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Towards Sustainable Urban Mobility: Evaluating Ghana's Readiness for Electric Vehicle Integration

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Abstract

Rapid global migration toward electric mobility offers opportunities and challenges to developing nations. Ghana is set to be a regional leader in West Africa. It has adopted the National Electric Vehicle Policy, in a bid to drive regional electrification, which aims for 35% of new vehicle sales to be EVs by 2035, followed by a full transition by 2045. However, there is limited information explored regarding the preparedness of urban transport infrastructure to support the transition. This paper assesses how well prepared the infrastructure is for electric vehicle integration in Accra, the capital and largest city of Ghana, with a view to bridging the gap between policy aspiration and actual implementation. The research used a quantitative research design, employing a descriptive case study approach. The quantitative data were gathered through survey questionnaires and yielded 150 responses. Descriptive and inferential statistics were performed using Smart PLS Structural Equation Modelling.. The research finds that Ghana has strong pillars for EV transition, public preparedness, private investment, grid confidence, and effective attention-raising, but has serious weaknesses in the regulatory infrastructure and distribution-level infrastructure, as well as the implementation rate and public relations. Key recommendations include speeding up infrastructure deployment by ensuring public readiness through quick approvals for 100 rapid charging infrastructure sites; promoting policy communication through simplified guides and community sensitization; adjusting regulatory frameworks to specifically consider EV charging in street parking; and prioritizing transport hubs. Theoretically, the study contributes by establishing a

context-sensitive assessment framework for EV readiness in terms of African urban landscapes; practically, it offers evidence-based guidance for policymakers and other stakeholders in the sustainable transport space.

Keywords
Urban mobility, electric vehicle, integration, sustainability, readiness.

1. Introduction
The global transportation industry is currently at a crucial juncture, with the transition to electric vehicles (EVs) playing an essential role in tackling climate change on a worldwide scale. In 2023, around 14 million new EVs were sold, making up 18% of total vehicle sales and bringing the cumulative global count to approximately 40 million EVs on the roads, according to data from the International Energy Agency (IEA, 2024). This swift progress has led to considerable discourse surrounding infrastructure planning; however, much of this literature predominantly emphasizes developed countries. Africa has had its own developmental efforts in the transport industry as far as electronic vehicles are concerned. For instance, in Ghana, this shift offers an exceptional opportunity for sustainable transportation while also posing complex challenges concerning infrastructure development and other socio-technical encumbrances (Ayetor et al., 2025).

Specific obstacles emerge within the African context, as noted by the Energy for Growth Hub (2025), which states that "the main factors driving the EV transition in Africa will be distinct from those in established markets, requiring tailored policies and infrastructure." In Ghana, governmental policies and incentives significantly motivate the adoption of EVs. The National Electric Vehicle Policy sets forth key goals: attaining a 35% share of new vehicle sales made up of EV models by 2035 and completing the overall transition by 2045 (Ministry of Energy and Green Transition, 2025). A range of strategic initiatives has been introduced to stimulate market growth, including VAT exemptions for imported electric vehicles used in public transport, reduced import duties, and tax incentives for component manufacturers (EV24.Africa, 2025).

The Ministry of Energy and Green Transition is spearheading efforts to develop rapid charging infrastructure nationwide over the next five years while leveraging solar-grid hybrid systems to boost overall capacity (Ministry of Energy and Green Transition, 2025). These efforts position Ghana as a regional leader in EV adoption, with estimates indicating that about 17,000 electric vehicles could be operational on its roads by 2035 (Atitianti, 2024). Despite this favorable policy environment, substantial concerns about infrastructure preparedness pose hurdles to integrating EVs into the existing framework. Research suggests that introducing EVs could raise electricity demand by at least 35%, thereby exerting additional pressure on Ghana's already overburdened electricity grid (Ayetor et al., 2025). Moreover, there is inadequate coordination in planning charging stations within urban areas, which may worsen existing inequalities in mobility access. The capacity of the grid to support high-power charging stations remains uncertain, particularly in densely populated cities where land use constraints make it challenging to identify suitable sites for necessary infrastructure. Additionally, informal transport services like "trotros" (minibuses), which are vital for many residents' transportation needs, might be overlooked during this transition unless comprehensive planning measures are implemented (OECD, 2025). Utilizing the Technology Organization and Environmental Framework (TOE Framework) and the Multiple-Level Perspectives Framework, this study assesses Ghana’s readiness for EV integration into its transportation sector to enhance sustainable urban mobility. In this research, the Technology contextual factors are represented by technical concerns, which include grid capacity, charging infrastructure, amongst others, while for the Organization, the public awareness campaigns and creation of transport hubs are observed. Also, the Environmental factors include the investment from the private sector and growth in EV usage. Even though a body of literature exists (Ayetor et al 2020; Ayetor et al. 2026; Ackaah et al.2025; Agyemang 2024) concerning Ghana’s transition process for EV uptake, there still exist gaps in the theoretical utilization of different theories to understand the readiness for EV integration into its transport sector. Again, various contextual variables matter in this case. Therefore, this research aims to contribute to the ongoing discourse regarding the EV readiness of Ghana.

2. Literature Review
2.1 EV Availability/integration in Ghana
The critical influence of Transportation on a country’s economic development cannot be overemphasized. The use of fossil fuel vehicles comes with its own downside, including Greenhouse emissions with its consequential depleting environmental devastation. Electric vehicles have been observed as a game-changer in the transport sector. The

promise of EVs has seen significant fruition. In the first-world countries, the significance of these vehicles in enhancing urban mobility has been well stated, especially with the advantage of sustainability. However, in emerging economies like Ghana, the World Bank (2025) estimates a staggering increment in vehicles rising from 40per 1000 individuals to 260 from 190 to 2015, with significant portions in Accra. Again, at the national level, by 2022, 3.2M vehicles were registered. Rapid urbanization within Accra has encouraged commuters, especially the middle class, to rely on private vehicles rather than the unreliable mass transport system, and the rising middle-income status (Ackaah et al.2025). This means a significant contributor to greenhouse gases and environmental pollution emanates from this phenomenon, and EV cars have entered the market to assist in reducing the negative effects of emissions on the environment. Ghana is actively pursuing this agenda as several private sector players have installed charging infrastructure within their premises. Total Ghana has installed a 22-KW EV Charger at its Liberation Road branch, while several have also been installed at various malls, including Achimota, Medina, and A&C Malls (Energy Commission 2025). Moreover, several vehicle assembling plants have commenced assembling cars and other two & three wheelers. In line with the growing ambition of stakeholders in the EV business, a comprehensive EV Policy has been established to provide regulatory oversight. This research is amongst the few to utilize the TOE Framework, supported by the multi-level perspective framework as a theoretical framework to assess the EV readiness and integration in the developing economy context.

2.2 Charging Infrastructure Preparedness

There's empirical evidence that underscores the existence of charging infrastructure as a problem. While the national agenda is set to deploy 1,000 charging stations by 2028, a 2024 UNDP survey found only seven public charging stations nationwide, all in Accra (Atitianti, 2025). That enormous shortfall makes it nearly impossible to fully offload the charging into homes, thereby limiting EV use to short trips within a city and making range anxiety even worse. Public charging sessions are short, which is about 25% to 50% of battery capacity, reflecting both infrastructure constraints and also affecting behavioral interventions intended to reduce anxiety for users (2025). Concerning grid capacity, the study uncovers empirical evidence behind one of the most severe constraints. Research by Ayetor et al. (2025) directly highlights a fundamental mismatch between national e-mobility policy targets and official electricity generation projections. Again, Ayetor et al. (2025) aver that uncoordinated EV charging (in particular, fast chargers) will put pressure on peak demand on a grid that is already bedeviled with reliability deficiencies ("dumsor") and significant technical/commercial losses (26.5% estimated in 2022). Additionally, Ghana should expect to add at least 2 GW of public charging capacity each year to ensure it meets long-term ambitions for EVs; an investment of this scale that needs to be handled holistically and with urgency (Energy for Growth Hub, 2025). There is insufficient granular spatial analysis for identifying optimal placement of charging stations, taking actual commuting patterns in Ghana, grid loading at the district level, and equity of access into account. For grid impact simulation, although there are mentions of potential policy-grid misalignment, no detailed simulations of how various scenarios of EV adoption will affect discrete segments of Accra's distribution network are reported (Agyemang, 2024).

2.3 Grid Capacity Constraints

The grid is already stretched too thin, and mass EV deployment in the region may further strain it. International studies show that a 1% increase in EV weight implies ~1% higher electricity consumption, so a full transition to e-mobility could increase consumption by 35% or more (Ayetor et al., 2025). Other research predicts a 400% surge in EV charging peak demand by 2030 and therefore emphasizes the need for improved charging and grid infrastructure optimization (Ayetor et al., 2025). According to a simulation study in Wollongong, Australia, the current grid infrastructure cannot accommodate ultra-fast charging without serious power quality degradation (Ayetor et al., 2025). Indeed, Ghana already suffers from erratic electricity delivery, especially outside the major cities, and the concentrated load from fast EV charging facilities is a major unaddressed challenge to the grid (Atitianti, 2024). Adopting renewable energy sources, such as solar power, is a great alternative. Using Ghana's plentiful solar resource, the Ministry of Energy and Green Transition (2025) is working on hybridizing solar-grid for charging stations that allow for resilience.

2.4 Public Awareness of EV Integration

Accra's urban transport system also calls for important equity implications because of the empirical observations of the urban transport ecosystem. The system is dominated by informal "trotro" minibuses, which accommodate most of the city's population but run into major accessibility problems (OECD, 2025). This form also represents a private vehicle–oriented EV transition risk, entrenching mobility inequalities, favoring a wealthy minority whose private vehicles already make up 75% of the road space and service a small portion of the population (OECD, 2025). The empirical roll-out of the 10 inaugural electric buses on roads within Accra makes this a key pilot of the feasibility and

returns of electrification of public transport directly (Electrive.com, 2024). Even though Ghana has made some significant strides in its quest to promote the EV into the transport system, a gap in terms of promoting the EV policy persists. A comprehensive plan geared towards its implementation has yet to be adequately observed. One of the major setbacks that hinders effective widespread uptake of EVs is the availability of the charging infrastructure. Several scholars argue that this phenomenon can be overcome by providing free charging stations, effective after-sales services, as well as consistent and reliable power (Ackaah et al.2018; Ayetor et al.2020; Dorhetso 2024). In terms of public perception and awareness, the EV policy could assist if a comprehensive rollout plan is implemented. However, no such agenda is on the table to advance such a course. Indeed, such strategies require coherent information sharing in the media landscape, Investment in public education, as well as publishing results and reports after market surveys on adoption success stories from other markets. Undoubtedly, a coordinated effort is required to integrate measures geared towards promoting the EV local value creation if a just and sustainable transition is to materialize.

2.5 Government Policies and Commitment to EV Integration

The government of Ghana instituted the national EV policy in 2023 to enhance the roadmap to transition from the fossil fuel-based vehicles to fully relying on EVs. The focus was on full electric battery vehicles, though there were hybrid electric vehicles, fuel cell electric, and plug-in electric vehicles. Battery electric was chosen for its advantages as it's able to generate zero tailpipe emissions, hence positioning them as an ideal choice for environmental protection over the current fossil fuel on the market. Also, they are more efficient in terms of a superior energy conversion rate.

The key objectives were to promote sustainable demand for EVs, support the development of the EV supply chain, and provide the regulatory framework for the EV ecosystem and the further development of charging systems and infrastructure. However, this seems far from realization. According to Ayetor 2026, the policy's implementation has not progressed as quickly as expected. This is due to the dwindling assurance of accelerated implementation of the renewable energy master plan to address the additional electricity demand resulting from EV integration. Existing laws to accommodate EV integration remain a mirage, while private-sector participation has not been ambitious enough because charging and other infrastructure challenges persist. Ideally, implementation should have been in its third year. The 1st phase, preparation to take off, was to be completed this year.

3. Methodology

3.1 Data Collection and Sampling

Survey questionnaires were distributed to collect the quantitative data for the study using a stratified sampling method (Collins, 2010). The sample for those who could speak to the EV discussion was targeted to answer the questionnaire, and this included employees of the Driver Vehicle and Licensing Authority, the Environmental Protection Agency, Electricity Company of Ghana, Ghana Energy Commission, drivers, and commuters, among others. Convenience sampling was also used to support the process by selecting readily available participants to save time and resources. Selection criteria included experience, credibility, and willingness to participate.

3.2 Theoretical Framework

This study adopts the TOE framework developed by Tornatzky and Fleischer (1990) and the Multiple-Level Perspective to evaluate the readiness of Ghana for EV integration. The TOE Framework advances a structured approach for examining the technological, organizational, and environmental contextual factors influencing EV readiness, while the MLP indicates the broader socio-technical transition from the conventional fossil fuel-based form of transportation into the sustainable electric vehicle mobility.

Within the TOE framework, technical readiness is represented by grid capacity, which constitutes the technological aspects. In this case, electricity generation capacity, transmission, and distribution infrastructure are essential to support the operational ability of EV charging, operation, and transition. The ability of Ghana's power sector to generate enough power to accommodate the EV system is paramount to influencing adoption and preparedness for EV integration. A composite, robust, and resilient grid reduces apprehension and anxiety about EV use and strengthens investor confidence. Environmental contextual factors are represented by public awareness and acceptance. When the public is fully aware of the environmental benefits, operational costs, charging areas, and EV technology, the propensity and intention to use increase. Undoubtedly, greater awareness connotes adequate sensitization, which promotes greater usage. This, in turn, facilitates behavioral change toward sustainable mobility as a viable option for sustainable development. From the MLT point of view, adequate awareness builds trust and enhances the diffusion of EV innovations while supporting the socio-technical advantages drawn from the adoption of EVs.

Also, the organizational contextual factors consist of the policy maker commitment, infrastructure preparedness, and private sector investment. Concerning policy maker commitment, it is incumbent on the government to exhibit adequate buy-in by enacting laws that provide incentives and strategic electrification efforts, while providing standards and regulatory frameworks that support EV transition efforts. This will enhance stakeholder assurance. Similarly, private-sector investment and infrastructure preparedness include investments in facilities such as maintenance, charging units and networks, EV dealerships and spares, battery system availability, and overall support for the transport and energy sectors. On the part of the MLP Framework, actors such as the private sector investors and policy makers are rightfully a composite part of the facilitating conditions towards a feasible eclectic mobility agenda. The EV integration readiness accounts for Ghana's overall preparedness for the successful adoption and integration of EVs into the urban transport system. EVs represent a niche innovation in the context of MLP. Hence, for this innovation to achieve a high level of legitimacy, it requires the creation of infrastructure, policy commitment, technical readiness, as well as public awareness for the mobility systems to thrive, since they determine the potential degree of transition towards sustainable urban mobility in Ghana.

3.3 Conceptual Framework and Hypothesis Development

This research is underpinned by the TOE framework propounded by Tornatzky and Fleischer (1990) and supported by the Multiple Level Perspective framework (Figure 1).

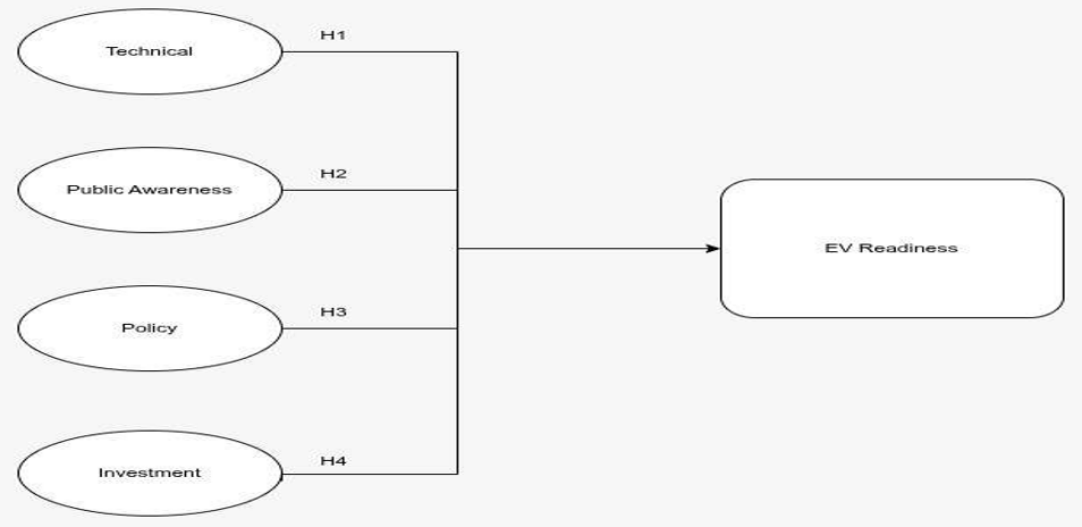

Figure 1. Conceptual Framework
Source: Author's own construct

3.4 Hypothesis development

3.4.1 Technical Concerns and EV Readiness

The technical concerns are prerequisites for effective uptake of EV, as espoused by Agyeman et al. (2022). For instance, the charging infrastructure has to be in place to ensure regular and consistent charging in urban public places such as malls, car parks, etc. This will enable easy access to the charging unit. Infrastructure disparity raises anxiety and discourages people from opting for EVs (Arthur et al.2026). Unreliable electricity and power outages are also a barrier to the uptake of EVs, as it reduces the consumer confidence among potential EV users. Incorporating renewable energy systems into existing fossil systems enables strategic energy management. Hence, it is hypothesized that;

H1: There is a direct significant relationship between the technical factors and EV readiness.

3.4.2 Public Awareness and EV Readiness

According to Nsan et al. (2025), the transition process towards EVs is a multifaceted journey which is influenced by consumer awareness and the capacity to purchase, income levels, and infrastructure base. In developed economies, educational efforts and awareness campaigns are rampant, thereby enhancing the visibility of EVs and assisting

potential users to familiarize themselves with the benefits of EVs. Limited access to information on EVs becomes a barrier to adoption and uptake, as many consumers are not aware of the requisite knowledge that builds trust, dispels misinformation and misconceptions, and supports behavioral change (Gicha et al.2024). Therefore, it is hypothesized that:

H2: A direct significant relationship exists between the public awareness of EVs and EV readiness.

3.4.3 Policy and EV readiness

Developing countries face existential policy gaps that impede EV uptake and adoption. These policies require integration with broader decarbonization targets while deploying such policies under strict coordination through highly regulated approaches, such as zero-emission mandates as well as fuel economy standards. This leads to the creation of strategic market signals, which create more awareness of the significance of EVs (Aidam et al. 2025). As such, policies that go to the core breed the motivation or intention to use since it shows government seriousness and buy-in. Therefore, it is hypothesized that;

H3: Policy availability relates directly to EV readiness.

3.4.4 Investment and EV Readiness

The high upfront cost of EVs for potential consumers can be a disincentive to their usage. There is a lack of private-sector investment and public subsidies in developing economies, which hampers the growth that should be realized in the EV sector (Ayetor et al. 2023). Further, limited financing models, limited fiscal space, and limited financing further exacerbate the phenomenon. The cost of accessories like the battery and other spare parts availability can be a hindrance to EV use (Sakyi-Agyei et al. 2026). Skill set is missing in dedicated universities researching EV technologies that could stimulate production, supply chain of spares, and collaborations that can lead to homegrown solutions and adaptation to local conditions, stifling innovation. With this, it is hypothesized that;

H4: There is a significant positive relationship between investments and EV Readiness

4. Inferential Statistics

The means range from 3.15 to 4.06, which indicates that on average respondent affirm towards agreement on every single item since the figures are above the midpoint of 3. This species the highest point of agreement. With regards to the strongest support, Private investment appeared to be the highest, with a mean of 4.06, while the switch to the EV happened to be 3.84. The lowest but still positive support fell on Transport hub priority, with a mean of 3.15 and 3.16 recorded for Street parking Support. These were close to neutral. Every item in the table had a negative skewness, denoting that the majority of respondents gave high ratings of 4s and 5s while leaving a long tail of lower scores of 1s and 2s.

Table 1. Descriptive Statistics

	mean	sd	min	max	skew	kurtosis
Grid_Sufficient	3.82	1.25	1	5	-0.85	-0.41
Govt_Policies_Clear	3.53	1.27	1	5	-0.43	-0.95
Barriers_Public_Charging	3.62	1.19	1	5	-0.66	-0.53
Public_Land_Sufficient	3.56	0.97	1	5	-0.39	-0.22
Street_Parking_Support	3.16	1.09	1	5	-0.07	-0.67
Transformer_Capacity	3.43	0.99	1	5	-0.49	-0.02
Awareness_Campaigns	3.64	1.01	1	5	-0.66	-0.01
Know_Charging_Stations	3.64	0.96	1	5	-0.56	0.2
Switch_To_EV	3.84	0.92	1	5	-0.68	0.17
Infrastructure_Growth	3.45	1.07	1	5	-0.28	-0.61
EV_Plan_Integrated	3.47	1.08	1	5	-0.44	-0.64

Transport_Hubs_Priority	3.15	1.01	1	5	-0.14	-0.17
Permitting_Efficient	3.53	1	1	5	-0.4	-0.22
Private_Investment	4.06	0.94	1	5	-0.88	0.37

Table 2. Regression

	Estimate	Std.Err	z-value	P(>|z|)
.Privt_Invstmnt	0.845	0.145	5.837	0
.Switch_To_EV	0.774	0.105	7.394	0
.Grid_Sufficint	1.409	0.265	5.311	0
.Prmttng_Effcnt	0.947	0.159	5.94	0

EV Readiness as dependent variable

Private investment recorded 0.145, indicating a relatively low standard error, showing a fairly precise estimate with moderate variability, but a z-value of 5.87 denoting a highly significant effect. In terms of the switch to EV, a standard error of 0.105 is the smallest variable, indicating a stable estimate. The z-value of 7.39 shows an extremely strong effect and deviation amongst all the variables. For Grid sufficiency, the moderate standard error of 0.265 is acceptable, but not with very high precision. However, the z-value of 5.311 exhibits robust statistical evidence. With respect to promoting efficiency, a moderate standard error of 0.159 is acceptable, while the corresponding z-value of 5.94 specifies a highly statistically reliable relationship. A p-value of less than 0.001for all constructs indicates that the relationship is highly significant (Figure 2).

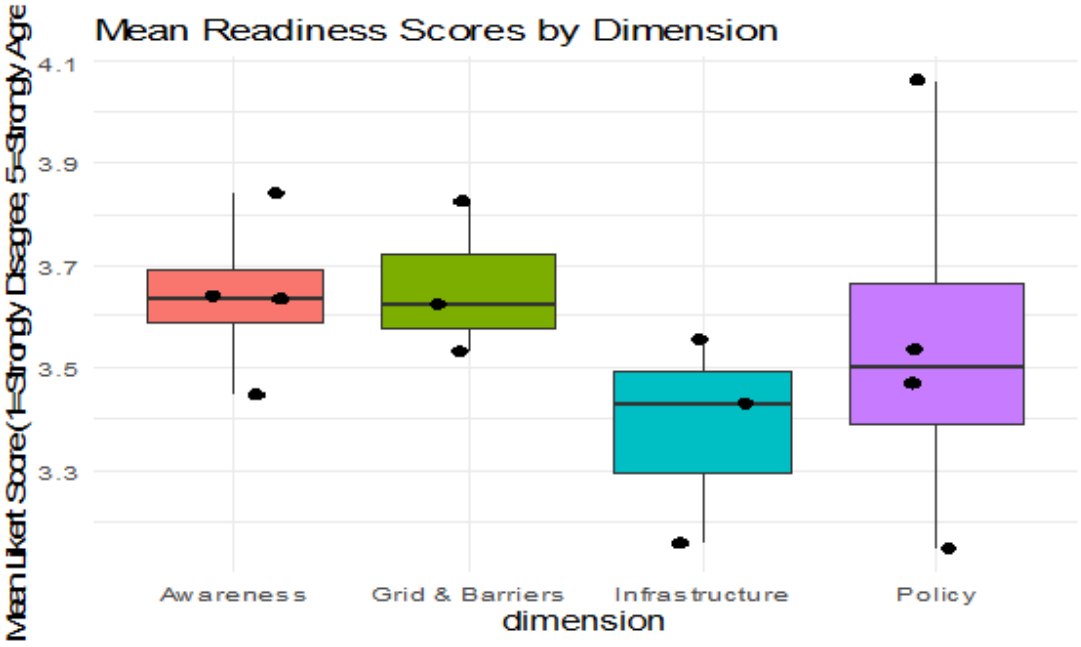

Figure 2. Mean Readiness Score

Awareness has the highest overall consistency with a median of 3.64. This means there is strong public consciousness for all items. In terms of Grid and barriers, the median figure is 3.62, which is high with a narrow interquartile range. Respondents have sentiments about power availability and the hurdles to be confronted. Infrastructure represents the lowest box on the plot with a median of 3.43and a tail dipping down to 3.15. This represents the weakest link to EV readiness and is the clearest bottleneck; adequate energy generation is key. Policy represents the tallest box on the

plot, with a range from 3.2 to the peak outlier at 4.06. This shows that policy issues are lagging, whilst private investments (4.06) are considered at the forefront and performing exceptionally (Figure 3).

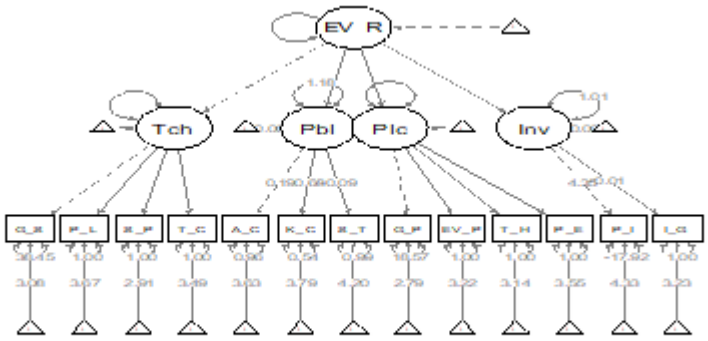

Figure 3. Structural Equation Model (Path Analysis)

The Structural Equation Model (SEM) has the determinants of EV Readiness incorporated. The four latent constructs include technology, public awareness, policy, and Investment infrastructure, all hypothesized to influence the dependent variable, EV readiness. The values are reliable, and the factor loading connecting the determinants (Grid stability, power load, supply reliability, and technical capacity) to technical appear very strong, indicating a strong representation of technical aspect preparedness by the dimensions. For the factor loading connecting the public awareness dimensions measured by knowledge and competence, stakeholder training, and general public awareness, the indicators show positive loadings, which indicate a significant influence of the public awareness construct. Finally, policy commitment measured by EV policies, tax incentives, and policy enforcement seems to capture government commitment very well in support of EV adoption. The mean figures are; G_S- 3.08, P_I- 3.67, S_P-2.91, T_C= 3.49 A_C=3.63

The values above 3 are moderate or agreement readiness, while those below 3 are weak in EV readiness, but those close to 4 are the strongest in agreement. Hence, P_J of 4.33 specifies that respondents are strongly in agreement with the policy statement, while S_P of 2.91 suggests a weak or less positive agreement with that phenomenon (Figure 4).

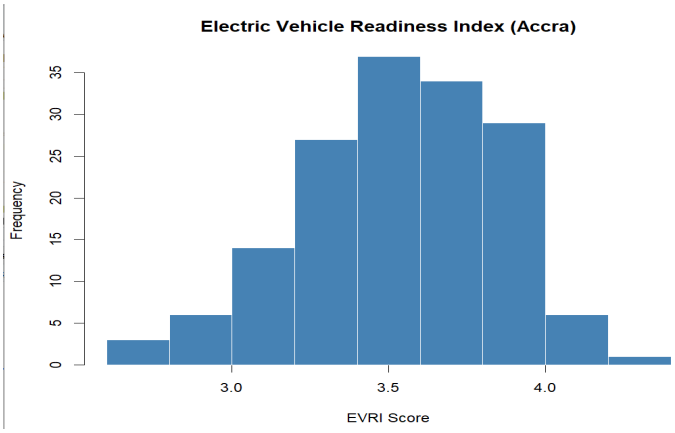

Figure 4. Electric Vehicle Readiness Index

The histogram depicts the distribution of EV Reediness Index scores. The core is highly represented and spread between 2.8 and 4.4, having most scores clustered around 3.2 and 3.7. However, the highest frequency is between 3.4 and 3.6. Moreover, a few respondents showed a very low score between 2.8 and 3.0.

5. Discussion

The empirical findings from the descriptive statistics offer significant, multidimensional insight and critically examine Ghana's structural and sustainable posture regarding EV integration. The collected data set reveals a clear narrative that, while macro-level market appetite is strong and private-sector willingness and baseline energy capacity are robust, sustainable urban mobility is adequately threatened by micro-infrastructural deficiencies, regulatory communication gaps, and localized urban constraints. The variable private investment yielded the highest mean score and had a remarkably low variance, as corroborated by Ayetor et al. (2025). This indicates that stakeholders believe the injection of private capital is a catalyst that can bolster EV infrastructure deployment. The belief that grids sufficiency is not a problem is a positive sign. This means there is an energy generation capacity surplus that can sustain the transition toward electric mobility. However, the lack of localized distribution resilience is the challenge. Localized transformers cannot withstand the pressure from charging by stakeholders, especially from multi-car residential charging units. Also, the lack of specialized design implementation and the severe congestion suffered by transport hubs pose a significant challenge. Additionally, legislative clarity is imperative, as breakdowns in institutional communications seem to derail the success of sustainable urban mobility frameworks. Moreover, this is in line with the argument raised by Agyemang (2025). High polarization exists between stakeholders, since while high-level players in the market may be familiar with an early-stage draft of EV adoption, the broader ecosystem players, including union leaders and private-sector players, have no clue; hence, consumers feel disconnected from the clarity the policy guideline should provide.

6. Conclusion

The paper concludes that for all the hypotheses developed, there was a direct significantly positive relationship between technical, public awareness, Policy, Investment, and EV readiness in Ghana, even though the extent of the strength of the relationships was considerably different.

7. Recommendations

- Policymakers and Government Institutions could fill the Credibility Gap by fast-tracking the 100 rapid charging stations with public milestones, prioritizing high-visibility sites, leverage public-private partnerships on trust.
- De-stigmatize Policies by bridging the policy clarity gap by disseminating plain-text, multilingual guides to EV incentives, launching community sensitization activities, and establishing a centralized information platform that has information on policies, permit availability, and charging locations.
- A Redesign of the Regulatory Framework can be done by addressing the lowest-rated criteria. Specifically, changing strict parking regulations in parking to allow for curbside charging, zoning the area to be EV-friendly, zoning to allow curbside charging for EVs, and creating zoning plans for public transport hubs as part of national EV plans with clear timelines for deployment.
- By addressing Distribution-Level Grid Constraints, distribution-level grid challenges can be addressed (e.g., optimization of grid upgrades and grid prioritization while managing the need for demand). Inclusion Equity and Inclusion in Infrastructure Plans can help prevent the move from contributing to closing mobility disjunctures to ensure equity metrics.
- Embrace High Public Confidence by Publicly featuring successful projects to convert the neutral cohort to a positive one for Transport Operators and Unions. Proposal on the Inclusion, actively engage in policy consultations to increase the rating on transport hub priority advocacy for dedicated charging infrastructure at public transport sites.

Practical, Theoretical, and Policy Implications

The practical implication of this research holds that to improve Ghana's readiness for electric vehicle integration into the transport sector, a modernized grid, charging infrastructure development, public sector awareness creation, and private sector involvement are key. Further, practically, the study endorses valuable guidance for investors, transport operators, utility agencies, and automotive industry stakeholders. Electricity Company of Ghana can utilize this finding to plan for energy demand hikes to expand the grid because of the introduction of EVs. Additionally, the investor community will benefit by identifying business opportunities and seizing them, especially in the service solution for EV integration. Financial institutions can develop products specifically for the EV space to augment the adoption of consumers, as well as educational institutions having specialized training programs for the EV uptake and sustainability.

By this, policymakers and various governmental agencies, such as the Transport Ministry, Energy and Green Transition Ministry, and Communication and Innovation Ministry, must ensure that the National Electric Vehicle Policy implementation roadmap is reviewed to provide the requisite investor incentives and strengthen the electricity infrastructure that can accommodate future charging endeavors. Also, public education campaigns must be aggressively rolled out to enhance consumer awareness and acceptance while building public-private partnerships for charging opportunities in various public places that can accelerate service provision.

Theoretically, the study contributes to the growing body of knowledge on sustainable transport and technological transitions by extending the TOE framework and the multi-level perspective framework in the context of EV readiness in emerging economies like Ghana. The study underscores the criticality of technological factors such as grid capacity and infrastructure preparedness, organizational factors such as government support and public awareness, and environmental factors such as policy commitment and private investment. The study also enriches the limited literature on EV adoption in Africa by underscoring the significance of the multidimensional sociotechnical phenomenon of EV readiness.

Future works

Future work can focus on the moderating influence of variables such as culture, age, educational level, and gender on the relationships between the independent and dependent variables in this study. Also, other theoretical underpinnings can be utilized, such as UTAUT 2, the Technology Acceptance Model, and Dynamic Capability theories, to test these relationships**.**

Limitation

The sample size of 150 is inadequate, and plans are put in place to increase the number to capture a lot more data to influence the robustness of the research.

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Biographies

Dr. Nana Agyeman-Prempeh is a project and supply chain professional with over 20 years of experience across industry and academia. He has over a decade of industry experience in the pharmaceutical sector, having worked with organisations such as Vicdoris Pharmaceuticals Ltd, and Sinopharm Ghana Ltd, Lidl (UK) and T.K Maxx (UK), He is currently a full-time lecturer at Ghana Communication Technology University (GCTU), where he teaches undergraduate and postgraduate courses in Procurement, Logistics, Supply Chain Management, Project Management, and Global Distribution Networks. He also teaches in a joint program of GCTU with Anhalt University of Applied Sciences (Germany) and Coventry University (UK) and leads the P-Learn Centre for Industrial Research and Innovation, focusing on sustainability and climate change. Nana contributed to the establishment of the Ghana Innovation Hub, funded by the World Bank. He holds a B.Ed. from the University of Cape Coast (Ghana), an MBA from GIMPA(Ghana), an MSc from Coventry University (UK), and a PhD from the University of the Western Cape (South Africa), alongside several international certifications. Dr. Nana has chaired sessions in conferences and is a multidisciplinary researcher focusing on Supply chain innovations, logistics, entrepreneurship, and sustainable health.

Mr. Joseph Oduro is a seasoned logistics and transportation professional with over eight years of experience in supply chain operations. I currently serve as Transport Supervisor at Keda Ceramics Ghana LTD, where I oversee fleet management, route optimization, and delivery coordination. I hold an MSc in Procurement and Logistics Management from Ghana Communication Technology University, a Chartered Certificate in Supply Chain and Procurement Management, and a BA in Psychology from the University of Ghana. My unique combination of behavioral psychology insight and technical logistics expertise enables me to lead teams effectively, improve operational efficiency, and drive cost-effective transport solutions.

Mr. Joseph Buabeng is a distinguished academic who teaches as a full-time faculty member at the Ghana Communication Technology University. He teaches courses at the undergraduate and postgraduate programs at the Department of Procurement, Logistics, and Supply Chain Management. He holds a master's degree in Procurement and Supply Chain Management from Kwame Nkrumah University of Science and Technology. He is currently pursuing his PhD at the Durban University of Technology.

Mr. Daniel Osei is a results-driven accounting professional with over 13 years of experience at Phoenix Insurance Company, where he works within the Treasury Department. He has developed strong expertise in cash flow management, investment monitoring, account reconciliation, and regulatory compliance. Daniel is known for his analytical skills and attention to detail, which enable him to support effective financial decision-making. He has a proven track record of improving financial processes and strengthening internal controls. His contributions have consistently supported organizational stability, operational efficiency, and sustainable growth within the company's financial management framework. Daniel is a chartered accountant and also pursues an MBA in International Trade from Anhalt University of Applied Science (Germany).

Mr. Felix Anim is a dedicated Procurement Officer in the Supply Chain Department at Asante Gold Chirano Limited. In his role, he is responsible for managing procurement processes, ensuring the timely acquisition of goods and services, and supporting efficient supply chain operations within the organization. He plays a key role in supplier evaluation, contract management, and cost optimization, contributing to operational efficiency and value creation. Felix has over a decade of experience in the mining industry, equipping him with extensive practical knowledge of procurement systems, supplier management, and logistics coordination in complex operational environments. He is currently pursuing a Master's degree in Procurement and Supply Chain Management at Ghana Communication Technology University, further strengthening his academic and professional expertise. He remains committed to continuous improvement and excellence in supply chain management, contributing to organizational competitiveness and sustainability.

Mr. Joseph Boateng Arhin is a results-driven Procurement Officer with over a decade of experience in supply chain management, procurement strategy, and risk assessment. I currently serve at Ghana Rubber Estates Limited in Takoradi, Ghana as a Procurement Officer, where I have consistently demonstrated expertise in supplier relationship management, cost optimization, and aligning procurement activities with production needs to enhance operational efficiency. I have a strong track record in developing and implementing procurement policies that streamline processes and reduce costs. My ability to analyze market trends and manage inventory effectively has contributed to improved supply chain performance and minimized operational disruptions. Before my current role, I worked as an Internal Auditor (Inventorist), where I strengthened inventory controls, conducted audits, and ensured data accuracy to support informed decision-making.I hold a Master of Science in Supply Chain Management from Coventry University in the United Kingdom and at the final level (level 3) of the Institute of Chartered Accountancy-Ghana. My academic background is complemented by certifications in Kaizen methodology and advanced Excel.

Mr. Sulemana Ibn Sa-eed is an accomplished transport management professional with the Ghana Airports Company Ltd. He is the director for transport at the company. He holds a master's degree in supply chain management from Coventry University, UK. Currently, he is pursuing a PhD at the Kwame Nkrumah University of Science and Technology in Ghana. He has achieved significant project success in his career.

Anita Cole is a results-oriented Procurement and Supply Chain professional with 10+ years of experience in contract negotiation, logistics coordination, and compliance management. Anita is working with UCS Ghana Ltd. She had previously worked with Zoom Janitorial Services and is currently pursuing an MSc in supply chain management at the Ghana Communication Technology University.