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Ready to Begin: Driving Towards the Best and Steering Away from the Worst in Road Pricing Policy Reform

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ABSTRACT: Declining revenue from traditional road funding sources, rising infrastructure costs, and the transition to electric vehicles have increased the urgency of road user charging reform as a key demand management strategy. While such schemes can improve transport system efficiency by pricing congestion and other externalities, their implementation requires careful balancing with concerns around fairness and affordability. Public acceptability therefore remains a critical constraint on policy adoption. This paper examines which policy features most strongly influence support for road user charging and how these preferences can inform the design of policies that advance efficiency, fairness, and affordability objectives. A best worst scaling approach is used to elicit the relative importance of policy features, with choices modelled using a hybrid choice framework that captures both observed preferences and underlying attitudes. Three distinct behavioural classes are identified, reflecting differing priorities related to efficiency, fairness and consistency, and broader public benefit. Across these groups, governance and institutional arrangements are central to perceived legitimacy. Features such as public ownership, not for profit operation, independent investment decision making, and transparent revenue use are strongly preferred, while more complex pricing mechanisms are viewed less favourably. The findings highlight the importance of trust, fairness, and affordability in supporting effective and acceptable reform.

KEY WORDS: ***Road user charging, Public acceptability, Best–worst scaling, Hybrid choice model, Transport policy, road funding, road pricing***

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1. Introduction

Charging road users for use of road infrastructure is not a new idea; ancient civilizations for example the Assyrians of the seventh century BC charged tolls (Eurowag 2024), and the Romans had various types and rates for tolls called portorium (van Tilburg 2020). The first toll road in Australia was introduced in 1811 between Sydney and Parramatta. Early academic work on the economics of road pricing can be seen in Dupuit (1844) who effectively stated that the only "utility is that which people are willing to pay for". With respect to the pricing of the externalities of road use within an economic framework, the idea of charging drivers was first proposed by Pigou (1920) and Knight (1924). Their central argument was that failing to set an appropriate price for road usage creates economic inefficiency because it ignores externalities, particularly congestion. When traffic is heavy, each additional vehicle slows down others, lengthening travel times. As drivers do not bear the extra costs they impose, these social costs remain unaccounted for, resulting in an inefficient allocation of resources. In such cases, the outcome is not Pareto efficient, because society could achieve a better allocation where at least one person is better off without making anyone else worse off (if properly compensated). Road pricing addresses this by internalising congestion costs, bringing the system closer to an economically efficient state.

While economically more efficient when properly designed and implemented, road pricing has often been considered politically unpalatable due to concerns about its public acceptability (Jacobsson et al. 2000, Schade and Schlag 2003). A small number of applications exist in cities, with London, Milan and Stockholm in particular reporting reductions in congestion as a result (Li and Hensher 2007). Fearing public resistance, New York City delayed the introduction of a congestion charge and significantly reduced its scope, but notable benefits have been reported since its implementation in early 2025 (Allen 2025, Milman 2025). Reflecting this initial hesitancy, several schemes around the world have failed due to a lack of public acceptability (Vrtic et al. 2007).

The New York experience, however, offers some hope with respect to future road pricing initiatives: should they not fail at the initial hurdle, there is tangible upside gain. There is also a sense that the mood towards road user charging is changing. Using data collected in 2024, Beck et al. (2025) established that in Australia, now is the time to discuss road pricing reform due to a growing recognition from the public that changing vehicle fleet (hybrids and electric vehicles) as well as the increasing road damage from extreme weather is severely impacting road funding. Recognising this outcome, the Australian Federal Government announced plans to investigate this reform with a view to trialling a scheme on heavy electric vehicles before applying it to all cars (Treasury 2025). Poignantly, the Managing Director of the Australian Automobile Association (the national peak body representing Australia's state and territory motoring clubs) wrote an opinion piece acknowledging the need for change and the importance of maintaining road-based revenues (Bradley 2025).

While Beck et al. (2025) identified five distinct clusters based on their underlying support for, or resistance to, reform and gave recommendations on how to navigate these initial reform discussions (particularly in the context of hidden agendas), in this paper we build on these insights by more explicitly examining the important policy features of a road user charging framework which may ultimately influence acceptability. The remainder of this paper is structured as follows. First, we review the literature pertaining to road pricing policy and acceptability; we then outline our contribution to the literature; we next outline our methodological approach that enables this contribution; we the provide information on the data collection process and resulting sample; we provide and interpret the results of our analysis; we the contextualise these results in the current policy debate and make recommendations for policy makers; we then finish the paper with concluding thoughts.

2. Literature Review & Contribution of Research

In this literature review, we limit our scope to papers whose predominant focus is on the acceptability of road pricing schemes to the public (for a discussion on political acceptability, see for example Hensher and Bliemer, 2014). In doing so, we do allow for research that covers road pricing in different guises, grouping discussion of papers under three main clusters: those that relate to the lessons learnt from congestion charging and/or cordon-based tolls; those that relate to toll roads; and road pricing and/or road user charging papers in general. Across these papers, the common theme is that road pricing can efficiently alleviate congestion and align private travel with social costs, but public acceptability is crucially important with respect to policy. Acceptance is most strongly shaped by perceptions of fairness and equity, trust and transparency, perceived effectiveness, and design simplicity (Schade and Schlag 2003, Schade and Baum 2007, Baranzini et al. 2021, Hsieh 2022). Across these three clusters of research, scheme purpose, distributional impacts, and governance credibility also play an important role (Jaensirisak et al. 2005, Kockelman and Kalmanje 2005, Börjesson et al. 2015).

2.1. Lessons from Congestion and Cordon Charging

Studies exploring acceptability of these types of road pricing frameworks are perhaps the most numerous, driven by the fact that among real world implementations of road pricing these types of charges are the most common. A central lesson from these experiences is that benefits, once experienced, shift opinions more than prior beliefs. Trials and early operations that visibly reduce delays and improve reliability are consistently followed by increased support (Winslott-Hiselius et al. 2009, Eliasson et al. 2009, Eliasson and Jonsson 2011). When users can see congestion relief and reinvestment in the transport network, net acceptance rises (Börjesson et al. 2015, Abulibdeh 2018 and 2022). The

Edinburgh referendum experience underscores how fragile support becomes when perceived benefits and design clarity are unconvincing (Gaunt et al. 2006 and 2007).

Fairness is an important albeit subjective lens through which people assess such pricing schemes, particularly with respect to the impact on lower income groups but also wanting schemes to ensure that like-users are treated similarly. Acceptance improves with income-sensitive discounts, resident accommodations, or well-justified exemptions, and declines when burdens appear concentrated on specific groups or places (Kim et al. 2013, Aasness and Odeck 2023). Methodological work shows that design choices (e.g., time-of-day structure, resident treatment) can materially redistribute burdens and benefits, which in turn may affect political feasibility (Eliasson and Mattsson 2006, Baranzini et al.2021), whilst other studies stress pairing pricing with credible public transport upgrades to bolster perceived fairness and effectiveness (Kottenhoff and Freij 2009, Li et al. 2020, Susilardi et al. 2025). Some have shown that perceptions of fairness are perhaps the most important determinant of acceptability (Wang et al. 2019).

Trust and procedural legitimacy are equally crucial. Acceptance improves when governments set clear objectives, publish performance indicators, and deliver clear and transparent revenue use (Schade and Baum 2007, Hsieh 2022). Other studies point to the importance of independent evaluation and open communication, with particular reference to the role of trials, help the public to update their beliefs about such schemes and reduce suspicion about "tax grabs" (Walker and Pickford 2018, Börjesson et al. 2015). While trust matters, so too does simplicity. Schemes with simple, legible tariffs and predictable billing reduce cognitive load, whereas complexity and surprise charges erode trust (Schade and Baum 2007, Hess and Börjesson 2019). Looking forward, even in future scenarios involving connected and autonomous vehicles, congestion-responsive designs remain acceptable when benefits are salient and rules are predictable (Simoni et al. 2019). Communication and framing that connect pricing to clean air, reliability, and urban quality also support acceptance (Nikitas et al. 201, Li et al. 2020).

2.2. Lessons from Tolling Roads and Other Infrastructure

For facilities such as bridges, motorways, or managed lanes, choice and value dominate acceptability. Users are more willing to pay when the payment of tolls correlates with reliability and time savings rather than access alone, and as with cordons, transparent reinvestment in the facility or corridor supports legitimacy and stabilizes support over time (Zmud et al. 2007, De Borger and Glazer 2017). Findings indicate that income-based discounts, off-peak pricing, or frequent-user rebates can blunt critics who claim that such pricing creates roads only for the wealthy while still preserving efficiency (Smirti et al. 2007, Adurthi et al. 2022). Tolling is also found to be more acceptable when the problems of congestion are known and recognised by the public (Fall 2022). However, socio-spatial differences play a significant role, with substantially higher opposition observed in areas facing greater toll exposure and where public transport alternatives are less competitive (Böcker et al. 2024).

2.3. Lessons from General Road User Charging Research

In examination of distance-based or national road user charging frameworks, *privacy* and data governance loom large. Acceptability rises when systems minimize data, limit purposes, enable user access to records, and guarantee independent oversight (Schade and Schlag 2003, Schade and Baum 2007, Sugiarto et al. 2020). Contemporary evaluations emphasise that trust is reinforced when road charging replaces rather than stacks on top of existing charges, avoiding perceptions of double taxation, and when transition rules are clear (Hsieh 2022, Lichtin et al. 2024, Moleman et al. 2025). Pilot studies and national debates also highlight that geographic fairness, essential-trip treatments, charging credits or rebates, and governance structures that separate road charging frameworks from short-term politics are effective in mitigating public concern (Golob 2001, Noordegraaf et al. 2014). With respect to communication surrounding such schemes, studies suggest that persuasive framing around congestion relief, reliability, and environmental gains can move attitudes when backed by credible implementation details (Hensher and Li 2013, Selmoune 2013, Di Ciommo et al. 2013).

Importantly, how revenues are used also strongly influences public acceptance, with transport pricing viewed more favourably when funds are reinvested back into the transport system rather than allocated to general public budgets (Schuitema and Steg 2008). Simplicity matters in the context of broader road pricing too: a clear price signal is essential to successful congestion charging; it is unrealistic to expect drivers to compute the exact charges for every possible route and departure time (Bonsall et al. 2007). However, while simplicity is important, more complex road user charging schemes may become acceptable as people grow familiar with the principles of road user charging (Viegas 2001).

2.4. What do we Learn about Acceptability?

Over these studies, there are a number of commonalities which the literature points to as being key determinants and/or influences on acceptability. To start, *fairness* is preeminent in the above studies and operates on two planes: horizontally (treating like users alike) and vertically (protecting low-income and constrained users). Acceptance grows when charging frameworks incorporate income-sensitive features (discounts, caps, allowances) and transparent rationales for any exemptions, while it falters when burdens appear concentrated on particular groups or places. *Trust* and *transparency* then determine whether people believe the scheme serves public rather than fiscal ends; credibility rises with clear objectives, hypothecation of revenues to transport activities, and independent evaluation and reporting that make the money flows and outcomes visible. *Perceived effectiveness* of such schemes in delivering congestion, reliability and transport network improvements is a third pillar. Such perceptions are strengthened when authorities measure and communicate before/after performance during trials and early operation. Perceived effectiveness could also extend to the ability to achieve revenue neutrality and/or sustainable road funding in the context of electric vehicle's impact of fuel excise by changing the way drivers pay for roads. A fourth driver is *simplicity*: legible tariffs, predictable bills, clear signage, and responsive support lower friction and suspicion. Finally, *experience* matters. Pilots and phased introductions allow people to see the benefits before they pay, and where benefits are real and communicated, acceptability rises.

2.5. Contribution of this Research

Beck et al. (2025) establish that road pricing reform is now, more than ever, a globally relevant issue, as many jurisdictions are experiencing declining revenues from traditional road funding sources alongside increasing costs of infrastructure provision and maintenance. This challenge has been anticipated for some time (Jenn et al. 2015). However, this study is fundamentally distinct from Beck et al. (2025). Rather than focusing on attitudinal frameworks alone, it empirically evaluates preferences using new data derived from a best–worst scaling (BWS) experiment, enabling a more granular identification of the relative importance of different policy attributes. In doing so, it moves beyond conceptualisation to provide applied insights into what matters most in the design of road user charging frameworks. Furthermore, it contributes to the literature by examining acceptability in a post-COVID context, where working from home constitutes a larger share of commuting behaviour, awareness of declining road funding is greater, and public understanding of road pricing has increased. These factors are accompanied by a growing sense of inevitability that reform is forthcoming. By identifying whether priorities such as equity, affordability, revenue stability or efficiency dominate, the framework offers a practical basis for designing demand management policies that are both effective and publicly acceptable.

In addition, the methodology described in this work offers a transparent way to quantify the relative importance of policy considerations by forcing respondents to trade off what matters most and least. While novel in the road pricing context, this approach can readily be adapted by researchers and policymakers in other domains. By tailoring the list of candidate policy features to reflect local institutional, economic, and social conditions, the same approach can provide robust, context-specific evidence to guide decision-making in different policy situations. In the case of road pricing, this means identifying whether issues such as equity, revenue stability, environmental outcomes, or administrative feasibility are given greatest weight, thereby providing a clear foundation for designing schemes that are both effective and publicly acceptable. In short, we provide a transparent, generalisable way to prioritise persuasive policy elements before pilots begin, because the literature makes it clear that durable acceptance rests on credible governance plus design choices that look and feel fair (Taylor and Kalauskas 2010, Hårsman and Quigley 2010, Schaller 2010, Wie et al. 2014).

3. Data and Methodology

3.1. Experimental Design and Attitudinal Data

Drawing on insights from the literature, supplemented by informal interviews with policymakers at both state and federal levels to confirm areas of interest for those ultimately responsible for devising and implementing policy change, Table 1 presents the final set of 16 policy features to be considered in the development of a road user charging framework. To establish the rank ordering of these policy features, we employ a BWS case 1 experiment (Louviere et al. 2013). In this approach, respondents are repeatedly presented with subsets of the features and asked to indicate which they consider to be the most important and the least important within each set shown. By forcing trade-offs, rather than allowing respondents to rate all features without any constraints on the responses provided, the method provides a clear and reliable indication of the relative importance of each policy consideration. This is particularly valuable in the road user charging context, where policymakers must balance competing objectives such as equity, efficiency and administrative feasibility, while also requiring an evidence-based prioritisation to guide the design of a workable framework.

In the BWS experiment, each respondent completed eight tasks, with each task consisting of six of the 16 total policy-related features that a road pricing scheme may include. A balanced incomplete block design (BIBD) was used, such that every statement appeared once in each block and, across the entire design, every statement appeared exactly nine times (Cochrane and Cox, 1957). In addition, all 360 possible pairwise comparisons among the 16 statements appeared across the three blocks (making the design balanced), though not within each block (making it incomplete). Rather than asking respondents to rate which policy consideration was "best" or "worst", we instead used "most important" and "least important" to assess the relative importance of the 16 policy measures. Table A1 in the Appendix provides the BIBD design used in the experiment.

Respondents also answered 17 attitudinal questions about road user charging, see Table A2 in the Appendix, which are discussed and analysed in more detail in Beck et al. (2025). For all items, a 6-point Likert scale ranging from *1 = Strongly Disagree* to *6 = Strongly Agree* was used. Different to Beck et al. (2025), an additional set of four attitudinal variables were included in this analysis that related directly to road funding reform itself, specifically the concept of a user-pays style system. For the perspective of this paper, it is worth mentioning that slightly more respondents disagreed than agreed with the statement "A cents per kilometre charge should be the way we pay for roads". Exploratory factor analysis was conducted to determine which latent constructs may be driving the responses observed on these attitudinal items. The result of this analysis forms the basis of the latent variables included in our econometric model, as discussed in the next section.

Table 1: Policy Features Identified

Statement #	**Policy feature**	***Related Lesson from Literature***
1	The price per kilometre depends on the weight of the vehicle (heavier vehicles pay more)	*Fairness; Perceived effectiveness*
2	The price per kilometre depends on the type of road being driven on (motorway/highway/street/lane etc)	*Perceived effectiveness; Fairness*
3	The price per kilometre depends on congestion levels	*Perceived effectiveness; Fairness*
4	Some free kilometres are provided each month	*Fairness; Simplicity*
5	The price per kilometre depends on the engine fuel type (electric/petrol/diesel/gas)	*Fairness; Perceived effectiveness*
6	Road use data (by vehicles) is collected and used to better manage roads and make road network investment decisions	*Trust and transparency; Perceived effectiveness*
7	Tolls are eliminated and replaced with the price per kilometre model	*Simplicity; Trust and transparency*
8	Roads are operated on a not-for-profit basis	*Trust and transparency; Fairness*
9	Publicly accessible roads are not owned or operated by private companies	*Trust and transparency*
10	Money collected is used on the roads it is collected from	*Trust and transparency; Perceived effectiveness; Fairness*
11	Road investment decisions are based on independent advice (and not made for political gain)	*Trust and transparency; Perceived effectiveness*
12	A nationally consistent road user charging system is introduced across the country	*Simplicity; Fairness; Trust and transparency*
13	Road rules, driver's licenses and vehicle registrations are national, and not state based	*Simplicity; Trust and transparency*
14	Road maintenance and construction is funded from money collected from users of the road, and not from other government sources	*Fairness; Trust and transparency*
15	Some of the money collected from road user charges is used to make improvements to public transport	*Perceived effectiveness; Fairness; Trust and transparency*
16	If road user charging reform occurs, it should be applied to all vehicles at the same time (and not made via a staged approach)	*Fairness; Simplicity*

3.2. Econometric Model

We estimate a hybrid latent class model to analyse respondents' preferences using data from the BWS case 1 experiment on policy features of road user charging. Each respondent completed a sequence of eight choice tasks, each presenting six policy statements, from which the respondent identified the most important ("best") and least important ("worst") statement. We assume random utility theory as the basis for modelling decision-making. Our proposed hybrid choice model simultaneously considers discrete best-worst choices, attitudes, and heterogeneity in preferences across classes of respondents. Since hybrid choice models are complex and are not often formulated in an exact way in the literature, we rigorously describe our model in this section. A visualisation of the dependencies between data, variables and parameters is shown in Figure 1.

Let N denote the number of respondents that completed the survey containing single response questions to capture socio-demographic/economic data and driving characteristics, Likert-scale questions to elicit attitudes, and choice tasks in the BWS experiment to capture preferences towards policy features. Covariates captured by the single response questions are contained in vector $\mathbf{z}_n$ for each respondent $n \in \{1,\dots,N\}$. Attitudes are elicited via $S = 17$ Likert-scale questions on an L-point scale, where $L = 6$ in our study. Based on exploratory factor analysis mentioned in Section 3.1, these attitudinal questions are divided into K sets to establish latent constructs, where the set of attitudinal questions corresponding to latent construct $k \in \{1,\dots,K\}$ is denoted by subset $\mathrm{S}_k \subset \{1,\dots,S\}$. Let $w_{ns} \in \{1,\dots,L\}$ denote the response by respondent n to Likert question $s \in \mathrm{S}_k$. In the BWS experiment, each respondent n is given a block of 8 choice tasks denoted by subset $\mathrm{T}_n \subset \{1,\dots,T\}$, where $T = 24$ is the total number of choice tasks, see Table A1 in the Appendix. In each BWS choice task $t \in \mathrm{T}_n$, a respondent is shown a choice set with $J = 6$ options, and is asked to indicate the most important and least important option. The J options in each choice task are selected from the list of $P = 16$ policy features as listed in Table 1, where $J < P$. Let $\mathrm{J} = \{1,\dots,J\}$ denote the choice set. The specific choice set shown in each choice task is determined by the underlying experimental design in Table A1. Let $x_{ntj} \in \{1,\dots,P\}$ be the policy feature shown as choice option $j \in \mathrm{J}$ in choice task $t \in \mathrm{T}_n$ to respondent n. Let $y_{nt}^{\mathrm{B}} \in \mathrm{J}$ denote the option that was selected as the most important ("best") by respondent n in choice task $t \in \mathrm{T}_n$. Similarly, let $y_{nt}^{\mathrm{W}} \in \mathrm{J} \setminus \{y_{nt}^{\mathrm{B}}\}$ denote the option that was selected as the least important ("worst"), where option y_{nt}^{B} is omitted from the choice set when choosing the least important option.

To summarise, for each respondent n, the data for our econometric model is defined by Likert-scale responses $\mathbf{w}_n = [w_{ns}]$, by design $\mathbf{x}_n = [x_{ntj}]$ for the BWS experiment, by best-worst choice responses $(\mathbf{y}_n^{\mathrm{B}}, \mathbf{y}_n^{\mathrm{W}})$, where $\mathbf{y}_n^{\mathrm{B}} = [y_{nt}^{\mathrm{B}}]$ and $\mathbf{y}_n^{\mathrm{W}} = [y_{nt}^{\mathrm{W}}]$, and by covariates $\mathbf{z}_n$. In the next subsection we describe the various components of our econometric model that estimates behavioural relationships based on the pooled data from all N respondents.

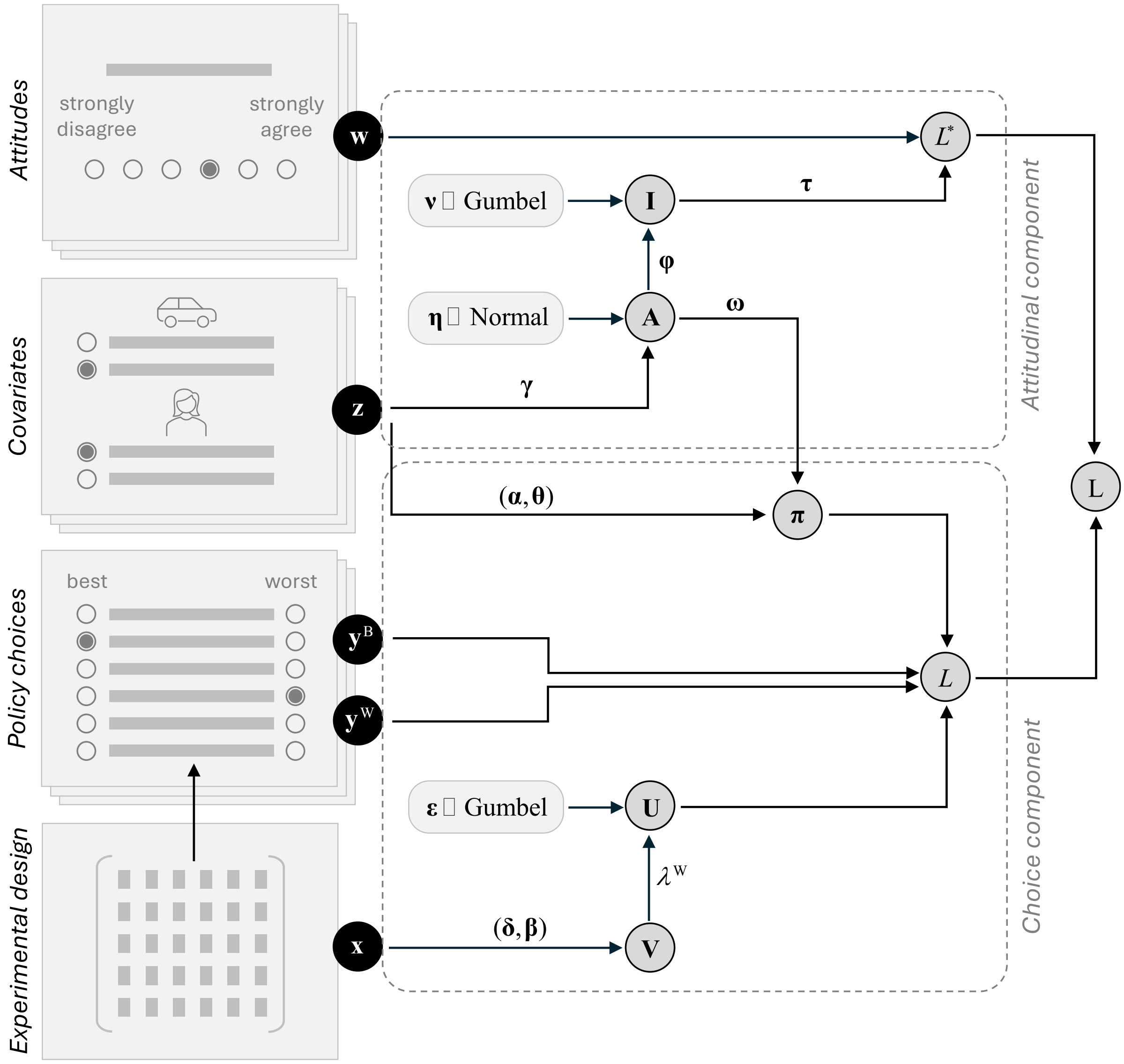

Figure 1: Relationship between input data, (latent) variables, and model parameters.

3.2.1. Structural and Measurement Equations

When using a reflective scale instead of a formative scale, it is not appropriate to directly add attitudinal responses, $\mathbf{w}$, to the utility functions in a discrete choice model due to measurement errors (Rose et al.2023). Instead, they need to be included as latent variables. With K underlying factors determined after an exploratory factor analysis of the attitudinal data, in our analysis we define K latent variables, each related to a latent construct k that describes a certain attitude as elicited via the set of responses to attitudinal questions $s \in \mathrm{S}_k$. The latent variables are defined by the following structural equations,

$$A_{nk} = \boldsymbol{\gamma}'_k \mathbf{z}_n + \eta_{nk}, \tag{1}$$

where A_{nk} contains the value of latent variable k for respondent n, $\boldsymbol{\gamma}_k$ is a vector of coefficients that capture the impact of the vector of covariates $\mathbf{z}_n$ on the latent variable, and η_{nk} is a standard normal distributed disturbance term. We denote $\mathbf{A}_n = [A_{nk}]$ as the vector of latent variables.

The latent variables are linked to the response to each attitudinal question via the following measurement equation,

$$I_{ns} = \boldsymbol{\varphi}'_s \mathbf{A}_n + \nu_{ns}, \tag{2}$$

where I_{ns} is a measurement variable associated with the response of respondent n to attitudinal question s, $\boldsymbol{\varphi}_s$ is a vector of coefficients that capture the impact of the vector of latent variables on the measurement, and ν_{ns} is a random error term. We denote $\mathbf{I}_n = [I_{ns}]$ as the vector of measurement variables.

Importantly, measurement variables $\mathbf{I}_n$ are not observed, only Likert responses on an L-point scale are observed for each respondent n. As such, the Likert response of individual n to attitudinal question s is linked to measurement variable I_{ns} as follows:

$$W_{ns} = \begin{cases} 1, & \text{if } \tau_{s,0} < I_{ns} \le \tau_{s,1}, \\ 2, & \text{if } \tau_{s,1} < I_{ns} \le \tau_{s,2}, \\ \vdots & \qquad \vdots \\ L, & \text{if } \tau_{s,L-1} < I_{ns} < \tau_{s,L}, \end{cases} \tag{3}$$

where $\tau_{s,1},\ldots,\tau_{s,L-1}$ are threshold parameters that are to be estimated, and $\tau_{s,0} = -\infty$, $\tau_{s,L} = \infty$. Assuming that ν_{ns} are independent and identically standard Gumbel distributed, the probability of observing a Likert response l by respondent n related to attitudinal question m is given by the ordered logit formula,

$$\Pr(W_{ns} = l) = \Pr(\tau_{s,l-1} < I_{ns} \le \tau_{s,l}) = \frac{1}{1+\exp(\boldsymbol{\varphi}'_s \mathbf{A}_n - \tau_{s,l})} - \frac{1}{1+\exp(\boldsymbol{\varphi}'_s \mathbf{A}_n - \tau_{s,l-1})}. \tag{4}$$

Therefore, the likelihood of respondent n observing the sequence of Likert-scale indicators $\mathbf{W}_n$ is equal to

$$L_n^* = \prod_{s=1}^{S} \Pr(W_{ns} = w_{ns}). \tag{5}$$

3.2.2. Choice Model Component

For each respondent n and each choice task $t \in \mathrm{T}_n$, a choice option $j \in \mathrm{J}$ is associated with random utility

$$U_{ntj}^{q} = \lambda^{q} V_{ntj} + \varepsilon_{ntj}^{q}, \qquad q \in \{\mathrm{B}, \mathrm{W}\}, \tag{6}$$

where V_{ntj} is the systematic component of utility and ε_{njt}^{q} is a random error term. Scale parameter λ^{W} is estimated for the worst ($q = \mathrm{W}$) choice, relative to normalised scale $\lambda^{\mathrm{B}} = 1$ for the best ($q = \mathrm{B}$) choice. Systematic utilities are determined as

$$V_{ntj} = \delta_j + \sum_{p=1}^{P} \beta_p \cdot 1_{\{x_{ntj}=p\}}, \tag{7}$$

where $1_{\{x_{ntj}=p\}}$ is a dummy variable that equals one if choice option j represents policy feature p and is zero otherwise, and $\boldsymbol{\beta} = [\beta_p]$ are coefficients that reflect preferences for the P policy features, where the last policy feature is assumed the base, hence $\beta_P = 0$. To account for possible order bias, we add alternative-specific constants $\boldsymbol{\delta} = [\delta_j]$ to the utility function. For identification purposes, we normalise the last constant to zero, i.e., $\delta_J = 0$.

Utilities V_{ntj} are not observed, only policy feature choices are observed for each respondent n. As such, the most and least preferred policy features selected by individual n in choice task t are linked to the utilities as follows:

$$Y_{nt}^{\mathrm{B}} = \begin{cases} 1, & \text{if } U_{nt1}^{\mathrm{B}} > U_{nti}^{\mathrm{B}}, \forall i \in \mathrm{J}_{-1}, \\ 2, & \text{if } U_{nt2}^{\mathrm{B}} > U_{nti}^{\mathrm{B}}, \forall i \in \mathrm{J}_{-2}, \\ \vdots & \vdots \\ J, & \text{if } U_{ntJ}^{\mathrm{B}} > U_{nti}^{\mathrm{B}}, \forall i \in \mathrm{J}_{-J}, \end{cases} \quad \text{and} \quad Y_{nt}^{\mathrm{W}} = \begin{cases} 1, & \text{if } U_{nt1}^{\mathrm{W}} < U_{nti}^{\mathrm{W}}, \forall i \in \mathrm{J}_{-1} \setminus \{Y_{nt}^{\mathrm{B}}\}, \\ 2, & \text{if } U_{nt2}^{\mathrm{W}} < U_{nti}^{\mathrm{W}}, \forall i \in \mathrm{J}_{-2} \setminus \{Y_{nt}^{\mathrm{B}}\}, \\ \vdots & \vdots \\ J, & \text{if } U_{ntJ}^{\mathrm{W}} < U_{nti}^{\mathrm{W}}, \forall i \in \mathrm{J}_{-J} \setminus \{Y_{nt}^{\mathrm{B}}\}. \end{cases} \tag{8}$$

where $\mathrm{J}_{-j} = \mathrm{J} \setminus \{j\}$ denotes the set of non-chosen options in the best choice. Assuming that ε_{ntj}^{q} are independent and identically standard Gumbel distributed, the probability that individual n chooses policy feature j in choice situation t is given by the logit formula for the best and worst choice, respectively, as

$$\Pr(Y_{nt}^{\mathrm{B}} = j) = \Pr\left(U_{ntj}^{\mathrm{B}} > U_{nti}^{\mathrm{B}}, \forall i \in \mathrm{J}_{-j}\right) = \frac{\exp(V_{ntj})}{\sum_{i=1}^{J} \exp(V_{nti})}, \tag{9}$$

$$\Pr(Y_{nt}^{\mathrm{W}} = j) = \Pr\left(U_{ntj}^{\mathrm{W}} < U_{nti}^{\mathrm{W}}, \forall i \in \mathrm{J}_{-j} \setminus \{Y_{nt}^{\mathrm{B}}\}\right) = \frac{\exp(-\lambda^{\mathrm{W}} V_{ntj})}{\sum_{i \in \mathrm{J} \setminus \{Y_{nt}^{\mathrm{B}}\}} \exp(-\lambda^{\mathrm{W}} V_{nti})}. \tag{10}$$

Therefore, the likelihood of respondent n observing the sequence of best-worst choices $(\mathbf{y}_{nt}^{\mathrm{B}}, \mathbf{y}_{nt}^{\mathrm{W}})$ is equal to

$$L_n = \prod_{t \in \mathrm{T}_n} \prod_{j \in \mathrm{J}_{nt}} \Pr(Y_{nt}^{\mathrm{B}} = y_{nt}^{\mathrm{B}}) \cdot \Pr(Y_{nt}^{\mathrm{W}} = y_{nt}^{\mathrm{W}}). \tag{11}$$

To account for unobserved preference heterogeneity, we consider C latent classes in the sampled population. Let π_{nc} denote the probability that respondent n belongs to class $c \in \{1,\ldots,C\}$. In the resulting latent class model, we estimate parameters λ_c^{W}, $\boldsymbol{\beta}_c$, and $\boldsymbol{\delta}_c$ in utility function (7) for each class c. The likelihood of the sequence of best-worst choices $(\mathbf{y}_{nt}^{\mathrm{B}}, \mathbf{y}_{nt}^{\mathrm{W}})$ observed for individual n can now be adapted from Eqn. (11) to

$$L_n = \sum_{c=1}^{C} \pi_{nc} L_{n|c}, \quad \text{with} \quad L_{n|c} = \prod_{t \in \mathrm{T}_n} \prod_{j \in \mathrm{J}_{nt}} \Pr(Y_{nt}^{\mathrm{B}} = y_{nt}^{\mathrm{B}} \mid c) \cdot \Pr(Y_{nt}^{\mathrm{W}} = y_{nt}^{\mathrm{W}} \mid c), \tag{12}$$

where the choice probabilities are now conditional on respondent n belonging to class c. We assume that the class allocation probabilities are determined as

$$\pi_{nc} = \frac{\exp(\alpha_c + \boldsymbol{\theta}_c' \mathbf{z}_n + \boldsymbol{\omega}_c' \mathbf{A}_n)}{\sum_{c'=1}^{C} \exp(\alpha_{c'} + \boldsymbol{\theta}_{c'}' \mathbf{z}_n + \boldsymbol{\omega}_{c'}' \mathbf{A}_n)}, \tag{13}$$

with class-specific parameters $(\alpha_c, \boldsymbol{\theta}_c, \boldsymbol{\omega}_c)$, where α_c are constants, and $\boldsymbol{\theta}_c$ and $\boldsymbol{\omega}_c$ are vectors of coefficients that capture the impact of respondent characteristics $\mathbf{z}_n$ and the impact of the latent variables $\mathbf{A}_n$ on the class allocation probability, respectively. For identifiability, the parameters in one of the classes are normalised to zero.

3.2.3. Joint Likelihood and Estimation

Note that L_n^* in Eqn. (5) depends on latent variables $\mathbf{A}_n$, and also L_n^* in Eqn. (12) depends on $\mathbf{A}_n$ because these latent variables impact the class allocation probabilities. In turn, $\mathbf{A}_n$ depends on randomly distributed disturbance terms $\boldsymbol{\eta}_n = [\eta_{nk}]$. To indicate this dependence, we write $L_n^*(\mathbf{A}_n \mid \boldsymbol{\eta}_n)$ and $L_n(\mathbf{A}_n \mid \boldsymbol{\eta}_n)$, respectively. To estimate parameters $(\boldsymbol{\gamma}, \boldsymbol{\varphi}, \boldsymbol{\tau}, \boldsymbol{\alpha}, \boldsymbol{\beta}, \boldsymbol{\theta}, \boldsymbol{\omega}, \lambda^{\mathrm{W}})$ in our econometric model, we maximise the joint log-likelihood,

$$\log \mathrm{L} = \sum_{n=1}^{N} \log \left(\int_{\eta_{n1}=-\infty}^{\infty} \cdots \int_{\eta_{nK}=-\infty}^{\infty} L_n^*(\mathbf{A}_n \mid \boldsymbol{\eta}_n) L_n(\mathbf{A}_n \mid \boldsymbol{\eta}_n) d\Phi_1(\eta_{n1}) \cdots d\Phi_K(\eta_{nK}) \right), \tag{14}$$

where $\Phi_k(\cdot)$ is the cumulative distribution function for the standard normally distributed disturbance term associated with latent construct k. The Riemann-Stieltjes integral in Eqn. (14) can be approximated using Monte Carlo simulation. Since $u = \Phi_k(\eta_{nk})$ maps by definition to a uniform distribution, inverse $\Phi_k^{-1}(u)$ returns the original (in our case, standard normal) distribution when $u \sim U(0,1)$. Therefore, the joint log-likelihood can be approximated using Monte Carlo simulation,

$$\log \mathrm{L} \approx \sum_{n=1}^{N} \log \left(\sum_{r=1}^{R} L_n^* \left(\mathbf{A}_n \mid \Phi_1^{-1}(u_{n1}^{(r)}), \ldots, \Phi_K^{-1}(u_{nK}^{(r)}) \right) L_n \left(\mathbf{A}_n \mid \Phi_1^{-1}(u_{n1}^{(r)}), \ldots, \Phi_K^{-1}(u_{nK}^{(r)}) \right) \right), \tag{15}$$

where $R = 500$ is the number of (pseudo- or quasi-) random draws between 0 and 1. In our study, sequences $(u_{n1}^{(r)},\ldots,u_{nK}^{(r)})$ are determined through modified Latin hypercube sampling. Note that in all models we estimate positional constants and a scale parameter on the worst choice, in order to ensure that the parameters of interest (measure of relative importance) are unbiased.

4. Data collection and Sample

Survey data were collected via an online survey fielded in New South Wales (NSW), Australia during the first quarter of 2024. Respondents were recruited through a commercial consumer panel; eligibility required residence in NSW and being qualified to vote in Australian elections. A small fee was paid to participating respondents by the panel provider. The instrument was programmed and administered on the SurveyEngine platform. Project resources supported recruitment of up to 1,500 participants. An initial pilot wave (n = 50) was used to pretest the survey before full launch. The main field phase yielded an additional 1,449 completes. After data-quality screening to remove suspected bots, poor-quality, and otherwise invalid cases, 1,227 respondents remained for analysis reported in this paper.

The respondents to our BWS experiment are identical to the sample described more fully in Beck et al. (2025), which established that the sample could be considered broadly representative of the NSW population. For ease of reference to readers of this current paper, we present key sociodemographic and socioeconomic comparisons to the most recent Census (ABS 2022) in Table 2. The sample skews slightly female and given that we wanted to obtain an adequate sample of regional and rural residents to gauge their attitudes, our sample is also biased towards non-urban areas. To account for this difference, we tested the addition of a dummy variable representing the residential location (metropolitan or not) in the latent class assignment model (along with all sociodemographic and economic variables), see Section 4, but we did not find a statistically significant effect.

Table 2: Sample Characteristics

	Sample	**Census (ABS 2022)**
Gender (Male)	42%	48%
Ave. Age (Years)	41yr	38yr
Ave. Household Income ($’000)	$111	$116
Share of those in Sydney region	53%	68%

5. Results

5.1. Factor Analysis and Latent Constructs

The factor loadings for of this our exploratory factor analysis on the attitudinal indicators are shown in the Appendix (Table A2), with four latent attitudinal constructs being identified. Note that the Kaiser–Meyer–Olkin (KMO) statistic of 0.91 indicates "superb" sampling adequacy, and Bartlett's Test of Sphericity is highly significant ($\chi^2 = 11{,}247$, d.f. = 136, $p < 0.001$), confirming that the correlations among items are strong and thus the identification of these factors is extremely markedly robust.

The first latent construct is termed *Fairness & Personal Benefits*, as it captures people's sense that a kilometre-based scheme could make travel fairer, provide better personal opportunities, improve the overall driving experience, and secure benefits for future generations. The second latent construct is termed *Environmental & Network Gains* as it loads indicator items linked to congestion relief, environmental responsibility, and encouraging more sustainable transport choices. The third construct is termed *Perceived Harms & Threats* as the indicators that load onto this factor reflect concerns that road pricing could undermine jobs, limit personal freedom, or harm people's ability to access roads: this latent variable represents the anxieties about risks and losses that people fear could come with reform. The fourth and final construct is termed *User-Pays Reform Support* as the indicators grouped in this factor relate to the need for new funding sources, the principle that roads should be paid for by those who use them, and recognition that reform will be challenging but necessary. This label captures the underlying acceptance of the user-pays principle and the broader rationale for change.

5.2. Multinomial Logit Best-Worst Model (MNL)

An initial MNL model was estimated to provide the overarching ordering of what matters most to respondents regarding the potential features of a road user charging scheme. Table 3 presents the parameter estimates for this model, noting that statistically insignificant parameters related to the policy features are not unimportant; rather, they are not statistically different from the base statement. Likewise, significant negative parameters do not imply a lack of importance but instead indicate that the feature is statistically less important than the base level. As mentioned in Section 4.2.2, the last statement (#16, "if road user charging reform occurs, it should be applied to all vehicles at the same time") is set as the base in the dummy coding scheme used in the utility function in Equation (7). To further aid interpretation, Figure 2 plots rescaled estimates from the model. Rescaling was achieved by subtracting the minimum parameter estimate from each item's estimate and dividing the result by the parameter range (i.e., the difference between the largest and smallest parameter values) and multiplying the result by 100. This produces a scaled value between 100 (most important) and 0 (least important).

Table 3: MNL Parameter Estimates – Road User Charging Policy BWS

	Estimate	Robust Std. Err.	Robust t-value
Policy features (β)			
Roads are operated on a not-for-profit basis	0.35	0.07	4.88
Publicly accessible roads are not owned or operated by private companies	0.30	0.07	4.33
Road investment decisions are based on independent advice (and not made for political gain)	0.25	0.05	4.93
Road use data (by vehicles) is collected and used to better manage roads and make road network investment decisions	0.19	0.06	3.24
A nationally consistent road user charging system is introduced across the country	0.18	0.05	3.70
Some free kilometres are provided each month	0.14	0.07	1.91
Road rules, driver's licenses and vehicle registrations are national, and not state based	0.14	0.06	2.46
Money collected is used on the roads it is collected from	0.10	0.05	1.90
If road reform occurs, it should be applied to all vehicles at the same time (and not made via a staged approach) [BASE]	0.00	NA	NA
Some of the money collected from road user charges is used to make improvements to public transport	-0.02	0.04	-0.41
Road maintenance & construction funded from money collected from road users, not from other government sources	-0.03	0.05	-0.58
The price per kilometre depends on the weight of the vehicle (heavier vehicles pay more)	-0.23	0.07	-3.11
The price per kilometre depends on the type of road being driven on (motorway/highway/street/lane etc)	-0.23	0.07	-3.24
Tolls are eliminated and replaced with the price per kilometre model	-0.24	0.06	-3.96
The price per kilometre depends on the engine fuel type (electric/petrol/diesel/gas)	-0.50	0.07	-6.67
The price per kilometre depends on congestion levels	-0.56	0.09	-6.54
Scale $(\lambda^{W}, \lambda^{B})$			
Least important feature (worst choice) *(t-value is a test against value of 1)*	1.32	0.15	2.11
Most important feature (best choice) [BASE]	1.00	NA	NA
Alternative-specific constants (δ)			
Position 1	0.23	0.07	3.23
Position 2	0.36	0.06	5.97
Position 3	0.16	0.04	3.64
Position 4	0.10	0.04	2.53
Position 5	-0.04	0.03	-1.09
Position 6 [BASE]	0.00	NA	NA
	LL (obs. Shares)		*-35395.79*
	LL (Final)		*-33157.60*
	Adj.Rho2		*0.063*
	AIC		*66357.20*
	BIC		*66508.53*

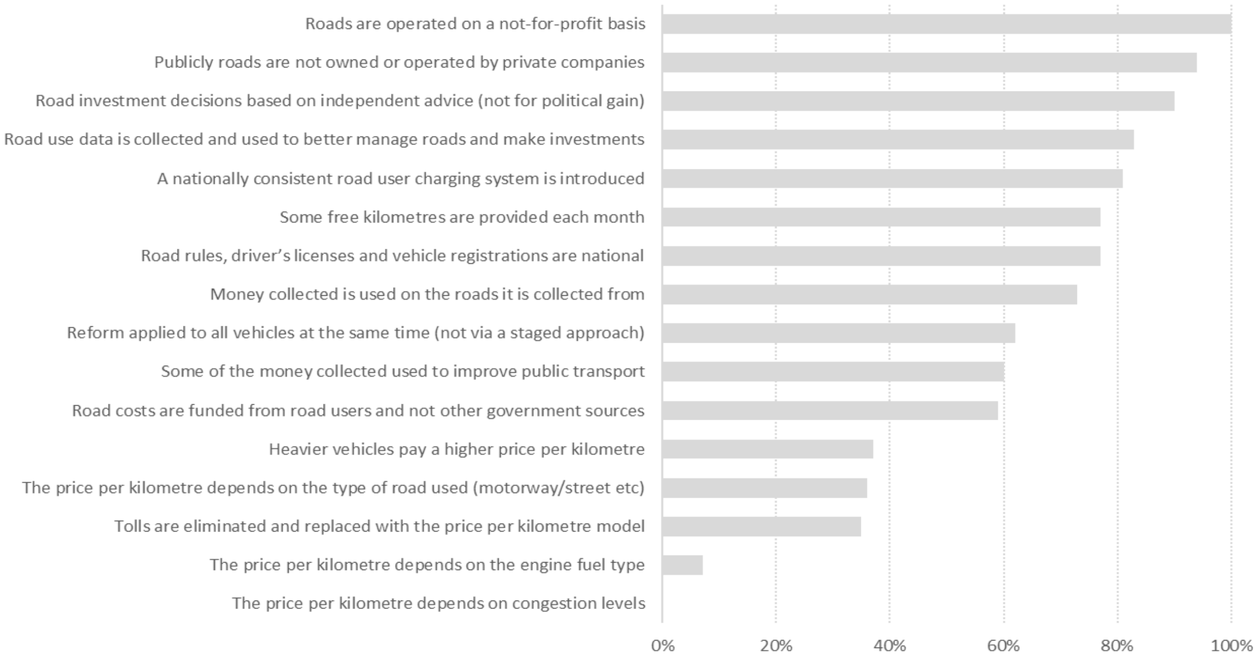

Figure 2: Relative Importance of Road User Charging Policy Measures

Respondents show a clear preference for governance and transparency features in a national road user charging reform. The strongest support is for roads being operated on a not-for-profit, publicly controlled basis, with investment decisions made independently and road use data guiding management and investment. National consistency in road user charging, rules, licensing and registration is also viewed positively. People welcome a modest allowance of free kilometres and favour revenue being spent on the roads where it is collected. Applying reform to all vehicles at once generates little reaction, while directing funds to public transport or relying solely on user charges elicits broadly neutral responses. Respondents resist complex price differentiation. There is strong relative dislike for prices that rise with congestion or vary by fuel type, as well as relatively negative reactions to pricing by road type, higher charges for heavier vehicles, and replacing tolls with a per-kilometre charge. Overall, legitimacy, public control and simplicity appear more important than finely tuned usage-based pricing.

5.3. Latent Class Best-Worst Hybrid Choice Model (LCM)

To better understand how preferences for elements of road pricing policy might vary within the population, we also estimated a latent class model on the data from our BWS experiment. Attitudes were used to explain preference heterogeneity via the class allocation model; hence a hybrid structure as described in Section 3.2 is employed to estimate the impact of latent attitudes on the best-worst policy feature choices as well as the responses observed on the attitudinal indicators.

5.3.1. Measurement Model Results

The measurement model is the component that links latent constructs that motivate both observed choices and attitudes, to the responses on the attitudinal indicators. Using the latent constructs identified by the factor analysis, we observed that the threshold parameters $\tau_{s,1}$ to $\tau_{s,5}$ from the ordered logit model (see Table A3 in the appendix) are all increasing, reflecting expected monotonic movement through the strength of agreement scale. Estimates of coefficients φ_1 to φ_{16} (see Table 4) measure the impact of each latent variable on the respective attitudinal indicator scales that are modelled to be a function of that construct. Note that it is difficult to interpret each set of these two coefficients in isolation as their impacts are not independent of each other. A more appropriate interpretation is via their joint impact on probabilities, and this is best done via the decision support system which we introduce and explore in Section 5.3.3.

Table 4: Latent Class Hybrid Choice Model – Measurement Model (Coefficients)

	LV1†	LV2†	LV3†	LV4†	Estimate	Robust Std. Err.	Robust t-ratio
Attitudes (φ)							
qCPKM	●				1.63	0.12	13.97
qATT1	●				3.72	0.31	12.18
qATT2	●				3.85	0.35	11.04
qATT5	●				3.64	0.25	14.45
qATT7	●				2.54	0.20	12.68
qATT8	●				2.84	0.25	11.40
qATT9	●				3.60	0.31	11.53
qATT10		●			2.34	0.33	7.00
qATT11		●			2.62	0.36	7.21
qATT12		●			1.94	0.19	10.48
qATT13		●			2.29	0.22	10.30
qATT3			●		1.89	0.15	12.77
qATT4			●		2.56	0.27	9.48
qATT6			●		2.05	0.19	10.85
qNWSF				●	0.40	0.24	1.69
qFUND				●	0.59	0.25	2.38
qUSCH				●	0.48	0.25	1.94

† Latent variable definitions: LV1 = Fairness & Personal Benefits, LV2 = Environmental & Network Gains, LV3 = Perceived Harms & Threats, LV4 = User-Pays Reform Support

Available covariates were trialled as variables in the measurement model, with income, the distance a respondent drives per year, and ownership of an EV or hybrid vehicle having significant impact. Estimated coefficients of these variables are shown in Table 5. These coefficients indicate that perceptions of *Fairness and Personal Benefits* are stronger among those who drive more and among EV/Hybrid owners, while income plays no role. In contrast, *Environmental and Network Gains* are most strongly perceived by EV/Hybrid owners, whereas heavier drivers tend to discount such benefits, and again, income has little effect. The latent variable *Perceived Harms and Threats* exhibit a different pattern, with higher income groups and those who drive more kilometres expressing stronger concerns, reflecting heightened sensitivity to risks or potential costs, while EV or hybrid ownership is insignificant. Finally, *User-Pays Reform Support* is significantly higher among wealthier individuals, but lower among heavier drivers.

Table 5: Covariate Impacts on Latent Variables

Latent variable	Covariate (γ)	Estimate	Robust Std. Err.	Robust t-value
Fairness & Personal Benefits	Income (in $10'000)	0.004	0.004	0.87
	KM Driven (in 1000km)	0.022	0.011	2.04
	Own EV/Hybrid (Yes)	0.144	0.064	2.24
Environmental & Network Gains	Income (in $10'000)	-0.003	0.004	-0.81
	KM Driven (in 1000km)	-0.007	0.003	-2.48
	Own EV/Hybrid (Yes)	0.214	0.072	2.97
Perceived Harms & Threats	Income (in $10'000)	0.011	0.004	2.54
	KM Driven (in 1000km)	0.009	0.002	3.87
	Own EV/Hybrid (Yes)	0.019	0.074	0.25
User-Pays Reform Support	Income (in $10'000)	0.022	0.011	2.04
	KM Driven (in 1000km)	-0.018	0.007	-2.55
	Own EV/Hybrid (Yes)	-0.093	0.181	-0.51

5.3.2. Choice Model Results

Table 6 provides the estimates of the parameters in the choice model component of the hybrid model and for better comparison of class specific results, Figure 3 shows the rescaled estimates from the model as per the MNL. As with the MNL results, the parameter estimates interpreted relative to the base level statement "If road reform occurs, it should be applied to all vehicles at the same time (...)", as are the level of significance measures. The policy features in this table have been sorted from most to least important as per the largest class (*Pragmatic Benefits*). In estimation, different numbers of classes were trialled before ultimately determining that three differing preferences classes ($C=3$) gave the best balance of model fit, sensible parameter estimates, and behavioural insight. Similarly to the naming of the latent variables, we named each class based on the mix of preferences exhibited within each class. We note that the scale parameter differs from the MNL when preference heterogeneity is included.

The first class is termed "*Fairness & Consistency*" and comprises 18% of the sample. This class is defined by a strong preference for uniformity and institutional control: they favour a nationally consistent charging system and public ownership of roads, while showing importance on differentiated charging schemes such as congestion-based, engine-based, or road user charging revenue being used for public transport provision. The policy rankings seemingly imply a desire for stable, simple, and universal rules among members of this class. With respect to who are more likely to belong to this segment, the coefficient for the *Perceived Harms & Threats* latent variable in the class allocation model is significantly negative, indicating that individuals who see road pricing as threatening or harmful are less likely to fall into this class. In contrast, coefficients for male and age are positive and significant, suggesting older and male respondents are more likely to belong. Overall, this segment appears to be motivated less by fear or hostility toward road pricing and more by procedural concerns with fairness and consistency, with a demographic skew toward older men. We note that

The second class is termed "*Public Good*" and accounts for 33% of respondents. Members of this class value not-for-profit road operations, have a stronger preference public ownership than other classes, and support independent investment decision-making; thus indicating a policy framework that ensures trust in collective arrangements (institutional legitimacy) and safeguards against private capture to be important (collective governance). Similar to the *"Fairness & Consistency"* class, this segment puts little importance on pricing differentiation by engine fuel type, road type, and congestion levels, but in addition also does not believe that differentiation by vehicle weight is important; implying a sceptical view of road user charging policy that is specifically targeted or more punitive to different groups. In contrast to the first class, this segment attaches more importance to the use of revenues for public transport investment. With respect class membership, this segment is the base class in the allocation model, but generally members of this group have a higher probability of being female as compared to the other two classes.

The third and final class is termed "*Pragmatic Benefits*" and accounts for almost half of respondents (49%). Overall, they place significant importance on a monthly free kilometre allowance and the allocation of funds to improve public transport. Outside of these two policy features, there is very little differentiation on policy features, suggesting that all are considered equally important. The class allocation model indicates that members of this class are more likely to be male, and more likely to have a stronger *Fairness & Personal Benefits* latent construct; the interpretation here being that those who see road pricing as a mechanism to deliver direct and tangible fairness, or individual advantages, are significantly more likely to belong in this class.

Table 6 (Part 1): Latent Class Hybrid Choice Model – Choice Model

	Fairness & Consistency (18%)			Public Good (33%)			Pragmatic Benefits (49%)		
	Estimate	Robust Std.err	Robust t-ratio	Estimate	Robust Std.err	Robust t-ratio	Estimate	Robust Std.err	Robust t-ratio
Policy features $(\boldsymbol{\beta}_c)$									
Some free kilometres are provided each month	-0.01	0.30	-0.04	0.04	0.20	0.18	0.52	0.19	2.78
Some of the money collected used to improve public transport	-2.51	0.55	-4.61	0.49	0.18	2.81	0.50	0.13	3.84
The price per kilometre depends on the type of road used (motorway/street etc)	-0.95	0.33	-2.89	-0.95	0.20	-4.69	*0.35*	*0.19*	*1.90*
Heavier vehicles pay a higher price per kilometre	0.23	0.32	0.72	-1.29	0.23	-5.56	0.30	0.19	1.57
Road use data is collected and used to better manage roads and make investments	-0.18	0.22	-0.78	0.47	0.17	2.70	*0.26*	*0.15*	*1.74*
Road costs are funded from road users and not other government sources	-0.11	0.29	-0.36	-0.18	0.17	-1.06	*0.26*	*0.15*	*1.78*
A nationally consistent road user charging system is introduced	0.81	0.17	4.66	0.07	0.15	0.45	0.18	0.13	1.37
Money collected is used on the roads it is collected from	-0.30	0.35	-0.85	0.60	0.17	3.53	0.17	0.15	1.14
Tolls are eliminated and replaced with the price per kilometre model	*0.44*	*0.24*	*1.85*	-1.08	0.20	-5.45	0.14	0.17	0.85
Roads are operated on a not-for-profit basis	*0.59*	*0.31*	*1.91*	1.02	0.20	5.03	0.12	0.17	0.69
Road investment decisions based on independent advice (not for political gain)	*0.40*	*0.22*	*1.83*	0.75	0.17	4.50	0.08	0.14	0.56
The price per kilometre depends on the engine fuel type	-2.55	0.59	-4.29	-1.11	0.19	-5.73	0.05	0.16	0.29
Road rules, driver's licenses and vehicle registrations are national	*0.55*	*0.30*	*1.85*	0.47	0.19	2.48	0.02	0.15	0.11
Reform applied to all vehicles at the same time (not via a staged approach) [BASE]	0.00	NA	NA	0.00	NA	NA	0.00	NA	NA
Publicly roads are not owned or operated by private companies	0.86	0.28	3.11	1.03	0.19	5.29	-0.01	0.16	-0.07
The price per kilometre depends on congestion levels	-2.46	0.44	-5.57	-1.22	0.21	-5.85	-0.10	0.19	-0.52
Scale $(\lambda_c^W, \lambda_c^B)$									
Least important feature (worst choice) *(t-value is a test against value of 1)*	0.48	0.07	-7.04	0.94	0.08	-0.71	0.43	0.09	-6.66
Most important feature (best choice) [BASE]	1.00	NA	NA	1.00	NA	NA	1.00	NA	NA
Alternative-specific constants $(\boldsymbol{\delta}_c)$									
ASC_Position_1	-0.11	0.27	-0.40	0.01	0.16	0.10	1.15	0.16	7.10
ASC_Position_2	-0.23	0.20	-1.11	0.56	0.15	3.73	0.77	0.15	5.04
ASC_Position_3	-0.23	0.22	-1.05	0.11	0.13	0.84	0.64	0.13	5.09
ASC_Position_4	-0.20	0.13	-1.57	0.22	0.11	2.05	0.33	0.12	2.75
ASC_Position_5	-0.13	0.23	-0.57	-0.09	0.12	-0.70	0.04	0.11	0.38
ASC_Position_6 [BASE]	0.00	NA	NA	0.00	NA	NA	0.00	NA	NA

Table 6 (Part 2): Latent Class Hybrid Choice Model – Class Allocation Model

	Fairness & Consistency (18%)			Public Good (33%)			Pragmatic Benefits (49%)		
	Estimate	**Robust Std.err**	**Robust t-ratio**	**Estimate**	**Robust Std.err**	**Robust t-ratio**	**Estimate**	**Robust Std.err**	**Robust t-ratio**
Constant (α_c)									
Constant	-3.95	0.66	-6.01	0	NA	NA	-0.12	0.32	-0.37
Latent variables (ω_c)									
Fairness & Personal Benefits	0.37	0.37	0.99	0	NA	NA	1.26	0.20	6.46
Environmental & Network Gains	0.02	0.22	0.11	0	NA	NA	0.02	0.16	0.13
Perceived Harms & Threats	-0.70	0.23	-3.08	0	NA	NA	0.11	0.13	0.86
User-Pays Reform Support	0.30	0.39	0.77	0	NA	NA	-0.12	0.17	-0.68
Covariates (θ_c)									
Gender (Male)	0.74	0.28	2.66	0	NA	NA	0.48	0.19	2.60
Age (yrs)	0.07	0.01	7.36	0	NA	NA	0.01	0.01	0.87

LL (Shares)	-70350.30
LL (Final)	-62896.94
Adj.Rho2	0.11
AIC	126163.90
BIC	127112.40

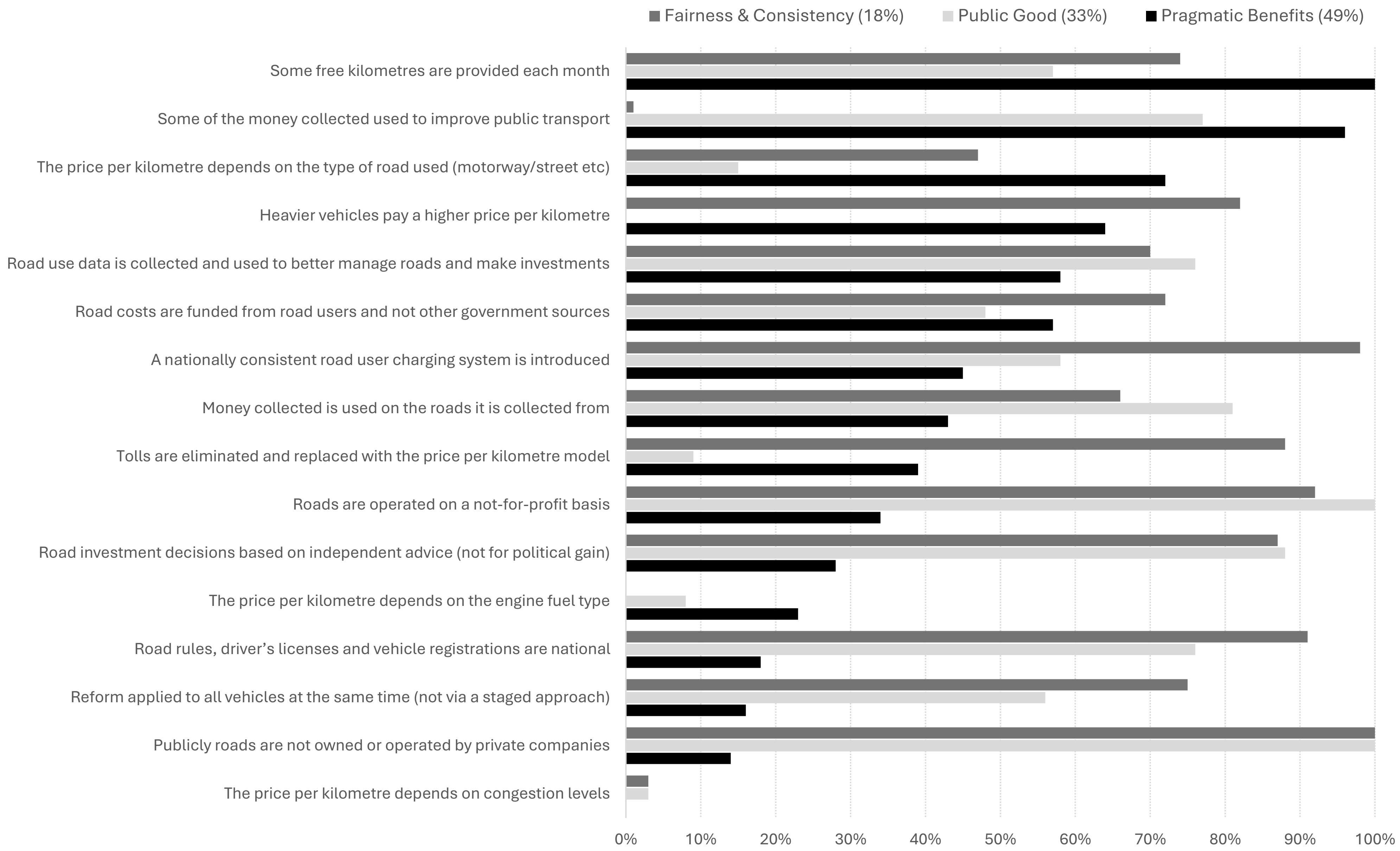

Figure 3: Relative Importance of Road User Charging Policy Measures by Preference Class

Looking at the preferences exhibited across the three classes, the most striking differences lie in the responses to differentiated pricing structures, governance safeguards, and the balance between principle and pragmatism. The "*Fairness & Consistency*" and "*Public Good*" classes exhibit converging preferences with respect to their general resistance to differentiated pricing mechanisms, though those in "*Fairness & Consistency*" do so with greater intensity, highlighting their stronger emphasis on uniformity. The "*Public Good*" segment instead distinguishes itself through prioritisation of governance legitimacy and institutional safeguards and place less weight on charging uniformity. Contrasting these two classes are those in the "*Pragmatic Benefits*" segment who differ markedly by exhibiting relative indifference to institutional features while expressing greater acceptance of differentiated pricing arrangements, positioning outcomes and personal benefits as primary evaluative criteria.

5.3.3. A Decision Support System to Assess Relative Impacts

As discussed in Section 5.3.1, the parameters from the measurement model hold no behavioural meaning given the current model specification and hence cannot be readily interpreted. This is because the measurement model parameters simply act as scalars of the estimated latent variables (see Equation 2) derived from the structural model (obtained from Equation 1), with the rescaled latent variables then compared to the statement specific threshold parameters. As such, given that both φ_s and threshold parameters differ for each statement, it is not possible to determine the impact of φ_s without simultaneously considering the associated statement specific vector of threshold parameters. Further, the estimated value for the k^{th} latent variable, A_{nk} in Equation (1) is a function of both covariates, $\boldsymbol{z}_n$ and estimated parameter weights, γ_k meaning that the sign of A_{nk} may differ across different respondents depending on the signs of the covariates and parameter estimates, making it difficult to interpret how latent variables impact both the measurement equation and discrete choice component of the hybrid model.

For this reason, rather than attempt to directly interpret the parameters of the model, we construct a decision support system (DSS) which allows us to determine the impact of various components of the model structure on the estimated behavioural outputs, such as the estimated model choice probabilities. The DSS, available in the supplemental material, is set up as a simple two-stage structure that links covariates, latent attitudes, and predicted choices within one simulation framework. At the input level, the model takes the set of covariates used in the model (age, gender, EV owner, KM driven, and income) that act as the drivers of the structural model. These inputs feed into a structural equation modelling (SEM) stage that estimates several latent attitudes using simulation draws to reflect unobserved differences across people. An important feature of the model overall is that the latent variables are not fixed in sign or size; they change depending on the input profile. In particular, it was observed that switching electric-vehicle ownership from 0 (non-owner) to 1 (owner), while holding everything else constant, was enough to flip the sign of some latent variables; most notably "*Environmental & Network Gains*" and "*User-Pays Reform Support*". The SEM stage also produces predicted probabilities for attitudinal survey responses, keeping a direct link between the unobserved attitudes and what respondents report. The estimated latent attitudes, together with the original input variables, are then passed into the discrete choice model (DCM), which predicts class membership and in turn the likelihood of selecting different policy or option outcomes.

Presented in Figure 4 are the results of nine different scenarios evaluated in the DSS. (1) represents the baseline scenario with the "sample averages" used to simulate the policy choice probabilities, with the subsequent variations made: (Input 2) Gender, (3) EV Owner, (4) Low-Kilometre EV Driver, (5) High-Kilometre EV Driver, (6) Lower-Income Driver, (7) Higher-Income Driver, (8) Younger Driver, and (9) Older Driver. When these different respondent covariate profiles are tested, a consistent pattern emerges: the covariates which are used in the estimation of the latent variables (see Table 4) have only a small effect on the final policy preference predictions compared with variables that enter the class allocation function direct, such as age or gender.

		Input 1		Input 2		Input 3		Input 4		Input 5		Input 6		Input 7		Input 8		Input 9
	Age	42	Age	42	Age	42	Age	42	Age	42	Age	42	Age	42	Age	20	Age	60
	Gender	0	Gender	1	Gender	0	Gender	0	Gender	0	Gender	0	Gender	0	Gender	0	Gender	0
	EV owner	0	EV owner	0	EV owner	1	EV owner	1	EV owner	1	EV owner	0	EV owner	0	EV owner	0	EV owner	0
	KM driven	11,585	KM driven	11,585	KM driven	11,585	KM driven	8,000	KM driven	15,000	KM driven	11,585	KM driven	11,585	KM driven	11,585	KM driven	11,585
	Income	$101,284	Income	$101,284	Income	$101,284	Income	$101,284	Income	$101,284	Income	$80,000	Income	$125,000	Income	$101,284	Income	$101,284
	Output 1		Output 2		Output 3		Output 4		Output 5		Output 6		Output 7		Output 8		Output 9	
Policy	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**
Price per kilometre depends on vehicle weight	0.048	0.093	0.054	0.082	0.050	0.090	0.048	0.093	0.048	0.093	0.048	0.093	0.048	0.093	0.044	0.101	0.059	0.073
Price per kilometre depends on road type	0.046	0.080	0.049	0.075	0.048	0.078	0.046	0.080	0.047	0.080	0.046	0.080	0.046	0.080	0.047	0.082	0.050	0.072
Price per kilometre depends on congestion levels	0.029	0.109	0.030	0.106	0.031	0.107	0.029	0.110	0.030	0.109	0.029	0.110	0.029	0.109	0.031	0.107	0.030	0.106
Some free kilometres are provided each month	0.070	0.047	0.072	0.048	0.071	0.048	0.069	0.047	0.070	0.048	0.070	0.047	0.070	0.047	0.070	0.047	0.072	0.048
Price per kilometre depends on engine fuel type	0.033	0.102	0.035	0.101	0.035	0.100	0.033	0.103	0.034	0.102	0.033	0.102	0.034	0.102	0.035	0.098	0.034	0.102
Road use data collected and used for planning and investment	0.070	0.046	0.068	0.048	0.070	0.047	0.070	0.046	0.070	0.046	0.070	0.046	0.070	0.046	0.073	0.044	0.065	0.050
Tolls eliminated and replaced with per-kilometre model	0.046	0.084	0.052	0.076	0.048	0.082	0.047	0.084	0.046	0.084	0.046	0.084	0.047	0.084	0.041	0.091	0.058	0.069
Roads operated on a not-for-profit basis	0.095	0.041	0.089	0.044	0.092	0.043	0.095	0.041	0.094	0.042	0.095	0.041	0.095	0.041	0.097	0.041	0.085	0.046
Public roads not owned or operated by private companies	0.096	0.043	0.091	0.046	0.093	0.045	0.096	0.042	0.095	0.043	0.096	0.043	0.096	0.043	0.095	0.043	0.090	0.047
Money collected is used on the roads it is collected from	0.070	0.046	0.066	0.050	0.070	0.047	0.070	0.046	0.071	0.046	0.071	0.046	0.070	0.046	0.074	0.045	0.062	0.052
Road investment decisions based on independent advice	0.079	0.044	0.075	0.047	0.077	0.046	0.079	0.044	0.079	0.045	0.079	0.044	0.079	0.044	0.080	0.044	0.073	0.049
Nationally consistent road user charging system	0.067	0.050	0.071	0.050	0.066	0.051	0.067	0.050	0.066	0.050	0.067	0.050	0.067	0.050	0.060	0.051	0.077	0.049
Road rules, licences and registrations are national	0.069	0.048	0.069	0.050	0.068	0.049	0.069	0.047	0.069	0.048	0.069	0.048	0.069	0.048	0.067	0.048	0.070	0.051
Road works funded from money collected from users	0.055	0.055	0.057	0.055	0.056	0.056	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.056	0.058	0.055
Some money used to improve public transport	0.074	0.055	0.070	0.064	0.075	0.055	0.074	0.056	0.074	0.055	0.074	0.055	0.074	0.055	0.081	0.045	0.064	0.074
Reform applied to all vehicles at the same time	0.052	0.056	0.052	0.057	0.052	0.057	0.052	0.056	0.052	0.056	0.052	0.056	0.052	0.056	0.051	0.056	0.053	0.057
sum	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**

Figure 4: Simulated Respondent Policy Choice Probabilities

There are several possible reasons for this. First, it may be possible that the latent attitudes themselves do not vary greatly between respondents, leading to only small differences across differing covariates. This does not necessarily indicate a "problem" with the input variables in the structural model (in this study however are scales items are robust and grounded in the literature): it may simply be there is limited variation. Second, some variables, such as EV ownership, push different latent attitudes in opposite directions, which can cancel out their overall effect. Third, this weak downstream impact of latent attitudes may actually be quite common in hybrid choice models but rarely discussed. In this sense, the DSS is less about inspecting individual coefficients and more about providing a practical way to see how demographics, attitudes, and choices interact when realistic respondent profiles are tested. Finally, wholesale differences in the magnitude of the latent variable itself across respondents produce the biggest impact on choice probabilities, justifying their incorporation via the hybrid approach.

6. Discussion

6.1. From Necessity to Design

Beck et al. (2025) established that there is a general acceptance of a need to change how roads are funded and an overall sense that a move towards some kind of road user charging is inevitable. The recognition is made considering increasing damage to roads from extreme weather and the greater adoption of more fuel efficient, and in particular electric, vehicles. In this paper we have extended that foundation by examining not just whether change is seen as necessary, but how different specific design features of a road user charging system are valued, and how the public feels about them. We identify the ranked policy preferences of respondents and attitudes that underpin them. This perspective allows us to move beyond technical design questions toward a more nuanced discussion of what makes reform socially and politically viable.

6.2. Policy Preferences and Measuring Mood

At an aggregate level, the BWS results indicate a preference for a road user charging framework that establishes institutional safeguards: not-for-profit operation, public ownership, independent investment advice, and transparent reinvestment of revenues. More granular concerns about operational factors such as differentiated charging (congestion, fuel type, road type, weight) rank at the bottom of the policy features evaluated. However, when allowing for preference heterogeneity we see an important split in these preferences. In this model, this overall preference ordering is generally consistent for those in the *Fairness & Consistency* (18%) and *Public Good* (33%) classes, but those in the *Pragmatic Benefits* (49%) class do see some scope for differential charging based on type of road and vehicle weight. It is interesting to know that type of road and vehicle weight are fixed characteristics of pricing, unlike congestion-based pricing which is variable and thus potentially more difficult for road users to calculate likely costs in advance. We note however that the size of the classes are estimated on sample data, and our sample has a slight overrepresentation of females, thus there could be marginal change in the class allocation probabilities at the population level.

Given this mix of preference structures, policy design should thus prioritise governance arrangements that are visibly independent, nationally consistent, and demonstrably fair to build credibility. The consistently low ranking of differential pricing features indicates that while these mechanisms may be attractive to planners seeking efficiency, they could be seen by the public as complex and potentially inequitable. Policymakers should therefore be cautious in foregrounding these tools. If they are to be considered, they must be framed as secondary refinements to a system that first secures legitimacy and simplicity. After establishing such legitimacy, roll out of any form of differentiated pricing should likely being with simple calculations of differences in charges that remain constant, such as the weight of the vehicle being driven.

Equity concerns emerged as the second major theme in the BWS experiment, when twinned with the concerns reported in Beck et al. (2025), there is a degree of apprehension about the impact of road user charging with respect to the impact on rural drivers, long-distance commuters, pensioners, and low-income households. Beck et al. (2025) reported that respondents often stated that they fear disproportionate burdens, especially where travel is unavoidable. In this study, the mid-ranked preferences for features such as a monthly free kilometre allowance, local hypothecation of funds, and investments in public transport reflect these anxieties. In particular, the majority of respondents, those in the *Public Good* (33%) and *Pragmatic Benefits* (49%) classes, desire that some money be used to improve public transportation, but this should be done across all jurisdictions rather than focusing on CBD oriented transit. The provision of some number of free kilometres will also be important and helping alleviate equity concerns and is a policy feature that ranks highly across all preference classes.

With respect to the role of attitudes in determining policy preferences, of the four latent attitudinal constructs identified only two were found to significantly impact on preference structures within the latent class model. Specifically, only "*Fairness & Personal Benefits*" and "*Perceived Harms & Threats*" played a role, suggesting that while people may express a broad set of attitudinal positions towards road user charging, it is the tension between fairness and perceived harm that most powerfully determines what is important with respect to policy. The sociodemographic effects add nuance to this picture, albeit the impact of this nuance is small. The latent "*Fairness & Personal Benefits*" attitudinal construct is higher among those who drive more and among EV/Hybrid owners, suggesting these groups can be natural allies of reform when framed around fairness, sustainability, and modernisation. At the same time heavy drivers (and higher-income individuals) are also more likely to emphasise "*Perceived Harms & Threats*" seeing road pricing as costly or restrictive. This duality is interesting as it suggests that those who drive a lot are simultaneously the most receptive to the fairness narrative and the most alert to potential downsides. For policymakers, this implies that communication and design must do more than rest on fiscal or environmental arguments. Instead, targeted efforts to emphasise fairness and benefits while directly addressing perceived harms.

It is interesting to note that hybrid and EV owners, arguably the group most directly affected by road user charging reform since they currently avoid fuel excise, have a stronger latent attitudinal construct with respect to "*Fairness & Personal Benefits*" and are thus more likely to belong to the *Pragmatic Benefits* segment. This paradox is consistent with Hensher (2013) who found a higher willingness to pay among those who drive further linked, and can potentially be explained by several factors: that purchasing such a vehicle is a manifestation of a latent importance placed social and environmental good; that it represents a pragmatic evaluation of trade-offs with respect to the upfront cost of the vehicle and the ongoing running costs; it is also a manifestation of an early adopter attitude and acceptance of new technologies. Given these potential traits, these individuals are perhaps more likely to interpret road user charging in terms of fairness across all road users and to focus on whether the system delivers tangible benefits, rather than resisting it on the grounds of short-term personal loss. More research into the motivation of group is recommended.

6.3. Translating Preferences into Policy Pathways

Beyond technical design, the evidence shows that legitimacy, fairness, and simplicity are the foundations on which reform must rest. Public acceptance will depend not only on what is implemented but on how it is communicated and governed. The following policy recommendations outline the core elements of a pathway forward:

1) Build legitimacy first: Anchor reform in independent governance, transparent reinvestment of revenues, and nationally consistent rules to establish credibility before introducing complex features.

2) Design for equity: Establish how the framework will be fair to rural/regional drivers, long-distance commuters, pensioners, and low-income households either via free kilometre allowances, or rebates, or visible reinvestment in broadly accessible public transport, or demonstrable improvements to road infrastructure.

3) Keep it simple: Begin with straightforward, constant pricing elements (e.g., vehicle weight) and defer more complex differentiated tariffs (such as congestion pricing) until legitimacy and public trust are secured.

4) Frame the narrative: Communicate the inevitability of reform while emphasising fairness, shared benefits, and fiscal sustainability; highlight both personal and collective gains to balance perceived harms with visible benefits.

5) Safeguard trust: Address anxieties around surveillance, data use, and system reliability, ensuring transparency and protections are embedded from the start. Make hypothecation of funds to transport projects similarly transparent.

We strongly recommend that a well-designed and independently overseen trial be conducted to demonstrate how a road user charging framework can deliver on the five policy imperatives outlined above. Such a trial would allow governments to establish credibility through transparent revenue reporting and independent governance, while testing equity measures such as kilometre allowances, different kilometre charging rates, and use of different reporting technologies. At the same time a trial can provide a platform for testing communication strategies that frame change around fairness, fiscal sustainability, and shared benefit. Addressing issues of privacy, data use, and reliability in a controlled setting would also help build trust, ensuring protections are seen as real and enforceable. Importantly, the trial could generate compelling vignettes, real-world stories of households, commuters, and regions navigating the new system, that serve as powerful communication tools, helping to humanise reform, illustrate tangible benefits, and grow wider acceptance of road user charging.

The policy pathways outlined and summarised in Table 7 closely reflect, but also extend, the core determinants of acceptability identified in the literature (summarised in Section 2.3 and 2.4). Consistent with prior research, fairness, trust and transparency, perceived effectiveness, and simplicity emerge as central pillars shaping public support for road pricing reforms (Schade and Schlag 2003, Schade and Baum 2007, Baranzini et al. 2021). However, while the literature largely treats these factors as co-existing influences, the results of this study provide a clearer sense of their relative priority and practical sequencing. In particular, the BWS findings show a strong preference for institutional safeguards, such as independent governance, public ownership, and transparent reinvestment, while more technically efficient but complex features, such as differentiated pricing, are consistently ranked lower. This suggests that legitimacy and trust are not simply complementary design features, but foundational preconditions for reform.

Table 7: Policy in Relation to Literature

Policy Pathway	Lessons from Literature
Build legitimacy first	Trust & transparency
Design for equity	Fairness (horizontal & vertical)
Keep it simple	Simplicity
Frame the narrative	Perceived effectiveness & communication
Safeguard trust	Trust & privacy & hypothecation

Similarly, the prominence of equity-related features, including free kilometre allowances and reinvestment in broadly accessible transport, reinforces longstanding concerns around distributional impacts while highlighting the importance of making such measures visible and tangible to users. The attitudinal results further deepen this insight, indicating that preferences are primarily structured by the tension between perceived fairness and perceived harms, rather than a broad set of diffuse attitudes. Taken together, these findings suggest that successful reform must do more than incorporate fairness, trust, and simplicity in principle; it must prioritise them in both design and communication. More broadly, this study contributes to the literature by translating well-established theoretical determinants into a structured and actionable reform pathway. Rather than identifying what matters in general terms, the findings demonstrate how these elements can be prioritised, sequenced, and operationalised in practice, offering policymakers a clearer basis for designing road user charging frameworks that are both effective and publicly acceptable.

7. Conclusion

The choice modelling results highlight three distinct but overlapping classes of preferences: *Fairness and Consistency* (18%), *Public Good* (33%), and *Pragmatic Benefits* (49%). Despite differences in emphasis, there is broad agreement across all three groups that governance safeguards are more important than complex pricing mechanisms. Where they diverge is in their tolerance for differentiated charging: the *Fairness and Consistency* and *Public Good* classes are largely sceptical of such measures, while the *Pragmatic Benefits* class shows some acceptance of fixed, predictable differentials such as vehicle weight or road type. Importantly, all groups converge in rejecting variable, complex tariffs like congestion charging.

This study is subject to several limitations. First, the findings are based on stated preference data from a best–worst scaling experiment, which, while effective for eliciting relative importance, may not fully capture how individuals behave when faced with real financial costs or lived experience of a road user charging system. Second, although the sample is broadly representative of New South Wales, it exhibits some deviations from population characteristics, including a slight overrepresentation of females and non-urban respondents. Third, we attempted to elucidate a complete set of policy features for evaluation via evaluation of the literature and discussion with stakeholders, but we acknowledge that there may be other policy features that other jurisdictions may find important.

Acknowledging these limitations, taken together, the results reveal that legitimacy, simplicity, and equity must be prioritised above efficiency or technical sophistication. Ideally in partnership, governments at either State or Federal level should seize on this current sentiment by commissioning a well-designed and independently overseen trial. Such a trial would provide a credible platform for testing governance arrangements, simple pricing structures, and equity measures, while also generating real-world vignettes to communicate benefits in ways that build trust and acceptance. The independence of researchers in designing and evaluating this trial will be critical to establishing legitimacy, ensuring that road user charging can be advanced as not only economically rational but also socially robust and politically viable.

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Appendix

Table A1: Best-Worst BIBD Experimental Design

TASK #	**State. 1**	**State. 2**	**State. 3**	**State. 4**	**State. 5**	**State. 6**	***BLOCK***
1	1	2	5	6	11	12	*1*
2	3	4	7	8	9	10	*1*
3	5	6	9	10	13	14	*1*
4	7	8	11	12	15	16	*1*
5	1	2	9	10	15	16	*1*
6	3	4	11	12	13	14	*1*
7	1	2	7	8	13	14	*1*
8	3	4	5	6	15	16	*1*
9	1	3	6	8	13	15	*2*
10	2	4	5	7	14	16	*2*
11	5	7	9	11	13	15	*2*
12	6	8	10	12	14	16	*2*
13	2	4	6	8	9	11	*2*
14	1	3	5	7	10	12	*2*
15	2	4	10	12	13	15	*2*
16	1	3	9	11	14	16	*2*
17	1	4	5	8	10	11	*3*
18	2	3	6	7	9	12	*3*
19	5	8	9	12	13	16	*3*
20	1	4	6	7	13	16	*3*
21	1	4	9	12	14	15	*3*
22	6	7	10	11	14	15	*3*
23	2	3	10	11	13	16	*3*
24	2	3	5	8	14	15	*3*

Table A2: Factor Analysis Loadings – Road User Charging Attitudes

Reference	**Attitudinal Indicator**	*Fairness & Personal Benefits*	*Environmental & Network Gains*	*Perceived Harms & Threats*	*User-Pays Reform Support*
qCPKM	A cents per kilometre charge should be the way we pay for roads	**0.630**	0.017	-0.078	0.428
qATT1	... Provide me with better opportunities for travelling *	**0.820**	0.218	-0.064	0.057
qATT2	... Provide me with fairer options for travelling *	**0.794**	0.280	-0.146	0.056
qATT5	... Be beneficial to my overall driving experience *	**0.823**	0.222	-0.090	0.055
qATT7	... Address problems with roads now so that future generations don't have to deal with it *	**0.667**	0.357	-0.002	0.143
qATT8	... Help develop better quality roads and infrastructure *	**0.652**	0.487	-0.122	0.092
qATT9	... Ultimately benefit everyone *	**0.723**	0.415	-0.174	0.118
qATT10	... Be needed to help pay for damage caused by increasing unpredictable weather *	0.514	**0.608**	-0.030	0.085
qATT11	... Help pay for environmental damage caused by driving *	0.509	**0.616**	-0.031	0.109
qATT12	... Help people think about walking, cycling or taking public transport more often *	0.158	**0.816**	-0.011	0.107
qATT13	... Help us address congestion problems in the economy *	0.376	**0.745**	-0.050	0.091
qATT3	... Threaten jobs for people like me *	0.082	-0.010	**0.848**	-0.040
qATT4	... Limit my choices and personal freedom *	-0.181	-0.056	**0.861**	-0.011
qATT6	... Will harm people and their ability to use roads *	-0.215	-0.039	**0.820**	0.020
qNWSF	New sources of funding to pay for our roads are needed	0.166	0.079	0.091	**0.572**
qFUND	Changing the way we fund our road infrastructure will be challenging	-0.172	0.199	-0.054	**0.730**
qUSCH	Roads should be paid for by those that use them	0.373	-0.024	-0.103	**0.676**

* This attitudinal statement was preceded with "A kilometre-based price for roads will ...".

Table A3: Latent Class Hybrid Choice Model - Measurement Model (Ordered Logit Thresholds)

	τ_0	τ_1		τ_2		τ_3		τ_4		τ_5		τ_6
		Estimate	Rob.S.E.	Estimate	Rob.S.E.	Estimate	Rob.S.E.	Estimate	Rob.S.E.	Estimate	Rob.S.E.	
Attitudes												
qCPKM	-∞	-2.07	0.23	-0.89	0.22	-0.02	0.22	1.61	0.22	3.33	0.25	∞
qATT1	-∞	-4.15	0.51	-2.05	0.50	-0.31	0.49	2.32	0.51	5.05	0.55	∞
qATT2	-∞	-4.68	0.54	-2.66	0.52	-1.01	0.51	1.79	0.51	4.75	0.56	∞
qATT5	-∞	-4.17	0.53	-1.99	0.50	-0.18	0.49	2.25	0.48	4.75	0.49	∞
qATT7	-∞	-3.80	0.36	-2.18	0.34	-0.86	0.33	1.19	0.35	3.53	0.38	∞
qATT8	-∞	-4.58	0.44	-2.75	0.39	-1.39	0.38	0.86	0.38	3.53	0.40	∞
qATT9	-∞	-4.46	0.50	-2.49	0.48	-0.94	0.47	1.51	0.49	4.08	0.53	∞
qATT10	-∞	-3.96	0.39	-2.42	0.33	-1.26	0.29	0.97	0.29	3.57	0.37	∞
qATT11	-∞	-4.12	0.43	-2.64	0.36	-1.46	0.33	0.97	0.32	3.84	0.41	∞
qATT12	-∞	-3.83	0.28	-2.50	0.25	-1.45	0.24	0.51	0.24	2.76	0.28	∞
qATT13	-∞	-4.01	0.34	-2.44	0.30	-1.15	0.28	0.87	0.28	3.38	0.33	∞
qATT3	-∞	-2.23	0.21	-0.45	0.18	0.70	0.18	1.96	0.20	3.47	0.23	∞
qATT4	-∞	-3.60	0.34	-1.62	0.26	-0.34	0.23	1.46	0.25	3.42	0.31	∞
qATT6	-∞	-3.47	0.27	-1.59	0.21	-0.23	0.19	1.34	0.20	3.13	0.23	∞
qNWSF	-∞	-3.48	0.19	-2.37	0.13	-1.56	0.11	0.002	0.09	1.73	0.13	∞
qFUND	-∞	-4.38	0.29	-3.20	0.20	-2.39	0.17	-0.72	0.13	1.04	0.14	∞
qUSCH	-∞	-3.14	0.20	-1.90	0.15	-1.11	0.12	0.22	0.10	1.83	0.13	∞