

# Tesla Inc. (TSLA)

## Initial framing of robotaxi opportunity, and updated FSD scenarios

Neutral

**TSLA** 12m Price Target: **\$175.00** Price: **\$155.45** Upside: **12.6%**

Tesla's opportunity to sell ADAS/autonomy software, both with its Full Self Driving (FSD offering) for consumers and from robotaxis, has recently received increased interest from investors. This follows broader interest in AI driven technologies in the market, commentary from Tesla on X about improved FSD performance using an end to end neural net approach (FSD version 12.3), and after Tesla's CEO posted on 4/5/2024 on X that the company will unveil its Robotaxi on 8/8/24.

In this note we frame scenarios for the market/business opportunity for Tesla in robotaxis from what we know so far, and also update our FSD analysis (with Tesla lowering the monthly subscription cost to \$99 from \$199 on 4/12/24).

The bottom line is that we believe Tesla is among the leaders in autonomy/ADAS technology, and in the long-term we believe that software & digital services can be a meaningful driver of its business (as we discussed in our 2030 EPS scenarios from our November 2023 report, Contextualizing Tesla's AI and FSD opportunities). However, we believe it will take time before Tesla can drive more significant growth in either robotaxi or FSD revenue, as we believe Tesla would need to reach at least L3 (situationally eyes-off, for example on the highway) capability with FSD to drive material adoption at \$99 per month, and we think Tesla's efforts specific to robotaxis (L4/L5) are likely in the earlier phases based on permitting requests (and this is a technology that has historically faced difficulties including with respect to R&D and regulations). We appreciate that the latest GPUs in addition to Tesla's end to end neural net approach could allow Tesla to iterate and develop the technology faster than we currently expect, although our base case view is that developing and growing these businesses will take time.

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### Key Data

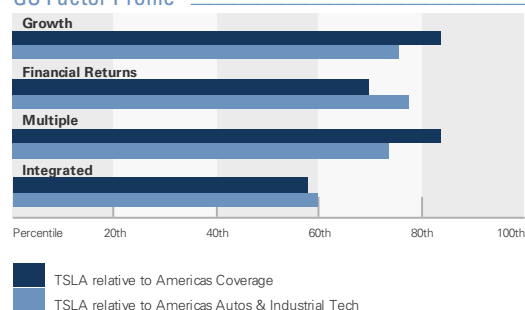
Market cap: \$542.8bn  
Enterprise value: \$526.6bn  
3m ADTV: \$18.7bn  
United States  
Americas Autos & Industrial Tech  
M&A Rank: 3

### GS Forecast

	12/23	12/24E	12/25E	12/26E
Revenue (\$ mn)	96,773.0	99,802.0	122,946.4	146,945.2
EBITDA (\$ mn)	16,633.0	16,076.1	24,189.2	31,649.5
EBIT (\$ mn)	8,891.0	7,090.9	12,628.6	18,017.5
EPS (\$)	2.60	1.90	3.25	4.45
P/E (X)	83.5	81.8	47.8	35.0
EV/EBITDA (X)	40.6	29.8	19.5	14.6
FCF yield (%)	0.6	0.4	2.0	2.9
Dividend yield (%)	0.0	0.0	0.0	0.0
Net debt/EBITDA (X)	(0.9)	(1.0)	(1.1)	(1.3)

	12/23	3/24E	6/24E	9/24E
EPS (\$)	0.57	0.31	0.41	0.54

### GS Factor Profile



Source: Company data, Goldman Sachs Research estimates.  
See disclosures for details.

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Neutral

## Tesla Inc. (TSLA)

Rating since Jun 25, 2023

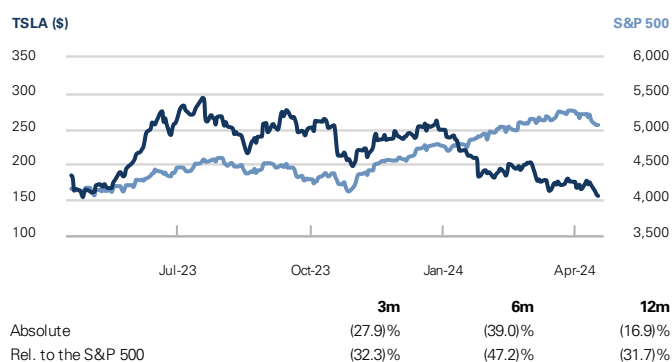
## Ratios &amp; Valuation

	12/23	12/24E	12/25E	12/26E
P/E (X)	83.5	81.8	47.8	35.0
EV/EBITDA (X)	40.6	29.8	19.5	14.6
EV/sales (X)	7.0	4.8	3.8	3.1
FCF yield (%)	0.6	0.4	2.0	2.9
EV/DACF (X)	45.2	37.2	24.4	18.0
CROCI (%)	33.9	21.8	27.4	30.9
ROE (%)	16.9	9.9	14.7	16.9
Net debt/EBITDA (X)	(0.9)	(1.0)	(1.1)	(1.3)
Net debt/equity (%)	(22.5)	(22.5)	(30.6)	(39.1)
Interest cover (X)	57.0	29.5	52.6	75.1
Inventory days	61.1	63.9	63.0	65.3
Receivable days	12.2	15.5	16.0	16.4
Days payable outstanding	68.5	67.0	64.9	65.8

## Growth &amp; Margins (%)

	12/23	12/24E	12/25E	12/26E
Total revenue growth	18.8	3.1	23.2	19.5
EBITDA growth	(22.1)	(6.6)	59.9	36.5
EPS growth	(28.2)	(27.0)	70.9	36.9
DPS growth	NM	NM	NM	NM
Gross margin	18.2	16.4	18.0	19.0
EBIT margin	9.2	7.1	10.3	12.3

## Price Performance



Source: FactSet. Price as of 17 Apr 2024 close.

## Income Statement (\$ mn)

	12/23	12/24E	12/25E	12/26E
Total revenue	96,773.0	99,802.0	122,946.4	146,945.2
Cost of goods sold	(79,113.0)	(83,394.7)	(100,827.7)	(119,075.7)
SG&A	(4,800.0)	(4,895.8)	(4,922.2)	(5,082.4)
R&D	(3,969.0)	(4,420.6)	(4,567.9)	(4,769.6)
Other operating inc./exp.)	—	—	—	—
<b>EBITDA</b>	<b>13,558.0</b>	<b>12,666.1</b>	<b>20,254.2</b>	<b>27,654.5</b>
Depreciation & amortization	(4,667.0)	(5,575.2)	(7,625.6)	(9,637.0)
<b>EBIT</b>	<b>8,891.0</b>	<b>7,090.9</b>	<b>12,628.6</b>	<b>18,017.5</b>
Net interest inc./exp.)	910.0	1,320.0	1,810.0	1,960.0
Income/(loss) from associates	—	—	—	—
<b>Pre-tax profit</b>	<b>9,975.0</b>	<b>8,410.9</b>	<b>14,438.6</b>	<b>19,977.5</b>
Provision for taxes	(926.0)	(1,682.2)	(2,887.7)	(3,995.5)
Minority interest	23.0	(75.0)	(75.0)	(175.0)
Preferred dividends	—	—	—	—
<b>Net inc. (pre-exceptionals)</b>	<b>9,072.0</b>	<b>6,653.7</b>	<b>11,475.8</b>	<b>15,807.0</b>
<b>Net inc. (post-exceptionals)</b>	<b>9,072.0</b>	<b>6,653.7</b>	<b>11,475.8</b>	<b>15,807.0</b>
<b>EPS (basic, pre-exception)</b>	<b>2.86</b>	<b>2.09</b>	<b>3.58</b>	<b>4.90</b>
<b>EPS (diluted, pre-exception)</b>	<b>2.60</b>	<b>1.90</b>	<b>3.25</b>	<b>4.45</b>
<b>EPS (ex-ESO exp., dil.) (\$)</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
DPS (\$)	—	—	—	—
Div. payout ratio (%)	0.0	0.0	0.0	0.0
Wtd avg shares out. (basic) (mn)	3,173.5	3,188.9	3,208.9	3,228.9
Wtd avg shares out. (diluted) (mn)	3,482.8	3,499.9	3,532.2	3,553.9

## Balance Sheet (\$ mn)

	12/23	12/24E	12/25E	12/26E
Cash & cash equivalents	17,189.0	19,084.7	29,018.6	43,254.4
Accounts receivable	3,508.0	4,984.2	5,773.7	7,466.9
Inventory	13,626.0	15,575.5	19,245.7	23,334.1
Other current assets	15,498.0	15,498.0	15,498.0	15,498.0
<b>Total current assets</b>	<b>49,821.0</b>	<b>55,142.4</b>	<b>69,535.9</b>	<b>89,553.4</b>
Net PP&E	33,905.0	38,901.8	41,356.2	42,799.2
Net intangibles	431.0	359.0	279.0	199.0
Total investments	0.0	0.0	0.0	0.0
Other long-term assets	22,666.0	22,766.0	22,866.0	22,966.0
<b>Total assets</b>	<b>106,618.0</b>	<b>116,964.3</b>	<b>133,832.2</b>	<b>155,312.6</b>
Accounts payable	14,431.0	16,198.5	19,630.6	23,334.1
Short-term debt	—	—	—	—
Current lease liabilities	2,373.0	2,373.0	2,373.0	2,373.0
Other current liabilities	11,944.0	11,944.0	11,944.0	11,944.0
<b>Total current liabilities</b>	<b>28,748.0</b>	<b>30,515.5</b>	<b>33,947.6</b>	<b>37,651.1</b>
Long-term debt	2,857.0	2,857.0	2,857.0	2,857.0
Non-current lease liabilities	—	—	—	—
Other long-term liabilities	11,404.0	11,404.0	11,404.0	11,404.0
<b>Total long-term liabilities</b>	<b>14,261.0</b>	<b>14,261.0</b>	<b>14,261.0</b>	<b>14,261.0</b>
<b>Total liabilities</b>	<b>43,009.0</b>	<b>44,776.5</b>	<b>48,208.6</b>	<b>51,912.1</b>
Preferred shares	—	—	—	—
<b>Total common equity</b>	<b>62,634.0</b>	<b>71,212.7</b>	<b>84,648.6</b>	<b>102,425.5</b>
Minority interest	975.0	975.0	975.0	975.0
<b>Total liabilities &amp; equity</b>	<b>106,618.0</b>	<b>116,964.3</b>	<b>133,832.2</b>	<b>155,312.6</b>
BVPS (\$)	17.98	20.35	23.97	28.82

## Cash Flow (\$ mn)

	12/23	12/24E	12/25E	12/26E
Net income	14,974.0	6,653.7	11,475.8	15,807.0
D&A add-back	4,667.0	5,575.2	7,625.6	9,637.0
Minority interest add-back	—	—	—	—
Net (inc)/dec working capital	(2,564.0)	(1,658.1)	(1,027.6)	(2,078.1)
Others	(3,821.0)	1,925.0	1,960.0	1,970.0
<b>Cash flow from operations</b>	<b>13,256.0</b>	<b>12,495.7</b>	<b>20,033.8</b>	<b>25,335.9</b>
Capital expenditures	(8,898.0)	(10,500.0)	(10,000.0)	(11,000.0)
Acquisitions	(6,685.0)	—	—	—
Divestitures	—	—	—	—
Others	(1.0)	(100.0)	(100.0)	(100.0)
<b>Cash flow from investing</b>	<b>(15,584.0)</b>	<b>(10,600.0)</b>	<b>(10,100.0)</b>	<b>(11,100.0)</b>
Dividends paid	—	—	—	—
Share issuance/(repurchase)	—	—	—	—
Inc/(dec) in debt	2,591.0	0.0	—	—
Others	342.0	—	—	—
<b>Cash flow from financing</b>	<b>2,593.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Total cash flow</b>	<b>265.0</b>	<b>1,895.7</b>	<b>9,933.8</b>	<b>14,235.9</b>
Free cash flow	4,358.0	1,995.7	10,033.8	14,335.9
Free cash flow per share (basic) (\$)	1.27	0.63	3.13	4.44

Source: Company data, Goldman Sachs Research estimates.

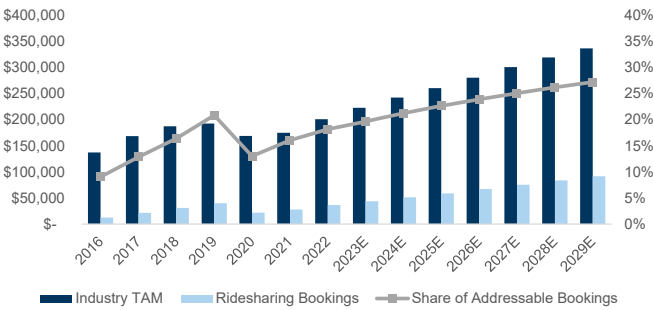
We believe that our current \$175 price target already gives Tesla credit for growing long-term in software related businesses such as autonomy, in particular selling FSD software to Tesla’s own installed base of vehicles. This is because we believe software and digital services would be needed to drive the 20-40% type EPS CAGR beyond 2025 necessary to justify the 50X target P/E multiple we use on Q5-Q8E EPS including SBC to derive our price target (based on PEG ratios for tech and industrial stocks in the S&P 500).

Rideshare market and TAM sizing

The rideshare market and TAM is large. Our colleagues Eric Sheridan, Ben Miller, and team estimate that the US/Canada ridesharing industry TAM will grow at a 7% CAGR (2023-2029E) and reach over \$300 bn, and that ridesharing bookings of about \$44 bn in 2023 (implying roughly 20% penetration) will grow at a 13% CAGR through 2029. With Tesla focusing its R&D efforts with autonomy to date on North America, we believe this is helpful to contextualize the market.

Globally, Uber has framed the long-term global personal mobility TAM at 11.9 tn miles per year, which represents a \$5.7 tn market opportunity per the company (across 175 countries).

Exhibit 1: Our GS colleagues estimate ridesharing bookings in US/Canada will grow at a mid-teens CAGR through 2029



Source: Company data, Goldman Sachs Global Investment Research, World Bank, McKinsey, Federal Reserve Bank of St. Louis, Second Measure, Statistics Canada

While Tesla has not recently commented on how it would seek to scale/deploy robotaxis, for illustrative purposes, we show scenarios assuming a commercial fleet that Tesla would own.

We show the early stage revenue opportunity from robotaxis based on trips per day, total robotaxis deployed, and an assumed revenue per mile of ~\$2-\$2.25 (in line with current market pricing in the US on average for ride sharing) in [Exhibit 2](#). We assumed an average of 9 miles driven per trip (similar to the current rideshare market), and 50-1,000 vehicles deployed (similar to the scale of early AV deployments from Waymo and Baidu).

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**Exhibit 2: Annual revenue opportunity (\$ mn) from initial deployment of robotaxis**

Trips per robotaxi per day	Annual revenue in mns from robotaxis				
	Tesla robotaxis in operation				
	50	100	250	500	1,000
5	\$2	\$3	\$9	\$17	\$35
8	\$3	\$6	\$14	\$28	\$56
10	\$3	\$7	\$17	\$35	\$70
12	\$4	\$8	\$21	\$42	\$84
15	\$5	\$10	\$26	\$52	\$105
18	\$6	\$13	\$31	\$63	\$126
20	\$7	\$14	\$35	\$70	\$140

Source: Company data, Goldman Sachs Global Investment Research

As we show in [Exhibit 3](#), revenue from robotaxis could be significant longer-term with a range of scenarios around trips per day, average revenue per trip, and number of robotaxis in operation.

**Exhibit 3: Analysis of the annual revenue opportunity (\$mn) from a larger fleet of robotaxis in a range of scenarios**

Revenue per trip	Trips per robotaxi per day	Annual revenue in mns from robotaxis							
		Tesla robotaxis in operation							
		5,000	10,000	25,000	50,000	100,000	250,000	500,000	1,000,000
\$15	5	\$137	\$274	\$684	\$1,369	\$2,738	\$6,844	\$13,688	\$27,375
	8	\$219	\$438	\$1,095	\$2,190	\$4,380	\$10,950	\$21,900	\$43,800
	10	\$274	\$548	\$1,369	\$2,738	\$5,475	\$13,688	\$27,375	\$54,750
	12	\$329	\$657	\$1,643	\$3,285	\$6,570	\$16,425	\$32,850	\$65,700
	15	\$411	\$821	\$2,053	\$4,106	\$8,213	\$20,531	\$41,063	\$82,125
	18	\$493	\$986	\$2,464	\$4,928	\$9,855	\$24,638	\$49,275	\$98,550
	20	\$548	\$1,095	\$2,738	\$5,475	\$10,950	\$27,375	\$54,750	\$109,500
\$25	5	\$228	\$456	\$1,141	\$2,281	\$4,563	\$11,406	\$22,813	\$45,625
	8	\$365	\$730	\$1,825	\$3,650	\$7,300	\$18,250	\$36,500	\$73,000
	10	\$456	\$913	\$2,281	\$4,563	\$9,125	\$22,813	\$45,625	\$91,250
	12	\$548	\$1,095	\$2,738	\$5,475	\$10,950	\$27,375	\$54,750	\$109,500
	15	\$684	\$1,369	\$3,422	\$6,844	\$13,688	\$34,219	\$68,438	\$136,875
	18	\$821	\$1,643	\$4,106	\$8,213	\$16,425	\$41,063	\$82,125	\$164,250
	20	\$913	\$1,825	\$4,563	\$9,125	\$18,250	\$45,625	\$91,250	\$182,500
\$35	5	\$319	\$639	\$1,597	\$3,194	\$6,388	\$15,969	\$31,938	\$63,875
	8	\$511	\$1,022	\$2,555	\$5,110	\$10,220	\$25,550	\$51,100	\$102,200
	10	\$639	\$1,278	\$3,194	\$6,388	\$12,775	\$31,938	\$63,875	\$127,750
	12	\$767	\$1,533	\$3,833	\$7,665	\$15,330	\$38,325	\$76,650	\$153,300
	15	\$958	\$1,916	\$4,791	\$9,581	\$19,163	\$47,906	\$95,813	\$191,625
	18	\$1,150	\$2,300	\$5,749	\$11,498	\$22,995	\$57,488	\$114,975	\$229,950
	20	\$1,278	\$2,555	\$6,388	\$12,775	\$25,550	\$63,875	\$127,750	\$255,500

Source: Company data, Goldman Sachs Global Investment Research

To help understand some of the key costs, [Lyft](#) has estimated that driver costs such as fuel, repair/maintenance, depreciation, and cleaning averaged \$0.31 per mile and, specifically for EVs, noted a cost per mile of \$0.23 (with lower fuel costs than ICE vehicles). In addition, commercial insurance that rideshare companies provide can average roughly \$0.30 per mile as implied by 10-K reports. Similarly, [Car and Driver](#) notes that taxi insurance (which Waymo commented is similar to the insurance an AV gets per [Marketwatch](#)) can range from \$5,000-\$10,000 annually and [Inshur](#) provides a range of \$3,000-\$10,000 annually based on driving history and coverage amount. This implies that insurance per mile for a robotaxi could be >\$0.50 to start (with a likely higher cost of repairs for an AV than a typical consumer vehicle), but could decline to well under \$0.30 per mile if AV accident rates are eventually significantly lower than

human drivers.

For Tesla, we believe a robotaxi would be built on Tesla's low-cost next generation platform and lack a steering wheel (per comments from Tesla at the 2023 investor day and 1Q23 earnings call), and we believe a robotaxi could have either more cameras than current consumer Tesla vehicles (with some observers noting the front placement on the B-pillars can reduce visibility) and/or potentially use advanced imaging radar to compliment vision (Tesla has been open to radar in the past and some of its vehicles still ship with radar, and there would be no human for redundancy; we do not expect Tesla would use lidar given past comments from management). We also believe that Tesla could have a cost advantage at scale vs. other AVs given the reduced sensor inputs and its ability to vertically integrate (including with its own ASICs on the vehicle).

### **Other ridehailing company snapshots**

#### **Uber**

Uber has framed the long-term global personal mobility TAM at 11.9 tn miles per year, which represents a \$5.7 tn market opportunity (across 175 countries).

Within US & Canada ridesharing specifically, our GSTMT colleagues estimate Uber & Lyft have exposure to a potential \$242 bn TAM in 2024 (growing to \$337 bn in 2029), based on the total US & Canada working age population. Within that, total bookings of ~\$44 bn represent 20% penetration of addressable industry bookings in 2023.

At its 2024 investor update, Uber noted that it has about 150 mn monthly active platform consumers as of 4Q23 and nearly 7 mn drivers and couriers globally.

At the 2022 investor update event, Uber commented that it expects autonomous vehicles to be an increasingly important part of the transportation ecosystem, and thus Uber's business over time. Uber also believes that lower prices through autonomous innovation will materially increase the size of the mobility-as-a-service TAM. The company estimates that reducing the price to \$1 per mile will meaningfully expand the category.

Rather than building its own AVs, Uber has decided to partner with AV developers including Waymo, Motional, and Aurora. Moreover, Uber noted at its 2024 investor event that it expects to leverage a hybrid network of autonomous and human drivers in order to expedite AV commercialization while maintaining reliability and managing the consumer experience, per the company.

According to industry observers, Uber pays ~60-70% of a passenger's pre-incentive fare to the driver, excluding any pass-through costs (e.g. tolls, city taxes, etc.).

#### **Lyft**

Lyft commented on its 4Q23 earnings call that it had 22.4 mn active riders and provided ~191 mn rides within the quarter and provided 709 mn rides across 2023. Lyft noted that ~66% of its US drivers had stated they also worked on other app-based platforms (e.g. Uber and Doordash).

On autonomy, Lyft has partnered with Motional to provide driverless rides in Las Vegas which has resulted

in 100k+ paid driverless riders per [Lyft's autonomous website](#). While the company had previously partnered with Waymo to provide rides in Metro Phoenix per [Waymo's blog](#), Lyft does not highlight Waymo as a partner on its autonomous website at present.

Lyft committed to paying drivers at least 70% of rider payments per week after external fees like commercial insurance are subtracted, and estimates that there are ~\$0.31/mi of expenses associated with operating the car for the driver (i.e. fuel costs, maintenance, cleaning, and depreciation). Lyft also noted that the median US driver on their platform drove 1,647 engaged miles and spent 75 hours on the platform in 2023 per a [blog post on the company's website](#). On a per engaged hour basis, Lyft estimated that it paid the median US driver \$30.68 (inclusive of driver incentives and average tip of \$2.41). Using the metrics, we estimate that the median Lyft driver in the US would be receiving \$1.29/mi from Lyft and \$1.40/mi when including tip.

## **Robotaxi effort snapshots**

### **Waymo**

Waymo currently operates 24/7 driverless robotaxis in a 225+ sq. mi. area of Metro Phoenix, all of San Francisco, 63 square miles of Los Angeles (from Santa Monica to Downtown), and is planning to expand to Austin later this year. Additionally, the company announced on [4/3/24](#) that Uber Eats customers can now have their meals delivered by a fully autonomous Waymo vehicle within its 225+ square mile Metro Phoenix service area as part of Waymo's ongoing partnership with Uber. Waymo has a permit for 250 robotaxis in San Francisco and deploys about 100 at any given time as of August 2023, [per media reports](#). Recall on [1/11/24](#), the DMV approved an expanded ODD for Waymo that authorizes Waymo to deploy driverless AVs in portions of the Los Angeles area and additional portions of the San Francisco Peninsula.

Per a [2/13/24](#) press release, Waymo had driven over 10 mn fully autonomous miles and served over 1 mn ride-hail trips to date. [Research](#) conducted by Swiss Re, a reinsurer that Waymo began partnering with in 2022, shows that in over 7 mn rider-only miles, the Waymo Driver demonstrated: 1) an 85% reduction or 6.8 times lower crash rate involving any injury, from minor to severe and fatal cases (0.41 incidence per million miles for the Waymo Driver vs 2.78 for the human benchmark) and 2) a 57% reduction or 2.3 times lower police-reported crash rate (2.1 incidence per million miles for the Waymo Driver vs. 4.85 for the human benchmark).

While Waymo has not provided a specific pricing formula or cost per mile, we note that [per media reports](#), costs per trip have ranged from \$4.99 for a 1-mile, 6-minute trip to \$23.14 for a 15.5-mile, 43-minute trip (resulting in a cost per mile ranging from \$1.49 to \$4.99, though we note it is likely that there is a flat fee and a per mile and minute cost, similar to other rideshare/AV platform costs).

### **Cruise**

On [4/9/24](#), Cruise (General Motors' self-driving subsidiary) announced that it is resuming manual driving to create maps and gather road information in select cities, starting in Phoenix, using human-driven vehicles without autonomous systems engaged. Cruise plans to expand this effort to other select cities as it

continues to engage with officials and community leaders. Cruise has not set a timeline for deployment yet and is in the process of meeting with officials in select markets to rebuild trust and share updates.

GM commented on its 4Q23 EPS call that its planned 2024 investment in Cruise (~\$1 bn lower in 2024 than in 2023) reflects its more deliberate and cadenced go-to-market strategy. GM said that it is in the process of developing new financial targets and a new roadmap and that it would share updates on Cruise as it finalizes the technology and relaunch plans.

Recall that in October 2023, the California DMV suspended Cruise's permit for autonomous driving, and Cruise paused operations of its fleet to redesign its approach to safety following two pedestrian injuries that involved Cruise vehicles, per press releases. Cruise had been testing/operating in 15 cities, and GM stated that Cruise had eclipsed > 5mn driverless miles as of its 3Q23 earnings call.

Per media sources, prior to halting paid autonomous drives, Cruise charged a base fare of \$5 and an additional \$0.90/mi and \$0.40 per minute, and any city specific taxes (e.g. 1.5% for San Francisco).

### **Apollo Go**

In 2023, Apollo Go, Baidu's robotaxi service, provided more than 3 million rides. The total rides provided to the public by Apollo Go since inception exceeded 5 million as of January 2, 2024 (including those with a safety operator present).

Baidu has been operating fully driverless commercial AVs since August of 2022, including in cities such as Beijing and Wuhan.

### **Regulatory landscape for AVs**

**US:** Laws and regulations for autonomous vehicle deployment vary state by state with regard to testing and whether or not the vehicle can be deployed without a backup human driver present. We also note that companies would need to apply for an exemption to NHTSA if a vehicle were to lack specific mandatory features like a rear view mirror. NHTSA and the US DOT have said that they are committed to overseeing the safe testing, development and deployment of these systems – currently in limited, restricted and designated locations and conditions.

**Europe:** The European Commission adopted technical legislation for fully driverless vehicles (level 4 of automation, e.g. urban shuttles or robotaxis) that establish a comprehensive assessment of the safety and maturity of the fully automated vehicles before they go onto the EU market. The rules will cover testing procedures, cybersecurity requirements, data recording rules, as well as safety performance monitoring and incident reporting requirements for manufacturers of fully driverless vehicles.

For automated vehicles replacing the driver on motorways (level 3 automation), EU legislation aligns with the UN level rules on level 3 automation. The Regulation sets out clear performance-based requirements that must be complied with by car manufacturers before equipped vehicles can be sold within countries mandating the



Regulation. It includes provisions governing type approval, technical requirements, audit and reporting, and testing both on test tracks and in real-world conditions. The updated functionalities will also have to be compliant with the cybersecurity and software update requirements laid out in the relevant UN Regulations.

**China:** China issued additional safety guidelines for the use of autonomous vehicles in public transport in December 2023. The guidelines apply to autonomous vehicles for passengers including taxis as well as for freight and cover vehicles of various degrees of automation, per the Ministry of Transport. Autonomous vehicles for freight transport and conditional autonomous taxis are required to carry one driver. With the approval of local governments, fully autonomous taxis could be operated unmanned over designated areas with one security inspector overseeing them remotely. They also require companies using autonomous vehicles for public transport to be qualified and licensed and state that companies can work together with automakers on such operations. Roboshuttles or robotrucks still need to have in-car safety operators, while robotaxis can use remote operators. The ratio of robotaxis to remote operators cannot exceed 3:1, and operators need to pass certain skill tests. There are also rules specifying what data the companies need to report when accidents happen. Additionally, the document noted that autonomous driving technology should be used cautiously for passenger transport services, and autonomous taxis should be operated in areas with good traffic conditions where risks are more manageable. By 2025, China said it aims to fully establish a system to encourage technology development and investment, platform/traffic infrastructure, the implementation of laws and regulations, etc., as it strives to achieve large-scale production of conditionally autonomous vehicles.

### **Updated Tesla FSD scenarios**

As we wrote in our November 2023 note Contextualizing Tesla's AI and FSD opportunities, under various ASP and take rate scenarios (shown in Exhibit 4 and Exhibit 5), Tesla could eventually derive tens of billions of dollars in revenue from FSD subscriptions or purchases, up from what we believe is a few billion dollars per year currently. We note that on 4/12/24, Tesla reduced the price of a monthly FSD subscription to US\$99 from \$199 for those users who had not purchased Enhanced Autopilot. We show updated scenarios for revenue from FSD below.



**Exhibit 4: Tesla revenue potential from monthly subscriptions of FSD**

Annual revenue in mns from monthly FSD subscriptions							
Monthly ASP	Attach Rate	Installed Base (mn)					
		25	30	35	40	45	50
\$25.0	10%	750	900	1,050	1,200	1,350	1,500
	20%	1,500	1,800	2,100	2,400	2,700	3,000
	30%	2,250	2,700	3,150	3,600	4,050	4,500
	40%	3,000	3,600	4,200	4,800	5,400	6,000
	50%	3,750	4,500	5,250	6,000	6,750	7,500
\$50.0	10%	1,500	1,800	2,100	2,400	2,700	3,000
	20%	3,000	3,600	4,200	4,800	5,400	6,000
	30%	4,500	5,400	6,300	7,200	8,100	9,000
	40%	6,000	7,200	8,400	9,600	10,800	12,000
	50%	7,500	9,000	10,500	12,000	13,500	15,000
\$100.0	10%	3,000	3,600	4,200	4,800	5,400	6,000
	20%	6,000	7,200	8,400	9,600	10,800	12,000
	30%	9,000	10,800	12,600	14,400	16,200	18,000
	40%	12,000	14,400	16,800	19,200	21,600	24,000
	50%	15,000	18,000	21,000	24,000	27,000	30,000
\$150.0	10%	4,500	5,400	6,300	7,200	8,100	9,000
	20%	9,000	10,800	12,600	14,400	16,200	18,000
	30%	13,500	16,200	18,900	21,600	24,300	27,000
	40%	18,000	21,600	25,200	28,800	32,400	36,000
	50%	22,500	27,000	31,500	36,000	40,500	45,000
\$200.0	10%	6,000	7,200	8,400	9,600	10,800	12,000
	20%	12,000	14,400	16,800	19,200	21,600	24,000
	30%	18,000	21,600	25,200	28,800	32,400	36,000
	40%	24,000	28,800	33,600	38,400	43,200	48,000
	50%	30,000	36,000	42,000	48,000	54,000	60,000

Source: Goldman Sachs Global Investment Research

**Exhibit 5: Tesla revenue opportunity from upfront FSD purchase**

Revenue in mns from upfront FSD purchase							
ASP	Attach Rate	2030 Unit Sales (mn)					
		5	6	7	8	9	10
\$5,000.0	10%	2,500	3,000	3,500	4,000	4,500	5,000
	20%	5,000	6,000	7,000	8,000	9,000	10,000
	30%	7,500	9,000	10,500	12,000	13,500	15,000
	40%	10,000	12,000	14,000	16,000	18,000	20,000
	50%	12,500	15,000	17,500	20,000	22,500	25,000
\$7,500.0	10%	3,750	4,500	5,250	6,000	6,750	7,500
	20%	7,500	9,000	10,500	12,000	13,500	15,000
	30%	11,250	13,500	15,750	18,000	20,250	22,500
	40%	15,000	18,000	21,000	24,000	27,000	30,000
	50%	18,750	22,500	26,250	30,000	33,750	37,500
\$12,000.0	10%	6,000	7,200	8,400	9,600	10,800	12,000
	20%	12,000	14,400	16,800	19,200	21,600	24,000
	30%	18,000	21,600	25,200	28,800	32,400	36,000
	40%	24,000	28,800	33,600	38,400	43,200	48,000
	50%	30,000	36,000	42,000	48,000	54,000	60,000
\$15,000.0	10%	7,500	9,000	10,500	12,000	13,500	15,000
	20%	15,000	18,000	21,000	24,000	27,000	30,000
	30%	22,500	27,000	31,500	36,000	40,500	45,000
	40%	30,000	36,000	42,000	48,000	54,000	60,000
	50%	37,500	45,000	52,500	60,000	67,500	75,000
\$20,000.0	10%	10,000	12,000	14,000	16,000	18,000	20,000
	20%	20,000	24,000	28,000	32,000	36,000	40,000
	30%	30,000	36,000	42,000	48,000	54,000	60,000
	40%	40,000	48,000	56,000	64,000	72,000	80,000
	50%	50,000	60,000	70,000	80,000	90,000	100,000

Source: Goldman Sachs Global Investment Research

**Valuation considerations**

We believe that our \$175 12-month price target (based on 50X Q5-Q8 EPS including SBC) gives Tesla future credit for growing in new areas such as FSD and robotaxis.

We are Neutral rated on the stock, with our positive view of Tesla's long-term growth potential and position in the market offset by what we believe is full valuation and weaker near-term fundamentals.

We believe an upside scenario for the stock over the next 12-24 months could be ~\$220-\$300 using a multiple of 50X-60X applied to 2026E EPS (note we model 2026 EPS including SBC of \$4.45 and excluding SBC of \$5.00), and the market could be more forward looking/ascribe a higher multiple should Tesla demonstrate improved traction with software and services products such as FSD. We believe a downside scenario, including if investors become less optimistic on the software and services opportunity, could be ~\$55-\$75 using a multiple of ~30X applied to 2024 EPS (note that we model 2024E EPS including SBC at \$1.90 and excluding SBC at \$2.45).

Key downside risks to our view relate to potentially larger vehicle price reductions than we expect, increased competition in EVs, slower EV demand, delays with products/capabilities like FSD/the third generation platform/4680, key person risk, the internal control environment, margins, and operational risks associated with Tesla's high degree of vertical integration. Upside risks include faster EV adoption and/or share gain from Tesla, a stronger macroeconomic environment for new vehicle sales more generally, earlier new product launches than we expect (e.g., a vehicle using the third generation platform), and an earlier/larger impact from AI enabled products (e.g., FSD, Optimus and robotaxis) than we currently anticipate.

# Disclosure Appendix

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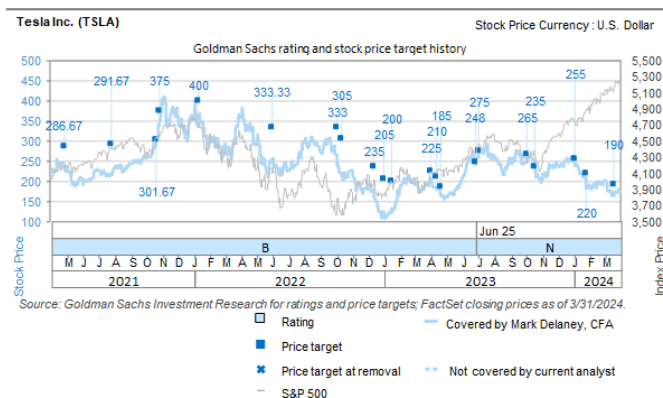
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