specific roads or waterways would enable TMR to develop education strategies and target segments of the community with a high propensity to respond positively to safety messages. Profiling can also assist in understanding the media consumption of each segment, ensuring that safety messages are communicated using the appropriate targeted marketing mix.

CONCLUSION

Customer analytics, particularly the application of geo-demographic customer segmentation is still in its early stages within TMR. The introduction of this approach has achieved promising results and continues to raise awareness of analytics and the value it can add to research and development programs within government agencies. The future will see TMR enhancing segment profiles and adding datasets which will further understanding and insights into each customer segment.

In only a short period of time, TMR has developed a strong capability in the application of customer segmentation that has resulted in deeper customer knowledge enabling more effective and targeted provision of government services.