Coming Full Circle: The Boring Company's Not So Boring Transportation Gamble with the Las Vegas Loop

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COMING FULL CIRCLE: THE BORING COMPANY’S NOT SO BORING TRANSPORTATION GAMBLE WITH THE LAS VEGAS LOOP

Las Vegas tourists and residents can soon travel in Tesla cars underneath the city in neon-lit tunnels in a project known as the Las Vegas Loop. The Boring Company—an American infrastructure and tunnel construction company founded by Elon Musk—is undertaking this “Teslas in Tunnels” project. The Loop plans to connect Downtown Las Vegas, the Las Vegas Strip, Harry Reid International Airport, and various other properties in the Vegas area. Boring seeks to offer a new form of public transit through the Loop to transport passengers across the Vegas area. This White Paper discusses the Loop’s development, compares the Loop to other forms of public transit, reviews different concerns surrounding the project, analyzes the Loop’s benefits and policy implications, and theorizes on the Loop’s future.

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* By Tanner Lucas Castro and Jorge “Coco” Padilla, with special thanks to William S. Boyd School of Law Professors Robert Correales and Joseph Regalia; University of Nevada, Las Vegas Department of Engineering Professor Dr. Hualiang “Harry” Teng; Las Vegas City Council Mayor Pro Tempore Stavros Anthony; and Las Vegas Director of Infrastructure and Public Works Mike Janssen for their contributions and guidance to this White Paper.
INTRODUCTION

Public transportation is a concern for Las Vegas residents and Nevada citizens.1 However, officials of the City of Las Vegas and the greater Clark County area plan to develop additional transportation with the help of Elon Musk’s The Boring Company.2 Boring plans to create tunnels across the greater Las Vegas area to transport people using human-driven Tesla vehicles as part of a new system of public transportation.3 And Boring has already developed a

2 Id.
Las Vegas Convention Center Loop that boasts transporting riders across the property within two minutes. Boring is expanding that Loop to additional Vegas properties, such as the new strip property and Resorts World, with plans to include even more properties—like Allegiant Stadium and Harry Reid International Airport. The Loop also seeks to provide transportation to university students at the University of Nevada, Las Vegas (UNLV), with an approved future station to be built on its campus.

This White Paper seeks to review the Las Vegas Loop project based on the current information available to the public. Part I of this Paper will explain the origins of the Loop and investigate the different public meetings held between Boring Company executives, the Las Vegas City Council, and the Clark County Zoning Commission. Part II will discuss how the Loop compares to other methods of public transportation. Part III will address different concerns surrounding the project. Part IV will examine the potential benefits of the Loop and the Loop’s policy implications. Finally, Part V looks at the future of the Vegas Loop and what additional stations and features it could bring to the Las Vegas valley.

I. BACKGROUND: THE ORIGINS OF THE VEGAS LOOP

Las Vegas will soon have new neon lights to boast about in an unexpected place: underground. Las Vegas visitors and residents may soon have the option to disembark from their flight and then travel at high speeds under the city in state-of-the-art Tesla vehicles in neon-lit tunnels built by The Boring Company. Boring hopes to deliver a system that will help visitors navigate Las Vegas’s many offerings and help people travel between Downtown Las Vegas, the Las Vegas strip, Harry Reid International Airport, and other planned locations. This project is known as the “Las Vegas Loop” or “Teslas in Tunnels.” The Vegas Loop started as a project currently in operation at the Las Vegas Convention Center (LVCC). Once construction began on the Loop, Boring put plans in place to expand the project throughout the City of Las Vegas and Clark County. This Part will first look at the birth of the Loop.

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5 Vegas Loop, supra note 3.
7 Vegas Loop, supra note 3.
8 Id.
9 Id.
11 LVCC Loop, supra note 4.
12 Vegas Loop, supra note 3.
Boring Company, then discuss the initial construction and testing of the Loop at the LVCC, and conclude by reviewing how the Loop project has expanded to additional parts of Las Vegas and the greater Clark County area.

A. Birth of the Boring Company and Initial Projects

In December 2016, Elon Musk tweeted, “Traffic is driving me nuts. Am going to build a tunnel boring machine and just start digging . . .”\textsuperscript{13} “It shall be called ‘The Boring Company.’”\textsuperscript{14} “Boring, it’s what we do.”\textsuperscript{15} One of the main reasons Musk pursued tunneling is that he does not fully support Silicon Valley’s traffic solution: flying cars.\textsuperscript{16} In an interview with Bloomberg, Musk explained how “it’s difficult to imagine the flying car becoming a scalable solution” because a “flying car will need to generate a lot of downward force to stop it from falling out of the sky, which means wind and noise for those on the ground, not to mention debris from midair fender-benders.”\textsuperscript{17} In fact, Musk stated, “If somebody doesn’t maintain their flying car, it could drop a hubcap and guillotine you.”\textsuperscript{18} On the other hand, Musk told WIRED that “[i]f you think of tunnels going 10, 20, 30 layers deep (or more), it is obvious that going 3D down will encompass the needs of any city’s transport of arbitrary size.”\textsuperscript{19}

What started as a subsidiary of SpaceX, one of Musk’s companies, Boring reportedly first began digging on SpaceX’s Los Angeles private property in January 2017.\textsuperscript{20} Boring was not required to seek permission to start this excavation because the project was on SpaceX’s private headquarters.\textsuperscript{21} Within the span of a weekend, workers were able to excavate a “test trench” that was thirty feet wide, fifty feet long, and fifteen feet deep.\textsuperscript{22} What employees originally thought would take two weeks to begin, Musk made possible over a couple of days, running twenty-four hours non-stop.\textsuperscript{23} At the time, the plan was to develop the huge trench into a ramp so that a tunnel boring machine could

\textsuperscript{13} Elon Musk (@ElonMusk), \textsc{Twitter} (Dec. 17, 2016, 5:05 AM), https://twitter.com/elonmusk/status/810108760010043392?lang=en.
\textsuperscript{14} Elon Musk (@ElonMusk), \textsc{Twitter} (Dec. 17, 2016, 6:15 AM), https://twitter.com/elonmusk/status/810126376871297024?lang=en.
\textsuperscript{15} Elon Musk (@ElonMusk), \textsc{Twitter} (Dec. 17, 2016, 6:16 AM), https://twitter.com/elonmusk/status/810126493326209025.
\textsuperscript{17} \textit{Id}.
\textsuperscript{18} \textit{Id}.
\textsuperscript{20} \textit{Id}.
\textsuperscript{21} \textit{Id}.
\textsuperscript{22} \textit{Id}.
begin to dig horizontally.24 This project would ultimately become known as Boring’s 1.14 mile R&D Tunnel, which was completed in December 2018 and cost less than $10 million.25

Boring used a tunnel boring machine (TBM) in constructing the R&D Tunnel and has subsequently used a TBM for the Vegas Loop.26 A TBM is “a machine used to excavate tunnels with a circular cross-section through a variety of soil and rock strata.”27 The TBM is an alternative to drilling and blasting, and the TBM can construct a tunnel using either trenchless construction methods or horizontal directional drilling.28 Additionally, the advantage to a TBM is the ability to reduce the disturbance of surrounding ground and “produce a smooth tunnel wall,” which reduces costs in terms of having to line the tunnel and makes it easier to use in urban areas, like big cities.29 Companies like Robbins, Herrenknecht, and Akkerman, to name a few, produce TBMs and micro-TBMs.30

The TBM is not a new concept and developers have used the TBM in various projects. For example, from 2012 to 2015, a TBM was used in London’s Crossrail project to connect London’s East and West.31 According to WIRED, each Crossrail TBM cost £10 million and needed a team of twenty to operate the machine.32 The Crossrail project used eight TBMs that were 150 meters long and were able to dig 21 kilometers worth of public transportation routes underground.33 Closer to home, the Intake 3 project used a TBM to construct a hydraulic tunnel over 4 kilometers long, 200 meters below Lake Mead.34

But tunneling can be expensive, and projects can take years to finish. Boston’s Big Dig, which moved a section of Interstate 93 underground, was delayed by about eight years and cost $12 billion more than what was initially planned.35 Los Angeles’s plan to expand its Purple Line subway route by 2.6 miles is estimated to cost $2.4 billion and will take approximately ten years to

24 Chafkin, supra note 16.
28 Id.
29 Id.
32 Id.
33 Id.
35 Chafkin, supra note 16.
complete.\textsuperscript{36} Even the machine that Boring was initially considering for its first project would have cost a sticker price of $15 million if brand new.\textsuperscript{37}

While tunneling technology has remained stagnant for the last fifty years, Musk plans to transform the tunneling sector.\textsuperscript{38} Musk hopes to improve tunneling speed “somewhere between 500 and 1,000 percent.”\textsuperscript{39} When Musk began digging at the Space X property in 2017, he intended to use TBMs to test improvements in tunneling technology, to use “more power, better materials, and a design that allows it to continue digging while installing the tunnel walls.”\textsuperscript{40} At that time, there was no machine that could accomplish this, but if made possible, the invention would significantly reduce the price of digging.\textsuperscript{41}

\subsection*{B. The Convention Center Loop}

In 2018, the Las Vegas Convention Center Visitors Authority (LVCVA) began to gauge interest in creating a people-mover under the property to better accommodate its expansion to over 200 acres of land by 2021.\textsuperscript{42} The LVCC expansion created a need to have an on-property transportation system to allow visitors to traverse the approximately two miles it would take to walk across the campus on foot.\textsuperscript{43} With LVCC hosting more than one million attendees annually, it was essential to find a solution.\textsuperscript{44} In response to the transportation demand, LVCVA began accepting proposals for people-mover projects in 2018.\textsuperscript{45} An evaluation team composed of LVCVA representatives, private organizations, transportation system consultants, and people-mover construction companies conducted interviews based on these submitted proposals.\textsuperscript{46}

The recommendation decision by the evaluation team eventually came down to two proposed projects.\textsuperscript{47} Doppelmayr—a people-mover manufacturer

\begin{thebibliography}{99}

\bibitem{1} Id.
\bibitem{2} Id.
\bibitem{3} Id.
\bibitem{4} Marshall, supra note 19.
\bibitem{5} Chafkin, supra note 16.
\bibitem{6} Id.
\bibitem{8} Id.
\bibitem{9} Id.
\bibitem{10} Id.
\bibitem{11} Id.
\bibitem{12} Minutes of the Regular Meeting of the Board of Directors of the Las Vegas Convention and Visitors Authority 5 (May 14, 2019) (available at https://assets.simpleviewcms.com/simpleview/image/upload/v1/clients/lasvegas/Minutes_May_14_2019_BOD_4e436285-bd2d-4dbb-a720-47554d15274d.pdf) [hereinafter LVCVA Minutes] (discussing the finalists for the LVCVA’s people mover system).
\end{thebibliography}
with over 125 years of experience—proposed a project to design an above-ground monorail train at a construction cost of $85 million. The second proposal was by The Boring Company—an American infrastructure and tunnel construction company founded by Elon Musk with three years of operation—where Tesla Model X and Model 3 vehicles would travel underground at a construction cost of between $35 and $66 million. By March 2019, the evaluation team chose to recommend Boring for the project, with LVCVA President Steve Hill and other board members citing affordability, innovation, and safety as the main reasons for the selection.

By May 2019, LVCVA approved Boring to move forward with the project and funded them with a $48.7 million contract. The contract is to be paid out in phases, with 55% of the total price of construction paid once the system is completed, along with a successful vehicle cycle through tunnels, 70% once the project successfully obtains a certificate of occupancy, and 100% once the performance capacity of the project reaches 4,400 passengers per hour. The contract also required Boring to secure a performance bond equal to 50% of the contract, a payment recovery bond requiring that Boring repay LVCVA all of the funds given to them if they fail to complete the project, a de-commissioning payment of $1.6 million, and a letter of credit to provide LVCVA $4.5 million of liquidated damages if the project has deficient system capacity during trade show events. Specifically, Boring would pay a $300,000 penalty for each large convention where it cannot move approximately 4,000 people per hour.

The prominent May 2019 designs for the system included two one-mile tunnels for vehicles and one pedestrian tunnel, three underground stations for passenger loading and unloading, and an elevator or escalator system for passenger access to each station. The LVCVA submitted design review documents for entrance structures for underground stations and an underground people-mover system to the Clark County Zoning Commission on July 17, 2019. The plan received conditional approval, in which the Commission

49 LVCVA Minutes, supra note 47.
50 Dennis, supra note 42.
51 LVCVA Minutes, supra note 47.
52 Id.
53 Id.
55 Id. at exhibit C (Design Build Special Conditions).
56 Id.
57 Id.
58 Minutes of the Regular Meeting of the Board of County Commissioners of Clark County, Nevada 23 (July 17, 2019) (available at
ordered a drainage study and compliance and approval by the county public works department.\textsuperscript{59}

Construction on the Convention Loop began on November 15, 2019.\textsuperscript{60} Two months after construction began, LVCVA reported that over 2,100 feet of the tunnel had been bored.\textsuperscript{61} By February 13, 2020, Boring declared that it “broke through the last bit of dirt and earth” underneath the West Hall of the convention center campus for the first tunnel.\textsuperscript{62} And by May 14, 2020, Boring completed the final breakthrough of its second 1.3 kilometer tunnel.\textsuperscript{63} The attention then transitioned to further construction within the tunnels to make the passenger stations on either end of the tunnels and a third midpoint passenger station.\textsuperscript{64} The Loop has expanded since its development at the LVCC and now embarks on building stations across the greater Las Vegas area. What first started as a project to carry convention attendees across a convention hall has now turned into a project to transport riders across an entire city.

C. \textit{Coming Full Circle: The Las Vegas Loop}

As the construction of the Convention Loop came to an end, Boring set its goal to expand the Loop to the Las Vegas Strip hotel corridor and the downtown corridor.\textsuperscript{65} By November 10, 2020, Boring submitted a special use permit to the Las Vegas City Council Planning Commission to begin construction along Las Vegas Boulevard from Sahara Avenue and Ogden Avenue up until Main Street and Ogden Avenue.\textsuperscript{66} This has become known as the Vegas Loop project. Since its inception, the project has been deemed a monorail tunnel system. The Las Vegas Municipal Code defines a monorail as

\textsuperscript{59} Id.

\textsuperscript{60} Mike Flemming, \textit{The Boring Company’s Tunnel in Las Vegas Is Nearly 50% Complete}, \textsc{Drive Tesla Canada} (Jan. 16, 2020), https://driveteslacanada.ca/news/the-boring-companys-tunnel-in-las-vegas-is-nearing-50-complete/.

\textsuperscript{61} Id.


\textsuperscript{64} Id.


[a non technology specific system used to transport passengers, including any system on a fixed land route installed and operated on an extensive fixed guideway or rail, and including a monorail as defined in NRS Chapter 705. This use does not include a system to transport passengers between two end-points with no intermediate stops, or a monorail that functions only as a part of a theme park or permanent exhibition under LVMC Chapter 6.81.

To approve a special permit application, the Las Vegas City Council must affirm the following findings:

a. The proposed land use can be conducted in a manner that is harmonious and compatible with existing surrounding land uses, and with future surrounding land uses as projected by the General Plan;

b. The subject site is physically suitable for the type and intensity of land use being proposed;

c. Street or highway facilities providing access to the property are or will be adequate in size to meet the requirements of the proposed use; and

d. Approval of the Special Use Permit at the site in question will not be inconsistent with or compromise the public health, safety and welfare or the overall objectives of the General Plan.

Regarding Boring’s application, the Las Vegas City Council made the following findings, respectively:

The transportation system will be located below ground, and therefore can be conducted in a manner that is harmonious and compatible with existing land uses. Future stations will be subject to design review to ensure that they are compatible with surrounding land uses.

... The land over the proposed tunnel route is physically suitable for the intensity of the proposed underground transportation system.

... The existing street and highway facilities are adequate in size to meet the requirements of the proposed underground transportation system.

... Approval of the Special Use Permit will not be inconsistent with or compromise the public health, safety, and welfare or the overall objectives of the General Plan. In addition, Goal 4 of the 2045 Downtown Master Plan encourages the implementation of transportation systems that can move people with higher efficiency and lower economic and environmental costs.

... The approval of the requested waiver, the use meets all of the applicable conditions per Title 19.12.

Having affirmed that the project would not harm its proposed location, the City Council staff recommended approval of the project. On December 16, 2020, City Councilwoman Olivia Diaz moved to approve the special use permit, and by a unanimous vote of 7–0, the permit was approved. The initial vision of the Vegas Loop is reflected in Image 1.
As the Las Vegas City Council decided on the permitting, Boring had to seek additional approval from the Clark County Board of Commissioners because part of the Vegas Loop project falls within its jurisdiction. The Clark County Zoning Commission heard from Denis Cederburg, the director of the public works department, on December 1, 2020. Boring was asking for a revocable license and maintenance agreement for tunnel construction between Paradise Road and Desert Inn Road to connect the Las Vegas Convention Center with the Encore Resort. According to the agreement, Boring needed to post a $25,000 security should it not fulfill its obligations of securing the tunnel when decommissioned. Boring also would need to pay an annual rent for the use of the subsurface area. Commissioner Larry Brown moved for the recommendation to issue this revocable license and approve the maintenance agreement. The entire Commission voted in favor to approve this motion by roll call vote. In February 2021, the Commission Council unanimously approved the expansion of the Loop from the Convention Center to Resorts World.

Near the end of 2021, the Clark County Zoning Commission decided on the expansion of the Vegas Loop further south of the Las Vegas Strip. The proposed expansion would encompass the resort corridor, the convention centers, Allegiant Stadium, Harry Reid International airport, and the University of Nevada, Las Vegas. The Loop plans to extend from Russell Road along Las Vegas Boulevard South to Sahara Avenue and into North Sahara, which falls under the jurisdiction of the City of Las Vegas. West of Las Vegas Boulevard South, the route would stretch along Flamingo Road, south on Arville Street, east on Tropicana Avenue, south on Valley View Boulevard, and

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73 Id.
74 Id.
75 Id.
76 Id.
77 Id. Commissioners Michael Naft, Justin Jones, Larry Brown, Marilyn Kirkpatrick, Lawrence Weekly, Jim Gibson, and Tick Segerblom all voted in favor of the revocable license and maintenance agreement. Id. at 8.
79 Minutes of the Regular Meeting of the Board of County Commissioners of Clark County, Nevada 27 (Oct. 20, 2021) (available at https://clark.legistar.com/View.ashx?M=M&ID=898177&GUID=C25B5CB5-8031-4C07-A347-DB5E5A64A8F4) [hereinafter October Meeting Minutes].
80 October BCC Hearing, supra note 6.
81 Id.
east on Russell Road to connect back to Las Vegas Boulevard South. There is another proposal for the route to run generally under Dean Martin Drive from Tropicana Avenue to Russell Road. East of Las Vegas Boulevard South, the route will extend along Tropicana Avenue and south on Paradise Road for a potential connection to the Harry Reid International Airport.

This extension will also reach the Thomas & Mack Center located on the UNLV campus. The purpose of this expansion is to connect to hotels east and west of the Las Vegas Strip and create passenger stations for properties located on the Strip itself. The proposed expansion means the Vegas Loop would span approximately twenty-nine miles just thirty feet below the surface level. Boring submitted to the Clark County Zoning Commission the following map with proposed passenger stations, depicted in Image 2. Commissioner Jim Gibson moved to approve the expansion, and the entire Commission unanimously voted in favor.

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82 Id.
83 Id.
84 Id.
85 Id.
86 Id.
87 Id.
88 See October Meeting Minutes supra note 79. Commissioners Marilyn Kirkpatrick, Jim Gibson, Justin Jones, Michael Naft, Tick Segerblom, Ross Miller, and William McCurdy II voted in favor of the expansion. Id.
Image 2: Proposed Passenger Stations
II. THE LAS VEGAS LOOP COMPARED TO OTHER TRANSPORTATION SYSTEMS

Once fully realized, the Vegas Loop can be classified as a personal rapid transit system (PRT), a public transport mode featuring small, automated vehicles operating on a network of dedicated guideways.\textsuperscript{89} Boring operates its Tesla vehicles on fixed guideways with cars able to carry up to four passengers.\textsuperscript{90} And although currently human operated, Boring has stated its plans to eventually make the vehicles in the Loop autonomous, which would classify Boring’s vehicles as a form of PRT.\textsuperscript{91} However, Boring is unique in that the Loop will be the first PRT developed for mass transit with a planned route of over twenty-nine miles.\textsuperscript{92} Comparing the Loop to current PRT systems and other forms of mass transit will help formulate theories on how the Loop may progress. This Part will first look at how the Loop compares to other PRT systems, then provide an analysis of how the Loop compares to monorail systems, and finally, compare the Loop to subway systems.

A. How the Las Vegas Loop Compares to Other PRT Systems

Mass transit systems such as bus and rail systems often move people on scheduled routes.\textsuperscript{93} However, PRT systems implement a method where passengers do not have to waste time for a vehicle to arrive.\textsuperscript{94} PRT passengers do not have to go to needless stops, as their vehicle takes direct routes to the desired drop-off point within the PRT network.\textsuperscript{95} Removing unnecessary stops in a transit system allows for both time and environmental efficiency in a city’s transportation network.\textsuperscript{96} A PRT system’s use of a network that utilizes individual vehicles also reduces maintenance and development costs for the

\textsuperscript{89} Gur Mittelman et al., Techno-economic Analysis of Energy Supply to Personal Rapid Transit (PRT) Systems, 306 APPLIED ENERGY 1, 1 (2022).
\textsuperscript{91} Mittelman et al., supra note 89, at 1; Chandraveer Mathur, Musk’s Boring Company Will Build Vegas Loop with 51 Stations, NEWSBYTES (Oct. 22, 2021, 8:34 AM), https://www.newsbytesapp.com/news/science/clark-county-greenlights-boring-company-s-vegas-loop-project/story ([T]he Boring Company plans to use autonomously driven Teslas in the Vegas Loop . . .").
\textsuperscript{92} See Mathur, supra note 91.
\textsuperscript{94} Anderson, supra note 93, at 39.
\textsuperscript{95} Id.
\textsuperscript{96} Mittelman et al., supra note 89, at 9.
vehicles in the transportation system. A PRT system’s use of smaller vehicles also allows for guideways and vehicle stations to be developed at a lower cost.

While the development costs for the Loop are still in question, the Vegas Loop matches several of the benefits associated with PRT systems. Aside from the LVCC that paid for the original implementation of the Loop, Boring will pay for the rest of the Loop’s development, with private properties paying for the construction of their stations. Despite the Loop’s benefits, a question remains as to how effective the Loop will be when acting as a mass transit system. Observing how other PRT systems compare to the Loop will help develop theories on how the Loop may progress. Internationally, two small-scale PRT systems are currently operating like the Loop. These PRT systems include the Morgantown PRT at West Virginia University (WVU) and the Ultra PRT at Heathrow Airport in the United Kingdom.

1. How the Las Vegas Loop Compares to the Morgantown PRT

The Morgantown PRT is an autonomous transit system in West Virginia that connects three Morgantown campuses at WVU and the city’s downtown area. The Morgantown PRT has been in operation since 1975, and the City of Morgantown developed the PRT through city and federal funding. Today, the Morgantown PRT utilizes over seventy vehicles with five stations at a distance of 3.6 miles. The Morgantown system operates using vehicles that resemble small buses with automatic doors that can carry up to twenty passengers. The Morgantown vehicles are also equipped with electric

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98 Anderson, supra note 93, at 7–8.
99 Sarah McBride, Elon Musk’s Boring Co. Will Pay Fees of up to 5% on Las Vegas Loop Sales, BUS. STANDARD (Oct. 24, 2021, 10:45 PM), https://www.business-standard.com/article/international/elon-musk-s-boring-co-will-pay-fees-of-up-to-5-on-las-vegas-loop-sales-121102400932_1.html (explaining that the company plans to pay for the loop but not the individual stations, which will be paid by each hotel or casino).
100 About the PRT, W. VA. UNIV.: PERS. RAPID TRANSIT, https://prt.wvu.edu/about-the-prt/.
101 Id.
104 About the PRT, supra note 100.
105 Steve Raney & Stanley E. Young, Morgantown People Mover—Updated Description, Presented at the Transportation Research Board Annual Meeting 6–9 (Jan. 9, 2005), https://drive.google.com/file/d/1LO0zyjXyvW77FOTHQ2QOmEpk2OqSYod/view.
pickups fixed to both sides of the cars that connect to electrified rails along the system’s guideways.\textsuperscript{106}

The Morgantown system utilizes three different forms of operation: demand, schedule, and circulation.\textsuperscript{107} When the Morgantown PRT is on “demand” mode, the system directly takes riders to their requested station during non-peak hours of operation.\textsuperscript{108} In “schedule” mode, the system operates cars on fixed routes of known demand, lowering the waiting time for a car traveling to a given destination.\textsuperscript{109} During low-demand periods, the Morgantown system uses its “circulation” mode, which operates a small number of vehicles that stop at every station, similar to a bus service.\textsuperscript{110}

Since the operation of the Morgantown PRT, the system has proven to be inexpensive to operate and currently has a ninety percent schedule reliability rating.\textsuperscript{111} The Morgantown PRT is also one of the cheapest guided transit systems in the United States, at only fifty cents per trip.\textsuperscript{112} However, the Morgantown PRT has had two accidents in its history, with a collision between two of its cars in 2016 and a boulder that struck one of the cars in 2020, with both incidents resulting in injuries to passengers.\textsuperscript{113} The Morgantown PRT has shown consistent ridership despite these accidents, with approximately 16,000 people riding the system per day.\textsuperscript{114}

The Vegas Loop is like the Morgantown PRT. Specifically, the distance and number of cars used in its operation are nearly identical.\textsuperscript{115} However, the Loop does not utilize an electrified rail in its design, and the entire system is underground.\textsuperscript{116} The non-existence of an electrified rail allows for the safe exit

\begin{footnotesize}
\begin{itemize}
    \item \textsuperscript{106} Id.
    \item \textsuperscript{107} Id. at 5–6.
    \item \textsuperscript{108} Id.
    \item \textsuperscript{109} Id.
    \item \textsuperscript{110} Id.
    \item \textsuperscript{112} Id.
    \item \textsuperscript{113} \textit{WVU Investigates PRT Collision Between Walnut and Beechurst Stations}, THE DA, (Dec. 1, 2016), https://www.thedaonline.com/news/articleb8e191ea-b7da-11e6-a7df-4f4e811b5847.html (detailing the events of the 2016 Morgantown PRT collision); \textit{3 People Hospitalized After Boulders Crash Down on Morgantown Road}, CBS NEWS PITTSBURGH (Feb. 10, 2020, 5:00 PM), https://pittsburgh.cbslocal.com/2020/02/10/wvu-morgantown-rock-slide/ (detailing the 2020 boulder collision at the Morgantown PRT).
    \item \textsuperscript{114} 1 \textit{ENCYCLOPEDIA OF TRANSPORTATION: SOCIAL SCIENCE AND POLICY} 1075 (Mark Garrett ed. 2014) (detailing transport such as PRT and labeling the Morgantown PRT as having a 16,000-person daily ridership).
    \item \textsuperscript{115} Mario Merano, \textit{The Boring Company’s LVCC Loop Ramps to 70 Cars as CES 2022 Kicks Off}, TESLARATI (Jan. 5, 2022), https://www.teslarati.com/elon-musk-boring-company-lvcc-loop-70-cars ces-2022/; \textit{Las Vegas Convention Center (LVCC) Loop}, supra note 4 (listing the LVCC Loop as 1.7 miles long); \textit{About the PRT}, supra note 101 (listing the Morgantown PRT as 3.6 miles long with 70 cars in its fleet).
    \item \textsuperscript{116} \textit{See Las Vegas Convention Center (LVCC) Loop}, supra note 4.
\end{itemize}
\end{footnotesize}
of passengers from Loop vehicles. The Loop’s underground design also prevents environmental hazards like Morgantown’s boulder incident in 2020.

While details on how passengers will be able to select what Loop station to travel to are unknown, the Loop could work efficiently by operating on a system like the Morgantown PRT. Implementing different modes of operation that allow vehicles to circulate the Loop system could ensure that cars are continuously available for Loop passengers. Eventually, offering larger group vehicles that circulate the different Loop stations like the Morgantown PRT could be an efficient way of increasing ridership while lowering fare costs.

2. How the Las Vegas Loop Compares to the Ultra PRT

The Ultra PRT is located at Heathrow Airport in London and has been in operation since 2011. Ultra consists of twenty-one podcar vehicles operating on a 2.4 mile route that connects Heathrow’s terminal five to its business passenger car park. Unlike the Morgantown PRT system that uses electrified guide rails, Ultra utilizes charged batteries and a local computer interface to power and control the cars. The trackway for the Ultra guideways is similar to that of a standard roadway and utilizes two parallel concrete barriers to keep the cars on the track. The Ultra vehicles themselves have four seats for passengers and can accommodate wheelchairs, shopping trolleys, and luggage along with the passengers. Ultra has also designed freight versions of its vehicles to carry cargo instead of passengers. Since airport executives put Ultra into operation at Heathrow, the pods have taken an average of 1,000 travelers per day and are free to ride.

The Vegas Loop is currently different from Ultra in that the Loop isn’t fully autonomous, and the Loop system is focused more on transporting tourists than it is on airport travelers. But the Loop is similar to Ultra in that the Tesla vehicles used in the Loop system can utilize autopilot software that

117 Loop, supra note 10 (discussing the safety of the system and noting that it has no internal touch hazards, such as an electrified third rail).
118 See supra note 114 and accompanying text.
120 Heathrow T5, supra note 100.
121 Raney & Young, supra note 105, at 6–9; Ultra Pods, ULTRA GLOB. PRT, http://www.ultraglobalprt.com/how-it-works/ultra-vehicle/.
122 Ultra Pods, supra note 121, at 1.
123 Id.
126 Mathur, supra note 91, at 1.
makes the cars nearly self-driving. The Loop guideway is also like Ultra, with the trackway being similar to a standard roadway with concrete tubing used to form a guideway for the vehicles. Ultra’s development of additional vehicles for alternate purposes may be ways for the Loop to develop in the future. The Loop could expand its vehicle offerings by creating Tesla vehicles that could deliver different items throughout the city, similar to Ultra’s use of cargo freights.

B. How the Las Vegas Loop Compares to Other Monorail Systems

The Vegas Loop is a unique form of transportation in that it is designated as a monorail under Nevada law but does not include any rail systems in its service. Instead, the Loop relies on the state and county definitions for a “monorail,” which include vehicles used to transport passengers along a “fixed guideway.” If the Vegas Loop is fully realized, it will be the largest monorail in the United States and one of the largest monorails in the world. Compared to other monorails and people-movers in the United States, the Loop shares the most similarities with the Las Vegas Monorail and the Seattle Center Monorail in Washington State.

1. How the Las Vegas Loop Compares to the Las Vegas Monorail

The Vegas Loop project is similar to the Las Vegas Monorail because it aims to connect multiple properties along the Las Vegas Strip resort corridor. However, the Las Vegas Monorail requires costly stations built inside the hotel properties to allow passengers to arrive and disembark. The cost and


128 Vegas Loop, supra note 3.

129 Vehicle Features, supra note 124.


133 Vegas Loop, supra note 3.

134 Id.

135 See Michael Scott Davidson, Extension of Las Vegas Monorail to Mandalay Bay Delayed Again, LAS VEGAS REV. J. (July 12, 2018, 6:07 PM), https://www.reviewjournal.com/local/the-strip/extension-of-las-vegas-monorail-to-mandalay-bay-delayed-again/ (discussing how funding is a major setback for creating an extension to the Mandalay Bay Resort); Jake, Why Doesn’t the Monorail Connect to the Airport?, LAS VEGAS THEN AND NOW (Mar. 8, 2022), https://lasvegashenandnow.com/why-doesnt-the-monorail-connect-to-the-airport/ (discussing the difficulty the location of the stations presents for expanding the monorail).
maintenance of these stations led to a decline in the expansion and ridership of the monorail. In contrast, the Loop utilizes access points where riders can emerge and enter the tunnel, similar to an underground valet system.

The Loop is now the only privately owned mass transit system in the United States, which is a title that used to belong to the Las Vegas Monorail before the LVCVA bought it. However, while public transit owners use local funding to help upkeep public transit and keep fare costs low, the Loop’s private nature may lead to higher fares. Higher fares for public transport have plagued the monorail because of its private ownership. Current fare for the Las Vegas Monorail is $5 a ride, which is significantly higher than other transit options, such as the Seattle Center Monorail with a fare of $3 or the New York City Subway with a fare of $2.75.

The Vegas Loop appears to be basing its fares on travel time and distance, with fares equating to around $2 per mile. For instance, Boring lists a planned fare for a 4.9 mile trip from Harry Reid International Airport to the LVCC as $10 with five minutes of travel time. Although Boring’s fare system is different in price compared to other public transit, it is notable that the Loop’s prices are still less than current rideshare prices. And the Loop is still more economical in price when compared to the Las Vegas Monorail.

136 See Davidson, supra note 135.
139 Andrew Clark, How Las Vegas Transport Gamble Turned into a One-Track Ride to Ruin, THE GUARDIAN (Feb. 15, 2008, 7:06 PM), https://www.theguardian.com/business/2008/feb/16/useconomy.marketturnmoil (documenting the private nature of the Las Vegas Monorail and how the five dollar fare is partly because of the project being funded on borrowed money as a private entity).
141 Vegas Loop, supra note 3; McBride, supra note 99 (“Rides on the Loop will cost about $5 to $20, depending on the distance, [a] spokeswoman [for the LVCVA] said.”).
142 Vegas Loop, supra note 3.
143 Maria Merano, The Boring Company’s Initial Fare Prices for the Greater Vegas Loop Are Released, TESLARATI (Apr. 13, 2021), https://www.teslarati.com/elon-musk-boring-company-vegas-loop-fare-price/ (noting that in April 2021, Lyft charges for a ride to the Harry Reid International Airport from the LVCC were about $14.19, as opposed to the Loop’s proposed $10 fare).
144 Id.; Ticket Information, LAS VEGAS MONORAIL, https://www.lvmonorail.com/ticket-information/.
The high costs of fares, maintenance, expansion, and lower-than-predicted ridership have led the Las Vegas Monorail to file for bankruptcy twice. The monorail first filed for Chapter 11 bankruptcy in 2010. Las Vegas Monorail executives cited the “economic downturn” and “decline in convention traffic” as reasons for the filing. Wendall Cox, a transport consultant who advised monorail opponents, predicted the bankruptcy filing. In an interview with the Guardian in 2008, Cox explained that the “Vegas street scene is one of the most interesting street scenes in the U.S.” and that many visitors like traveling “on foot.” Despite the filing, the Las Vegas Monorail continued to operate—until it filed for bankruptcy again in 2020; the monorail was then purchased by the LVCVA in 2021.

The Vegas Loop must differ from the Las Vegas Monorail to ensure that it attracts riders and does not fall prey to the same pitfalls that the monorail faced. Unlike the Las Vegas Monorail, Boring plans to use the Vegas Loop to connect the Las Vegas Strip resort corridor, the city’s downtown area, Harry Reid International Airport, and other properties of interest. Where the Las Vegas Monorail allowed tourists to move throughout different Vegas Strip properties, the Vegas Loop will enable residents and tourists the ability to traverse the greater Vegas area. Although the Loop has higher prices than most public transport systems in the United States, Boring predicts faster travel times with riders not needing to wait for stops like most rail systems. If Boring can learn from the Las Vegas Monorail and work with local government entities to ensure the creation of its proposed stations, then Boring will likely see success in its gamble with the Loop.

2. How the Las Vegas Loop Compares to the Seattle Center Monorail

The Las Vegas Loop is similar in its conception and scope to the Seattle Center Monorail. Initially developed in 1962 for the Seattle World’s Fair, the Seattle Center Monorail was first created as a people-mover to link attendees

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146 Clark, supra note 139.
147 Id.
148 Id.
149 McFarland, supra note 145.
150 Vegas Loop, supra note 3.
152 Vegas Loop, supra note 3.
between the fairgrounds and amenities of downtown Seattle.\textsuperscript{154} The City of Seattle hired contractors to build the monorail at $3.5 million.\textsuperscript{155} The Seattle monorail used two trains to transport more than eight million guests during the six months of the World’s Fair, which paid for the cost of construction along with a profit.\textsuperscript{156} After the fair, the system was eventually sold to the City of Seattle in 1965 for $600,000.\textsuperscript{157} Today, while the City of Seattle owns the monorail, it is operated by a private contractor who splits the profits with the city through an operations contract.\textsuperscript{158} The Seattle Center Monorail receives no operating funds from public sources, with costs covered by fares and federal grants for capital projects.\textsuperscript{159}

The Vegas Loop is similar to the Seattle Center Monorail in that Boring designed the Loop to help transfer its riders to different Las Vegas amenities located in Downtown Las Vegas and the Las Vegas Strip.\textsuperscript{160} In comparison, Seattle representatives sought to develop the Seattle Center Monorail for a similar purpose, and riders use the monorail today to travel to different downtown amenities and tourist attractions.\textsuperscript{161} The Loop is also similar to the Seattle Center Monorail in that its creation and design will be of no cost to the public, with Boring expecting to recoup expenses through fares once it is fully operational.\textsuperscript{162}

The Loop differentiates from the Seattle Center Monorail in its design because the Loop will be primarily underground and will utilize Tesla cars rather than railcars.\textsuperscript{163} Once the Loop is fully operational, the fares will go to Boring.\textsuperscript{164} Unlike the Seattle Center Monorail owned by the City of Seattle, Boring has full ownership of the Loop and will receive all of the fare profits.\textsuperscript{165} However, if the Loop proves successful, it may be beneficial for Boring and its contracting entities to enter into additional agreements similar to the Seattle Center Monorail to potentially receive government funding to lower the fare costs for riders.\textsuperscript{166}

\textsuperscript{154} A Brief Seattle Monorail History, SEATTLE CTR. MONORAIL, https://www.seattlemonorail.com/about-seattle-monorail/history/.
\textsuperscript{155} Id.
\textsuperscript{156} Id.
\textsuperscript{157} Id.
\textsuperscript{158} About Seattle Monorail, SEATTLE CTR. MONORAIL, https://www.seattlemonorail.com/about-seattle-monorail/.
\textsuperscript{159} Operation, SEATTLE CTR. MONORAIL, https://www.seattlemonorail.com/about-seattle-monorail/operation/.
\textsuperscript{160} Vegas Loop, supra note 3.
\textsuperscript{161} A Brief Seattle Monorail History, supra note 154.
\textsuperscript{163} Vegas Loop, supra note 3.
\textsuperscript{164} Clark, supra note 139.
\textsuperscript{165} Id.
\textsuperscript{166} See About Seattle Monorail, supra note 159.
C. How the Las Vegas Loop Compares to Subway Systems

The Vegas Loop will be a mass transit system that lacks an electrified rail. The Loop’s lack of a rail heightens passenger safety, as the absence of an electrified rail allows passengers to safely exit the Loop vehicles and the rest of the system without fear of electrocution. Mass transit rail systems run on a scheduling system with train cars in constant operation regardless of the passenger size or where the passengers desire to stop. Through the Loop’s PRT vehicles, vehicles will go from their charging stations straight to passengers and take them on a direct route to their destination.

Despite these advantages over rail transit, the Loop’s design as a PRT system has largely gone underutilized and will be the first of its kind to be used in operation for mass transit. Conversely, local entities have used subway systems for mass metropolitan transit for over 100 years. Rail systems also can carry large groups of people at a relatively low cost. U.S. rail systems are also publicly owned, with the operation often leased to different entities. The public ownership of rail systems allows them access to public government subsidies and regular maintenance. But what the Loop system lacks in public subsidy, it makes up for in the affordability of construction. The Loop system may be the first of its kind to be put into practice, but its affordability compared to subway systems is unmatched.

III. Project Concerns

A. Environmental

The idea of a loop project to create a network of tunnels beneath large cities continued in Elon Musk’s home base—California. In 2017, Boring had

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167 Vegas Loop, supra note 3.
168 Id.
169 Id.
170 Id.
171 Id.
172 Mittelman et al., supra note 89, at 1.
176 Id.
177 Id.
already been granted the applicable permits to begin the construction of its first tunnel, the R&D Test Tunnel located in Hawthorne, California. By November 2017, Los Angeles City Councilmembers Mike Bonin and Paul Koretz submitted motions to the City Council related to Boring and public transportation.\textsuperscript{179} Contained within Councilmember Bonin’s motion was an interest in having representatives of Boring and Hyperloop give a presentation to the Los Angeles City Council Transportation Committee on “the status of the new technology [and] its potential applications for increased mobility and traffic relief.”\textsuperscript{180} Following Musk’s tweets that showed intentions to begin tunneling in Los Angeles, Councilmember Koretz’s motion instructed the Bureau of Engineering, Department of Transportation, and Department of City Planning to “report with options on ways the City can expedite the necessary permits for Elon Musk’s Boring Company to develop new electric-vehicle tunnel technology . . . .”\textsuperscript{181}

Thus began the developments on the second tunnel in Los Angeles, California. The purpose for the second tunnel, titled the Proof of Concept Tunnel Project, was to be “used solely for construction logistics verification, systems testing, operating, procedure verification, and line-switching demonstrations.”\textsuperscript{182} The Proof of Concept Tunnel Project was set to be a 2.7 mile long underground stretch in Los Angeles by Sepulveda Boulevard, north of West Pico Boulevard and south of Mississippi Avenue.\textsuperscript{183}

On March 13, 2018, the Los Angeles Department of Building and Safety issued a building demolition permit for the tunnel entrance on Sepulveda Boulevard.\textsuperscript{184} By March 27, 2018, the Board of Building and Safety Commissioners determined that the Proof of Concept Tunnel Project was exempt from the California Environmental Quality Act (CEQA).\textsuperscript{185} The Bureau of Engineering prepared a notice of exemption on March 28, 2018, in compliance with CEQA.\textsuperscript{186} The Los Angeles City Council reviewed the notice

\textsuperscript{179} Motion by Mike Bonin, Councilmember, 11th Dist., Before the Los Angeles City Council Comm’n on Transp. (Nov. 21, 2017) (available at http://clkrep.lacity.org/onlinedocs/2017/17-1315_mot_11-21-2017.pdf) [hereinafter Bonin Motion]; see also Motion by Paul Koretz, Councilmember, 5th Dist., Before the Los Angeles City Council Comm’n on Transp. (Nov. 28, 2017) (available at https://docslib.org/doc/2310069/mmsft-2x4-4%C2%A4o-0) [hereinafter Koretz Transportation Motion].

\textsuperscript{180} Bonin Motion, supra note 179.

\textsuperscript{181} Koretz Transportation Motion, supra note 179.


\textsuperscript{183} Id.

\textsuperscript{184} See Verified Petition for Writ of Mandate and Complaint for Declaratory Relief ¶ 28, Brentwood Residents Coal. v. City of Los Angeles, No. BS173523 (Cal. Super. Ct. filed May 2, 2018) [hereinafter Petition and Complaint].

\textsuperscript{185} Koretz Public Works Motion, supra note 182.

\textsuperscript{186} Id.
of exemption and determined that the project was categorically exempt from CEQA under Section 15332, Class 32 of the CEQA Guidelines.\textsuperscript{187} Councilmember Koretz submitted a new motion to the City Council on April 11, 2018, which authorized the Bureau of Engineering and the city departments to grant all permits necessary to begin constructing the Proof of Concept Tunnel Project.\textsuperscript{188}

1. \textit{What Is the California Environmental Quality Act?}

The purpose of CEQA is to “inform government decisionmakers and the public about the potential environmental effects of proposed activities and to prevent significant, avoidable environmental damage.”\textsuperscript{189} CEQA also seeks to disclose to the public the reasons why a governmental agency approved a project if significant environmental impacts were to be involved.\textsuperscript{190} A project subject to CEQA must follow certain requirements, including the creation of an environmental impact report that evaluates whether the proposed project has a significant impact.\textsuperscript{191} CEQA also requires an agency to “solicit and respond to comments from the public and other agencies concerned with the project.”\textsuperscript{192} Once a lead agency determines that a project is subject to CEQA, it must also determine whether the project is exempt from CEQA.\textsuperscript{193} A project may be exempt from CEQA for various reasons, but applicable to the Proof of Concept Tunnel Project is a categorical exemption.\textsuperscript{194} Section 21084 of the Public Resources Code requires CEQA to have a list of classes of projects that “have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA.”\textsuperscript{195} After determining that a project is exempt, an agency must prepare a notice of exemption, which includes information such as a description of the project, the location of the project, findings that the project is exempt from CEQA, and reasons to support those findings.\textsuperscript{196}

Projects that are characterized as in-fill development projects (Class 32) are exempt from CEQA requirements.\textsuperscript{197} The following criteria must be established to classify a project as a Class 32 project:

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\textsuperscript{187} \textit{Id.}
\textsuperscript{188} \textit{Id.}
\textsuperscript{189} \textit{CEQA: The California Environmental Quality Act, GOVERNOR’S OFF. OF PLAN. AND RSCH., https://opr.ca.gov/ceqa/#new-ceqa.}
\textsuperscript{191} \textit{Id.}
\textsuperscript{192} \textit{Id.}
\textsuperscript{193} \textit{Id.} § 15061.
\textsuperscript{194} \textit{Id.}
\textsuperscript{195} \textit{Id.} § 15300.
\textsuperscript{196} \textit{Id.} § 15062.
\textsuperscript{197} \textit{Id.} § 15332.
The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.

The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses.

The project site has no value as habitat for endangered, rare or threatened species.

Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.

The site can be adequately served by all required utilities and public services.198

But various exceptions apply to the class exemption, one of which is cumulative impact.199 When “successive projects of the same type in the same place, over time” create a significant cumulative impact, an individual project in that succession may not avail itself of the Class 32 exemption.200

According to the notice of exemption filed on March 28, 2018, the City of Los Angeles Bureau of Engineering, the lead agency in the Proof of Concept Tunnel Project, deemed the project exempt from the provisions of CEQA because the bureau considered it a Class 32 in-fill development project,201 based on the criteria detailed above.202 The bureau did not find a cumulative impact because

[t]he Project would not occur at the same time or in the same place as similar projects including current and proposed tunneling projects (e.g. Metro, The Boring Company Hawthorne Tunnel), public works projects, and pending/approved haul routers, in a way that would contribute to cumulative impacts, as discussed in the Initial Study.203

2. Pushback and Potential Litigation in California Against the Proof of Concept Tunnel Project

While the application and permitting process for the Proof of Concept Tunnel Project were expedited by the Los Angeles City Council, which made it seem like the public highly supported the project, there were early indications that there would be pushback on the project. In a letter addressed to Los Angeles City Councilmember Bob Blumenfield, fellow Councilmember Mike Bonin flagged a letter from Phillip Washington, CEO of the Los Angeles County Metropolitan Transportation Authority (Metro), as a reason to continue

198 Id.
199 Id. § 15300.2.
200 Id.
202 See supra note 190 and accompanying text.
203 See Notice of Exemption, supra note 201, at 3.
consideration of Class 32 categorical exemption and delay a decision. Councilmember Bonin explained how in November 2016, California voters approved Measure M, which funded mass transit projects—one of which was to be built near the Proof of Concept Tunnel Project. In Washington’s letter, which was addressed to Elon Musk, he informed Musk that “all plans proposed for the design, construction, and implementation of public mass transit systems or projects in Los Angeles County must be submitted to Metro for approval.”

While the letters extended offers for cooperation between Boring and L.A. Metro, it was apparent that Metro had been undergoing a lengthy environmental study on the transit system they were proposing near the Proof of Concept Tunnel Project, whereas Boring was on the verge of skipping this phase of the planning process.

And then came the pushback from the Brentwood Residents Coalition. The Coalition opposed the notice of exemption in a letter addressed to Chairman Blumenfield and the entire Los Angeles City Council on April 18, 2018. John P. Given and Wendy-Sue Rosen, representatives for the Brentwood Residents Coalition, expressed concern that the Proof of Concept Tunnel Project was being rushed through the planning and permitting process and argued that adequate public comment and a CEQA environmental impact report should be required. According to the Coalition, the project should not fall within the Class 32 exemption because it failed to meet the Class 32 requirements (listed above).

For example, the Coalition put forth that L.A. Metro has jurisdiction over the construction and implementation of mass transit systems in Los Angeles County, and “nothing in the record suggest[ed] that the Project ha[d] been vetted or reviewed by Metro.” The Coalition argued that the project was not less than the required five-acre limit, and in fact, the project was just a “piece-meal” of a longer, more robust project that exceeded five acres. The project—according to the Coalition—would have significant impacts on traffic noise, air quality, or water quality. They noted that the project was expected

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205 Id.
207 See id.
209 Id.
210 Id. at 2–4.
211 Id. at 3.
212 Id.
213 Id.
to “generate 80,000 cubic yards of export, requiring 26 haul trucks per day, six
days per week, for approximately nine months.”214 The Coalition was adamant
that the cumulative impacts of a longer tunnel should remove this project from
the Class 32 category and require an environmental impact report.215 Despite
these concerns, the notice of exemption was filed after the short amendment
process.216

Shortly after the hearing on the notice of exemption, the Coalition filed a
petition for writ of mandate and complaint for declaratory relief against the
City of Los Angeles, the Los Angeles Board of Building and Safety
Commissioners, the Boring Company, the Los Angeles Metropolitan
Transportation Authority, and the City of Culver.217 The Coalition alleged that
the Los Angeles City Council and Los Angeles Board of Building and Safety
Commissioners inappropriately applied the Class 32 exemption to the Proof of
Concept Tunnel Project in violation of CEQA.218 The complaint also alleged
that the Los Angeles City Council and the Boring Company were piecemealing
the project into smaller projects to avoid the lengthy assessment period under
CEQA.219 The complaint further alleged more specifics as to why the project
was not exempt from CEQA under the Class 32 exemption, focusing mostly on
the fact that there may be a “reasonably foreseeable expanded tunnel
network.”220 The complaint’s second cause of action alleged that the defendants
violated the Los Angeles City Charter because the Building and Safety
Commission approved the haul route application of the proposed tunnel and
determined the project was exempt from CEQA without the guidance of the
City Planning Commission.221

By November 2018, Boring announced that it would no longer be working
on the Proof of Concept Tunnel Project.222 In a statement from Boring, the
spokesman said, “The parties (The Boring Company, Brentwood Residents
Coalition, Sunset Coalition, and Wendy-Sue Rosen) have amicably settled the
matter of Brentwood Residents Coalition et al. v. City of Los Angeles.”223

Boring went on to state that it will direct its attention to constructing a new

214 Id.
215 Id. at 4.
216 See Petition and Complaint, supra note 184, ¶ 46.
217 See generally id.
218 Id. ¶ 3.
219 Id. ¶ 51.
220 Id. ¶ 69.
221 Id. ¶ 78.
222 Dennis Romero, Elon Musk’s L.A. Freeway Tunnel Won’t See the Light of Day, NBC
freeway-tunnel-won-t-see-light-n940981.
223 Id.
tunnel at Dodger Stadium.\textsuperscript{224} On December 19, 2018, Boring officially canceled the permitting application for the Proof of Concept Tunnel Project.\textsuperscript{225}

3. \textit{Is the Abandoned California Proof of Concept Tunnel Cause for Concern for the Vegas Loop?}

Naturally, there is concern that the Vegas Loop will have the same outcome as the California Proof of Concept Tunnel Project. While the Clark County Board of Commissioners requires Boring to conduct many studies for permitting purposes, Nevada does not have an equivalent of CEQA for this type of project.\textsuperscript{226} And while there may be concerns about what will happen should Boring choose to abandon this project, the Clark County Board of Commissioners required Boring to have a decommissioning plan.\textsuperscript{227} The decommission plan states that should Boring (1) not complete the construction of the project, (2) stop construction, or (3) stop the use of the project as a people-mover, Boring must continue any remaining work to make the site safe.\textsuperscript{228} This work may include filling in all excavations and completing any in-grade foundations with reinforcing steel in place.\textsuperscript{229} The plan also requires Boring to conduct annual monitoring should Clark County determine that access to the tunnels be maintained and not plugged.\textsuperscript{230} While this may not dispel all environmental concerns for the Vegas Loop, it at least creates a mitigation plan should this project not be completed. As of April 2022, the Las Vegas City Council has not released its licensing agreement with Boring, but it will likely contain the same language for a decommissioning plan.

B. \textit{Liability Concerns}

Another concern regards potential incidents inside the tunnel or related to the tunnel. With the Vegas Loop being considered “public transportation,” will the county or city be liable for any incidents? The Revocable License and Maintenance Agreement between Clark County and Boring is telling as to liability.\textsuperscript{231} The agreement includes an indemnification clause in which Boring agrees to indemnify, defend, and hold harmless the county and its officers,

\begin{itemize}
\item \textsuperscript{224} Id.
\item \textsuperscript{227} Id. at 27.
\item \textsuperscript{228} Id.
\item \textsuperscript{229} Id.
\item \textsuperscript{230} Id.
\item \textsuperscript{231} Id. at 34.
\end{itemize}
agents, employees, and volunteers. The clause includes indemnification for
three major liability areas:

[F]rom injury to or death of any person, or against and from damage to, or loss
or destruction of property whatsoever when such injury, death, loss, destruction,
or damage is due to or arising from or as a result of or connected to the Encore
Connector or the Improvements;

[A]ny action or inaction, including intentional, reckless or willful misconduct,
by the LICENSEE [Boring], its officers, employees, and agents, including those
represented as contractor or sub-contractor, in connection with the Encore
Connector, the Improvements, the County Property, and this Agreement;

[T]he design, construction, installation, use, operation, maintenance,
modification, or repairs of the Improvements, or remediation or
decommissioning of the Encore Connector, including the Improvements.

While the clause allows the county to hire an attorney to defend itself,
indemnification still applies, and Boring is responsible for paying all
reasonable attorney’s fees and other expenses in bringing the action.

Based on the indemnification clause, it appears it will be rather difficult to sue the
county, and Boring would carry the brunt of the liability issues.

The Revocable License and Maintenance Agreement also has an insurance
policy that addresses liability issues against the county. The agreement requires
Boring to obtain and maintain a “commercial general liability insurance naming
the County, its officers, employees, volunteers, and agents as additional
insureds for the duration of the Agreement.” The agreement also requires
that the policies must include “coverage for bodily injury, personal injury,
broad form comprehensive general liability, property damage, premises
operations, severability of interests, products and completed operations, and
contractual and independent contractors.” The insurance coverage must be
on a “per occurrence” basis only and not “claims made.” Notably, the policy
limits must be at least a $1 million combined single limit per occurrence for
bodily injury (including death), personal injury, and property damages.

According to the Certificate of Liability Insurance provided, Boring
complies with the requirements in the Revocable License and Maintenance
Agreement. The certificate lists Final Frontier Insurance, LLC as the insurer
for Boring. This type of insurance is for commercial general liability and
contractual liability, and the general aggregate limit applies per policy. The
limit for each occurrence is $3 million, far more than the $1 million minimum,
which includes $100,000 for damages to the rented premises, $10,000 for

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232 Id.
233 Id.
234 Id.
235 Id.
236 Id.
237 Id.
238 Id.
239 Id.
240 Id.
medical expenses of any one person, and $3 million for personal and adverse injury. The certificate holders are listed as Clark County and Clark County Public Works.

While there may be liability concerns as to personal injury, death, and premise issues, the provisions in the Revocable License and Maintenance Agreement are highly favorable to the county. Obviously, the goal is to avoid these types of liability issues in the first place, but if they were to arise, the county is highly protected because of the indemnification clause and insurance policy. Again, it is likely that the City of Las Vegas will mirror this language in issuing licenses and permits in the future.

IV. BENEFITS OF THE LAS VEGAS LOOP AND POLICY IMPLICATIONS

A. Why Singular Vehicles and Not Larger People-Movers?

One concern that might arise when evaluating the Vegas Loop is Boring’s decision to use a singular vehicle system and not a bigger option, such as a train, monorail, or light rail. But a larger people-mover is not always the solution for efficient and cost-effective transportation, and Las Vegas has a prime example of this in its backyard: the Las Vegas Monorail. As discussed above, the Las Vegas Monorail was not exactly successful, filing for bankruptcy on two separate occasions and experiencing a decrease in expansion and ridership. At the launch of the Las Vegas Monorail in 2004, it was advertised that the monorail would encounter over 20 million riders per year. The harsh reality was that the Las Vegas Monorail only hosted 4.9 million rides in 2016, out of nearly 43 million tourists that visited Las Vegas and a local population of about 632,000. And as one rider would describe it, “I was literally the only person on a train built to carry 222 people. It was like walking through a deserted mall at midnight—creepy as hell.”

The Las Vegas Monorail system was not cost-effective based on the number of times it ran a day. On the weekends, the Las Vegas Monorail would stay open for eighteen hours. With seven stops on its route, the Las Vegas Monorail purports to have trains arrive every four to eight minutes at each

241 Id.
242 Id.
243 See Adam Something, The Vegas Loop: Just as Stupid as You Think, YOUTUBE (Jun. 6, 2021), https://www.youtube.com/watch?v=QvK2i9Jxy5c.
245 See supra notes 145–50 and accompanying text.
246 Lindeman, supra note 244.
247 Id.
248 Id.
A one-ride ticket is five dollars, and a one-day unlimited pass is thirteen dollars. If, as mentioned above, only one person rides the monorail, the profit of five dollars or thirteen dollars to run the very expensive monorail is not much. When considering that the Las Vegas Monorail has a fixed route, which requires the train to stop at the seven different stops, the ride is also relatively long.

Had the Vegas Loop used the same train system as the Las Vegas Monorail, the project would have been more expensive and not as easy to build beneath hotels on the Strip. The Las Vegas Monorail uses a fleet of nine INNOVIA Monorail 200 four-car trains on its tracks. The length of this four-car train is 138 feet, with an overall width of 8 feet 8 inches. The height of the train, however, is over 11 feet. Because of the size of the monorail’s guideway and the monorail train itself, the average station space is 0.5 miles long. This train system would naturally require a larger excavation diameter and underground stations as big as the train system.

On the other hand, the singular Tesla allows for more independent movement and a much smaller tunnel. The Tesla Model X is 89.4 inches wide, which is about 7.5 feet. The overall height is 66.1 inches or 5.5 feet, and the overall length of the vehicle is 199.1 inches, or 16.5 feet. These measurements allow for the tunnel to be 12 feet wide and for a higher number of vehicles to enter the tunnel system. Boring’s use of the TBM also makes it possible for excavation to take place in urban areas, which is perfect for creating tunnels in the middle of the hotel-saturated Strip, rather than having to build stations further outside of the centralized city center. The Loop itself will have multiple routes and entry and exit stations, which makes the rides be more efficient, allowing for vehicles to skip stops when necessary—a huge difference compared to a traditional monorail system. Because the singular vehicle is so small, Boring also claims that stations can be as small as two

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250 Id. The seven stops are at Sahara Las Vegas, Westgate, the Las Vegas Convention Center, Harrah’s/The Linq, Flamingo/Caesars Palace, Bally’s/Paris, and MGM Grand. Id.
251 Id.
253 Id.
254 Id.
255 Id.
257 Id.
258 Claire Reilly, Elon Musk’s Boring Loop Is Finally Transporting Passengers in Las Vegas, CNET (Jun. 9, 2021, 5:00 AM), https://www.cnet.com/science/elon-musks-boring-loop-is-finally-transporting-passengers-in-las-vegas/. It was reported that about 65 Tesla vehicles were inside the Convention Center Loop at once. Id.
259 See supra note 27 and accompanying text.
260 Loop, supra note 10.
parking spots, meaning a small station footprint is possible within a hotel. These are stark contrasts to using a train system and may better serve the Las Vegas Strip, though it is too early to say with certainty.

B. The Financial Benefit to the County (and Potentially the City, Too)

Tourism is a huge component of the Las Vegas economy. In fact, the LVCVA reports that hotels and casinos are one of the largest employers in Las Vegas, employing over 164,000 workers. The amount of visitor spending correlates directly to the employment flow in Las Vegas, making up about 376,000 jobs in the tourism industry. While locals may or may not use the Vegas Loop as part of their commute, the ability to transport tourists from the Las Vegas Strip to Downtown Las Vegas will bolster the Las Vegas economy, and as a result, create more employment opportunities for locals. The Vegas Loop allows for tourists to visit areas they had never considered in the past, such as Downtown Las Vegas, and for those reasons, there is a marked financial benefit to this project.

Keeping this in mind, a huge reason why the Clark County Board of Commissioners, and potentially the Las Vegas City Council, may support the construction of the Vegas Loop is the financial benefits. First, the Clark County Franchise Agreement requires Boring to pay to build the Loop and collect fares from passengers. This means that Nevadan taxpayer dollars will not go towards funding for this project. And while Boring will pay for the tunneling of the Loop, it is reported that the hotels and casinos will pay for the construction of their stations that will connect to the Loop. Additionally, Boring will pay the county a franchise fee that is based on the success of the Loop. On a quarterly basis, Boring will pay the county 0.5% on the first $17.5 million of quarterly revenue, and the fee increases to 5% on additional revenue over $17.5 million. This plan is slightly better than the 1998

261 Id.
263 Id. at 4.
264 Id.
266 Id.
268 Id.
269 McBride, supra note 99
270 Franchise Agreement, supra note 131, at 1.
271 Id.; see also McBride, supra note 99.
franchise agreement for the Las Vegas Monorail, which fixed the franchise fee to 0.5% for quarterly profits.272

And while the Las Vegas City Council’s franchise agreement is still in limbo, it is worth mentioning the Las Vegas Convention Center’s contractual fees. As discussed above, the LVCC required Boring to obtain a performance bond equal to 50% of the contract value under NRS Chapter 339, which conditions the faithful performance of the contract following the plans and specifications of the contract.273 The purpose of this type of bond is “solely for the protection of the contracting body which awarded the contract.”274 The LVCC also required a $300,000 penalty for “each large convention where [Boring] cannot move around 4,000 people per hour.”275 For the LVCC, this big event would be one the size of CES.276 As the Las Vegas City Council negotiates and finalizes its franchise agreement with Boring, they will likely benefit financially from Boring’s success and may still benefit even if the project fails.

C. Autonomous Driving Legislation

The Loop currently utilizes human drivers for its convention center operation and will likely continue using drivers when the Loop becomes fully realized.277 However, the use of human drivers is not due to the lack of autonomous capabilities of the Tesla vehicles used in the Loop tunnels. The Tesla vehicles in the Loop can utilize self-driving technology that will allow the cars to become mostly autonomous.278 The current vehicles in the Vegas Loop can use Tesla’s “autopilot” feature that enables cars to steer, accelerate, and break automatically while in a lane.279 Despite these features, Tesla does not label its autopilot software as autonomous.280 However, Tesla states that its cars “have the hardware needed in the future for full self-driving in almost all circumstances” and that the self-driving features are dependent on achieving reliability and regulatory approval.281

272 McBride, supra note 99.
274 Id. The “contracting body” is defined as the “[s]tate, county, [or] city … which has authority to contract for the construction, alteration or repair of any public building or other public work or public improvement.” Id. § 339.015(2).
276 Id.
277 Mihalascu, supra note 90.
278 See id. (Noting that the Loop uses Tesla Model X and Model Y cars); Future of Driving, TESLA, https://www.tesla.com/autopilot (explaining that all new Tesla vehicles, including the Model X and Model Y, “have the hardware needed in the future for full self-driving”).
279 Id.
280 Id.
281 Id.
Nevada is a prime target to expand on autonomous vehicle regulations—especially for a fleet of autonomous vehicles like Boring may implement with the Loop. Nevada was the first state to create a regulatory scheme for self-driving vehicles. 282 NRS 482A is the chapter in the Nevada Revised Statutes that regulates autonomous vehicles, and NAC 482A is its counterpart in the Nevada Administrative Code. 283 The Nevada Revised Statutes grant the Department of Motor Vehicles the ability to regulate how one can operate an autonomous vehicle. 284 The Nevada Department of Motor Vehicles requires individuals to register autonomous vehicles, provide proof of insurance for the vehicle, and provide an affidavit that states that the operator has been trained in the capabilities and limitations of operating the vehicle. 285 The same affidavit requirements also apply to entities that operate a fleet of autonomous vehicles. 286

Boring has yet to release a statement about why its fleet of Tesla vehicles does not utilize its self-driving features. But a possibility may lie within Nevada’s autonomous driving statutes that provide little guidance as to how a fleet of autonomous vehicles may operate within the state. 287 Depending on the advancements of self-driving vehicles and the success of the Loop, autonomous vehicle legislation may accelerate to allow Boring to implement autonomous driving in the Loop system. The Loop’s success may also lead Nevada legislators to legislate the Loop itself because of its emerging existence as a new form of mass PRT. 288 With the continued development of autonomous driving legislation and technology developed by Tesla, the Vegas Loop will likely become autonomous in the near future.

V. FUTURE OF THE LAS VEGAS LOOP

To fully achieve its vision, the Vegas Loop requires agreements with Clark County, the City of Las Vegas, and the Federal Aviation Authority. 289 Currently, Boring only has a franchise agreement with Clark County and a special use permit with the City of Las Vegas. 290 Despite the Loop being limited to Clark County governed properties, it has the potential to expand and

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284 NEV. REV. STAT. § 482A.100.
285 NEV. ADMIN. CODE § 482A.050.
286 Id.
287 Husch & Teigen, supra note 282.
288 See supra notes 89–92 and accompanying text.
289 Vegas Loop, supra note 3.
offer additional services to the entire Las Vegas valley. This Part will first propose additional Loop stations that Boring could implement throughout Las Vegas; it will then discuss additional services that the Loop could offer and conclude with a review of Boring’s future Loop projects outside of the Las Vegas area.

A. Potential Loop Station Proposals

The Vegas Loop has current plans to operate fifty-one different stations across the City of Las Vegas, the Las Vegas Strip in Clark County, and the Harry Reid International Airport. There are also talks to include stations for the City of Las Vegas’s arts district and medical district in future developments. But where can we see the Loop expand from here? Boring has stated that any entity that wishes to be part of the Loop network needs to pay for the construction costs of developing a new station. With development costs in mind, several Las Vegas properties could benefit from possibly having stations built on or near their properties.

1. Station Casinos Properties

There are no current talks on record between Boring and Station Casinos executives to add Loop stations to their properties. However, with the significant traffic of locals who use the Station Casinos properties and with most of Station’s properties residing off-strip, Station Casinos would likely benefit from adding several of their properties as stations on the Loop network. Notably, Palace Station would be a prime location to implement a Loop station because of its proximity to Downtown Las Vegas and the Vegas Strip. The heavy use of Station Casinos properties by Vegas locals could also serve as a means for these entities to create park and ride systems for the

292 Vegas Loop, supra note 3.
294 Id.
295 Station Casinos is an American hotel and casino company based in Las Vegas, Nevada. About Station Casinos, STATION CASINOS, https://www.stationcasinos.com/about-us/.
296 Id.
297 Id.
Creating a park and ride system to use the Loop, especially from Station Casinos’ properties, could allow for greater use of the Loop by locals who reside farther from Downtown Las Vegas and the Vegas Strip. Depending on the Loop’s success in the coming years, it is likely that talks of a possible Loop station at Station Casinos properties will come to fruition.

2. Las Vegas Ballpark and Downtown Summerlin

The Howard Hughes Corporation may develop an interest in creating a station for the Vegas Loop at their Summerlin properties, depending on the Loop’s success. Notably, a station for the Las Vegas Ballpark and Downtown Summerlin may interest the Hughes Corp. Hughes Corp. owns both the Las Vegas Ballpark—a baseball stadium home to minor league baseball team the Las Vegas Aviators—and Downtown Summerlin, a shopping and business center in the Las Vegas Summerlin Community.

However, Hughes Corp.’s properties are relatively far from the closest planned Loop station at the Orleans, over ten miles away. The cost of developing a station over ten miles away from the Loop may be out of the question for Hughes Corp. In addition, the price that a rider would have to pay to go to and from Loop stations would also likely prove uneconomical. But as Boring begins to develop additional stations for Vegas properties, there may come a time when creating a station for Hughes’s Summerlin properties may not be so far out of reach.

B. Additional Services

Boring currently only lists its plans to offer one-way fares for the Loop for its riders, but the Loop may benefit from other services. Making a multi-day pass for tourists or a subscription service for Vegas residents may garner additional ridership. Creating a pass system like New York City’s Metro Pass or the ORCA Card for the Seattle Center Monorail may benefit Boring and


300 Id.

301 Id.

302 Vegas Loop, supra note 3; Driving Directions from Downtown Summerlin to The Orleans Hotel & Casino, GOOGLE MAPS, http://maps.google.com (follow “Directions” hyperlink; then search starting point field for “Downtown Summerlin” and search destination field for “The Orleans Hotel & Casino”).

303 The sample fares for the Loop are set at approximately two dollars per mile, so to travel over ten miles could cost over twenty dollars. Vegas Loop, supra note 3.
Vegas residents and tourists.\textsuperscript{304} With additional collaboration from the City of Las Vegas and Clark County, Boring could potentially enter talks to create a metro card where Vegas locals could use the pass to ride the different Vegas transit systems.

\textit{C. Projects Outside of Las Vegas}

As of April 2022, Boring is in talks with the cities of Austin and San Antonio, Texas, to connect their downtown areas to their respective airports.\textsuperscript{305} The announcement of potential projects in Texas came just months after Tesla moved their corporate headquarters to Austin and opened a new factory in the location.\textsuperscript{306} If the Vegas Loop proves successful and the additional Texas loops come into fruition, other loop systems may be seen throughout the country or possibly the world. While the cost of developing additional public transit seems out of the question to some cities, Boring and Tesla introduce a new cost-effective solution through a new form of private transit.

\textbf{CONCLUSION}

The Boring Company’s loop projects are not without their criticisms.\textsuperscript{307} However, the affordability of the Vegas Loop to Las Vegas residents is without question with Boring paying for most of the Loop’s development costs.\textsuperscript{308} Boring is taking an educated gamble on the city of Las Vegas to implement its PRT style of transportation. And local entities both on the Vegas Strip and in Downtown Las Vegas have shown their support and desire for stations to be built on their properties.\textsuperscript{309} The Vegas Loop may also be slightly off from its initial desire to solve local traffic concerns through autonomous vehicles.\textsuperscript{310} But the Loop’s endeavor of forming a transportation system that can serve

\textsuperscript{304} See New York MTA, supra note 140; Buy Tickets, SEATTLE CTR. MONORAIL, https://www.seattlemonorail.com/buy-tickets/.


\textsuperscript{308} McBride, supra note 99.

\textsuperscript{309} Vegas Loop, supra note 3.

Vegas riders may ultimately prove profitable for both Boring and the greater Vegas area. The Boring Company and the Las Vegas area will be a location to watch as feats of both engineering and policy develop with Boring’s goal to hit the transportation jackpot with its Las Vegas Loop system.