EV Ridership Survey Analysis – Quetta CBD Electric Vehicle Project

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1. Drivers' Economic and Operational Insights

i. Average Trips per Day

Rickshaw drivers in Quetta's CBD perform a high volume of trips daily, indicating robust demand. The majority of drivers (280 out of 641, ~44%) complete 10–15 trips per day, forming the backbone of daily mobility. A significant share (194 drivers, ~30%) manage 15–20 trips daily, showing that many drivers push towards higher productivity. A smaller segment (143 drivers, ~22%) make only 5–10 trips – possibly due to shorter working hours or operating in less busy areas. Only a very small minority (24 drivers, ~4%) achieve 20–25 trips per day, representing the upper limit of what a driver can handle in a day.

These figures highlight consistently high demand for rickshaw services, with most drivers operating in a moderate trip range that balances workload and available passengers. The fact that only a few drivers can exceed 20 trips underscores physical and temporal limits (fatigue, vehicle wear-and-tear) that constrain daily operations.

Implications for EV adoption: EV Shuttle service could help improve operational efficiency – for example, less downtime for refueling (with proper charging infrastructure) and smoother driving could reduce driver fatigue. This would support drivers in sustaining their 10–15 trip routines more comfortably, and possibly allow higher trip counts without excessive strain.

Policy Opportunity/Risk: Policymakers should recognize EV Shuttle Services' central role in mobility and implement measures (like designated charging hubs or driver rest programs) that improve efficiency and reduce driver fatigue, as these are objectives directly supported by EV Services. By doing so, Quetta can maintain the current trip throughput while making the service more sustainable and driver-friendly.

ii. Average Passengers per Day

The survey reveals that rickshaws typically serve several passengers each day, underlining their importance in moving people. The largest group of drivers (approximately 247 drivers) reported carrying about 3 passengers per day on average, and another 199 drivers handle 4 or more passengers daily. Smaller groups of drivers average 2 passengers (128 drivers) or just 1 passenger per day (65 drivers). In essence, most rickshaw drivers transport between 2–4 individuals each day, indicating that rickshaws are used for multiple trips or group rides rather than single-passenger journeys in many cases.

This distribution highlights the rickshaw's central role in meeting urban mobility needs, as drivers are collectively transporting thousands of people across the city daily. The data implies that rickshaws often carry more than one passenger per trip (for example, family members or ride-sharing among commuters), which maximizes each trip's utility.

Implications for EV adoption: EV Shuttle service will need to accommodate the same passenger capacity and reliability as existing rickshaws. The typical occupancy of 2–4 passengers means EV Shuttle service should be designed with sufficient seating and power to carry small groups without performance issues.

Opportunities: By providing a cleaner and quieter ride for these passengers, EV Shuttle service could enhance customer satisfaction, especially for groups (e.g. families or students carpooling) who would benefit from reduced noise and emissions.

Policy Recommendation: Ensure that EV Shuttle service models introduced have comparable or better passenger capacity and comfort. This will maintain the high utilization rates and reinforce the public perception that the new EV service remain an indispensable transport option for daily commuters.

iii. Average Income per Day

Daily income levels for rickshaw drivers are generally modest, underscoring economic vulnerability in the current system. Most drivers earn in the low thousands of PKR per day. The largest segment of drivers (114 drivers) reported an average daily income of about PKR 2,000, and a considerable number earn around PKR 2,500 (85 drivers). Only small groups of drivers reach higher daily earnings (e.g. 58 drivers make ~PKR 5,000; 84 drivers ~PKR 6,000; 59 drivers ~PKR 8,000), and only 4 drivers reported as high as PKR 15,000 in a day. Conversely, many drivers subsist on the low end of the spectrum – for instance, 14 drivers make only PKR 1,000 per day and 66 drivers around PKR 1,500. In fact, the vast majority (over 95%) of drivers earn below PKR 8,000 daily, which translates to roughly <PKR 240,000 per month before expenses.

This income distribution closely mirrors the passenger flow patterns and indicates that most rickshaw drivers are living on thin margins. Earning PKR 1,000–2,000 per day (≈ PKR 30k–60k per month) often proves insufficient to comfortably sustain a household, given urban living costs.

Implications for EV adoption: The EV Shuttle service offers an opportunity for the drivers to switch to new service as employees within the new system.

Risks: The no. of EV vehicles involved will be much less than the currently running rickshaws, meaning that there will be lesser job opportunities.

Policy Recommendations: The EV service, after success of the pilot project, may be expanded and run in a disciplined modality in shifts, which shall augment job opportunities.

iv. Working Days per Week

Rickshaw driving in Quetta is largely a full-time, nearly every-day job for most operators. The majority of surveyed drivers (330 out of 639, ~52%) reported working 6 days a week, and another 252 drivers (~39%) work all 7 days. Only a small fraction take more days off – 53 drivers (8%) work 5 days a week, and just a handful (only 4 drivers in the survey) work 4 days or fewer. This means over 90% of drivers work six or seven days weekly, leaving little time for rest.

Such long work weeks reflect the economic pressure on rickshaw drivers, who feel the need to maximize working days to earn enough income. The job is demanding: few can afford to take weekends or regular breaks.

Implications for EV adoption: EV Shuttle Service must be integrated in a way that does not force drivers to reduce their working days due to lengthy charging times or maintenance. Therefore, reliable fast-charging or battery-swapping solutions should be in place so that drivers can continue a 6-7 day work schedule without significant interruptions.

Opportunities: EVs have fewer mechanical parts and no need for fuel stops, which could mean less maintenance downtime and more consistent daily operation. Over a week, this could help drivers maintain their vehicles with potentially fewer breakdowns.

Policy Recommendations: Establish sufficient charging infrastructure and possibly designated time-slots or queue systems at charging stations to avoid long waits.

v. Peak Hours

Rickshaw demand in Quetta is not confined to a single "rush hour" – it remains strong throughout the day with notable peaks. According to the survey, evening is the busiest period, with 187 drivers (the largest group) citing the evening as their peak time for passengers. The afternoon is also very busy (145 drivers identify afternoon peaks), and mornings see high demand as well (108 drivers). Even during what might be off-peak times, night-time usage remains significant (91 drivers report nights as a peak). Some drivers described "mixed" peak hours, indicating they are busy throughout multiple periods of the day.

These findings show that rickshaws provide consistent, round-the-clock service, underpinning urban mobility from morning until late night. Rather than having one short rush, Quetta's rickshaw usage is spread out – perhaps a reflection of staggered work hours, shopping times, and social activities in the city.

Implications for EV adoption: EV service will need to meet this sustained all-day demand. Specifically, battery capacity and charging strategies must account for multiple peak periods. A rickshaw might work from morning, through an afternoon lull, into a busy evening; thus an EV should ideally run an entire shift or have the ability to recharge during off-peak intervals (e.g., a quick top-up in mid-afternoon) to be ready for the evening rush.

Risks: If EVs have insufficient range or if charging is only available at certain times, drivers could be forced to sit out a portion of these peak hours, reducing service availability. This could frustrate commuters and drivers alike.

Opportunities: The data confirms there is demand to fill nearly 18+ hours of the day, which means an EV Shuttle service would be well-utilized if managed properly. Policymakers can leverage this by planning charging station placement and schedules to align with usage patterns (for example, installing charging points near major stands so drivers can charge during quieter times). Ensuring "infrastructural and operational readiness for uninterrupted service during maximum load periods" is crucial. In summary, EV service must be integrated in a way that keeps them on the road through all key periods, matching the reliability that current rickshaws offer across Quetta's long daily peaks.

vi. Other Income Sources

The survey asked drivers if they have any secondary income aside from rickshaw driving. The result was clear: the vast majority (575 out of 641 drivers, ~90%) do not have any other income source – rickshaw driving is their sole livelihood. Only 66 drivers (~10%) indicated having an additional source of income to supplement their earnings.

This heavy reliance on a single income stream (rickshaw driving) means drivers are economically vulnerable. Any disruption to their rickshaw operations – be it illness, vehicle breakdown, or policy changes – can immediately threaten their financial stability.

Implications for EV adoption: These drivers cannot easily absorb income shocks. It underlines why many drivers may be cautious about the EV project: their entire livelihood is at stake if anything goes wrong.

Implications for EV adoption: The EV Shuttle service offers an opportunity for the drivers to switch to new service as employees within the new system.

Risks: The no. of EV vehicles involved will be much less than the currently running rickshaws, meaning that there will be lesser job opportunities.

Policy Recommendations: The EV service, after success of the pilot project, may be expanded and run in a disciplined modality in shifts, which shall augment job opportunities.

vii. Worry about the EV Project

Drivers' attitudes toward the EV Shuttle service project range from enthusiastic to apprehensive. On a scale of 1 (not worried at all) to 5 (very worried), a significant portion of drivers report low worry or neutral feelings about the transition. Specifically, 156 drivers (about 24%) are "not worried" (completely unconcerned) and supportive, and an additional 146 drivers (~23%) are neutral. This means roughly half of drivers are either outright positive or at least open-minded about the EV project. On the other hand, some drivers do have reservations: 108 drivers (17%) are slightly worried, 178 (28%) are worried, and 53 (8%) are very worried about the EV initiative's impact on them. In total, about one-third of drivers express moderate to strong concern.

This promising split – with a sizable cohort already supportive or neutral – suggests there is a foundation of driver goodwill to build on, as well as a significant group whose concerns need addressing. The worries drivers have likely stem from uncertainties about operational costs, charging infrastructure, and income security rather than from an opposition to the technology itself. Many fear the unknown: Will an EV be expensive to maintain? Will I waste time charging it? Will I earn less during or after the transition?

Implications for EV adoption: Gaining driver buy-in is crucial. If too many drivers are anxious, adoption will stall or face pushback. However, the data shows nearly 1 in 4 drivers is already on board (not worried at all), which is a good sign for pilot programs or early adopters who can champion the project. The neutral group (another 1 in 4) could likely be swayed with proper information and incentives.

Risks: The roughly one-third who are worried or very worried might resist or even quit. This could undermine the project by reducing the rickshaw fleet or causing labor issues.

Opportunities and Recommendations: The key will be outreach and support. As the report suggests, targeted awareness campaigns, hands-on demonstrations of EV, and policy incentives (like subsidies or guarantees) can alleviate fearsOverall, while some skepticism exists, it is largely manageable with proper stakeholder engagement and support, paving the way for the EV project to be feasible and sustainable in Quetta.

viii. If EV Replaces Rickshaw (Drivers' Intended Responses)

The survey explored what drivers might do if traditional rickshaws are phased out in favor of EV rickshaws. The responses show a mix of adaptation and potential exit from the profession. Encouragingly, 249 drivers (~39% of those surveyed) said they would "switch to an EV" rickshaw, indicating a strong willingness among many to continue their profession with a new technology. On the other hand, an equally large group, 247 drivers (~39%), chose "Other", suggesting they might seek alternatives – possibly different jobs, different vehicles, or are undecided. A smaller but notable segment, 94 drivers (~15%), stated they would "stop working" as rickshaw drivers altogether if petrol rickshaws were eliminated. Lastly, 51 drivers (8%) said they would move to non-transport work (i.e., find a job in another field) rather than drive an EV rickshaw.

On one hand, nearly 40% are ready to adopt EVs – a solid base of early adopters who see clear advantages like lower operating costs or environmental benefits. This group can lead the way in the pilot phase of the project. On the other hand, an equally large group is uncertain or considering leaving the trade, which signals concern about the viability of rickshaw driving in the EV era. The 94 drivers planning to quit entirely likely represent those who feel they cannot manage the change – perhaps due to age, financial constraints, or mistrust in the new system.

Implications: If a large number of drivers exit (over 20% combining the "stop working" and possibly some of the "Other" category), Quetta could face a shortage of rickshaw services or unemployment issues for those drivers.

Risks: A poorly managed Integration of EVs could lead to job losses – 94 drivers (and possibly more among the 247 "other") losing their livelihood is a social and economic risk. Additionally, if those drivers seek other work, the city loses experienced transport workers.

Opportunities: The fact that so many are willing to switch to EVs (249 drivers) is a positive sign – these could become "EV ambassadors" demonstrating the benefits to their peers. For the 247 "other" responders, this is an opportunity for authorities to engage and understand their hesitations. They might be open to EVs if their specific concerns (financing, training, etc.) are resolved. Perhaps they need incentives or proof of concept. As the report notes, drivers interested in alternative livelihoods could benefit from reskilling or financial support programs aligned with broader city goals. For example, some might become EV maintenance technicians, or take roles in the charging infrastructure, if they truly don't want to drive.

Recommendations: Develop a comprehensive Integration of EVs plan for drivers:

- Set up training sessions for all drivers to familiarize them with EV operation and maintenance, reducing fear of the unknown.

- For those considering exit, offer alternative job training (perhaps within the transport sector, like bus driving, parcel delivery, etc., or within the EV ecosystem as technicians or charging station operators). This way, even those who don't want to drive an EV Shuttle service can find productive employment.
- Implement social protection measures (e.g., temporary income support or buy-back for old rickshaws) to cushion the impact on those 94 who currently say they'd quit. Overall, the divided outlook highlights a responsibility for policymakers: with the right support structures and awareness campaigns, many drivers can be guided to successfully shift towards EV rickshaws, ensuring both livelihood security for drivers and sustainable mobility for Quetta.

ix. Required Monthly Income

Drivers were asked what monthly income they consider sufficient for a decent living. The majority of drivers pinpointed a monthly income requirement in the range of PKR 30,000 to PKR 80,000, with a particularly high concentration around PKR 60,000–69,000. Specifically, 153 drivers (about 24%) said PKR 60–69k is needed for relative financial ease. Substantial numbers also chose PKR 50–59k (133 drivers, ~21%) and PKR 40–49k (125 drivers, ~19%) as required income levels. On the higher side, 102 drivers (16%) need PKR 70–79k and 68 drivers (11%) seek PKR 80k or more per month. Very few (only 9 drivers, ~1%) would be content with less than PKR 30k (the 20–29k band), underscoring that almost all drivers feel they need well above that to sustain their households.

This establishes a benchmark of roughly PKR 50k–70k per month as the common "target" income for drivers. By comparison, as noted, many drivers currently earn around PKR 1,000–2,000 per day (PKR 30k–60k/month if working daily), which means a large portion are at the lower end or below their desired comfort income.

Implications for EV adoption: If EV Shuttle service can help drivers approach these income targets, driver buy-in will be strong. EVs present a compelling case here: with lower fuel and maintenance costs, drivers can save more of their daily earnings, potentially bridging the gap between current incomes and their required income. For example, if a driver currently makes ~PKR 50k/month net and needs 60k, the savings from not buying petrol daily could make up that difference.

Opportunities: This frames EV Shuttle service not just as an environmental upgrade, but as an economic uplift strategy for drivers. By reducing operating expenses, EVs can improve drivers' take-home pay, moving them closer to the ~PKR 60k+ monthly income they consider acceptable.

Risks: However, if the Integration of EVs is mishandled such that drivers incur new costs (loan repayments for the EV, expensive battery replacements, or downtime losses) that *offset* the fuel savings, then the promise of higher income might not materialize. Drivers could then become disillusioned or financially worse off.

Policy Recommendations: To maximize this opportunity, structure the financial model of EV adoption so that monthly costs for the driver (after subsidies or savings) are equal or lower than current costs. For instance, if a driver saves PKR 500 daily on fuel, that's ~PKR 15k/month – which can go toward a lease payment on the EV, *without* reducing current income. Any additional savings become extra income, helping meet their required levels. Also, track the progress: treating PKR 60k (most cited benchmark) as a target, policymakers can evaluate if drivers' average incomes are rising toward that after EV rollout. If not, adjustments (like greater subsidies or fare tweaks) might be needed. In summary,

establishing drivers' required income clarifies that EV adoption should be positioned not only as a green initiative but also as a means to improve drivers' financial stability, which will be key to its long-term success.

x. Education Level

The educational profile of rickshaw drivers in Quetta shows that most come from limited formal education backgrounds. Among surveyed drivers, 199 have no formal education (31%), and 85 (13%) have only primary level schooling. A majority, 267 drivers (42%), reached secondary education (matric or high school level). Only 88 drivers (14%) have attained higher education (college/university). In other words, nearly three-quarters of drivers have a high school education or less, and a significant chunk are not formally educated at all.

This matters because education often determines what other job opportunities are available. The data suggests that most drivers have limited options in the wider job market due to their educational qualifications. If rickshaw driving were to become unviable, many would struggle to find alternative employment that meets their income needs. Indeed, earlier survey questions revealed that if forced to quit rickshaw driving, many would consider non-transport work or might leave the workforce, which ties back to their skill and education limits.

Implications for EV adoption: The introduction of EV Shuttle service is not just a technological change but also a lifeline for sustaining the livelihoods of these drivers in the transport sector. Since many can't easily switch careers (due to educational barriers), enabling them to continue doing what they know (driving rickshaws) but in a cleaner, modern form is critically important.

Opportunities: EV Shuttles, if implemented with adequate training, allow drivers to remain employed in their familiar profession while improving their earnings and working conditions. It's a socially inclusive path – drivers don't need a college degree to drive an EV rickshaw, but they will need some new skills (like understanding battery charging, basic troubleshooting of electric systems). The survey analysis points out that with targeted training and awareness programs, drivers can adapt to the new technology with relative ease. This training is feasible even for those with low literacy, as it can be hands-on and visual.

Risks: If the educational gap is not addressed, some drivers might feel intimidated by the new technology, fearing they lack the knowledge to operate or maintain an EV. This could feed resistance. Also, without training, misuse of the EVs (e.g., improper charging) could reduce their benefits.

Policy Recommendations: Develop a comprehensive capacity-building program for drivers: workshops or short courses on EV operation, charging protocols, and minor maintenance. Use simple, vernacular instructions and demonstrations to ensure inclusivity. Perhaps pair less-educated drivers with pilot drivers who have learned the EV system (peer-

to-peer learning). Additionally, since many drivers might not be adept with formal banking or financing (again tied to education levels), provide facilitated access to loans/leases for EVs – e.g., help with paperwork or have an agent assist them. In essence, the EV transition should be crafted as a "practical strategy for sustaining livelihoods" for drivers of all education levels, ensuring no one is left behind simply because they lack formal schooling. This will make the EV Shuttle service rollout not only an environmentally sustainable move, but a socially equitable and economically viable path forward for Quetta's transport workforce.

2. Commuters' Insights

i. Gender of Commuters

Rickshaws are a critical mode of transport for both women and men in Quetta, with usage split almost evenly between genders. Out of 639 commuter respondents, 289 (45%) were female and 350 (55%) male, indicating substantial female ridership. This near-equal gender distribution highlights that rickshaws aren't just a convenience for a few – they are an essential service for the entire population, including women.

This finding is particularly important in a cultural context where women and girls often face greater mobility challenges. Women might have concerns about safety on public transport, restricted access to private vehicles, or social norms limiting their travel. Rickshaws in Quetta help bridge these gaps by providing a dependable and flexible mode of transport for women – enabling them to reach schools, universities, workplaces, markets, and healthcare facilities with relative ease.

Implications for EV adoption: The introduction of EV Shuttle service stands to benefit female commuters significantly. Quieter, cleaner vehicles mean a more pleasant travel environment (less noise and exhaust fumes), which can improve comfort and health for passengers. Moreover, if EV Shuttle service are paired with improvements like better seating or safety features, they could further enhance the experience for women riders.

Opportunities: By modernizing the rickshaw fleet to EVs, Quetta has a chance to reinforce the inclusivity of this mode. For instance, some women may currently avoid certain routes or times due to pollution or noise – EVs could remove those barriers. The survey commentary notes that EV Shuttle service will *"further enhance inclusivity"* by offering cleaner and more reliable travel, directly benefiting female commuters. Additionally, there is an opportunity to promote women's empowerment through this new electric mobility. A cleaner transport option can be marketed as a public good that especially aids women (who often travel with children, or during off-peak hours when other options are scarce).

Risks: It's important to ensure the EV rollout does not inadvertently reduce service frequency or coverage on routes heavily used by women (for example, routes to educational institutions or hospitals). If initial EV deployment is limited, authorities should be careful that female commuters (nearly half the user base) are not left waiting.

Policy Recommendations: Incorporate gender-sensitive planning into the EV Shuttle service project. This could include training drivers on respectful behavior and safety (since rickshaws are mixed-gender spaces), regulating fares to remain affordable (women, especially students or homemakers, may have limited income for transport), and even considering women-driven EV Shuttle service or reserved seating as pilot initiatives. By

doing so, Quetta can ensure EV Shuttle become a supportive and equitable mobility solution for all, with particular benefits for women and girls. In summary, maintaining the rickshaw service's accessibility to women and improving it via EVs will enhance urban mobility and gender equity in the city.

ii. Occupation of the Commuters

Commuters from a wide range of occupations rely on rickshaws in Quetta, underlining the mode's importance across the socio-economic spectrum. The survey categorized riders by their work/occupation and found that students are the largest group of regular rickshaw users (144 respondents, ~23%), reflecting how crucial rickshaws are for daily travel to educational institutions. Following students, businesspeople (105 respondents, ~16%) and office workers (85 respondents, ~13%) form the next largest user groups. These figures illustrate a significant formal-sector dependence on rickshaws – many people are using them to reach offices, shops, and businesses on time. Additionally, shopkeepers comprised 24 respondents (around 4%), and the remaining 280 respondents (~44%) fell into the "Other" category. The "Other" category likely includes informal workers, homemakers, laborers, unemployed persons making trips for personal errands, and others not classified in the main job categories.

The data paints rickshaws as both a formal and informal transport backbone. Students rely on them to get to class; employees use them to commute to work; and a large portion of people use them for various personal and household needs. This shows that rickshaws are not just a last-resort or niche option – they are deeply integrated into the city's daily functioning for all kinds of trips (from school runs to business errands).

Implications for EV adoption: Any changes to the rickshaw system will ripple through multiple sectors of society. If EV Shuttle service are fewer or operating differently (e.g., needing charging breaks), it could affect students getting to exams, workers getting to their jobs, or merchants ferrying goods. Therefore, the Integration of EVs must ensure continuity of service for all these groups. The broad usage also means there is a broad base of support for improvements: students and professionals alike would appreciate cleaner air and quieter streets that EVs bring.

Opportunities: EV Shuttle service can enhance the reliability and quality of service for both formal and informal needs. For instance, students often travel at fixed times (morning, afternoon); if EV Shuttle service reduce pollution, the city benefits from better air during school commute hours. Office workers might value the quieter ride to make phone calls or simply have a less jarring commute. The data confirms rickshaws are a *"backbone of Quetta's daily mobility system"*, so introducing EVs could strengthen this backbone if done correctly. It could also improve the city's image as modern and commuter-friendly, encouraging more people to use public transport instead of personal cars.

Risks: A poorly executed EV rollout that reduces the number of rickshaws (even temporarily) could disrupt access to workplaces or schools, disproportionately hurting those without alternatives. Affordability is key too – many students and low-income workers

use rickshaws because they are cost-effective. If EVs led to higher fares without subsidies, these groups might suffer (or shift to walking or unsafe alternatives).

Policy Recommendations: The Integration of EVsplan should maintain at least the current number of rickshaws in service, if not increase it, to meet demand across all occupations. Any pilot that takes petrol rickshaws off the road should replace them with an equal or greater number of EVs to avoid gaps in service. Additionally, fare regulations or student discounts could be introduced to keep rickshaw travel affordable during and after the transition. The government could also engage universities and employers in supporting the EV shift – for example, by installing charging stations near campuses or office areas, or by encouraging employee carpools in rickshaws. In short, because rickshaw commuters include everyone from students to businessmen, EV Shuttle service integration must be handled in a way that *enhances* their mobility needs – reliability, capacity, and affordability should be preserved or improved. If successful, EV Shuttle service will create a more sustainable and inclusive transport system that serves Quetta's diverse commuter base even better than before.

3. User Demand and Perception Analysis

i. Support for EV

Commuters in Quetta exhibit overwhelming support for the introduction of EV Shuttle service. When asked about their stance on EV rickshaws, the vast majority leaned positive. Specifically, 390 respondents (about 61% of 639 surveyed) labeled themselves "Supportive", and another 176 (27.5%) were "Very Enthusiastic" about EVs – effectively meaning nearly 89% of commuters are favorable to the project. In stark contrast, opposition is minimal: only 5 people (0.8%) are "Strongly Opposed" and 28 (4.4%) "Slightly Opposed," totaling under 5% expressing any level of resistance. The remainder, about 40 people (6.3%), are neutral, neither for nor against.

This strong mandate from the public indicates a city eager for cleaner and quieter transport solutions. Commuters recognize current problems like noise, air pollution, and congestion caused by traditional rickshaws and see EVs as a *"much-needed positive change"* for the city. Unlike some drivers who have understandable concerns about costs and logistics, commuters are focused on the benefits they will experience – such as reduced exhaust fumes, less noise, and possibly smoother rides.

Implications: Public acceptance is often the hardest part of implementing new transport technology, and here Quetta's commuters are clearly signaling green light for EV Shuttles. This means policymakers and investors have a supportive customer base, which reduces the risk of the project failing due to lack of ridership.

Opportunities: The strong public backing can be leveraged to accelerate policy decisions – for instance, implementing pilot zones for EV Shuttle service or securing funding (public support can justify budget allocations or subsidies). The fact that only a handful of people are firmly against it suggests there won't be significant public backlash if, say, certain regulations (like phasing out very old polluting rickshaws) are implemented. Additionally, the enthusiasm of 176 respondents indicates a segment of the population might actively help promote or adopt the system – they might choose EV Shuttle service even if slightly costlier or be willing to adjust routines to support the initiative.

Risks: Although opposition is minimal, it's worth noting that neutrality (6%) and slight opposition (4%) exist – these could stem from concerns like "will I find a rickshaw when I need one during Integration of EVs?" or skepticism about promises. If not handled carefully, any early hiccups (like not enough EVs leading to waiting times, or a highly publicized breakdown of an EV Shuttles) could sour some opinions. Thus maintaining public confidence is key.

Policy Recommendations: Keep the public informed and involved. Use this goodwill by involving commuter representatives in planning – for example, get feedback on preferred routes for initial EV deployment or on acceptable fare ranges. Transparently share the benefits (maybe via a public awareness campaign on how EVs improve air quality – since commuters already value that). Also, as the project rolls out, highlight success stories (e.g., a testimonial from a daily commuter about improved commute experience). The goal should be to convert the current strong support into enduring patronage of EV Shuttles. Ensuring that commuter support stays high will provide a stable demand for EV Shuttles, making the system economically viable and validating the environmental and quality-of-life improvements that the public expects.

ii. Would Pay More

Quetta's commuters not only support EV Shuttle service in principle, but they're also willing to pay a bit extra in fares to make the transition possible. An overwhelming 623 out of 639 respondents (97.5%) said "Yes" – they would accept paying more for an EV Shuttle service ride than they currently pay for a conventional rickshaw. Only 16 people (2.5%) responded "No," insisting on no fare increase. This is a remarkable consensus indicating that the public values the benefits of EVs enough to bear part of the cost.

The willingness to pay more suggests that resistance is not towards the technology itself, but purely about affordability. People generally understand that cleaner technology might come with a price premium, and in Quetta's case, they are largely accepting of a "slightly higher fare" as a trade-off for cleaner air and quieter streets.

Implications: This broad agreement gives policymakers room to introduce modest fare hikes or a small surcharge to support the EV system (for example, a "green fee" of a few rupees per ride that goes into charging infrastructure or subsidies for drivers). It also indicates that commuters acknowledge the collective benefit – they are effectively saying, "We're willing to invest in better transport for the city."

Opportunities: With commuters prepared to contribute financially, the government can design a fare structure that balances sustainability and accessibility. Perhaps a new fare table where an EV Shuttle service ride is marginally more expensive than a petrol rickshaw ride, justified by better service quality. The near-universal willingness can also encourage public-private partnerships: private operators will be more confident if they know passengers accept higher fares, meaning their return on investing in EVs could be reasonable. Another opportunity is in public messaging: the fact that the public is on board financially can be used to push for supportive policies, such as saying "Look, 98% of people support this and will even pay a bit more – we must not let them down, let's implement the EV project."

Risks: The key caveat is how much more people will pay (addressed in the next subsection). Willingness to pay is not unlimited – if fare increases are too steep, the goodwill might evaporate. Also, a small minority (2.5%) are against any increase; while tiny, this could include vocal individuals or those for whom even a minor hike is a burden (perhaps very low-income daily wagers or students). So equity considerations should be kept in mind so that those 16 (and others like them) are not priced out of rickshaw travel.

Policy Recommendations: Proceed with introducing a moderate fare increase or structured surcharge for EV rides, but do so transparently and gradually. For instance, if current average fare is X, perhaps make EV fare X + 10% initially and communicate that this is going into maintaining the service and supporting drivers' training. It's also wise to consider subsidies or discounts for vulnerable groups despite the general willingness – e.g.,

maybe those 16 “No” responders represent people who genuinely can’t afford even a slight increase, so the government could use some of the extra revenue to provide student passes or discounts for low-income riders, ensuring inclusivity. Ultimately, the survey’s finding that almost everyone is willing to pay more is a strong green light – it “highlights the strength of public support” and ensures that with careful planning, EV Shuttle service can be introduced as a viable solution without alienating the user base on cost grounds.

iii. How Much Can They Pay More

While commuters are willing to pay a premium for EV Shuttles , their ability to pay has practical limits. The survey asked those who agreed to higher fares *how much more* they'd be comfortable paying per trip. The results show that the additional amount most people can afford is relatively modest. The single most common acceptable extra fare was PKR 50: about 198 respondents (~32% of those willing to pay more) said they could pay PKR 50 above the normal fare. Another sizeable group, 93 respondents (~15%), could pay PKR 100 extra. Smaller numbers of people were okay with increments like PKR 40 (86 respondents), PKR 30 (22 respondents), or PKR 20 (only 3 respondents). On the higher end, very few would go much beyond PKR 100 – for instance, 43 people (around 7%) were willing to pay +PKR 150, and only a handful could go to +PKR 200 or more (literally 1 person for +PKR 200, 4 people for +PKR 250, and 2 people for +PKR 300). Essentially, the vast majority of commuters who agreed to pay extra indicated a range of roughly PKR 20 to PKR 100 additional, with PKR 50 being the sweet spot for many.

This provides a clear benchmark for policymakers: asking for much more than a 50–100 PKR increase per trip would likely strain public acceptance. Given current rickshaw fares in Quetta (for context, a typical fare might be on the order of a few hundred PKR for a short ride), an extra Rs.50 is a significant but not outrageous percentage increase.

Implications: If the cost structure of operating EV Shuttle service requires fare hikes larger than ~PKR 100 per ride, the city may encounter pushback or ridership loss. The data suggests fare increases beyond PKR 150–200 would face strong resistance. So, it's crucial that the economics of the EV system be managed to keep needed fare hikes within this tolerance range.

Opportunities: Knowing that around one-third of riders are fine with +PKR 50 and many with +PKR 100 means the project can likely introduce a moderate fare hike successfully. For example, if an average ride is PKR 200, perhaps making it PKR 250 (a 50 increase) could be broadly acceptable and significantly improve the financial viability of EV operations (by boosting driver income or covering battery costs). Additionally, since about 15% even support +PKR 100, there might be room in the future, as EV benefits are demonstrated, to adjust fares up to that level in stages – but initially staying around +PKR50 might capture the biggest group of willing payers.

Risks: The relatively low threshold of willingness to pay reflects that many rickshaw users are fare-sensitive (students, low-income workers, etc.). If operating costs for EVs turn out high (e.g., expensive batteries or electricity tariffs), relying solely on fare hikes to cover these could overshoot what users can pay. There's a risk of either financial shortfalls for drivers or pricing out commuters if costs aren't controlled.

Policy Recommendations:

Develop a balanced pricing strategy:

- Consider a small initial fare premium (e.g., 10–20% higher than current fares) for EV Shuttles , roughly equivalent to that PKR 50 zone for typical trips. Monitor public response and ridership; if it remains positive, this could perhaps be raised gradually but keep it ≤PKR 100 for typical rides for the near term.

- Use subsidies or incentives to reduce the need for fare increases. For instance, if electricity for charging is subsidized or if capital costs are offset by government grants, drivers won't need to charge much more to passengers. This is important because the survey clearly signals a limit to commuters' ability to pay.

- Ensure transparency and communication: if fares go up, explain that it's to support drivers and maintain service quality (commuters are more likely to accept increases when they know it's facilitating a cleaner environment and not just arbitrary).

- Also, be ready with support for those extremely price-sensitive riders: maybe keep a small fleet of conventional rickshaws until EV costs come down, or provide concessions as earlier mentioned.
  By respecting the boundaries commuters have indicated, policymakers can maintain public goodwill. In summary, Quetta's commuters are willing to invest in a better mobility system, but that investment has a modest cap – mostly up to PKR 50 extra per ride (and in fewer cases up to PKR 100). Keeping fare policies within this range, or offsetting costs elsewhere, will be crucial to ensure the Integration of EVs remains affordable and broadly supported.

iv. Concerns

Commuters were also asked about their specific concerns regarding EV Shuttles, and the responses highlight a few key areas that need to be addressed for the project to succeed. The most common worry relates to "Charging" – about 156 respondents (~24%) are concerned about the availability and convenience of charging stations for EVShuttles. This likely stems from fear that if there aren't enough charging points or if charging takes too long, it could disrupt their travel (for instance, fewer rickshaws on the road or longer wait times while vehicles charge). The second major concern is "Delays", cited by 136 respondents (~21%). This is probably related: commuters worry that EV Shuttle service might introduce delays in service – perhaps due to time out for charging or reduced speed/range. Another significant concern is "Price" (fares) – 119 people (~19%) fear that the new EV system will lead to higher commuting costs for them. This aligns with the earlier willingness-to-pay data; people support EVs but are wary of steep fare hikes. A smaller number mention "Safety" (24 respondents, ~4%) as a concern. Safety could refer to multiple things: the safety of the new vehicles (battery fires or malfunctions), or personal safety (maybe a concern that quieter vehicles could pose road safety issues, or simply fear of the unfamiliar). Lastly, a large segment, 203 respondents (~32%), fell under "Other" concerns. "Other" could include a variety of miscellaneous worries such as reliability of the new rickshaws, availability during late hours, losing the door-to-door flexibility, etc.

In essence, the top three concerns (charging infrastructure, potential service delays, and cost increases) account for the bulk of commuter anxiety about EV shuttles.

Implications: If these concerns are not adequately addressed, even supportive commuters might become frustrated once the project is underway. For example, a commuter might initially support EVs for the environmental benefits, but if they frequently can't find an available EV shuttle service because many are stuck charging ("delays"), or if the fare becomes too high ("price"), they might revert to other modes or criticize the project. Some respondents even implied they might stick to "cheaper but lower-quality" transport if EV Shuttle service become too costly or scarce.

Opportunities: On the positive side, these concerns point directly to areas policymakers can work on. They are *actionable*. If the city invests in a robust charging network, plans for quick turnaround, keeps fares reasonable, and ensures vehicles are safe, it will directly alleviate the majority of commuter worries. Addressing these issues head-on will not only maintain public support but also improve the overall success and reliability of the EV system.

Risks: Each concern corresponds to a risk:

- **Charging:** If not enough charging stations are in place, EV sjuttles might queue up to charge, taking vehicles off the road. Commuters would face longer wait times or

unavailability, undermining trust in the system. This could compel some to seek other modes of transport (maybe motorcycles, which would worsen traffic and pollution again).

- **Delays:** Related to charging and possibly battery range – if EVs can't complete peak hours without stopping, commuters might experience interruptions in service or longer travel times. This routine challenge could make daily commutes unpredictable.
- **Price:** If EV adoption leads to a fare hike beyond what people expect, it could price out some riders or simply breed resentment, particularly if the promised benefits (e.g., cleaner air) are not immediately tangible to them.
- **Safety:** Any incident of an EV Shuttle service malfunction (like a battery short-circuit) could be blown out of proportion in public perception, causing fear. Also, pedestrians might not hear an EV coming due to low noise, raising minor safety adjustments that need attention.
- **Other:** While we don't know all "other" concerns, this large category means there may be a spread of niche issues (perhaps weather effects on batteries, or questions like "will drivers charge more for luggage with EV" etc.). Not addressing these could leave pockets of dissatisfaction.

Policy Recommendations: To mitigate these concerns, a multipronged approach is needed:

1. **Charging Infrastructure:** Deploy ample charging stations in the city, especially in high-demand corridors and rickshaw stands. Explore fast-charging technology or battery swapping to minimize downtime. Perhaps schedule driver charging in shifts (incentivize charging during off-peak midday hours by offering discounted electricity, for example) so that during rush hours, most EV shuttles are available. Publicize the plan: if commuters see new charging points being installed, it instills confidence that charging won't be a bottleneck.
2. **Maintain Service Levels (Avoid Delays):** Ensure that the number of EV Shuttle service rolled out keeps pace with or exceeds the petrol rickshaws being phased out. If an EV has to be out of service to charge, consider having spare vehicles or swap batteries to keep service continuous. Use route scheduling data to position charged vehicles where needed. Essentially, make the transition seamless from the user perspective, so they hardly notice any "downtime." This may involve smart management or even a real-time app to locate available EVs so that users feel the system is reliable.
3. **Cost Control:** As discussed, keep fare increases modest. Additionally, consider subsidizing either the fare or the backend costs during the initial years. For example,

government can subsidize electricity for charging or provide grants to drivers – this way, drivers don't need to charge passengers more to recoup costs. Clearly communicate any fare changes and frame them as necessary for cleaner air, which commuters have shown they value. Also highlight the long-term savings (maybe EV fares could eventually drop if scale is achieved and running costs are low).

4. **Safety Assurance:** Implement and enforce safety standards for EV Shuttle service (battery quality, vehicle construction). Train drivers on safe charging practices and emergency procedures. Educate the public that EV Shuttle are tested and safe. Perhaps have a few female commuters or general public figures experience them and share positive safety feedback. Additionally, a small thing like adding a gentle alert sound to EV Shuttle (since they are very quiet) could help pedestrians – some EV vehicles globally do this to enhance safety.

5. **Address "Other" Concerns through Communication:** Since a large number of "other" concerns were raised, hold public forums or Q&A sessions where people can ask anything about EV shuttles. This will surface specific issues and allow officials to clarify misconceptions. For example, if someone is worried "What if an EV Shuttle battery dies while I'm in it?", you can explain the contingency plans.

In summary, charging, delays, and cost concerns are the top priorities to tackle. The success of Quetta's EV Shuttle service project will depend on proactively building the infrastructure and policies to avoid these pitfalls. If done right, commuters should feel little inconvenience from the transition – except noticing the air is cleaner and rides are quieter. By carefully planning to prevent charging bottlenecks and fare shocks, and by communicating safety and reliability, the authorities can convert these concerns into confidence. Many survey respondents worry about these issues now, but effective action can ensure that in practice, commuters find EV Shuttle service to be as convenient and affordable and improve the city's livability. Quetta can then truly reap the benefits of an electric transport revolution with broad public satisfaction.