EV Infrastructure Analysis Report: Austin, TX

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Executive Summary

This executive summary analyzes the electric vehicle (EV) charging infrastructure in Austin, TX, highlighting key findings and actionable insights. Austin's built area of 649.51 sq km [1] supports a total of 74 EV charging stations [2], indicating a significant need for expansion. The current infrastructure predominantly consists of Level 2 chargers (67, representing 90.5% of total chargers) [3] with 12 DC fast chargers [4], a total of 183 ports [3,4]. While nearly all stations (98.7%) are free to use [5], the existing infrastructure is heavily reliant on a single network, ChargePoint (58.1%), with a lack of updated data (0% verified in the last 90 days) [6]. The limited number of stations compared to the extensive road network (over 60,000 roads of all types) [7,8,9,10,11,12], and high proportion of older stations suggest that Austin is falling behind current EV adoption rates and future projections.

Despite the high percentage of public access (100%) [13] and 24/7 availability (75.7%) [13], the limited number of chargers poses a significant challenge. The prevalence of free charging [5] could signal a need for more comprehensive, sustainable financial models for EV charging infrastructure, particularly considering the potential for increased adoption. The lack of network diversity also presents a vulnerability.

Austin requires a strategic expansion of EV charging stations to meet the anticipated increase in EV adoption. Prioritizing the installation of DC fast chargers in strategic locations, such as along major transportation corridors and near residential areas, is crucial. Diversifying the network of providers would ensure greater resilience and reduce reliance on a single network. Finally, exploring sustainable financial models for EV charging is needed to ensure long-term viability and encourage continued development.

Infrastructure Overview

Austin, TX EV Infrastructure Overview

This report analyzes the existing Electric Vehicle (EV) charging infrastructure in Austin, Texas, considering its geographic context and potential for future expansion. Austin's total area is 1679.20 sq km [1], with 649.51 sq km designated as built area [1]. The current EV charging infrastructure consists of 74 total stations [6], significantly lower than the number of surface parking lots (2958) [5] and parking structures (272) [5] indicating a substantial opportunity for growth. The limited number of stations is a key constraint on the wider adoption of EVs in the city.

The existing EV charging stations comprise 12 DC fast chargers with 63 ports [7] and 67 Level 2 chargers with 120 ports [7]. Notably, 98.7% of stations are currently free to use [11], potentially hindering revenue generation and future investment in infrastructure expansion. While 100% of stations are publicly accessible [8], credit card and mobile pay acceptance rates are only 58.1% and 64.9% respectively [9], suggesting a need for increased payment flexibility. The

infrastructure is largely dominated by the ChargePoint network (58.1% of stations) [10], with significant portions un-networked (35.1%) and operated by Tesla (6.8%) [10].

Considering Austin's extensive road network encompassing 62,041 roads of various types [2,3,4], the current charging station density presents a challenge to widespread EV adoption. Strategic placement of charging stations along major thoroughfares and in high-traffic areas is crucial to improve accessibility and encourage EV usage. Furthermore, the concentration of stations within certain networks might hinder interoperability and create potential user limitations. The data highlights a considerable need for expansion and strategic planning to fully support Austin's growing EV market. The age of the stations (all over 3 years old) [12] suggests potential upgrades and maintenance requirements may also need to be addressed. The low verification rate for stations in the last 90 days (0.0%) [13] signals a need for more rigorous monitoring of station status and availability.

Current EV Assessment

Austin, TX EV Infrastructure Assessment

This report analyzes the current state of electric vehicle (EV) charging infrastructure in Austin, Texas, considering its geographical context and existing transportation networks. The analysis reveals a significant disparity between the existing infrastructure and the projected demand, highlighting areas for immediate improvement and strategic planning.

The city's built area of 649.51 sq km [1] supports a relatively low number of publicly accessible EV charging stations. Currently, there are only 74 total stations [2], significantly less than what would be required to support a rapidly growing EV adoption rate. While 75.7% of stations offer 24/7 access [3], and 100% are publicly accessible [4], the distribution and capacity are uneven. The majority of stations (58.1%) belong to the ChargePoint Network [5], indicating a concentration of infrastructure within a single provider's network. The dominance of free charging stations (98.7% [6]) also presents a challenge for long-term sustainability of the EV charging infrastructure.

Austin's extensive road network, including 42,682 service roads [7] and a significant number of residential roads [8], implies a potential for widespread EV charging station deployment. However, the current concentration of charging stations raises concerns regarding accessibility in certain neighborhoods and transportation corridors. Improving accessibility requires strategic station placement in areas with limited access to current infrastructure, taking into consideration residential density, proximity to commercial centers and public transport, thereby ensuring equitable access to EV charging across all areas of Austin. The analysis of charging capabilities shows a higher prevalence of Level 2 chargers (67 chargers with 120 ports [9]) compared to DC fast chargers (12 chargers with 63 ports [9]). This indicates a need for investment in DC fast charging infrastructure to cater to the increasing demand for quicker charging times.

To effectively address these challenges, a comprehensive plan is needed for the expansion of EV charging infrastructure. This plan should focus on diversifying charging network providers, strategically locating additional stations in underserved areas to ensure equitable access, and providing a mix of Level 2 and DC fast chargers to cater to various user needs. The plan should also consider implementing a sustainable revenue model that ensures the long-term viability and maintenance of the EV charging network. A robust data-driven approach, along with public-

private partnerships, is essential for achieving the goals of sustainable and equitable EV infrastructure development in Austin.

Demand Analysis

Demand Analysis for EV Infrastructure in Austin, TX

This analysis examines the demand for EV charging infrastructure in Austin, Texas, considering existing infrastructure and projected growth. Austin currently has a total of 74 EV charging stations [1], serving a city area of 586.14 square miles [1]. This translates to a low density of approximately 0.13 stations per square mile. Considering Austin's rapid population growth and increasing EV adoption rates, this density is likely insufficient to meet future demand. The current infrastructure heavily favors Level 2 chargers (67 stations, representing 90.5% of the total) [2], with a comparatively smaller number of DC fast chargers (12 stations, 16.2%) [2]. This suggests a potential gap in infrastructure for longer trips and faster charging needs.

Austin's existing infrastructure is primarily concentrated in accessible locations, with nearly all stations boasting public access [3] and a high percentage offering 24/7 availability (75.7%) [3]. However, the payment methods available remain a point of concern; only 58.1% of stations accept credit cards and 64.9% accept mobile payments [4]. This limits access for users without specific mobile applications or preferred payment methods, highlighting a need for improved payment options at charging stations. This is further compounded by the fact that a significant percentage of the charging stations (35.1%) are not associated with any network [5], which can reduce the usability for drivers who prefer using network apps for payments and station location search. The aging of the stations, with 100% being over 3 years old, further suggests the need for improvements and new station construction [6].

Given the current limitations and future growth prospects, it's crucial to significantly increase the number of EV charging stations, particularly DC fast chargers, across diverse locations within Austin to match projected EV adoption rates and enhance driver convenience. Further strategic investment should focus on expanding payment options, integrating stations into networks, and regular upgrades to ensure the infrastructure remains robust and responsive to the rising demand. The existing infrastructure also has a high percentage of free charging stations (98.7%), meaning that the sustainability of this model needs to be reassessed based on the increasing demand [7].

Supply Analysis

Supply Analysis of EV Charging Infrastructure in Austin, TX

This analysis examines the current supply of EV charging infrastructure in Austin, Texas, considering its geographical context and existing transportation networks. Austin boasts a substantial built-up area of 649.51 sq km [1], but the current EV charging infrastructure appears inadequate relative to its population and future EV adoption projections. The existing 74 total charging stations [2] are distributed across various networks, with ChargePoint dominating at 58.1% [3]. This concentration raises concerns about potential network vulnerabilities and the need for increased diversity in infrastructure providers.

The majority of existing stations (98.7%) offer free charging [4], indicating a potential market gap for paid premium charging services, especially for fast-charging needs. While 100% of

stations currently offer public access [5], the limited number of stations presents a significant challenge to widespread EV adoption. The city's extensive road network, encompassing 42682 service roads [6] alone, demands a far more extensive and strategically placed charging network. The current supply of charging stations (475 stations [7]) is concentrated in existing parking structures and lots, which may not be optimal for efficient EV usage across the city. Future planning needs to take into account less centrally located areas and the distribution of future EV adoption.

Actionable insights suggest an immediate need to incentivize private investment in EV charging infrastructure, especially for faster DC fast chargers. Furthermore, expanding the network beyond the current providers to encourage competition and improve reliability is crucial. City planning should prioritize strategic placement of charging stations along major roadways, near residential areas, and at transportation hubs to meet growing EV demand. Given the high percentage of older stations (100% over 3 years old [8]), investment in new technology and station upgrades should be considered to ensure operational efficiency and the ability to adapt to future EV technologies.

Gap Analysis

This report analyzes the gap between existing EV charging infrastructure and projected needs in Austin, TX. Austin's total area is 1679.20 sq km [1], with 649.51 sq km designated as built area [1]. Currently, there are 74 total EV charging stations across the city [2], covering 586.14 sq miles [2]. This translates to a low density of approximately 0.13 stations per square mile. This starkly contrasts with the projected increase in EV adoption rates, anticipated to significantly surpass the current infrastructure capabilities. The existing stations are primarily Level 2 chargers (67) [3], indicating a lack of high-speed DC fast charging infrastructure that is crucial for long-distance travel. Further analysis reveals that a significant portion (98.7%) of the stations are free to use [4], posing challenges to long-term maintenance and sustainability. This free model may not be financially sustainable in the long term, potentially hindering future expansion and upgrades.

Considering Austin's substantial built area and rapid growth, the existing infrastructure is inadequate. The 475 total EV charging stations identified within parking structures and surface lots across the city [1] are spread unevenly throughout the city, potentially creating charging deserts in certain areas. The aging infrastructure further exacerbates the problem: all existing stations are more than three years old [5], underscoring the need for investment in new and improved stations. A significant percentage (58.1%) of charging stations have been verified within the last 30 days [5], however, this still does not address the underlying deficiency in the overall number of stations and their location.

To address this shortfall, a phased approach to expanding EV infrastructure is recommended. This includes prioritizing the development of DC fast-charging stations in strategic locations along major roadways and in areas with high traffic congestion. Moreover, a shift towards a sustainable charging model involving a mix of free and paid stations, paired with investment in smart charging technologies, should be considered. The adoption of an incentivized model by the city might be crucial in attracting private sector investments to augment public efforts. Regular maintenance and upgrades of existing infrastructure are crucial for ensuring reliability and preventing further aging of stations. Further analysis should prioritize mapping and modelling

potential areas to focus investment on to maximize the benefits to the community, and to mitigate the creation of EV charging deserts.

Location Recommendations

Austin, TX EV Infrastructure Analysis

This report analyzes the existing EV charging infrastructure in Austin, TX, considering its spatial distribution relative to population density, traffic patterns, and existing transportation networks. The analysis reveals significant opportunities for expansion and optimization to meet the growing demand for EV charging in the city. Key areas of focus include enhancing charging station density in high-traffic corridors [1] and improving accessibility features such as 24/7 access and diverse payment options [2].

Austin's current EV charging infrastructure comprises 74 total stations [3], distributed across a city area of 586.14 square miles [4]. While the existing infrastructure has a high rate of public accessibility (100%) [5], the spatial distribution needs further investigation to optimize its effectiveness. The current network is heavily reliant on ChargePoint, which represents 58.1% of the stations [6], highlighting the potential for increased competition and network diversification to increase reliability and reduce reliance on single providers. The current ratio of stations to the city's built area (649.51 sq km) [7] suggests a need for substantial infrastructure growth. The predominantly free charging model (98.7%) [8] could be leveraged for incentivized usage in areas with lower station density.

Future infrastructure planning should focus on leveraging existing transportation hubs, such as the 2241 bus stops [9] and 10 train stations [10] as strategic locations for charging stations. This will not only improve convenience but also promote the adoption of public transit in conjunction with electric vehicles. Furthermore, a detailed spatial analysis correlating station placement with residential and commercial building density (3749 apartments and 480 commercial buildings, respectively) [11], along with traffic patterns derived from road network data (e.g., 42682 service roads) [12], is needed to optimize the placement of new stations and ensure adequate coverage for diverse users. This approach should consider the needs of not only residential users but also those in the commercial and retail sector (634 retail buildings) [13], potentially integrating charging solutions into newly constructed buildings or existing parking structures (272 parking structures) [14].

Implementation Strategy

This report analyzes the existing EV charging infrastructure in Austin, TX, and its implications. Austin's total area is 1679.20 sq km [1], with 649.51 sq km being built area [1]. Currently, there are 74 total EV charging stations [2] across the city, which is significantly low considering the built-up area and growing EV adoption. This translates to a station density that needs improvement. The majority of these stations (67) offer Level 2 charging [2], while only 12 offer DC fast charging [2], indicating a potential bottleneck for faster charging needs. A comprehensive expansion strategy is needed to address this deficiency. Furthermore, almost all stations (98.7%) are currently free to use [2], suggesting a potential revenue generation opportunity for the city while enhancing financial sustainability of the infrastructure.

The existing infrastructure shows high accessibility, with 100% of stations having public access [2], and a large portion offering 24/7 access (75.7%) [2]. Payment methods are somewhat limited, however, with credit card acceptance at only 58.1% and mobile pay at 64.9% of stations [2]. Expanding payment options could significantly improve user experience and adoption. The network distribution is dominated by ChargePoint (58.1%), with a substantial portion (35.1%) being non-networked [2], which presents an opportunity to increase efficiency and network coverage through strategic partnerships.

Analysis reveals that all existing stations are more than 3 years old [2], highlighting the immediate need for upgrades and expansion to meet the growing demand. The fact that only 58.1% of stations were verified in the last 30 days [2] also indicates the necessity for improved monitoring and maintenance protocols. Austin's extensive road network, with 42682 service roads [1] for example, presents many opportunities for strategically placing additional chargers. Given the increasing number of EVs and the city's growth, a significant increase in EV charging infrastructure is critically important, ideally focusing on high-traffic areas and expanding network coverage to reduce reliance on un-networked chargers. A detailed cost-benefit analysis and prioritization of locations based on traffic data and population density should be a crucial next step.

Executive Summary Citations

[1] 649.51 (Data: summary.area_metrics.built_area) [2] 74 (Data: ev_data.metadata.total_stations) [3] 67 Level 2 chargers with 120 ports (Data: ev_data.charging_capabilities.by_type.level2) [4] 12 DC fast chargers with 63 ports (Data: ev_data.charging_capabilities.by_type.dc_fast) [5] 98.7% (Data: ev_data.network_analysis.pricing_types.free.percentage) [6] 0% (Data: ev_data.station_age.last_verified.last_90_days.percentage) [7] 1124 (Data: summary.roads.motorways) [8] 225 (Data: summary.roads.trunks) [9] 2002 (Data: summary.roads.primary_roads) [10] 5295 (Data: summary.roads.secondary_roads) [11] 3482 (Data: summary.roads.tertiary_roads) [12] 13200 + 42682 = 55882 (Data: summary.roads.residential_roads, summary.roads.service_roads) [13] 100% Public Access and 75.7% 24/7 Access (Data: ev_data.accessibility.access_type.public.percentage, ev_data.accessibility.access_type.24_7_access.percentage)

Infrastructure Overview Citations

[1] 1679.20 sq km total area, 649.51 sq km built area (Data: infrastructure.area_metrics.total_area, infrastructure.area_metrics.built_area) [2] 1124 motorways (Data: infrastructure.roads.motorways) [3] 225 trunk roads (Data: infrastructure.roads.trunks) [4] 2002 primary, 5295 secondary, 3482 tertiary, 13200 residential, and 42682 service roads (Data: infrastructure.roads.primary, infrastructure.roads.secondary, infrastructure.roads.tertiary, infrastructure.roads.residential, infrastructure.roads.service) [5] 2958 surface parking lots, 272 parking structures (Data: infrastructure.parking.surface, infrastructure.parking.structures) [6] 74 total EV charging stations (Data: ev_infrastructure.overview.total_stations) [7] 12 DC fast chargers (63 ports), 67 Level 2 chargers (120 ports) (Data: ev_infrastructure.charging_capabilities.dc_fast, ev_infrastructure.charging_capabilities.level2) [8] 100% public access (Data: ev_infrastructure.accessibility.public_access) [9] 58.1% credit card, 64.9% mobile pay

acceptance (Data: ev_infrastructure.accessibility.payment_methods.credit_card, ev_infrastructure.accessibility.payment_methods.mobile_pay) [10] ChargePoint 58.1%, Non-Networked 35.1%, Tesla 6.8% (Data: ev_infrastructure.network_analysis.networks) [11] 98.7% free stations (Data: ev_infrastructure.network_analysis.pricing.free) [12] 100% of stations are more than 3 years old (Data: ev_infrastructure.station_age.more_than_3_years) [13] 0% station verification in last 90 days (Data: ev_infrastructure.station_age.last_verified.last_90_days)

Current EV Assessment Citations

[1] 649.51 sq km (Data: summary.area_metrics.built_area) [2] 74 total stations (Data: ev_data.metadata.total_stations) [3] 75.7% (Data: ev_data.accessibility.access_type.24_7_access.percentage) [4] 100% (Data: ev_data.accessibility.access_type.public.percentage) [5] 58.1% (Data: ev_data.network_analysis.networks[0].percentage) [6] 98.7% (Data: ev_data.network_analysis.pricing_types.free.percentage) [7] 42,682 service roads (Data: summary.roads.service_roads) [8] 13200 residential roads (Data: summary.roads.residential_roads) [9] 67 Level 2 chargers (120 ports) and 12 DC fast chargers (63 ports) (Data: ev_data.charging_capabilities.by_type)

Demand Analysis Citations

[1] 74 stations, 586.14 sq miles (Data: ev_data.metadata.total_stations, ev_data.metadata.city_area_square_miles) [2] 67 Level 2 chargers, 12 DC fast chargers (Data: ev_data.charging_capabilities.by_type.level2, ev_data.charging_capabilities.by_type.dc_fast) [3] 100% public access, 75.7% 24/7 access (Data: ev_data.accessibility.access_type.public.percentage, ev_data.accessibility.access_type.24_7_access.percentage) [4] 58.1% credit card, 64.9% mobile pay (Data: ev_data.accessibility.payment_methods.credit_card.percentage, ev_data.accessibility.payment_methods.mobile_pay.percentage) [5] 35.1% non-networked stations (Data: ev_data.network_analysis.networks[1].percentage) [6] 100% of stations are more than 3 years old (Data: ev_data.station_age.age_distribution.more_than_3_years.percentage) [7] 98.7% free charging stations (Data: ev_data.network_analysis.pricing_types.free.percentage)

Supply Analysis Citations

[1] 649.51 sq km (Data: summary.area_metrics.built_area) [2] 74 total charging stations (Data: ev_data.metadata.total_stations) [3] 58.1% (Data: ev_data.network_analysis.networks[0].percentage) [4] 98.7% (Data: ev_data.network_analysis.pricing_types.free.percentage) [5] 100% (Data: ev_data.accessibility.access_type.public.percentage) [6] 42682 service roads (Data: summary.roads.service_roads) [7] 475 stations (Data: summary.parking.ev_charging) [8] 100% (Data: ev_data.station_age.age_distribution.more_than_3_years.percentage)

Gap Analysis Citations

[1] 1679.20 sq km total area, 649.51 sq km built area, 475 total EV charging stations in parking structures/lots (Data: summary.area_metrics.total_area, summary.area_metrics.built_area, summary.parking.ev_charging) [2] 74 total EV charging stations, 586.14 sq miles city area (Data: ev_data.metadata.total_stations, ev_data.metadata.city_area_square_miles) [3] 67 Level 2

chargers (Data: ev_data.charging_capabilities.by_type.level2) [4] 98.7% of stations are free (Data: ev_data.network_analysis.pricing_types.free.percentage) [5] 100% of stations are more than 3 years old, 58.1% verified in last 30 days (Data: ev_data.station_age.age_distribution.more_than_3_years.percentage, ev_data.station_age.last_verified.last_30_days.percentage)

Location Recommendations Citations

[1] High-traffic corridors in Austin (Data: summary.roads.primary_roads, summary.roads.secondary_roads) [2] 75.7% 24/7 access, 58.1% credit card payment, 64.9% mobile pay (Data: ev_data.accessibility.access_type.24_7_access.percentage, ev_data.accessibility.payment_methods.credit_card.percentage, ev_data.accessibility.payment_methods.mobile_pay.percentage) [3] 74 total stations (Data: ev_data.metadata.total_stations) [4] 586.14 square miles (Data: ev_data.metadata.city_area_square_miles) [5] 100% public access (Data: ev_data.accessibility.access_type.public.percentage) [6] 58.1% ChargePoint Network (Data: ev_data.network_analysis.networks[0].percentage) [7] 649.51 sq km built area (Data: summary.area_metrics.built_area) [8] 98.7% free charging (Data: ev_data.network_analysis.pricing_types.free.percentage) [9] 2241 bus stops (Data: summary.transport.bus_stops) [10] 10 train stations (Data: summary.transport.train_stations) [11] 3749 apartments, 480 commercial buildings (Data: summary.buildings.apartments, summary.buildings.commercial) [12] 42682 service roads (Data: summary.roads.service_roads) [13] 634 retail buildings (Data: summary.buildings.retail) [14] 272 parking structures (Data: summary.parking.parking_structures)

Implementation Strategy Citations

[1] 1679.20 sq km total area, 649.51 sq km built area (Data: summary.area_metrics.total_area, summary.area_metrics.built_area) [2] 74 total stations, 67 Level 2 chargers, 12 DC fast chargers, 98.7% free, 100% public access, 75.7% 24/7 access, 58.1% credit card, 64.9% mobile pay, all stations >3 years old, 58.1% verified last 30 days (Data: ev_data.metadata.total_stations, ev_data.charging_capabilities.by_type.level2, ev_data.charging_capabilities.by_type.dc_fast, ev_data.network_analysis.pricing_types.free.percentage, ev_data.accessibility.access_type.public.percentage, ev_data.accessibility.access_type.24_7_access.percentage, ev_data.accessibility.payment_methods.credit_card.percentage, ev_data.accessibility.payment_methods.mobile_pay.percentage, ev_data.station_age.age_distribution.more_than_3_years.percentage, ev_data.station_age.last_verified.last_30_days.percentage) [3] 42682 service roads (Data: summary.roads.service_roads) [4] 586.14 square miles city area (Data: ev_data.metadata.city_area_square_miles) [5] ChargePoint Network: 58.1% (Data: ev_data.network_analysis.networks[0].percentage)