Speakers, in chronological order

Brett Horton - Boring company & spaceX senior director of facilities and construction
Mayor: Alex Vargas

Council|Member Olivia Walentine

council Member Angie Reyes English

Mayor Pro Tem Awad City Manager Arnie Shadbh Council|Member Nilo Michelin

Brett horton speaking on behalf of the Boring company

Brett: What we're going to be doing today is clearing up a few things, telling you exactly what we're doing and proposing, and then also introducing you and the community to the Boring company

Who are we; so very simply we're the Boring Company, founded by Elon Musk here in Hawthorne with a singular and very simple purpose - to solve the problem of soul destroying traffic. We've all been in it, we all live in it, we all see it every day. What we are proposing is a network of tunnels long term) to carry autonomous, zero emission vehicles at higher speeds than traffic allows currently, throughout short and long term distances. What we are talking about today is a test tunnel, purely for research and development-2 miles (32 km) long under 120th St. 'I address the proposed alignment and then several major concerns, one being safety and one being monitoring of the existing utilities under 20th St. Then I'll open it up to any questions that the council members may have

so first, the alignment. We are currently permitted to tunnel in our private parking lot that spaceX owns, at the corner of Crenshaw and Rocket Rd, the first tunnel permit is for 350 feet (105m). The second phase that we are discussing today for the test tunnel turns the corner to 120th and goes down 120th to Hawthorne Blvd, right at 2 miles (3.2km) long. This is the extend of this tunnel. It is a research and development tunnel meant for us (The Boring Company) to learn about our tunneling machine (Godot), understand the technology and where we can improve it, and also test and prove out the transportation system, so to speak very quickly about how the transportation system works and how we're going to be testing in this tunnel is it's based on Tesla technology. We all know about autonomous driving and the capabilities we've seen demonstrated in various videos. We're going to be using that technology, but instead of an enclosed Tesla, it's going to be an electric skate, so imagine the drivetrain of a Models with a flat platform on top of it, where cars can drive on, turn off and drive through the system. In this tunnel, we won't be putting any cars. One of the critical things to understand today is that we'll be testing the skate, and we'll be testing the technology. This is not meant to be a tunnel that's inhabited by people, and it's actually not meant to transport cars or people through the tunnel. It is just a test tunnel

so one of the primary concerns, and it's really been a pleasure to work with City staff to address these concerns, is utilities. We know there is gas, electrics, fibre optics, sewers, storm drains and water lines running throughout Crenshaw Blvd and specifically along 120th, We've reached out to all 19 utilities we thought have or may have utility lines in the street and we've got responses from those that do. We've actually invited them to take the same tour that Council members took, the same tour so that you can see what we're doing their

primary concern, and one of the two major concerns about tunneling is does the ground move, does it settle - which means does it shrink? Are we going to break the storm drain line when we tunnel under it? The answer is no. We prove that in two different ways. First it's through appropriate and responsible design at the beginning of the project. then it is through monitoring and any action required by any monitored settlement. What we are doing, we've done an extensive survey throughout the two mile alignment we know all the utilities that are in place. What we're going to do we're going to locate Utility Monitoring Points, UMPs, a fancy way of saying we're going to drill a small hole down to the top of the pipe and stick a steel rod down on top of it with a little prism on top. Then we're going to survey it continuously to make sure we know if it goes up, if it goes down if it goes left or right. The way this used to be done is you would hire licensed land surveyors and they would come out we've all seen the tripods and the poles next to the road where they're shooting grades, What we have is a system called CYCLOPS. It's a proven technology that's already been in the field for many years where it automates the process. Instead of relying on someone to physically come on site to take those measurements, it takes it every two hours automatically and reports the data out. We will provide, in addition to the settlement and monitoring analysis that we've already provided the city, we'll provide addendums that show, as we go, once we cross the public right of way, what each and every utility is doing in terms of movement and also what the surface level of the road is doing in terms of movement.

the way the tunnel is designed, and think this will also put a lot of people at ease, is we acquired a used Tunnel Boring Machine that was used in Sunnydale, in the Bay Area in California for a sewer project. We really didn't change anything. We used the same design, the same machine, the same operating procedures. They're already approved by CaloshA. already designed to the same design standards that LA Metro uses. We are not re-inventing that type of tunneling technology. What we're doing is we're learning the capabilities of the machine and what we can do to make it better. The other key to understanding, and what we're addressing with each individual utility is that we believe through our structural design, that we will not see any settlement greater than one half of an inch (125cm) at any point along the entire alignment. If e come close or exceed that one half inch, and we will know every two hours, at every utility if we are exceeding that, activity will stop immediately. We'll put a remediation plan in place, review it with City staff and the affected utility, and then not progress any farther until we have that remediation plan in place and any settlement addressed. It is a continual process that we will continue to go through. throughout the entire alignment

Next of course is safety the way tunneling works, we couldn't start tunneling on our property until we had two things; approval from Caosha and approval from City of Hawthorne which we have. OSHA actually came out and did a pre-start job walk and they went through our entire operations, listed anything they saw that they thought we could improve and then we did that We are going above and beyond. For instance, CaOSHA requires that we have toolbox meetings once every ten days. That's where

our compliance officer gathers all of the operational staff and they go through safety procedures, and ideas or issues that need to be addressed in the operations, and then the staff can execute. We do that daily Ten times better than OSHA requires that's important because we one, we are a new company and we're learning, and two, we want to be safe. We want the tunnel to be ridiculously safe want to be able to take my little five year old and three year old into the tunnel and show it to them. That's what we're aspiring to not industry standard, not bare minimum, not just get it done. We want to be safe

The other thing is, like I said before, that we are designed to the same standards that Metro is and this is a proven machine that has already done a tunnel in Sunnydale that is active currently. It has a sewer line in it, but it is an active tunnel. same segment design, same tunnel boring machine design. We're not re-inventing the wheel on that

To sum up, what are we trying to do? We want to prove our technology, we want to prove that we can solve traffic, once and for all. This is a two mile tunnel. We know it comes with a certain amount of risk. The other thing we want to clear up is we are not asking the city of Hawthorne to assume any risk the Boring company is assuming that risk if we break something, we will fix it. We know we're not going to break anything If we bend something, we'll bend it back. We know we're not going to bend anything. We know that we're going to be safe and we're going to be successful. We just need this two mile tunnel to prove that... that's why we're asking for

thank you

Alex: sir, thank you very much for the presentation. If anyone would like to see what the future of this underground tunneling type of travel would look like, where can they find it at the Boring company?

Brett boring company.com

Alex: it's the first youtube that pops up. You guys can take a look just so you can see for yourself

Brett. There are several online videos that show where we're going to be in the future, it show the tunnels under LA, it shows the cars going through it, it shows them going up and down the elevators. None of that is what we're talking about today we're talking about the first step in that process, and the first step in this journey that will allow us to prove the technology to eventually do that.

Alex: I have two questions before open it up to my colleagues, optical monitoring you said prisms. There's going to be some type of optical monitoring to determine any

Brett Currently we have a pole currently in our parking lot that is a surveying mechanism that's mounted on a pole and it spins 360 degrees. Currently in our parking lot we have 30 of these prisms set already. They look kind of like a reflector on a road, they are about 3/4 of an inch high (2 cm) and it's actually half a dome, they're ready for traffic, you can drive over them, you'd never know other than a little bump. They have a very small reflector prism in them. When the cyclops machine spins around it is measuring through lasers, the distance to the prism, it will know if it's going up or down

Alex: the diameter of the tunnel, will it be the same as what we've seen? It might be proprietary, we don't want to say what the diameter is right now

Brett that's actually an interesting point

because we have our skeptics and people have said tunneling is hard, tunneling is expensive tunneling is slow. That's actually correct the way it's always been done. We don't accept that answer: "It's always been done that way. We are pushing this a little bit differently if you were going to build a single lane highway as a tunnel, the minimal dimension for the tunnel would need to be around 28 feet (8.5m). By making it autonomous by removing the human component and the ability for human error, we realize we can get it down much smaller, the tunnel we're currently boring, the actual tunnel boring machine is 14 feet (4.25m) in diameter which gives a finished inner diameter of around 12 1/2 feet (3.8m)

Alex: Because of the supporting structure might have questions later. I want to open up to my council colleagues, does anybody have any questions? Who would like to go first?

Olivia: Through the chair, thank you. Thank you very much for this presentation and thank you allowing the council to come and examine the excavation site. I certainly enjoyed my visit. So, what will success look like at the time you finish the tunnel at Hawthorne Blvd what are you looking to determine at that point?

Brett success at first will actually getting the tunnel done, showing people that we can do this. Success for the test portion of the tunnel will be understanding the true performance specifications and what the machine can do. Understanding where we can improve that for future tunnel boring machines and future tunnelling projects, and also laying the groundwork to prove the technology that we're developing for the skates Because we know it's going to operate a little bit differently in a tunnel verses on the street, so taking what we're designing, some of which is proprietary; we won't give away the secret sauce, then proving that in the tunnel and showing that we do it safely, reliably and for a significant cost saving to traditional projects

olivia: What timetable have you set to determine whether or not this is going to be successful?

Brett. Once we cross our property line and go into the public right of way, we think it's going to take us eight months to finish the tunnel. We don't have a set tim will want to test as quickly and as reliably as possible so success will come quickly. We don't move slowly, that's why we're here, and we will continuously iterate. We like to failfast and continuously improve. Success will come very quickly. I think it will be, won't put an exact timeline on it other than to say: it's going to be very fast

Olivia: Once you've completed the tunnel at hawthorne Blvd. what's the next step?

Brett: the next step is to use what we learn, to make faster, stronger tunnel boring machines, to make a safe transportation system and then to figure out where we want to go next. If you've had the opportunity to look at the videos online, it's not a secret we want these tunnels to be everywhere. We want to duplicate the road network in LA, underground. The next step is to go anywhere and everywhere that we can to extend this network could it be under Hawthorne, could it go to the mall, could it come to City Hall? We might pop up right here, we don't know. That is part of it

Olivia: You've already demonstrated the Hyperloop. How will the Hyperloop and the tunnel you're building, how will they interact? Or will they?

Brett Currently there are two separate ideas. What is interesting about tunnels, and this is something didn't personally know, is that the way the concrete segments are designed to basically make them waterproof it's very easy to make them a vacuum we could at some point in the future, create a hyperloop out of this, but that's not what we're testing in this tunnel is it a potential idea sometime in the future, sure But is that what we're doing now? no

Olivia: I may have questions later on but now I'll turn it over to my colleagues

Alex: That's a good clarification that you made, with regards to the Hyperloop and the tunnel being a separate type of effort. Some people think that somehow you we going to incorporate them, but thanks for clarifying that

Angie: Thank you so much for being in here today and first of all need to commend Mayor Pro Tem Awad for the convening of this meeting because it's important for one, and echo the sentiments that have already been expressed for one want to ensure we are working collectively in this matter, that we all understand each other's concerns, moving forward in a united front and for the betterment of Hawthorne and it's residents. My concerns in further questioning will be with the residents interests and/or concerns in hand. With regards to what you just presented here today have concerns, obviously however there are additional things that still have to evaluate. sure with we had the presentation before us so we could have at least myself, seen it and been more familiar with it. I know you made mention the Boring Company not being a secret to be honest it's new to me. Moreover the last council meeting was the first that heard of an EIR permitting process. So with all fairness, if you will,

Brett: Absolutely.

Angie. With regards to the two mile tunneling, will be people for instance, we can't say necessarily for instance that the Boring company will put people at ease. Right? The Boring Company machinery that's going to be used, it's putting your agency at ease, knowing first of all, it's been inquired by previous work. That's again putting at ease for your organization and group know you made mention that it's similar to Metro and having said that I'm familiar with Metro, sat on the service council for Metro for over four years know in the Metro development of it's extended lines throughout the city and LAX, they've been very helpful to the businesses and those affected by these types of tunneling. Having said that my question to you would be and you can comeback with it if you don't have that answer, whether or not the Boring Company would be helping those businesses and/or residents who would be affected, compensating them somehow, especially to build businesses that have ongoing patrons at their locations. So that's one there too. I know you made mention of an eight month timeline, I have my concerns regarding that. I think there's going to have to be a continuum of the concerns that we have here with regards to coming back with additional information. I'll wait to see what our city Manager and other folks in our city have to say, ultimately in advising our council,

Brett: Absolutely, and to kind of hit on those two points, if we were tunneling under this room right now, we'd be talking just like this. You wouldn't know were were there. Affects to businesses, and affects primarily to traffic, there won't be any. We won't require

any street closures, no traffic diversion, no red light changes, no crossing guards. The traffic as it is today, will be exactly as it is the entire process. In terms of any affects to businesses, the only potential effect would be through settlement, and that's where the Boring company is assuming all risk. It wouldn't be at the Council, it wouldn't be on Public works, it would be at the Boring company to replace it. We know we're not going to have an impact. We'll get to the deepest where the top of the turne is 24 feet (7.3m) tallow the surface of the road. You won't even know we're there

It was kind of funny, a few days ago one of your Public Works inspectors was actually on-site at the tunneling to test noise, to understand do you feel vibrations, do you hear this machine when it's activate, we stood at the back of the launch shaft and waited until we saw the dirt coming out and then we walked to the parking lot to where we were standing over roughly where the machine was going. You didn't hear it you could put your hand on the parking lot, you didn't feel the vibration and it was a 14 foot (2.4m) machine spinning and chewing dirt

any other information we can provide, we'd be very happy to provide. We still hope that you'll come out as see it we'll do that same test, you'll be standing above it running, the dirt moving equipment that's on the lot and the crane and the compressor that provides air to the shaft, actually makes more noise than the tunnel boring machine in it. All above ground operations, and think that's another good point to clarify, there is no construction work above ground except for on spaceX's own land. It is our way because we know that when tunnels come out of the ground, they can disrupt businesses, especially traffic, were not doing that with this test tunnel Everything is confined to our land. We're only digging up our parking lot

Angie: ok, just to be clear have coordinated some appointed dates and times to come out. As you know I have a full time job so trying to accommodate in assuring that I too have the experience that my colleagues have had and are able to speak a little bit more on it since they were on site and have yet to get there see the activity happening as travel every day here in hawthorne, it's quite exciting, just as the Hyperloop was and continues to be. We're going to be looking at another Hyperloop event coming up here shortly

Brett the end of this month. The next student competition.

Angie. I want to again thank you for coming and expressing. obviously it's very important to the Mayor, he made an effort to get back from vacation just to be here today, so that's important. But also I want to make mention that are you going to be doing any community outreach to the community of Hawthorne to address their concerns, their questioning in the same manner that we're here today through meeting with their organization groups, homeowners, or those alike so that they could fully understand exactly the impacts, and or not because understand we're still doing an EIR (Environmental impact Report) and it's possible that the EIR and some other requests might happen down the road, not sure. I know you like to move fast, we like to move assuredly that we're doing everything in the correct and right manner

Brett: think that's actually a good point with community outreach. We know this is a big project and we kind of wanted to start at the top, that's why we're here today and we

appreciate the special Council Meeting being called. I think we'll take that back and we will start that outreach immediately

Angie. Thank you.

Pro Tem: First of all want to thank you for coming out here with the presentation. know when came to you and the Boring company team and wanted to call a special Meeting, just to have the residents kind of know where we are, and their safety. That's the biggest concern, just safety. When was at the test site yesterday and you were going over the safety procedures you guys were implementing within the tunnel, you guys were being very over compliant which is a phenomenal thing. If you could just stress to the public again the different extra procedures you and the Boring company are doing to ensure the tunnel is being built safely as well as for the residents

Brett: so the primary mechanism we have is one, that we have a full time safety compliance officer. This is in a position that is, from an inexperienced tunnel person, we actually contracted someone from JF Shea (www.jfshea.com) who is doing the Corridor extension for the Blackline, this is someone with a decade or more of experience doing tunnels. He's our safety compliance officer, he's on site full time. He does daily what are called Toolbox Meetings. Basically he pulls all of the operators and all the above ground personnel together and he does a full safety review check-in, check-out procedure, making sure that they're all wearing their safety vests and their hard hats, Any tools that they have are the correct tools and are registered properly so that we know everyone who's in the mine checks in properly, who's coming out of the mine checks in property. We do that daily, versus an oshA requirement to do that every ten days. The other thing that we do, our classification for CaloSHA is "Potentially Gassy, which is pretty much every tunnel in the IA basin, which means we have the potential to hit primarily methane gas or some other gases while were boring OSHA requirements say you have to take air monitoring two times per shift we do it every hour because we have a full time safety compliance officer and again, we are concerned about safety. It's our number one priority. We go above and beyond it puts our mind at ease, it puts our workers mind at ease to know we're not doing the bare minimum. We are going to provide you with accurate information, in real time to continue

Pro Tem: Wonderful. Thank you for that. Also Mr City Manager, just so that we can all be aware, the timeline and where we're at with regards to the project with the permits and you know the next proceeding meetings, where are you as a city in respect with the tunnel

Arnie. Currently we are still buttoning up with regard to reaching out to other underground utilities owners. In fact as of two hours ago we received a response from sanitation Districts hopefully with cooperation from spaceX we can complete that part with sanitation districts and basically satisfy their concerns and needs. The other hold off is with Edison company. I know today that happened with Edison company in addition to that we are currently reviewing their plans and construction calculations they submitted. We have some comments on those, we are going to provide those to spaceX this afternoon right after our meeting then the determination of the appropriate secret document tunneleasement Permit that's one of the

purposes of this meeting also. That's also a key element into timeline based on city Councils approval of that process, so we are hoping that everything moves forward and we get all the feedbacks. We are hoping for the the last Council Meeting in August perhaps if everything moves forward with the agreement. It's a hopeful target date at this point can say, but hopefully that will... this is what spaceX is seeking and this is why he's looking at me like that. But we can have to see if we can hopefully meet that deadline for them. But then, right after that then encouragement permit. Once the agreement is approved by the city Council then we can move forward with the encouragement permit process.

Pro tem: So just to clarify, we're just at the very beginning stages and we're continuing to move forward

Arnie: Yes,

Pro Tem: Thank you for that, it's a very exciting time in Hawthorne. Boring company, Elon Musk and your team, you guys are knocking on innovation that hasn't been seen really ever it's exciting to be a part of it, it's exciting to you know, start here in our city. I guess over the next couple of months Hawthorne's going to get a little bit more boring, but it's a good thing. Thank you again

Alex: Councilman Michelin, do you have a question?

Niko: Yes, first of all thank you very much to Mayor wargas, Mayor Pro Tem Awad for taking the initiative on this. I'm very excited about this project toured the site and too want to have a very safe tunnel and you say your standards are very high so you can have your own kids go through it. You raised some concerns about gas, electric, fire lines and our City Manager says we're still reaching out for that You did acknowledge there's a potential of some risk about potentially hitting methane gas. You told us you're going to be moving fast, and you don't move slow. However, if there are any safety issues, you will move slow is that true?

Brett Correct, and that's also where we're implementing the continuous monitoring system for the settlement. When you do move fast you have to have data that chases you. You can't move fast and rely on old technology and wait until tomorrow to see if something messed up. We will basically have instantaneous results to know that if something even begins to go wrong we stop. We stop until we know what happened. we know how to fix it and we bring in the appropriate parties, whether it is Public works or it is a specific utility, to put the fix in place before we go any farther.

Nilo. And usually in these projects we have an environmental impact report to tell us about the impact on the environment. Are we going to have an environmental impact report for this project?

Brett: We've actually been discussing that over this entire process and the way we feel, because this is a test tunnel, because it's not meant for human occupancy and it's only a proof of concept also because all of the construction work is basically done on our private land, there is no cultural impact, there is no environmental impact there is no business impact that this project will create. It's already happening under our private land and when we continue, you won't even know we're there, Any risk to the environment is negligible in our opinion

Nilo-so are we going to have an environmental impact report Brett i think

we're still discussing that

Nilo: Are you for it or against it? Brett where we are is that we feel like we qualify for an exemption under CEQA (http://resources.ca.gov/cedamore fac.html) and that is the path that we would like to proceed on.

Nilo. There's another way we can go, there's an expedited environmental impact report, in negative declaration, which will shorten the length, Are you open to that?

Brett: think we will discuss anything. We're open to anything that the council presents or city agencies present to find a path forward

Alex: Sir, when you were talking about the monitoring, of course you're boring so you can set all of the monitoring points behind you. Do you have a manner in which you could monitor right up ahead of you to anticipate any potential hazards that you might encounter, so then you could stop and address that,

Brett: The prisms

actually set out along the entire alignment before we start Alex: Oh before you start ok good

Brett: so what we did on our property, and part of it was because there's a storm drain on our property that we're going under and were fairly close, we shoot elevation grades prior so we can set a benchmark. We know where are today, we shoot during the excavation work so we know where we are now and we'll shoot them after we pass up a utility or an intersection to know where we've gone

Alex: I guess when the Metro or like up in Sunnyville, they built these tunnels, they used boring machines like the one you have right now. Have there been any impacts to the residents or to the businesses that these groups have had to compensate them for?

Brett can't speak to sunnydale or any other tunnels but we toured the Metro Black line, that extension that's going underground. The section that we saw, they were seeing settlement at a quarter of an inch (6mm) or less so it's almost imperceivable is that somewhere that we could potentially find a tunnel that impacted a business. I'm sure that does exist but nothing in our research shows we're going to have any impact on any of the businesses along the alignment

Alex: What was trying to get at was it was going to be solow that people aren't going to feel that they could be tunneling under us and you don't know.

Brett: Absolutely, you don't hear it, you don't feel it and you don't see it because it's 20 to 24 feet (6m - 7.3m) below the surface of the ground

Alex: Ok, anybody else?

Angie: Yes I was just thinking to myself when you said you are not aware of any impacts, Los Angeles has a lot of them, especially the Crenshaw Line. So just an FY you might want to look into that too. With regards to the CEQA exemption I'm obviously going to be listening very clear to what is being recommended by our department heads on those efforts. Because at this point we have the unknown and think we owe it to our residents to provide them what ultimately what can or can not happen. And think that's important can you provide, just out of curiosity, what is the estimated cost of the project?

Brett actually don't have that information and part of what we're doing is making tunneling cheaper so we're not going to give

away the secret sauce, But what I do know is it is significantly less than traditional tunnelling methods

Angie: Traditional what? Brett. Like tunneling methods, where a government would go out and contract for a

company like JF Shea to tunnel the Metroline. We are seeing significant cost savings But the cost of this project I don't have can possibly get that estimate

Angie: ok, thank you. Alex: Anyone else? Nilo-Briefly. You said you were going to ask for an exemption...if you do get this

exemption, are we going to have any kind of independant report to tell us about the environmental impact

brett: Yes we've actually already prepared one. We hired Dudek (https://www.dudek.com/) who's an environmental consultant and we can get that report to all of the Council Members.

Nilo. Thank you

Alex: thank you for now

Council then voted in the affirmative for appointment of City Manager Arnie Shadbher as real property negotiator for the tunneleasement

en retired to discuss price and terms of the tunneleasement in private with the Boring company with Arnie acting as the negotiator for the city