

Tesla Inc. (TSLA): Initial thoughts on 'We, Robot' 10/10 event

We attended Tesla's 10/10 'We, Robot' event in LA, where Tesla unveiled its Cybercab (robotaxi) and Robovan, and showcased progress with Optimus. We think the company demonstrated very strong progress with the Optimus humanoid robot, and we think the Cybercab looked attractive. However, we believe the lack of data shared on Full Self Driving (FSD) performance, relatively limited details on the robotaxi business plan, and absence of a lower-cost consumer vehicle unveil may be disappointing for some market participants and lead the stock to pull back after the recent run (although Tesla may share more on these topics in the coming months/quarters in other forums). We'd expect Optimus to become a growing part of the investor discussion, and we see potential in the long-term for Tesla in ADAS/AVs (with it potentially benefiting from a scale and cost structure advantage). While we believe reaching L4 in wide scale may take some time (e.g. full AV without a narrow geofence), in the next few years we think Tesla can reach highway eyes-off capability (e.g. L3) and we believe this could support growing FSD revenue.

Specifically:

Cybercab - Tesla unveiled a two-seat Cybercab vehicle without a steering wheel or pedals/controls, and with winged doors. The company also showcased a Robovan that can carry up to 20 people or could transport goods. Tesla expects to start unsupervised FSD robotaxi operations in Texas and California next year with its currently available models (e.g. 3 and Y) and be in production with the Cybercab in 2026/before 2027 (although the company noted that it tends to be optimistic with timelines).

Given that vehicles are only typically used for several hours per week, Tesla believes that autonomous vehicles can offer 5X or even 10X higher utilization. Importantly on costs, Tesla believes the average operating cost of its Cybercab over time will be ~\$0.20 per mile and may be priced at ~\$0.30-\$0.40 per mile including taxes and other costs. Tesla expects the Cybercab to cost ~\$30K or less. Tesla also commented that it plans to over-spec the computer for the Cybercab (AI 5 computer) as the company believes that distributed inference compute can be utilized when the vehicle is not in use. Additionally, the robotaxi will use inductive charging, and Tesla indicated there would be self-cleaning capabilities. Finally, Tesla said one business model could be a person owning a small fleet that they put onto the

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network. Tesla did not provide other details on its business plan (e.g. scope of the initial deployments, pricing to start, if Tesla will own the early fleet, remote assistance, etc).

The timelines for AV deployment (next year with 3/Y in Texas and California) and with Cybercab (in 2026/by 2027) and lack of incremental FSD performance data will likely leave the debate on how close Tesla is to unsupervised FSD (L4) unresolved.

As we have previously written in our report, “Can new AI technology help accelerate AV deployments? Updating our global ADAS and AV forecast” we believe there is a material long-term revenue opportunity from robotaxis. However, revenues from initial smaller scale deployments would likely be more limited, as we show in Exhibit 1 and Exhibit 2.

Exhibit 1: Annual revenue opportunity (\$ mn) from initial deployment of robotaxis

Trips per robotaxi per day	Annual revenue in mns from robotaxis				
	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: Goldman Sachs Global Investment Research

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Exhibit 2: Analysis of the annual revenue opportunity (\$mn) from a larger fleet of robotaxis deployed globally in a range of scenarios

Annual revenue in mns from robotaxis									
Revenue per trip	Trips per robotaxi per day	Robotaxis in operation							
		5,000	10,000	25,000	50,000	100,000	250,000	500,000	1,000,000
\$5	2	\$18	\$37	\$91	\$183	\$365	\$913	\$1,825	\$3,650
	4	\$37	\$73	\$183	\$365	\$730	\$1,825	\$3,650	\$7,300
	6	\$55	\$110	\$274	\$548	\$1,095	\$2,738	\$5,475	\$10,950
	8	\$73	\$146	\$365	\$730	\$1,460	\$3,650	\$7,300	\$14,600
	10	\$91	\$183	\$456	\$913	\$1,825	\$4,563	\$9,125	\$18,250
	12	\$110	\$219	\$548	\$1,095	\$2,190	\$5,475	\$10,950	\$21,900
	14	\$128	\$256	\$639	\$1,278	\$2,555	\$6,388	\$12,775	\$25,550
\$10	2	\$37	\$73	\$183	\$365	\$730	\$1,825	\$3,650	\$7,300
	4	\$73	\$146	\$365	\$730	\$1,460	\$3,650	\$7,300	\$14,600
	6	\$110	\$219	\$548	\$1,095	\$2,190	\$5,475	\$10,950	\$21,900
	8	\$146	\$292	\$730	\$1,460	\$2,920	\$7,300	\$14,600	\$29,200
	10	\$183	\$365	\$913	\$1,825	\$3,650	\$9,125	\$18,250	\$36,500
	12	\$219	\$438	\$1,095	\$2,190	\$4,380	\$10,950	\$21,900	\$43,800
	14	\$256	\$511	\$1,278	\$2,555	\$5,110	\$12,775	\$25,550	\$51,100
\$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: Goldman Sachs Global Investment Research

We also provide an illustrative cost model for an owned and operated fleet of robotaxis in [Exhibit 3](#). At scale, we believe that Tesla could benefit from lower per mile costs for its vehicle depreciation (e.g. if Tesla can produce a robotaxi at \$30k vs a competitor robotaxi at \$50k-\$75k, at 100k miles per year and a three year useful life, Tesla would have depreciation costs of \$0.10/mi vs a standard robotaxi at \$0.15-\$0.25/mi). This is driven by the volume leverage Tesla already has making cars (with each vehicle already equipped with inference silicon), and its more narrow sensor stack (e.g. no lidar). Tesla said the cybercab will use vision and AI, implying that it may not use radar (and how it would handle operating in certain weather/lighting conditions without a secondary sensor type is something that may remain a debate).

Exhibit 3: Illustrative cost model for a vertically integrated AV rideshare company

	2023	2024E	2025E	2030E	2035E	2040E
AV cost per vehicle (\$US)	125,000	100,000	85,000	50,000	50,000	50,000
Miles driven per car	22,500	25,000	27,500	75,000	100,000	125,000
Vehicles in service year end	177	259	478	2,570	18,597	72,967
Wages per remote operator	76,875	78,797	80,373	87,870	94,661	99,982
Cars per operator	3	3	3	10	30	35
Vehicle driving cost per mile	\$3.35	\$3.13	\$2.94	\$0.98	\$0.70	\$0.58
R&D (\$US mn)	825	908	998	1,521	1,960	2,502
SG&A (\$US mn)	230	265	304	612	1,127	1,479
Total cost per mile	\$268.71	\$184.11	\$102.03	\$12.04	\$2.36	\$1.02

Source: Goldman Sachs Global Investment Research

Optimus- The progress with Optimus was impressive in our view especially given where Tesla was just a few years ago. The robots were very life like in several of the movements, and interacted via voice with attendees, danced, and gave out snacks. We had an impromptu conversation with one of the robots which asked us if we'd checked out the snack bar, and when we asked what it would suggest to eat, it said to ask its friend that was actually giving out snacks (which we found to be relatively human like). We expect Optimus to be a growing part of the Tesla story.

The TAM for higher-end humanoid robots could be >\$10 bn in 2030 per research from a report led by our colleague Jacqueline Du. Recall that on its 2Q24 earnings call, Tesla stated that it expects to have limited production of Optimus Version 1 starting early next year for internal Tesla use (and expects to have several thousand produced and deployed by the end of next year), and expects to ramp production and provide Optimus Version 2 to external customers in 2026.

We are Neutral-rated on TSLA shares. While we believe that Tesla can grow longer term including with FSD, we believe headwinds in the auto business (e.g. a high degree of competition and pricing pressure in EVs) will limit the rate of its EPS growth in the near to intermediate term, we expect it will take time to grow its FSD/software business to a more meaningful level, and we believe valuation is full. Our 12-month price target is \$230, which is based on 65X applied to our Q5-Q8E EPS estimate including SBC.

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/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 by Tesla, a stronger macroeconomic environment for new vehicle sales more generally, earlier new product launches than we expect, and an earlier/larger impact from AI enabled products (e.g., FSD, Optimus and robotaxis) than we currently anticipate.

TSLA	12m Price Target: \$230.00	Price: \$238.77	Downside: 3.7%			
Neutral	GS Forecast					
		12/23	12/24E	12/25E	12/26E	
	Market cap: \$831.2bn	Revenue (\$ mn)	96,773.0	99,797.9	118,504.8	140,042.1
	Enterprise value: \$819.6bn	EBITDA (\$ mn)	16,633.0	15,087.0	21,977.6	29,536.6
	3m ADTV: \$20.1bn	EBIT (\$ mn)	8,891.0	6,749.1	11,438.6	16,811.2
	United States	EPS (\$)	2.60	1.80	2.95	4.20
	Americas Autos & Industrial Tech	P/E (X)	83.5	132.3	80.8	56.9
	M&A Rank: 3	EV/EBITDA (X)	40.6	49.8	34.0	25.1
		FCF yield (%)	0.6	0.1	1.1	1.4
		Dividend yield (%)	0.0	0.0	0.0	0.0
		Net debt/EBITDA (X)	(0.9)	(0.8)	(0.9)	(1.0)
			6/24	9/24E	12/24E	3/25E
		EPS (\$)	0.42	0.47	0.57	0.54

Source: Company data, Goldman Sachs Research estimates, FactSet. Price as of 10 Oct 2024 close.

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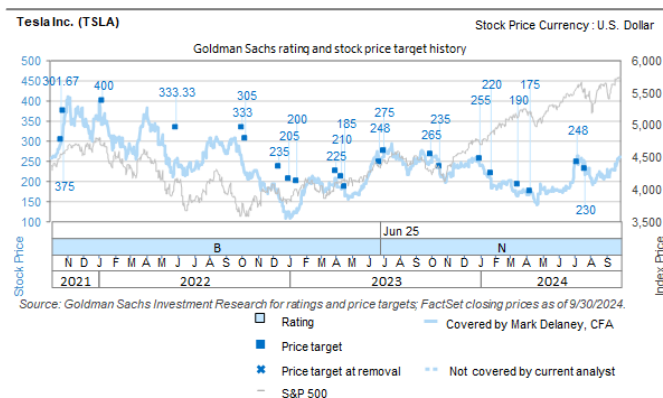
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