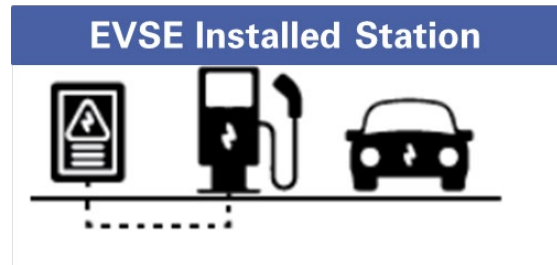


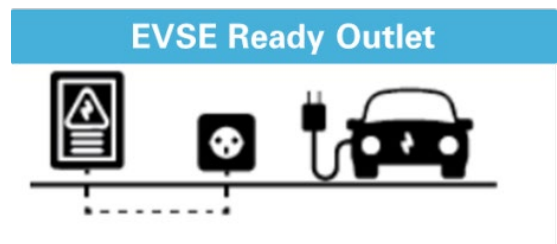
EV Infrastructure Readiness Levels

EV infrastructure falls into the following Readiness Levels, listed from highest to lowest cost:



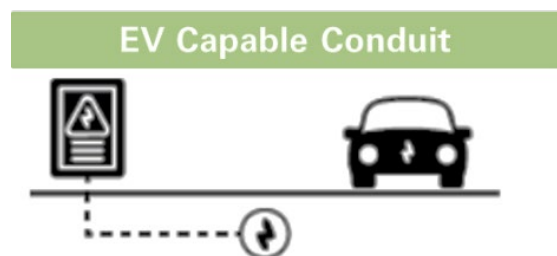
EV Installed Stations – *Installed charging station accessible to an EV parking space.*

The purpose of EV Installed station is to provide easy access for EV charging to a wide range of the general public. This is the most visible investment in EV infrastructure. The cost per installed station ranges from \$500 - \$7,000.



EV Ready Outlet – *Installed electrical panel capacity and raceway with conduit to terminate at a usable outlet within reach of an EV parking space.*

The purpose of EV Ready EV is to provide lower cost ready access to EV charging in locations with familiar or semi-regular users. Location-specific management strategies can be utilized to monitor or bill for charging access. Users may be required to provide their own charging cables to connect to an available outlet, or management may opt to provide this component. The cost per outlet alone ranges from \$15 - \$50.



EV Capable Conduit - *Installed electrical panel capacity with a conduit from the panel to a future EV parking space.*

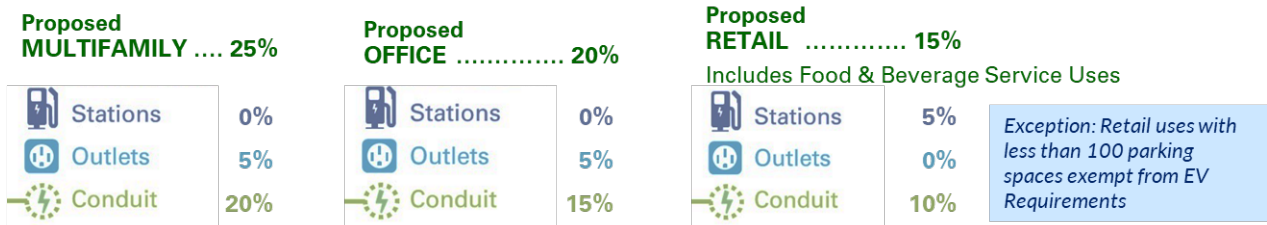
The purpose of EV Capable conduit is to provide cost effective 'future proofing' for future EV charging at a site. The cost per foot of conduit is \$22 - \$43.

EV Readiness Proposal Presented July 12, Mayor and Council Public Hearing

Require EV Readiness in **new** multifamily and commercial development and provide incentives for additional infrastructure beyond minimum standards.

Requirements are for new construction or expansions that hit thresholds for code compliance already established in the UDC

Baseline requirements are for Level 2 charging capability.



Incentives:

- Installation of Level 3 charging station counts for 3 spaces towards required EV % in any use.
- Installation of Level 2 outlets & stations above the minimum count towards reductions in total required parking.

Electric Vehicle Readiness Frequently Asked Questions

Have the costs to require EV charging infrastructure been considered?

The proposed requirements prioritize conduit in all uses. Installing conduit during construction is up to four times less expensive than retrofitting through costly trenching. There is less difference in costs for returning to upgrade pre-installed conduit with outlets and charging stations as demand increases.

With costs in mind, the multifamily and commercial use requires lower cost EVSE (no stations required in these uses). Developers can opt to install stations which qualify for the following incentives:

In MF or Office

For any Level 2 stations, reduce total parking lot size by 2 spaces

In Retail

For any Level 2 stations more than 5%, reduce total parking lot size by 2 spaces

In all uses

For any Level 3 stations, reduce total EV readiness spaces by 3

May qualify for TEP rebates

Under the current proposal, retail development with less than 100 parking spaces (less than 10,000sqft) would be exempted from the EV requirements

Have the ongoing costs of operation, maintenance, insurance, etc. of EV infrastructure been estimated? If so, how much are the estimated costs?

The costs of operating a charging station include electricity and maintenance, as well as any applicable networking fees. It is important to establish responsibility for maintenance costs and determine if the site host, charging network, or installer is responsible.

While actual maintenance costs vary, station owners should estimate average maintenance costs of up to \$400 annually, per charger. Most networks also offer a maintenance plan for an additional annual fee.

https://afdc.energy.gov/fuels/electricity_infrastructure_maintenance_and_operation.html

How would these requirements be affected by changes to EV charging technology?

The majority of the proposed requirements is conduit and outlets, which are the components least likely to be subject to changing technology. The NEMA 14-50 outlet is the standard for level 2 EV charging and accept the charging cable that comes with most EVs.

Installing Level 2 outlets is much less expensive than charging stations and have no cables which is a deterrent if vandalism is a concern.

Projects that have an application into the City for a commercial rezoning, plat, or site development plan prior to adoption of the ordinance should be exempt from any adopted EVSE requirement.

This is currently the way it works for submitted Development Package, which is when compliance with the EV requirements will be reviewed. Applications for a development package (site plan) that are submitted prior to the effective date of any ordinance that is passed will not have to meet the new requirements. For rezonings in progress, those projects must comply with all UDC requirements at the time a development package is submitted.

Where will EV charging stations be required to be located? Can they be clustered in one location?

It is encouraged that EV infrastructure is installed in a manner to maximize efficient and cost-effective layout. Where constraints allow, it is worth considering lot designs that site each installed and future stations and outlets so that they can be accessed by more than one parking space.

While not regulated, it is also worth considering to not site EV spaces as the only spaces near building entrances, which will help reduce the competition for these spaces between EVs and conventional vehicles. However, four percent (e.g., 1 in 25 spaces) but no less than one of the EV charging spaces, in any given parking facility, must be accessible compliant. These spaces are accessible EV charging spaces and do not count toward the required number of ADA parking spaces in the lot.

Will the City of Tucson receive EV charging station funding through the Build Back Better funding? / Will the City implement a P3 program where the City could use BBB funds to install EV charging stations within commercial projects that meet defined size or personnel volume criteria?

EV Infrastructure funding through the Build Back Better program is currently focused on Federal Highway Administration (FHWA) alternative fuel corridors.

[https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/#:~:text=Build%20a%20national%20network%20of%20electric%20vehicle%20\(EV\)%20chargers](https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/#:~:text=Build%20a%20national%20network%20of%20electric%20vehicle%20(EV)%20chargers)

How will the TEP variable rate pricing for EV units Based on Rates for EV owners play out for commercial EV charging stations?

As of December 2021, TEP offers three new pricing plans designed for commercial customers who install EV charging stations as a commercial venture, for their own EV fleets, or for the convenience of their customers and employees. The options are varied to support both level 3 DC fast chargers as well as small, medium, and large commercial time of use customers.

For more information on TEP rates, please visit:

<https://www.tep.com/news/tep-offers-new-ev-rates-for-commercial-customers/>

Did the peer cities used for comparison have comparable ratios of electric vehicle ownership, 1:300?

Four ‘peer cities’ in the US were studied to capture a range of EV Readiness policies. At the September 28 Mayor and Council Study Session, it was suggested that Tucson policy be more aggressive than Albuquerque EV requirements (2% of all new development) and more aligned with Salt Lake City EV requirements (25% of all new multifamily development)

The proposal is forward looking, to support current EV owners as well as those drivers who will make the switch to EVs in the coming years. Increased EV model availability, decreasing gas and diesel vehicle availability, decreasing EV costs, as well as local, state and federal support for EVs and their benefits, EV ownership is expected to grow. EV ownership will be further supported with convenient charging locations.

What is the utilization data in peer cities?

The sparse data available on EV charging is either outdated, based on small regional studies, or siloed within organizations. Some industry leaders support development of a national charging database.

<https://energycenter.org/thought-leadership/blog/demystifying-charging-data-will-expand-ev-market>

Based on informational interviews with selected peer cities, staff who developed ordinances that were considered ambitious at the time appear less than adequate once implemented. What is considered ambitious is a quickly moving target, and it was noted that EV spaces are ‘always full.’

City	Requirement	Adopted	Publicly Accessible Stations
Albuquerque, NM	ALL: 2 stations : 200 spaces	Nov 2017	69 (L2: 75%, L3: 24%)
Tucson, AZ	None (stations incentivized)	n/a	135 (L2: 75%; L3: 24%)
Salt Lake City, UT	MF: 1 station : 25 spaces, 20% outlets	May 2019	332 (L2: 93%; L3: 6%)
Miami Dade County, FL	Non Residential: 20% outlets	Jan 2022	899 (L2: 85%; L3: 15%)
San Jose, CA	MF: 10% stations, 20% outlets, 70% conduit	Sept 2019	1,027 (L2: 85%; L3 14%)

How does the City propose to address unintended consequences of EVSE use by those that are not tenants, employees, or customers of the commercial property?

Planning Commission recommended that staff evaluate the impact of these code changes in 1-2 years. Staff recommend a one-year evaluation to consider any technology changes, EV adoption rates, and overall impact of the ordinance.

If there are electric utility company or material, product, and labor delays outside of the control of the commercial developer or property owner which impact compliance with the City’s EVSE standard, can the City confirm that commercial certificates of occupancy will not be delayed pending EVSE installation?

PDSD works collaboratively with developers on a site-by-site basis to the extent possible to ensure that critical milestones are met.

How will a large, phased development campus with shared parking fields, numerous buildings (of similar or different commercial use types), that include multiple both owner and tenant occupancy be evaluated?

Site specific requirements and phased developments are supported through a Planned Area Development (PAD).

Given the current draft ordinance categories, how will the EVSE requirements for a mixed-use development be calculated?

Parking requirements for mixed use developments will be calculated as currently indicated in the UDC. EV requirement percentages will be applied to the relevant uses.

From UDC 7.4.4.A

The total number of required spaces for a multiple or mixed use development is 90% of the sum of the amount required for each separate principal use in Section 7.4.4.B, Minimum Number of Motor Vehicle Spaces Required. The square footage of Entertainment, Food Service (i.e., restaurants), and/or Alcohol Beverage Service (i.e., bars) uses may not be included in the calculation for multiple or mixed use parking requirements. The parking requirements for these uses are calculated individually in accordance with Section 7.4.4.B, Minimum Number of Motor Vehicle Spaces Required.

1. Exceptions

The calculation for a multiple or mixed use development does not apply to Shopping Centers, Golf Course, Religious, Travelers’ Accommodation, and Lodging uses. Refer to Section 7.4.4.B, Minimum Number of Motor Vehicle Spaces Required, for multiple or mixed use motor vehicle parking requirements pertaining to these uses.

Multifamily housing provides an important component in regional housing availability and affordability. Are there any statistics on electric vehicle ownership among those that rent versus own?

Eighty percent of current EV owners charge overnight at home. The top barrier to choosing an EV is lack of reliable charging. Providing renters (which make up 50% of

Tucson population) with some access supports a city-wide transition. The proposal is forward looking, to support current EV owners as well as those drivers who will make the switch to EVs in the coming years.

Construction Sales Tax–Construction sales tax related to all costs associated with EVSE ordinance compliance should be 100% reimbursed to the developer.

These types of rebates are more applicable to projects that spur job creation. If EV readiness is required by code, then financial incentives would not be appropriate.

Requirement Sunset–Any EVSE requirement must include a utilization monitoring program and a defined procedure for revising the ordinance if Tucson’s overall EV demand does not match what the City of Tucson is predicting and there continues to be geographic disparity between demand locations and EVSE ordinance generated supply. Developers should not be required to continue to install EVSE that is underutilized.

Planning Commission recommended that staff evaluate the impact of these code changes in 1-2 years. Staff recommend a one-year evaluation to consider any technology changes, EV adoption rates, and overall impact of the ordinance.

The City should implement the following incentives for EV infrastructure:

1. *CONSTRUCTION SALES TAX REBATE: 100% reimbursement of construction sales tax for the qualifying expense of EVSE Level 2 or Level 3 Charging Stations. (Level Two 240v: 1 hour = 12-30 miles and Level Three 480v: 1 hour = 180 –900 miles)*

These types of rebates are more applicable to projects that spur job creation. If EV readiness is required by code, then financial incentives would not be appropriate.

2. *PUBLIC CHARGING STATIONS IN LIEU FEE: In-Lieu of installing site specific electricity upgrades, trenching and conduit and EVSE Ready (Plugs/Outlets) or EVSE Installed (Stations), payment of a \$3,500 EVSE In-Lieu Fee for the City of Tucson to use to develop and construct EVSE Public Charging Stations in strategic geographic locations with high EV ownership.*

An in-lieu fee is a potential way to help fund public EV infrastructure to help provide equitable access to charging facilities. However, a program such as this is complex and would require significant planning to set up. Important portions of an in-lieu fee program would include:

- Properly valued fee that would be appropriate to fund the purchase, installation, and maintenance of EV infrastructure.
- Plan for placement of new EV infrastructure in appropriate and impactful areas.

- Coordination of across different City departments with clear set of roles for each.

Staff have recommended a one-year evaluation of the proposal to assess whether site constraints have cause challenges in installing EV infrastructure, geographic distribution, and other aspects. Based on this evaluation, off-site alternatives or in lieu fees may be considered.

3. *EVSE SIGNAGE BONUS: Increase in the maximum allowable square feet of signage for each EVSE Ready or EVSE Installed Station (EX: 30% of each EVSE 180 sq. ft. parking space = 60' additional signage.)*

Increased signage is not aligned with the goals of this proposed ordinance.

4. *EXISTING DEVELOPMENT LOCATION ALTERNATIVE: Ability to propose an off-site alternate location of an existing commercial development when the alternative location is under the same ownership or control.*

As the goal of this proposal is to ensure that EV infrastructure is included in new developments whose lifecycle overlaps with the growing shift to EVs, this suggestion was not recommended by staff. The easiest location to add EV infrastructure is one that is currently under construction.

Proposals to allow for off-site locations of EV charging facilities in areas with more EVs, could potentially do the opposite of the above stated equity goals and lead to some areas of the City (generally more affluent areas) with significant levels of EV infrastructure, while providing minimal improvements to those areas that have very little available EV infrastructure.

Staff have recommended a one-year evaluation of the proposal to assess whether site constraints have cause challenges in installing EV infrastructure, geographic distribution, and other aspects. Based on this evaluation, off-site alternatives or in lieu fees may be considered.

5. *CLEAN ENERGY INNOVATION ALTERNATIVE: Commercial Development Project Design Alternative which allows a project to demonstrate a reduction in CO2 emissions consistent with the intent of the EVSE Capable, Ready, and Installed requirements.*

Alternatives out of the scope of this proposed ordinance but will be large focus of future climate adapted development initiatives.

6. *PHASED MIXED-USE PROJECT ALTERNATIVE: For Large Commercial Projects or Campuses which include a variety of land use types, building types and sizes, different ownership and lease structures; the ability to maximize efficiency and customize the EVSE installation timing and location.*

Site specific requirements are already possible through a Planned Area Development (PAD)

7. *PUBLIC PRIVATE PARTNERSHIP ALTERNATIVE: Replacement of the EVSE ordinance requirements when a Commercial Development Project is enrolled and participating in a P3 clean energy program or initiative with a Government, NGO, or Utility Provider where the purpose is consistent with the intent of the EVSE ordinance.*

This strategy does not align with this proposed ordinance. It could be considered on a site by site basis as appropriate.

Is this the wrong time to add requirements to new construction given the growing concerns around housing affordability?

Constructing new multi-family homes without access to electric vehicle charging will unfortunately worsen the affordability issues we see today. It is critical to provide EVSE infrastructure at a time when it is the most affordable, to prevent the creation of “charging deserts” and that time is during the new construction phase.

Are there concerns about possible electric grid with the shift to EVs?

As part of TEP’s Transportation Electrification Implementation Plan, programing will benefit the grid, through incentives for off peak charging. Their objectives include grid planning to assess loads and minimize impacts. “The Company is well positioned to reduce customer fueling costs through awareness of EV rates and through load management opportunities that will minimize impacts and costs to the electrical grid.”

Are household cost savings associated with EV ownership valid when considering used EVs and long term battery lifecycles?

EV batteries typically last between 10-20 years, longer than most people own a vehicle, and longer than the average gas-powered car. (Concerns raised likely quote typical warranty periods that are 8 years or 100,000 miles, not lifespans)

Batteries are designed not to die fully, but slowly lose charging capacity over time. However, while an EV’s battery will lose its ability to fully charge over time, it is unlikely that it will stop altogether. Best practices can also help extend the life of a battery.

However, as with many components of older vehicles, the battery will eventually begin to degrade. To measure this, when looking at the average decline across all vehicles, the loss is arguably minor, at 2.3 percent per year. This means that if you purchase an EV

today with a 150 miles range, you'll have only lost about 17 miles of accessible range after five years. (Evbox.com, reviewgeek.com)

Colder weather causes EVs to lose range, so EVs are simply going to be less effective in colder states and more effective in warmer states. EVs lose range in cold weather because the electrons in their batteries move slower when the temperatures drop, thus lowering their performance. They also power inside-the-car accessories from the same battery, so heater use equates to a drop in range.

Are the proposed requirements out of pace with EV ownership in Tucson, which may see a slower transition due to lower average income levels?

The car industry expects 50% of US new car sales will be electric by 2030. Providing EV charging access in multifamily development like standard amenities (such as air conditioning) reduces barriers to EV adoption, and the associated savings of lower fuel and maintenance costs.

Electric vehicles are approaching price parity with standard vehicles and are increasingly more economically attractive as gasoline prices reach all time highs. The average internal combustion engine car today can be expected to last 200,000 miles, according to Car and Driver, which makes maintaining a traditional vehicle about \$20,200 and an EV \$12,200 – an \$8,000 difference.

<https://thehill.com/changing-america/sustainability/energy/559971-finally-heres-the-exact-cost-of-owning-an-electric-car/>

The top barrier to choosing an EV is lack of reliable charging, providing renters (which make up 50% of Tucson population) with some access supports a city-wide transition.

Increased use of EV will improve air quality and may spur economic development – benefits for all of Tucson residents.

From The New York Times, July 18, 2022: California is on the verge of requiring that all new cars sold there be electric or zero-emission by 2035. Colorado and New York have sharply cut their electricity emissions in recent years. About 20 other states have also taken aggressive steps to slow global warming, as have some local governments and companies.

By mandating electric vehicles, California and other states will lead automakers to build many more of them, likely spurring innovations and economies of scale that will reduce costs for everybody and thereby increase their use around the country.