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THE JANUARY 2024 ISSUE IN BRIEF

GM CEO MARY BARRA, who also sits on *CRUISE*'s board, has told investors that *CRUISE* could generate \$50 billion in revenue by 2030. That's one-third of GM's 2022 revenue. It's slightly more than one-half of TESLA's 2022 annual revenue. The *CRUISE* operation lost more than \$700 million in the third quarter of this year. Mary Barra cannot really believe what she is saying.

In this issue's lead article I will attempt to dissect another corpus, *WAYMO*, which some people believe is in the same business as *CRUISE*, or vice versa. I am choosing to look at *WAYMO*, rather than *CRUISE*, because *WAYMO* has come much, much farther than *CRUISE* in demonstrating that it has a truly driverless vehicle. *WAYMO* is also part of an organization, ALPHABET, which unlike GM, has proven over the fourteen years it has funded and supported *WAYMO* that it believes there is a place for the operation somewhere within its company, but has also demonstrated that it can cut an operation or a CEO loose if they don't fit comfortably into ALPHABET's total structure.

WAYMO has three possible futures:

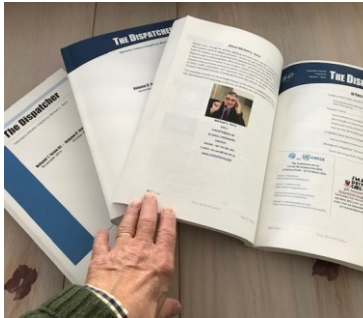
- *Defunct, meaning that Alphabet decides it no longer wants to fund it and closes it down, rather than selling it to a third party.*
- *Continued life inside Alphabet, either as a standalone subsidiary or as a part of another subsidiary, like Alphabet is now making WAZE part of Google Maps.*
- *Continued life as a spinoff outside Alphabet, either as an independent company or as an acquisition by another company.*

I believe that if ALPHABET has its way, it knows exactly where *WAYMO* belongs inside ALPHABET and nowhere else. Understanding *WAYMO*'s future will bring us a long way toward understanding who will operate driverless vehicle services, and what should happen with *CRUISE*.

THE DISPATCHER

Mobility Industry Insights by Michael L. Sena
January 2024 – Volume 11, Issue 3

Feature: The Real Case for Driverless Mobility



Feature Articles



The real case for driverless mobility



Vehicle-related telecommunications



Automotive artificial intelligence



The business of delivering transport systems



People and transport – the effects of how and where we live, work, and recreate on our requirements for transport



Standardization and regulation of transport systems

Who Will Operate Driverless Vehicle Services

WAYMO WATCHERS WERE all atwitter in late October 2023 when two events occurred involving the wholly-owned ALPHABET INC. subsidiary. First, on the 25th of October, a message came from WAYMO staff to all of its passengers:



Hi there,

Many of our riders choose Waymo for the clean and consistent vehicle we offer. To ensure every rider gets this experience, we'll be applying a vehicle cleaning fee **for riders who leave a mess behind in the vehicle**, such as vomit, excessive trash, and smoking odors.

For those that self-report their mess during their ride (not including smoking), the fee will be \$50. For issues that go unreported, we'll charge riders \$100 for the first violation and increase the fee for subsequent violations. Repeat trash and smoking related violations may also impact your account standing.

Here are a few reminders to avoid this fee:

- **Take your trash with you.** At the end of each ride, please take any trash with you to dispose of at your destination.
- **If you're feeling sick, request a pull over.** The Waymo Driver will find the next safe spot to pull over where you can exit the vehicle.
- **Do not smoke in the car.** Smoking of any kind, including vaping, is prohibited in Waymo vehicles.

We appreciate you keeping Waymo One fresh and clean for everyone! Please reach out to Rider Support via the Waymo One app if you have any questions.

Thanks,
The Waymo Team

Then, on the 26th of October, WAYMO put out a news release with the headline: *"The Waymo Driver: now available on Uber in Phoenix"*. Here is what it said:

Good news, Phoenix

There's now another way to catch a ride with the Waymo Driver. Starting today, Uber customers can get matched with a fully autonomous, all-electric Waymo ride – with no human driver behind the wheel – in the 225+ square miles of Metro Phoenix where Waymo currently operates.

When an Uber customer requests an UberX, Uber Green, Uber Comfort, or Uber Comfort Electric ride through the Uber app,

they'll have the option to confirm a ride in a Waymo vehicle if matched to one. This is the first launch of our strategic partnership with Uber we announced earlier this year.

"Our partnership with Uber gives their riders the chance to experience the Waymo Driver," said Tekedra Mawakana, co-CEO of Waymo. "As we continue to scale, we want as many people as possible to experience the safety, consistency and delight of riding with the Waymo Driver."

Bringing the Waymo Driver to more people in more places

Riders will still be able to hail the Waymo Driver directly through the Waymo One app, available to the public in Metro Phoenix, San Francisco, Los Angeles, and soon, Austin. Tens of thousands of people hail the Waymo Driver every month in Metro Phoenix, and the Waymo Driver currently provides more than 10,000 rides each week in the region – over a thousand of which are to or from Sky Harbor International Airport.

We're proud of the rider community we're building in Metro Phoenix – the result of years spent developing a genuinely useful service in the market. This month marks five years since we first launched Waymo One in Chandler, Arizona, and three years of offering our fully autonomous service to the public. In that time, we've quintupled the size of our service area in Phoenix, making it the largest AV ride-hailing territory in the world.

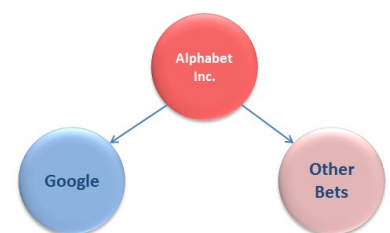
Scaling the benefits of full autonomy

Our partnership with Uber allows us to expand the benefits of safe, reliable, autonomous driving technology and lets more people experience the excitement of riding with Waymo. We're delighted to welcome even more riders into Waymo vehicles with Uber.

I cannot say for sure whether the timing of the behave-and-clean up your mess "Mom Reminder" and the UBER announcement were related, but I suspect they were. Together they set in motion a great deal of speculation in the ether about what it all meant for WAYMO, UBER, and EVERYTHING.

The answer is not 42

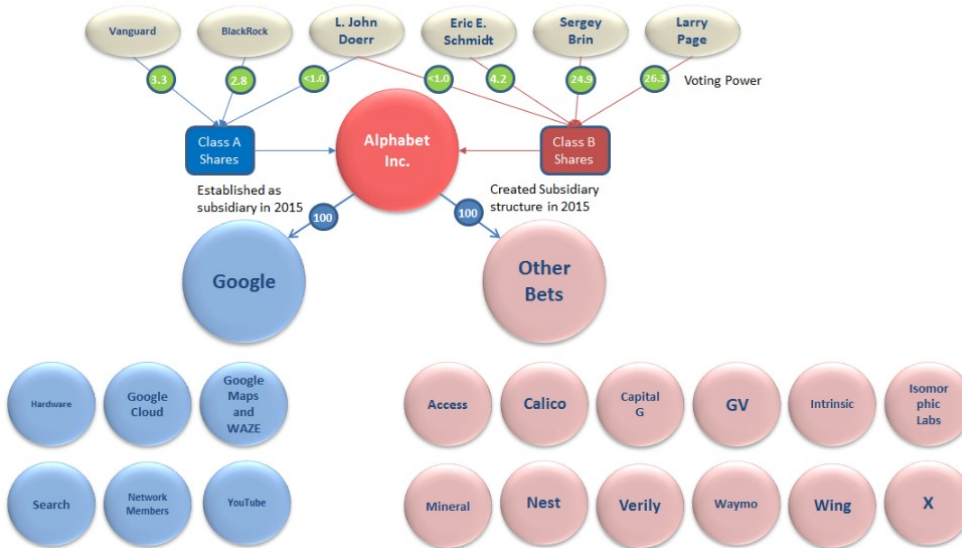
WAYMO LLC began life in 2009 as the Google Self-Driving Car Project. It became a subsidiary of ALPHABET INC. in its "Other Bets" division in December 2016 when it was taken out of Google (which was by then the "Alpha Bets" division of ALPHABET), made a limited liability company, and renamed WAYMO LLC. It was placed in the Other Bets division because that is where ALPHABET parks those businesses that it owns which have no income and an uncertain future. The name



'Waymo' was derived from "a new WAY forward in MOBility", according to ALPHABET. Its current co-CEOs, Dmitri Dolgov and Tekedra Mawakana, who took over from John Krafcik in 2021,¹ report to ALPHABET CEO Sundar Pichai (who is also CEO of ALPHABET subsidiary Google). WAYMO's business is listed on the company's organization chart as "Autonomous driving".

In the diagram below, I have shown both the major owners of ALPHABET shares and the organization of the company into its two divisions. Company founders Sergey Brin and Larry Page have a controlling position in the company with their 51.2% share of the votes. In the sidebar you will find short descriptions of the twelve companies, including WAYMO, in the Other Bets division.

Alphabet Inc. Organization – Revised on 3 November 2023



What does all of the recent activity with UBER and car tidiness have to do with where WAYMO is going, and how does WAYMO's future affect the question of who or what will operate driverless vehicle services? To answer both of these questions, let's first take an in-depth look at WAYMO's current business and possible futures.

Alphabet is in the ad brokering business and nothing else

Shall we agree that for the foreseeable future, ALPHABET will remain in the ad brokering business, where it is now, and

¹ Krafcik was the former president of TrueCar and president and CEO of Hyundai Motor America. He was named CEO of Google's self-driving car project in September 2015. Krafcik remained CEO when Waymo was formed.

Alphabet's Other Bets

Alphabet's Other Bets comprise a list of twelve companies in 2023 that span from life science to self-driving companies:

Access – Runs Google Fiber, which offers super-high-speed broadband access over fiber optic cables to new cities

Calico – Human health by overcoming age

CapitalG – Private equity for growth stage technology companies

GV – Venture capital for technology companies

Intrinsic – Robotics software

Isomorphic Labs – Drug discovery

Mineral – Sustainable agriculture

Nest – Creates a set of smart home devices

Verily – Develops tools to collect and organize health data

Waymo – Autonomous driving

Wing Aviation – Developer of delivery drones

X – Research and development for "mootshot" technologies

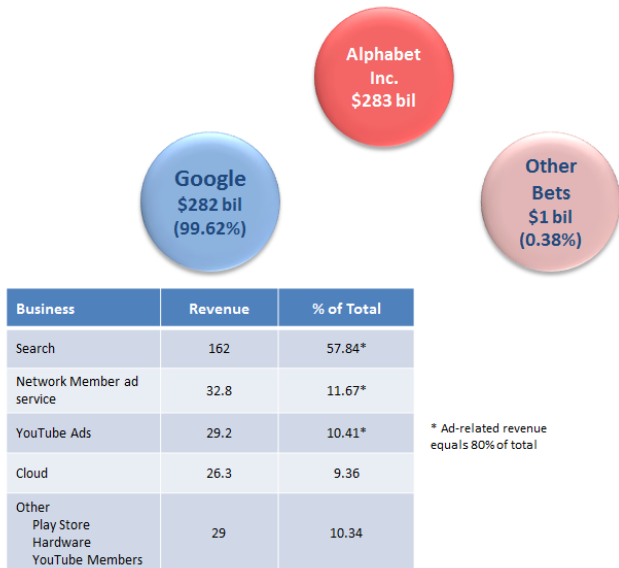
Compared to Alphabet's total revenue, Other Bets represented less than 1% of overall revenues for 2021.

Other Bets that have moved out:

DeepMind – merged with Google Brain and is now part of Google Research.

shall not transform itself into any of the businesses in its Other Bets group? Other Bets accounts for less than one-half of one percent of total revenue. Its ad-related revenue, which is all under the Google division, represents 80% of its total revenue, as the diagram here shows. Fully 57.84% comes from ad revenue driven by Google Search, and the remainder from companies that subscribe to its ad service (11.67%) and *YOUTUBE* advertisers (10.41%). Its \$26.3 billion Cloud business, which is non-ad-related, represents a bit over 9% of its revenue, and it might seem that it has the potential to grow, given that it has only approximately one-third of the revenue of each of its principal competitors, MICROSOFT and AMAZON. Google Cloud has been generating losses, but it supports all of ALPHABET's businesses and enables the company's total revenue. ALPHABET is simply getting others to pay for its IT systems by selling cloud services. Other non-ad revenue in the 'Google Other' category, which totals \$29 billion and is a bit over 10%, contributes indirectly to Google's (and ALPHABET's) principal way of earning money.

Alphabet Inc. 2022 Revenue – Revised 3 November 2023



Michael L. Sena

What this means is that *WAYMO* has a future inside ALPHABET if – and only if – it either 1) generates additional ad revenue, or 2) contributes to more ad revenue being generated. In either case it will move into the Google division. If it is an ad generator, the contribution has to be meaningful, and the business would at least have to carry its costs. As a meaningful ad contributor, I would assume that it needs to be in a similar class as *YOUTUBE* ads, so somewhere around \$20-30 billion. *YOUTUBE* today has 2 billion monthly active users globally.² Nearly 43% of global Internet users access the site every single month, and 63% use the site for around 17 minutes every day. Of the 2 billion monthly active users, only 1.5%, or 30 million, are paid subscribers accounting for

² <https://backlinko.com/youtube-users>

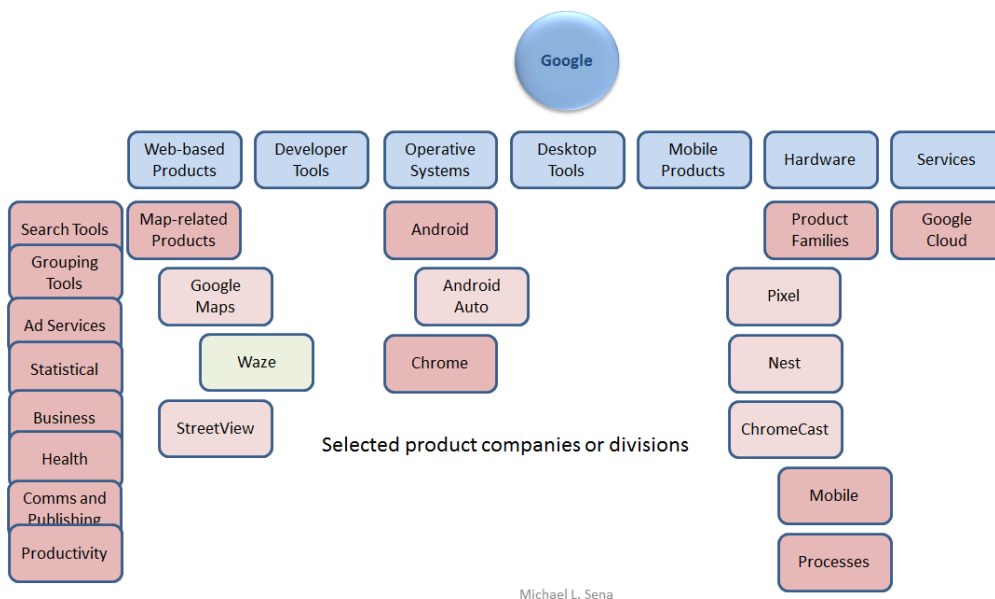
just \$3.6 billion annually, which is counted in the Google Other business category. The rest of the *YOUTUBERS* are free-loaders.



Note: I saw an article in which a pundit tried to value WAYMO's ad-generation potential by giving it the revenue YouTube content creators receive. That would be like giving APPLE all of the YouTube revenue if an iPhone user accessed YouTube on the device. Google does pay APPLE for making Google Search the default search engine for Safari, and the amount Google pays is substantial (in the \$20 billion range), but it does not pay APPLE if I use my iPhone to watch a YouTube video. It pays the content creator, and gets paid by the advertisers.

Only Google/ALPHABET has any idea whether *WAYMO* has significant ad revenue generation potential. Will users of their "autonomous driving" service jump into *WAYMO*-equipped cars and immediately begin using a device in the vehicle that will rack up ad revenue? I and a couple of billion others have 24 hours (minus the hours we spend sleeping) with our smartphones or at least six hours in front of our laptops every day to use Google Search or dip in and out of *YOUTUBE*. Does 17 minutes in a taxi every now and then by a fraction of the number of *YOUTUBE* users have the possibility to generate similar numbers as *YOUTUBE*? Someone inside *WAYMO* or Google ***must*** be working on this problem, wouldn't you think? Otherwise, *WAYMO* is going to be a Google Other company or division doing something that the other "Other" companies or divisions do, which combined, generated \$29 billion in revenue in 2022.

Google Organization – Revised 8 November 2023



Looking at the diagram above of Google with its seven divisions and a selection of product groups, you can see that included among those other companies/divisions are Google Maps, Android with Android Auto, Chrome, and many other familiar products and services. Android Automotive, the vehicle OS-integrated version of Android Auto, is part of Android Auto, which in turn is part of the Android group inside the Operative Systems division. If *WAYMO* is not a big ad generator, it will most likely find a home somewhere within this collection of companies, perhaps under Services with Google Cloud or within Hardware or inside Operative Systems, or in parts of all of them.

I believe we need to put to the test the idea that *WAYMO* is going to be a company supplying driverless rides generating large revenues, employing thousands of staff, and having its own place in the Google hierarchy. That's what it appears to be doing today with its own fleet of cars and its customer app, and now taking real money for rides.

It's a Long, Long Way to Tipperary

In order to climb out of the minor leagues and make it to the majors as a ride-supplying company, *WAYMO* has its work cut out for it. At the present time, *WAYMO* is little more than a money-sucking technical marvel operating in a few markets. It has *WAYMO*-labelled cars in a few cities, and it is taking money from passengers for rides. How would it scale up so that it has enough cars to either earn its keep as an "autonomous driving" company, or put enough eyeballs in front of advertising clickbait? I have tried to find analogs for what *WAYMO* could become as a ride-supplying business, and I have settled on two: a global taxi company or the equivalent of *UBER*.

Waymo as one, big taxi company

If *WAYMO* with its "autonomous driving" offering were to replace all 36,474 taxi companies in the U.S. operating around 100,000 taxi vehicles³, what would that represent in total annual revenue? Today, total revenue generated by all taxi



³ This is a rough estimate based on the numbers of taxis in NYC (12,000), Chicago (6,600), Los Angeles (2,300), DC (6,500), San Francisco (1,600), Boston (1,825).

companies in the U.S. is somewhere around \$12 billion.⁴ This does not include limo services, nor does it include the so-called “ride-hailing” services like UBER or LYFT. WAYMO’s current revenue from its operations in three U.S. cities, Phoenix, San Francisco, and Los Angeles, combined with the revenue from the eleven other Bets companies, comes to a grand total of \$1 billion. Is WAYMO 1%, 10%, 50% of that total? We don’t know, but whatever it is, it’s currently peanuts.

Even if WAYMO scaled to the entire U.S. and replaced all 36,474 taxi companies currently operating in the country, and its total revenue from fares came to somewhere in the vicinity of \$12 billion, that would be a drop in the ALPHABET bucket. Since most taxi drivers in the U.S. are not employed by taxi companies, but lease the cars from the taxi companies and pay a fee for their use, the fee they pay is included in the total revenue for taxi companies. That fee comes out of what the drivers earn from fares, and their average take-home pay is around \$25,000 annually. Multiply that number by the 250,000 taxi drivers, and you have \$5.4 billion, the amount of money the drivers claim as taxable income. This is money WAYMO would not have to pay out because it wouldn’t have drivers, but WAYMO would also not be receiving any payments from drivers for their leasing of the vehicles. But just to keep things as simple as possible, let’s say that a U.S. taxi business delivering all the rides that all taxis in the U.S. combined deliver today would put \$12 billion into WAYMO’s revenue pocket.

It will be WAYMO paying for buying or leasing the vehicles used for delivering rides. At around \$80,000 per vehicle, the cost to buy 100,000 of them, whether it’s WAYMO or a leasing company, is around \$8 billion. After all the expenses are paid for lease payments, or depreciation if owned by WAYMO, for operating the vehicles, for the cleaning and maintenance of the them, for everything related to operating the platform, and for providing back-office support, maybe WAYMO could eke out a small profit. Is it worth it to ALPHABET? Double the revenue and double the costs if it expands to Europe, and it is still not up to the revenue of YOUTUBE.

⁴ <https://bolddata.nl/en/companies/usa/taxi-companies-usa/>;
<https://fred.stlouisfed.org/series/REVEF48531TAXABL>

I'm certain that Google/Alphabet has run their numbers a thousand times from Sunday, and know very well what both the upside and downside are for WAYMO as a taxi company.

Waymo as Uber

Looked at from another perspective, what if WAYMO suddenly became UBER? UBER generated \$14 billion in global revenue from its taxi service in 2022, of which \$8.4 could be attributed to the U.S. and Canada. (Did you think it was more?) It did that with around 3.4 million drivers in the U.S. and Canada.⁵ Other revenue was \$10.9 for mobility (mainly food delivery) and \$7 billion in freight. It had a \$9.1 billion loss for 2022 on its \$31.8 billion of total income.⁶ UBER does not own the vehicles used to provide rides to its customers, so it has no costs related to them. Those costs are on the drivers. UBER is giving its drivers on average only 60% of the fares paid by riders these days (and it still can't make money), and that 60% has to pay for all of the costs of the driver's vehicle as well as leaving something over to pay the driver for his or her time.⁷

Taking over UBER and turning all of its cars into "autonomous driving" vehicles means paying all the costs for those vehicles, including all the additional kit needed to make them "autonomous". It will not need 3.4 million cars in the U.S. because not all of those cars driving around today are operating simultaneously. WAYMO has 300 cars in Phoenix, according to one source,⁸ and if one scales that up to the U.S., it results in around 65,000-80,000 cars for the entire U.S.⁹ WAYMO would need to shovel out about \$5-6 billion for that number of cars if it were to buy them and add the driverless kit.

⁵ Uber had 5.4 million drivers globally in 2022, and Uber does not provide the number of drivers just for the U.S. and Canada. It does, however, break out its revenue by region, so I have used the percentage of revenue to obtain the percentage of drivers.

⁶ With these numbers, it is a mystery to me how Uber deserves a \$100 billion market valuation, but that is what it has. Someone is convincing shareholders that there is a big payout coming in the foreseeable future.

⁷ <https://maximumridesharingprofits.com/uber-lyft-take-rate/>

⁸ <https://techcrunch.com/2022/05/18/waymo-is-expanding-its-driverless-program-in-phoenix/>

⁹ 1.6 million people in Phoenix with 300 cars. 65,625 for 350 million population in the U.S.

So, if UBER can't make money without owning the cars or employing the drivers, and receiving up to 40% of what a passenger pays, how does WAYMO earn money by having both the driver in the form of "autonomous driving" kit and the vehicle costs? I suppose Google/ALPHABET has already answered this question, even though this is exactly what WAYMO appears to be doing in Phoenix, San Francisco, and in a few other markets. To the casual observer, it looks like it is competing directly with UBER and LYFT.

Things aren't always what they seem

I do not believe for a minute that WAYMO wants to be a national or global taxi company, or that it yearns to be UBER or something like it. I also do not believe that ALPHABET is pouring money into WAYMO so that it can become a ride supplying company. As the sign on the WAYMO office front lawn says, WAYMO is in the "Autonomous driving" business.

When Waymo eventually moves from Other Bets to Alpha Bets, it will be providing autonomous driving services, not autonomous riding services. There is a big difference.

It's a test with UBER. Maybe WAYMO will provide "loaner" vehicles to prospective customers in the future, like it will do with UBER in this test, while these customers are getting up and running. However, in its main business, WAYMO will either license the *Waymo Autonomous Driving* kit to operators who will order cars that include the *WAYMO AUTOMOTIVE* systems, or, more likely, WAYMO will license the kit to multiple automotive OEMs that will build it into their vehicles, which they will then sell to operators or leasing companies. Until that happens and as long as WAYMO is providing access to the vehicles that it owns or leases, it will be WAYMO that has to keep them clean and in good shape for delivering rides, and customers – whether they sign up with WAYMO or ride supplying companies like UBER, will have to behave. That's the reason for the 'Mom Reminder' emanating from WAYMO now, as it prepares to deliver rides in its vehicles to the perhaps more rowdy UBER customers.

Advertising, advertising, advertising

I believe the reason that ALPHABET has funded WAYMO for the past fourteen years is to build it into an advertising data generator, not to build it into an advertising revenue generator or a taxi company or a Uberesque company. This is



what *Android Automotive* is, a data generator. While *Android Automotive* has been making conquests with its *Android Automotive* integrated maps, navigation and infotainment software systems, it is not in the *YOUTUBE* tier of Google companies. Even if it managed to take all of the automotive OEM business currently owned by HERE and TOMTOM, the principal choices by most car companies for integrated automotive navigation, mapping and traffic information systems, the revenue would represent just under \$1.5 billion. This is what the two companies combined bring in annually.¹⁰

ALPHABET must have concluded long ago that it doesn't make *WAYMO* part of its advertising machine by having the company jump into new cities, one after the other, buying more cars and fitting them out with its driverless kit, competing with the existing transit alternatives, the existing taxi companies, and the existing driver-rider intermediaries, like *UBER* and *LYFT*? That would be a very long-term strategy that does not fit at all with ALPHABET's revenue growth policies. *Waymo Autonomous Driving*, like *Android Automotive*, will have the goal of being in every vehicle that rolls off the production line, not just in 80,000-100,000 taxis. Neither *Android Automotive* nor *Waymo Autonomous Driving* will have a place inside of *TESLA* as long as *TESLA* management believes that it can produce better infotainment and better driverless systems than Google or anyone else. Neither will it have a place in Chinese brands that decide to use domestic providers, such as *Pony* or *AutoX*. However, as we have seen with *Android Automotive*, companies that have tried to develop their own infotainment solutions, like *VOLVO CARS* and *AUDI*, are adopting *Android Automotive*. They will do the same with *Waymo Autonomous Driving*.

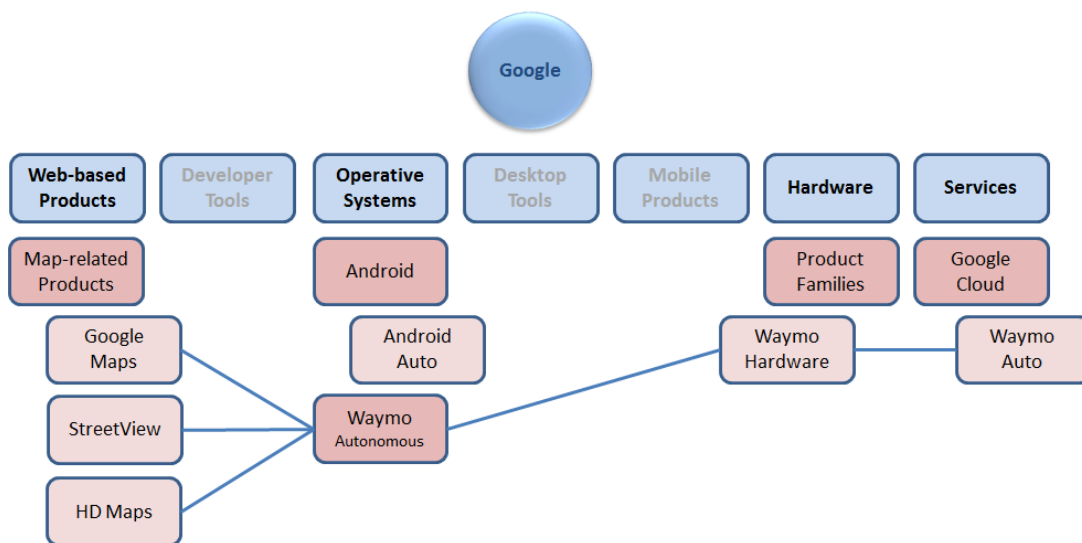
To win a *Get Out of Other Bets* card, *WAYMO* "Autonomous driving" needs to quickly start getting into more cars that are giving rides-without-drivers, and it needs to do it in a way so that ALPHABET is not the parent at the restaurant picking up the tab for everybody's dinner (as well as reminding everyone at the table to mind their manners). *WAYMO* needs to do something similar to what *Android Auto* is doing, which is working with automobile manufacturers to make *Android*

¹⁰ According to their respective annual reports, Here's 2022 annual revenue was \$928 million, and TomTom 2022 revenue was \$536 million.

Automotive the first choice for the vehicle’s infotainment operating system. *Waymo Autonomous Driving* needs to be the first choice for every car’s driverless operating system. Once it is there, any potential ride supplier can purchase or lease cars and deliver rides on its own terms. UBER can continue to serve the party set, the jet set, the well-heeled crosstown commuters who want to avoid public transit and everyman’s hackneys. Existing taxi companies could lease the driverless cars and run them along with their fleet of driver driven cars. Transit companies could buy them and run them as part of their fleets. Individual car owners can do what TESLA is planning for its car buyers, which is to turn them into driverless ride suppliers during the times that the owner is otherwise occupied. *WAYMO* will bear no cost for the purchase, maintenance and operation of the vehicles. It delivers the kit to the auto makers and the services to the ride supplying operators, and, like Android Automotive, it builds into cars the potential to support ad revenue generation as Google does with all of its products.

Google has all of the pieces in place for *Waymo Autonomous Driving*, as the diagram below shows. Its Map-related Products division, which includes *Google Maps* and *StreetView*, has already started delivering High Definition (HD) maps to VOLVO CARS that will be used in VOLVO’s advanced driver assistance systems. These maps are the basis for *WAYMO*’s driverless functions, and there is no reason they cannot be

Theoretical Google Organization with Waymo Autonomous
Revised 8 November 2023



Michael L. Sena

used for driver assistance functions while the *HD Maps* division gears up for delivering data for many more operational design domains. Google's Hardware division has plenty of experience with sourcing the kind of hardware that *Waymo Autonomous* will deliver to vehicle manufacturers for installation in their vehicles, and *Google Cloud* is already hosting *WAYMO's* suite of operation software.

It's not necessarily all in Alphabet's hands

The U.S. Federal Trade Commission (FTC), the U.S. Department of Justice (DOJ), and the EU Competition ministry will have the most impact on whether *WAYMO* stays inside *ALPHABET*. On the 12th of September 2023, DOJ opened an anti-trust trial against Google/*ALPHABET*. It maintains that the company has "intentionally stifled competition against its search engine," and accuses the company of "spending billions (of dollars) to operate an illegal monopoly that has harmed every computer and mobile device user in the United States". DOJ alleges that Google's negotiation of exclusive contracts with wireless carriers and phone makers "helped to cement its dominant position in violation of U.S. antitrust law".¹¹ Prosecutors allege that by installing Google's search engine on mobile devices, Google has a steady flow of user data which reinforces its monopoly. Google Search data and the revenue it generates feeds into all of *ALPHABET's* businesses, so the outcome of this trial will potentially affect every business activity within *ALPHABET*, including *WAYMO*.

The EU has been suing and fining Google and then *ALPHABET* since 2010, accusing the company of antitrust activities. The basis of the suits is the European Competition Laws, which "promotes the maintenance of competition within the European Single Market by regulating anti-competitive conduct by companies to ensure that they do not create cartels and monopolies that would damage the interest of society".¹² Most of the suits against Google and then *ALPHABET* were brought following complaints filed by competitors. *ALPHABET* has appealed all judgments.

¹¹ Quotes from a CNN report from the 12 September 2023 trial. <https://edition.cnn.com/2023/09/12/tech/google-antitrust-lawsuit-government-trial-duplicate-2/index.html>

¹² https://en.wikipedia.org/wiki/European_Union_competition_law

Don't kill the Google that laid the golden egg

Will one of President Biden's legacies be that he set in motion a force that destroyed one of the most successful companies the country has ever produced? Everything that WAYMO does, and all the inputs and support it receives from Google's businesses, are of one piece. This is true of all of Google's businesses. WAYMO cannot survive if it gets spun out on its own with no connections back to the Google Mother Ship. That would leave the U.S. at the complete mercy of CHINA, INC. with all the data from vehicles equipped with CHINA, INC. driverless kit flowing back to clouds tethered to hosts in China.

I don't believe it will go that far. It doesn't look like the government's case is all that strong, at least that is what the prosecutors on the Microsoft browser case think.¹³ Even if the current case finds Google at fault, there will be years of appeals, changes at the FTC and DOJ, and accommodation by Google to address the basis of the charges. There is too much at stake for the U.S. to lose this one.



¹³ <https://www.cnbc.com/2020/10/22/lawyers-who-pressed-microsoft-on-antitrust-claims-say-the-google-case-differs.html>

About Michael L. Sena

Through my writing, speaking and client work, I have attempted to bring clarity to an often opaque world of highly automated and connected vehicles. I have not just studied the technologies and analyzed the services. I have developed and implemented them, and have worked to shape visions and followed through to delivering them. What drives me – why do what I do – is my desire to move the industry forward: to see accident statistics fall because of safety improvements related to advanced driver assistance systems; to see congestion on all roads reduced because of better traffic information and improved route selection; to see global emissions from transport eliminated because of designing the most fuel efficient vehicles.

This newsletter touches on the principal themes of the industry, highlighting what, how, and why developments are occurring so that you can develop your own strategies for the future. Most importantly, I put vehicles into their context. It's not just roads; it's communities, large and small. Vehicles are tools, and people use these tools to make their lives and the lives of their family members easier, more enjoyable and safer. Businesses and services use these tools to deliver what people need. Transport is intertwined with the environment in which it operates, and the two must be developed in concert.



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