

MWPVL International
Supply Chain | Experience

BANK OF AMERICA 

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Marc Wulfraat
President
Information@Mwpvl.com
(514) 482-3572 x 100



About the Speaker



Name	Marc Wulfraat
Position	President and Founder of MWPVL International Inc.
Experience	Marc has 35 Years of supply chain consulting experience. He is widely recognized as an industry thought leader and has successfully managed over 330 consulting mandates over the span of his career. He is currently involved in over \$1.6 Billion of new distribution center capital projects.
Industries Served	Retail Distribution, E-commerce, Grocery, Foodservice, Food Processing, Beverage, Consumer Goods, Apparel, Wholesale Distribution, Parts Distribution, Health care, Pharmaceuticals, Automotive Aftermarket, Technology, 3PL.
Achievements	<ul style="list-style-type: none">• Supply Chain Digest Guru, 2011 – 2018• Supply Chain Pro to Know 2018• Over 150 presentations and keynote speaking events• Over 120 White Papers; & articles published in journals including Time, Fortune, Wall Street Journal, The Economist, Bloomberg, New York, Times, The Financial Times
Education	<ul style="list-style-type: none">• Master of Business Administration, McGill University, Manchester Business School, United Kingdom• Bachelor of Science, Mathematics

Qualifying Statements

- **MWPVL** is strictly unbiased in its views and opinions towards the companies discussed in this presentation
- Any errors or omissions are unintended, and we have made every effort to report accurate information
- There is no confidential information within the body of this presentation
- For more detailed information about Amazon please visit:
 - https://www.mwpvl.com/html/amazon_com.html and
 - https://www.mwpvl.com/html/amazon_distribution_network_maps.html
 - <https://www.mwpvl.com/html/walmart.html>
 - <https://www.mwpvl.com/html/target.html>

- **MWPVL** is a supply chain consulting firm that helps companies around the world optimize their supply chains through:
 - Strategic improvements to their distribution networks
 - Design of distribution centers and automation
 - Logistics and Supply Chain Technology consulting services
- We have tracked Amazon (and other companies) closely for the past 15 years because history is being made due to unprecedented disruption in the retail industry
- Amazon is increasing customer expectations for convenience, speed and service levels and this is having a domino effect in almost every industry

A Look Back at 2021 – A Year of History: Major Accomplishments

➤ Logistics:

- U.S. small packages delivered by Amazon is estimated at **5.4 billion** which will soon surpass UPS for the first time
- Opening of massive new **\$1.5 billion** Regional Air Sortation Center in Hebron KY to enable efficient hub and spoke air network to **48** Airports in the USA
- Expanded U.S. Sortation Center network by **31** facilities
- Expanded U.S. delivery station network by **231** buildings totaling **37.2 M sq ft** including Heavy/Bulky and Wagon Wheel facilities that shipped **72+%** of all domestic packages
- Amazon DSP in USA now at **2,000** small businesses
- Amazon Freight truck brokerage moving **40,000** company-owned trailers
- **30,000** vans and **80** planes / 164 daily flights

➤ Import:

- Full fledged ocean carrier – 5th largest trans-Pacific company moving up to 10,000 containers/month from China to US
- Manufacture 5 – 10,000 AMZ ocean containers to secure inventory

➤ HR:

- Employ **950,000** people in USA of which **789,000** work in warehouses and **150,000** seasonal associates are hired
- Globally employ **1,608,000** full and part-time workers.
- Estimated **260,000** delivery drivers

➤ Automation Accomplishments:

- Over **350,000** robots deployed

Amazon Buildout: 2021 vs Projected 2022: Known Projects USA

New USA Facilities 2021:							New USA Facilities 2022:							
Facility Type	New Facilities	% Increase	Sq Ft Added Ground-Level (Millions)	% Increase	Sq Ft Added Incl. Mezzanines (Millions)	% Increase	Facility Type	New Facilities	% Increase	Sq Ft Added Ground-Level (Millions)	% Increase	Sq Ft Added Incl. Mezzanines (Millions)	% Increase	Avg Sq Ft (Ground) (000)
Fulfillment Centers:							Fulfillment Centers:							
Small Sortable FC	15	20%	9.4	15%	42.2	29%	Small Sortable FC	24	26%	16.9	23%	73.2	39%	640
Large Non-Sortable FC	26	33%	24.5	35%	26.7	35%	Large Non-Sortable FC	23	22%	23.6	25%	24.3	24%	1,000
Specialty	8	20%	4.5	24%	5.0	23%	Specialty	6	12%	1.2	5%	1.2	5%	446
SubSameDay	19	238%	3.1	242%	3.1	242%	SubSameDay	18	67%	2.9	65%	2.9	65%	158
SubTotal Fulfillment Centers	68	29%	41.5	26%	77.0	31%	SubTotal Fulfillment Centers	71	23%	44.6	21%	101.6	30%	628
Logistics Centers:							Logistics Centers:							
Inbound Receiving Centers	9	47%	5.3	46%	5.3	38%	Inbound Receiving Centers	11	39%	6.8	40%	6.8	35%	600
Sortation Centers	31	46%	11.3	46%	11.4	46%	Sortation Centers	20	20%	6.8	19%	6.8	19%	271
Air Hubs	8	80%	1.7	73%	4.3	146%	Air Hubs	4	22%	1.0	24%	1.0	14%	187
Delivery Stations (AMZL)	182	55%	35.0	60%	35.1	61%	Delivery Stations (AMZL)	143	28%	22.8	25%	23.4	25%	178
Delivery Stations (AMXL)	49	69%	2.1	97%	2.1	97%	Delivery Stations (AMXL)	11	9%	1.0	23%	1.0	23%	68
SubTotal Logistics Centers	279	52%	55.6	51%	58.2	52%	SubTotal Logistics Centers	189	22%	38.4	24%	38.9	24%	203
Total 2021	347	41%	97.1	36%	135.2	37%	Total 2022	260	22%	82.9	22%	140.5	28%	319

- Amazon spent an estimated **\$25.4** billion on leased property and **\$5.8** billion on build-to-suit development of fulfillment centers in 2021
- We expect that in absolute terms this trend will continue in 2022 but as a % to sales it will start to taper off in 2023

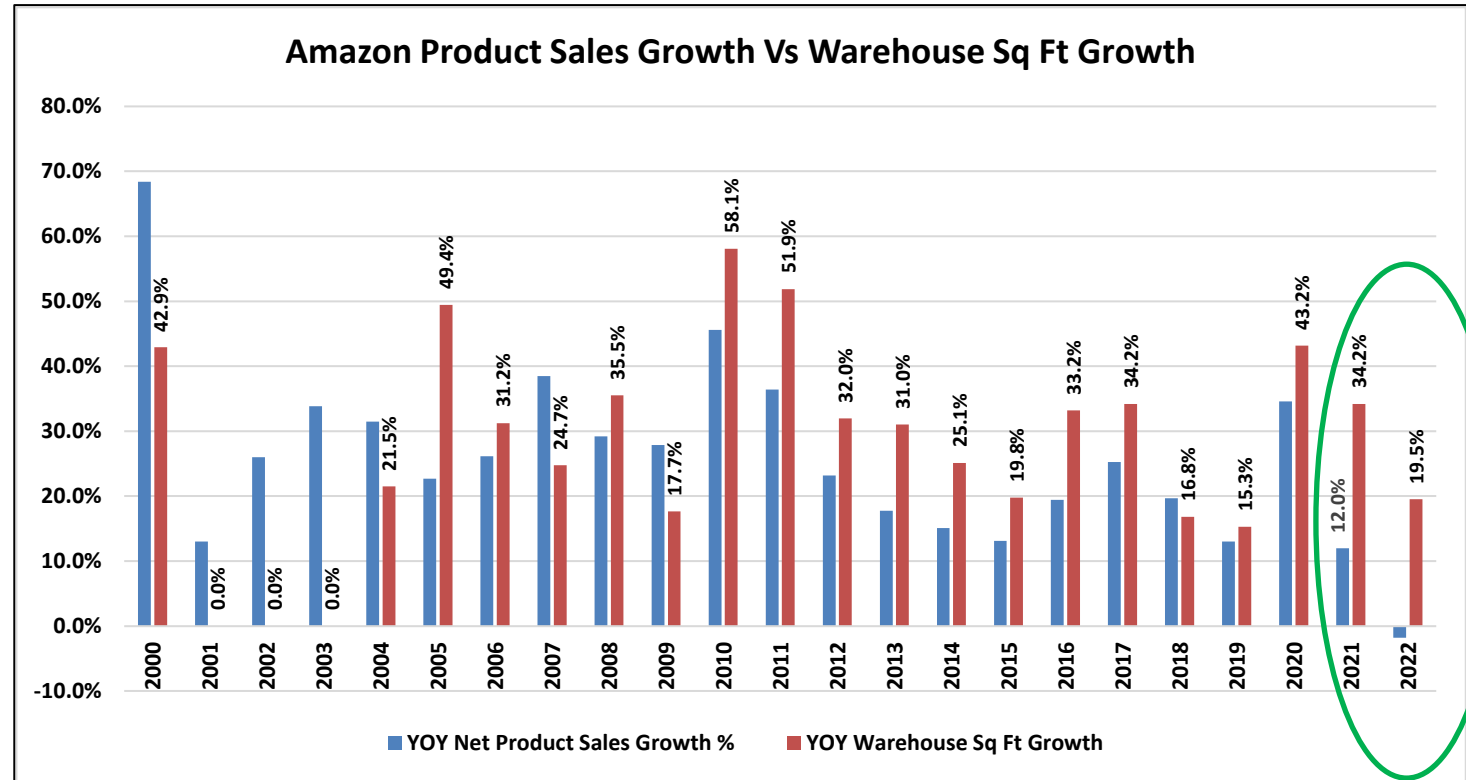
Amazon Buildout: 2021 vs Projected 2022: Known Projects Rest of World

New Rest of World Facilities 2021:							New Rest of World Facilities 2022:							
Facility Type	New Facilities	% Increase	Sq Ft Added Ground-Level (Millions)	% Increase	Sq Ft Added Incl. Mezzanines (Millions)	% Increase	Facility Type	New Facilities	% Increase	Sq Ft Added Ground-Level (Millions)	% Increase	Sq Ft Added Incl. Mezzanines (Millions)	% Increase	Sq Ft Added Ground-Level (Millions)
Fulfillment Centers:							Fulfillment Centers:							
Small Sortable FC	32	21%	14.4	26%	32.5	39%	Small Sortable FC	17	9%	10.8	15%	26.7	23%	11
Large Non-Sortable FC	10	18%	2.5	10%	2.5	8%	Large Non-Sortable FC	3	5%	1.4	5%	1.7	5%	1
Specialty	1	4%	0.7	11%	0.7	7%	Specialty	0	0%	0.0	0%	0.0	0%	0
SubSameDay	0	0%	0.0	0%	0.0	0%	SubSameDay	0	0%	0.0	0%	0.0	0%	0
SubTotal Fulfillment Centers	43	18%	17.6	20%	35.7	29%	SubTotal Fulfillment Centers	20	7%	12.2	11%	28.4	18%	12
Logistics Centers:							Logistics Centers:							
Inbound Receiving Centers	2	33%	1.2	26%	1.2	23%	Inbound Receiving Centers	1	13%	0.6	10%	0.6	9%	1
Sortation Centers	11	28%	4.1	47%	4.5	51%	Sortation Centers	12	24%	3.2	25%	3.2	24%	3
Air Hubs	0	0%	0.0	0%	0.0	0%	Air Hubs	0	0%	0.0	0%	0.0	0%	0
Delivery Stations (AMZL)	117	62%	13.4	77%	13.4	77%	Delivery Stations (AMZL)	34	11%	3.6	12%	3.6	12%	4
Delivery Stations (AMXL)	2	200%	0.1	180%	0.1	180%	Delivery Stations (AMXL)	0	0%	0.0	0%	0.0	0%	0
SubTotal Logistics Centers	132	47%	18.8	58%	19.2	57%	SubTotal Logistics Centers	47	11%	7.4	14%	7.4	14%	7
Total 2021	175	34%	36.3	30%	54.9	35%	Total 2022	67	10%	19.6	12%	35.7	17%	20

- Rest of World build-out will slow down at a faster rate than the USA
- We forecast that UK will remain the strongest market for new space

Amazon Global Overbuild Explained

This chart is distorted because it includes fulfillment + logistics space

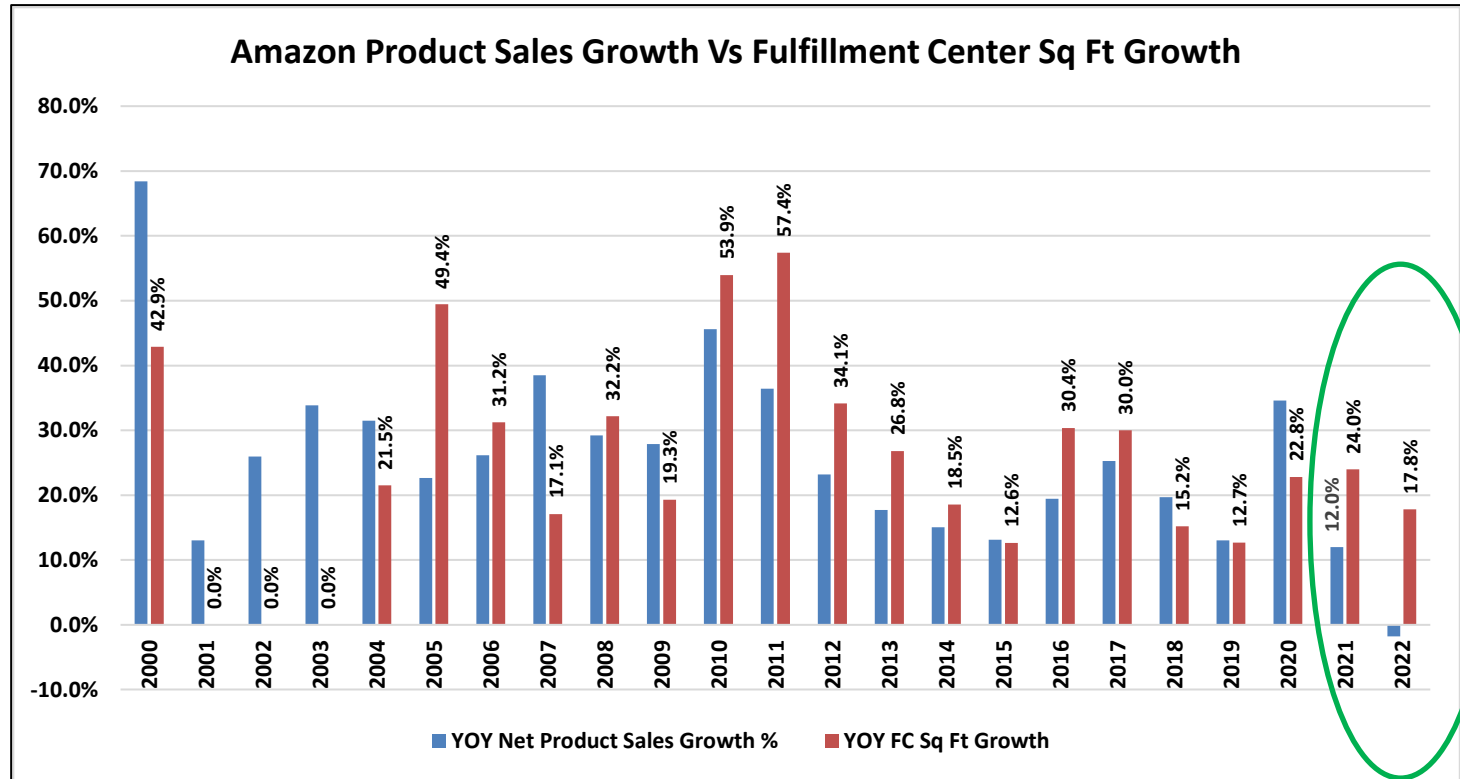


➤ YE 2022 Projection as compared to YE 2020 Actual

- Historically global total warehouse sq ft growth has been slightly ahead of, but in line with product sales growth
- In 2021-2022 we see that this trend is out of balance
- Based on our YE2022 projection as compared to YE2020, Amazon will expand its warehouse network by **239M sq ft (60% warehouse expansion in 2 years)**
- Assuming product sales remain flat in 2022, net product sales will have expanded by **12%** during this same time period
- This is why the company is now in an over-capacity situation

Amazon Overbuild: Net Product Sales Versus Global Fulfillment Center Sq Ft

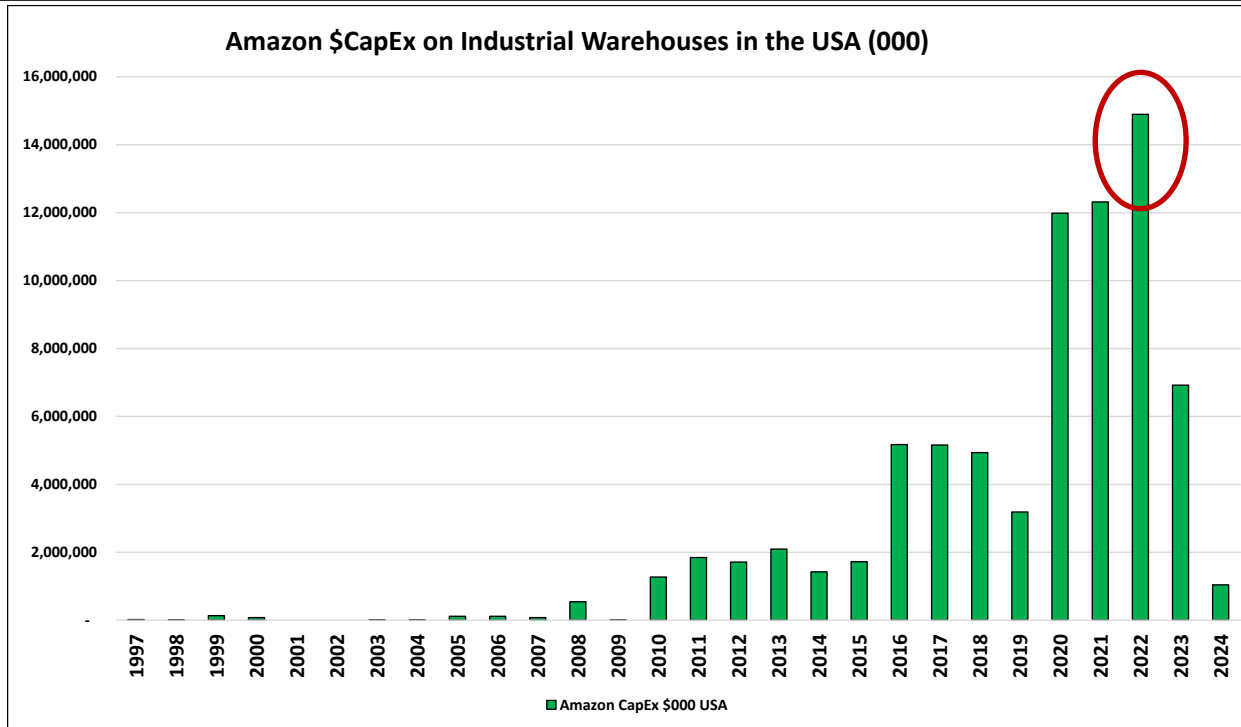
Same chart but
with logistics-
related space
removed



➤ YE 2022 Projection as compared to YE 2020 Actual

- Based on our YE2022 projection as compared to YE2020, Amazon will expand its Fulfillment Center network by **117M sq ft (46% warehouse expansion in 2 years)**
- Assuming product sales remain flat in 2022, net product sales will have expanded by **12%** during this same time period
- The net result will be a significant reduction in new FCs opening in 2023 unless product sales increase

Amazon CapEx USA \$(000)



- Note that this chart shows CapEx for building and equipment from **MWPVL** Data based on the year of opening of a facility
- In reality the CapEx is spent over the lifespan of a project (1 – 3 years) so timing of cash outflows will not align to Amazon Financials
 - E.g. Over 40 facilities opening in 2022 had most of their CapEx spent in 2021
- In most cases, Amazon signs a long-term lease for the Sortable FC rather than spending Capex therefore we would expect their CapEx numbers to be lower than what we show here which represents the total CapEx of the project regardless of how it was financed

- This chart shows the \$USD investment into Fulfillment Center/Logistics Facilities and Equipment for Amazon's USA buildout since 1997
 - **The main point here is that 2022 CapEx will remain at peak levels unless something dramatic happens**

This is not a reflection of Amazon's CapEx outlay since most of the company's facility construction costs are financed by developers and in turn Amazon establishes a long-term lease agreement. This chart reflects the investment requirements required to establish the company's American facility network as paid for by the developers and by Amazon as a total.

How Much OpEx Needs to be Cut?

Amazon 2022 Financial Results Projected Based on 2021 Q1 Versus 2022Q1 (000)

Amazon

		2021 Q1	2022 Q1	2021 Q1 Annualization Factor	2021 Actual	2022 Projected	Annual Delta	Annual Delta %
North America	Net Sales	\$ 64,366	\$ 69,244	4.35	279,833	301,040	\$ 21,207	7.6%
	Operating Expenses	\$ 60,916	\$ 70,812	4.47	272,562	316,841	\$ 44,279	16.2%
	Operating Income	\$ 3,450	-\$ 1,568		\$ 7,271	-\$ 15,800	-\$ 23,071	
Rest of World	Net Sales	\$ 30,649	\$ 28,759	4.17	127,787	119,907	-\$ 7,880	-6.2%
	Operating Expenses	\$ 29,397	\$ 30,040	4.38	128,711	131,526	\$ 2,815	2.2%
	Operating Income	\$ 1,252	-\$ 1,281		-\$ 924	-\$ 11,619	-\$ 10,695	
AWS	Net Sales	\$ 13,503	\$ 18,441	4.61	62,202	84,949	\$ 22,747	36.6%
	Operating Expenses	\$ 9,340	\$ 11,923	4.68	43,670	55,747	\$ 12,077	27.7%
	Operating Income	\$ 4,163	\$ 6,518		\$ 18,532	\$ 29,202	\$ 10,670	
Total	Net Sales	\$ 108,518	\$ 116,444		\$ 469,822	\$ 505,896	\$ 36,074	7.7%
	Operating Expenses	\$ 99,653	\$ 112,775		\$ 444,943	\$ 504,114	\$ 59,171	13.3%
	Operating Income	\$ 8,865	\$ 3,669		\$ 24,879	\$ 1,782	-\$ 23,097	

- Based on this analysis Amazon needs to reduce OpEx by **\$23.1B** to return to 2021Q1 Operating Income levels
- This needs to be done at the same time that North American sales are expanding by **7.6%**

We Assume OpEx Cuts are Allocated by Expense Type

Amazon Financial Results: 2022 Projections

Amazon

Income Statement (Millions)		2021	2022 Projected (Do Nothing)	Annual Delta	Scenario 1		Scenario 2	
					2022 Projected (Do Something)	Necessary Cuts (Best Case)	2022 Projected (Do Something)	Necessary Cuts (Worst Case)
Sales	Net Product Sales	\$ 241,787	\$ 237,430	-\$ 4,357	\$ 237,430		\$ 237,430	
	Net Services Sales	\$ 228,035	\$ 268,085	\$ 40,050	\$ 268,085		\$ 268,085	
	Total Net Sales	\$ 469,822	\$ 505,515	\$ 35,693	\$ 505,515		\$ 505,515	
	Cost of Sales	\$ 271,984	\$ 291,518	\$ 19,534	\$ 278,206	-\$ 13,312	\$ 291,518	
	Gross Profit	\$ 197,838	\$ 213,997	\$ 16,159	\$ 227,309		\$ 213,997	
Global Operating Expenses	Fulfillment Expense	\$ 75,111	\$ 92,110	\$ 16,999	\$ 87,904	-\$ 4,206	\$ 78,429	-\$ 9,928
	Marketing and Sales Expense	\$ 32,551	\$ 43,632	\$ 11,081	\$ 41,640	-\$ 1,992	\$ 37,152	-\$ 4,703
	Technology and Content Expense	\$ 56,052	\$ 66,618	\$ 10,566	\$ 63,576	-\$ 3,042	\$ 56,723	-\$ 7,180
	General and Administrative Expense	\$ 8,823	\$ 11,518	\$ 2,695	\$ 10,992	-\$ 526	\$ 9,808	-\$ 1,242
	Other Operating Expenses	\$ 62	\$ 406	\$ 344	\$ 388	-\$ 19	\$ 346	-\$ 44
	Total Operating Expense	\$ 444,583	\$ 505,803	\$ 61,220	\$ 482,706	-\$ 23,097	\$ 482,706	-\$ 23,097
	Total Operating Income	\$ 25,239	-\$ 287	-\$ 25,526	\$ 22,810		\$ 22,810	

- Assuming that \$23.1B needs to be cut then we allocate this amount by expense category
 - Scenario 1 - Cost of sales expense is cut by driving more revenue through 3P fees, logistics services
 - Scenario 2 – Operating expenses reduced as cost of sales rise due to inflationary pressures

Amazon Financial Results: Required Fulfillment Expense Reduction

Amazon

Fulfillment Expense by Type		% of Total	2021 Estimate	2022 Projected (Do Nothing)	Scenario 1 2022 Projected (Do Something)	Scenario 2 2022 Projected (Do Something)	Scenario 1 Necessary Cuts (Best Case)	Scenario 2 Necessary Cuts (Best Case)
North America	Labor	56%	\$ 29,444	\$ 34,227	\$ 32,578	\$ 30,335	-\$ 1,649	-\$ 3,892
	Lease	7%	\$ 3,680	\$ 4,278	\$ 4,072	\$ 3,792	-\$ 206	-\$ 486
	Depreciation	5%	\$ 2,629	\$ 3,056	\$ 2,909	\$ 2,708	-\$ 147	-\$ 347
	Packaging	14%	\$ 7,361	\$ 8,557	\$ 8,144	\$ 7,584	-\$ 412	-\$ 973
	All Other	18%	\$ 9,464	\$ 11,001	\$ 10,471	\$ 9,751	-\$ 530	-\$ 1,251
	NA Fulfillment Expense	100%	\$ 52,578	\$ 61,119	\$ 58,175	\$ 54,169	-\$ 2,944	-\$ 6,950
Rest of World	Fulfillment Expense	56%	\$ 12,619	\$ 12,895	\$ 12,188	\$ 11,227	-\$ 707	-\$ 1,668
	Marketing and Sales Expense	7%	\$ 1,577	\$ 1,612	\$ 1,524	\$ 1,403	-\$ 88	-\$ 208
	Technology and Content Expense	5%	\$ 1,127	\$ 1,151	\$ 1,088	\$ 1,002	-\$ 63	-\$ 149
	General and Administrative Expense	14%	\$ 3,155	\$ 3,224	\$ 3,047	\$ 2,807	-\$ 177	-\$ 417
	Other Operating Expenses	18%	\$ 4,056	\$ 4,145	\$ 3,918	\$ 3,609	-\$ 227	-\$ 536
	ROW Fulfillment Expense	100%	\$ 22,533	\$ 23,026	\$ 21,764	\$ 20,048	-\$ 1,262	-\$ 2,978
Global	Total Fulfillment Expense		\$ 75,111	\$ 84,145	\$ 79,939	\$ 74,217	-\$ 4,206	-\$ 9,928

- Assuming that \$23.1B needs to be cut then we allocate this amount by expense category
 - Scenario 1 - Cost of sales expense is cut by driving more revenue through 3P fees, logistics services
 - Scenario 2 – Operating expenses reduced as cost of sales rise due to inflationary pressures

How Much OpEx Needs to be Cut?

- NA Labor Reduction Target: **65,000 FTEs**
- NA Sq Ft Reduction Target by YE22: **30 - 46M Sq Ft** (11%)
- This rough-cut analysis tries to put a conservative order of magnitude on the right-sizing effort in 2022
- The FTE reduction should easily be achieved in the next several months due to normal attrition in the warehouse
- The reduction in space will take longer and will result in one-time write-off expense in 2022 for thruway CapEx

Recently Cancelled Projects

- **20** U.S. projects totaling **7.4 M sq ft** have recently been cancelled for various reasons and the table below is what we believe to be unfolding in the USA to date:

Location	Cancelled/ Closed	Sq Ft Added Ground-Level (000)	Sq Ft Added Incl. Mezzanines (000)	Estimated CapEx \$M	Notes
Delivery Stations:					
Hayward, California	Cancelled	507	507	\$ 64	Subleased due to failure to obtain permit.
Oceanside, California	Cancelled	143	143	\$ 24	Cancelled due to failure to obtain permit.
San Leandro, California	Closed	294	294	\$ 39	Closed and subleased. Facility was leased but never opened.
San Leandro, California	Closed	137	137	\$ 24	Closed and subleased. Facility was leased but never opened.
Santa Rosa, California	Cancelled	181	181	\$ 28	Cancelled. No reason provided.
Sonoma, California	Cancelled	250	250	\$ 35	Cancelled. No reason provided.
West Covina, California	Cancelled	177	177	\$ 28	Cancelled due to public protests.
Arvada, Colorado	Cancelled	112	112	\$ 40	Cancelled due to public protests.
Branford, Connecticut	Cancelled	98	105	\$ 20	Cancelled. No reason provided.
Gaithersburg, Maryland	Cancelled	200	200	\$ 92	Cancelled. No reason provided.
New York City, New York	Closed	87	87	\$ 12	Facility opened and closed shortly thereafter. Now up for sublease.
Wilmington, North Carolina	Cancelled	142	142	\$ 30	Cancelled. No reason provided.
Sortation Centers					
Bessemer, Alabama	Cancelled	278	278	\$ 58	Cancelled. Shortly after labor union vote.
Fulfillment Centers					
Salinas, California	Cancelled	640	2,800	\$ 458	Build to Suit facility. Now up for sublease.
Hoffman Estates, Illinois	Cancelled	250	250	\$ 35	Build to Suit Sub Same-Day FC. Now up for sublease.
Hudson, New Hampshire	Cancelled	1,000	1,000	\$ 120	Cancelled due to public protests.
Hudson, New Hampshire	Cancelled	1,000	1,000	\$ 120	Cancelled due to public protests.
Peñitas, Texas	Cancelled	650	2,800	\$ 300	Cancelled. No reason provided.
Round Rock, Texas	Cancelled	635	2,800	\$ 250	Cancelled. No reason provided. Acquired land wil likely be sold off.
Lawrence, Wisconsin	Cancelled	635	2,800	\$ 330	Cancelled. No reason provided.
20 Facilities		7,417	16,064	\$ 2,107	
Fulfillment Centers Delayed Openings:					
Davenport, Iowa	Delayed	640	2,911	\$ 250	Delayed opening by 1 - 2 years from Sep 2022 to 2024.
Clarksville, Tennessee	Delayed	1,008	1,008	\$ 130	Delayed opening by 8-10 Months from Aug 2022 to 2023.

Amazon Lease vs Own Prior to 2022

Facility Type (Primary Role)	Facility Existing or New	Facility Open (Y/N)	Facility Code Name	Ground Square Feet	Mezzanine Square Feet	Total Working Square Feet	Site Acres	Address	City	State/ Province
D	Existing	Y	DOT4	308,780	-	308,780	18	3001 Mission Oaks Blvd	Camarillo, Ventura	California
D	Existing	Y	DPS2	220,000	70,220	290,220	44	400 National Way	Simi Valley	California
D	Existing	Y	DPS5	155,680	-	155,680	23	28820 Chase Place	Valencia	California
D	Existing	Y	DPS6	211,575	-	211,575		1757 Tapo Canyon Rd	Simi Valley	California
D	Existing	Y	DRD8	32,000	-	32,000		201 Toland Street	San Francisco	California
D	Existing	Y	DSJ7	77,608	-	77,608	11	615 North King Rd	San Jose	California
D	Existing	Y	DYO5	124,000	-	124,000	35	7120 Main Street	Trumbull	Connecticut
D	Existing	Y	DGE7	1,009,360	-	1,009,360		2125 Anvilblock Rd	Ellenwood	Georgia
D	Existing	Y	DGT2	156,263	-	156,263	16	4000 Venture Drive	Duluth	Georgia
D	Existing	Y	DXH5	260,000	-	260,000	16	3523 South Ashland Avenue	McKinley Park, Chicago	Illinois
D	Existing	Y	DMD9	276,080	-	276,080	28	1000 Prince Georges Blvd	Upper Marlboro	Maryland
D	Existing	Y	DOR3	111,600	-	111,600	21	223 W Mercury Boulevard	Hampton, Newport News	Virginia
D	Existing	Y	DVA3	200,000	-	200,000	61	181 Centreport Pkwy	Stafford, Fredericksburg	Virginia
D	Existing	Y	WTN1	70,350	-	70,350		103 Thomas Road	Bristol	Virginia

- Historically, Amazon has leased every warehouse building in the USA with the exception of the 14 delivery stations listed above
 - 3.2 M out of 376M sq ft or < 1%

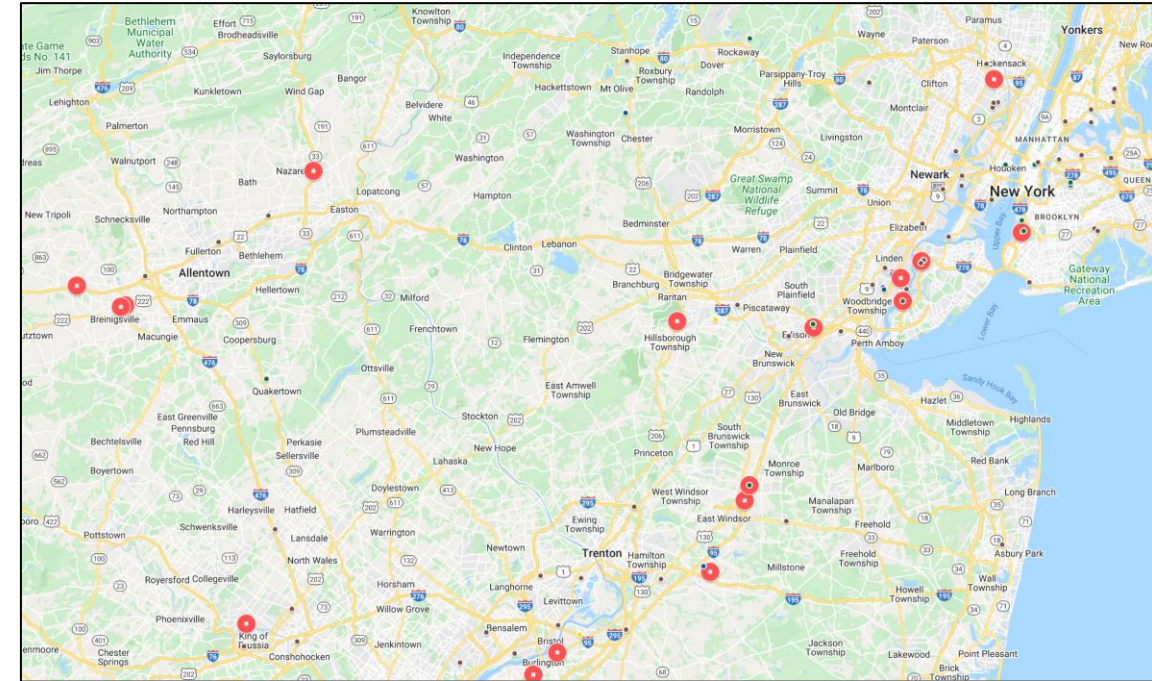
Amazon Lease vs Own into the Future

Facility Type (Primary Role)	Facility Existing or New	Facility Open (Y/N)	Facility Code Name	Ground Square Feet	Mezzanine Square Feet	Total Working Square Feet	Site Acres	Address	City	State/Province	Zip Code/Postal Code
F	New Confirmed	N		823,871	3,046,129	3,870,000	152	SW Corner County Road 30 and I-25	Loveland	Colorado	80528
F	New Not Confirmed	N		823,969	2,167,000	2,990,969	133	West side of Hiatus Road, Between NV	Sunrise	Florida	33351
F	New Confirmed	N	BTR1	855,000	2,945,000	3,800,000		9001 Cortana Place	Baton Rouge	Louisiana	70815
A	New Confirmed	N	KBOI	31,000	-	31,000	3	W. Gowen Road	Boise	Idaho	83705
S	New Confirmed	N		701,572	-	701,572	71	Pecos Road west of Signal Butte Rd	Mesa, Phoenix	Arizona	85212
S	New Confirmed	N		560,000	-	560,000	77	Northeast 147th Avenue and north of N	Vancouver	Washington	98682
D	New Confirmed	N		180,000	-	180,000	43	SW Corner of Elliot Road and Everton	Mesa, Phoenix	Arizona	85212
D	New Confirmed	N		100,000	-	100,000	51	Valencia & Kolb	Tucson	Arizona	85756
D	New Confirmed	N		423,000	-	423,000	18	3175 Mission Oaks Blvd	Camarillo, Ventura	California	93012-8710
D	New Confirmed	N	DSF9	215,000	-	215,000		1000 San Mateo Ave	San Bruno	California	94066
D	New Not Confirmed	N	DXC1	143,153	-	143,153	59	Intersection of Highway 152 and Camir	Gilroy	California	95020
D	New Confirmed	N		112,485	-	112,485	17	625 N. Grand Ave.	Santa Ana	California	92701
D	New Confirmed	N		94,325	-	94,325	18	1605 S 7th Street	San Jose	California	95112
D	New Not Confirmed	N		150,000	575,000	725,000	6	900 Seventh Street	San Francisco	California	94107
D	New Not Confirmed	N		201,000	-	201,000	59	3000 Busch Road	Pleasanton	California	94566
D	New Confirmed	N		105,000	-	105,000	19	4607 Forge Rd	Colorado Springs	Colorado	80907
D	New Confirmed	N		10,000	-	10,000	26	10 Victoria Ave	Monroe	Connecticut	06468
D	New Confirmed	N		123,768	-	123,768	26	6604 S. Dale Mabry Highway	Tampa	Florida	33611
D	New Confirmed	N		123,115	-	123,115	48	NW Passage	Tallahassee	Florida	32303
D	New Confirmed	N	DAT8	141,360	-	141,360	40	5663 3rd Army Rd SE	Acworth	Georgia	30101
D	New Confirmed	N		103,000	-	103,000	24	Catalina Drive	Chamblee	Georgia	30341
D	New Confirmed	N		100,000	-	100,000	14	2101 Auiiki St.	Kalihi Kai, Honolulu	Hawaii	96819
D	New Confirmed	N		22,500	-	22,500	49	91-310 Hanua St	Kapolei, West O'ahu	Hawaii	96707
D	New Confirmed	N	DIL8	100,000	-	100,000		2101 W Lake St #2141	Melrose Park	Illinois	60101
D	New Confirmed	N		300,000	-	300,000	70	3000 W 51st St	Gage Park, Chicago	Illinois	60632
D	New Confirmed	N		141,360	-	141,360	26	1260 N. Kostner Ave	West Humboldt Park, Chicago	Illinois	60651
D	New Not Confirmed	N		102,000	-	102,000		565 Squire Road	Revere	Massachusetts	02151
D	New Confirmed	N		181,500	-	181,500	57	Lakeshore and Bayview Road	Hamburg, NY	New York	14219
D	New Not Confirmed	N		180,000	-	180,000	65	Southridge Parkway and Gastonia Park	Bessemer City	North Carolina	28016
D	New Confirmed	N		230,132	-	230,132	25	760 Moore Rd	King of Prussia	Pennsylvania	19406
D	New Not Confirmed	N		141,386	-	141,386		E Pittsburgh McKeesport Blvd	North Versailles, Pittsburgh	Pennsylvania	15137

- The table above lists 31 Amazon facilities not yet open (i.e. future) that are owned instead of leased – they total 7.5M sq ft
- We currently show a total of 111M sq ft of future new space projected for the U.S. market so ownership represents **6.8%** new space
 - The number % may be slightly higher because we do not have complete visibility into lease versus own, but it is still a relatively small percentage in the big picture

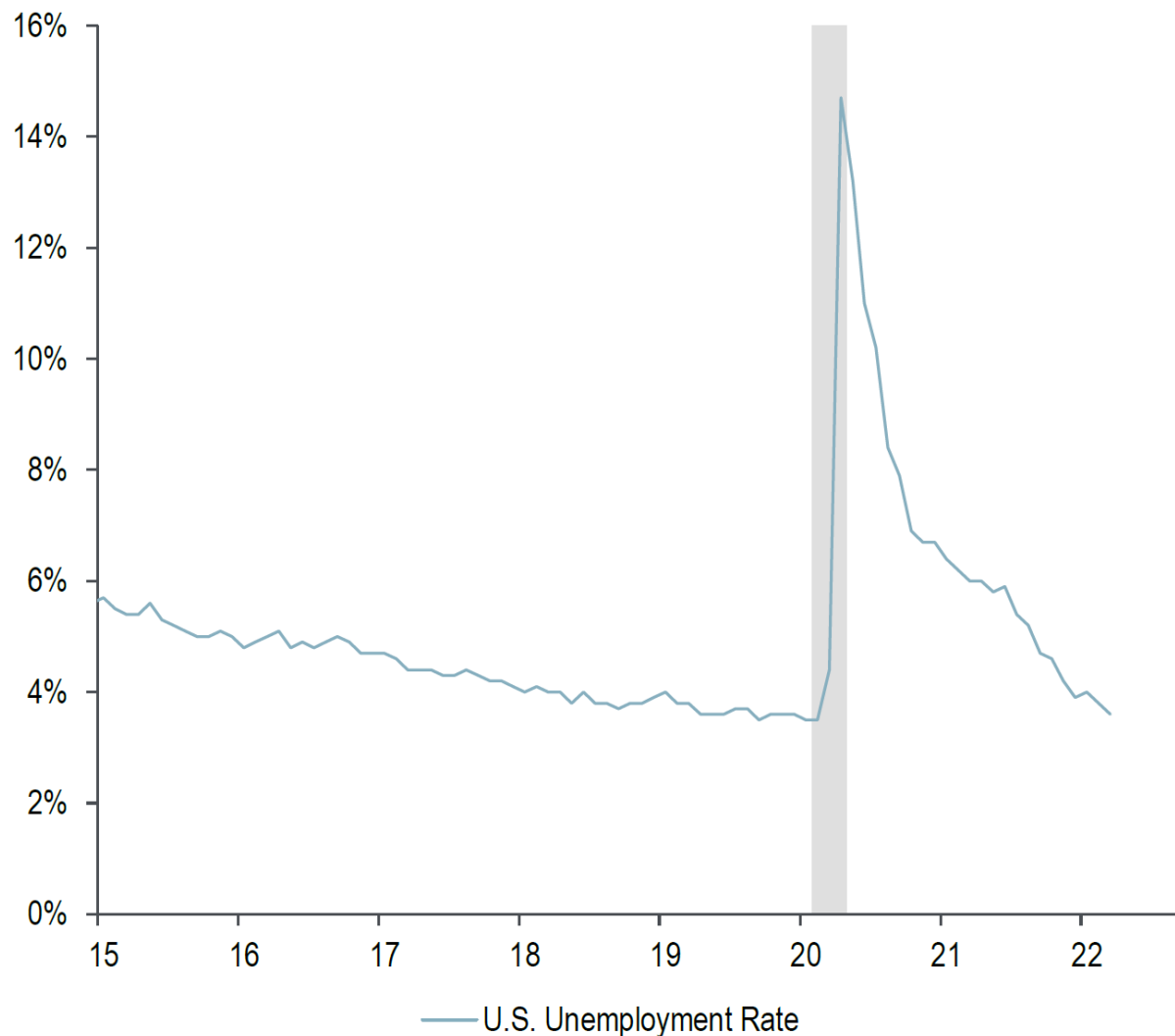
Impact of New Labor Union in Staten Island

- Staten Island FC:
 - Small Sortable
 - 5,000 employees
 - \$18 base hourly wage rate
 - Annual Wages & Benefits est. \$338M
 - Union wants \$30 wage rate which is too high and would increase labor cost by \$218M at this facility alone
 - Facility ships 450M units/yr (est.) and Amazon has the option to shift volume to other nearby FCs in the event of a slowdown or strike
- Main risk of the union is the domino effect that this could spread to other markets such as Baltimore, Chicago, Detroit, Cleveland, Los Angeles
- Much will depend on how Amazon responds to the upcoming challenges in labor relations in the months ahead



The red dots represent other non-union Amazon FCs that are within a reasonable distance to New York City such that Amazon could siphon volume away from Staten Island in the event of a work stoppage or unreasonable wage rate demands

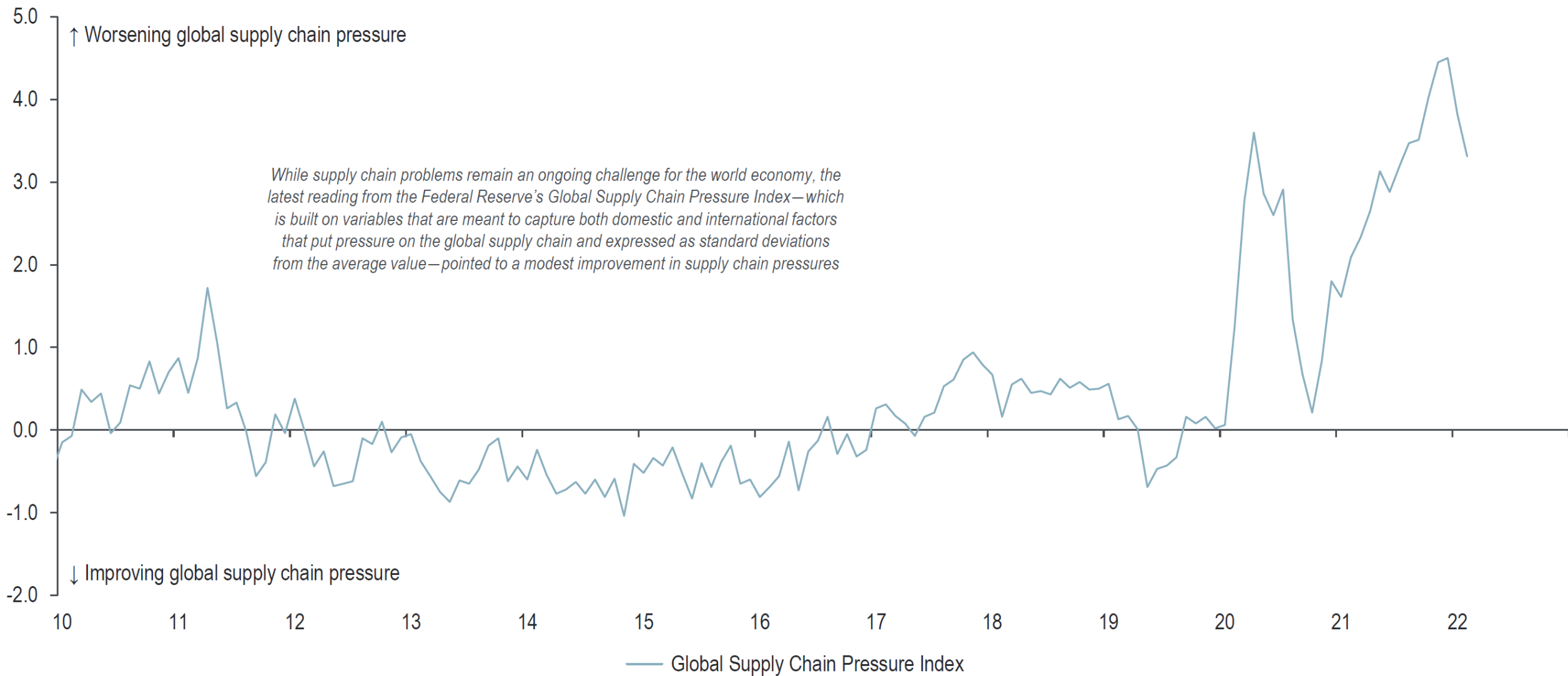
Labor Market Conditions Challenged with Inflationary Pressure



Source: RBC Wealth Management, Bloomberg, Federal Reserve; shaded regions are U.S. recessions; data through 4/22/22

Supply Chain Disruptions Remain Elevated

Significantly Higher CapEx and Longer Lead Times for New Facility Construction



Source: RBC Wealth Management, Bloomberg, Federal Reserve; shaded regions are U.S. recessions; data through 4/22/22

A Look Ahead - What's Next

➤ USA:

- Goal: To be within 45 minutes of 90% of the U.S. Population.
 - Currently at 77% up from 51% in 2018
- Expansion of up to **150** sub-same day fulfillment centers with 5-hour service level
- Expand delivery station network by an additional **800** facilities
- Increase aircraft from **80 to 200** by 2028
- Invest and expand in hundreds of automated food distribution facilities and Amazon Fresh brick & mortar stores
- Logistics as a Service Offering (LSO)
- Buy with Prime initiative

➤ Rest of World:

- Continued expansion in UK and Germany in line with e-commerce growth projections > 10%/year
- Modest expansion into developing markets: Brazil, Mexico, Middle East
- Advancement of Amazon air and delivery station network throughout Europe
- Potential new markets: Israel, South Africa

Amazon: Recap of Current Situation

➤ Looking Back:

- 2019 – 2021 Amazon sales soared from **\$280 to \$469 Billion** (67%) and market cap surged to **\$1.7 Trillion**
- In the US alone, 100M sq ft of new space added in 2020 and in 2021 = **200M sq ft** which is 1.35X Walmart's footprint which took 53 years to build
- 2022Q1 Sales down **-1.8% (\$1 B)** versus 2021Q1 but fulfillment expense is up by **22.6% (\$3.7B)**
- This hefty build-out will drag on the bottom line until it is right-sized and this process is well underway with the company looking to sublease delivery stations and shed underperforming assets
- Since 2015 shipping cost per fulfilled unit has consistently increased from **\$2.28 to \$3.70 (62%)** as service levels get faster and the company moves closer to market
- Labor union in NYC and inflationary labor cost pressure due to lack of available unskilled blue-collar labor
- Competitors innovating and becoming smarter and better at supporting online retail

➤ Looking Ahead:

- Choppy waters and uncertainty ahead
- Amazon is a high-speed freight train that can't stop on a dime and they have numerous options available to return to profitability
- Company scheduled to add **83M sq ft** to the US market in 2022 – most of these projects well underway already. About **8M sq Ft** remain unconfirmed.
- The warehouse market is tight thus Amazon will be able to slim down quickly by shedding non-core under performing assets such as non-essential delivery stations, older manual fulfillment centers, rest of world facilities and retail stores
- Amazon has higher than normal warehouse labor turnover thus the ability to reduce head count through attrition will be fast
- Higher 3P and fuel surcharge fees will likely be passed on to help defer rising expenses
- Generating revenues through Buy with Prime and Logistics as a Service will be a high priority

Closing Thoughts

- The E-Commerce retail channel has created a renaissance for the supply chain
- Amazon is a freight train that has disrupted nearly every industry that it has touched
- 2022 will see a significant reduction in growth for online sales as people get back to normal and return to brick and mortar stores
- Amazon will need to right size labor costs and overall footprint due to overbuild within fiscal 2022 but profitability will likely be nil
- Choppy waters in the short term but Amazon and the rest of the retail channel will continue to expand capacity to support online sales growth into the future

Amazon Facility Types – Each Has a Different Role in the Supply Chain

➤ **Fulfillment Centers:**

- Small & Large Sortable
- Heavy / Bulky / Non-Sortable
- SubSameDay - Co-located Delivery Station
- Specialty
- Pantry / Fresh
- Supplemental Fulfillment Centers (Seasonal)
- Prime Now Hubs
- Returns Processing Centers

➤ **Logistics Centers:**

- Inbound Cross Dock Centers (IXD)
- Airport Cargo / Airport Sortation Hubs
- Outbound Sortation Centers
- Delivery Stations
 - Small Package
 - Heavy / Bulky (w/ White Glove)
 - Wagon Wheel (Rural)

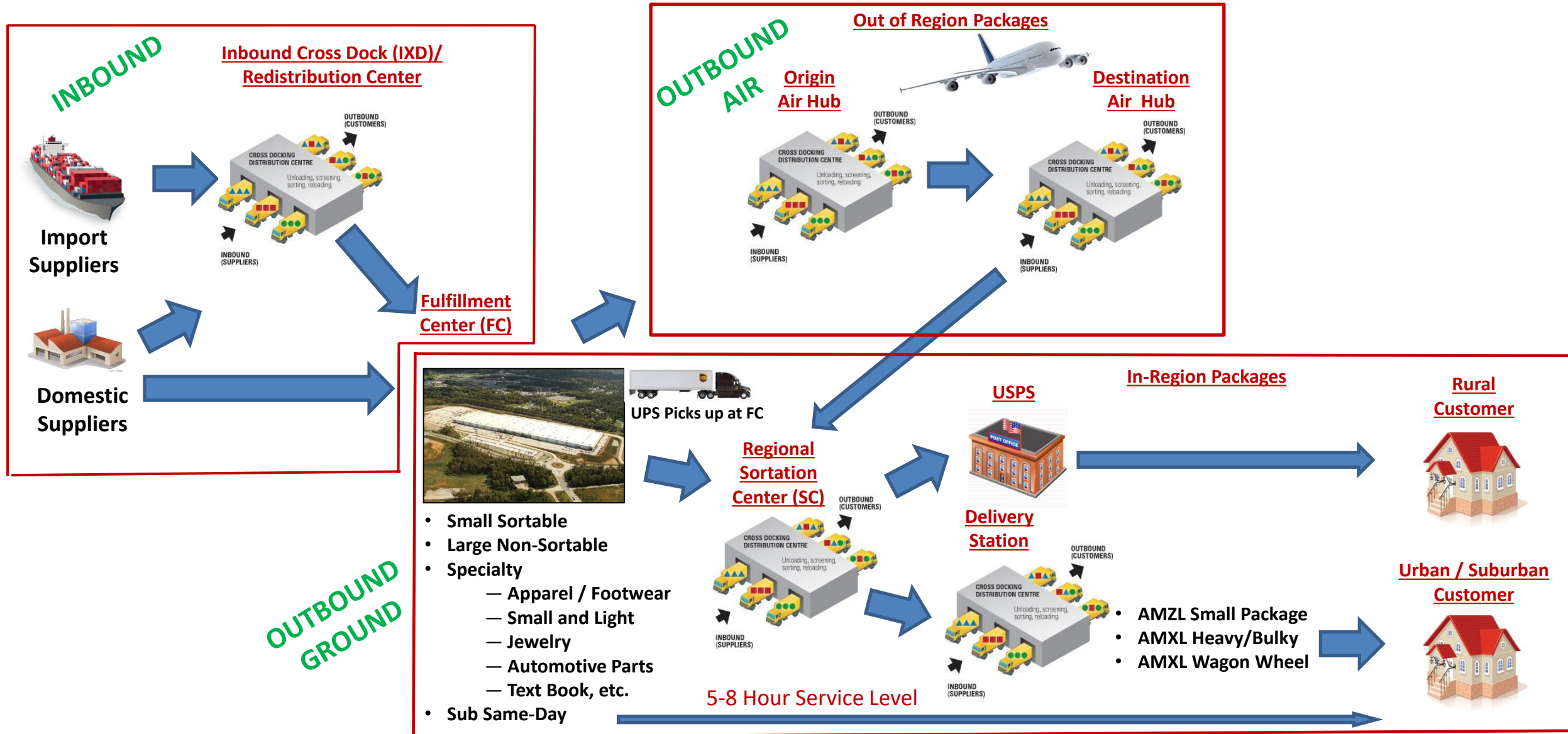
Fulfillment Facilities that Service Customers and generate revenue



Logistics Facilities that service Amazon's Transportation Network




Amazon Supply Chain in a Nutshell



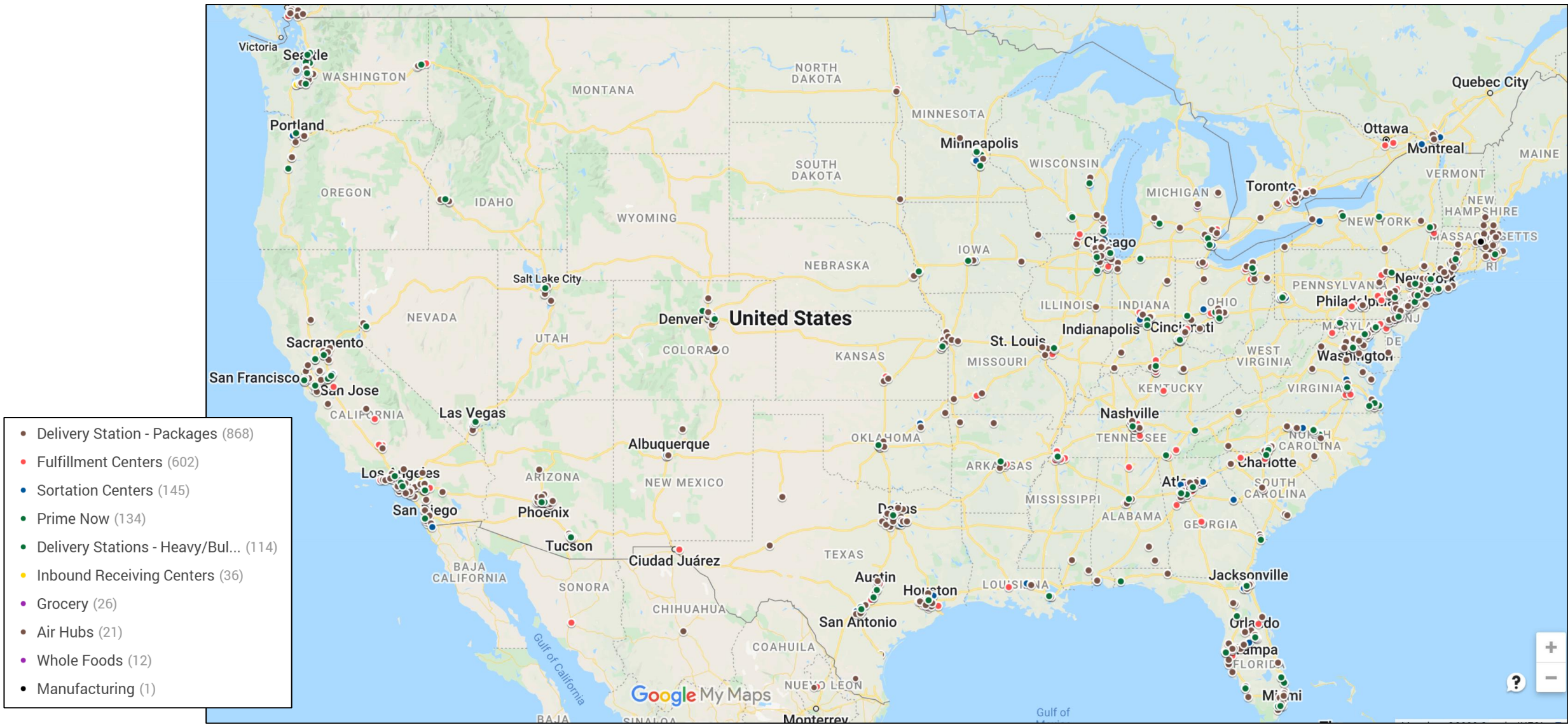
Amazon is in the Process of Adding 110M Sq Ft to its US Distribution Network

The Vast Majority of this Space Will Go Live in 2022-2023 Unless Projects are Delayed/Cancelled

					Ground-Level		Including Mezzanines		
Flag	Country	Facility Type	Currently Active Facilities	Future Facilities	Active Square Feet	Future Square Feet	Active Square Feet	Future Square Feet	% Increase
	United States of America	Small Sortable Fulfillment Centers	92	43	73,648,843	30,068,667	188,419,490	132,644,533	70.4%
		Large NonSortable FCs	104	30	95,114,525	30,670,090	103,138,232	31,706,569	30.7%
		3PL NonSortable FCs	12	0	6,431,265	-	6,431,265	-	0.0%
		Specialty Fulfillment Centers	49	6	23,624,189	1,242,926	26,634,189	1,248,656	4.7%
		Sub Same Day Fulfillment Centers	30	16	4,913,783	3,390,655	4,913,783	3,390,655	69.0%
		Supplemental	18	0	4,321,778	-	4,321,778	-	0.0%
		Retruns Processing Centers	7	0	3,740,269	-	3,740,269	-	0.0%
		Pantry/Fresh Food FCs	22	2	5,537,381	1,026,480	5,537,381	1,026,480	18.5%
		Whole Foods Retail Grocery DCs	12	1	1,566,172	132,942	1,566,172	132,942	8.5%
		Prime Now Hubs	79	1	3,066,150	145,000	3,083,660	145,000	4.7%
		Inbound Receiving Centers	29	11	17,621,465	6,804,914	19,933,377	6,804,914	34.1%
		Outbound Sortation Centers	98	28	36,265,826	10,324,518	36,380,403	10,504,518	28.9%
		Delivery Stations (Packages)	522	154	93,186,781	26,009,733	93,276,908	27,139,720	29.1%
		Delivery Stations (Heavy/Bulky)	128	3	5,068,656	145,403	5,068,656	145,403	2.9%
		Airport Hubs	20	4	5,074,634	352,277	8,176,634	352,277	4.3%
		SubTotal USA	1222	299	379,181,716	110,313,605	510,622,196	215,241,667	42.2%
		SubTotal Rest of World			975	77	159,920,568	24,073,203	216,593,078
Global Total			2197	376	539,102,284	134,386,808	727,215,274	256,850,554	35.3%

- In 2021, Amazon added an estimated **194 Million square feet (Including Mezzanines)** of new distribution center space globally which is completely unprecedented in mankind's history
- This is an average of **3.7 Million square feet per week** which is astonishing since many large retailers add this amount of space to their network once every decade
- Signs of a slow down after 2022 for new fulfillment center and logistics space are clearly underway

Amazon USA (Current + Projected Facilities)



Small Sortable Fulfillment Center (92 Active in USA)

Typical New Facility: 640,000 Sq Ft with Floor-Level + 5 Mezzanine Levels Totaling 2.5 - 3.9 M Sq Ft



Legacy



**Amazon
Robotics**

- These buildings are typically build-to-suit can range in height from 80' to 125'
- \$250M - \$500M CapEx
- 1,500 – 6,000 employees
- 2 Types:
 - Legacy (older manual facilities)
 - Amazon Robotics (AR) (Newer)
- 3,000+ Amazon Robots/FC
- \$100 – 250M OpEx/Yr

U.S. Buildout of Small Sortable Fulfillment Centers: New Facilities

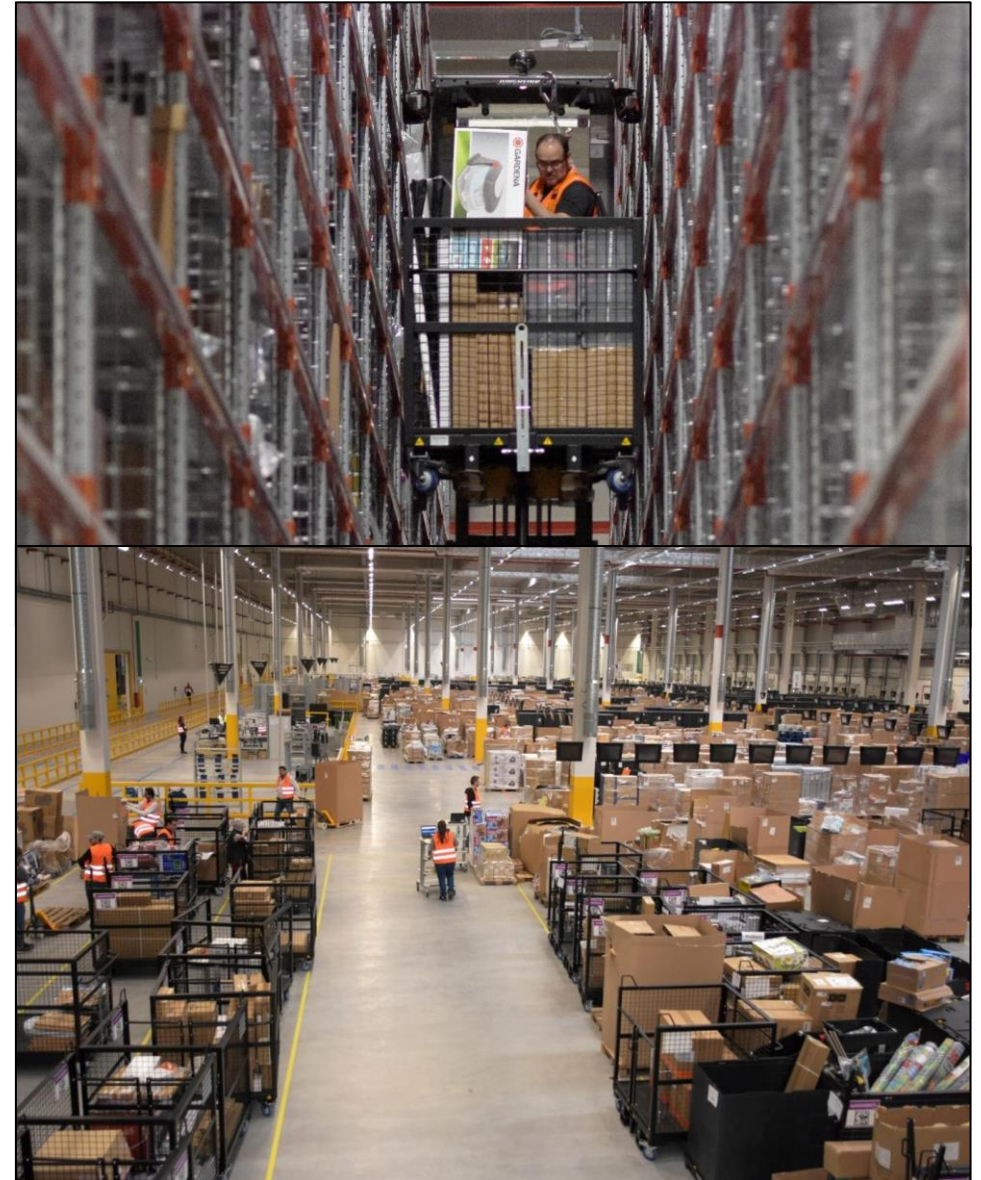
- Amazon is currently investing in **43** new 3,4 and 5-level (60' - 105' High) small sortable fulfillment centers across U.S. markets with populations as small as **250,000 people**.
- A list of small sortable FCs already under construction follows:

City State	Sq Ft/W Mezz (000)	Population (000)	City State	Sq Ft/W Mezz (000)	Population	City State	Sq Ft/W Mezz (000)	Population
Mesa AZ	635 / 2,900	4,661	Elkhart IN	800 / 3,800	204	Woodburn OR	630 / 3,850	2,425
Tracy CA	823 / 2,924	4,679	Davenport IA	629 / 2,910	382	Providence RI	820 / 3,865	1,615
Ontario CA	800 / 2,300	4,527	Baton Rouge LA	855 / 3,500	835	Sioux Falls SD	640 / 2,965	256
Ontario CA	800 / 4,100	4,527	Shreveport LA	650 / 3,400	442	Knoxville TN	635 / 3,600	869
San Jose CA	800 / 2,300	1,979	Hagerstown MD	798	264	San Antonio TX	750 / 3,727	2,429
Sacramento, CA	629 / 2,800	2,296	Boston MA	855 / 3,800	4,795	Waco TX	640 / 2,630	265
Loveland, CO	800 / 2,400	334	Worcester MA	640 / 2,900	936	Norfolk VA	860 / 3,837	1,727
Windsor/Hartford CT	640 / 3,730	1,206	Detroit MI	823 / 3,800	4,298	Richmond VA	650 / 2,600	1,282
Tampa FL	465 / 2,632	3,032	Jackson MS	700 / 2,800	579	Seattle WA	600 / 2,800	3,799
Fort Lauderdale FL	823 / 2,991	6,066	Omaha NB	700 / 2,700	924	Green Bay WI	635 / 2,800	318
Tallahassee FL	635 / 2,872	379	Buffalo NY	650 / 3,008	1,132	Madison WI	650 / 3,400	648
Daytona Beach FL	634 / 2,800	638	Syracuse NY	820 / 3,800	657			
Fort Myers FL	600 / 1,480	722	Rochester NY	640 / 2,600	1,079			
Atlanta GA	650 / 3,470	5,789	Greensboro, NC	635 / 1,995	756			
Savannah GA	640 / 3,730	384	Columbus OH	700 / 2,700	2,042			
Fort Wayne IN	629 / 2,900	432	Dayton OH	630 / 3,800	801			

Large Non-Sortable (104 Active in USA Excluding 3PL Sites)

Typical 1,000,000 Sq Ft – Large Non-Conveyable Products > 18”; \$100M CapEx; \$100 M OpEx Typical

- These buildings are standard height at 40’
- Build to suit, leased greenfield speculative and brownfield
- \$100M - \$140M CapEx
- 500 – 1,000 employees
- Robotics partially used, primarily manual operations
- \$100 – 250M OpEx/Yr

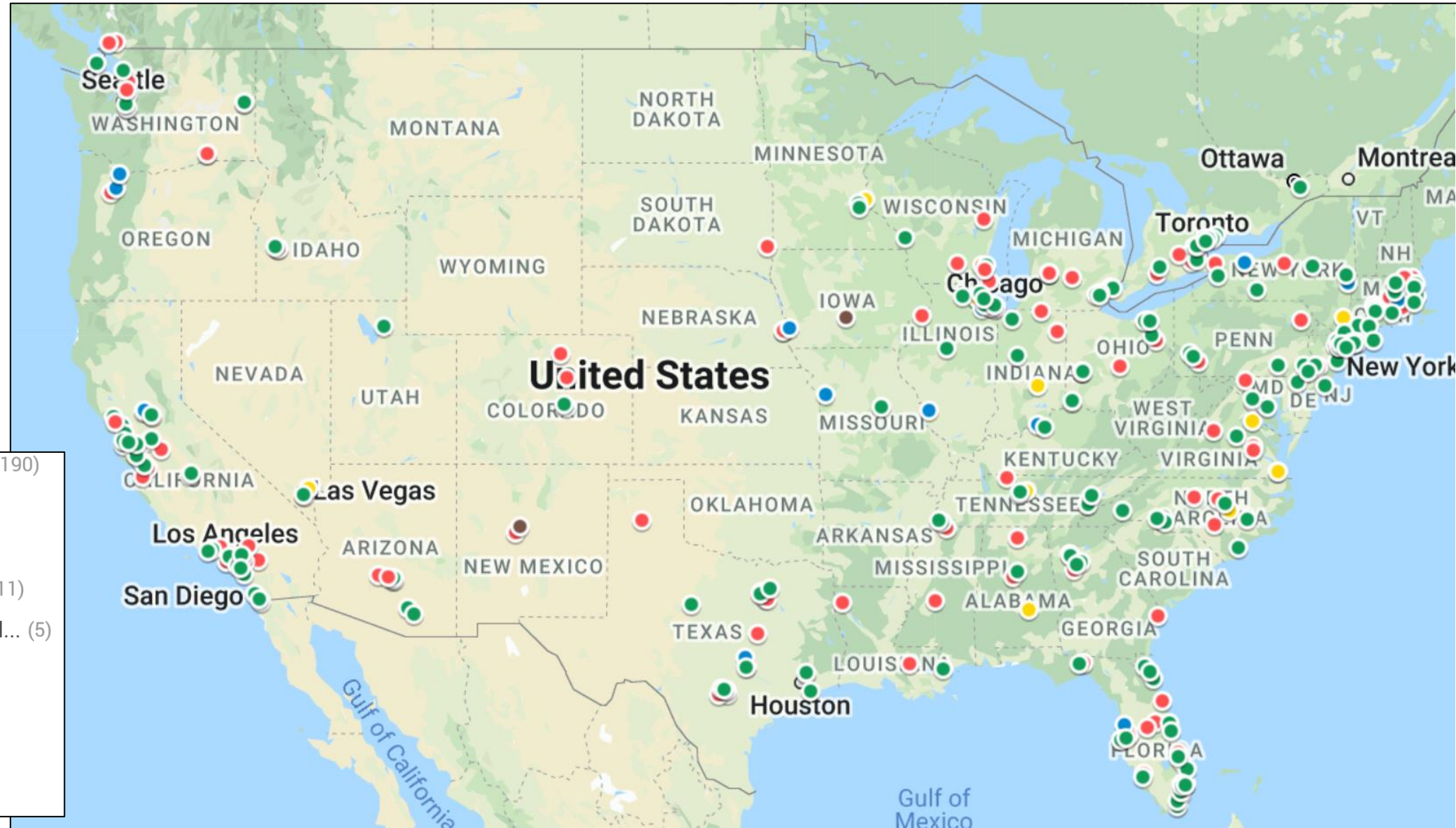


U.S. Buildout of Large Non-Sortable Fulfillment Centers: Projects Under Construction

- Amazon is currently investing in **30** new 1 and 2-level 40'-High large non-sortable fulfillment centers across U.S. markets with populations as small as **150,000 people**. A list of large non-sortable FCs under construction follows.

City State	Sq Ft/W Mezz (000)	Population (000)	City State	Sq Ft/W Mezz (000)	Population
Huntsville AL	1,000	448	Albuquerque NM	1,000	910
Beaumont CA	816	4,527	Fayetteville NC	1,000	380
Turlock/Modesto CA	1,080 / 1,249	542	Dayton OH	1,169	801
Hesperia CA	1,000	4,527	Canton OH	1,000	401
San Jose CA	1,050	1,979	Pittsburgh PA	1,000	2,342
Denver CO	1,000 / 1,200	2,853	Clarksville TN	1,100	282
Miami FL	1,100	6,066	San Antonio TX	1,005	2,430
Palm Beach FL	1,000	6,066	Wilmer / Dallas TX	1,075	7,233
Port St Lucie FL	1,100	465	Irving / Dallas TX	518	7,233
Atlanta GA	1,150	5,789	Dallas TX	1,000	7,233
Boise ID	1,082 / 1,350	691	Amarillo TX	1,000	263
Chicago, IL	1,160	9,513	Richmond VA	1,000	1,282
Joliet IL	1,035	147	Pasco WA	1,080	150
Lansing MI	1,000	475	Pasco WA	1,050	150
Memphis TN	1,000	1,343			
Omaha NB	1,000	924			

Amazon USA (New Future Facilities 2022 - 2024)





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Supply Chain Update
May 30 2022

Marc Wulfraat
President
Information@Mwpvl.com
(514) 482-3572 x 100