More than a feeling: symbolic meanings of transport modes in popular music

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SHORT SUMMARY

This study explores how transport modes are emotionally and symbolically represented in popular music, a cultural form that reflects collective values and shapes mobility meanings often invisible to conventional travel surveys. Analyzing 27,017 Billboard Hot 100 songs (1958–2025) through a hybrid NLP pipeline combining transformer-based affect classification and LLM coding across 18 symbolic dimensions, we find that emotional differences between modes are modest, while symbolic distinctions are pronounced: cars align with status and self-presentation, trains with escape and nostalgia, and less frequent modes with self-expression. Active modes remain underrepresented and symbolically marginal.

As widely circulated cultural texts, lyrics help reproduce shared meanings around mobility. Our findings suggest mobility cultures are driven more by symbolic meaning than emotional association, with implications for sustainable transport promotion.

Keywords: Mobility Culture, Emotion Analysis, Symbolic Meanings, Sustainable transitions, Natural Language Processing (NLP), Large Language Models (LLM)

1. INTRODUCTION

Why people continue using private cars even when alternatives are available, affordable, and environmentally superior has long preoccupied mobility researchers. Improving public transport or promoting alternative modes often proves insufficient, because car dependence is not merely a matter of rational calculation but of the meanings, emotions, and identities different modes carry (Steg, 2005; Sheller, 2004; Gatersleben, 2007; Van Eenoo, 2025).

Mobility choices are embedded in "mobility cultures" (Klinger et al., 2013; Stolze et al., 2025): shared constellations of meanings and practices shaping how movement is organised, experienced, and valued. Transport modes are not merely functional instruments but also symbolic objects that communicate status, identity, and group membership. The car carries associations of freedom, autonomy, masculinity, and social distinction (Sheller, 2004; Mögele & Rau, 2020), making it resistant to substitution even when compelling alternatives exist (Haustein, 2021). Steg (2005) identifies three interconnected travel motives: instrumental, symbolic, and affective, with the latter two frequently outweighing the former. Hunecke et al. (2007) elaborate this framework, identifying status, excitement, privacy, and autonomy as key dimensions of the symbolic-affective domain.

These cultural patterns show strong path dependency: historical decisions and infrastructures create self-reinforcing mobility cultures that are resistant to purely instrumental interventions (Klinger et al., 2013; Schwanen et al., 2012; Mattioli et al., 2020). Since symbolic and affective attachments are harder to shift than instrumental factors, policies targeting only the latter are unlikely to produce the cultural transformations required for sustainable mobility transitions. However, while existing research demonstrates the importance of meanings, emotions, and identities in shaping mobility practices, it offers limited empirical insight into how these meanings are produced, reproduced, and circulated in everyday cultural forms.

Popular music offers a rich site for such investigation: as a widely circulated and emotionally resonant cultural form, lyrics both reflect and actively shape cultural imaginaries of transport through repetition, reach, and resonance. The present study addresses this gap by analyzing representations of transport modes in a large corpus of lyrics. Through a multi-stage pipeline that identifies transport references, classifies their emotional content, and codes their symbolic meanings, the study asks: what emotional and symbolic profiles do different transport modes carry?

2. METHODOLOGY

Corpus construction

The corpus comprises chart-topping popular songs from 1958 to 2025, drawn from the Billboard Hot 100. This prioritizes cultural prominence and mainstream circulation over comprehensive coverage, reflecting the interest in dominant cultural narratives rather than subcultural or marginal representations.

Lyrics were obtained via web scraping of the Genius website. Non-English songs were translated using Facebook/nllb-200-distilled-600M (NLLB Team et al., 2022), an open-source machine translation model capable of handling around 200 languages. Metadata included song title, artist, year, and chart position. The corpus consists of 350787 songs; after deduplication, the corpus yielded 27017 unique songs. Of these, 4657 (17.2%) contained at least one reference to a specific transport mode, as established by the extraction pipeline described below. This subset constituted the primary analytic sample for emotion and symbolic analyses.

Transport detection and classification pipeline

Transport mode references were identified using a custom text-scanning pipeline that combines exact word matching with contextual interpretation. The approach draws on an established disambiguation method from computational linguistics (Lesk, 1986) and was applied across 18 transport terms (Appendix 1). The term list encompasses morphological variants, regional synonyms, and brand names. Notable decisions include pairing "motorcycle" with "motorbike", extending "scooter" to "e-scooter", and expanding "train" to include rail infrastructure terms. Generic mobility terms such as "ride" and "trip" were also included to capture references to movement where no specific mode is named, reflecting the tendency in popular music to encode travel in abstract or experiential terms rather than by vehicle. These terms allow the analysis to capture broader imaginaries of mobility, though their inherent ambiguity means associated findings should be interpreted as reflecting generalised movement rather than mode-specific meanings. "Walk" required special handling given its frequent figurative use in English. A two-stage filter was applied: lyrics were first checked for surrounding mobility-related vocabulary, then remaining idiomatic phrases were manually removed. This process reduced 8,633 raw mentions to 406 transport-relevant instances (4.7% retention).

For each mention, a lyric segment spanning two lines before and after the transport term was extracted for emotion classification. Extraction yielded 5410 segments from 4018 unique songs. Car was the most frequent mode (*n*= 2220 songs), followed by ride (910), truck (537), train (506), and trip (416).

Affective Analysis

Emotion classification was performed using a transformer-based model fine-tuned on the GoEmotions dataset, applied to each extracted transport segment. GoEmotions is a benchmark dataset of 58000 comments annotated with 27 fine-grained emotions, collapsed into primary categories for downstream applications.

Building on Ekman's (1992) framework of basic emotions, four categories were selected for this study: *happiness*, *sadness*, *anger*, and *fear*. These were chosen for their established relevance to textual sentiment analysis and their widespread use in computational emotion classification, rather than as an exhaustive representation of Ekman's full taxonomy.

Two additional affective categories were included to capture dimensions particularly salient in mobility contexts. *Love* is operationalized here in terms of its affective component, feelings of warmth, attachment, and interpersonal closeness, rather than as a theoretically complete account of the construct. *Optimism* is understood as a forward-looking, positive orientation that reflects anticipatory expectations about future experiences (Carver & Scheier, 2014). Both categories are thus understood as affective orientations rather than basic emotions in a strictly psychological sense.

For each transport segment, the model produced continuous scores for each emotion, reflecting the probability of that emotion's presence in the text. Mean emotion scores were then computed by transport term, providing a profile of the average emotional content of lyrical segments in which each mode appeared. Chi-square analysis was conducted on a normalized contingency table to test whether emotion profiles differed systematically across modes. A Cramér's V statistic was computed as a measure of effect size.

Symbolic Analysis

The symbolic dimensions were drawn from two complementary bodies of literature: transport psychology, which addresses individual-level motivations and self-concepts tied to mobility, and the mobilities paradigm in sociology, which foregrounds the social and cultural embeddedness of movement. A dimension was included only when supported by evidence from both traditions, ensuring integration across the levels at which symbolic meanings of transport operate.

The taxonomy spans four levels and comprises 18 symbolic dimensions. At the individual level, these include self-expression (transport as an expression of identity or lifestyle), self-presentation and impression management (how transport shapes how one is seen by others) (Steg, 2005; Lois & López-Sáez, 2009), gender identity (masculine or feminine associations), environmental self-identity, moral or value expression (Whitmarsh & O'Neill, 2010), and individualism (self-reliance and independence). At the social level, dimensions include status and prestige (wealth, success, exclusivity) (Hiscock et al., 2002; Steg, 2005), group belonging or social distinction (Sheller & Urry, 2006), and the signaling of environmental concern. At the experiential level, the taxonomy captures how transport is lived and felt, including freedom and autonomy, power and control, escape or liberation, privacy (as a protected personal space), isolation (detachment or loneliness), and nostalgia or memory (Hiscock et al., 2002; Sheller & Urry, 2006). At the cultural level, modernity and technological progress, as well as collective social connectivity (shared journeys and public connections), are included as counterweights to the individualist meanings that dominate the automobility literature.

Symbolic classification was performed using LLaMA 3, an open-weight large language model deployed locally via Ollama, across all transport-relevant lyrical segments (*n*= 6429). Each segment was processed

with a structured prompt instructing the model to identify transport-specific symbolic meanings, using the taxonomy as a classification framework to assign a confidence rating, provide textual evidence, and explain its reasoning. Segments containing purely literal transport descriptions or metaphors unrelated to transport were left unclassified, as they carried no interpretable symbolic content within the framework. Of the 6429 segments, 722 received at least one symbolic classification.

Symbolic profiles were constructed by computing, for each mode, the proportional representation of each dimension among all classifications attributed to that mode. This normalization allows comparison across modes with different numbers of classified instances.

3. RESULTS AND DISCUSSION

Corpus overview and transport mode distribution

Car was by far the most frequently represented mode (2220 song segments). The dominance of car-related content is notable: car segments outnumber those for all public transport modes combined by more than two to one and exceed bicycle segments by nearly 90 times. This distributional finding is itself significant, consistent with the observation that popular music has been deeply shaped by automotive culture. The scarcity of references to cycling, walking, and public transport suggests that they occupy a marginal position in the collective imagination encoded in song lyrics.

Affective profiles of transport modes

To control for large differences in sample size across transport modes, a normalized chi-square analysis was first conducted, with each of the 17 modes contributing equally (100 weighted observations). This yielded a significant result ($\chi^2(80) = 189.12$, $p < .001$, Cramér's V= 0.149), suggesting that emotional profiles differ across transport modes, albeit to a modest extent. Two modes with low sample sizes, tram (n= 1) and scooter (n= 13), were driving much of this effect.

To obtain a more reliable estimate, both modes were excluded, and the analysis was rerun, retaining only the 15 modes with at least 25 songs (Appendix 2). With these low-n modes removed, the test was no longer significant ($\chi^2(70) = 65.08$, $p = 0.644$, Cramér's V= 0.093).

An inspection of standardized residuals (Figure 1) across the filtered sample revealed several interpretable patterns: walking songs were notably low in anger (residual= −2.48), and bicycle songs showed elevated optimism (+2.55), while both train and taxi songs were disproportionately associated with sadness (+1.81 each). Anger was overrepresented across motorbike (+1.79), van (+1.60), coach (+1.48), and truck (+0.97) songs, and limousine songs leaned toward joy (+1.24). Although these associations fall short of statistical significance at the overall test level, they represent tentative emotional tendencies worth noting, and the non-significant result should be interpreted in the context of modest sample sizes and a constrained range of emotional variation across modes.

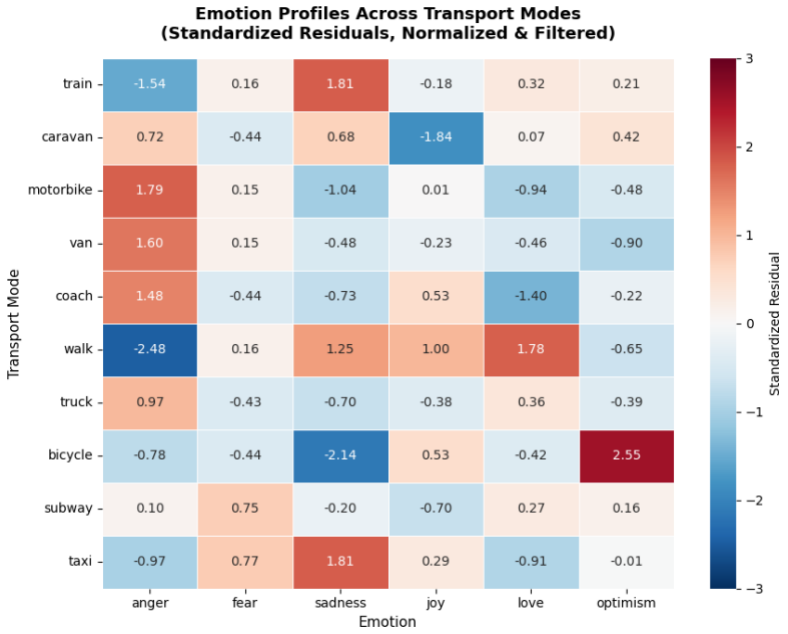


Figure 1. Emotion profiles across transport modes

Symbolic profiles of transport modes

The symbolic chi-square analysis yielded a highly significant result: $\chi^2(91) = 872.07$, $p < .001$, Cramér's V= 0.408. This effect size is larger than that observed for the affective analysis, indicating that transport modes are more strongly differentiated by their symbolic associations than by their emotional tone.

The most striking pattern is the consistent differentiation of modes by their status associations (Figure 2). Car songs are strongly associated with status and prestige (+6.54) and self-presentation (+2.54), while being underrepresented in escape and liberation themes (−8.15). Limousine songs show a similar orientation (+5.38). Truck songs are elevated in status (+4.44), though with co-occurring self-expression absent from the car and limousine profiles. Train songs show the largest negative status residual in the dataset (−10.14), paired with the strongest escape and liberation signal (+13.89) and elevated nostalgia (+5.63).

A second grouping emerged around self-expression and personal identity. Van (+4.12), ride (+3.57), motorbike (+2.96), bicycle (+2.43), and caravan (+2.43) are all meaningfully overrepresented in self-expression and self-identity, associated with individual agency rather than social positioning. Ride also showed the strongest association with freedom and autonomy across all modes (+4.93). Coach (+3.10) and motorbike (+3.89) show additional self-presentation signals, suggesting that how one appears to others while traveling retains importance alongside the identity-expressive function.

Bus (+2.91) and caravan (+6.29) are the only modes meaningfully elevated on social distinction and group belonging, with caravan's residual the largest on that dimension by a considerable margin, though small sample size (n= 34) warrants caution.

Walk and subway songs are primarily associated with nostalgia (+4.33 and +3.29), with no other residuals of note for either mode, and both are largely absent from the status and self-expression patterns that structured the rest of the data.

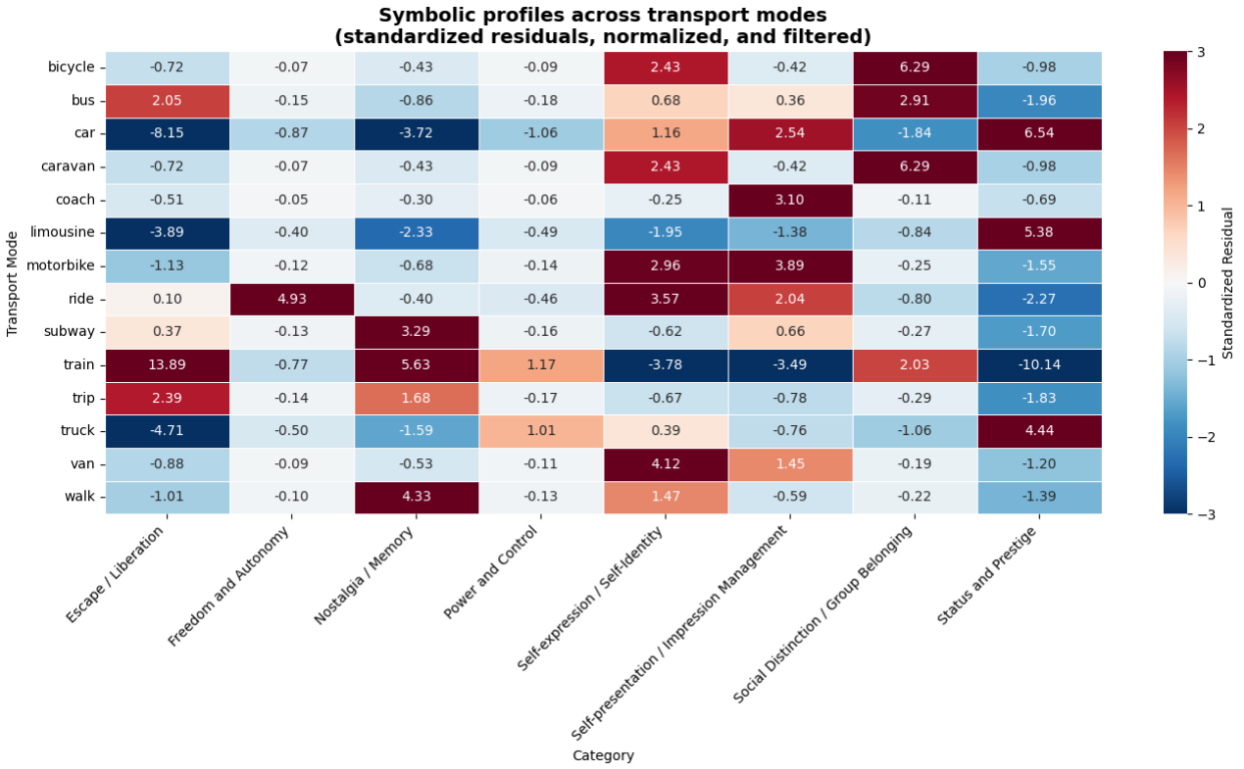


Figure 2. Symbolic profiles across transport modes

4. CONCLUSIONS

This study examined the emotional and symbolic profiles of transport modes across nearly seven decades of chart-topping song lyrics. The findings confirm that popular music encodes a coherent and differentiated cultural vocabulary of mobility, structured primarily by symbolic meaning rather than emotional tone.

Emotionally, transport modes differ less than might be expected. While some variation exists, their affective profiles are broadly similar, and differences in emotional tone are modest rather than sharply distinguishing. Symbolically, however, the picture is considerably more structured. Meanings cluster around three recurring dimensions: status and aspiration, escape and longing, and individual self-expression and transport modes occupy these dimensions in notably distinct ways.

The car, despite being by far the most frequently mentioned mode, is associated with a relatively narrow symbolic range, centered primarily on status and aspiration. The train, by contrast, is strongly and consistently tied to themes of escape and longing, suggesting a more specific and stable symbolic function. Smaller and more individualised modes cluster around self-expression, capturing forms of identity and individuality that the car does not strongly convey in this corpus. These patterns suggest that while emotional associations with transport are relatively diffuse, symbolic meanings are more structured and mode-specific. These findings both confirm and extend existing arguments about the symbolic dimensions of mobility (Steg, 2005; Sheller, 2004; Sheller & Urry, 2006), while grounding them in systematic textual evidence.

The distributional findings are equally telling. Walking, cycling, and public transport are not merely underused in the corpus; they are symbolically thin, carrying few of the aspirational or experiential meanings that make the car and train culturally resonant. This marginalisation may itself be a barrier to

sustainable mobility transitions: modes that lack cultural legibility are harder to choose, identify with, and advocate for. The train's escape associations, the bicycle's optimism, and the motorbike's self-expressive charge are not merely lyrical conventions but cultural resources that could, in principle, be amplified to make sustainable modes more compelling. The present study establishes that the cultural landscape of mobility in popular music is structured, legible, and open to change.

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APPENDIX 1. Transport Mode Terms

Transport Mode	Terms
Bike	Bike, bicycle, biking, biked, cycling, cycled
Bus	Bus, coach, minibus
Car	Car, automobile, Sedan, SUV, Ferrari, Porsche, Jeep, BMW, Lambo, Lamborghini, Tesla, Cadillac
Caravan	Caravan, trailer
Limousine	Limousine
Motorcycle	Motorcycle, motorbike
Ride	Ride
Scooter	Scooter, e-scooter
Subway	Subway, underground, metro
Taxi	Taxi
Train	Train, railroad, rail tracks, light rail
Tram	Tram
Trip	Trip
Truck	Truck, Pickup truck
Van	Van, minivan
Walk	Walk, walking, walked

APPENDIX 2. Transport Mode & Emotion Scores

Mode	Anger	Fear	Sadness	Joy	Love	Optimism
Bicycle	0.244	0.016	0.050	0.201	0.150	0.339
Bus	0.276	0.027	0.142	0.158	0.180	0.217
Car	0.302	0.025	0.121	0.174	0.177	0.202
Caravan	0.261	0.029	0.131	0.157	0.196	0.226
Coach	0.362	0.018	0.099	0.196	0.115	0.210
Limousine	0.290	0.019	0.093	0.183	0.153	0.262
Motorbike	0.380	0.025	0.088	0.178	0.134	0.196
Ride	0.254	0.023	0.115	0.199	0.180	0.229
Subway	0.286	0.037	0.116	0.147	0.184	0.230
Taxi	0.277	0.024	0.139	0.162	0.186	0.212
Train	0.201	0.029	0.190	0.170	0.179	0.231
Trip	0.308	0.022	0.117	0.169	0.172	0.213
Truck	0.333	0.024	0.105	0.164	0.178	0.197
Van	0.372	0.028	0.101	0.166	0.176	0.157
Walk	0.154	0.031	0.169	0.222	0.236	0.188