

Ep.6 Trevor Pawl_mixdown

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SPEAKERS

Announcer, Ed Clemente, Trevor Pawl

A Announcer 00:01
Welcome to the Michigan Opportunity, an economic development podcast featuring candid conversations with business leaders across Michigan. You'll hear firsthand accounts from Michigan business leaders and innovators about how the state is driving job growth and business investment, supporting a thriving entrepreneurial ecosystem, building vibrant communities and helping to attract and retain one of the most diverse and significant workforces in the nation.

E Ed Clemente 00:28
Welcome to the Michigan opportunity brought to you by the Michigan Economic Development Corporation. Hi, I'm your host, that Clemente for the show today. And today, we're fortunate that we have a guest, good guy, Trevor Paul, Chief Mobility Officer for the State of Michigan, as well as the Office of Future Mobility Electrification, which is a mouthful. But welcome, Trevor.

T Trevor Pawl 00:52
It's great to be here. How are you doing, Ed?



Ed Clemente 00:54

Good, good I, I imagine that tires you out when you got to give your whole title like that, especially



Trevor Pawl 01:00

It's so long, so long.



Ed Clemente 01:05

I can see where at a certain point too many syllables wear you out? The... Why don't you just sort of give your elevator speech about what that means if you're talking to people that didn't never heard of this before.



Trevor Pawl 01:19

Yeah, so let's put it quite simply, the next 10 years are going to be a landmark decade, for the future of transportation, the future of mobility, you know, you look at electric vehicles, they're expected to pass gas powered vehicle sales by 2030. You know, by 2030 software will represent more than 50% of the value of a vehicle. You know, you look at autonomous vehicles, self driving vehicles, and they're expected to take off this decade with over 50% of production of new vehicles being partially autonomous. So the likelihood that you still will drive your car by 2030 is high. But it's there's a good chance that your car might park itself or navigate the highway or a construction zone by itself. So you know that that was the thinking behind this new office, a future mobility electrification, when Governor Whitmer created it, it's intended to be a dedicated resource that's focused on, you know, effective responsive policy, and super dynamic programming, you know, launching new technologies in the state that impact the lives of all residents, whether you live in the Upper Peninsula or in Detroit. And, you know, also to be a bridge for public private partnerships, where companies want to come in and invest in try new deploy new technologies, we want to make sure that, you know, the state's ready. And there's a place to go for some of these companies to talk about these partnerships. And so this office actually sits between a couple of different departments, strategically, really, the Michigan Economic Development Corporation focused on economic development, m dot, which is focused on transportation, the Department of Labor and economic opportunity focused on jobs workforce. And then the Department of Environment, Great Lakes and energy, which is focused on the grid, and then charging infrastructure. So by being seated sort of directly, you know, in the middle of those four agencies, we're able to begin to connect the dots and help you know, anyone that's working on mobility electrification, you know, have

a common script or follow a common vision. That's really the idea behind this office.

E

Ed Clemente 03:23

Yeah. And I'm going to get back to you a little bit more about that some of the more a little bit of the technical side, but you've actually had the pleasure. I think I saw it on one of your posts. But you've been in quite a few autonomous vehicles already. Right. And you've done some long trips even right?

T

Trevor Pawl 03:41

Well, I will say I've been on a few. And it's different. Like, I'll give you an example. We were out in Silicon Valley at waymo. And we, we took a drive through a subdivision. And because of the precision provided by artificial intelligence, we were coming within inches of mailboxes... and it was freaking me out! And I have to say, autonomous driving systems have not mastered the art of the soft break. So it's a little jerky. So yeah, no, it's been it's been sort of interesting to see, you know, back when we first really started to have good substantive conversations around a V's like 2015 1617, to where things are now in 21. It's, you know, we're seeing passenger autonomy stall a little bit, actually. And you're seeing more focus on the mobility of goods and freight autonomous freight supply chain regionalization, you know, delivery robot. So all that technology, it seems to be, it seems it's shifting into the world of logistics, and it's really exciting because that's where it's that's where the use cases are going to begin. Where later in the decade, you can leverage those same use cases to then try some new things with passengers as it relates to self driving vehicles?

E

Ed Clemente 05:02

Well in fact, I think I've mentioned this to you once before, but I tuned into one of your staff members, and why don't you mention real quickly? Who is on your team?

T

Trevor Pawl 05:13

Yes, sure - So as I mentioned earlier, we have team members that represent multiple different departments that before that I had mentioned. So we have Kelly Bartlett, who is one of the leaders in autonomous vehicle policy in the state, but he's housed in m dot and he works for office, we have john herzer, who's based in the Department of Labor and economic opportunity. Former transportation advisor for Governor Whitmer, he operates as our Managing Director of Policy. And then you have the oldPlanet M team, which is now part of the office and they focus on industry engagement. And the leader of that

team is Catherine Sorensen. And then we have Charlie Tyson in Kate Partington. And then we work with a variety of different people within Eagle, the Department of Environment, Great Lakes and energy as well. So we, we do really span, state government. And it makes it difficult to look at people's schedules to schedule meetings, but we're making it work. And it's pretty exciting to have so many different perspectives.

E

Ed Clemente 06:16

And, you know, you you said when I was going to get it as I listened to a really interesting, I don't know if was a webinar or whatever it was, but it was with one year department set up with Michigan Tech, and autonomous like ships, like underwater, and with someone from Sweden. fascinating, because this lady, this lady was, you know, the podcast was with the lady right from there. I think like Sweden or Finland. I'm trying to remember now. But yeah, but it was just amazing. Like, how fast even Europe is moving too?

T

Trevor Pawl 06:53

Yeah, no, it's true. I mean, you know, Michigan can leverage its automotive advantage to lead other modes of transportation. And, you know, to be honest, I mean, that the truth is that a systems level approach is what's going to create global leadership, I mean, how people in goods move is not isolated to one mode. So simply being the best that driverless passenger cars is too narrow of a window to claim global leadership over all mobility, these core elements, the core technologies of the new mobility era, you're talking like autonomous technology connected technology that helps your car connect to for instance, stoplight. Shared technology, what you're seeing with Uber, and then electric vehicle technologies, these are all systematically linked. So a state that can intentionally and consistently integrate these elements to, you know, drive forward, the future of marine autonomy, freighters that pass for the Detroit River, all the way to commercial drones, and trucking like that these are things that mean are all connected, and Michigan has a really unique opportunity over the next 10 years to not only maintain its lead, but develop new forms of leadership in this category.

E

Ed Clemente 08:12

Yeah. And, you know, let's, I want to focus a little bit more on the connectivity part of it. But I know I've had some conversations with Siemens, and they're big in Europe and Michigan, too. But can you explain a little bit like the backbone of connectivity, and how that's going to be pretty relevant to building out sort of the infrastructure and smart cities for a lot of this mobility we're talking about.

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Trevor Pawl 08:36

Yeah, sure. So my thinking is that by 2040, up to 80%, of us intersections will connect to vehicles, and 90% of vehicles will share information with U.S. intersections. So you think about that. Michigan already has nearly 500 miles of technology enabled corridors, and we were the first state to legally allow autonomous vehicle testing without a human operator on our 20,000 miles of public road. And by laying that groundwork, we're essentially allowing innovation to start here versus other places. And what we're seeing in making these investments is that, you know, companies will come here to test you know, you look at waymo, for example, came here to test good winter testing, good supply network, good, good road system. Now, the invested way mo now is building in Detroit, the first factor 100% dedicated to autonomous vehicles. And so if it's true if where companies test, they invest, it makes so much sense to make our infrastructure smarter, more connected, and then leverage that as currency as we talk to some of the great technology companies in the world saying hey, You want to locate in North America - locate here; you want to locate closer to your customer - locate here. And, you know, I'm just I guess I'm looking at it from an economic development perspective. But the truth is smarter, more connected, infrastructure saves lives. To throw another stat out, there's been almost 10,000 fatal car crashes in Michigan over the last decade. 94% are attributed to human error. So the sooner we can get this stuff on the road, the safer we're all gonna be. And here's another one for you. I'm not done with percentages that deploying smart infrastructure and highly automated vehicles could reduce accidents up to 90%. CASE CLOSED Mic drop, right. I mean, that's, that's why we do this. That's why we invest in and that's why this is such a priority.

E

Ed Clemente 10:53

Well, you know, and then once again, I'm probably going to clarify this a little bit. But Waymo is owned, or is it independent now?

T

Trevor Pawl 11:02

I believe it's still a Google outfit. alphabet, the alphabet orbit in which Google's apart, Waymo is also a part.

E

Ed Clemente 11:11

Yeah. And one of the big advantage, I think, to Michigan, is that we have all four seasons. You know, I know a lot of the testing has been done traditionally, like in drier climates. And when you especially for electric vehicles, it's pretty important to know, you know, how well

they test in colder climates do I believe in in hot climates too?



Trevor Pawl 11:33

Yeah, I think you're, you know, I'm not, I'm not very technical when it comes to the engineering that necessary to install a map of charging stations. But yeah, temperature does affect the speed by which we can charge and, you know, it can impact to obviously road conditions, and the customer experience when they charge, so there's a bunch of different variables to consider. That were cold weather does matter. And even with commercial drones, I mean, you know, for a lot of these different tests, I mean, they're gonna eventually need cold weather climates. You're seeing vertical takeoff and landing technologies, Uber elevate Airbus, flying cars, flying cars here, but not here in Michigan yet, because you need to test in consistent weather before you introduce a snowstorm. But we're already having conversations with some of these companies about, you know, first making sure that our Michigan companies are potentially part of that supply chain. If we're eventually we're headed towards a high volume world of flying vehicles. But then secondly, once they begin to look at areas, metro areas that have some sprawl that could benefit from more air traffic that Michigan and Detroit are considered as long as it makes sense to our natural fabric, our transportation networks, as long as it helps someone get to work a little earlier, to help someone with a mobility barrier, get to a doctor's appointment, or the grocery store. This technology needs to work in everyday lives. And that's how we we try to we try to you know, have these conversations with that lens.



Announcer 13:21

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Ed Clemente 13:38

You mentioned too that Waymo was going into Detroit and someone else told me this, but I didn't know you, you did a TEDx, and I and I believe, I don't know when it was, but he said you said something interesting about the city of Detroit. Do you kind of want to paraphrase what you said back then?



Trevor Pawl 13:59

Um, yeah, sure I can. I can try - it's been a while.



Ed Clemente 14:05

Okay



Trevor Pawl 14:06

So the premise of my TED talk was what Detroit Metro Detroit would look like in 50 years. This was back in 2019. And the idea was that the year 2069 is not something future city officials will just enter. It's something that today's city officials will create in every concept technology that I mentioned during that talk, and we're talking, again, flying cars, we're talking, you know, wireless charging, charging in the road where there's not even a station. We're talking wearables that allow for new forms of safety tracking, health tracking, subscription models, where you don't necessarily own a vehicle anymore, but it's easier to just have this subscription. Where at any point if you need to get somewhere, you have the option of a e bike and E rickshaw and autonomous vehicle, bus, whatever you need any concepts mentioned, it's already in development. So if the idea was with bold, clever action, and a 50 year headstart, Detroit or any other city could bring this vision to life in for us in particular, and for Detroit, in particular, activating all these technologies would still be easier than the motor city's first act, which was putting the world on wheels. If you think about it, that's pretty substantial. So I you know, whether it was, you know, talking Hyperloop, under, you know, tunnels underground - get you from Detroit to Grand Rapids in 15 minutes, or Detroit, Chicago and less than 30 minutes like a pizza, or repurposing highway bridges for air hubs. I mean, I think the future is ours still, even in this environment, the future is ours.



Ed Clemente 15:56

Yeah, I think that, you know, a lot of these projects, you know, I was in Vietnam panaway, I think. And there was more electric bikes than combustion engine bikes, and you couldn't be here them. And so when you tried to cross the street, you almost got clipped all the time. But that, I think, in some ways, developing countries sometimes have a sort of an advantage, because they don't have a lot of incumbencies of infrastructure. But they're adapting so fast, and so many other places the E-bikes were just huge.



Trevor Pawl 16:34

Well, they just think about this, think of the world that we might be entering into, let's take a street. Let's say let's stay in Detroit, let's let's go to Midtown where I live. And let's pick like a Cass Avenue, for example, what could it look like, for example, without lanes, because vehicles are programmed to always stay in their lane, or when they do there,

they would never veer and hit a pedestrian vehicles and citizens operating in harmony aware of each other thanks to, you know, 24 seven real time digital mapping. You know, it streets like cat springs are a lot quieter now, because you're not gonna need car horns or sirens. Because these different data platforms will be communicating with one another, and pick up sort of close calls or emergencies. And like I mentioned earlier, like any sort of electric vehicle, you know, the charging components now embedded in the pavement hidden, hidden, you know, from from public view. I mean, this stuff can start here, much like how the three color traffic lights started here, much like how lanes themselves started here. If we allow ourselves to think bigger, think different. Yeah. Here's another one. Here's another for you. Another, you got me going? You got me written. So what if Jefferson Avenue is 10 lanes of traffic, moved underground into well lit tunnels with no stop signs, red lights, only signs that give your eta above those tunnels. We move streams and water, waterfalls from clean water runoff. They're elevated and exposed. Then we have a network of like walkways, bikeways, waterways, green. Yeah, redesigning city streets to serve people first vehicles second, what how would that change things? What would happen? I don't know...

E

Ed Clemente 18:28

There's a lot of opportunities with Detroit because there is space right now and so you want to make you want to put these sort of long range zoning planning issues when you start thinking about the future technology now so you don't decide down the line. I also wanted to ask you, you what is the...It's called CAV. But can you tell us a little bit about the Connect autonomous Vehicle Corridor a little bit?

T

Trevor Pawl 18:58

I'd love to show thanks for asking, Ed. So this is really cool. We're actually building the road of the future right now. From Detroit to Ann Arbor it's about a 40 mile stretch. And actually, I should say that we're we're in phase one, which is more the feasibility where we design the route, what the roadway looks like some of the technical requirements, policy implications. And then phase two, you'll see I think, a little bit more of a build out. But essentially, what you're looking at is this dedicated lane for driverless vehicles. Right now part of the reason why you're not seeing more driverless vehicles isn't because the technology isn't ready. It's just hard to create a situation where there's not unpredictable things that happen. You know, we still have drivers on the road. They will react differently to driverless vehicles. So what we're doing is creating a space just for these drivers, driverless vehicles operate and we're not just doing it. It's not just like tech for tech sake, where anyone that can afford driver's vehicle has a place to drive it. The idea is that this will sink into our existing public transit networks, enhance our public transit from Detroit

to the airport, and Arbor to the airport, Detroit to U of M U of M to Detroit and everything in between Ypsilanti to Dearborn whatever it is. And, you know, we're looking at like, there's basically four different types of infrastructure. And you're probably like, What do you mean, there's just roads is one form of infrastructure? Well, the truth is, there's the physical infrastructure, right? There's separation barriers, that that will be needed here to make where it makes sense, enhanced machine readable markings, digital signage, then there's the digital infrastructure, which is high definition maps, installed in the computers of these vehicles, high accuracy, ground based GPS, road sensors, for weather conditions, things like that, then you have a coordination infrastructure, to ensure that, you know, as you cross into different communities on the stretch, that there's no changes, there's this great consistency. And then there's the operational infrastructure, which is essentially like smart curbs, chargers, other supporting infrastructure that support the passenger experience, and make it something that enhances people's lives makes it makes it a little easier, a little safer, a little more productive, to get around. And it also upholds a person's dignity. I think they're great paratransit opportunities with this as well. And so right now, I mentioned that a couple of different ways that the team is approaching this. And this is a project that the Michigan Department of Transportation is leading along with a company called k Avenue, which was started by sidewalk infrastructure partners, which was formed out of alphabet. So the same place where Waymo was formed. They're working together on really five different areas, technology and infrastructure, policy and regulation, community engagement, because that's going to be very important, the financing of this thing, and then planning and design. So it's, it's pretty, it's pretty busy time.

E

Ed Clemente 21:57

Yeah, in fact, we're getting close on time for ourselves. But I got a few more questions for you. One thing I don't know if you did mention in those layers, but also human wearables, I heard are gonna play a factor to like your watch your smartwatch or something like that, as the traffic issues as well as if you guys factored in that too, as well, what humans are doing?

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Trevor Pawl 22:22

Oh, yeah, certainly. So what we're finding with wearables, the trend, as we see it, is that they're getting smaller. Think of wearables now as something you put on your wedding ring. earring uses body heat or solar energy to charge. And it's being used to detect important things like whether someone has a virus, you know, whether someone is in danger, physically, or requires any sort of medical attention. And that, you know, as, as we embark on a new era, from 4g to 5g, where connection speeds are hundreds of times faster than they were in like 2014. You're gonna see a proliferation, I think of these

wearables and the safety around them, the cybersecurity around them, to where you can have your wearable talk to a vehicle, not worry that your deepest, darkest secrets are going to be shared on the internet. And I think with wearables, too, you're going to be able to have a more. A lot of times people I think right now, especially with social media, people are feeling bombarded either by ads or opinions. And I think with the more intelligent use of wearables, especially when people are in transit situations, or moving or ...

E

Ed Clemente 23:47

Or walking across the street even... right?

T

Trevor Pawl 23:49

Yeah, I think you'll be able to enhance sort of the the consumer good experience, how you shop in ways that are actually valuable, that save time, or enhance experience. So wearables are, I mean, the thing about mobility, and it's a shame, it's called mobility. I wish there was a broader name for it, because yeah, it really is a bunch of industries converging together to figure out how things and people should know.

E

Ed Clemente 24:19

Yeah, it's pretty fascinating. And I know we could just talk an hour just about what's 5g is gonna change but we won't today... I'm down to two questions. One is, if I used to teach high school, middle school, what would you tell a kid that was listening to us today? Maybe on this podcast? What do they think about because I'm sure there's a lot in there that's exciting to them. What kind of would you tell them to go to educationally like to start studying kinda...

T

Trevor Pawl 24:47

Oh, man, that's a that's a good question. A big question. I wouldn't ensure that, you know, if you are interested in this space, it's easy to geek out, it's easy to forget about the human element. It's easy to want to project just because it's cool and different and new and not think about or consider the adverse effects what it displaces. So I would, I would recommend making sure that in your head, you have sort of this mental scale, where everything that you see that is technology significant or technologically significant out there, that's changing the way people move, things move, think about what could potentially be displaced. And it isn't just person or job, it could be a revenue channel that ultimately leads to someone losing their job. And that's the secret, right? If you can

understand that balance, and be thought about the innovations you're bringing to market. And that's key to victory. And the only thing I'd add is the futures not all right, all white and in color white, not all sort of shiny plastic with robots everywhere. I actually think the futures gonna could resemble the backseat comfort of a late 1970s Cadillac, I just, I wouldn't assume design wise, that you're walking into something that looks like Star Trek, or the Jetsons or anything else futuristic, you've seen I think the future is going to be a lot different than what people think it's going to look like,

E Ed Clemente 26:30
Hopefully not Blade Runner!

T Trevor Pawl 26:32
Hopefully not!

E Ed Clemente 26:33
Yea... the last question for you is what do you like best about living in Michigan?

T Trevor Pawl 26:41
Oh, man, um, there's, I say, oh, man, because a lot of different ways to go. I love the amazing diversity, specifically of living in Southeast Michigan and I spent a lot of my time but even in West Michigan - I went to Grand Valley. I love I love being a being a part of a community. We have people from all over the world that have come together and have a certain pride a certain chip on their shoulder. The other thing I like is the obviously I can say the you know who are their Michigan and the beaches. But I love the the heritage that, I mean, to me, it means something that I lived down the street from the house where my family from Ireland and Scotland first lived and when they came to the US, I love that. I love the fact that that that is something I can experience and feel close to where if I lived somewhere else, I may not have a chance to appreciate it.

E Ed Clemente 27:52
Well. Once again, I want to thank Trevor Paul, Chief Mobility Officer from State of Michigan for being our guest today. Hey, thanks for taking time out of your schedule. We'll do this We appreciate it.



Trevor Pawl 28:02

Thanks for having me. This was fun.



Announcer 28:05

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