RoboCorp: A Structured Corpus and Analysis of News Reports on Robotaxi Incidents

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Shared automated vehicles, commonly referred to as robotaxis, are becoming increasingly present in major urban environments. Their deployment introduces new forms of interaction between automated systems, urban infrastructures, and everyday social practices, while a growing number of operational challenges and traffic incidents has raised concerns about how these systems are designed, governed, and made accountable in public space. As an emerging technology, there is currently a lack of systematic collection of these incidents in publicly available datasets. Using a structured, multi-query search and relevance-screening process on the LexisNexis Nexis Uni database, we assembled and coded a corpus of 63 English-language newspaper articles on such incidents, spanning their formative years of deployment from 2016 to 2023, which serves as a starting point for investigating them. We categorise risks, including collisions, operational breakdowns, and situations in which human intervention remains consequential, and examine their influence on perceptions of safety, responsibility, and trust in urban contexts.

Shared automated vehicles, robotaxis, urban mobility, media analysis, news report corpus, trust in automation, accountability

1. INTRODUCTION & MOTIVATION

Developments in mobility influence how societies organise, govern, and experience everyday life. Autonomous vehicles (AVs) are among the most influential developments in this space, reshaping transportation systems, regulatory frameworks, and long-standing assumptions about driving, ownership, and control (Heineke et al. 2024), amid growing interdisciplinary attention to their social, political, and ethical implications (Othman 2022; Stilgoe and Mladenović 2022; Li et al. 2024). Private car ownership is increasingly giving way to shared, service-oriented mobility (Mische 2020). Robotaxis, a prominent example of Shared Automated Vehicles (SAVs) (Yoo et al. 2020), are defined by Hede (2021) as either retrofitted conventional vehicles or purpose-built vehicles for autonomous transit, typically operating at SAE Levels 4 and 5, where the vehicle handles most or all driving tasks without human intervention (SAE International 2024; Doll et al. 2020).

SAVs are positioned as a route to safer and more efficient urban mobility by reducing human error and congestion (Carlos 2024), as well as more sustainable mobility through reduced emissions and health risks (Narayanan et al. 2020; Hede and Edman 2021). Yet substantial technological, regulatory, and commercial constraints, from adverse weather conditions (Vargas et al. 2021) to public acceptance (Othman 2022; Narayanan et al. 2020), mean deployments remain largely confined to controlled settings such as urban centres, campuses, or fixed routes. Real-world encounters reveal how far this falls short of full autonomy: in one widely reported test, an Instagram user who wore a t-shirt printed with a stop sign found that a Waymo robotaxi in Phoenix halted in 4 out of 5 trials (Banner 2024). While often retold humorously, the episode illustrates the gap between designed and actual system behaviour, and the need for more systematic analysis of SAV failures and near misses.

This corpus responds to that need. SAV technologies are relatively new and are approved for public roads only in a narrow sense, and there is still a lack of datasets documenting the difficulties encountered during their early deployment. Systematically

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documenting these incidents is a first step toward more informed design and governance practices, and toward strengthening user trust and acceptance (Lee et al. 2022). Specifically, we ask what recurring patterns of type, severity, and cause emerge from a structured corpus of news coverage of SAV incidents, and what these patterns — particularly continued dependencies on emergency responders and remote operators — imply for accountability and trust in SAV design.

2. RELATED WORK

Prior HCI work has laid methodological groundwork for studying automotive interaction more broadly, from techniques for exploring driver and passenger behaviour as vehicles moved toward automation (Pettersson and Ju 2017) to non-driving in-car activities (Winkler et al. 2016). Most relevant to the safety perspective adopted here, Passero et al.'s (2024) analysis of 63 video-recorded incidents of Tesla beta testers being honked at identified delayed responses, inconsistent steering, erroneous stopping, and excessive speed as the main triggers for how other drivers react to AV driving behaviour. Closer to our focus on shared automated vehicles specifically, Meurer et al. (2020) used a Wizard-of-Oz study across 33 real-world robo-taxi rides to identify design themes spanning hailing, pick-up, travel, and drop-off.

Less attention, however, has been given to safety-related events specifically within shared automated vehicles and their implications for users and the communities in which SAVs operate. This paper addresses that gap by assembling a corpus of news reports spanning eight years, from the first SAV road tests to the first fully operational services. We categorise the collisions, operational breakdowns, and human-system frictions reported, and examine their consequences for safety, responsibility, and trust. By documenting these formative years, we provide a foundation for examining the socio-technical dynamics of SAV deployment before early incidents are overlooked as the technology becomes normalised infrastructure.

3. CORPUS DEVELOPMENT AND ANALYSIS

We developed a corpus of newspaper articles on SAV incidents and conducted a qualitative content analysis, drawing on the methodological frameworks of Schade et al. (2024) and Lin et al. (2017) and the thematic categorisation approach of Stryker et al. (2006). Following Lin et al. (2017), our procedure comprised three stages: corpus development (Fig. 1), expert-led coding, and content analysis, whose results are presented in Section 4.

For the purposes of this corpus, we define an *incident* as any reported event in which a shared automated vehicle was implicated in an unintended, disruptive, or contentious occurrence that reveals tensions or challenges in its deployment within a public urban environment. This definition intentionally encompasses both technical and operational failures and organised public responses, as both constitute observable moments where the integration of SAVs into urban life proved problematic or contested — reflecting the socio-technical framing of this work.

3.1. Phase 1: Corpus Development

We searched Nexis Uni (LexisNexis 2024), filtering by article type, language, and publication date. We focused on newspaper articles to capture real-world discussions and developments around SAVs, while recognising that news media are not a neutral conduit for events and may over-represent visually striking or severe incidents relative to routine ones. We restricted the search to English-language articles. The search spanned August 2016, when the first robotaxi began testing in Singapore (Watts 2016), to December 2023, when data collection was conducted, and the first fully operational services began. As SAV deployment and regulation continue to evolve rapidly, this corpus captures the technology's formative years rather than its current state.

Search queries were constructed from keywords and synonyms identified through preliminary research. The initial 94-word query was the primary search and yielded 1807 results, of which the first 1000 were screened; a second, 71-word query focused on social impact and produced 1654 results; a third, 13-word query generated over 10,000 results. As the latter two were supplementary searches intended to broaden the primary search, pragmatic screening limits of 100 articles each were applied. After removing duplicates and applying a relevance check, this yielded 50, 6, and 7 articles, respectively, for a final corpus of 63 articles.

3.2. Phase 2: Expert-Led Coding

We coded the articles using a codebook comprising four groups:

1. **Article Basic Properties:** Title, publisher, publication date, and article type (e.g., straight news, feature news, interview).
2. **Vehicle Conditions:** Vehicle type (robotaxi, 'robobus', 'robotrain'), manufacturer, passenger presence, and test/trial status.
3. **Environmental Conditions:** Time of day and weather conditions as reported.

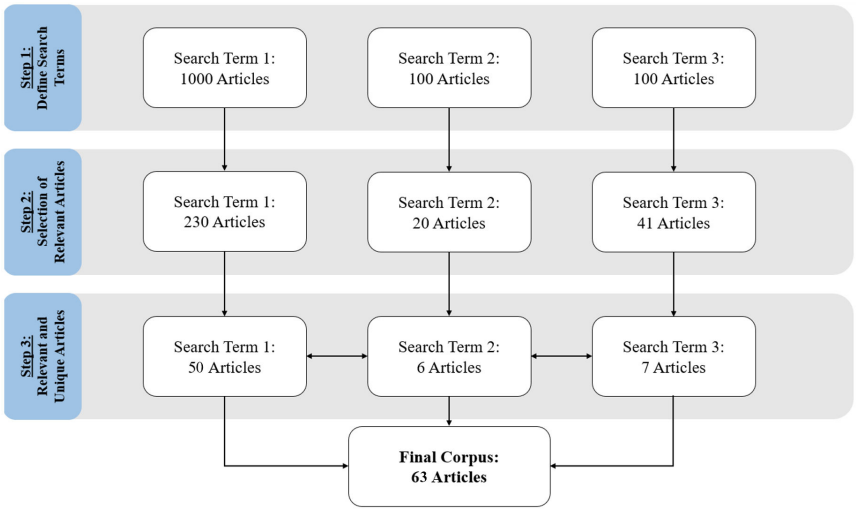

Figure 1: *PRISMA-style process of corpus development. It outlines the three essential stages: defining search parameters, refining search queries, and conducting a relevance check. This culminated in a final corpus of 63 relevant articles.*

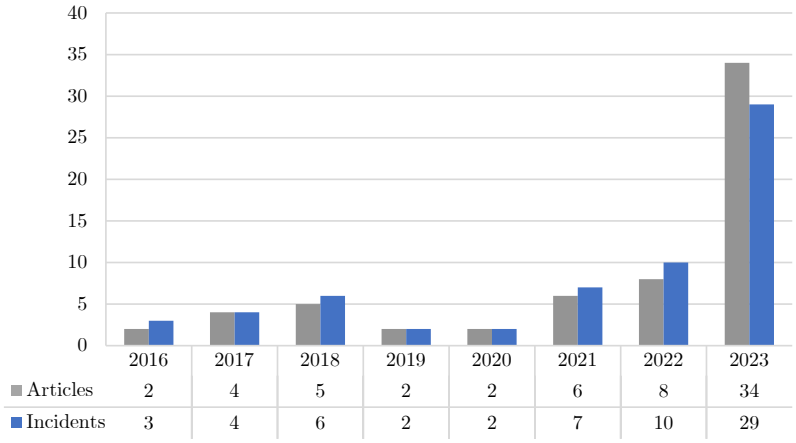

Figure 2: *Publication Year of Articles and Incident Occurrence of SAV Accidents.*

4. **Incident Basic Properties:** Location, date, severity of damage to individuals and vehicles, incident type (e.g., collision, public safety obstruction), cause, and human error/intervention.

4. CORPUS OVERVIEW

In the following, we provide an overview of the corpus and its articles based on our content analysis, highlighting key categorisations, including issue types, damage severity, and incident causes. All numbers and percentages use the 63 articles as the unit of analysis, rather than unique underlying incidents; multiple articles may report the same incident. To keep the tables below compact and to separate our primary corpus from the secondary scholarly literature, we cite the 63 corpus articles using bracketed numbers (e.g., [1]), listed in full in Appendix A, while scholarly work is cited in author-year format throughout the paper.

4.1. Article Properties

News coverage increased markedly over time (Fig. 2). Publications tripled between 2016 and 2018, likely reflecting SAVs' growing proliferation, before dropping in 2018–2019, coinciding with the first fatal robotaxi accident (Uber, Tempe, Arizona) and reduced SAV activity during the COVID-19 pandemic. Coverage then rose sharply from 2021 to 2023, surging from 8 articles in 2022 to 34 in 2023. The number of reported incidents grew more modestly over the same period, from 10 in 2022 to 29 in 2023, suggesting that the rise in coverage outpaced the underlying growth in incidents.

Feature news dominated the corpus (72.3%, 47 articles), followed by interviews and straight news reports (12.3% each, 8 articles).

Table 1: Incident classification based on all 63 articles. *Percentages are rounded to the nearest whole number and may not sum to group totals.*

	% (#)	Articles
Collisions With		
Vehicles	24% (15)	[1–15]
Pedestrians	10% (6)	[16–21]
Objects and Animals	10% (6)	[22–27]
Operational and Movement Challenges		
System Problems	13% (8)	[28–35]
No or Wrong Obstacle Detection	11% (7)	[36–42]
Environmental and Weather-Related Problems	3% (2)	[43, 44]
Public Safety and Emergency Services Obstruction		
SAVs Impacted Police Officers	6% (4)	[45–48]
SAVs Impacted Firefighters	6% (4)	[49–52]
SAVs Impacted Ambulances	3% (2)	[53, 54]
SAVs Impacted Other Vehicles	2% (1)	[55]
Navigation and Route Selection Issues		
Inefficiencies in Route Planning and/or Adaption	5% (3)	[56–58]
Erratic or Bad Navigation	3% (2)	[59, 60]
Protests and Public Demonstrations		
Public Dissatisfaction	3% (2)	[61, 62]
Organised Protests against SAVs Deployment	2% (1)	[63]

Table 2: Incident Severity for Vehicles

Severity	% (#)	Articles
None	14% (9)	[32, 35, 36, 40–42, 56, 57, 59]
Low	40% (25)	[22, 26, 28–31, 33, 34, 37–39, 43–48, 50, 52, 53–55, 58, 60, 63]
Medium	30% (19)	[1, 2, 4, 7, 8, 10, 12, 13, 15, 17–19, 21, 23–25, 51, 61, 62]
High	12% (8)	[3, 5, 6, 9, 16, 20, 27, 49]
Critical	3% (2)	[11, 14]

Table 3: Incident Severity for Individuals

Severity	% (#)	Articles
None	14% (9)	[1, 24, 26, 33, 34, 39, 41, 43, 44]
Low	43% (27)	[2–4, 28–32, 35, 36, 38, 40, 42, 45–48, 50, 51, 55–61, 63]
Medium	25% (16)	[7–10, 12, 13, 15, 17, 18, 23, 25, 37, 49, 52, 54, 62]
High	13% (8)	[5, 6, 11, 14, 16, 19, 21, 27]
Death	5% (3)	[20, 22, 53]

4.2. Reported Incidents

Incidents were concentrated in North America (83%, 52 articles), followed by Asia (9%, 6), Europe (5%, 3), and Australia (3%, 2), with over half occurring in San Francisco, California (52%, 33 articles) and a further 6% (4 articles) in Mountain View, California.

Robotaxis dominate the corpus (80%, 50 articles), followed by robobuses (19%, 12) and robotrains (1%, 1). General Motors/Cruise (40%, 25 articles) and Waymo (22%, 14) are the manufacturers most represented; of Cruise's incidents, 16% (10) were software-related and 11% (7) hardware-related, while Waymo's were split 13% (8) hardware and 6% (4) software, and all three of Uber's incidents were hardware-related.

4.2.1. Classification

Table 1 groups incidents into five categories: collisions (43%, 27 articles), operational and movement challenges (27%, 17), public safety and emergency service obstruction (17%, 11), navigation and route selection issues (8%, 5), and protests and public demonstrations (5%, 3) — included, alongside the technical and operational categories, under our broader definition of *incident* (Section 3) — with subcategory breakdowns shown in the table. Passenger risk was noted for a single passenger in 30% (18 articles) and multiple passengers in 17% (11), while 43% (27) of articles did not report on passenger risk.

4.2.2. Incident Severity

Reported incidents varied widely in impact. Passenger safety concerns were noted in 46% (29 articles).

Severity ranged from no impact to critical/fatal (Tables 2 and 3). For vehicles, most incidents

Table 4: Incident Causes

Cause	% (#)	Articles
Hardware Failure	41% (26)	[1, 3, 4, 7, 10, 12, 13, 17, 19, 20, 22, 26, 27, 30, 36, 37, 39, 41, 42, 44, 46, 47, 51, 53, 57, 60]
Software/ System Error	37% (23)	[14, 16, 18, 24, 25, 28, 29, 31–35, 40, 43, 45, 48, 50, 52, 54–56, 58, 59]
SAV Unaccountable	22% (14)	[2, 5, 6, 8, 9, 11, 15, 21, 23, 38, 49, 61–63]
Human Error Involved	21% (13)	[2, 5, 6, 8, 9, 11, 15, 21, 23, 38, 61–63]

caused no damage or only low-impact disruptions to traffic flow (14% and 40%, respectively), with 30% causing medium (superficial) damage and 12% high to critical damage, including total loss. For individuals, most reported harm was low severity (43%), with 25% medium-severity injuries (e.g., bruises, sprains), 13% high-severity injuries requiring emergency care, and 4.5% (3 articles) fatal.

Severity also decreased over time: a Pearson correlation analysis showed incident year correlated negatively with severity for both human-involved ($r = -0.30, p < 0.05, n = 63$) and vehicle-only incidents ($r = -0.31, p < 0.05, n = 63$), though both correlations are weak in magnitude.

4.2.3. Incident Causes

Table 4 shows hardware failure (41%, 26 articles) and software errors (37%, 23) as the leading causes, followed by cases where the SAV itself was not accountable (22%, 14) and human error (21%, 13). A quarter of incidents prompted human intervention (25%, 16 articles) either by emergency responders [24, 28, 33, 47, 48, 51–54] (14%, 9 articles) or by manufacturers via remote vehicle control [18, 25, 30, 35, 36, 40, 56] (11%, 7 articles).

Taken together, these multifaceted incident characteristics provide high-level insights into the complex socio-technical nature of SAV incidents in our corpus, where multiple stakeholders are involved, and responsibility between human actors and automated systems remains persistently ambiguous.

5. DISCUSSION

Individually, many of the socio-technical dynamics can be observed in the corpus — the hybrid nature of nominally autonomous systems, the gap between designed and actual use, the unpredictability of public space — are already recognised in the broader HCI and STS literature. What this corpus contributes is not a new theory but the first systematic, dated evidence of how these dynamics played out across SAVs' first eight years of public deployment. Our corpus analysis reveals patterns that illuminate both the progress of SAV deployment and the challenges ahead.

The geographic concentration of incidents is striking (albeit not surprising): 58% (38 articles) occurred in just two cities, San Francisco and Mountain View, reflecting the localised nature of current SAV testing and permitting (Commission 2023; Thadani 2024). As operators scale toward broader commercial deployment (Tan 2024; Statista 2020), this concentration also marks a gap in our understanding of how SAVs perform across more diverse urban contexts. The distribution of causes further complicates simplistic safety narratives: while hardware (41%) and software (37%) failures dominate, human error accounts for 21% of cases, broadly consistent with industry evidence that autonomous systems are involved in only a small share of collisions (Jeffs 2023). SAVs in our corpus were responsible for lower-severity incidents overall, but all three fatalities were attributed entirely to SAV failure, underscoring that critical failures carry severe consequences even as low-severity incidents remain more evenly attributable.

These findings carry implications beyond individual users. Perceived risk, service quality, and reliability of the experience are known to shape user acceptance of SAVs (Etminani-Ghasrodashti et al. 2022; Yang et al. 2023): the navigation-related incidents in our corpus, while not life-threatening, still affect perceived reliability, and the organised protests and public dissatisfaction we documented point to concerns that extend to broader community impacts, particularly around the obstruction of emergency services and shared urban spaces. For regulators, the corpus highlights the tension between enabling innovation and ensuring accountability. Cruise's operating permits were revoked only after a pedestrian-dragging incident (Burn et al. 2023), showing that regulators often act after incidents happen rather than before. Mandatory crash reporting (US Department of Transportation 2022) takes a more systematic approach, but transparency alone does not provide a framework for assessing socio-technical failures. That 25% of incidents required human intervention by responders, or manufacturers, suggests that full autonomy remains aspirational for the foreseeable future and that oversight must account for hybrid human-machine operations.

Real-world incident reports reveal challenges that emerge only through prolonged public deployment,

beyond what controlled studies of passenger experience can show. The 17% of incidents (11 articles) requiring emergency service intervention, including SAVs obstructing firefighters, ambulances, and police, expose interaction design failures in how these vehicles recognise, prioritise, and respond to urgent social contexts — from perception systems that must distinguish emergency personnel and their signals from ordinary pedestrians and traffic, to the handoff protocols that determine when and how a vehicle should cede control to a remote human operator, relevant to the 11% of incidents in our corpus resolved through manufacturer remote intervention — echoing the stop-sign anecdote from our introduction and the broader ubicomp challenge of designing for context and ambiguity. This ambiguous distribution of responsibility also raises accountability questions: when responsibility cannot be clearly assigned, communities experience disruption without recourse, and trust erodes not simply because systems fail, but because the arrangements around failure remain opaque. This corpus offers concrete, real-world material for researchers and practitioners working on transparency mechanisms and accountability frameworks, complementing Alavi et al.'s (2017) account of driverless cars' urban impacts, which found negative implications for five of the six urban-design dimensions it examined based on real-world incidents.

Perhaps most importantly, this corpus documents the limits of prediction and control in complex socio-technical systems: the stop-sign t-shirt incident described in our introduction, the taco truck navigation failure [40], and the wet concrete incident [39] are not merely edge cases but evidence that public space is inherently unpredictable, that social practices continuously evolve, and that systems designed for normal conditions will inevitably encounter the abnormal.

Taken together, these findings underscore that SAV incidents must be examined as socio-technical phenomena, where responsibility is distributed and contested, and where addressing these tensions will require governance frameworks that can engage with this complexity, not just continued technical refinement.

Limitations. This work has several limitations. The corpus, while systematically assembled, comprises a relatively modest 63 articles, which constrains the generalisability of the patterns identified. Our reliance on English-language newspaper articles introduces a geographical and cultural bias toward English-speaking contexts. This bias is somewhat contextualised by the fact that the most extensive real-world SAV deployments to date have occurred predominantly in such contexts, particularly the United States, though it remains a substantive limitation on the corpus's geographic and cultural scope. More broadly, news media are not a neutral conduit for events: editorial framing and newsworthiness criteria mean the corpus reflects incidents as represented in the press, which may differ from objective incident records, and outlets are more likely to report incidents that are visually striking, severe, or reputationally damaging than routine or minor failures. The geographic concentration of incidents noted above further limits the generalisability of our findings across more diverse urban contexts. Finally, our coding process was not independently validated through formal inter-rater reliability testing, though many coded properties (e.g., date, location, manufacturer) required little subjective interpretation.

6. CONCLUSION

As SAVs move from experimental deployments toward broader urban integration, understanding their real-world challenges becomes critical for responsible development. We present a corpus of 63 news reports as a starting point for this work, showing that SAV incidents are fundamentally socio-technical, with accountability distributed across automated systems, infrastructure, human actors, and regulatory frameworks, and ranging from technical failures to emergency service obstructions and public resistance. These breakdowns raise questions of trust, transparency, and governance that extend beyond engineering into the social fabric of shared urban spaces, and further examination of documented incidents such as these can help inform the design, regulation, and deployment of automated vehicles going forward. Future work could extend this corpus beyond English-language sources and past the technology's formative years captured here, and provide more detailed analysis that goes beyond the high-level categorisations of this corpus.

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We used Claude to shorten and adjust the phrasing of sections of an earlier draft of the paper under close control and oversight. We further used Overleaf's spell checker, Grammarly, LanguageTool, ChatGPT and Claude to correct spelling and improve the writing of this paper. These tools were not employed to generate original ideas or data.

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APPENDIX A: CORPUS ARTICLES

The 63 news articles constituting the corpus analysed in this paper are listed below in numbered form; in-text citations to individual corpus articles (e.g., in Tables 1, 2, 3, and 4) refer to these numbers. This separates the corpus itself from the scholarly literature cited throughout the paper, which is listed under References above.

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