



Daniel Research Group
Understanding the Future

United States Personal Device Market Size and Forecast, 1975-2028 October 2024 Update

Table of Contents

[Our Approach](#)

[The Forecasting Challenge](#)

[Major Influencing Factors and Assumptions](#)

[Market Segment Forecast Overview](#)

[Product Forecast Tables and Charts](#)

[Desktop PCs](#)

[Mobile PCs](#)

[Tablets](#)

[Mobile Phones](#)

[Market Aggregations](#)

[Market Model Variables](#)

[Total Available Market \(TAM\)](#)

[Penetration](#)

[Density](#)

[Replacement Rates](#)

[Unit Shipments](#)

[Installed Base](#)

[Methodology](#)

[About Daniel Research Group](#)

Our Approach

The **Daniel Research Group's EquilibriumSolver (EQS)** is a forecasting methodology and application that utilizes a combination of long-term market trends, current unit shipments and revenue data, and analyst assessments of influencing economic, demographic, and market factors. The purpose of the **EQS** is to generate forecasts that are highly predictive by incorporating both mathematical calculations and insights from external sources.

The **EQS** algorithm considers variables such as Total Available Market (TAM), Penetration, Density, and Replacement Rate trends, as well as actual reported year-to-date data on unit shipments and revenue. Additionally, it incorporates the insights and expertise of our analysts regarding the magnitude and direction of major causal factors influencing the market.

By leveraging this comprehensive set of inputs, the **EQS** algorithm calculates forecasts for key variables and metrics. The algorithm aims to converge on the most likely forecast for each variable based on the provided input data and parameters. The resulting forecasts are expected to be both mathematically consistent and aligned with the narrative developed from external data, information, and analysts' knowledge and insights.

In summary, the core algorithm of the **Daniel Research Group's EquilibriumSolver** is designed to generate highly predictive forecasts by considering a wide range of factors and data, resulting in forecasts that are mathematically sound and consistent with the overall market narrative.

The Forecasting Challenge

Personal Computer, Tablet, and Smartphone vendors are beginning to introduce next generation products capable of supporting artificial intelligence (AI) applications and capabilities. The immediate challenge is to determine how the introduction of AI devices will influence the overall demand for personal computing and communication devices.

Consumer and Enterprise buyers will have a choice to replace their existing devices with an AI device or a non-AI device for at least the next two to three years. The rate that they will choose the AI device is almost entirely based on the availability of compelling applications that warrant the higher cost of the AI device, as well as overcoming the trust, privacy, security, and operational concerns. At the moment these compelling applications **do not exist**. AI adoptions has been almost entirely cloud based to date. However, we do expect these compelling applications to become available shortly.

The core **EQS** algorithm computes Unit Shipments as a function of four variables,

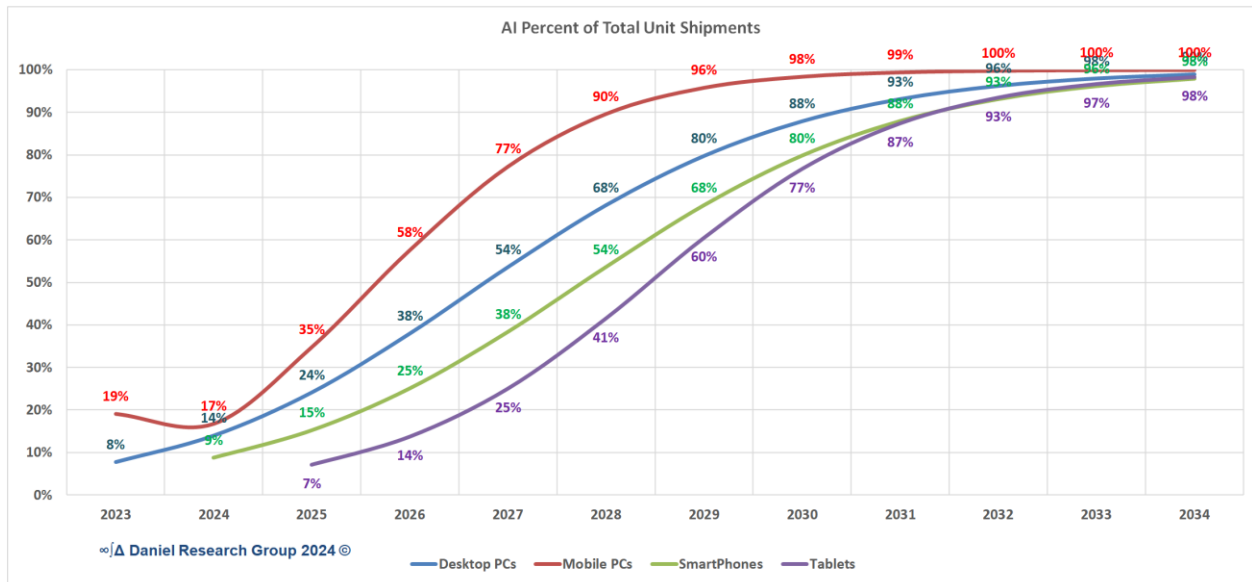
1. **Total Available Market (TAM)** – The number of Households and Business is unaffected by the introduction of AI devices
2. **Penetration Rate** – The percent of the TAM that owns and uses at least one device. If AI devices accelerate the Penetration Rate, it will be after compelling applications become available, than the only slightly.
3. **Density** – The average number of the device owned and used in a Household or Business that own and use at least one device. **DRG** does expect a percentage of users to purchased AI devices early in anticipation of future compelling applications to become available.
4. **Replacement Rate** – **DRG** does anticipate a slight increase in the replacement rate reflecting early buyer activity. Longer-term the overall replacement rate will not be effected by the introduction of AI devices and will continue to be reflective of economic conditions.

The tables and charts in this report cover our market size and forecast for the total PC, Tablet and Smartphone markets. Our AI market size and forecasts is covered in a separate report.

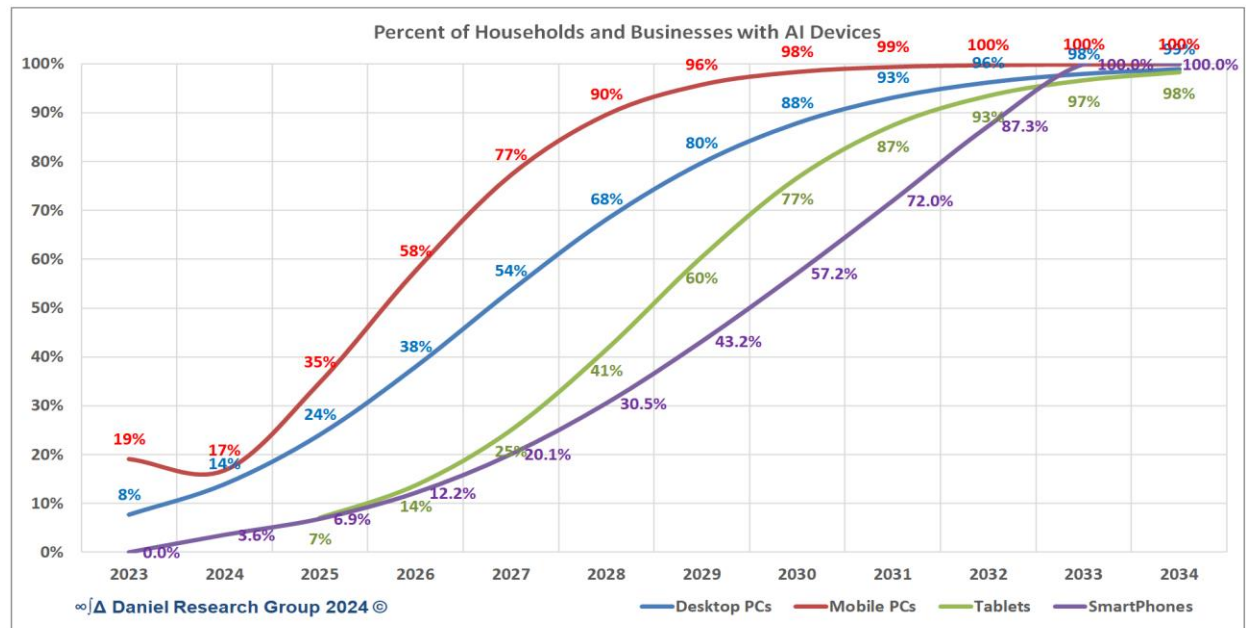
The United States AI Enabled Personal Computing Devices Market Size and Ten-Year Forecast

October 2024

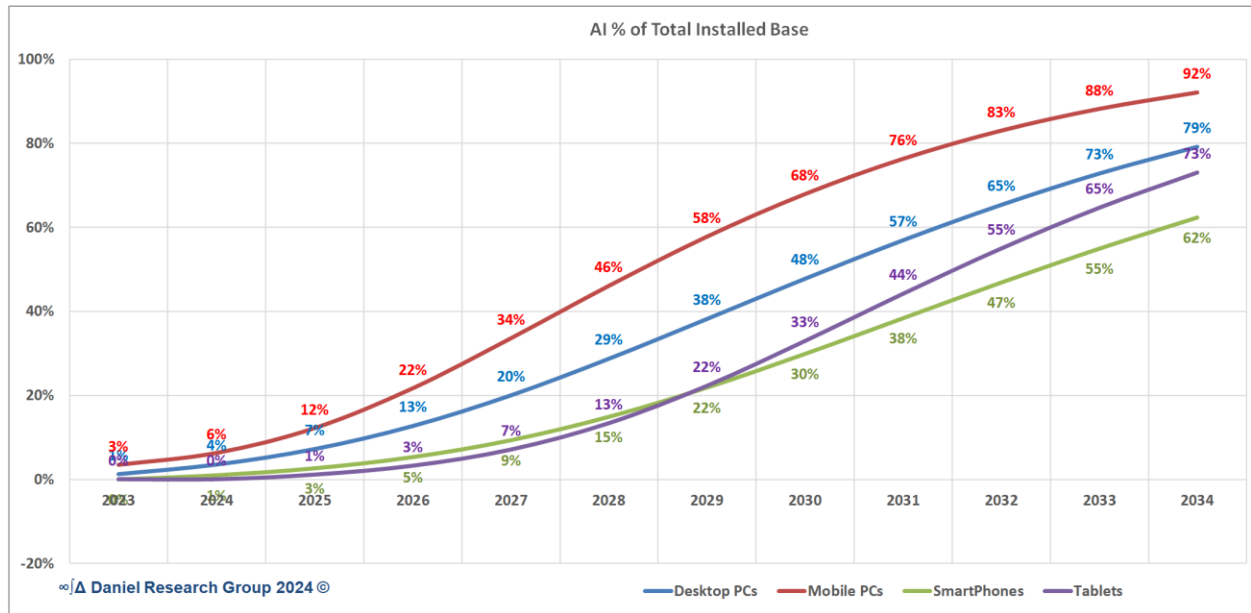
AI Percent of Unit Shipments



AI Market Penetration of Households and Businesses that own the Device

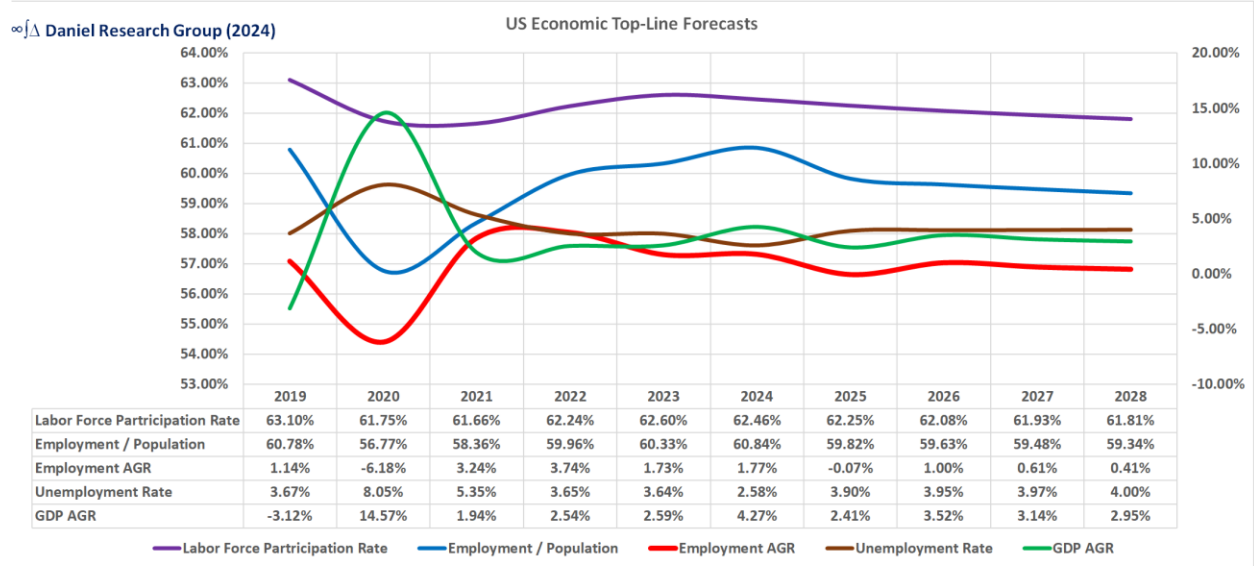


AI Percent of Installed Base



Major Influencing Factors and Assumptions

The US Economy



DRG develops its own forecast for Households and Business that are the Total Available Market for Personal Devices. Our forecasts are based on current economic forecast from government and major financial institutions. Our **Business Economic Demographic Database (BEDD)** report is also available [free from our web site](#).

United States Personal Device Market

Market Segment Forecast Overview

Total Market

		United States Total Personal Devices Unit Shipments (K)							
		2023	2024	2025	2026	2027	2028	CAGR ('22-'27)	Trend
Desktop PCs									
Desktop PC	Desktop PC	13,674	13,257	11,821	10,600	9,494	8,504	-9.1%	
AGR	AGR	-14.8%	-3.0%	-10.8%	-10.3%	-10.4%	-10.4%		
Mobile PCs									
Traditional Mobile PCs		42,701	48,016.8	49,192.9	50,387.4	51,517.5	52,643.4	4.3%	
AGR		-12.9%	12.4%	2.4%	2.4%	2.2%	2.2%		
Convertible Mobile PCs		7,597	8,993	9,386	10,086	10,804	11,551	8.7%	
AGR		-14.2%	18.4%	4.4%	7.5%	7.1%	6.9%		
	Total Mobile PCs	50,298	57,010	58,579	60,474	62,321	64,194	5.0%	
AGR	AGR	-13.1%	13.3%	2.8%	3.2%	3.1%	3.0%		
Total PCs									
	Total PCs	63,972	70,267	70,400	71,073	71,815	72,698	2.6%	
AGR	AGR	-13.5%	9.8%	0.2%	1.0%	1.0%	1.2%		
Tablets									
Detachable		19,233	25,349	23,886	24,475	24,918	25,257	5.6%	
AGR		-21.3%	31.8%	-5.8%	2.5%	1.8%	1.4%		
Slate		14,694	17,043	17,779	17,001	16,239	15,511	1.1%	
AGR		-47.1%	16.0%	4.3%	-4.4%	-4.5%	-4.5%		
	Total Tablets	33,927	42,392	41,665	41,477	41,156	40,768	3.7%	
AGR	AGR	-35.0%	25.0%	-1.7%	-0.5%	-0.8%	-0.9%		
Total Computers									
Total Computers		97,899	112,659	112,066	112,550	112,971	113,466	3.0%	
AGR		-13.5%	9.8%	0.2%	1.0%	1.0%	1.2%		
Mobile Phones									
	Standard Phone	5,139	4,101	4,019	3,957	3,887	3,815	-5.8%	
	AGR	25.3%	-20.2%	-2.0%	-1.5%	-1.8%	-1.9%		
	SmartPhones	130,594	124,800	124,011	123,774	123,248	122,589	-1.3%	
	AGR	-6.9%	-4.4%	-0.6%	-0.2%	-0.4%	-0.5%		
Total Mobile Phones		135,733	128,901	128,030	127,732	127,135	126,404	-1.4%	
AGR		-6.0%	-5.0%	-0.7%	-0.2%	-0.5%	-0.6%		
Total Devices									
Total Devices		233,632	241,560	240,095	240,282	240,106	239,870	0.5%	
AGR		-13.6%	3.4%	-0.6%	0.1%	-0.1%	-0.1%		

∞ ∫ Δ Daniel Research Group © (2024)

Consumer Segment

		United States Consumer Personal Devices Unit Shipments (K)							
		2023	2024	2025	2026	2027	2028	CAGR ('22-'27)	Trend
Desktop PCs									
Desktop PC	Desktop PC	5,990	6,148	5,275	4,546	3,908	3,356	-10.9%	
AGR	AGR	-14.8%	2.6%	-14.2%	-13.8%	-14.0%	-14.1%		
Mobile PCs									
Traditional Mobile PCs		18,526	20,363.5	20,510.2	20,473.0	20,383.1	20,266.9	1.8%	
AGR		-14.0%	9.9%	0.7%	-0.2%	-0.4%	-0.6%		
Convertible Mobile PCs		2,431	2,831	2,503	2,438	2,369	2,299	-1.1%	
AGR		-8.2%	16.4%	-11.6%	-2.6%	-2.8%	-2.9%		
Total Mobile PCs		20,958	23,194	23,013	22,911	22,752	22,566	1.5%	
AGR		-13.4%	10.7%	-0.8%	-0.4%	-0.7%	-0.8%		
Total PCs									
Total PCs		26,948	29,343	28,289	27,457	26,660	25,922	-0.8%	
AGR		-13.7%	8.9%	-3.6%	-2.9%	-2.9%	-2.8%		
Tablets									
Detachable		15,929	22,806	21,133	21,481	21,668	21,735	6.4%	
AGR		-18.5%	43.2%	-7.3%	1.6%	0.9%	0.3%		
Slate		13,752	14,695	15,663	15,200	14,709	14,214	0.7%	
AGR		-46.5%	6.9%	6.6%	-3.0%	-3.2%	-3.4%		
Total Tablets		29,681	37,501	36,795	36,680	36,377	35,949	3.9%	
AGR		-34.4%	26.3%	-1.9%	-0.3%	-0.8%	-1.2%		
Total Computers									
Total Computers		56,629	66,843	65,084	64,137	63,037	61,871	1.8%	
AGR		-13.7%	8.9%	-3.6%	-2.9%	-2.9%	-2.8%		
Mobile Phones									
Standard Phone		5,067	4,057	3,974	3,909	3,836	3,761	-5.8%	
AGR		25.3%	-19.9%	-2.1%	-1.6%	-1.9%	-2.0%		
SmartPhones		118,891	113,241	112,477	112,215	111,690	111,045	-1.4%	
AGR		-7.1%	-4.8%	-0.7%	-0.2%	-0.5%	-0.6%		
Total Mobile Phones		123,958	117,298	116,451	116,124	115,526	114,806	-1.5%	
AGR		-6.1%	-5.4%	-0.7%	-0.3%	-0.5%	-0.6%		
Total Devices									
Total Devices		180,587	184,142	181,535	180,261	178,564	176,677	-0.4%	
AGR		-13.4%	2.0%	-1.4%	-0.7%	-0.9%	-1.1%		

© Daniel Research Group © (2024)

Enterprise Segment

		United States Enterprise Personal Devices Unit Shipments (K)							
		2023	2024	2025	2026	2027	2028	CAGR ('22-'27)	Trend
Desktop PCs									
Desktop PC	Desktop PC	7,684	7,109	6,546	6,054	5,586	5,148	-7.7%	
AGR	AGR	-14.9%	-7.5%	-7.9%	-7.5%	-7.7%	-7.8%		
Mobile PCs									
Traditional Mobile PCs		24,175	27,653.3	28,682.7	29,914.4	31,134.4	32,376.4	6.0%	
AGR		-12.0%	14.4%	3.7%	4.3%	4.1%	4.0%		
Convertible Mobile PCs		5,165	6,162	6,883	7,649	8,435	9,252	12.4%	
AGR		-16.8%	19.3%	11.7%	11.1%	10.3%	9.7%		
Total Mobile PCs		29,340	33,815	35,566	37,563	39,570	41,628	7.2%	
AGR		-12.9%	15.3%	5.2%	5.6%	5.3%	5.2%		
Total PCs									
Total PCs		37,024	40,924	42,112	43,617	45,155	46,776	4.8%	
AGR		-13.3%	10.5%	2.9%	3.6%	3.5%	3.6%		
Tablets									
Detachable		3,304	2,543	2,753	2,995	3,249	3,522	1.3%	
AGR		-32.3%	-23.0%	8.3%	8.8%	8.5%	8.4%		
Slate		942	2,349	2,117	1,802	1,529	1,297	6.6%	
AGR		-54.0%	149.4%	-9.9%	-14.9%	-15.1%	-15.2%		
Total Tablets		4,246	4,891	4,870	4,796	4,779	4,819	2.6%	
AGR		-38.7%	15.2%	-0.4%	-1.5%	-0.4%	0.8%		
Total Computers									
Total Computers		41,270	45,816	46,982	48,413	49,934	51,595	4.6%	
AGR		-13.3%	10.5%	2.9%	3.6%	3.5%	3.6%		
Mobile Phones									
Standard Phone		73	43	46	48	51	54	-5.8%	
AGR		25.3%	-40.4%	5.4%	5.9%	5.6%	5.5%		
SmartPhones		11,702	11,559	11,533	11,559	11,558	11,544	-0.3%	
AGR		-4.4%	-1.2%	-0.2%	0.2%	0.0%	-0.1%		
Total Mobile Phones		11,775	11,602	11,579	11,608	11,609	11,598	-0.3%	
AGR		-4.2%	-1.5%	-0.2%	0.2%	0.0%	-0.1%		
Total Devices									
Total Devices		53,044	57,418	58,561	60,021	61,543	63,193	3.6%	
AGR		-14.4%	8.2%	2.0%	2.5%	2.5%	2.7%		

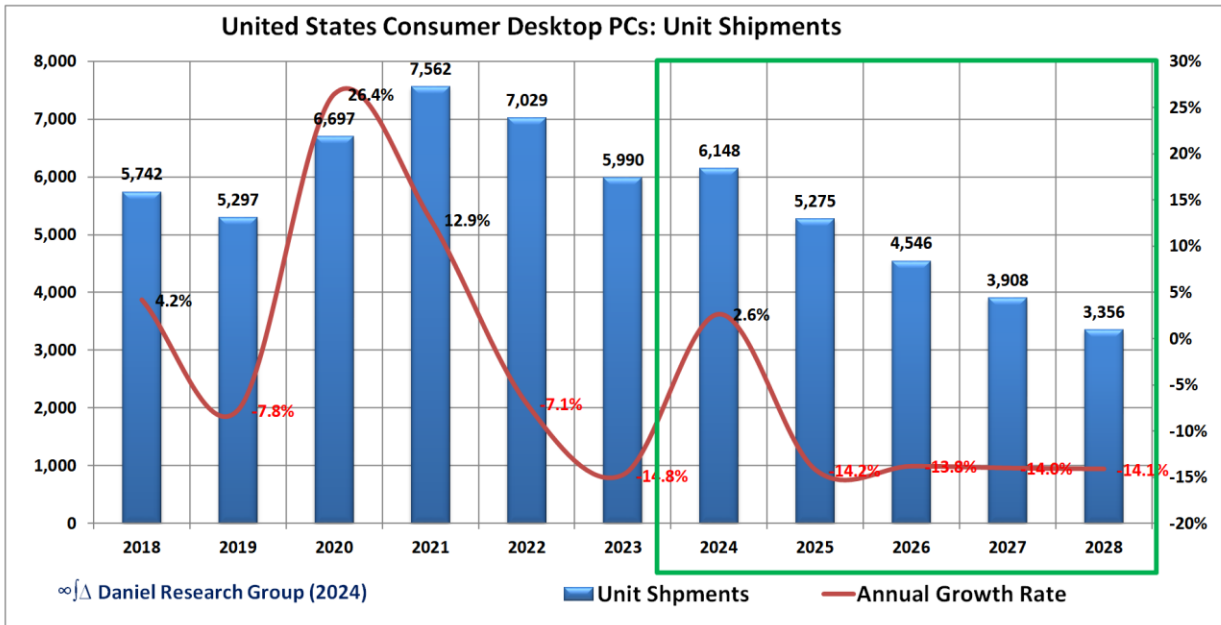
© Daniel Research Group © (2024)

Product Forecast Tables and Charts

Desktop PCs

Consumer

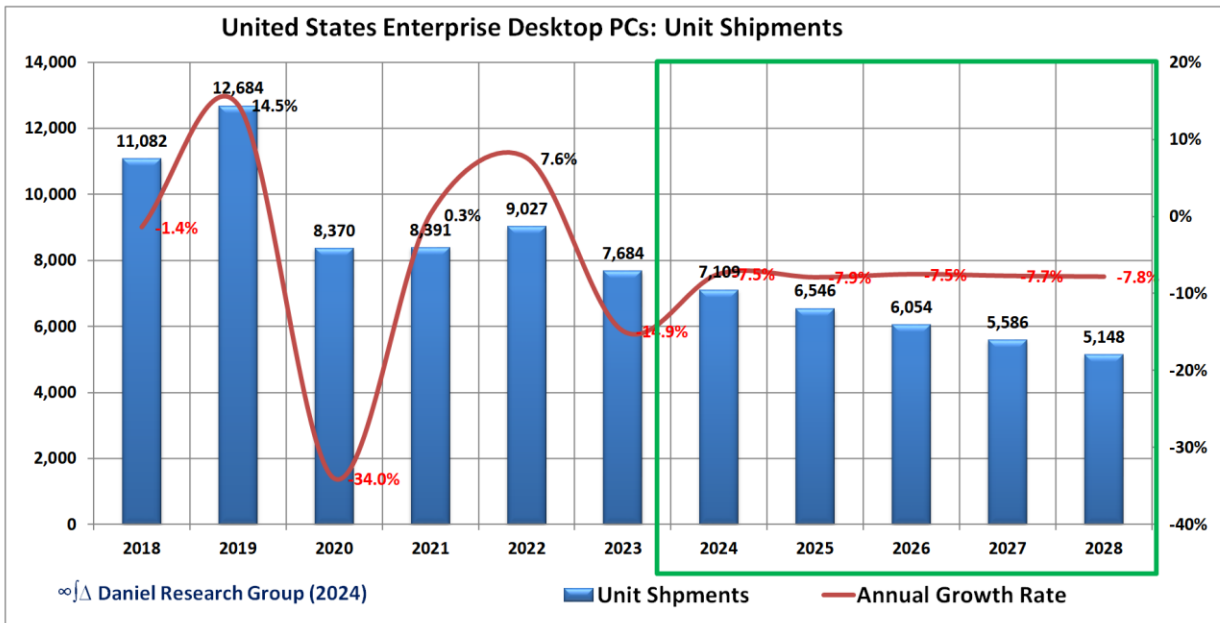
United States Consumer Desktop PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	5,990	6,148	5,275	4,546	3,908	3,356	-14.0%	
AGR	-14.8%	2.6%	-14.2%	-13.8%	-14.0%	-14.1%		
Revenue (\$M)	7,268	7,665	6,757	5,982	5,285	4,663	-11.7%	
AGR	-16.0%	5.5%	-11.8%	-11.5%	-11.7%	-11.8%		
Average Price (\$)	1,213	1,247	1,281	1,316	1,352	1,389	2.7%	
AGR	-1.5%	2.7%	2.7%	2.7%	2.7%	2.7%		
Installed Base (K)	18,104	17,379	16,430	15,299	14,064	12,783	-7.4%	
AGR	-2.9%	-4.0%	-5.5%	-6.9%	-8.1%	-9.1%		
Removal Age (Y)	4.04	3.88	4.01	4.17	4.35	4.56	4.1%	
AGR	2.2%	-3.9%	3.4%	4.0%	4.3%	4.7%		
Average Installed Base Age (Y)	3.99	4.01	4.10	4.23	4.37	4.52	3.0%	
AGR	0.5%	0.6%	2.2%	3.1%	3.4%	3.4%		
Replacement Cycle Length (Y)	3.77	3.53	3.64	3.70	3.73	3.76	1.6%	
AGR	2.7%	-6.4%	3.2%	1.5%	1.1%	0.6%		
Units per Households (#)	1.00	1.00	1.00	1.00	1.00	1.00		
AGR								
Market Penetration (%)	13.6%	12.9%	12.1%	11.2%	10.2%	9.2%	-4.4%	
AGR								



Enterprise

United States Enterprise Desktop PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	7,684	7,109	6,546	6,054	5,586	5,148	-7.8%	
AGR	-14.9%	-7.5%	-7.9%	-7.5%	-7.7%	-7.8%		
Revenue (\$M)	5,950	5,648	5,335	5,062	4,792	4,531	-5.4%	
AGR	-20.1%	-5.1%	-5.5%	-5.1%	-5.3%	-5.4%		
Average Price (\$)	774	794	815	836	858	880	2.6%	
AGR	-6.1%	2.6%	2.6%	2.6%	2.6%	2.6%		
Installed Base (K)	27,709	25,401	23,276	21,333	19,559	17,930	-8.3%	
AGR	-8.2%	-8.3%	-8.4%	-8.3%	-8.3%	-8.3%		
Removal Age (Y)	4.82	4.83	4.83	4.81	4.79	4.78	-0.3%	
AGR	1.4%	0.2%	0.0%	-0.4%	-0.5%	-0.2%		
Average Installed Base Age (Y)	4.62	4.62	4.62	4.61	4.60	4.59	-0.2%	
AGR	0.2%	0.0%	-0.1%	-0.2%	-0.2%	-0.2%		
Replacement Cycle Length (Y)	3.73	3.70	3.68	3.67	3.66	3.65	-0.4%	
AGR	1.1%	-0.8%	-0.4%	-0.4%	-0.3%	-0.3%		
Units per Businesses (#)	11.38	11.63	12.19	12.78	13.56	14.50	5.7%	
AGR	0.9%	2.2%	4.8%	4.8%	6.1%	7.0%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	36.0%	31.7%	27.7%	24.0%	20.7%	17.7%	-18.3%	

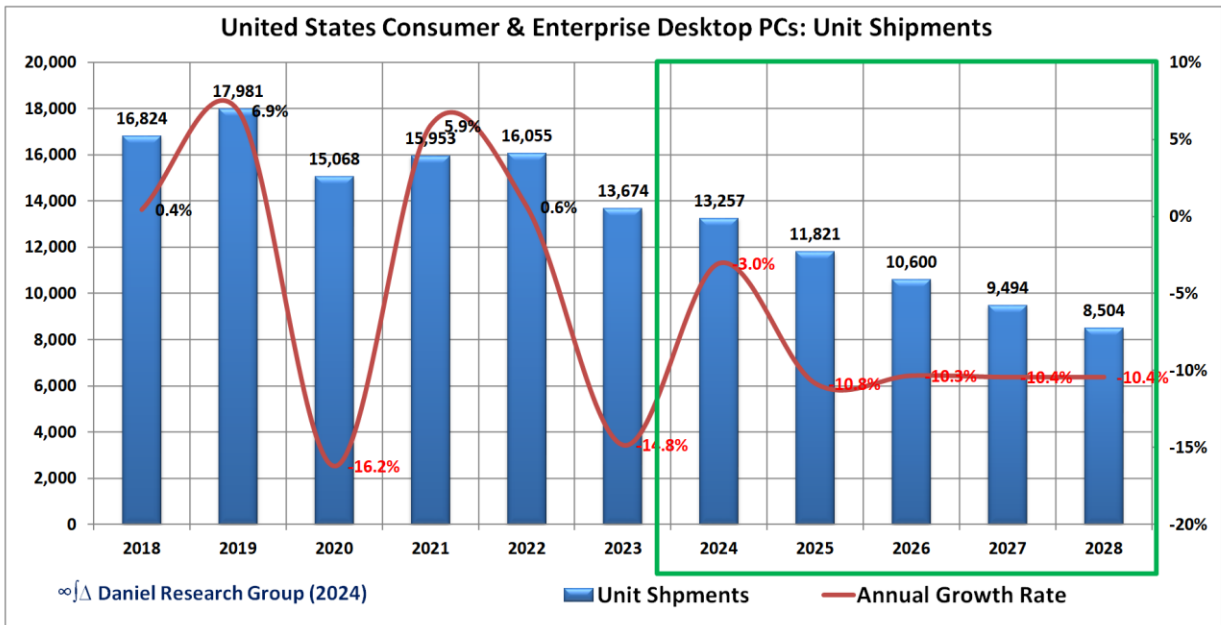
∞Δ Daniel Research Group ©(2024)



Total Desktop PCs

United States Consumer & Enterprise Desktop PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	13,674	13,257	11,821	10,600	9,494	8,504	-10.5%	
AGR	-14.8%	-3.0%	-10.8%	-10.3%	-10.4%	-10.4%		
Revenue (\$M)	13,218	13,312	12,092	11,045	10,076	9,194	-8.8%	
AGR	-17.9%	0.7%	-9.2%	-8.7%	-8.8%	-8.8%		
Average Price (\$)	967	1,004	1,023	1,042	1,061	1,081	1.9%	
AGR	-3.6%	3.9%	1.9%	1.9%	1.9%	1.9%		
Installed Base (K)	45,813	42,780	39,706	36,632	33,623	30,713	-8.0%	
AGR	-6.2%	-6.6%	-7.2%	-7.7%	-8.2%	-8.7%		
Removal Age (Y)	4.52	4.44	4.49	4.54	4.61	4.69	1.4%	
AGR	1.6%	-1.7%	1.2%	1.2%	1.4%	1.7%		
Average Installed Base Age (Y)	4.37	4.37	4.40	4.45	4.50	4.56	1.1%	
AGR	0.1%	0.0%	0.7%	1.1%	1.3%	1.3%		
Replacement Cycle Length (Y)	3.74	3.63	3.67	3.68	3.69	3.69	0.4%	
AGR	1.7%	-3.1%	1.1%	0.4%	0.3%	0.0%		
Units per Households & Businesses (#)	2.23	2.19	2.17	2.16	2.17	2.19	0.0%	
AGR	-2.6%	-2.0%	-1.0%	-0.3%	0.4%	1.0%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	14.7%	13.9%	12.9%	11.8%	10.7%	9.6%	-5.1%	

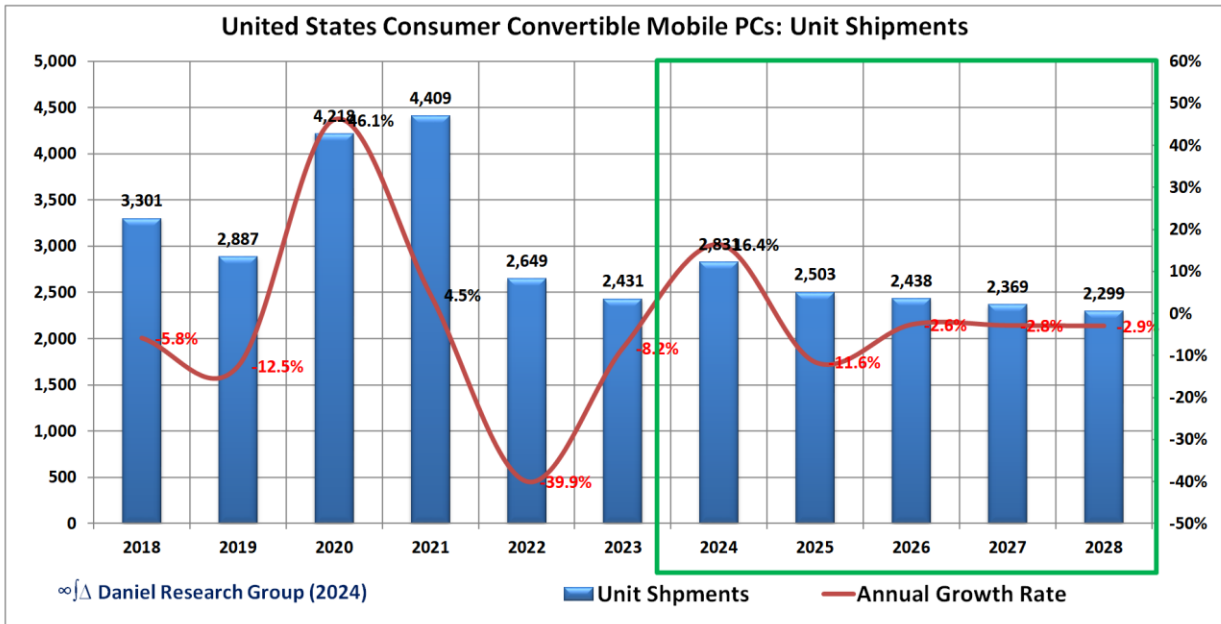
∞ Δ Daniel Research Group ©(2024)



Mobile PC Consumer Convertible

United States Consumer Convertible Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	2,431	2,831	2,503	2,438	2,369	2,299	-5.1%	
AGR	-8.2%	16.4%	-11.6%	-2.6%	-2.8%	-2.9%		
Revenue (\$M)	1,698	2,012	1,808	1,789	1,764	1,736	-3.6%	
AGR	-18.9%	18.5%	-10.1%	-1.1%	-1.4%	-1.6%		
Average Price (\$)	698	711	722	734	745	755	1.5%	
AGR	-11.6%	1.8%	1.7%	1.6%	1.5%	1.4%		
Installed Base (K)	10,644	10,579	10,217	9,792	9,331	8,859	-4.3%	
AGR	-3.8%	-0.6%	-3.4%	-4.2%	-4.7%	-5.1%		
Removal Age (Y)	3.91	4.08	4.41	4.60	4.75	4.84	4.4%	
AGR	12.2%	4.4%	8.1%	4.4%	3.1%	1.9%		
Average Installed Base Age (Y)	3.97	4.15	4.34	4.47	4.56	4.60	2.6%	
AGR	10.1%	4.6%	4.6%	3.1%	1.9%	0.9%		
Replacement Cycle Length (Y)	4.73	4.65	4.57	4.42	4.30	4.20	-2.6%	
AGR	1.2%	-1.6%	-1.9%	-3.2%	-2.7%	-2.4%		
Units per Households (#)	1.00	1.00	1.00	1.00	1.00	1.00		
AGR								
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	8.0%	7.9%	7.5%	7.2%	6.8%	6.4%	-1.6%	

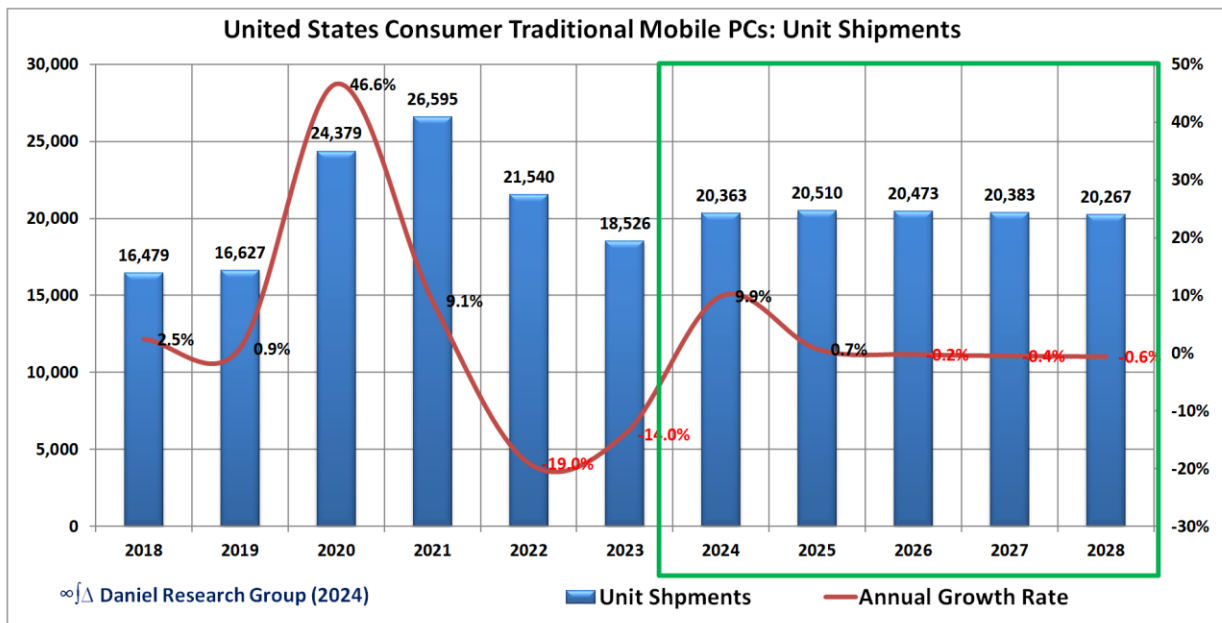
∞ Δ Daniel Research Group ©(2024)



Consumer Traditional

United States Consumer Traditional Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	18,526	20,363	20,510	20,473	20,383	20,267	-0.1%	
AGR	-14.0%	9.9%	0.7%	-0.2%	-0.4%	-0.6%		
Revenue (\$M)	21,877	25,812	27,907	29,902	31,957	34,109	7.2%	
AGR	-14.7%	18.0%	8.1%	7.1%	6.9%	6.7%		
Average Price (\$)	1,181	1,268	1,361	1,461	1,568	1,683	7.3%	
AGR	-0.8%	7.3%	7.3%	7.3%	7.3%	7.3%		
Installed Base (K)	89,839	89,961	89,821	89,313	88,540	87,593	-0.7%	
AGR	-0.6%	0.1%	-0.2%	-0.6%	-0.9%	-1.1%		
Removal Age (Y)	1.03	0.99	1.01	1.02	1.04	1.05	1.3%	
AGR	12.6%	-3.2%	1.3%	1.8%	1.3%	0.8%		
Average Installed Base Age (Y)	4.24	4.35	4.43	4.48	4.51	4.52	1.0%	
AGR	4.9%	2.5%	1.7%	1.2%	0.7%	0.3%		
Replacement Cycle Length (Y)	5.72	5.44	5.35	5.26	5.19	5.13	-1.5%	
AGR	2.2%	-4.8%	-1.7%	-1.7%	-1.4%	-1.1%		
Units per Households (#)	1.00	1.00	1.00	1.00	1.00	1.00		
AGR								
Market Penetration (%)	67.6%	67.0%	66.3%	65.3%	64.2%	62.9%	-4.6%	
AGR								

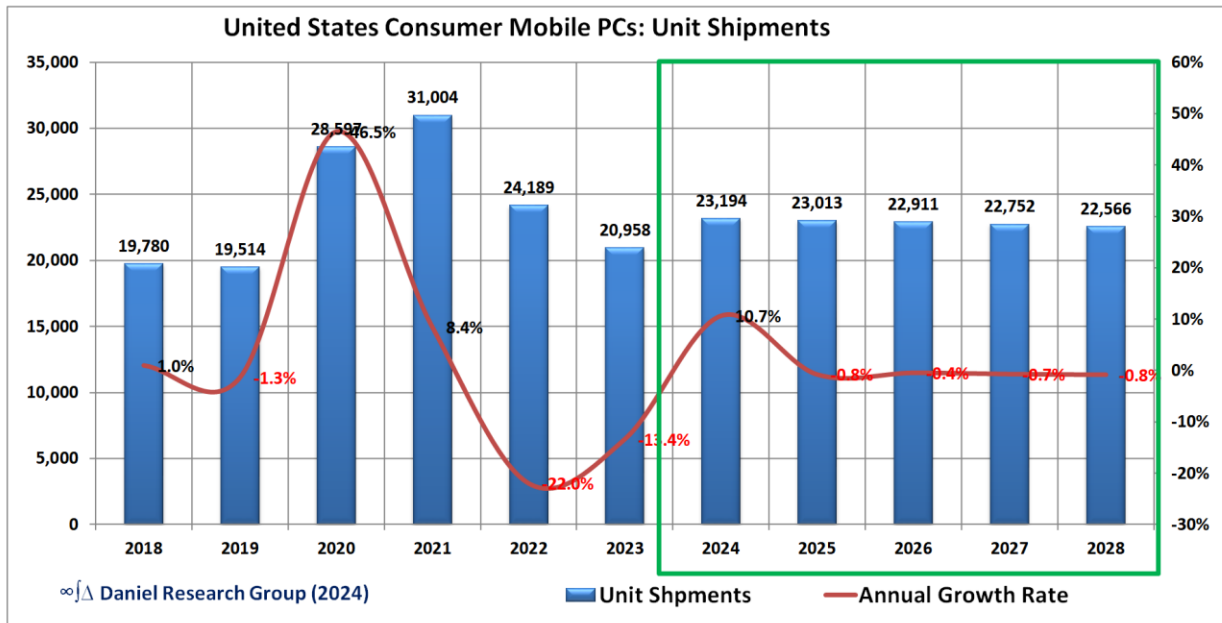
∞Δ Daniel Research Group ©(2024)



Consumer Total

United States Consumer Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	20,958	23,194	23,013	22,911	22,752	22,566	-0.7%	
AGR	-13.4%	10.7%	-0.8%	-0.4%	-0.7%	-0.8%		
Revenue (\$M)	23,575	27,824	29,716	31,691	33,721	35,845	6.5%	
AGR	-15.0%	18.0%	6.8%	6.6%	6.4%	6.3%		
Average Price (\$)	1,125	1,200	1,291	1,383	1,482	1,588	7.3%	
AGR	-1.9%	6.6%	7.6%	7.1%	7.2%	7.2%		
Installed Base (K)	100,483	100,540	100,038	99,105	97,871	96,452	-1.0%	
AGR	-0.9%	0.1%	-0.5%	-0.9%	-1.2%	-1.5%		
Removal Age (Y)	4.75	4.82	4.96	5.07	5.16	5.22	2.0%	
AGR	7.6%	1.5%	2.9%	2.2%	1.8%	1.2%		
Average Installed Base Age (Y)	4.20	4.32	4.41	4.48	4.51	4.53	1.2%	
AGR	5.5%	2.8%	2.1%	1.4%	0.8%	0.4%		
Replacement Cycle Length (Y)	5.59	5.35	5.25	5.16	5.08	5.02	-1.6%	
AGR	2.2%	-4.4%	-1.7%	-1.9%	-1.5%	-1.2%		
Units per Households (#)	1.06	1.06	1.05	1.05	1.05	1.05	-0.2%	
AGR	-0.2%	0.0%	-0.2%	-0.2%	-0.2%	-0.2%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	71.6%	70.9%	70.0%	68.9%	67.5%	66.1%	-5.5%	

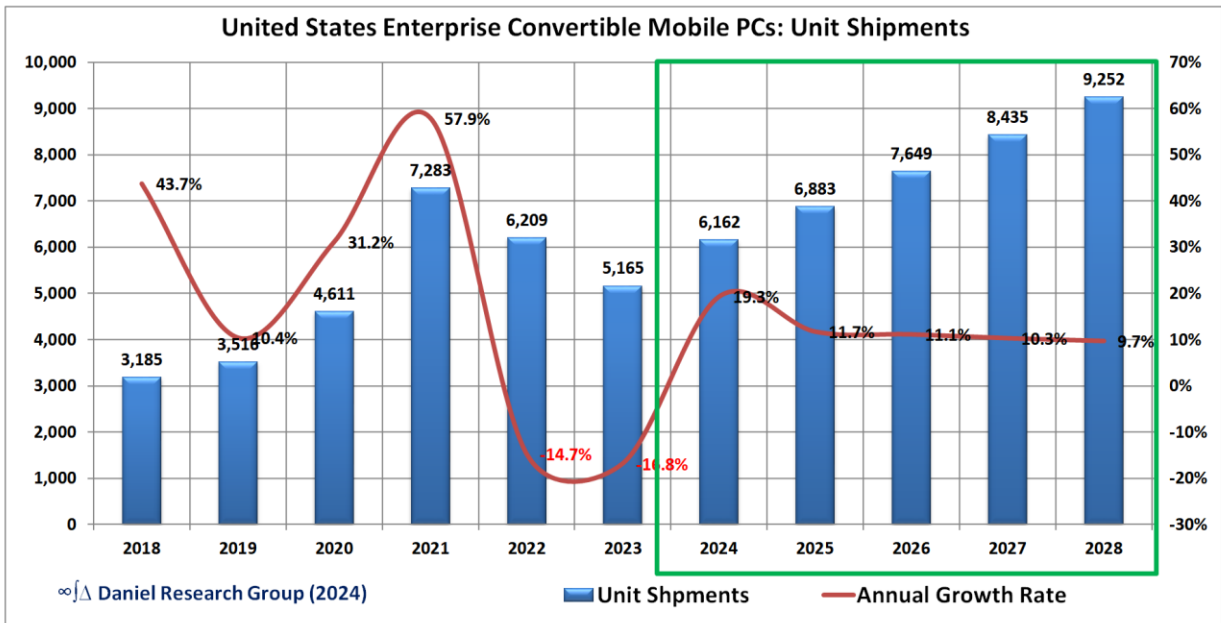
∞Δ Daniel Research Group ©(2024)



Enterprise Convertible

United States Enterprise Convertible Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	5,165	6,162	6,883	7,649	8,435	9,252	10.7%	
AGR	-16.8%	19.3%	11.7%	11.1%	10.3%	9.7%		
Revenue (\$M)	3,081	3,597	3,931	4,275	4,614	4,952	8.3%	
AGR	-27.4%	16.7%	9.3%	8.7%	7.9%	7.3%		
Average Price (\$)	596	584	571	559	547	535	-2.1%	
AGR	-12.7%	-2.1%	-2.1%	-2.1%	-2.1%	-2.1%		
Installed Base (K)	14,521	15,874	17,382	19,060	20,911	22,942	9.6%	
AGR	8.9%	9.3%	9.5%	9.7%	9.7%	9.7%		
Removal Age (Y)	2.72	2.83	2.96	3.05	3.12	3.17	2.9%	
AGR	17.6%	3.9%	4.7%	3.0%	2.3%	1.6%		
Average Installed Base Age (Y)	3.05	3.24	3.35	3.41	3.44	3.46	1.6%	
AGR	11.0%	6.1%	3.5%	1.9%	0.9%	0.3%		
Replacement Cycle Length (Y)	4.64	4.30	4.23	4.19	4.18	4.18	-0.7%	
AGR	9.0%	-7.4%	-1.5%	-1.0%	-0.4%	0.0%		
Units per Businesses (#)	3.49	3.18	3.10	3.13	3.26	3.47	2.2%	
AGR	-15.1%	-9.1%	-2.3%	0.8%	4.2%	6.3%		
Market Penetration (%)	61.5%	72.5%	81.3%	87.8%	92.2%	95.1%	33.7%	

∞Δ Daniel Research Group ©(2024)



∞Δ Daniel Research Group (2024)

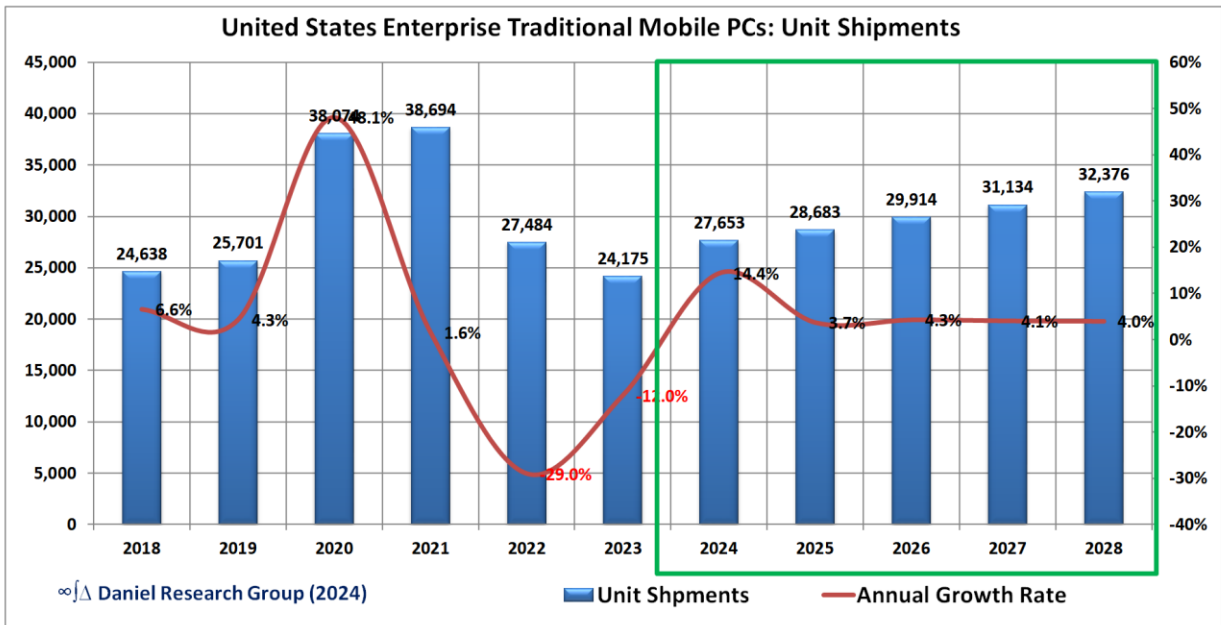
■ Unit Shpments

— Annual Growth Rate

Enterprise Traditional

United States Enterprise Traditional Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	24,175	27,653	28,683	29,914	31,134	32,376	4.0%	
AGR	-12.0%	14.4%	3.7%	4.3%	4.1%	4.0%		
Revenue (\$M)	16,440	19,001	19,913	20,984	22,066	23,185	5.1%	
AGR	-18.2%	15.6%	4.8%	5.4%	5.2%	5.1%		
Average Price (\$)	680	687	694	701	709	716	1.0%	
AGR	-7.0%	1.0%	1.0%	1.0%	1.0%	1.0%		
Installed Base (K)	93,528	99,254	104,703	109,964	115,047	119,950	4.8%	
AGR	4.8%	6.1%	5.5%	5.0%	4.6%	4.3%		
Removal Age (Y)	4.60	4.54	4.56	4.57	4.58	4.61	0.4%	
AGR	15.9%	-1.4%	0.5%	0.1%	0.3%	0.6%		
Average Installed Base Age (Y)	4.06	4.05	4.05	4.05	4.06	4.07	0.1%	
AGR	1.3%	-0.4%	0.0%	0.2%	0.2%	0.2%		
Replacement Cycle Length (Y)	5.69	5.53	5.51	5.46	5.42	5.37	-0.7%	
AGR	49.9%	-2.9%	-0.4%	-0.8%	-0.8%	-0.9%		
Units per Businesses (#)	17.62	18.09	18.85	19.41	20.02	20.64	3.4%	
AGR	0.8%	2.7%	4.2%	3.0%	3.1%	3.1%		
Market Penetration (%)	78.5%	79.6%	80.7%	81.7%	82.6%	83.6%	5.0%	
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend

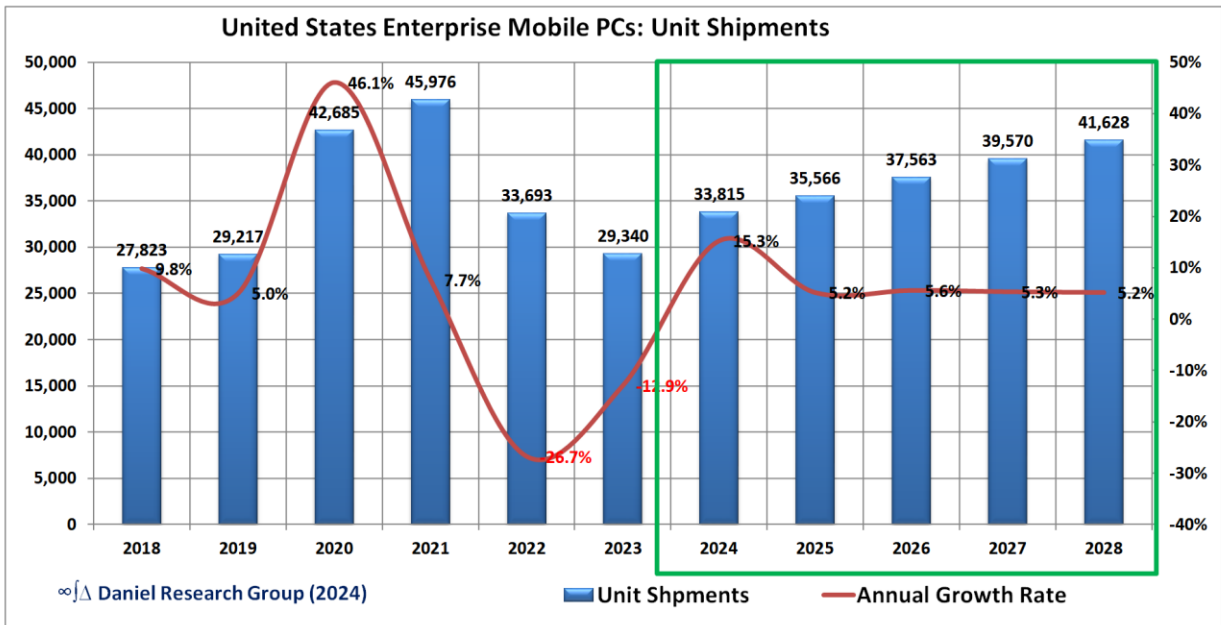
∞Δ Daniel Research Group ©(2024)



Enterprise Total

United States Enterprise Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	29,340	33,815	35,566	37,563	39,570	41,628	5.3%	
AGR	-12.9%	15.3%	5.2%	5.6%	5.3%	5.2%		
Revenue (\$M)	19,521	22,597	23,844	25,259	26,680	28,137	5.6%	
AGR	-19.8%	15.8%	5.5%	5.9%	5.6%	5.5%		
Average Price (\$)	665	668	670	672	674	676	0.3%	
AGR	-7.9%	0.4%	0.3%	0.3%	0.3%	0.2%		
Installed Base (K)	108,049	115,127	122,085	129,024	135,958	142,892	5.5%	
AGR	5.3%	6.6%	6.0%	5.7%	5.4%	5.1%		
Removal Age (Y)	4.33	4.26	4.28	4.29	4.30	4.31	0.3%	
AGR	15.1%	-1.6%	0.5%	0.1%	0.3%	0.4%		
Average Installed Base Age (Y)	3.92	3.93	3.93	3.94	3.95	3.95	0.2%	
AGR	1.8%	0.0%	0.2%	0.2%	0.2%	0.1%		
Replacement Cycle Length (Y)	5.52	5.31	5.27	5.21	5.17	5.12	-0.9%	
AGR	43.3%	-3.8%	-0.7%	-1.0%	-0.9%	-0.9%		
Units per Businesses (#)	16.55	17.18	18.13	18.93	19.83	20.78	4.9%	
AGR	1.9%	3.8%	5.5%	4.4%	4.7%	4.8%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	96.6%	97.2%	97.8%	98.2%	98.6%	98.9%	2.3%	

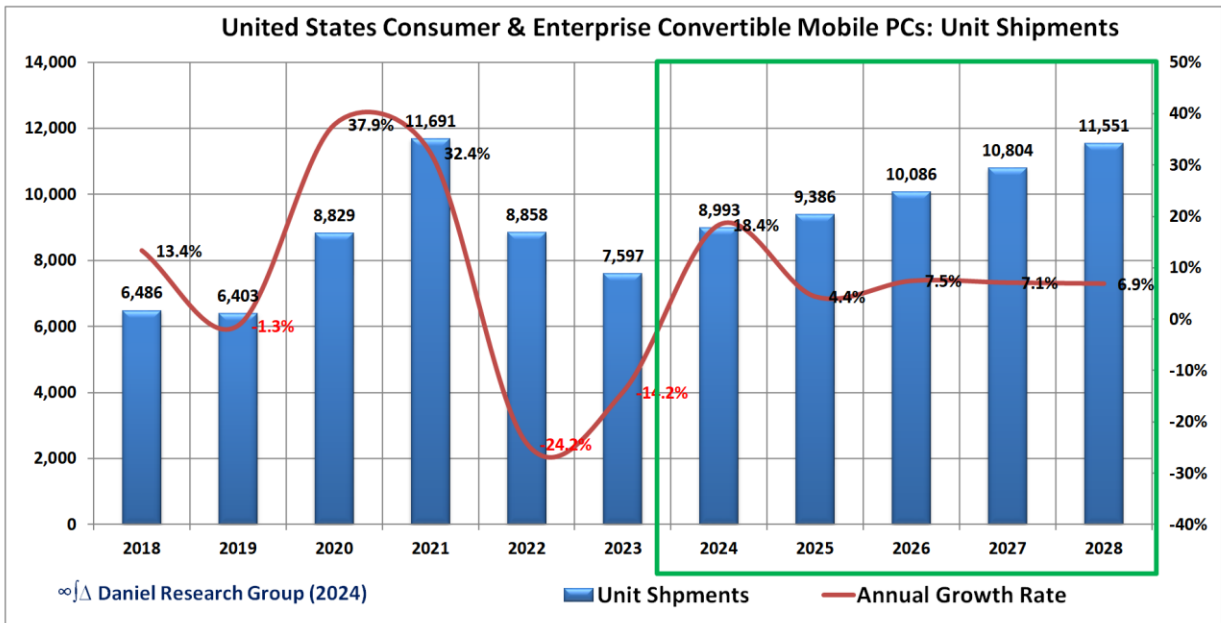
∞ Δ Daniel Research Group ©(2024)



Total Convertible Mobile PCs

United States Consumer & Enterprise Convertible Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	7,597	8,993	9,386	10,086	10,804	11,551	6.5%	
AGR	-14.2%	18.4%	4.4%	7.5%	7.1%	6.9%		
Revenue (\$M)	4,779	5,608	5,740	6,064	6,378	6,688	4.5%	
AGR	-24.6%	17.4%	2.3%	5.6%	5.2%	4.9%		
Average Price (\$)	629	624	612	601	590	579	-1.8%	
AGR	-12.1%	-0.9%	-1.9%	-1.7%	-1.8%	-1.9%		
Installed Base (K)	25,165	26,452	27,600	28,852	30,243	31,801	4.7%	
AGR	3.1%	5.1%	4.3%	4.5%	4.8%	5.2%		
Removal Age (Y)	3.21	3.31	3.47	3.55	3.61	3.63	2.3%	
AGR	14.8%	3.1%	4.9%	2.4%	1.5%	0.6%		
Average Installed Base Age (Y)	3.43	3.60	3.71	3.77	3.78	3.77	1.2%	
AGR	9.8%	4.7%	3.2%	1.5%	0.4%	-0.3%		
Replacement Cycle Length (Y)	4.68	4.43	4.35	4.27	4.21	4.18	-1.4%	
AGR	5.5%	-5.3%	-1.9%	-1.9%	-1.2%	-0.7%		
Units per Households & Businesses (#)	1.70	1.70	1.74	1.82	1.92	2.05	4.9%	
AGR	-0.3%	-0.1%	2.7%	4.1%	5.7%	7.0%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	10.6%	11.0%	11.1%	11.0%	10.9%	10.6%	0.0%	

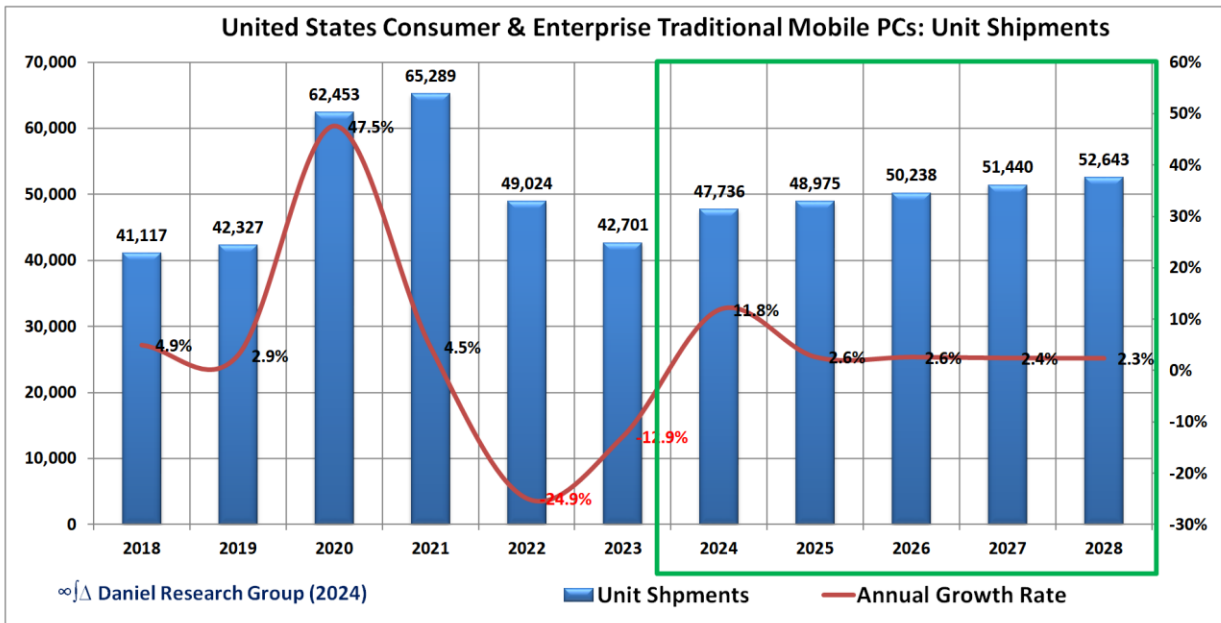
∞ Δ Daniel Research Group ©(2024)



Total Traditional Mobile PCs

United States Consumer & Enterprise Traditional Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	42,701	47,736	48,975	50,238	51,440	52,643	2.5%	
AGR	-12.9%	11.8%	2.6%	2.6%	2.4%	2.3%		
Revenue (\$M)	38,317	44,579	47,634	50,754	53,954	57,294	6.5%	
AGR	-16.2%	16.3%	6.9%	6.6%	6.3%	6.2%		
Average Price (\$)	897	934	973	1,010	1,049	1,088	3.9%	
AGR	-3.8%	4.1%	4.1%	3.9%	3.8%	3.8%		
Installed Base (K)	183,367	189,177	194,462	199,204	203,513	207,480	2.3%	
AGR	2.1%	3.2%	2.8%	2.4%	2.2%	1.9%		
Removal Age (Y)	4.72	4.72	4.78	4.82	4.86	4.90	0.9%	
AGR	12.0%	0.0%	1.3%	0.9%	0.8%	0.7%		
Average Installed Base Age (Y)	4.13	4.18	4.22	4.24	4.26	4.26	0.5%	
AGR	3.2%	1.2%	0.9%	0.6%	0.4%	0.1%		
Replacement Cycle Length (Y)	5.71	5.51	5.45	5.38	5.32	5.26	-1.2%	
AGR	27.3%	-3.4%	-1.1%	-1.3%	-1.1%	-1.0%		
Units per Households & Businesses (#)	1.93	1.98	2.04	2.10	2.16	2.22	2.9%	
AGR	2.4%	2.9%	2.9%	2.9%	2.9%	2.9%		
Market Penetration (%)	68.1%	67.6%	66.9%	66.0%	65.0%	63.8%	-4.3%	

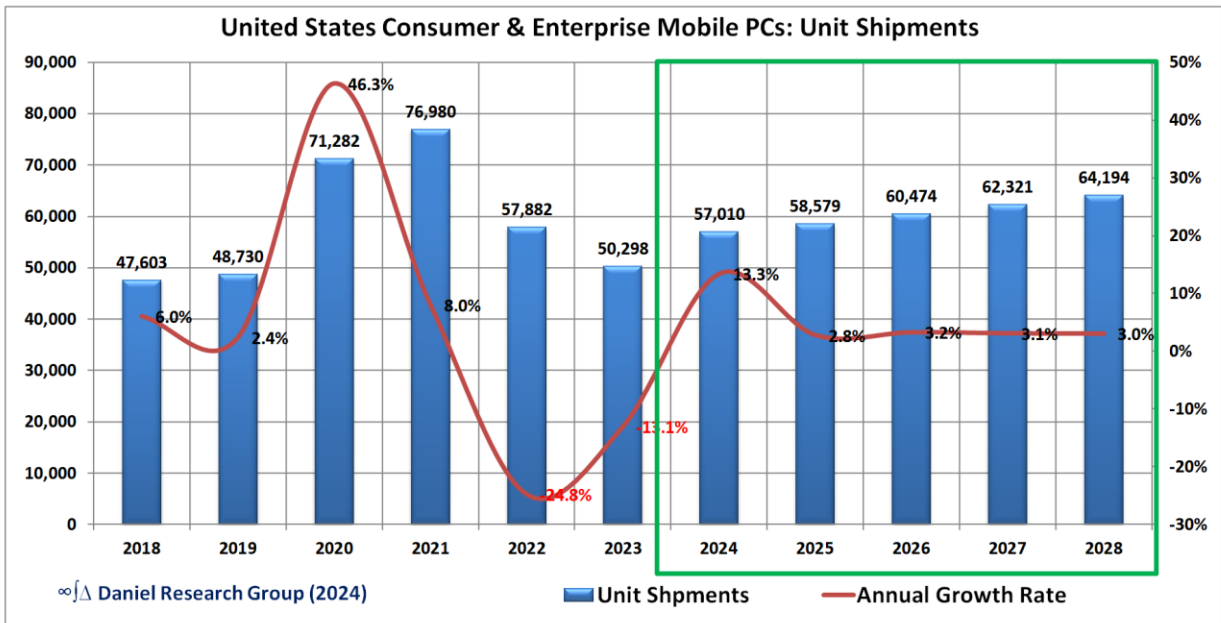
∞Δ Daniel Research Group ©(2024)



Total Mobile PC

United States Consumer & Enterprise Mobile PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	50,298	57,010	58,579	60,474	62,321	64,194	3.0%	
AGR	-13.1%	13.3%	2.8%	3.2%	3.1%	3.0%		
Revenue (\$M)	43,096	50,421	53,560	56,950	60,401	63,982	6.1%	
AGR	-17.3%	17.0%	6.2%	6.3%	6.1%	5.9%		
Average Price (\$)	857	884	914	942	969	997	3.0%	
AGR	-4.8%	3.2%	3.4%	3.0%	2.9%	2.8%		
Installed Base (K)	208,532	215,667	222,123	228,129	233,829	239,344	2.6%	
AGR	2.2%	3.4%	3.0%	2.7%	2.5%	2.4%		
Removal Age (Y)	4.50	4.50	4.57	4.61	4.65	4.68	1.0%	
AGR	11.8%	-0.1%	1.6%	1.0%	0.8%	0.6%		
Average Installed Base Age (Y)	4.04	4.10	4.14	4.17	4.18	4.18	0.5%	
AGR	3.8%	1.4%	1.1%	0.7%	0.3%	0.0%		
Replacement Cycle Length (Y)	5.55	5.32	5.26	5.19	5.13	5.08	-1.2%	
AGR	24.0%	-4.1%	-1.2%	-1.4%	-1.1%	-1.0%		
Units per Households & Businesses (#)	2.05	2.12	2.18	2.26	2.34	2.42	3.4%	
AGR	2.7%	3.2%	3.3%	3.4%	3.5%	3.6%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	72.8%	72.2%	71.4%	70.3%	69.0%	67.7%	-5.1%	

∞Δ Daniel Research Group ©(2024)

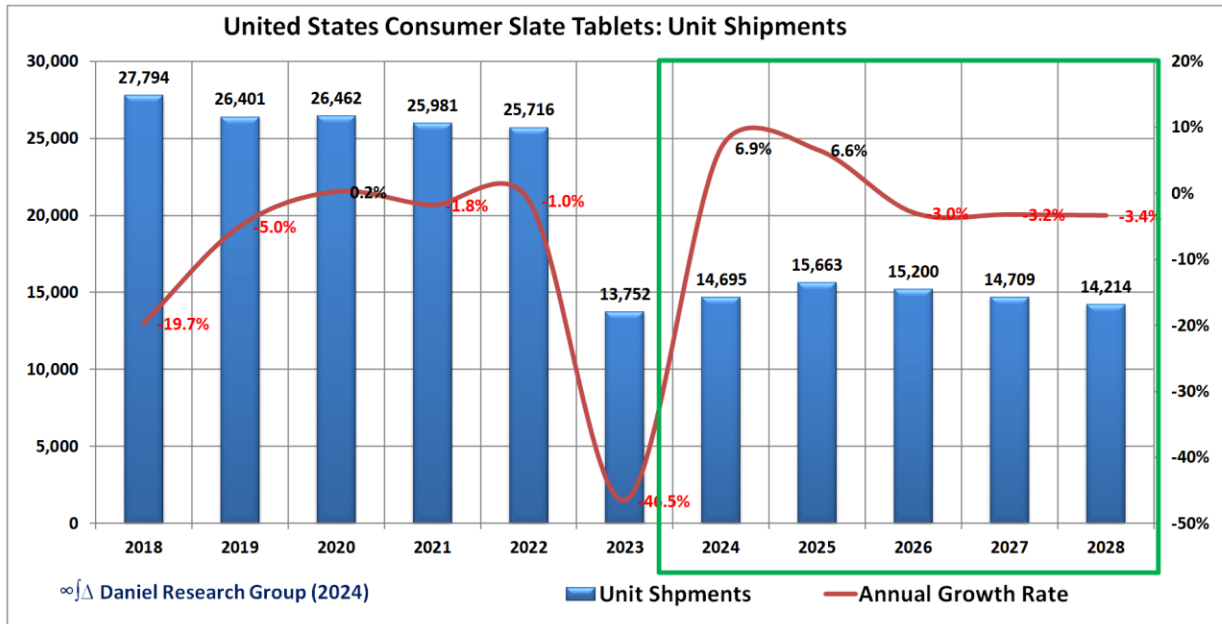


Tablets

Consumer Slate

United States Consumer Slate Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	13,752	14,695	15,663	15,200	14,709	14,214	-0.8%	
AGR	-46.5%	6.9%	6.6%	-3.0%	-3.2%	-3.4%		
Revenue (\$M)	2,911	3,363	3,891	4,109	4,339	4,585	8.1%	
AGR	-36.7%	15.6%	15.7%	5.6%	5.6%	5.7%		
Average Price (\$)	212	229	248	270	295	323	9.0%	
AGR	18.4%	8.1%	8.5%	8.8%	9.1%	9.3%		
Installed Base (K)	117,820	106,581	97,113	88,452	80,836	74,267	-8.6%	
AGR	-10.7%	-9.5%	-8.9%	-8.9%	-8.6%	-8.1%		
Removal Age (Y)	6.25	6.53	6.74	6.85	6.82	6.68	0.6%	
AGR	14.2%	4.4%	3.2%	1.7%	-0.6%	-2.0%		
Average Installed Base Age (Y)	5.30	5.51	5.57	5.53	5.45	5.34	-0.8%	
AGR	7.1%	4.0%	0.9%	-0.6%	-1.5%	-2.0%		
Replacement Cycle Length (Y)	5.23	5.11	4.86	4.71	4.62	4.57	-2.7%	
AGR	3.6%	-2.3%	-4.8%	-3.2%	-1.8%	-1.0%		
Units per Households (#)	1.48	1.33	1.20	1.08	1.00	1.00	-6.9%	
AGR	-11.8%	-10.4%	-9.6%	-9.7%	-7.8%			
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	59.7%	59.7%	59.6%	59.6%	58.6%	53.3%	-6.4%	

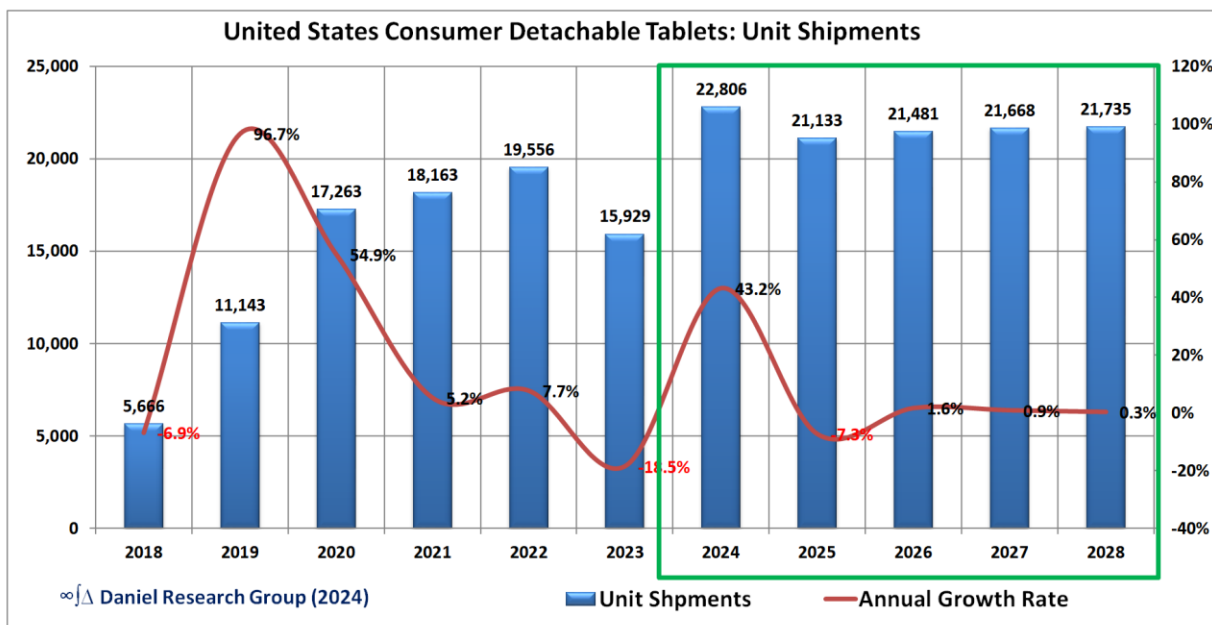
∞ Δ Daniel Research Group ©(2024)



Consumer Detachable

United States Consumer Detachable Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	15,929	22,806	21,133	21,481	21,668	21,735	-1.2%	
AGR	-18.5%	43.2%	-7.3%	1.6%	0.9%	0.3%		
Revenue (\$M)	10,781	15,352	14,149	14,305	14,352	14,319	-1.7%	
AGR	-20.3%	42.4%	-7.8%	1.1%	0.3%	-0.2%		
Average Price (\$)	677	673	670	666	662	659	-0.5%	
AGR	-2.2%	-0.5%	-0.5%	-0.5%	-0.5%	-0.5%		
Installed Base (K)	57,921	63,752	67,855	71,613	75,143	78,426	5.3%	
AGR	8.4%	10.1%	6.4%	5.5%	4.9%	4.4%		
Removal Age (Y)	3.24	3.12	3.44	3.70	3.89	4.11	7.2%	
AGR	11.3%	-3.9%	10.5%	7.4%	5.3%	5.7%		
Average Installed Base Age (Y)	3.24	3.38	3.56	3.71	3.83	3.94	3.9%	
AGR	11.4%	4.3%	5.4%	4.1%	3.4%	2.8%		
Replacement Cycle Length (Y)	6.06	4.76	4.98	5.04	5.14	5.25	2.5%	
AGR	-14.4%	-21.6%	4.8%	1.1%	2.0%	2.1%		
Units per Households (#)	2.33	2.33	2.25	2.17	2.08	1.99	-3.9%	
AGR	-2.1%	-0.2%	-3.2%	-3.8%	-4.1%	-4.4%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	18.7%	20.4%	22.2%	24.2%	26.2%	28.3%	9.6%	

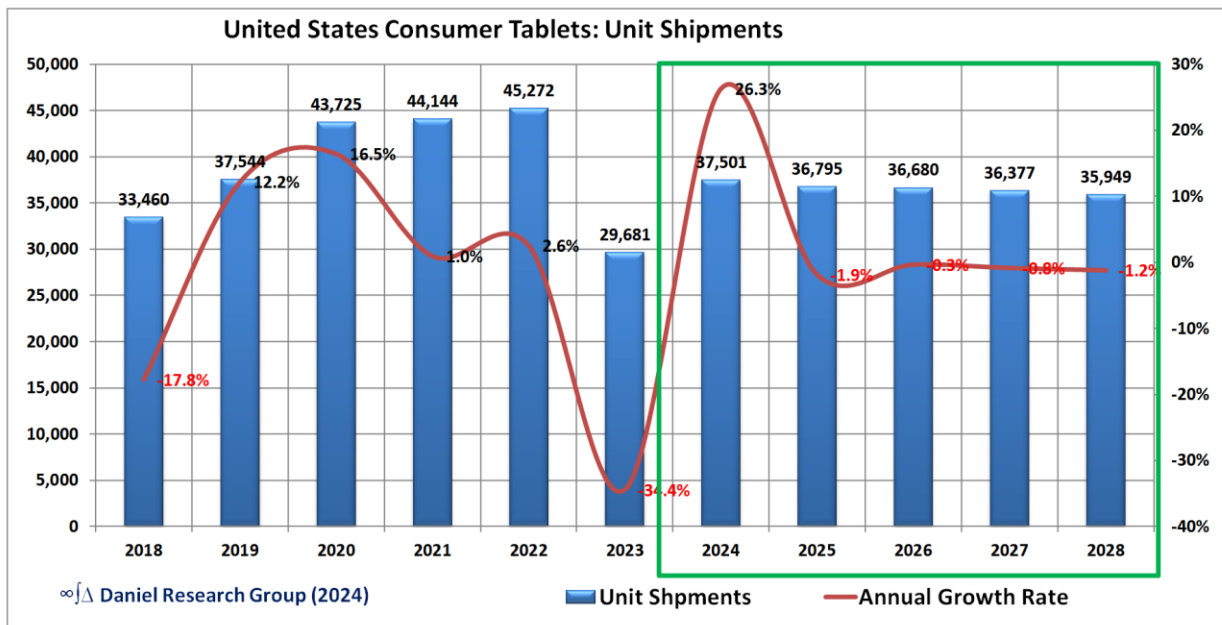
∞Δ Daniel Research Group ©(2024)



Consumer Total

United States Consumer Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	29,681	37,501	36,795	36,680	36,377	35,949	-1.1%	
AGR	-34.4%	26.3%	-1.9%	-0.3%	-0.8%	-1.2%		
Revenue (\$M)	13,691	18,715	18,040	18,414	18,691	18,904	0.3%	
AGR	-24.5%	36.7%	-3.6%	2.1%	1.5%	1.1%		
Average Price (\$)	461	499	490	502	514	526	1.3%	
AGR	15.2%	8.2%	-1.8%	2.4%	2.3%	2.3%		
Installed Base (K)	175,741	170,333	164,968	160,065	155,979	152,693	-2.7%	
AGR	-5.2%	-3.1%	-3.1%	-3.0%	-2.6%	-2.1%		
Removal Age (Y)	5.39	5.29	5.46	5.52	5.49	5.44	0.7%	
AGR	11.2%	-1.7%	3.2%	1.1%	-0.6%	-0.9%		
Average Installed Base Age (Y)	4.64	4.70	4.72	4.69	4.65	4.60	-0.5%	
AGR	5.9%	1.4%	0.3%	-0.6%	-0.9%	-0.9%		
Replacement Cycle Length (Y)	5.47	4.97	4.91	4.85	4.85	4.89	-0.4%	
AGR	-0.1%	-9.2%	-1.1%	-1.3%	0.1%	0.8%		
Units per Households (#)	1.91	1.81	1.72	1.63	1.58	1.62	-2.7%	
AGR	-7.5%	-5.2%	-5.2%	-5.1%	-3.4%	3.0%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	69.1%	69.9%	70.8%	71.7%	71.7%	67.5%	-1.6%	

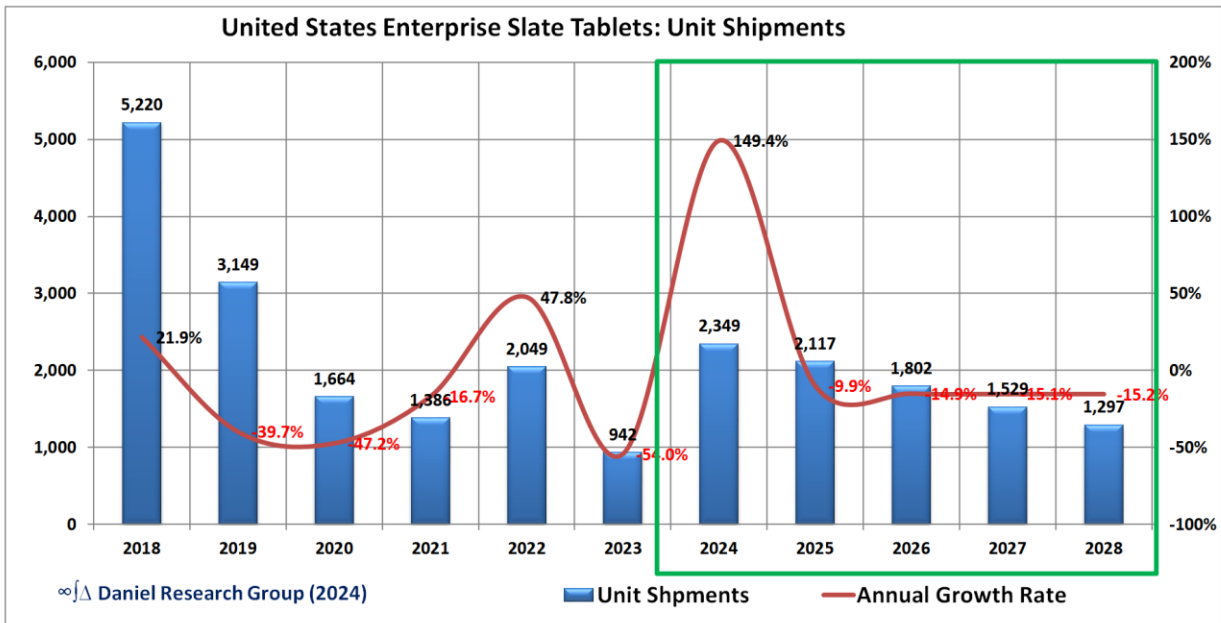
∞ Δ Daniel Research Group ©(2024)



Enterprise Slate

United States Enterprise Slate Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	942	2,349	2,117	1,802	1,529	1,297	-13.8%	
AGR	-54.0%	149.4%	-9.9%	-14.9%	-15.1%	-15.2%		
Revenue (\$M)	300	736	652	546	456	380	-15.2%	
AGR	-63.6%	145.2%	-11.4%	-16.3%	-16.5%	-16.6%		
Average Price (\$)	319	313	308	303	298	293	-1.7%	
AGR	-20.8%	-1.7%	-1.7%	-1.7%	-1.7%	-1.7%		
Installed Base (K)	12,344	10,818	9,548	8,460	7,546	6,862	-10.8%	
AGR	-13.7%	-12.4%	-11.7%	-11.4%	-10.8%	-9.1%		
Removal Age (Y)	7.01	6.31	6.48	6.69	6.89	6.88	2.2%	
AGR	13.6%	-10.0%	2.7%	3.3%	3.0%	-0.1%		
Average Installed Base Age (Y)	6.02	5.97	5.82	5.63	5.40	5.24	-3.2%	
AGR	8.5%	-0.9%	-2.5%	-3.4%	-4.0%	-3.0%		
Replacement Cycle Length (Y)	5.26	3.79	3.82	3.93	4.09	4.47	4.2%	
AGR	-2.8%	-27.8%	0.7%	2.8%	4.1%	9.2%		
Units per Businesses (#)	6.73	5.28	4.27	3.45	2.84	2.39	-18.0%	
AGR	-23.4%	-21.5%	-19.1%	-19.2%	-17.9%	-15.8%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	27.1%	29.7%	32.4%	35.3%	38.3%	41.3%	14.2%	

∞ Δ Daniel Research Group ©(2024)



∞ Δ Daniel Research Group (2024)

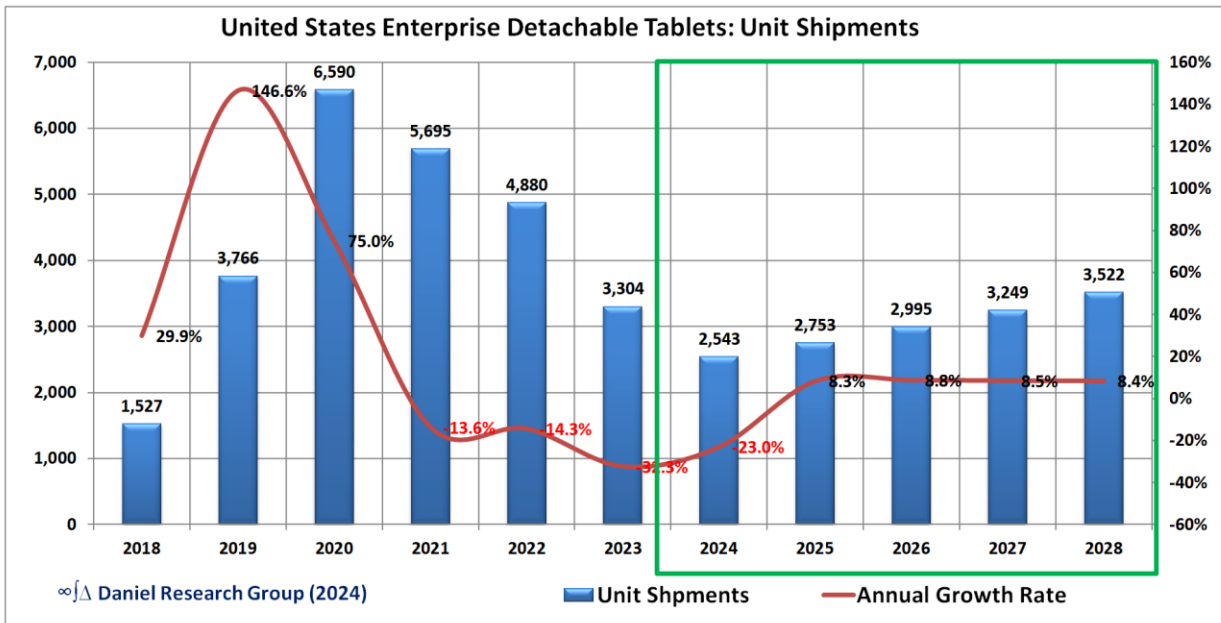
■ Unit Shpments

— Annual Growth Rate

Enterprise Detachable

United States Enterprise Detachable Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	3,304	2,543	2,753	2,995	3,249	3,522	8.5%	
AGR	-32.3%	-23.0%	8.3%	8.8%	8.5%	8.4%		
Revenue (\$M)	2,381	1,799	1,912	2,041	2,174	2,313	6.5%	
AGR	-25.4%	-24.4%	6.3%	6.8%	6.5%	6.4%		
Average Price (\$)	721	707	694	682	669	657	-1.8%	
AGR	10.2%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%		
Installed Base (K)	9,350	10,449	11,225	11,714	11,969	12,040	3.6%	
AGR	10.3%	11.8%	7.4%	4.4%	2.2%	0.6%		
Removal Age (Y)	2.60	3.44	3.70	3.91	4.04	4.09	4.4%	
AGR	33.5%	32.2%	7.7%	5.5%	3.4%	1.3%		
Average Installed Base Age (Y)	3.00	3.35	3.64	3.87	4.03	4.12	5.3%	
AGR	12.6%	11.6%	8.7%	6.2%	4.1%	2.3%		
Replacement Cycle Length (Y)	4.85	8.24	6.68	5.67	5.00	4.49	-14.1%	
AGR	63.9%	70.0%	-19.0%	-15.0%	-11.9%	-10.2%		
Units per Businesses (#)	11.68	10.03	8.53	7.08	5.87	4.88	-16.5%	
AGR	-16.4%	-14.1%	-14.9%	-17.0%	-17.2%	-16.9%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	11.8%	15.1%	19.1%	23.8%	29.3%	35.5%	23.7%	

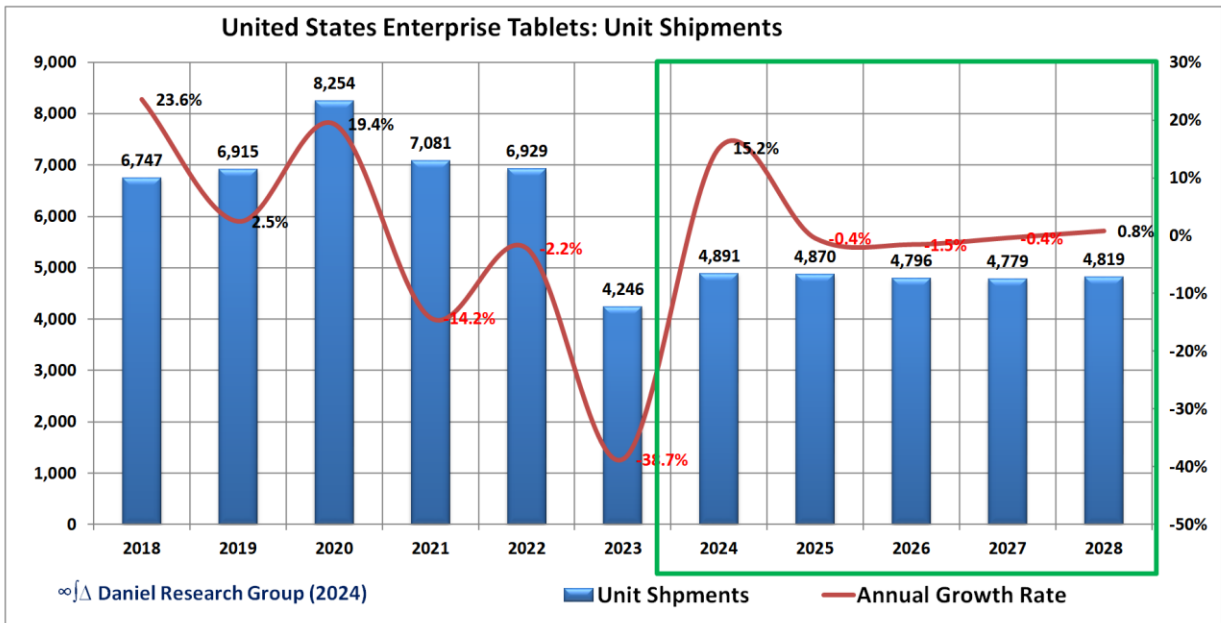
∞Δ Daniel Research Group ©(2024)



Enterprise Total

United States Enterprise Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	4,246	4,891	4,870	4,796	4,779	4,819	-0.4%	
AGR	-38.7%	15.2%	-0.4%	-1.5%	-0.4%	0.8%		
Revenue (\$M)	2,681	2,535	2,564	2,587	2,630	2,693	1.5%	
AGR	-33.2%	-5.5%	1.2%	0.9%	1.7%	2.4%		
Average Price (\$)	631	518	527	539	550	559	1.9%	
AGR	9.0%	-17.9%	1.6%	2.4%	2.0%	1.6%		
Installed Base (K)	21,694	21,267	20,773	20,173	19,514	18,902	-2.9%	
AGR	-4.8%	-2.0%	-2.3%	-2.9%	-3.3%	-3.1%		
Removal Age (Y)	4.80	4.90	5.05	5.17	5.21	5.11	1.0%	
AGR	20.8%	2.2%	3.0%	2.3%	0.9%	-2.0%		
Average Installed Base Age (Y)	4.40	4.51	4.57	4.59	4.57	4.54	0.2%	
AGR	6.6%	2.5%	1.4%	0.5%	-0.4%	-0.7%		
Replacement Cycle Length (Y)	5.07	5.00	4.87	4.74	4.59	4.48	-2.7%	
AGR	26.5%	-1.4%	-2.5%	-2.7%	-3.2%	-2.4%		
Units per Businesses (#)	9.71	8.50	7.60	6.73	6.00	5.40	-10.7%	
AGR	-15.8%	-12.5%	-10.6%	-11.4%	-10.9%	-10.1%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	33.0%	36.3%	39.7%	43.2%	46.7%	50.3%	17.3%	

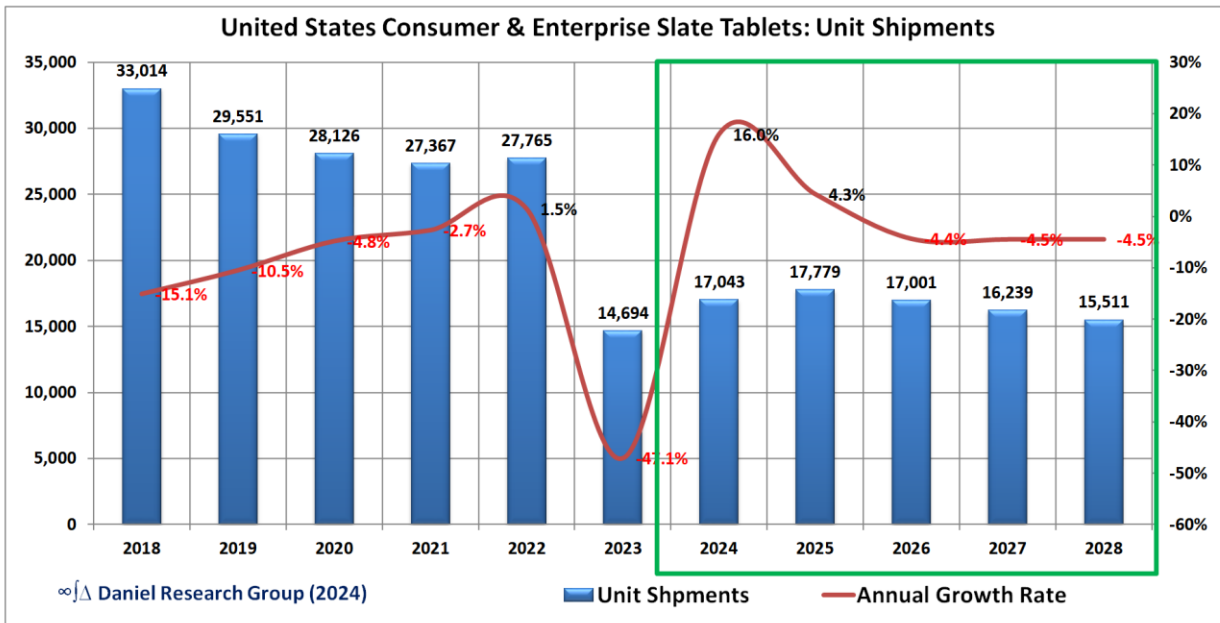
∞Δ Daniel Research Group ©(2024)



Total Slate

United States Consumer & Enterprise Slate Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	14,694	17,043	17,779	17,001	16,239	15,511	-2.3%	
AGR	-47.1%	16.0%	4.3%	-4.4%	-4.5%	-4.5%		
Revenue (\$M)	3,211	4,099	4,543	4,655	4,795	4,965	4.9%	
AGR	-40.8%	27.7%	10.8%	2.5%	3.0%	3.5%		
Average Price (\$)	219	241	256	274	295	320	7.4%	
AGR	11.9%	10.1%	6.2%	7.2%	7.8%	8.4%		
Installed Base (K)	130,164	117,399	106,661	96,912	88,381	81,129	-8.8%	
AGR	-11.0%	-9.8%	-9.1%	-9.1%	-8.8%	-8.2%		
Removal Age (Y)	6.33	6.50	6.71	6.84	6.82	6.70	0.7%	
AGR	14.1%	2.8%	3.2%	1.9%	-0.2%	-1.9%		
Average Installed Base Age (Y)	5.37	5.55	5.59	5.54	5.44	5.33	-1.0%	
AGR	7.2%	3.5%	0.6%	-0.9%	-1.8%	-2.1%		
Replacement Cycle Length (Y)	5.23	4.94	4.74	4.62	4.57	4.56	-2.0%	
AGR	3.0%	-5.6%	-4.0%	-2.5%	-1.2%	-0.1%		
Units per Households & Businesses (#)	1.60	1.43	1.28	1.15	1.06	1.05	-7.4%	
AGR	-12.3%	-10.9%	-10.1%	-10.1%	-8.3%	-0.6%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	58.2%	58.2%	58.3%	58.4%	57.6%	52.8%	-5.4%	

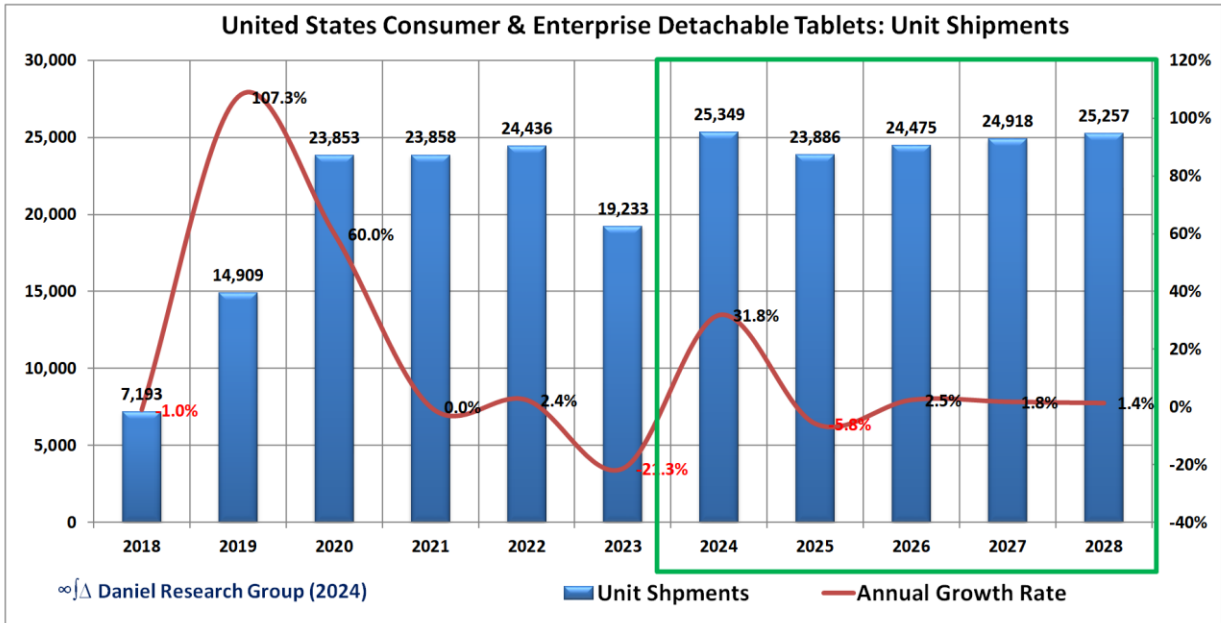
∞ Δ Daniel Research Group ©(2024)



Total Detachable

United States Consumer & Enterprise Detachable Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	19,233	25,349	23,886	24,475	24,918	25,257	-0.1%	
AGR	-21.3%	31.8%	-5.8%	2.5%	1.8%	1.4%		
Revenue (\$M)	13,162	17,151	16,061	16,346	16,526	16,632	-0.8%	
AGR	-21.3%	30.3%	-6.4%	1.8%	1.1%	0.6%		
Average Price (\$)	684	677	672	668	663	659	-0.7%	
AGR	0.0%	-1.1%	-0.6%	-0.7%	-0.7%	-0.7%		
Installed Base (K)	67,271	74,201	79,080	83,326	87,112	90,465	5.1%	
AGR	8.7%	10.3%	6.6%	5.4%	4.5%	3.8%		
Removal Age (Y)	3.10	3.12	3.45	3.70	3.90	4.10	7.1%	
AGR	17.5%	0.8%	10.6%	7.4%	5.3%	5.2%		
Average Installed Base Age (Y)	3.18	3.35	3.56	3.72	3.85	3.96	4.3%	
AGR	12.1%	5.6%	6.1%	4.6%	3.6%	2.8%		
Replacement Cycle Length (Y)	5.85	5.03	5.16	5.12	5.12	5.13	0.5%	
AGR	2.3%	-14.0%	2.6%	-0.8%	0.1%	0.2%		
Units per Households & Businesses (#)	2.62	2.61	2.52	2.40	2.28	2.16	-4.6%	
AGR	-2.4%	-0.5%	-3.6%	-4.5%	-5.0%	-5.4%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	18.4%	20.1%	22.1%	24.1%	26.3%	28.7%	10.3%	

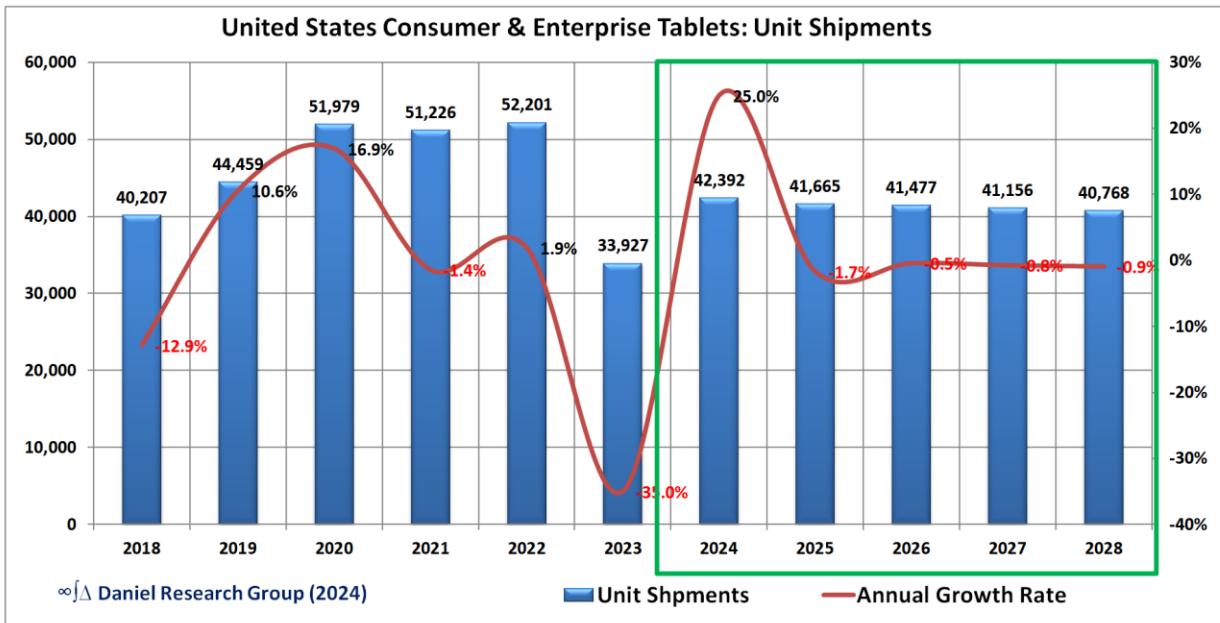
∞Δ Daniel Research Group ©(2024)



Total Tablets

United States Consumer & Enterprise Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	33,927	42,392	41,665	41,477	41,156	40,768	-1.0%	
AGR	-35.0%	25.0%	-1.7%	-0.5%	-0.8%	-0.9%		
Revenue (\$M)	16,372	21,250	20,604	21,001	21,321	21,597	0.4%	
AGR	-26.1%	29.8%	-3.0%	1.9%	1.5%	1.3%		
Average Price (\$)	483	501	495	506	518	530	1.4%	
AGR	13.7%	3.9%	-1.4%	2.4%	2.3%	2.3%		
Installed Base (K)	197,435	191,601	185,741	180,238	175,494	171,595	-2.7%	
AGR	-5.1%	-3.0%	-3.1%	-3.0%	-2.6%	-2.2%		
Removal Age (Y)	5.30	5.24	5.40	5.47	5.45	5.40	0.8%	
AGR	12.5%	-1.3%	3.2%	1.3%	-0.4%	-1.0%		
Average Installed Base Age (Y)	4.60	4.68	4.70	4.67	4.64	4.60	-0.4%	
AGR	6.0%	1.6%	0.4%	-0.5%	-0.8%	-0.8%		
Replacement Cycle Length (Y)	5.43	4.97	4.91	4.84	4.82	4.84	-0.7%	
AGR	3.3%	-8.3%	-1.3%	-1.5%	-0.3%	0.4%		
Units per Households & Businesses (#)	2.10	1.99	1.88	1.78	1.72	1.76	-3.0%	
AGR	-7.6%	-5.3%	-5.3%	-5.3%	-3.7%	2.5%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	67.3%	68.3%	69.3%	70.3%	70.5%	66.7%	-0.6%	

∞Δ Daniel Research Group ©(2024)

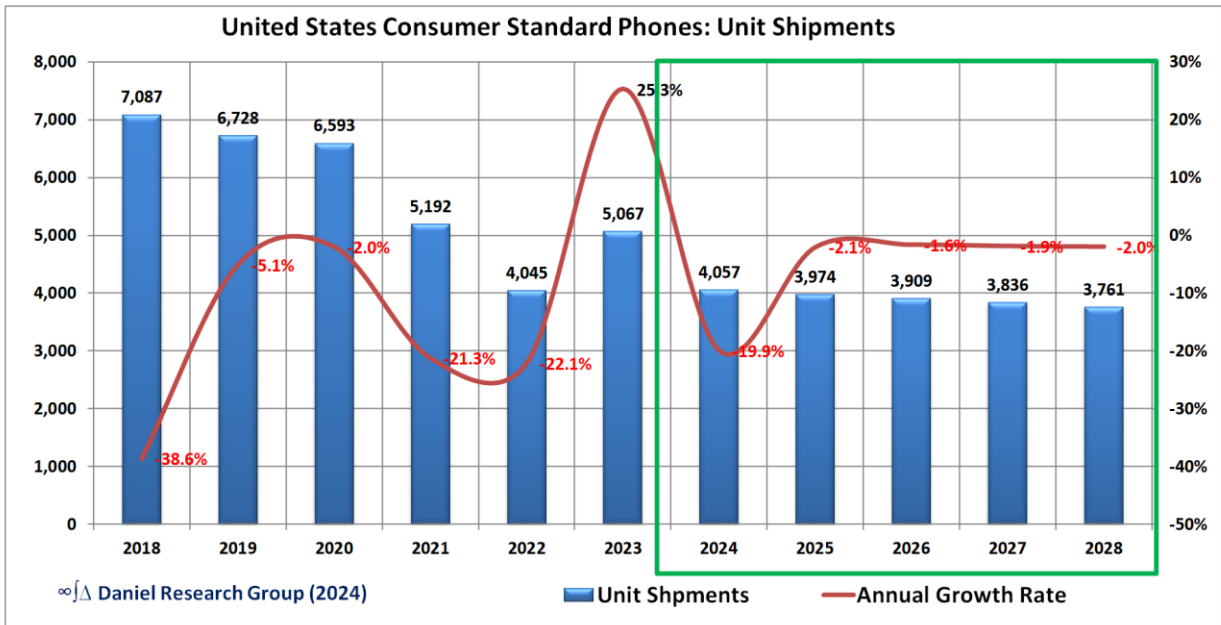


Mobile Phones

Consumer Standard

United States Consumer Standard Phones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	5,067	4,057	3,974	3,909	3,836	3,761	-1.9%	
AGR	25.3%	-19.9%	-2.1%	-1.6%	-1.9%	-2.0%		
Revenue (\$M)	349	285	285	286	287	288	0.2%	
AGR	7.5%	-18.3%	0.0%	0.4%	0.3%	0.2%		
Average Price (\$)	69	70	72	73	75	77	2.1%	
AGR	-14.2%	2.0%	2.1%	2.1%	2.2%	2.2%		
Installed Base (K)	89,887	69,684	54,010	43,130	35,987	31,570	-18.0%	
AGR	-20.1%	-22.5%	-22.5%	-20.1%	-16.6%	-12.3%		
Removal Age (Y)	12.40	12.71	12.55	12.07	11.34	10.35	-5.0%	
AGR	-0.2%	2.5%	-1.3%	-3.8%	-6.0%	-8.7%		
Average Installed Base Age (Y)	9.82	9.59	9.17	8.69	8.26	7.99	-4.5%	
AGR	-0.3%	-2.3%	-4.4%	-5.3%	-5.0%	-3.2%		
Replacement Cycle Length (Y)	4.25	3.87	3.75	3.92	4.28	4.86	5.8%	
AGR	-7.5%	-9.0%	-3.2%	4.5%	9.2%	13.6%		
Units per Households (#)	5.43	5.05	4.72	4.56	4.62	4.58	-2.4%	
AGR	-4.9%	-7.0%	-6.5%	-3.4%	1.3%	-0.8%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	12.5%	10.3%	8.4%	6.9%	5.6%	5.0%	-7.5%	

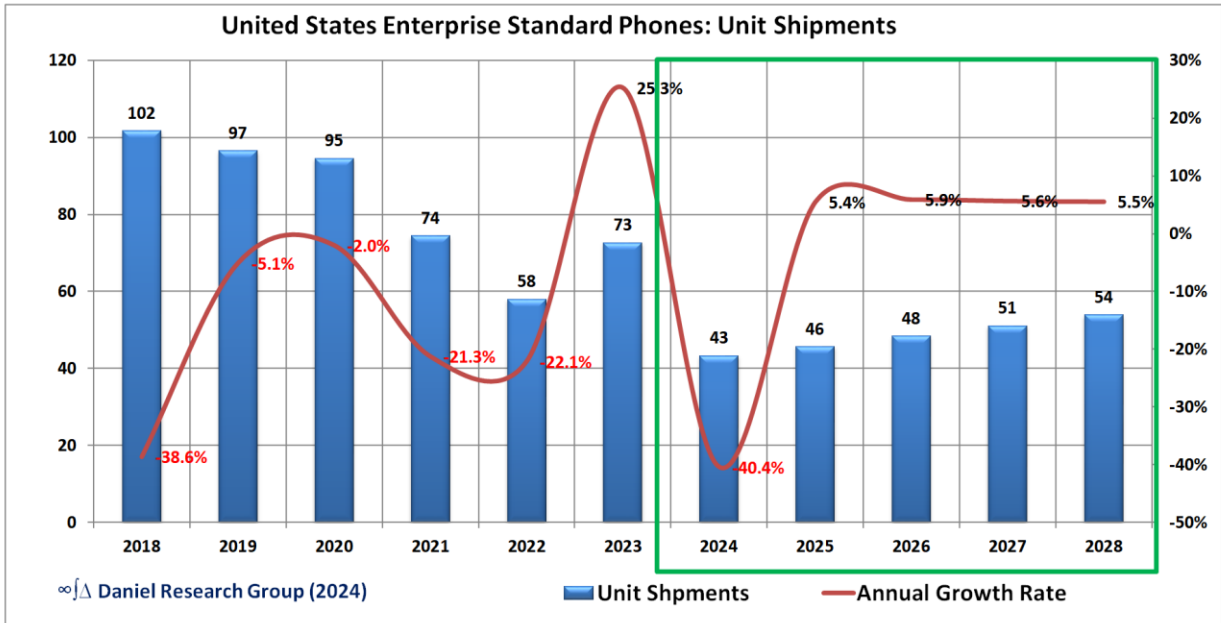
∞ Δ Daniel Research Group ©(2024)



Enterprise Standard

United States Enterprise Standard Phones									
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend	
Unit Shipments (K)	73	43	46	48	51	54	5.6%		
AGR	25.3%	-40.4%	5.4%	5.9%	5.6%	5.5%			
Revenue (\$M)	27	17	19	22	24	27	12.1%		
AGR	7.5%	-36.6%	12.0%	12.5%	12.1%	11.9%			
Average Price (\$)	373	397	421	447	475	504	6.2%		
AGR	-14.2%	6.3%	6.3%	6.2%	6.1%	6.1%			
Installed Base (K)	6,634	4,281	3,134	2,067	922	531	-40.7%		
AGR	-29.5%	-35.5%	-26.8%	-34.0%	-55.4%	-42.4%			
Removal Age (Y)	13.84	14.15	13.84	14.18	14.51	13.86	-0.5%		
AGR	1.6%	2.2%	-2.2%	2.5%	2.3%	-4.5%			
Average Installed Base Age (Y)	11.67	11.73	12.13	12.28	11.01	9.34	-5.5%		
AGR	2.3%	0.5%	3.5%	1.2%	-10.4%	-15.2%			
Replacement Cycle Length (Y)	3.33	2.79	3.63	2.85	1.77	2.19	-5.8%		
AGR	-11.4%	-16.2%	30.1%	-21.3%	-37.9%	23.8%			
Units per Businesses (#)	37.93	34.05	35.45	33.05	20.97	17.22	-15.7%		
AGR	-2.8%	-10.2%	4.1%	-6.8%	-36.6%	-17.9%			
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend	
Market Penetration (%)	2.6%	1.8%	1.3%	0.9%	0.6%	0.4%	-2.1%		

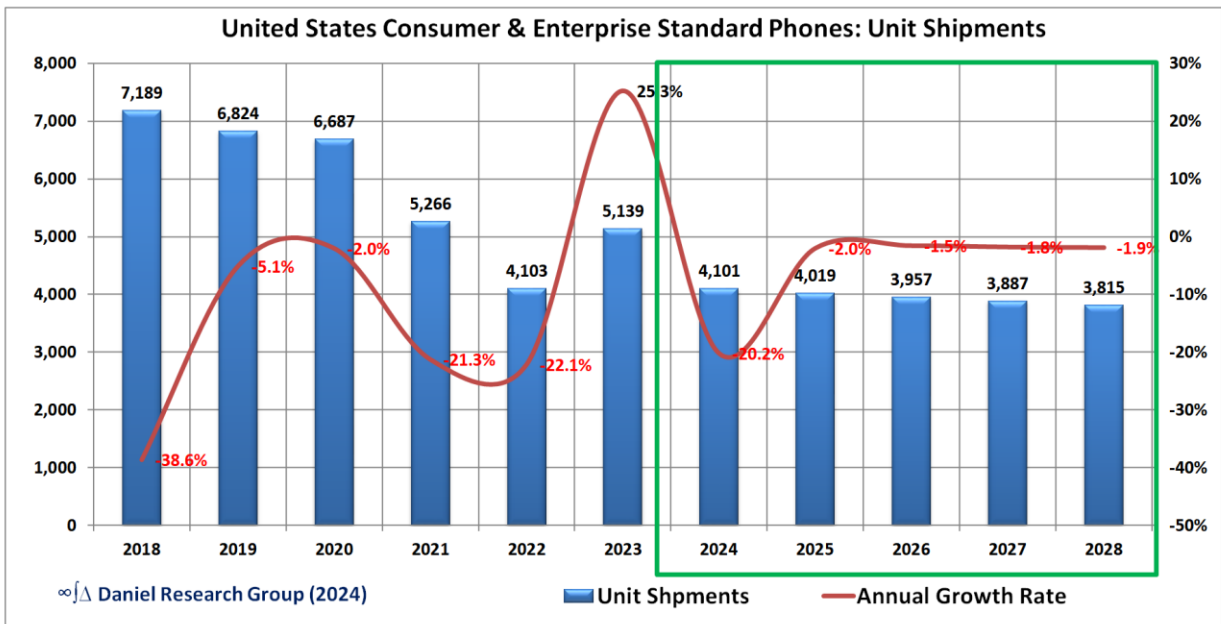
∞ Δ Daniel Research Group ©(2024)



Total Standard

United States Consumer & Enterprise Standard Phones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	5,139	4,101	4,019	3,957	3,887	3,815	-1.8%	
AGR	25.3%	-20.2%	-2.0%	-1.5%	-1.8%	-1.9%		
Revenue (\$M)	376	302	304	308	311	315	1.0%	
AGR	7.5%	-19.6%	0.6%	1.2%	1.1%	1.1%		
Average Price (\$)	73	74	76	78	80	83	2.9%	
AGR	-14.2%	0.7%	2.7%	2.8%	2.9%	3.0%		
Installed Base (K)	96,520	73,965	57,143	45,197	36,910	32,101	-18.8%	
AGR	-20.8%	-23.4%	-22.7%	-20.9%	-18.3%	-13.0%		
Removal Age (Y)	12.53	12.85	12.62	12.22	11.70	10.54	-4.8%	
AGR	0.0%	2.5%	-1.8%	-3.2%	-4.3%	-9.9%		
Average Installed Base Age (Y)	9.95	9.72	9.34	8.86	8.32	8.00	-4.7%	
AGR	-0.2%	-2.4%	-3.9%	-5.1%	-6.1%	-3.8%		
Replacement Cycle Length (Y)	4.17	3.77	3.74	3.84	4.03	4.72	5.8%	
AGR	-7.7%	-9.4%	-0.9%	2.7%	4.9%	17.1%		
Units per Households & Businesses (#)	5.77	5.31	4.95	4.74	4.71	4.64	-3.3%	
AGR	-5.6%	-8.0%	-6.7%	-4.2%	-0.7%	-1.6%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	12.0%	9.9%	8.1%	6.6%	5.4%	4.7%	-7.2%	

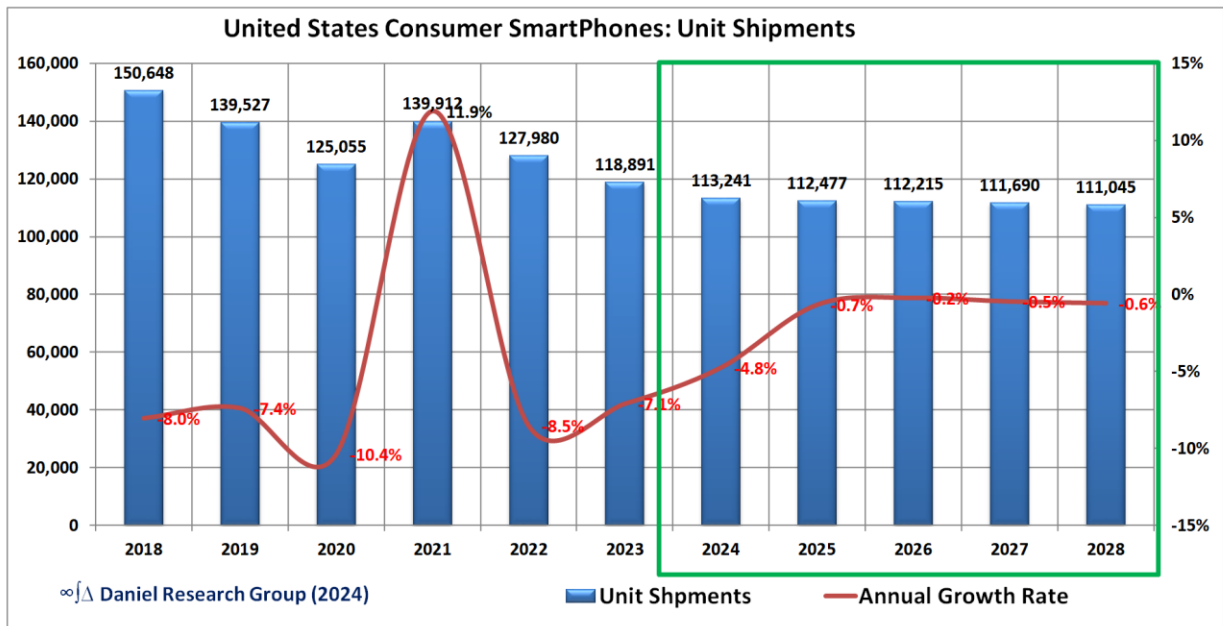
∞ Δ Daniel Research Group ©(2024)



Consumer Smartphone

United States Consumer Smartphones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	118,891	113,241	112,477	112,215	111,690	111,045	-0.5%	
AGR	-7.1%	-4.8%	-0.7%	-0.2%	-0.5%	-0.6%		
Revenue (\$M)	97,070	93,397	93,709	94,441	94,955	95,366	0.5%	
AGR	4.8%	-3.8%	0.3%	0.8%	0.5%	0.4%		
Average Price (\$)	816	825	833	842	850	859	1.0%	
AGR	12.8%	1.0%	1.0%	1.0%	1.0%	1.0%		
Installed Base (K)	540,376	542,398	538,564	530,904	522,035	509,641	-1.5%	
AGR	0.8%	0.4%	-0.7%	-1.4%	-1.7%	-2.4%		
Removal Age (Y)	4.19	4.60	5.08	5.37	5.46	5.74	5.7%	
AGR	10.2%	9.9%	10.5%	5.7%	1.7%	5.2%		
Average Installed Base Age (Y)	5.56	5.81	5.97	6.06	6.14	6.14	1.4%	
AGR	5.3%	4.3%	2.8%	1.7%	1.2%	0.0%		
Replacement Cycle Length (Y)	5.72	5.88	5.63	5.43	5.33	5.13	-3.3%	
AGR	3.6%	2.8%	-4.2%	-3.6%	-1.8%	-3.8%		
Units per Households (#)	4.31	4.23	4.12	3.99	3.86	3.72	-3.1%	
AGR	-2.2%	-2.0%	-2.6%	-3.1%	-3.1%	-3.7%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	94.2%	95.5%	96.5%	97.3%	97.9%	98.4%	4.2%	

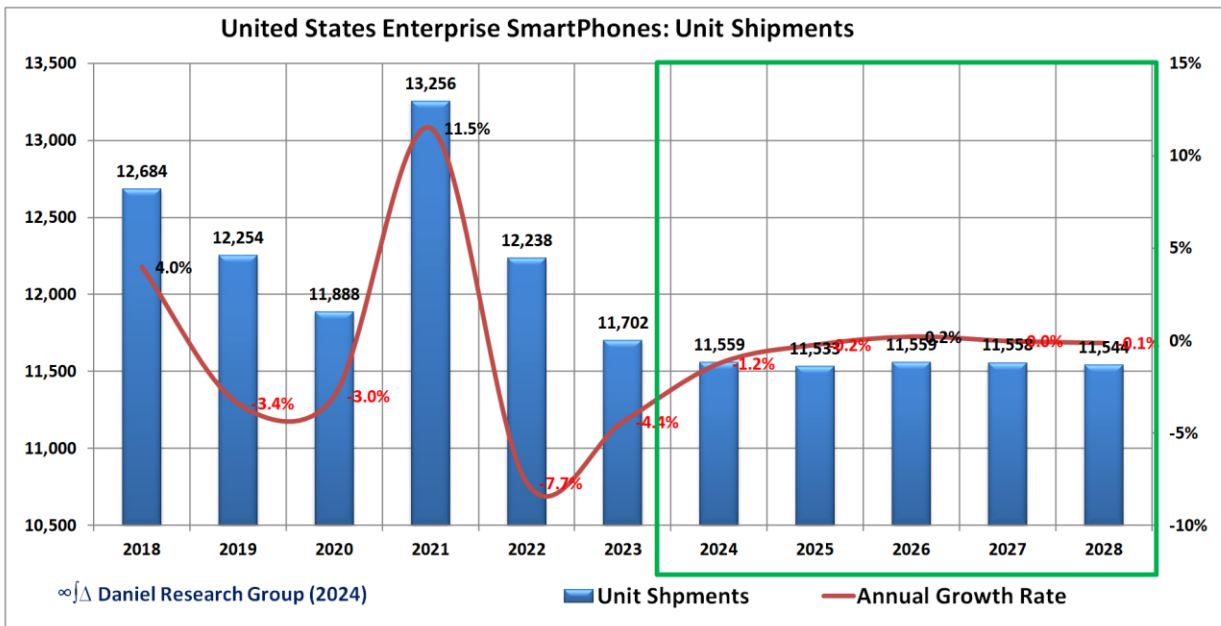
∞ Δ Daniel Research Group ©(2024)



Enterprise Smartphone

United States Enterprise Smartphones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	11,702	11,559	11,533	11,559	11,558	11,544	0.0%	
AGR	-4.4%	-1.2%	-0.2%	0.2%	0.0%	-0.1%		
Revenue (\$M)	10,750	10,886	11,136	11,442	11,729	12,010	2.5%	
AGR	5.9%	1.3%	2.3%	2.7%	2.5%	2.4%		
Average Price (\$)	919	942	966	990	1,015	1,040	2.5%	
AGR	10.7%	2.5%	2.5%	2.5%	2.5%	2.5%		
Installed Base (K)	50,524	48,622	47,419	46,491	45,808	45,508	-1.6%	
AGR	-4.3%	-3.8%	-2.5%	-2.0%	-1.5%	-0.7%		
Removal Age (Y)	6.13	6.12	5.65	5.42	5.21	4.87	-5.5%	
AGR	11.1%	-0.2%	-7.7%	-3.9%	-3.9%	-6.5%		
Average Installed Base Age (Y)	6.11	5.93	5.83	5.76	5.72	5.75	-0.8%	
AGR	-2.2%	-2.9%	-1.6%	-1.2%	-0.7%	0.5%		
Replacement Cycle Length (Y)	4.62	4.61	4.72	4.72	4.74	4.84	1.2%	
AGR	-7.2%	-0.2%	2.4%	0.0%	0.4%	2.1%		
Units per Businesses (#)	51.24	57.82	67.76	79.49	94.48	113.81	18.4%	
AGR	11.1%	12.8%	17.2%	17.3%	18.9%	20.5%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	14.6%	12.2%	10.2%	8.4%	7.0%	5.7%	-8.8%	

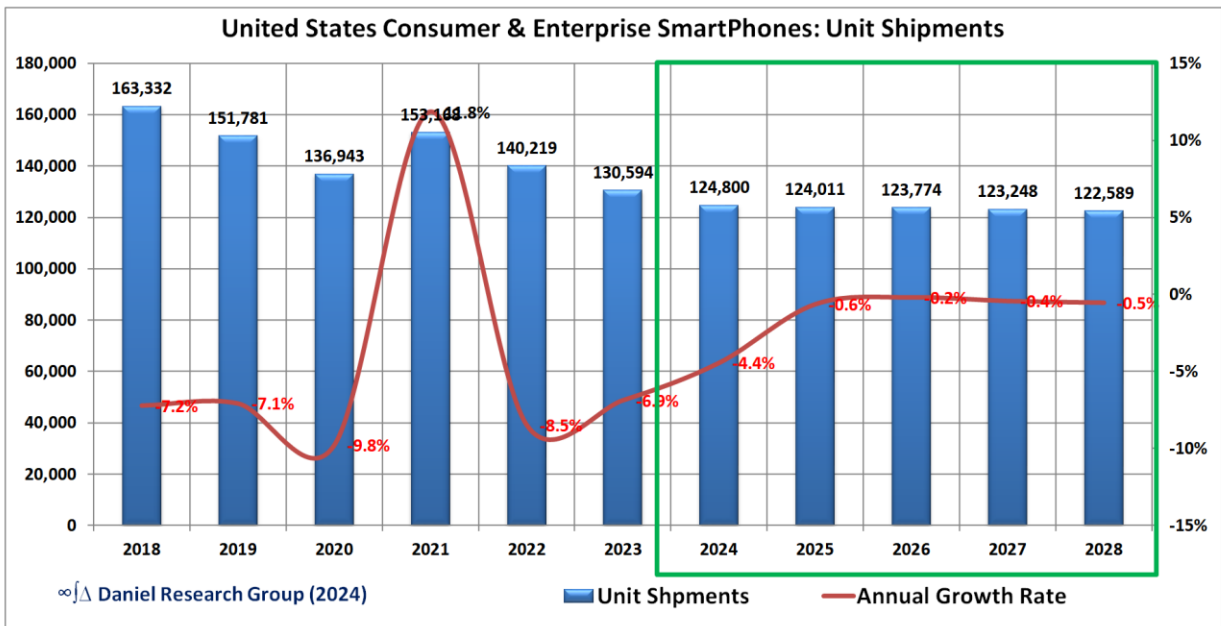
∞ Δ Daniel Research Group ©(2024)



Total Smartphone

United States Consumer & Enterprise SmartPhones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	130,594	124,800	124,011	123,774	123,248	122,589	-0.4%	
AGR	-6.9%	-4.4%	-0.6%	-0.2%	-0.4%	-0.5%		
Revenue (\$M)	107,820	104,283	104,845	105,883	106,684	107,376	0.7%	
AGR	4.9%	-3.3%	0.5%	1.0%	0.8%	0.6%		
Average Price (\$)	826	836	845	855	866	876	1.2%	
AGR	12.6%	1.2%	1.2%	1.2%	1.2%	1.2%		
Installed Base (K)	590,900	591,020	585,984	577,395	567,843	555,149	-1.6%	
AGR	0.4%	0.0%	-0.9%	-1.5%	-1.7%	-2.2%		
Removal Age (Y)	4.40	4.77	5.14	5.38	5.44	5.66	4.4%	
AGR	10.7%	8.3%	7.8%	4.6%	1.2%	4.2%		
Average Installed Base Age (Y)	5.61	5.81	5.95	6.04	6.10	6.10	1.2%	
AGR	4.5%	3.6%	2.4%	1.4%	1.1%	0.0%		
Replacement Cycle Length (Y)	5.60	5.74	5.54	5.36	5.28	5.10	-2.9%	
AGR	2.4%	2.5%	-3.5%	-3.2%	-1.6%	-3.3%		
Units per Households & Businesses (#)	4.68	4.58	4.46	4.32	4.19	4.04	-3.1%	
AGR	-2.5%	-2.2%	-2.7%	-3.1%	-3.1%	-3.5%		
Market Penetration (%)	90.4%	91.4%	92.3%	93.0%	93.5%	94.0%	3.6%	
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend

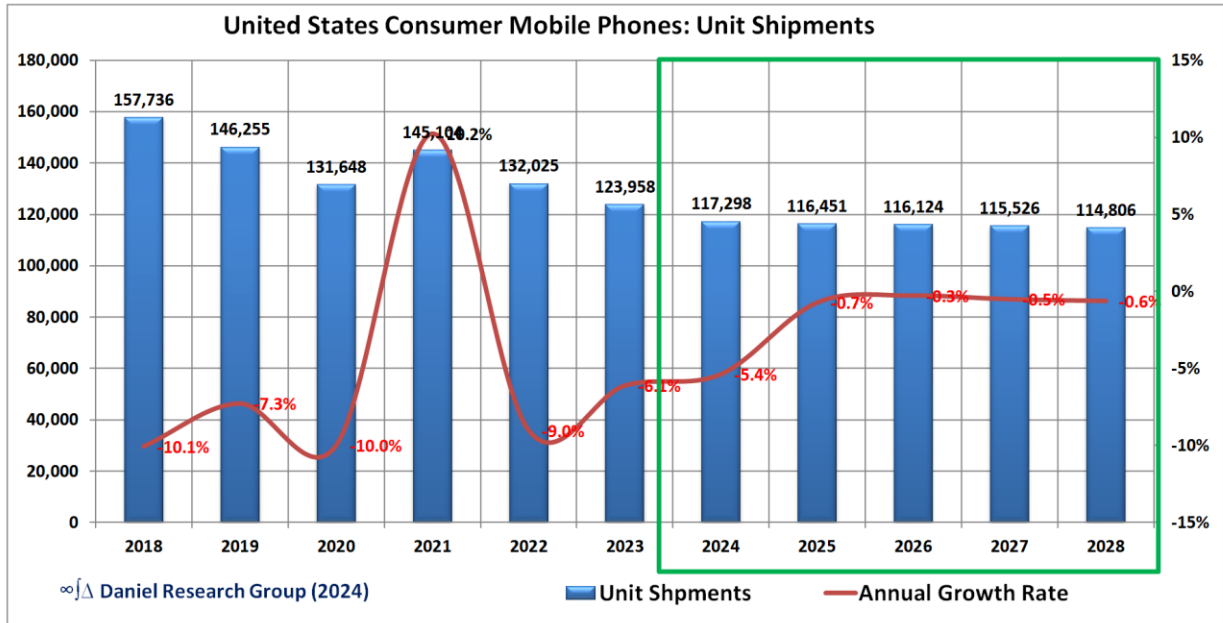
∞ Δ Daniel Research Group ©(2024)



Consumer Total

United States Consumer Mobile Phones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	123,958	117,298	116,451	116,124	115,526	114,806	-0.5%	
AGR	-6.1%	-5.4%	-0.7%	-0.3%	-0.5%	-0.6%		
Revenue (\$M)	97,419	93,682	93,995	94,728	95,242	95,654	0.5%	
AGR	4.8%	-3.8%	0.3%	0.8%	0.5%	0.4%		
Average Price (\$)	786	799	807	816	824	833	1.1%	
AGR	11.6%	1.6%	1.1%	1.1%	1.1%	1.1%		
Installed Base (K)	630,263	612,082	592,574	574,035	558,022	541,211	-3.0%	
AGR	-2.8%	-2.9%	-3.2%	-3.1%	-2.8%	-3.0%		
Removal Age (Y)	5.65	5.91	6.07	6.06	5.97	6.09	0.8%	
AGR	3.1%	4.7%	2.7%	-0.2%	-1.5%	2.1%		
Average Installed Base Age (Y)	6.14	6.23	6.27	6.29	6.30	6.25	0.1%	
AGR	2.1%	1.6%	0.7%	0.2%	0.1%	-0.7%		
Replacement Cycle Length (Y)	5.43	5.52	5.36	5.26	5.24	5.11	-1.9%	
AGR	2.0%	1.5%	-2.9%	-1.8%	-0.4%	-2.5%		
Units per Households (#)	4.75	4.56	4.37	4.20	4.04	3.89	-3.9%	
AGR	-4.2%	-3.9%	-4.1%	-4.0%	-3.7%	-3.9%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	99.9%	99.9%	100.0%	100.0%	100.0%	100.0%	0.1%	

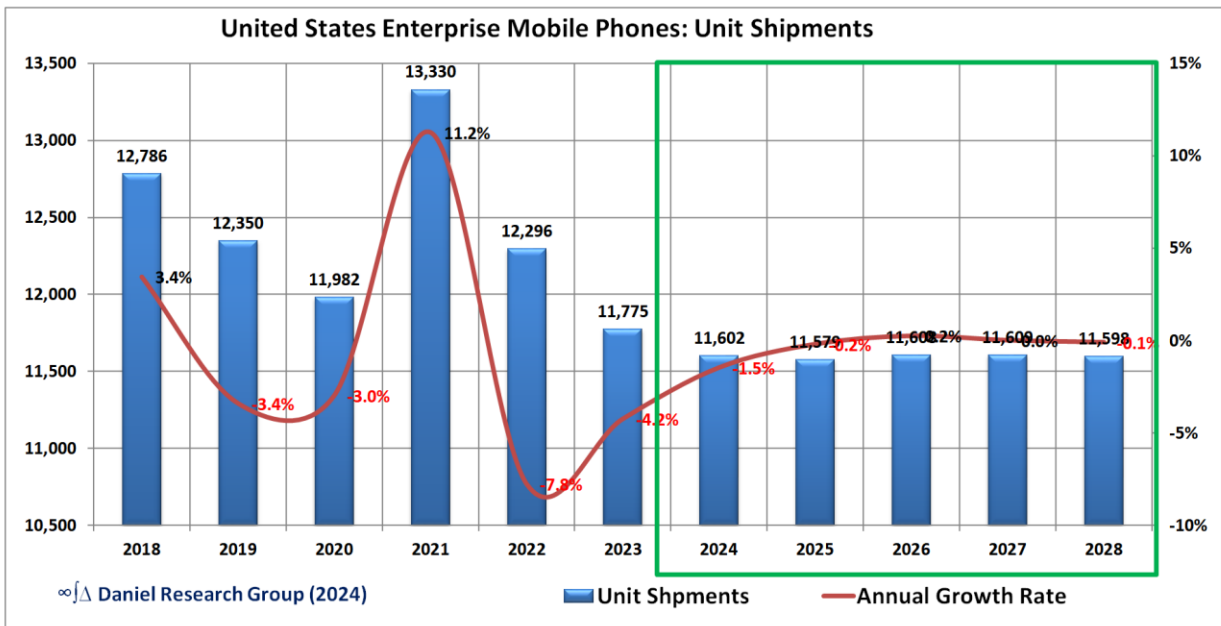
∞ Δ Daniel Research Group ©(2024)



Enterprise Total

United States Enterprise Mobile Phones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	11,775	11,602	11,579	11,608	11,609	11,598	0.0%	
AGR	-4.2%	-1.5%	-0.2%	0.2%	0.0%	-0.1%		
Revenue (\$M)	10,778	10,903	11,155	11,464	11,753	12,037	2.5%	
AGR	5.9%	1.2%	2.3%	2.8%	2.5%	2.4%		
Average Price (\$)	915	940	963	988	1,012	1,038	2.5%	
AGR	10.6%	2.7%	2.5%	2.5%	2.5%	2.5%		
Installed Base (K)	57,158	52,903	50,553	48,558	46,730	46,039	-3.4%	
AGR	-8.1%	-7.4%	-4.4%	-3.9%	-3.8%	-1.5%		
Removal Age (Y)	7.37	7.26	6.38	6.10	5.95	5.20	-8.0%	
AGR	4.0%	-1.6%	-12.1%	-4.3%	-2.6%	-12.6%		
Average Installed Base Age (Y)	6.73	6.39	6.21	6.03	5.85	5.81	-2.3%	
AGR	-3.7%	-5.0%	-2.9%	-2.8%	-3.1%	-0.6%		
Replacement Cycle Length (Y)	4.40	4.34	4.63	4.57	4.48	4.75	2.3%	
AGR	-6.9%	-1.4%	6.8%	-1.3%	-2.0%	6.0%		
Units per Businesses (#)	53.25	63.79	81.37	104.39	135.70	181.93	30.0%	
AGR	16.7%	19.8%	27.6%	28.3%	30.0%	34.1%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	15.9%	12.0%	9.0%	6.7%	5.0%	3.6%	-12.2%	

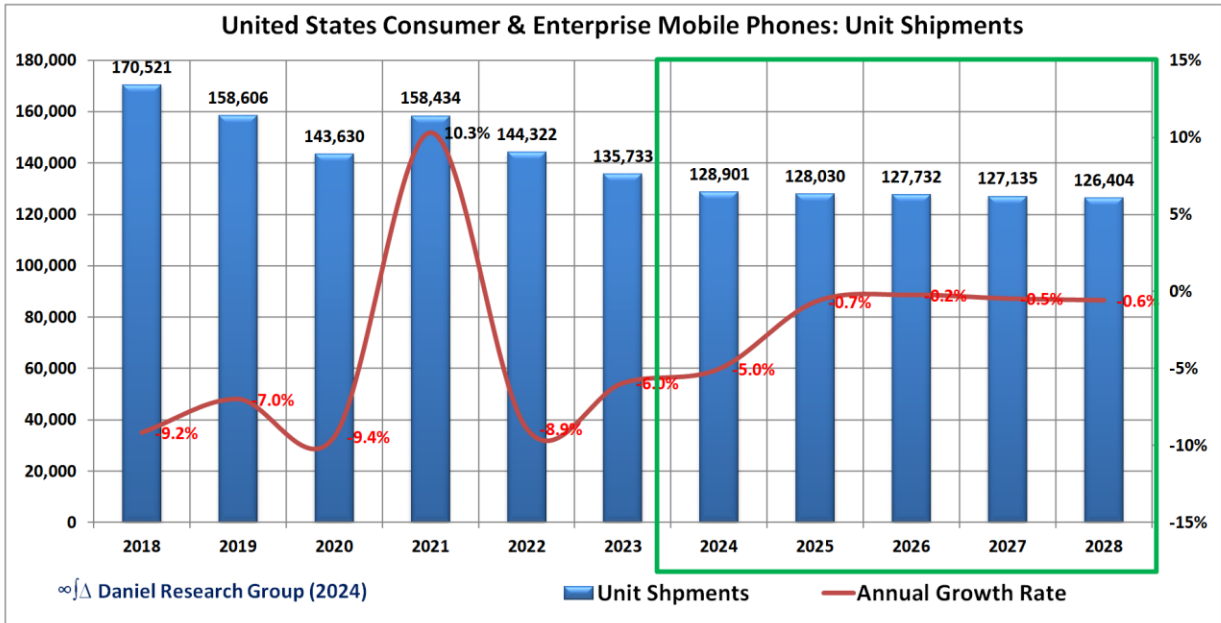
∞ Δ Daniel Research Group ©(2024)



Total Mobile Phones

United States Consumer & Enterprise Mobile Phones								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	135,733	128,901	128,030	127,732	127,135	126,404	-0.5%	
AGR	-6.0%	-5.0%	-0.7%	-0.2%	-0.5%	-0.6%		
Revenue (\$M)	108,197	104,585	105,150	106,192	106,995	107,691	0.7%	
AGR	4.9%	-3.3%	0.5%	1.0%	0.8%	0.7%		
Average Price (\$)	797	811	821	831	842	852	1.2%	
AGR	11.5%	1.8%	1.2%	1.2%	1.2%	1.2%		
Installed Base (K)	687,420	664,985	643,127	622,593	604,753	587,250	-3.1%	
AGR	-3.3%	-3.3%	-3.3%	-3.2%	-2.9%	-2.9%		
Removal Age (Y)	5.84	6.06	6.10	6.07	5.97	6.01	-0.2%	
AGR	3.4%	3.8%	0.7%	-0.6%	-1.6%	0.7%		
Average Installed Base Age (Y)	6.19	6.24	6.27	6.27	6.26	6.22	-0.1%	
AGR	1.4%	0.9%	0.4%	0.0%	-0.1%	-0.7%		
Replacement Cycle Length (Y)	5.32	5.39	5.29	5.20	5.17	5.08	-1.5%	
AGR	1.1%	1.3%	-1.9%	-1.7%	-0.5%	-1.8%		
Units per Households & Businesses (#)	4.92	4.71	4.52	4.33	4.17	4.02	-3.9%	
AGR	-4.6%	-4.3%	-4.1%	-4.1%	-3.7%	-3.7%		
Market Penetration (%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend

∞ Δ Daniel Research Group ©(2024)



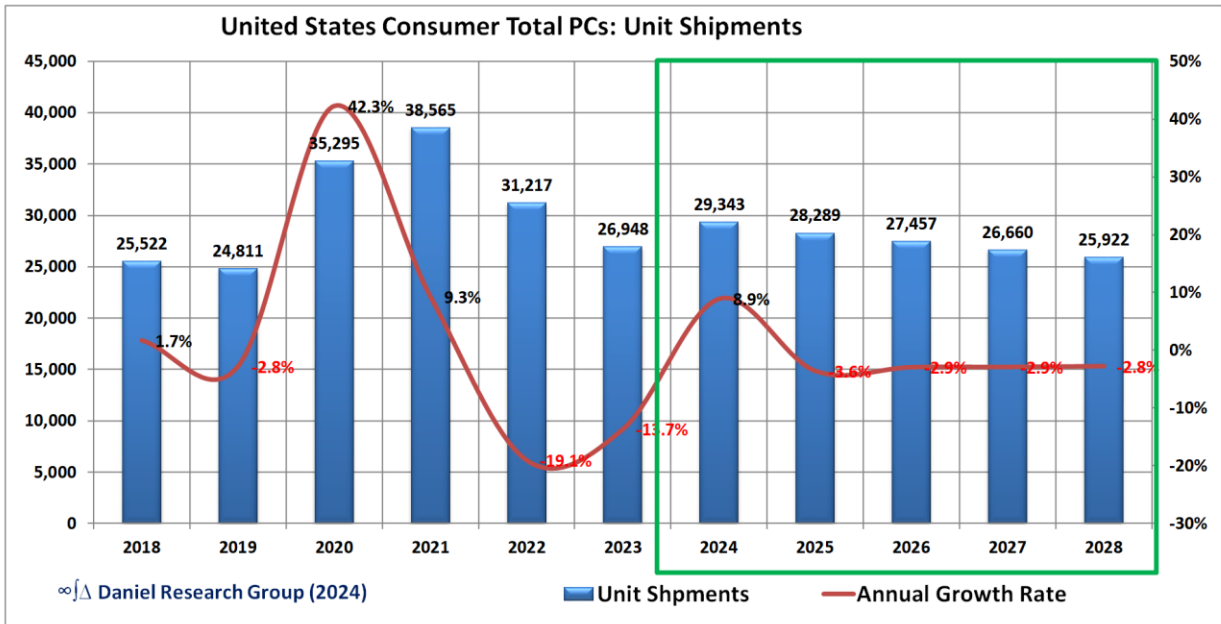
Market Aggregations

Total PCs (Desktop and Mobile)

Consumer PCs

United States Consumer Total PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	26,948	29,343	28,289	27,457	26,660	25,922	-3.1%	
AGR	-13.7%	8.9%	-3.6%	-2.9%	-2.9%	-2.8%		
Revenue (\$M)	30,843	35,489	36,472	37,674	39,006	40,508	3.4%	
AGR	-15.2%	15.1%	2.8%	3.3%	3.5%	3.9%		
Average Price (\$)	1,145	1,209	1,289	1,372	1,463	1,563	6.6%	
AGR	-1.8%	5.7%	6.6%	6.4%	6.6%	6.8%		
Installed Base (K)	118,586	117,919	116,468	114,404	111,935	109,235	-1.9%	
AGR	-1.2%	-0.6%	-1.2%	-1.8%	-2.2%	-2.4%		
Removal Age (Y)	4.63	4.64	4.77	4.89	4.99	5.09	2.3%	
AGR	6.4%	0.2%	2.9%	2.5%	2.1%	1.8%		
Average Installed Base Age (Y)	4.15	4.25	4.34	4.41	4.47	4.51	1.5%	
AGR	4.5%	2.3%	2.1%	1.7%	1.3%	0.9%		
Replacement Cycle Length (Y)	5.17	4.93	4.92	4.88	4.84	4.82	-0.6%	
AGR	2.4%	-4.7%	-0.3%	-0.8%	-0.7%	-0.5%		
Units per Households (#)	1.14	1.09	1.04	1.00	1.00	1.00	-2.1%	
AGR	-5.6%	-4.3%	-4.6%	-3.7%				
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	78.4%	80.6%	82.7%	83.6%	81.1%	78.5%	0.1%	

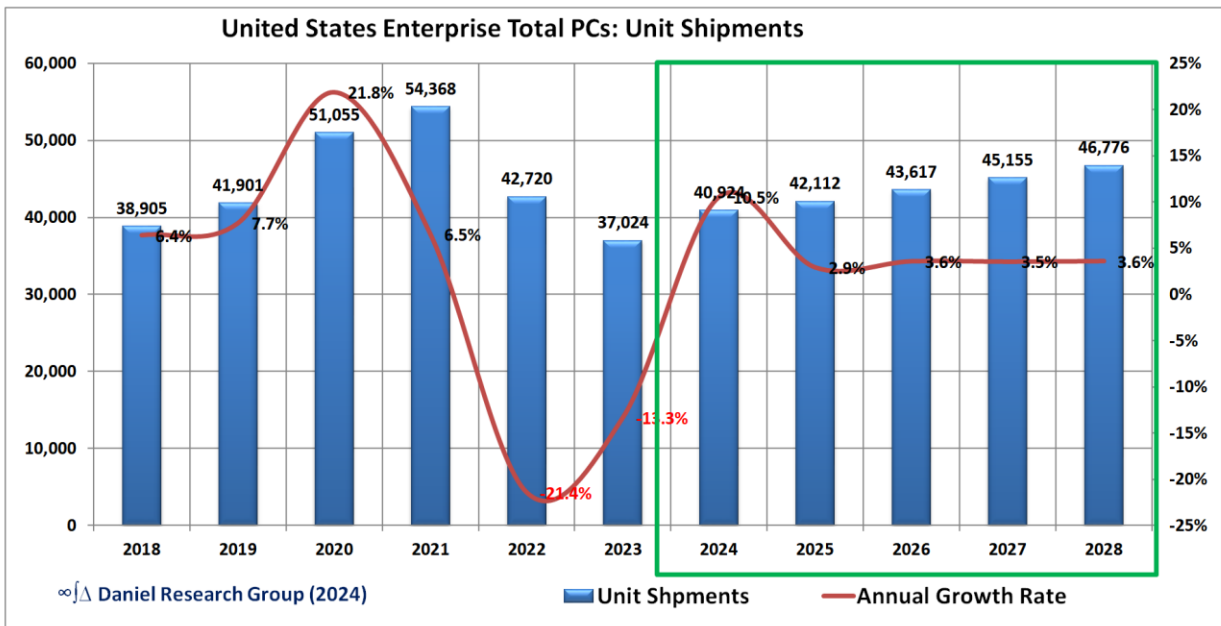
∞ Δ Daniel Research Group ©(2024)



Enterprise PCs

United States Enterprise Total PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	37,024	40,924	42,112	43,617	45,155	46,776	3.4%	
AGR	-13.3%	10.5%	2.9%	3.6%	3.5%	3.6%		
Revenue (\$M)	25,471	28,245	29,179	30,321	31,472	32,668	3.7%	
AGR	-19.9%	10.9%	3.3%	3.9%	3.8%	3.8%		
Average Price (\$)	688	690	693	695	697	698	0.3%	
AGR	-7.6%	0.3%	0.4%	0.3%	0.3%	0.2%		
Installed Base (K)	135,758	140,528	145,361	150,358	155,517	160,822	3.4%	
AGR	2.2%	3.5%	3.4%	3.4%	3.4%	3.4%		
Removal Age (Y)	4.45	4.39	4.40	4.39	4.39	4.39	0.0%	
AGR	11.3%	-1.3%	0.2%	-0.2%	-0.1%	0.1%		
Average Installed Base Age (Y)	4.07	4.06	4.05	4.05	4.04	4.03	-0.2%	
AGR	1.2%	-0.3%	-0.2%	-0.2%	-0.1%	-0.2%		
Replacement Cycle Length (Y)	4.98	4.89	4.90	4.89	4.89	4.88	0.0%	
AGR	30.7%	-2.0%	0.3%	-0.1%	-0.1%	-0.2%		
Units per Businesses (#)	20.08	20.39	21.11	21.67	22.36	23.12	3.2%	
AGR	-0.2%	1.5%	3.5%	2.7%	3.2%	3.4%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	

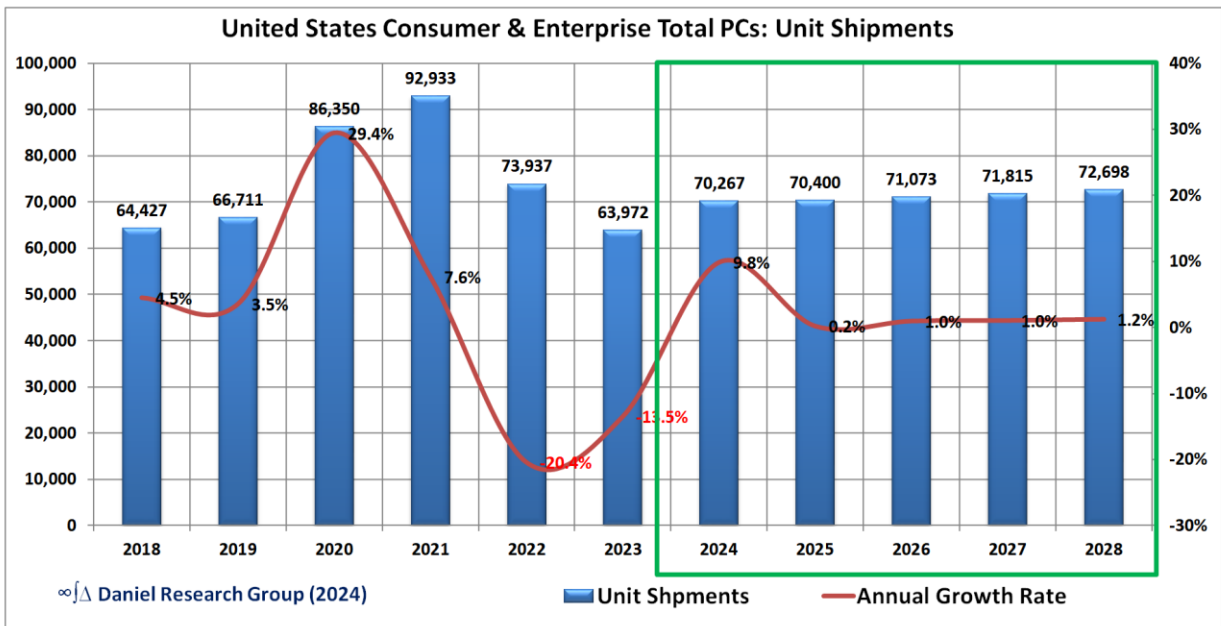
∞ Δ Daniel Research Group ©(2024)



Total PCs

United States Consumer & Enterprise Total PCs								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	63,972	70,267	70,400	71,073	71,815	72,698	0.9%	
AGR	-13.5%	9.8%	0.2%	1.0%	1.0%	1.2%		
Revenue (\$M)	56,314	63,734	65,652	67,994	70,477	73,176	3.5%	
AGR	-17.4%	13.2%	3.0%	3.6%	3.7%	3.8%		
Average Price (\$)	880	907	933	957	981	1,007	2.6%	
AGR	-4.5%	3.0%	2.8%	2.6%	2.6%	2.6%		
Installed Base (K)	254,345	258,447	261,829	264,761	267,452	270,057	1.1%	
AGR	0.6%	1.6%	1.3%	1.1%	1.0%	1.0%		
Removal Age (Y)	4.52	4.50	4.56	4.60	4.64	4.67	1.0%	
AGR	9.2%	-0.6%	1.4%	1.0%	0.8%	0.7%		
Average Installed Base Age (Y)	4.10	4.14	4.18	4.20	4.22	4.23	0.5%	
AGR	2.8%	1.0%	0.9%	0.6%	0.4%	0.1%		
Replacement Cycle Length (Y)	5.07	4.91	4.91	4.89	4.87	4.85	-0.3%	
AGR	18.2%	-3.2%	0.0%	-0.4%	-0.3%	-0.3%		
Units per Households & Businesses (#)	2.29	2.24	2.20	2.18	2.25	2.32	0.9%	
AGR	-3.7%	-2.1%	-1.9%	-0.8%	3.1%	3.3%		
Market Penetration (%)	79.4%	81.6%	83.5%	84.4%	82.0%	79.5%	0.1%	
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend

∞ Δ Daniel Research Group ©(2024)



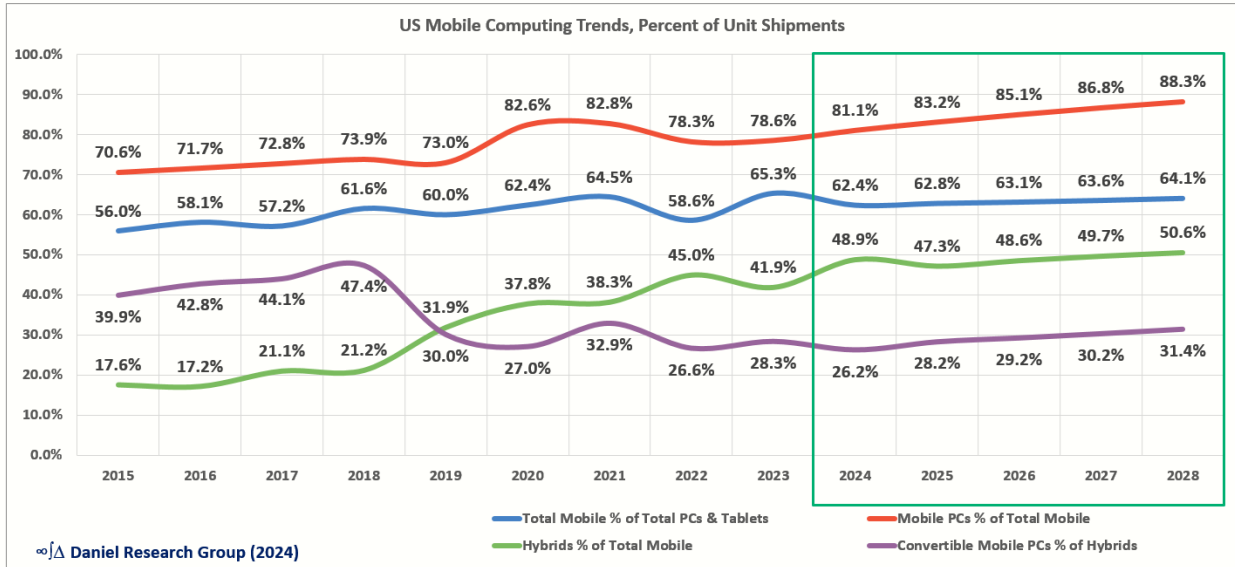
∞ Δ Daniel Research Group (2024)

■ Unit Shpments

— Annual Growth Rate

Mobile PCs and Tablets

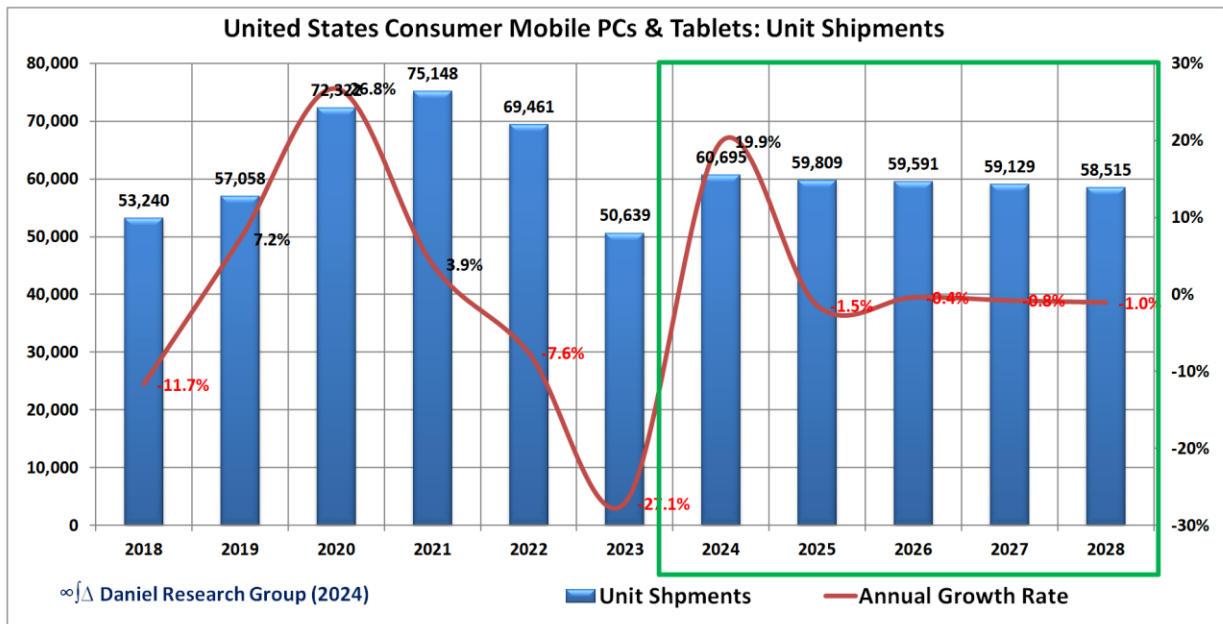
Mobile Trends



Consumer

United States Consumer Mobile PCs & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	50,639	60,695	59,809	59,591	59,129	58,515	-0.9%	
AGR	-27.1%	19.9%	-1.5%	-0.4%	-0.8%	-1.0%		
Revenue (\$M)	37,266	46,539	47,756	50,105	52,413	54,749	4.1%	
AGR	-18.7%	24.9%	2.6%	4.9%	4.6%	4.5%		
Average Price (\$)	736	767	798	841	886	936	5.1%	
AGR	11.5%	4.2%	4.1%	5.3%	5.4%	5.6%		
Installed Base (K)	276,224	270,873	265,007	259,170	253,850	249,145	-2.1%	
AGR	-3.7%	-1.9%	-2.2%	-2.2%	-2.1%	-1.9%		
Removal Age (Y)	5.16	5.13	5.28	5.36	5.37	5.36	1.1%	
AGR	9.9%	-0.7%	3.1%	1.4%	0.2%	-0.2%		
Average Installed Base Age (Y)	4.48	4.56	4.60	4.61	4.59	4.58	0.1%	
AGR	5.7%	1.8%	0.9%	0.1%	-0.3%	-0.4%		
Replacement Cycle Length (Y)	5.52	5.10	5.04	4.96	4.94	4.94	-0.8%	
AGR	0.7%	-7.5%	-1.3%	-1.5%	-0.5%	0.0%		
Units per Households (#)	2.10	2.03	1.97	1.90	1.85	1.79	-3.1%	
AGR	-5.4%	-3.2%	-3.3%	-3.3%	-3.0%	-2.8%		
Market Penetration (%)	98.8%	99.2%	99.4%	99.6%	99.7%	99.8%	0.9%	

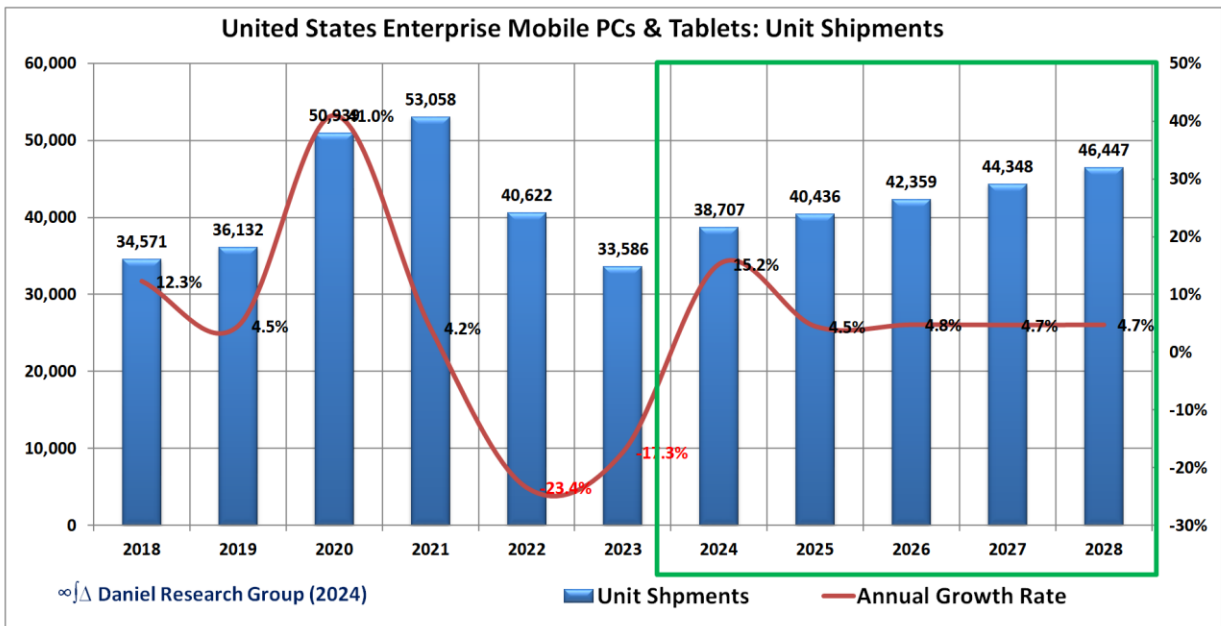
∞ Δ Daniel Research Group ©(2024)



Enterprise

United States Enterprise Mobile PCs & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	33,586	38,707	40,436	42,359	44,348	46,447	4.7%	
AGR	-17.3%	15.2%	4.5%	4.8%	4.7%	4.7%		
Revenue (\$M)	22,202	25,132	26,408	27,846	29,310	30,830	5.2%	
AGR	-21.7%	13.2%	5.1%	5.4%	5.3%	5.2%		
Average Price (\$)	661	649	653	657	661	664	0.6%	
AGR	-5.3%	-1.8%	0.6%	0.7%	0.5%	0.4%		
Installed Base (K)	129,742	136,394	142,858	149,198	155,472	161,794	4.4%	
AGR	3.5%	5.1%	4.7%	4.4%	4.2%	4.1%		
Removal Age (Y)	4.41	4.36	4.40	4.41	4.43	4.42	0.3%	
AGR	15.9%	-1.0%	0.8%	0.3%	0.2%	-0.1%		
Average Installed Base Age (Y)	4.00	4.02	4.03	4.03	4.03	4.02	0.0%	
AGR	2.6%	0.4%	0.2%	0.1%	0.0%	-0.1%		
Replacement Cycle Length (Y)	5.44	5.26	5.21	5.14	5.08	5.03	-1.1%	
AGR	40.2%	-3.3%	-0.9%	-1.2%	-1.1%	-1.0%		
Units per Businesses (#)	19.19	19.79	20.74	21.51	22.36	23.26	4.1%	
AGR	1.0%	3.1%	4.8%	3.7%	3.9%	4.1%		
Market Penetration (%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	

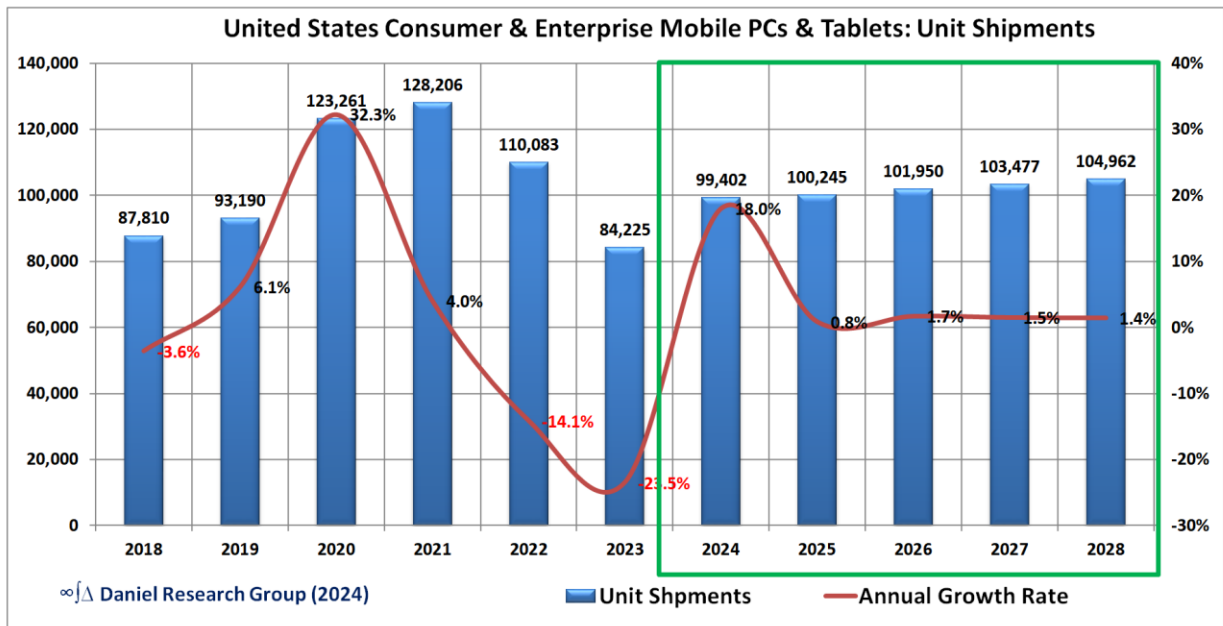
∞ Δ Daniel Research Group ©(2024)



Total Mobile PCs and Tablets

United States Consumer & Enterprise Mobile PCs & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	84,225	99,402	100,245	101,950	103,477	104,962	1.4%	
AGR	-23.5%	18.0%	0.8%	1.7%	1.5%	1.4%		
Revenue (\$M)	59,468	71,671	74,164	77,951	81,722	85,579	4.5%	
AGR	-19.9%	20.5%	3.5%	5.1%	4.8%	4.7%		
Average Price (\$)	706	721	740	765	790	815	3.1%	
AGR	4.7%	2.1%	2.6%	3.3%	3.3%	3.2%		
Installed Base (K)	405,966	407,268	407,865	408,368	409,323	410,939	0.2%	
AGR	-1.5%	0.3%	0.1%	0.1%	0.2%	0.4%		
Removal Age (Y)	4.88	4.84	4.95	5.00	5.00	4.99	0.8%	
AGR	12.1%	-0.8%	2.3%	1.0%	0.1%	-0.3%		
Average Installed Base Age (Y)	4.30	4.36	4.39	4.39	4.38	4.36	0.0%	
AGR	4.9%	1.4%	0.7%	0.0%	-0.3%	-0.5%		
Replacement Cycle Length (Y)	5.49	5.15	5.09	5.03	4.99	4.98	-0.9%	
AGR	13.7%	-6.2%	-1.1%	-1.3%	-0.7%	-0.3%		
Units per Households & Businesses (#)	2.94	2.91	2.88	2.85	2.83	2.82	-0.8%	
AGR	-3.3%	-1.0%	-0.9%	-0.9%	-0.7%	-0.5%		
Market Penetration (%)	98.9%	99.2%	99.4%	99.6%	99.7%	99.8%	0.9%	
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend

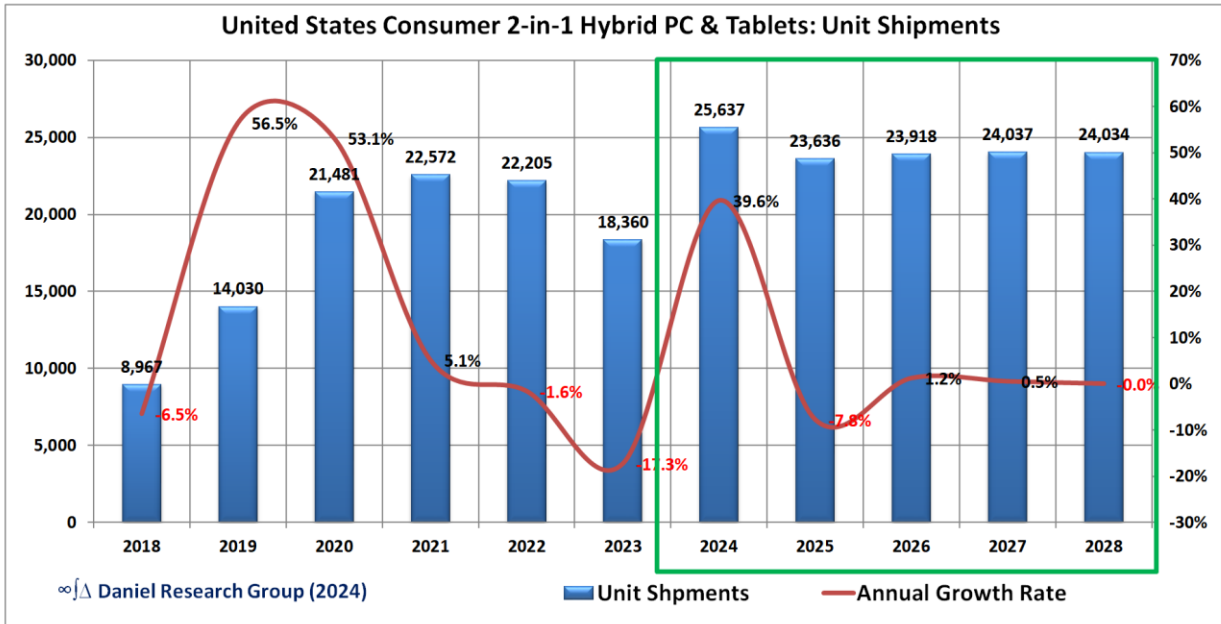
∞ Δ Daniel Research Group ©(2024)



Hybrids, 2-in-1, Convertible Model PCs, and Detachable Tablets Consumer

United States Consumer 2-in-1 Hybrid PC & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	18,360	25,637	23,636	23,918	24,037	24,034	-1.6%	
AGR	-17.3%	39.6%	-7.8%	1.2%	0.5%	0.0%		
Revenue (\$M)	12,479	17,364	15,958	16,094	16,116	16,055	-1.9%	
AGR	-20.1%	39.1%	-8.1%	0.9%	0.1%	-0.4%		
Average Price (\$)	680	677	675	673	670	668	-0.3%	
AGR	-3.4%	-0.3%	-0.3%	-0.3%	-0.4%	-0.4%		
Installed Base (K)	68,564	74,331	78,073	81,405	84,475	87,284	4.1%	
AGR	6.3%	8.4%	5.0%	4.3%	3.8%	3.3%		
Removal Age (Y)	3.37	3.27	3.59	3.82	4.01	4.21	6.6%	
AGR	11.8%	-3.0%	9.8%	6.6%	4.9%	5.0%		
Average Installed Base Age (Y)	3.36	3.50	3.67	3.81	3.92	4.01	3.5%	
AGR	10.8%	4.0%	5.0%	3.7%	3.0%	2.4%		
Replacement Cycle Length (Y)	5.80	4.74	4.92	4.95	5.03	5.11	1.9%	
AGR	-10.4%	-18.2%	3.9%	0.6%	1.5%	1.7%		
Units per Households (#)	2.27	2.27	2.22	2.15	2.07	1.99	-3.3%	
AGR	-1.5%	0.1%	-2.5%	-3.2%	-3.6%	-3.9%		
Market Penetration (%)	22.7%	24.3%	26.0%	27.7%	29.6%	31.5%	Change '20-'25	Trend
							8.8%	

∞ Δ Daniel Research Group ©(2024)



∞ Δ Daniel Research Group (2024)

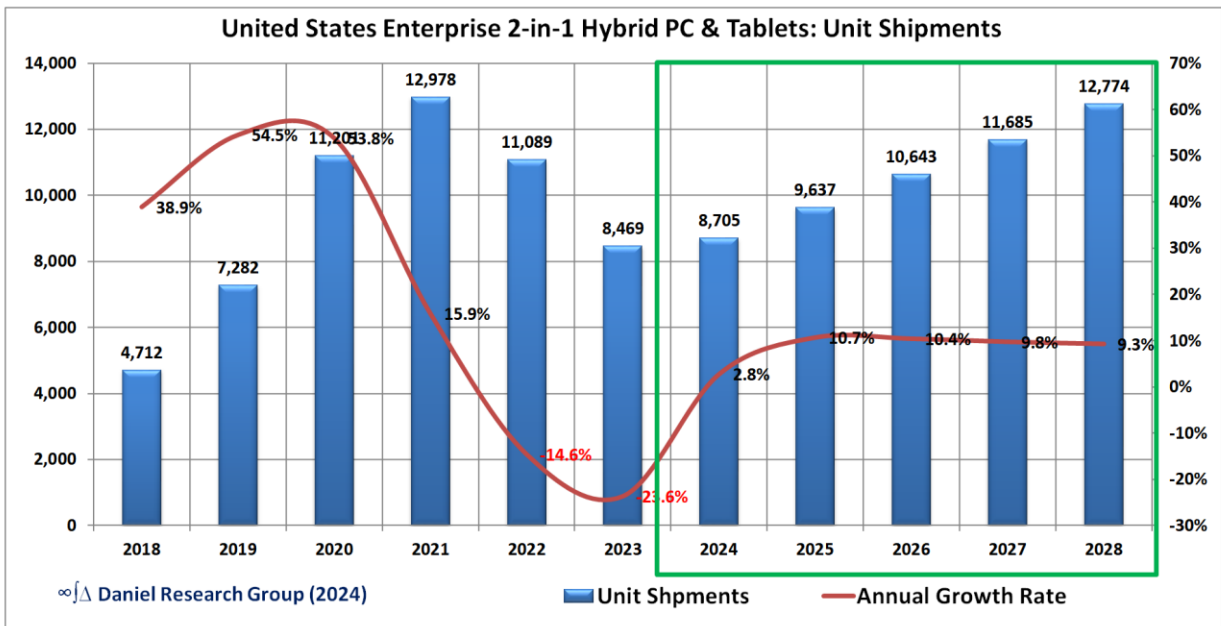
■ Unit Shpments

— Annual Growth Rate

Enterprise

United States Enterprise 2-in-1 Hybrid PC & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	8,469	8,705	9,637	10,643	11,685	12,774	10.1%	
AGR	-23.6%	2.8%	10.7%	10.4%	9.8%	9.3%		
Revenue (\$M)	5,462	5,395	5,843	6,316	6,788	7,265	7.7%	
AGR	-26.5%	-1.2%	8.3%	8.1%	7.5%	7.0%		
Average Price (\$)	645	620	606	593	581	569	-2.1%	
AGR	-3.8%	-3.9%	-2.2%	-2.1%	-2.1%	-2.1%		
Installed Base (K)	23,871	26,323	28,607	30,774	32,880	34,982	7.4%	
AGR	9.4%	10.3%	8.7%	7.6%	6.8%	6.4%		
Removal Age (Y)	2.66	3.01	3.19	3.32	3.41	3.45	3.5%	
AGR	24.9%	13.0%	6.1%	4.0%	2.6%	1.3%		
Average Installed Base Age (Y)	3.03	3.27	3.44	3.56	3.63	3.67	2.9%	
AGR	11.8%	8.0%	5.4%	3.4%	2.0%	0.9%		
Replacement Cycle Length (Y)	4.72	5.21	4.89	4.63	4.43	4.28	-4.8%	
AGR	31.5%	10.4%	-6.1%	-5.3%	-4.3%	-3.5%		
Units per Businesses (#)	3.69	3.89	4.18	4.45	4.73	5.03	6.6%	
AGR	0.3%	5.3%	7.6%	6.3%	6.4%	6.3%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	95.6%	98.2%	99.3%	99.7%	99.9%	100.0%	4.3%	

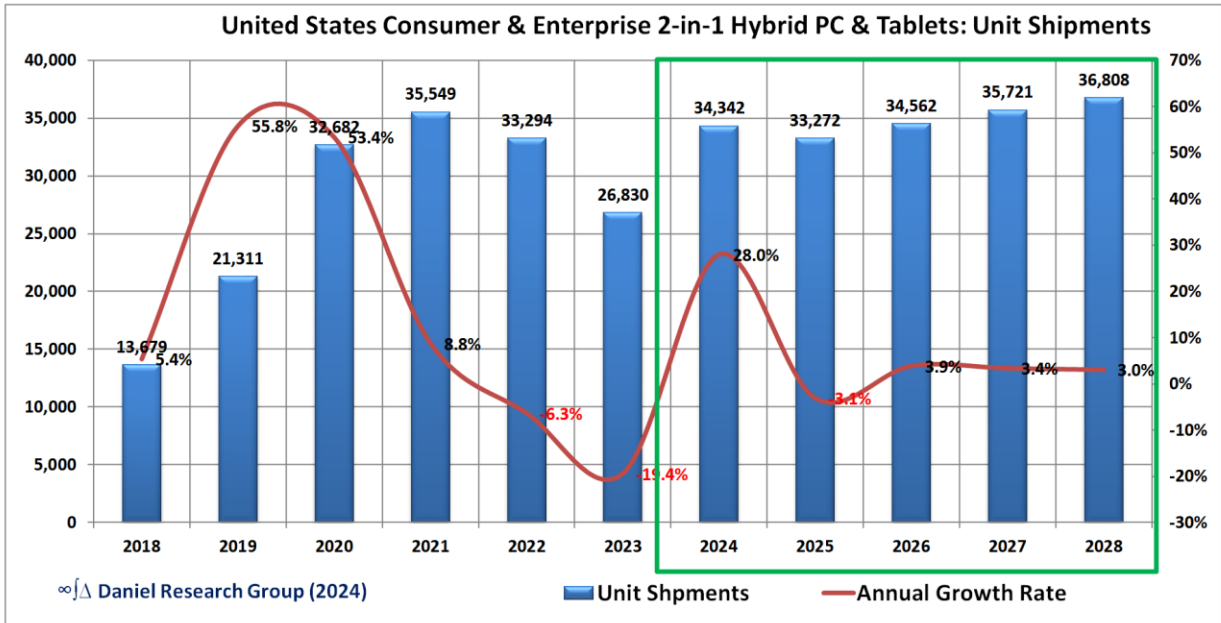
∞ Δ Daniel Research Group ©(2024)



Total Hybrids

United States Consumer & Enterprise 2-in-1 Hybrid PC & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	26,830	34,342	33,272	34,562	35,721	36,808	1.7%	
AGR	-19.4%	28.0%	-3.1%	3.9%	3.4%	3.0%		
Revenue (\$M)	17,940	22,759	21,801	22,410	22,904	23,320	0.6%	
AGR	-22.2%	26.9%	-4.2%	2.8%	2.2%	1.8%		
Average Price (\$)	669	663	655	648	641	634	-1.1%	
AGR	-3.5%	-0.9%	-1.1%	-1.0%	-1.1%	-1.2%		
Installed Base (K)	92,435	100,654	106,680	112,178	117,355	122,266	5.0%	
AGR	7.1%	8.9%	6.0%	5.2%	4.6%	4.2%		
Removal Age (Y)	3.13	3.18	3.46	3.66	3.82	3.97	5.7%	
AGR	16.8%	1.4%	8.9%	5.9%	4.3%	3.8%		
Average Installed Base Age (Y)	3.25	3.42	3.60	3.73	3.83	3.91	3.4%	
AGR	11.3%	5.2%	5.2%	3.7%	2.7%	1.9%		
Replacement Cycle Length (Y)	5.46	4.85	4.92	4.86	4.84	4.83	-0.1%	
AGR	3.7%	-11.2%	1.3%	-1.1%	-0.4%	-0.2%		
Units per Households & Businesses (#)	2.52	2.55	2.54	2.50	2.46	2.40	-1.5%	
AGR	-0.9%	1.1%	-0.6%	-1.4%	-1.8%	-2.1%		
Market Penetration (%)	26.2%	27.9%	29.5%	31.2%	33.0%	34.8%	8.6%	

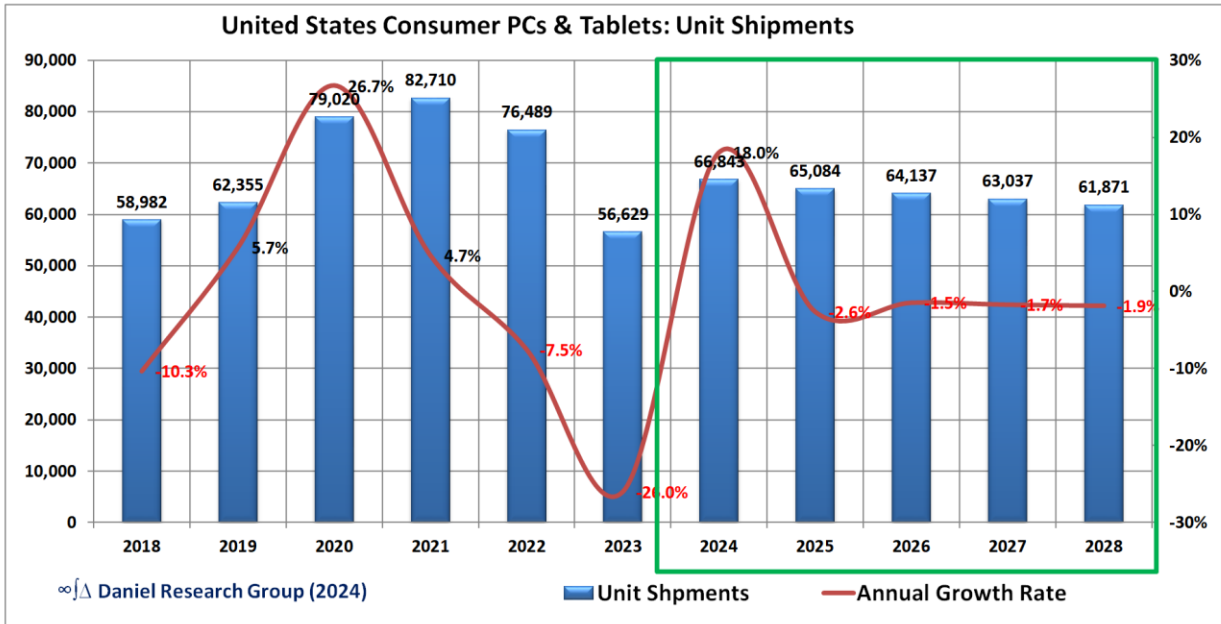
∞ Δ Daniel Research Group ©(2024)



Total PCs and Tablets Consumer

United States Consumer PCs & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	56,629	66,843	65,084	64,137	63,037	61,871	-1.9%	
AGR	-26.0%	18.0%	-2.6%	-1.5%	-1.7%	-1.9%		
Revenue (\$M)	44,534	54,204	54,512	56,088	57,697	59,412	2.3%	
AGR	-18.3%	21.7%	0.6%	2.9%	2.9%	3.0%		
Average Price (\$)	786	811	838	875	915	960	4.3%	
AGR	10.3%	3.1%	3.3%	4.4%	4.7%	4.9%		
Installed Base (K)	294,327	288,252	281,436	274,469	267,914	261,928	-2.4%	
AGR	-3.6%	-2.1%	-2.4%	-2.5%	-2.4%	-2.2%		
Removal Age (Y)	5.07	5.02	5.17	5.25	5.27	5.29	1.3%	
AGR	9.2%	-1.1%	2.9%	1.5%	0.5%	0.3%		
Average Installed Base Age (Y)	4.43	4.51	4.55	4.57	4.57	4.57	0.3%	
AGR	5.3%	1.7%	1.0%	0.3%	0.0%	-0.1%		
Replacement Cycle Length (Y)	5.35	4.95	4.91	4.86	4.85	4.86	-0.5%	
AGR	0.9%	-7.4%	-0.8%	-1.1%	-0.2%	0.2%		
Units per Households (#)	2.22	2.15	2.08	2.01	1.94	1.88	-3.3%	
AGR	-5.0%	-3.2%	-3.3%	-3.4%	-3.3%	-3.1%		
Market Penetration (%)	99.7%	99.8%	99.9%	99.9%	99.9%	100.0%	Change '20-'25	Trend
							0.3%	

∞ ∫ Δ Daniel Research Group ©(2024)



∞ ∫ Δ Daniel Research Group (2024)

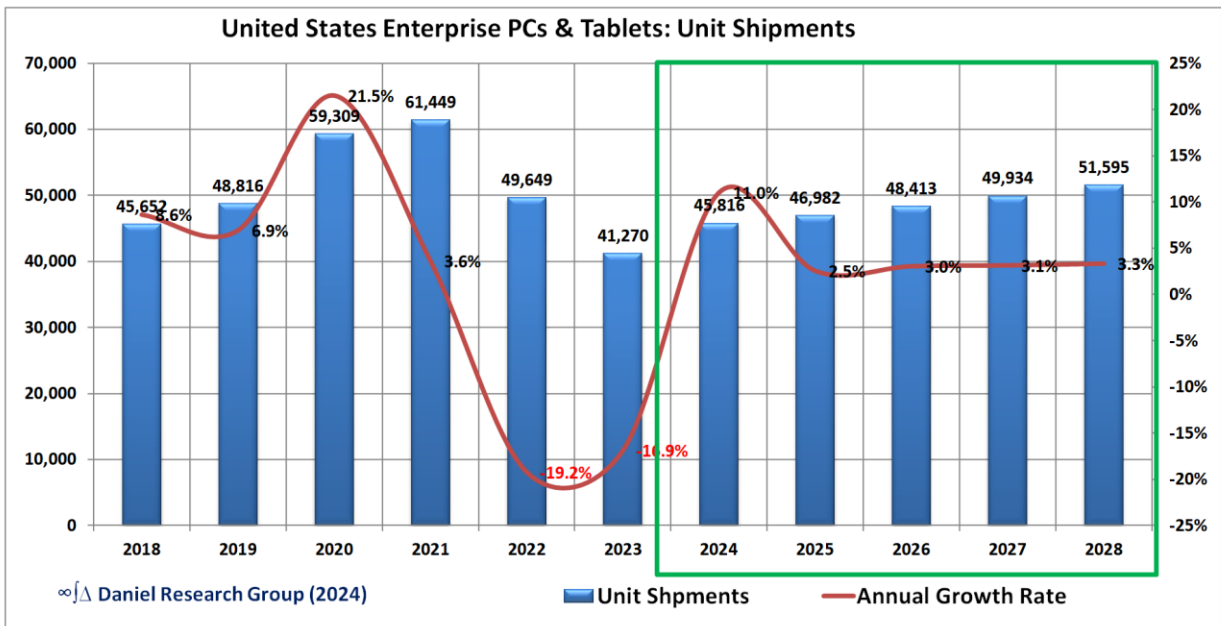
■ Unit Shpments

— Annual Growth Rate

Enterprise

United States Enterprise PCs & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	41,270	45,816	46,982	48,413	49,934	51,595	3.0%	
AGR	-16.9%	11.0%	2.5%	3.0%	3.1%	3.3%		
Revenue (\$M)	28,152	30,780	31,743	32,908	34,101	35,361	3.5%	
AGR	-21.4%	9.3%	3.1%	3.7%	3.6%	3.7%		
Average Price (\$)	682	672	676	680	683	685	0.5%	
AGR	-5.4%	-1.5%	0.6%	0.6%	0.5%	0.4%		
Installed Base (K)	157,452	161,796	166,134	170,531	175,031	179,724	2.7%	
AGR	1.2%	2.8%	2.7%	2.6%	2.6%	2.7%		
Removal Age (Y)	4.50	4.46	4.48	4.48	4.48	4.47	0.1%	
AGR	12.5%	-0.9%	0.5%	0.1%	0.0%	-0.2%		
Average Installed Base Age (Y)	4.11	4.12	4.12	4.11	4.10	4.09	-0.2%	
AGR	1.9%	0.1%	0.0%	-0.1%	-0.2%	-0.3%		
Replacement Cycle Length (Y)	5.00	4.90	4.90	4.87	4.85	4.83	-0.4%	
AGR	30.1%	-1.9%	-0.1%	-0.4%	-0.4%	-0.4%		
Units per Businesses (#)	23.29	23.47	24.12	24.58	25.17	25.84	2.4%	
AGR	-1.2%	0.8%	2.8%	1.9%	2.4%	2.7%		
Market Penetration (%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	

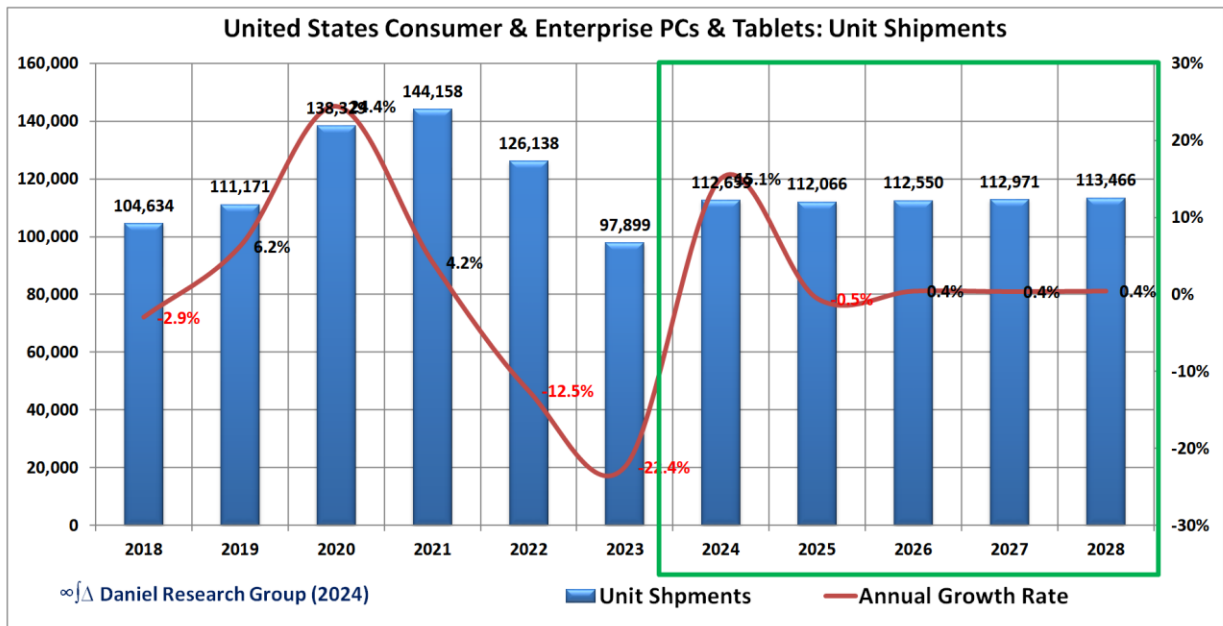
∞ Δ Daniel Research Group ©(2024)



Total PCs and Tablets

United States Enterprise PCs & Tablets								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	41,270	45,816	46,982	48,413	49,934	51,595	3.0%	
AGR	-16.9%	11.0%	2.5%	3.0%	3.1%	3.3%		
Revenue (\$M)	28,152	30,780	31,743	32,908	34,101	35,361	3.5%	
AGR	-21.4%	9.3%	3.1%	3.7%	3.6%	3.7%		
Average Price (\$)	682	672	676	680	683	685	0.5%	
AGR	-5.4%	-1.5%	0.6%	0.6%	0.5%	0.4%		
Installed Base (K)	157,452	161,796	166,134	170,531	175,031	179,724	2.7%	
AGR	1.2%	2.8%	2.7%	2.6%	2.6%	2.7%		
Removal Age (Y)	4.50	4.46	4.48	4.48	4.48	4.47	0.1%	
AGR	12.5%	-0.9%	0.5%	0.1%	0.0%	-0.2%		
Average Installed Base Age (Y)	4.11	4.12	4.12	4.11	4.10	4.09	-0.2%	
AGR	1.9%	0.1%	0.0%	-0.1%	-0.2%	-0.3%		
Replacement Cycle Length (Y)	5.00	4.90	4.90	4.87	4.85	4.83	-0.4%	
AGR	30.1%	-1.9%	-0.1%	-0.4%	-0.4%	-0.4%		
Units per Businesses (#)	23.29	23.47	24.12	24.58	25.17	25.84	2.4%	
AGR	-1.2%	0.8%	2.8%	1.9%	2.4%	2.7%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	

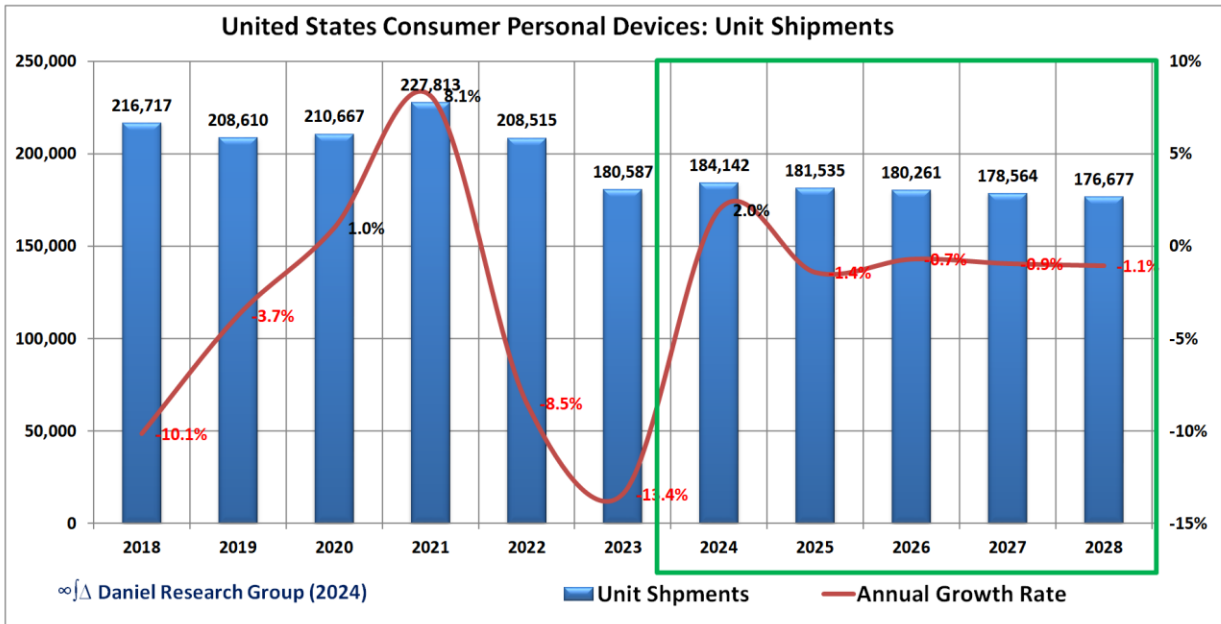
∞ Δ Daniel Research Group ©(2024)



Total Personal Devices Consumer

United States Consumer Personal Devices								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	180,587	184,142	181,535	180,261	178,564	176,677	-1.0%	
AGR	-13.4%	2.0%	-1.4%	-0.7%	-0.9%	-1.1%		
Revenue (\$M)	141,954	147,886	148,507	150,816	152,939	155,066	1.2%	
AGR	-3.8%	4.2%	0.4%	1.6%	1.4%	1.4%		
Average Price (\$)	786	803	818	837	856	878	2.2%	
AGR	11.1%	2.2%	1.9%	2.3%	2.4%	2.5%		
Installed Base (K)	924,590	900,334	874,010	848,503	825,936	803,139	-2.8%	
AGR	-3.1%	-2.6%	-2.9%	-2.9%	-2.7%	-2.8%		
Removal Age (Y)	5.38	5.51	5.74	5.84	5.80	5.84	1.5%	
AGR	6.0%	2.4%	4.2%	1.6%	-0.6%	0.6%		
Average Installed Base Age (Y)	5.72	5.83	5.88	5.88	5.87	5.84	0.0%	
AGR	3.3%	1.9%	0.8%	0.1%	-0.1%	-0.6%		
Replacement Cycle Length (Y)	5.41	5.32	5.20	5.12	5.11	5.03	-1.4%	
AGR	1.6%	-1.6%	-2.2%	-1.6%	-0.3%	-1.6%		
Units per Households (#)	6.96	6.71	6.45	6.20	5.99	5.77	-3.7%	
AGR	-4.4%	-3.6%	-3.8%	-3.8%	-3.5%	-3.6%		
Market Penetration (%)	99.9%	99.9%	100.0%	100.0%	100.0%	100.0%	Change '20-'25	Trend
							0.1%	

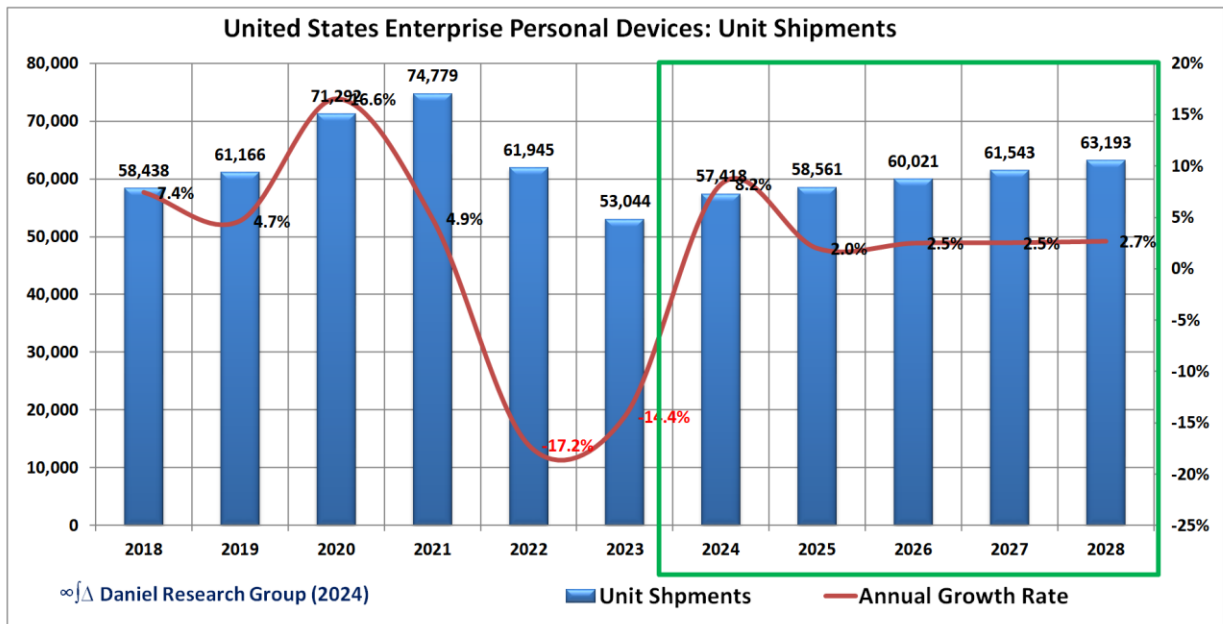
∞ Δ Daniel Research Group ©(2024)



Enterprise

United States Enterprise Personal Devices								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	53,044	57,418	58,561	60,021	61,543	63,193	2.4%	
AGR	-14.4%	8.2%	2.0%	2.5%	2.5%	2.7%		
Revenue (\$M)	38,929	41,683	42,899	44,371	45,855	47,398	3.3%	
AGR	-15.3%	7.1%	2.9%	3.4%	3.3%	3.4%		
Average Price (\$)	734	726	733	739	745	750	0.8%	
AGR	-1.1%	-1.1%	0.9%	0.9%	0.8%	0.7%		
Installed Base (K)	214,609	214,699	216,687	219,089	221,762	225,763	1.3%	
AGR	-1.5%	0.0%	0.9%	1.1%	1.2%	1.8%		
Removal Age (Y)	5.09	4.99	4.90	4.84	4.79	4.71	-1.4%	
AGR	9.4%	-2.0%	-1.8%	-1.3%	-1.0%	-1.6%		
Average Installed Base Age (Y)	4.87	4.80	4.74	4.68	4.61	4.56	-1.3%	
AGR	0.0%	-1.4%	-1.3%	-1.3%	-1.3%	-1.2%		
Replacement Cycle Length (Y)	4.82	4.75	4.83	4.80	4.77	4.81	0.4%	
AGR	19.1%	-1.5%	1.8%	-0.6%	-0.7%	1.0%		
Units per Businesses (#)	31.78	31.17	31.48	31.59	31.89	32.46	1.0%	
AGR	-3.9%	-1.9%	1.0%	0.4%	1.0%	1.8%		
	2023	2024	2025	2026	2027	2028	Change '20-'25	Trend
Market Penetration (%)	99.9%	99.9%	100.0%	100.0%	100.0%	100.0%	0.1%	

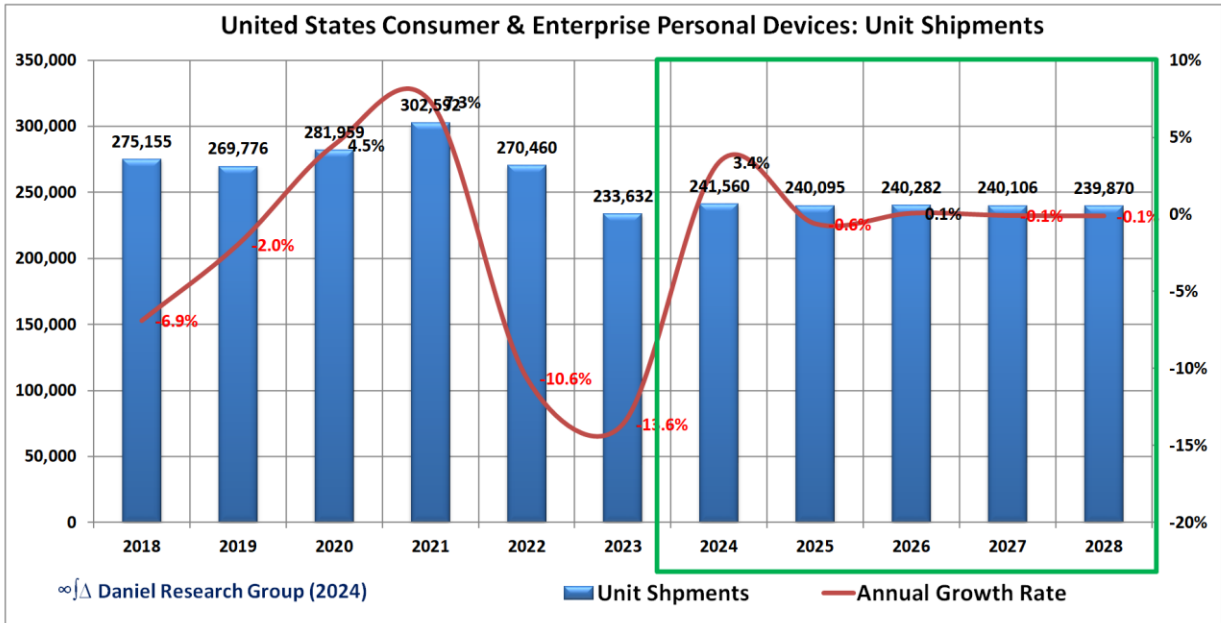
∞ Δ Daniel Research Group ©(2024)



Total Personal Devices

United States Consumer & Enterprise Personal Devices								
	2023	2024	2025	2026	2027	2028	CAGR '24-'28	Trend
Unit Shipments (K)	233,632	241,560	240,095	240,282	240,106	239,870	-0.2%	
AGR	-13.6%	3.4%	-0.6%	0.1%	-0.1%	-0.1%		
Revenue (\$M)	180,883	189,569	191,405	195,187	198,794	202,463	1.7%	
AGR	-6.5%	4.8%	1.0%	2.0%	1.8%	1.8%		
Average Price (\$)	774	785	797	812	828	844	1.8%	
AGR	8.2%	1.4%	1.6%	1.9%	1.9%	1.9%		
Installed Base (K)	1,139,200	1,115,033	1,090,697	1,067,592	1,047,698	1,028,902	-2.0%	
AGR	-2.8%	-2.1%	-2.2%	-2.1%	-1.9%	-1.8%		
Removal Age (Y)	5.35	5.43	5.56	5.61	5.58	5.57	0.7%	
AGR	6.9%	1.4%	2.4%	0.9%	-0.5%	-0.1%		
Average Installed Base Age (Y)	5.57	5.63	5.66	5.64	5.61	5.57	-0.3%	
AGR	2.6%	1.2%	0.4%	-0.3%	-0.5%	-0.8%		
Replacement Cycle Length (Y)	5.28	5.20	5.12	5.05	5.03	4.98	-1.1%	
AGR	5.5%	-1.6%	-1.4%	-1.4%	-0.5%	-1.0%		
Units per Households & Businesses (#)	8.16	7.90	7.66	7.43	7.23	7.04	-2.8%	
AGR	-4.2%	-3.2%	-3.0%	-3.0%	-2.7%	-2.6%		
Market Penetration (%)	99.9%	99.9%	100.0%	100.0%	100.0%	100.0%	0.1%	

∞ Δ Daniel Research Group ©(2024)



Market Model Variables

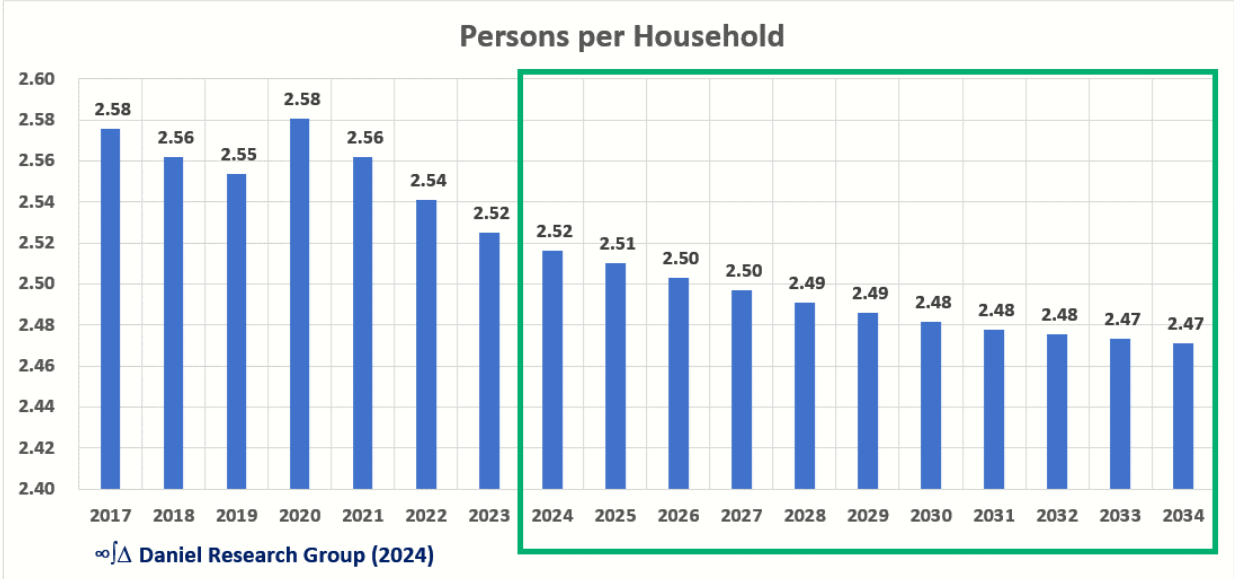
The market for almost any product or service can be defined in terms of six variables;

- 1. Total Available Market
- 2. Penetration
- 3. Density
- 4. Replacement Cycle Length
- 5. Unit Shipments
- 6. Installed Base

The **DRG** EquilibriumSolver (**EQS**) algorithm expresses these variables such that each of the six variables can be computed from the other five. The resulting model is **direction agnostic** facilitating the development of forecast scenarios that are consistent with historical trends while reflecting current and future exogenous market and economic events.

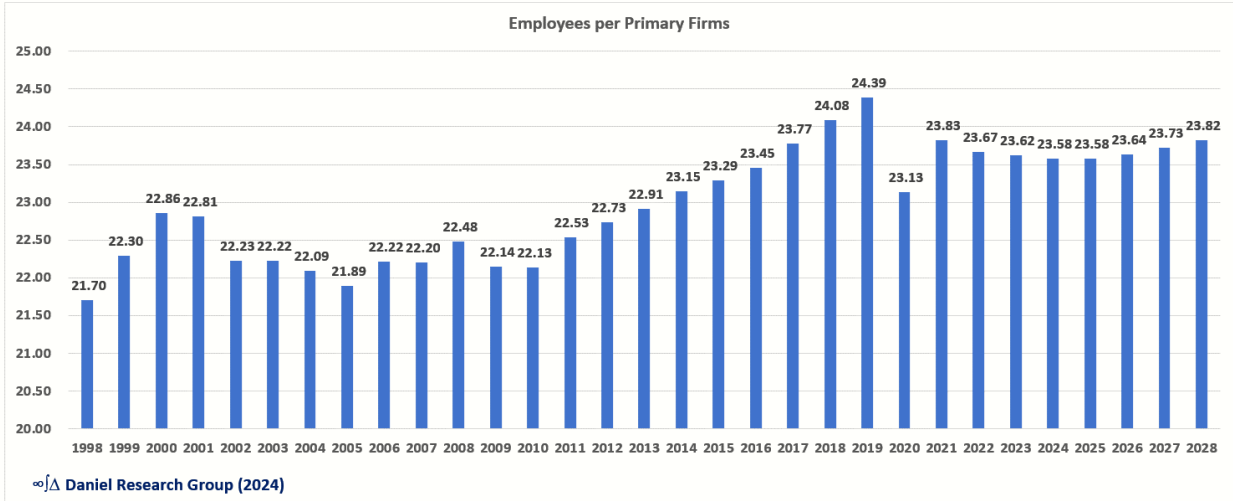
Total Available Market (TAM)

Consumer Households: The historic and forecast data was obtained from the United States Census Bureau and the Congressional Budget Office and projected to 2034.



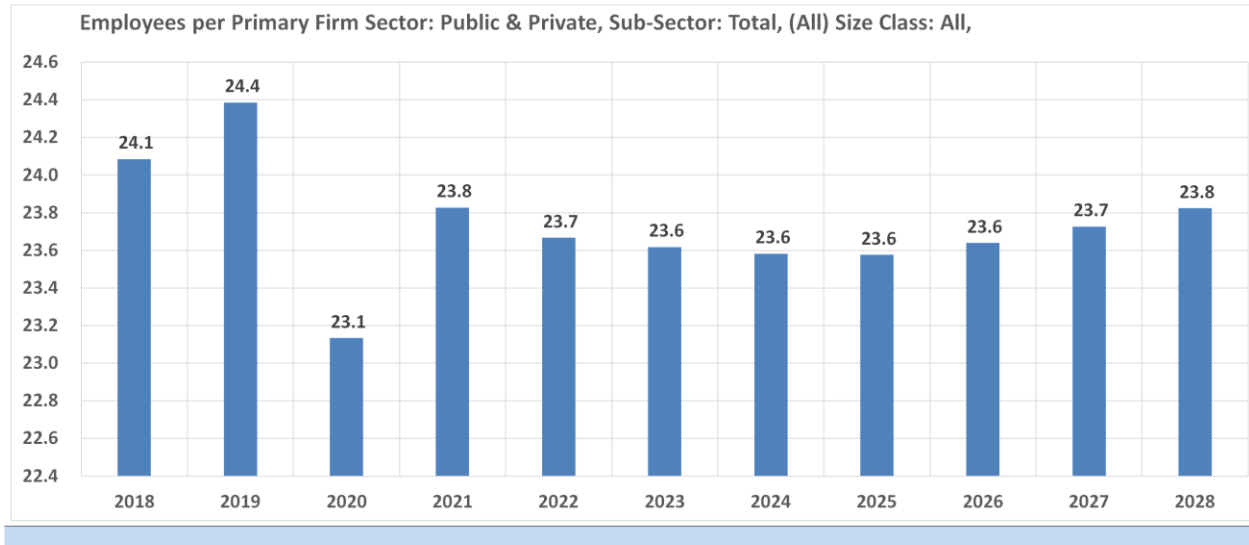
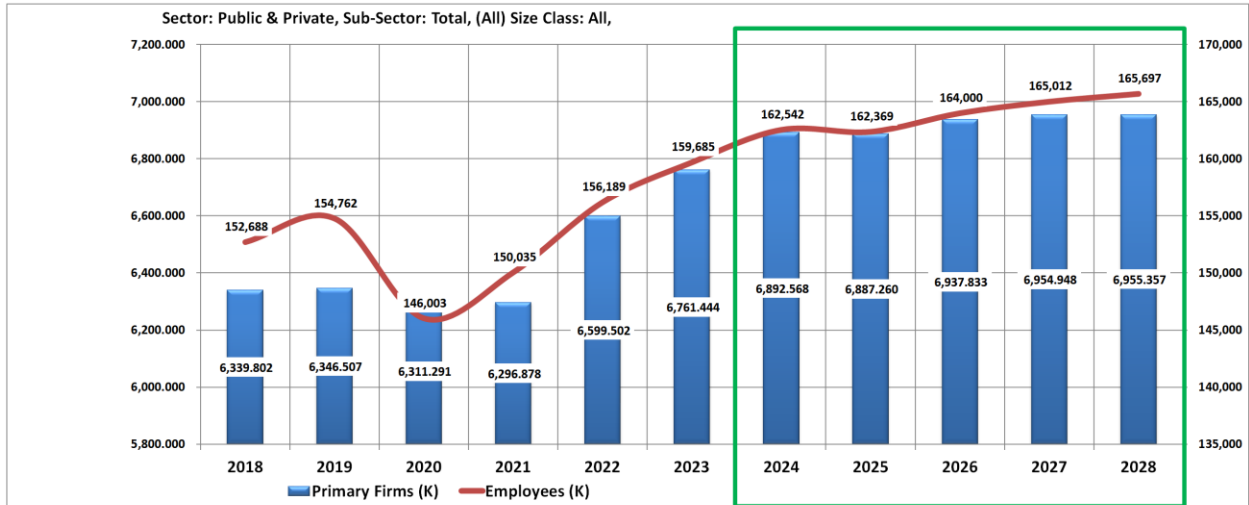
The long-term trend of slowly decreasing household size temporarily reverse2 during economic disruption as in 2011 and 2020.

Enterprise Businesses: Historic data obtained from the US Census Bureau Statistics of the United States Businesses (SUSB) database.

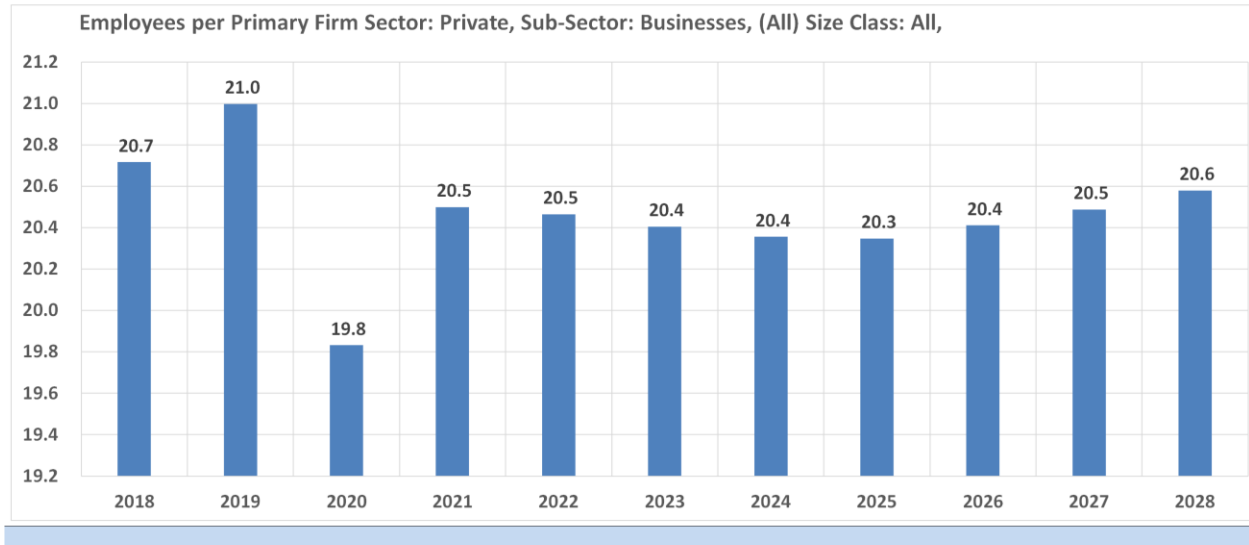
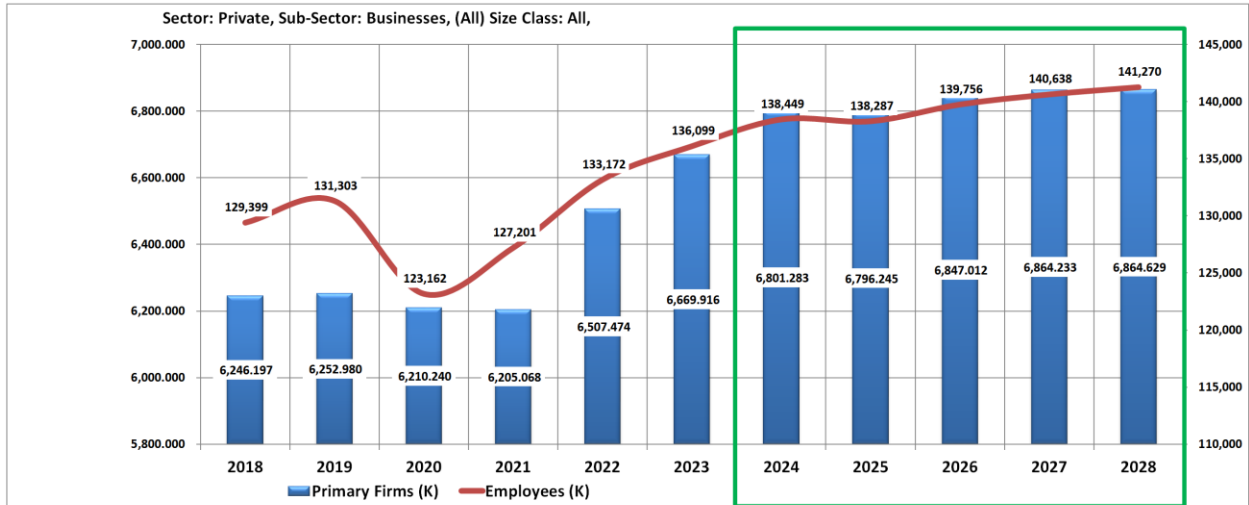


The long-term trend of increasing business size was disrupted by the pandemics. **DRGs Business Economic Demographic Database (BEDD)** forecast models predicted that the average size of business will start to increase again in 2025. The TAM used in the Enterprise Models is **Primary Firms** as computed in the **DRG BEDD** model that incorporates data from the US Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, The Congressional Budget Office, the Department of Defense, and other public and private sources.

Total Public and Private Sectors



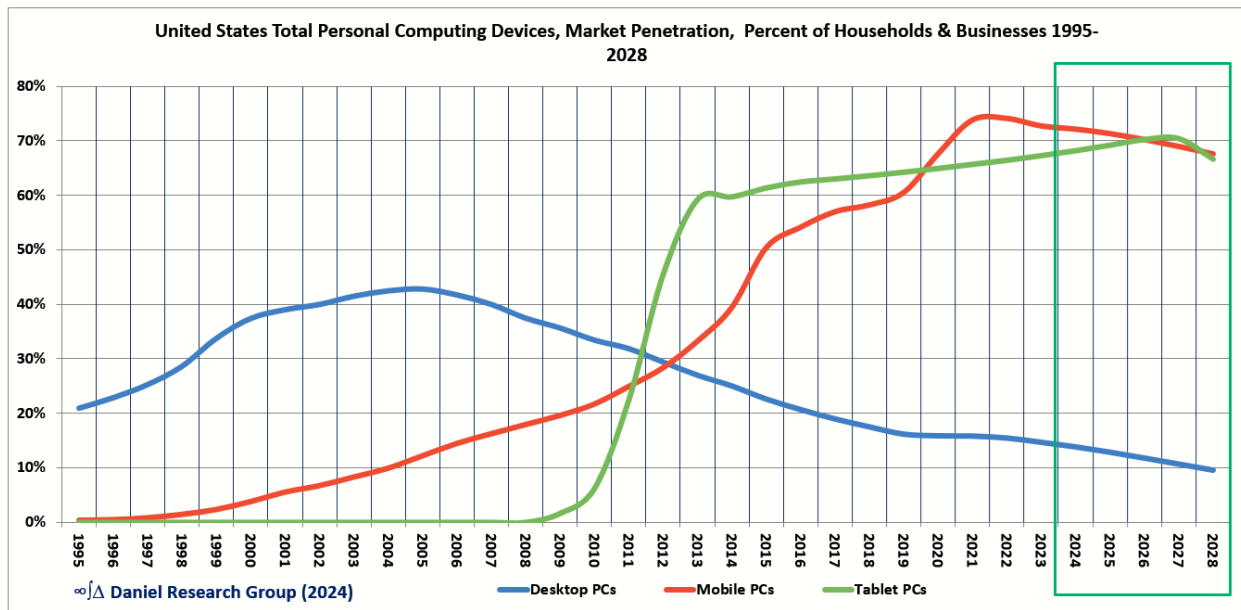
Private Sector Only



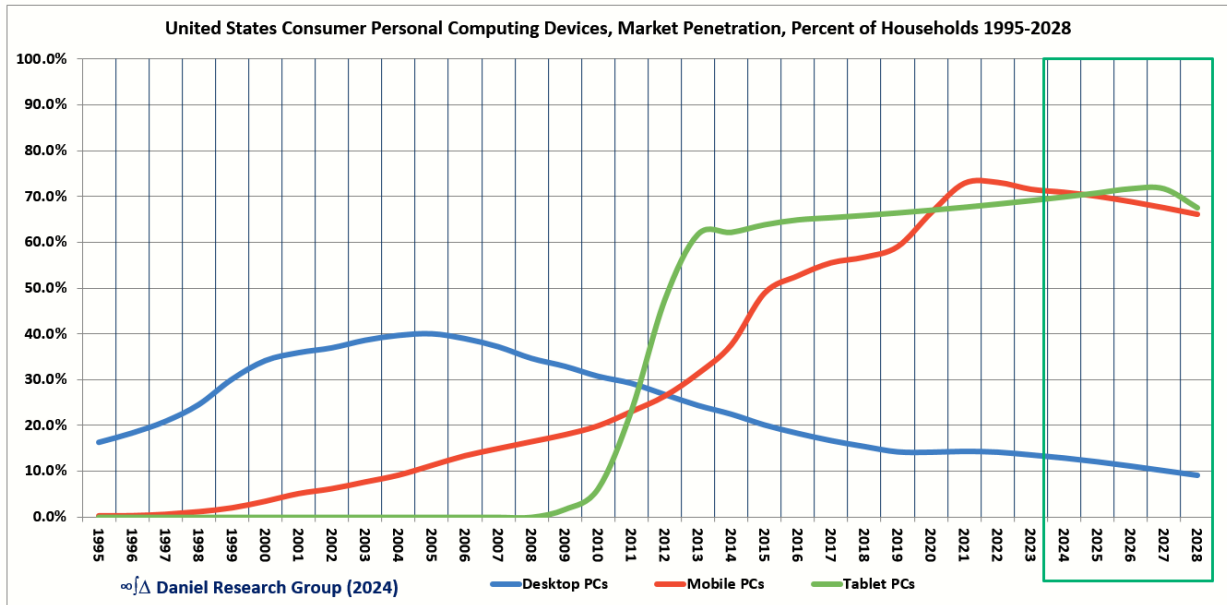
Penetration

Theoretically, penetration rates should follow the Diffusion of Innovation S-Shaped curve. However, in most cases there are deviations where the actual curve accelerates, flattens, or even declines from its expected path, sometimes even returning to the expected path later. There are several reasons for this such as an economic shock, or an incorrect assumption as to the size of the TAM. More often, the S-shaped penetration parameters change because of changes in user/buyer preferences due to new product introduction, upgrades, or emerging use-cases.

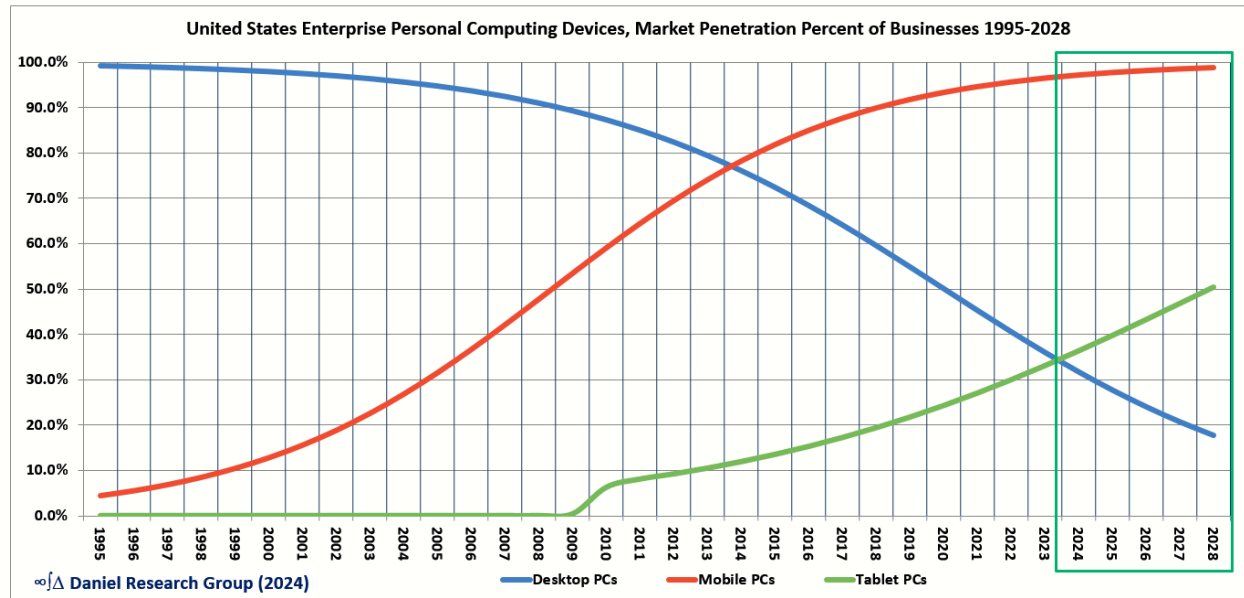
Total PCs and Tablets



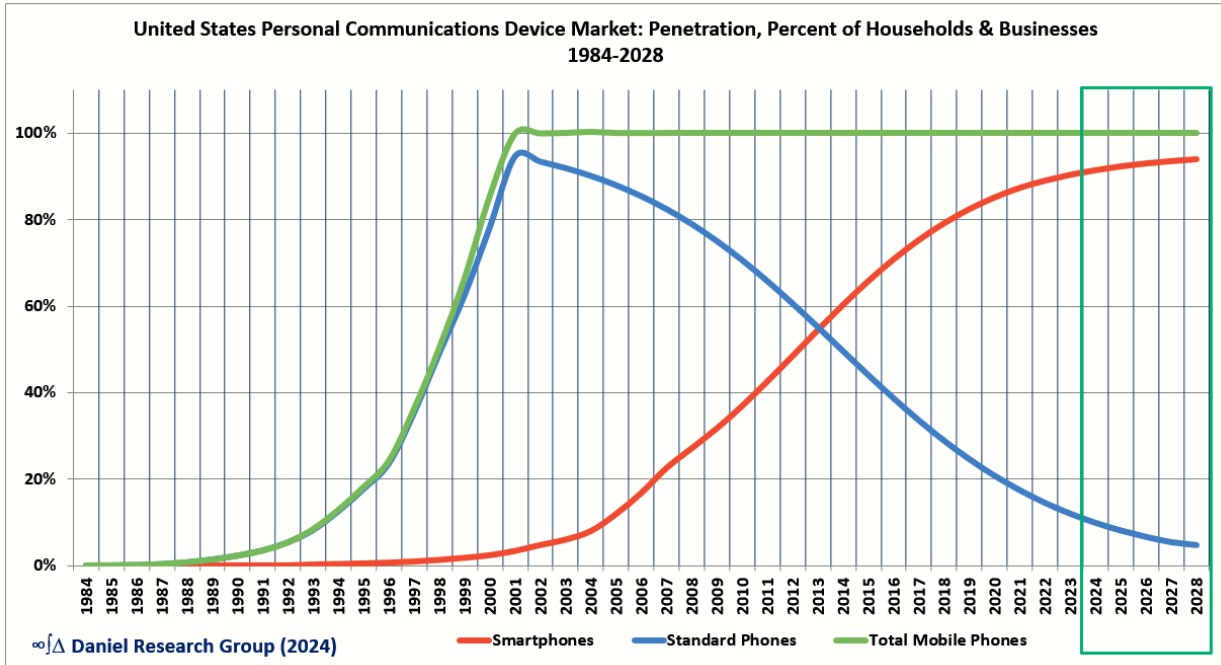
Consumer PCs and Tablets



Enterprise PCs and Tablets



Mobile Phones

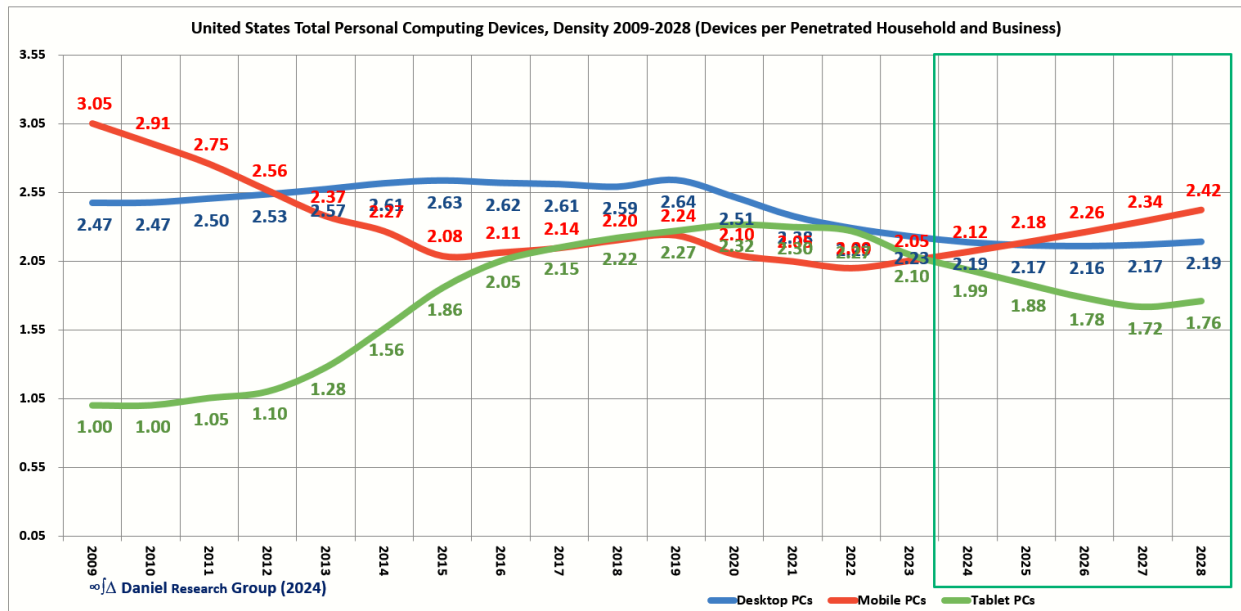


Density

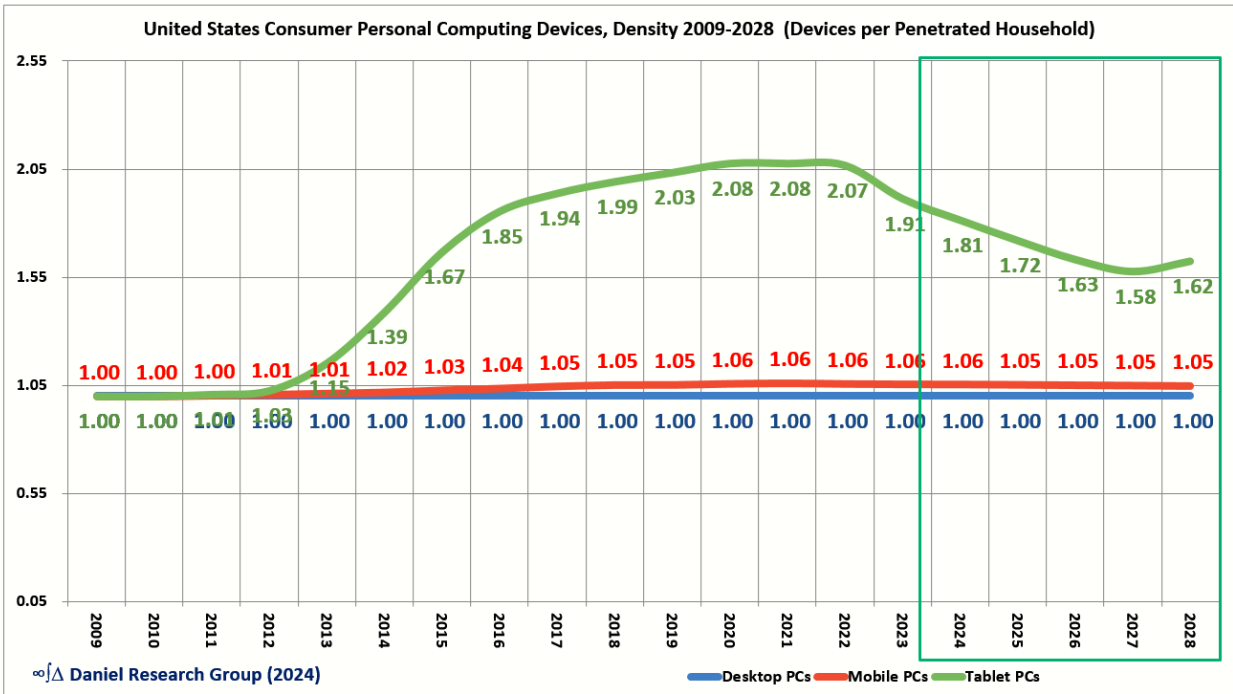
Density is the average number of Installed Base units in penetrated households and/or businesses. Densities are independent of penetration and reflect the distribution of single or multiple product users over the life of the product and the timing of the purchase of additional units. For most products, early adopters are more likely to be multiple unit buyers than later adopters. As the product enters the middle phase of its market life, the density will begin to decrease. For some products the density will start to increase again at the very end of the product life as the few remaining users are more likely to be multiple unit users than those who have stopped using the product.

The significant increase densities for Mobile PCs reflects the excess buying in the Consumer Segments to support pandemic caused increase in Work From Home, Learn From Home and home entertainment use cases. The significant increase in desktop density in the Enterprise Segment in the forecast period is reflective of the need to provision employees shifting back to on-site workplace work or hybrid working arrangements, as well as an increase in use cases that require the power off desktops.

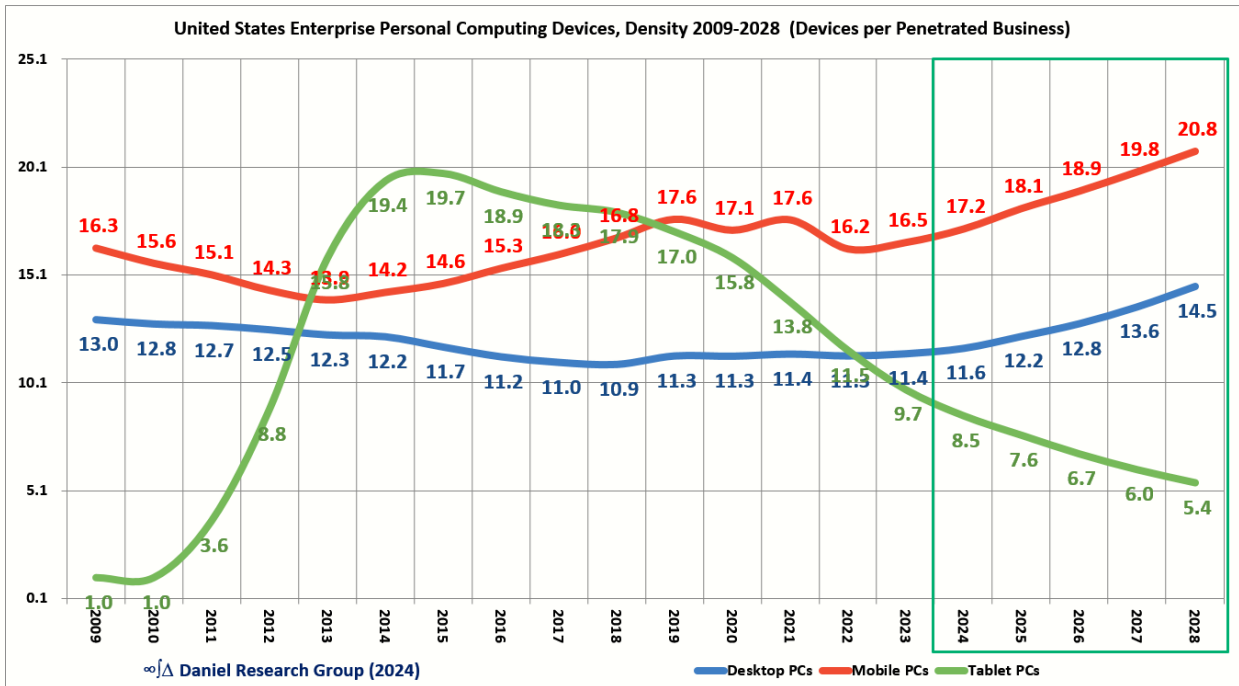
Total



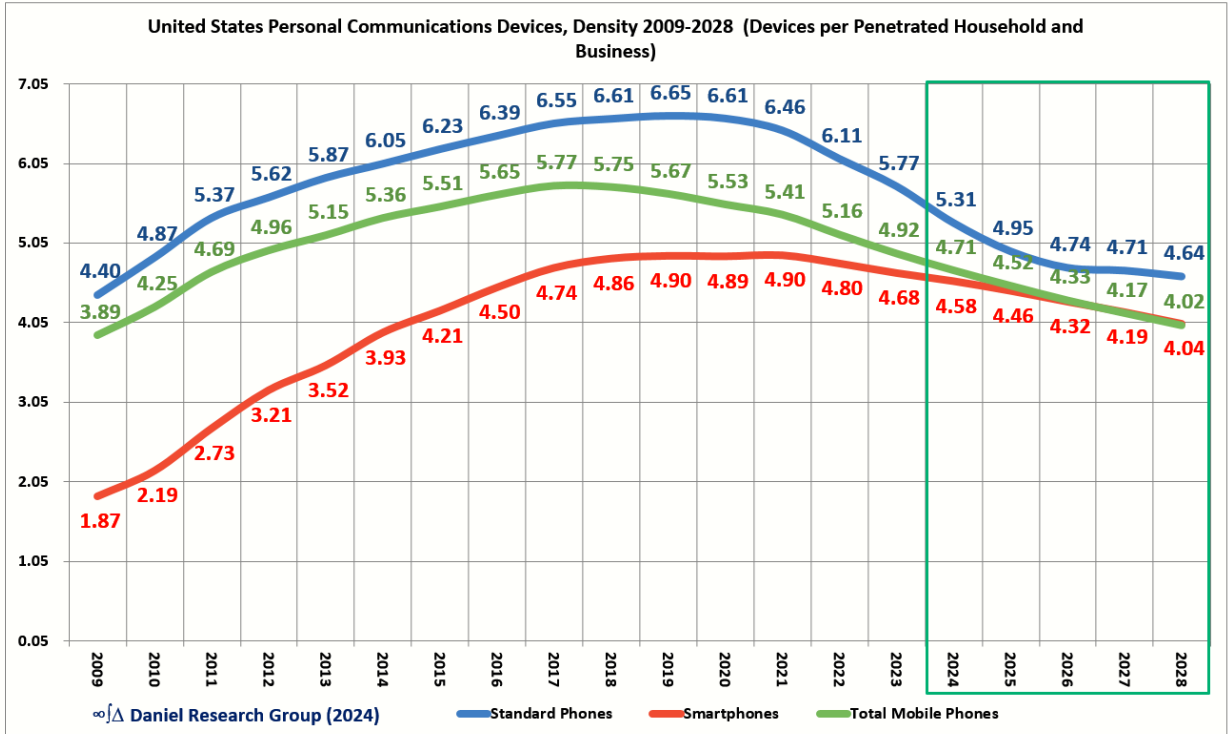
Consumer



Enterprise



Mobile Phones



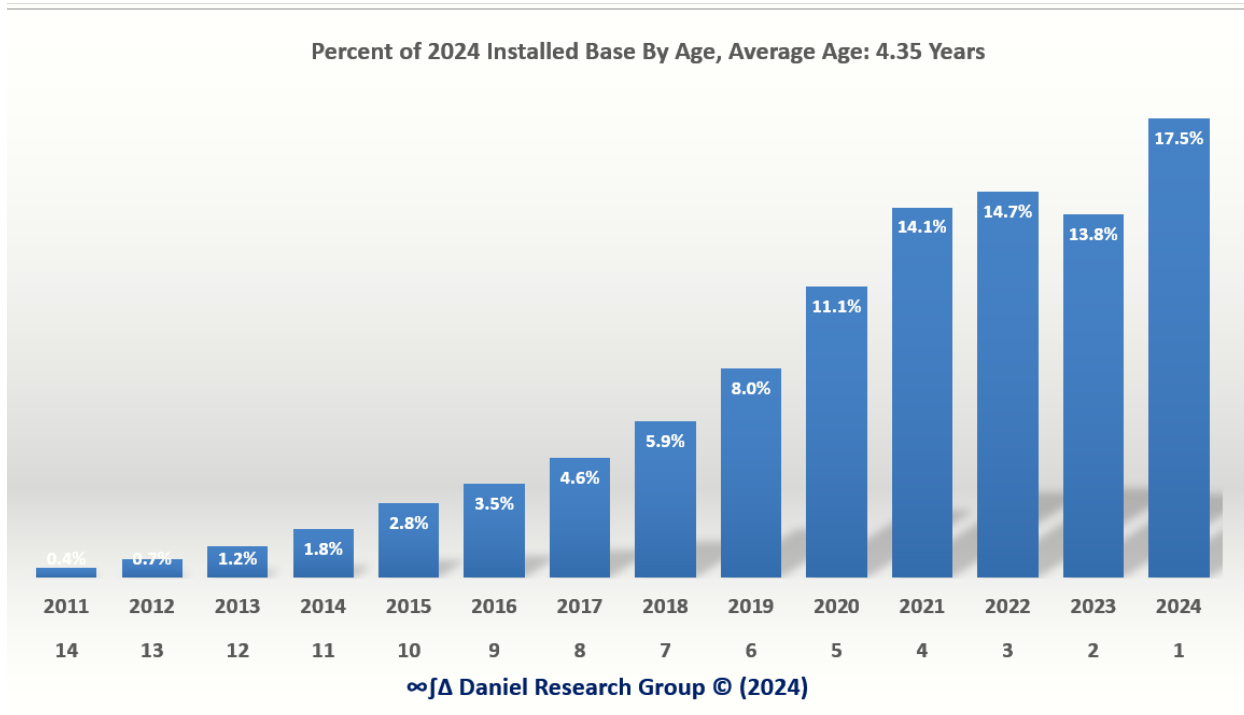
Replacement Rates

How long are current users expected to continue to use their current device until they replace them? That is one of the most important questions that device vendors and sellers need to ask, and is very difficult to answer. Asking current users when they expect to replace requires them to have knowledge of future product, economic and market conditions that they may not know. The **EQS** methodology and models utilize four different metrics to measure historical and forecasted length of time a device is in use before being removed from the Installed Base.

Retention Rate Distribution Mean (RRD- μ), Standard Deviation and Maximum Life. Given the number of Units Shipped in any year, the RRD- μ is the number of years from the current year when 50% of those Units will still be in the Installed Base. The distribution is assumed to be a left (1) and right (Maximum Life) truncated normal distribution with a specified standard deviation. The RRD parameters are usually inputs to the model and are based on our analysis of economic, market, and user behavior factors. However, the RRD- μ may be either an input or an output of the forecast model depending on the directional configuration. When constructing a model for the first time, the RRD parameters are solved for by **EQS** based on known historical Unit Shipments and Installed Base data. This provides the historical context for constructing and then validating RRD forecasts, as well as providing an historical baseline to validate the forecasts.

Average Installed Base Age (AIBA). The **EQS** models compute the age distribution of the Installed Base in every year. However, AIBA is often highly dependent on the relative magnitude of current Unit Shipments in relationship to the Installed Base, and is therefore may not be an accurate estimate of how long users will continue to use the device when either Unit Shipments or Removals exhibit high year to year variance.

Total PCs and Tablets



The **EQS** Models compute and output the age distribution of the Installed Base for every historical and forecasted year. The demand for After Market/Reverse Logistics products and services are more a function of the Installed Base than the initial Unit Shipments.

Replacement Cycle Length (RCL)

$$RCL = \frac{\text{Starting Installed Base} + \text{Unit Shipments}}{\text{Units Exiting the Installed Base}}$$

RCL is the length of time it will take for all the existing units in the Installed Base to be replaced given the current Installed Base size, Unit Shipments, and number of Units Removed from the Installed Base in that year. The **EQS** algorithm allows the RRD-μ to be adjusted to produce a target RCL value. Therefore, the models may be configured to use RCL as either an input or an output variable.

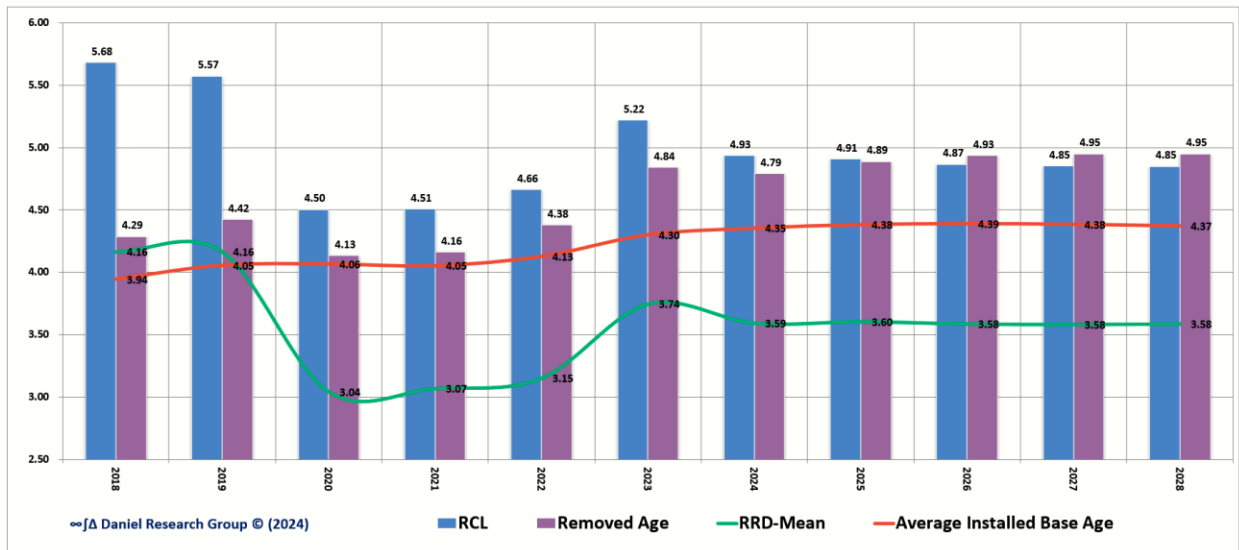
Under normal conditions, RCL is the favored metric for predicting the length of use/ownership trends of Personal Devices. However, like the AIBA metric, its predictive properties diminish when the variance of the Unit Shipments or Removed Units exiting the Installed Base increases. In 2020 and 2021, RCL will show considerable variance in the Enterprise Segment due to the significant number of Units exiting the Installed Base as a result of business closures in 2020 and

recovery buying in 2021. Moving forward from 2023, RCL will regain its strong predictive and explanatory properties.

Average Removal Age (ARA) – This is the average age of the units exiting the Installed Base for any reason. It is an estimate of the average age that would be computed if you could ask every user who stopped using the device how long they had used it before replacing or other reasons for use termination.

The value of each of these metrics is more in the trend than in the point values. A comparison of the four Installed Base age metrics for Total Computing Devices is presented in this chart. The RCL and RRD-Mean will exhibit the most variance due to anomalous events such as the operating system migration and economic shocks. Therefore, currently the Average Installed Base Age and the Average Removal Age are better estimates of future replacement rates.

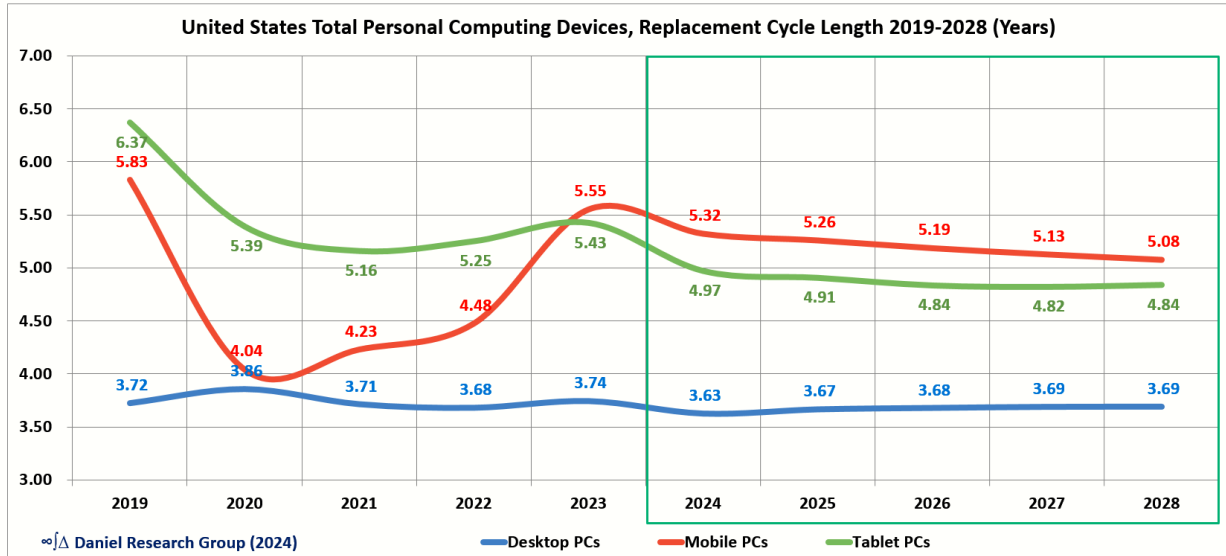
Total PCs and Tablets



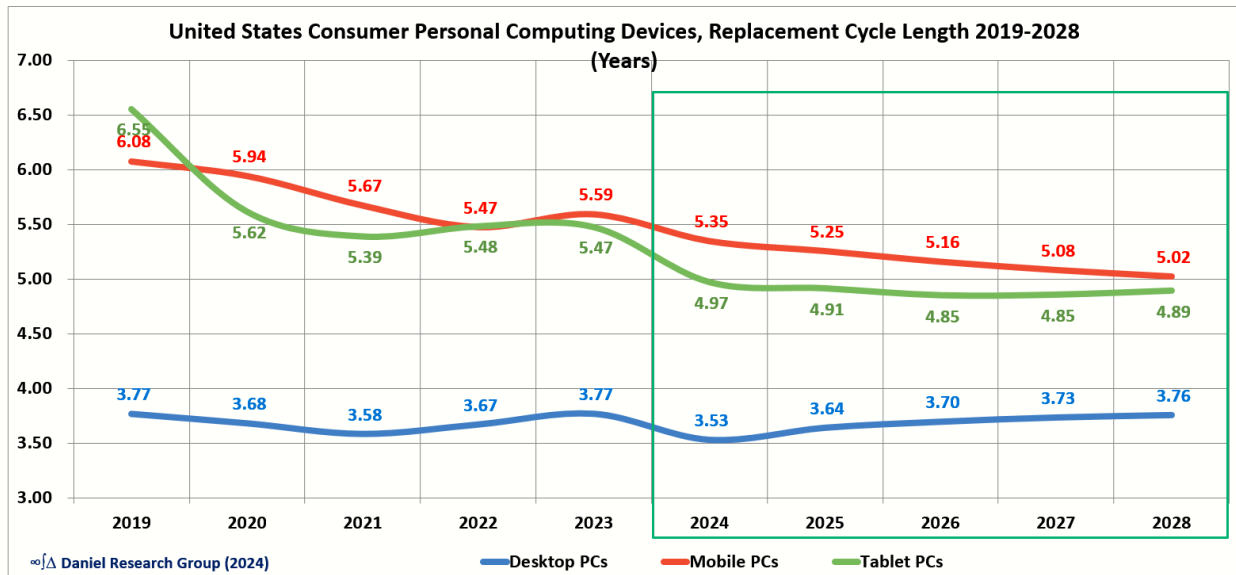
Each of the Age metrics answers a different question.

Metric	Question
AIBA	How old are the units in the Installed Base?
ARA	How old are the units people are just now no longer using.
RRD-μ	How much time from now will 50% of this year’s Unit Shipments still be in use?
RCL	How long will it take to replace all the units in the Installed Base?

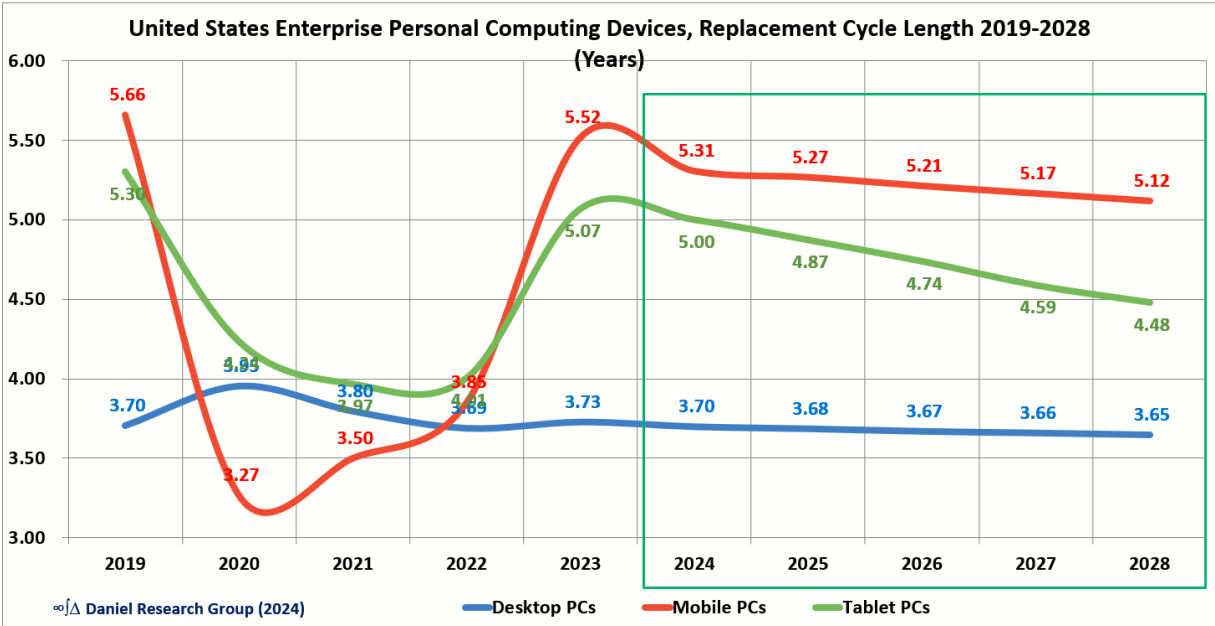
Replacement Cycle Length Total



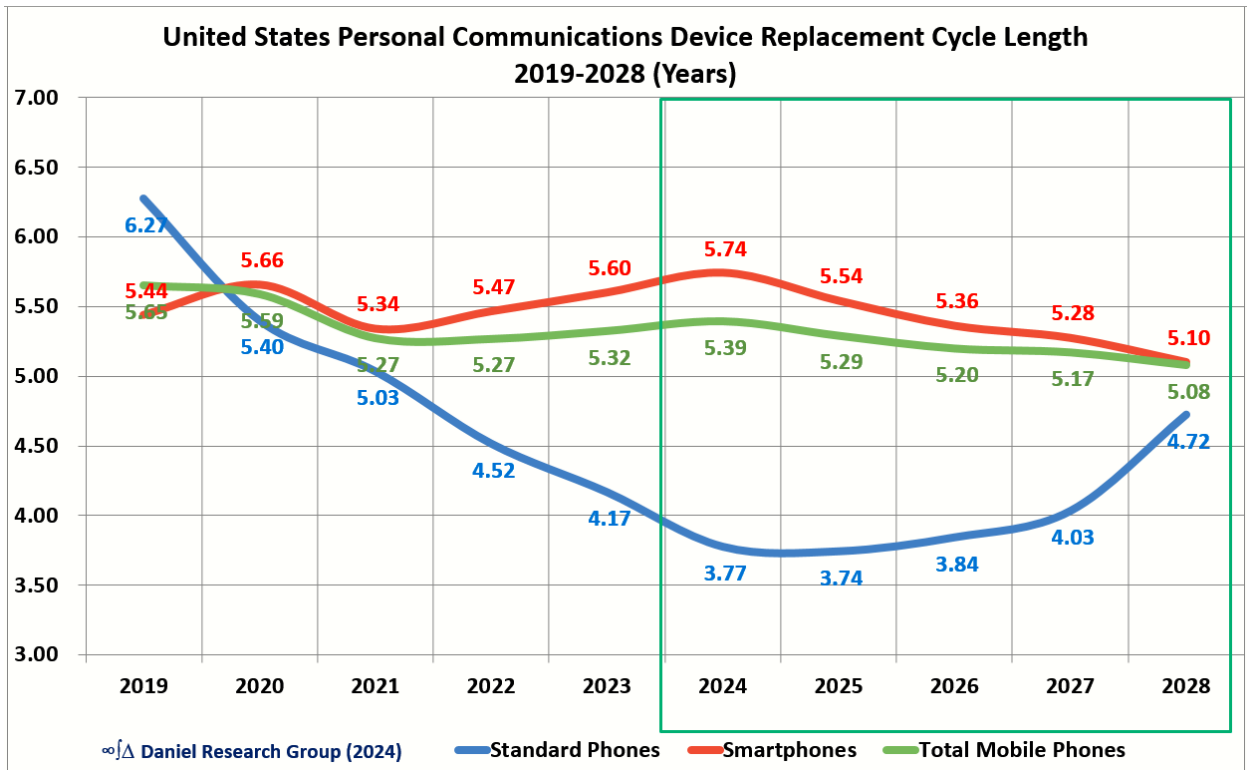
Consumer



Enterprise



Mobile Phones

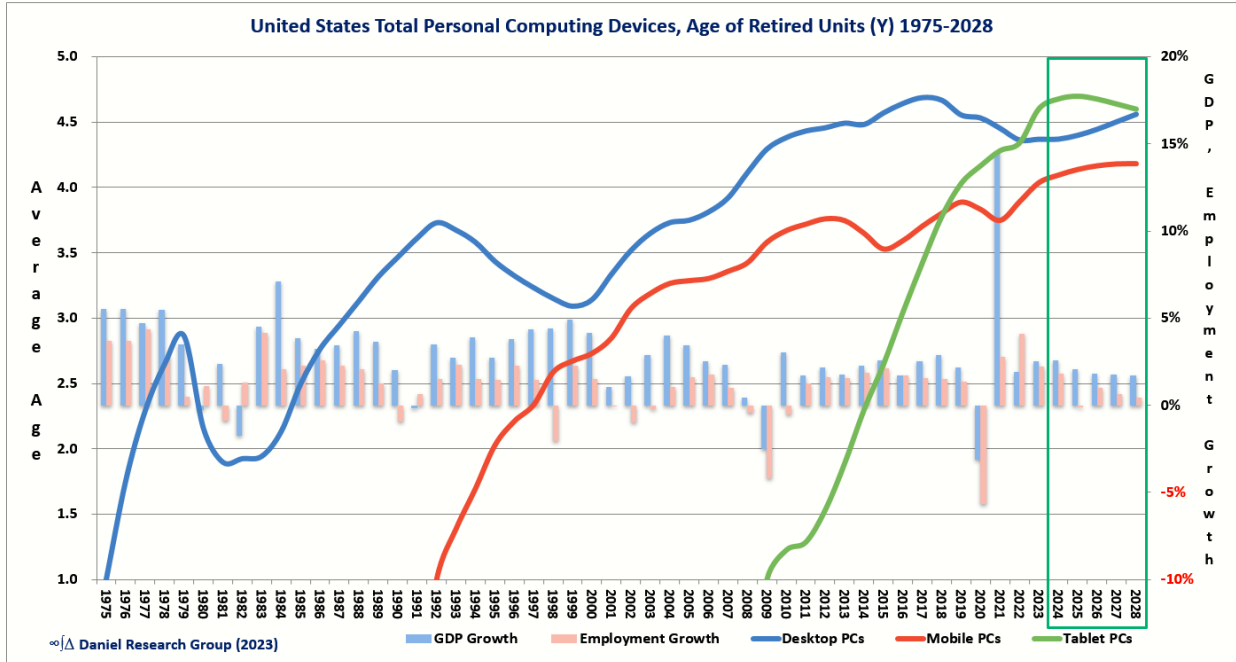


Long-Term Charts

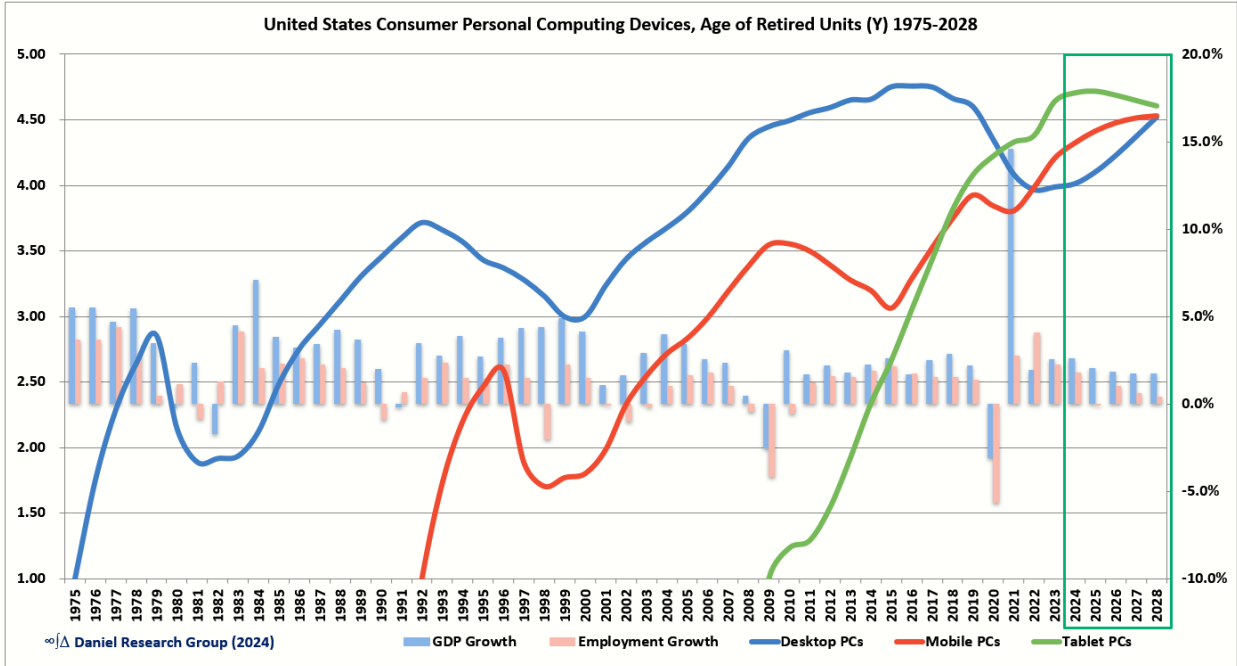
These charts provide additional historical context to better understand both the current state and the forecast in comparison to long-term trends.

Average Removal Age

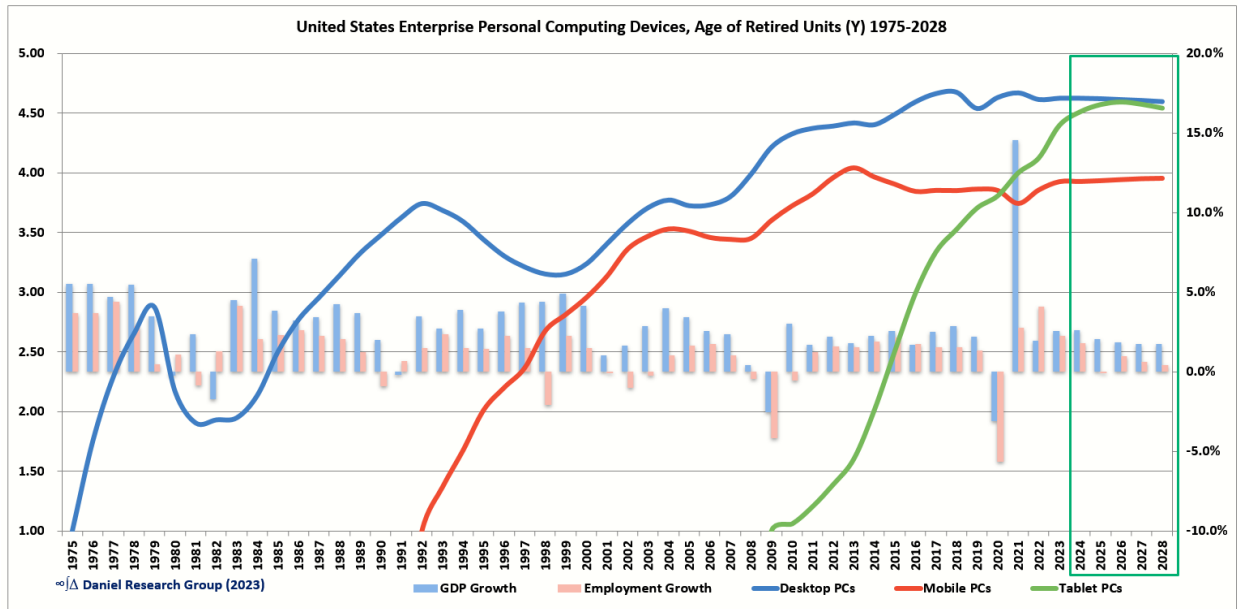
Total



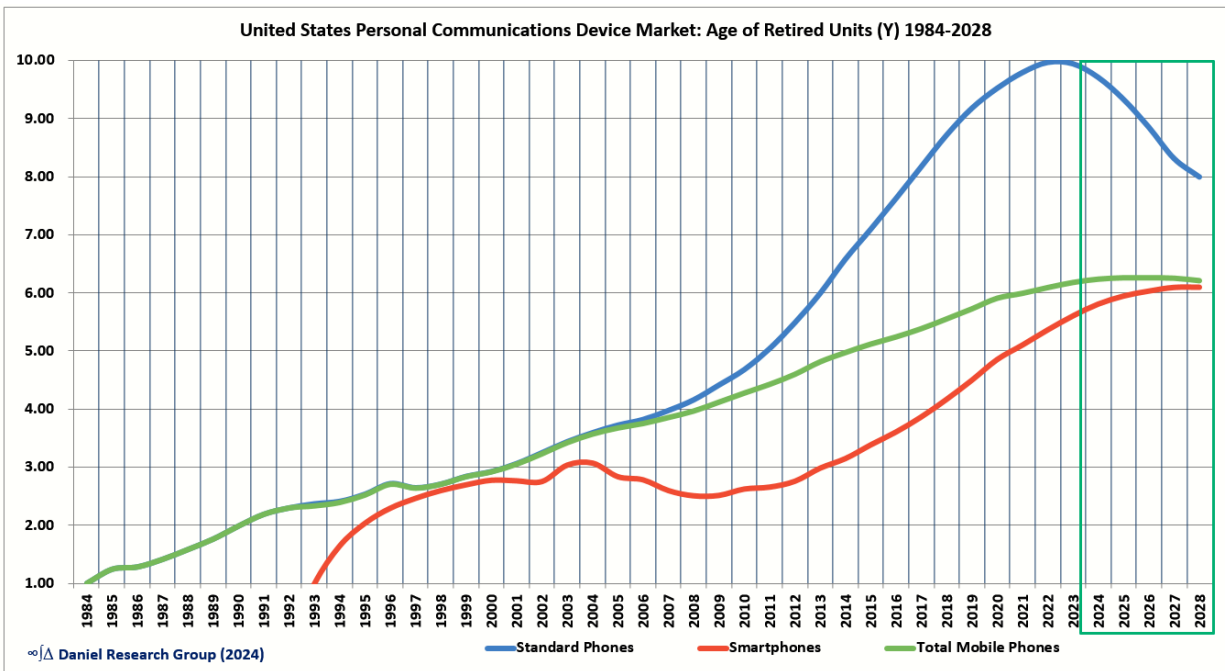
Consumer



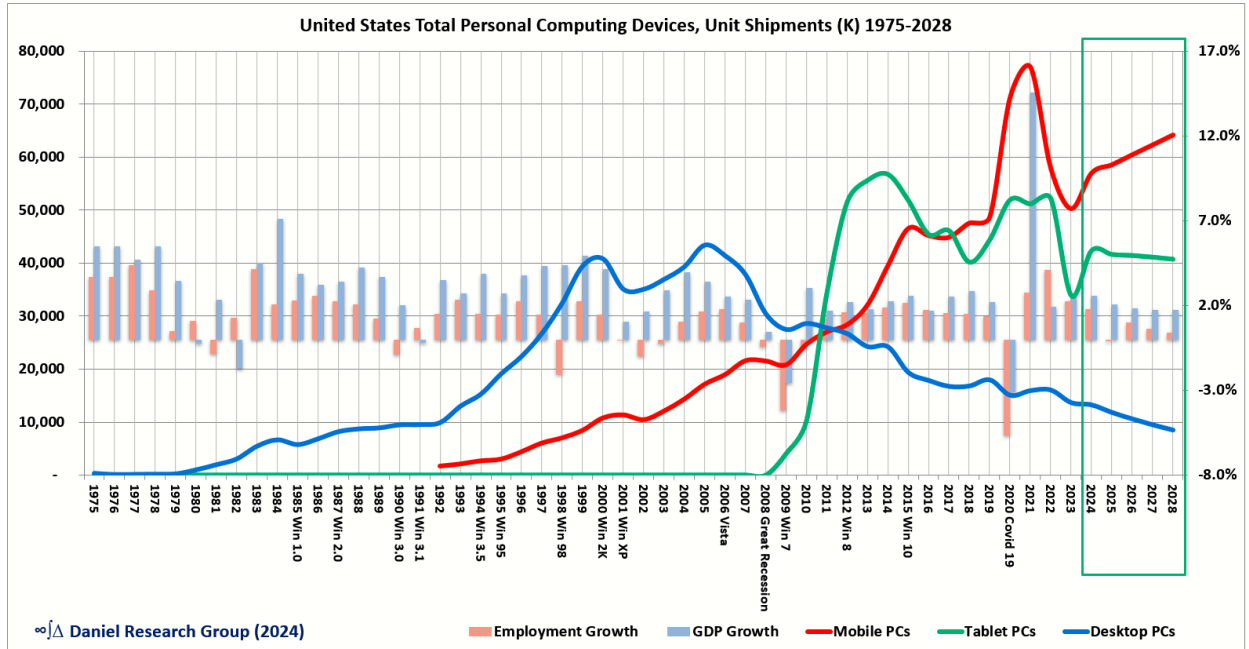
Enterprise



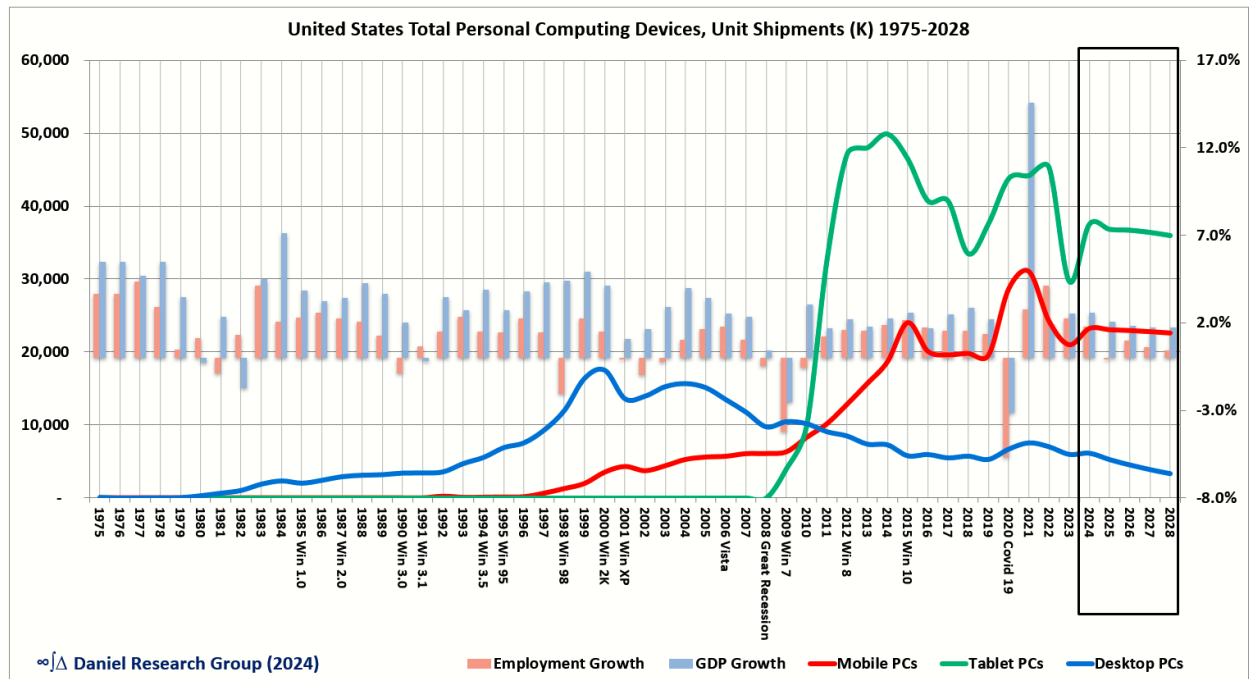
Mobile Phones



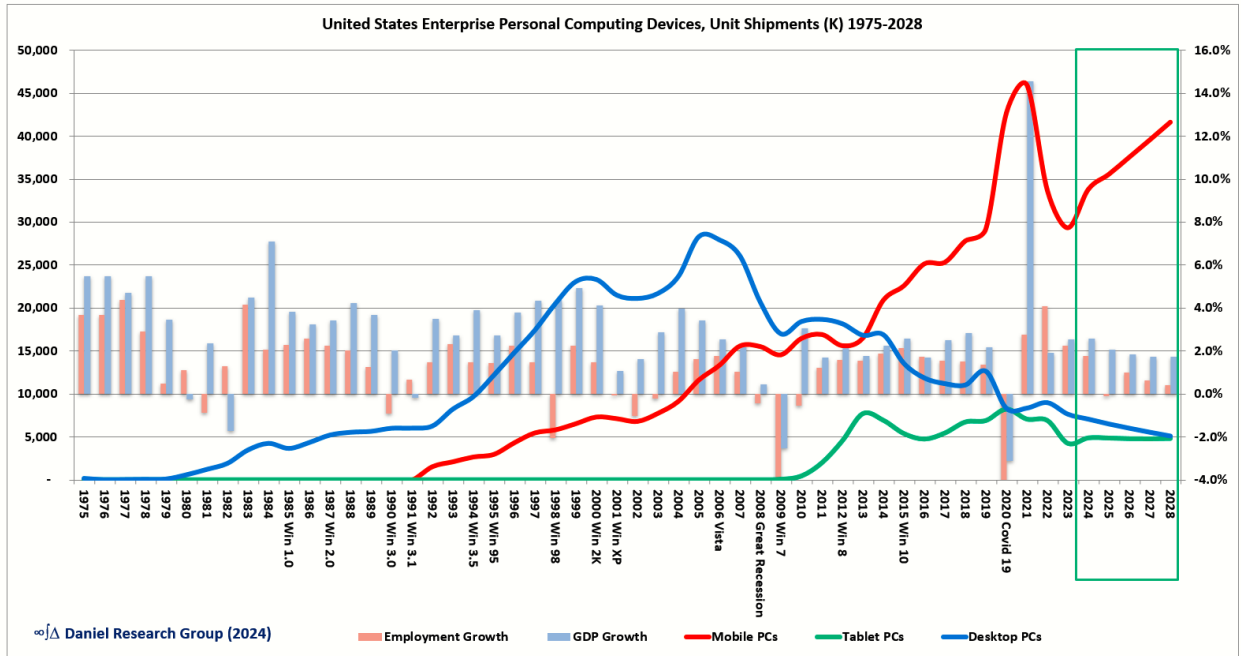
Unit Shipments Total



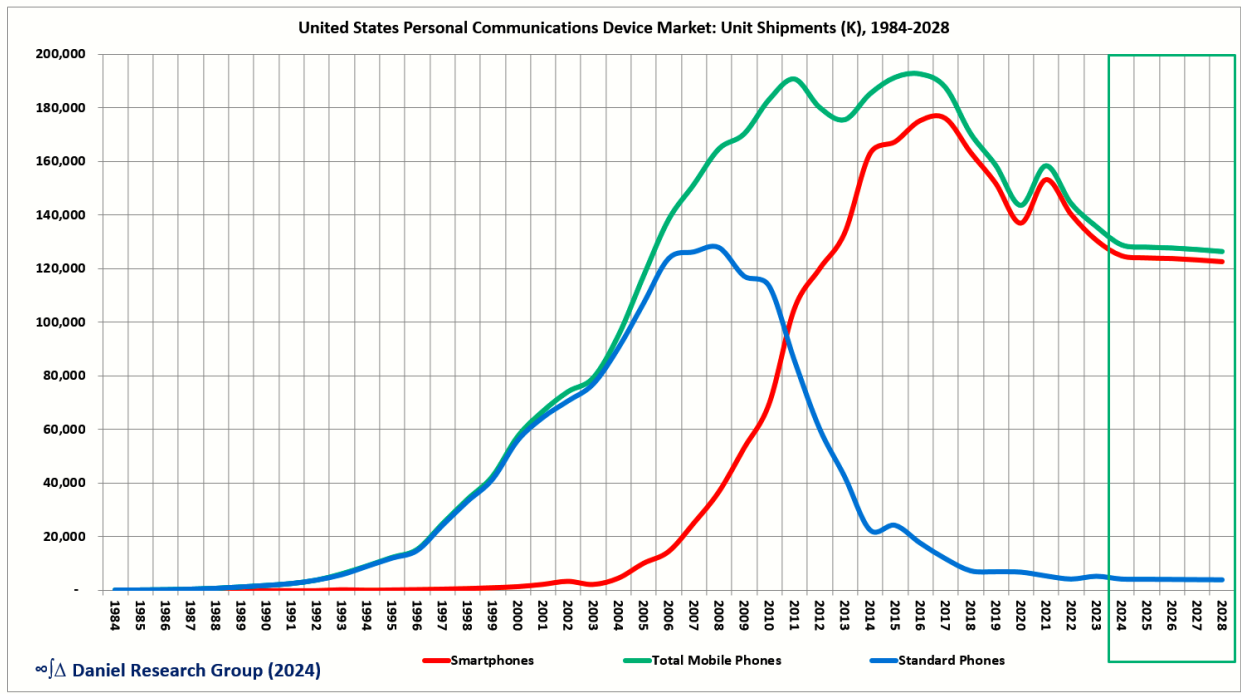
Consumer



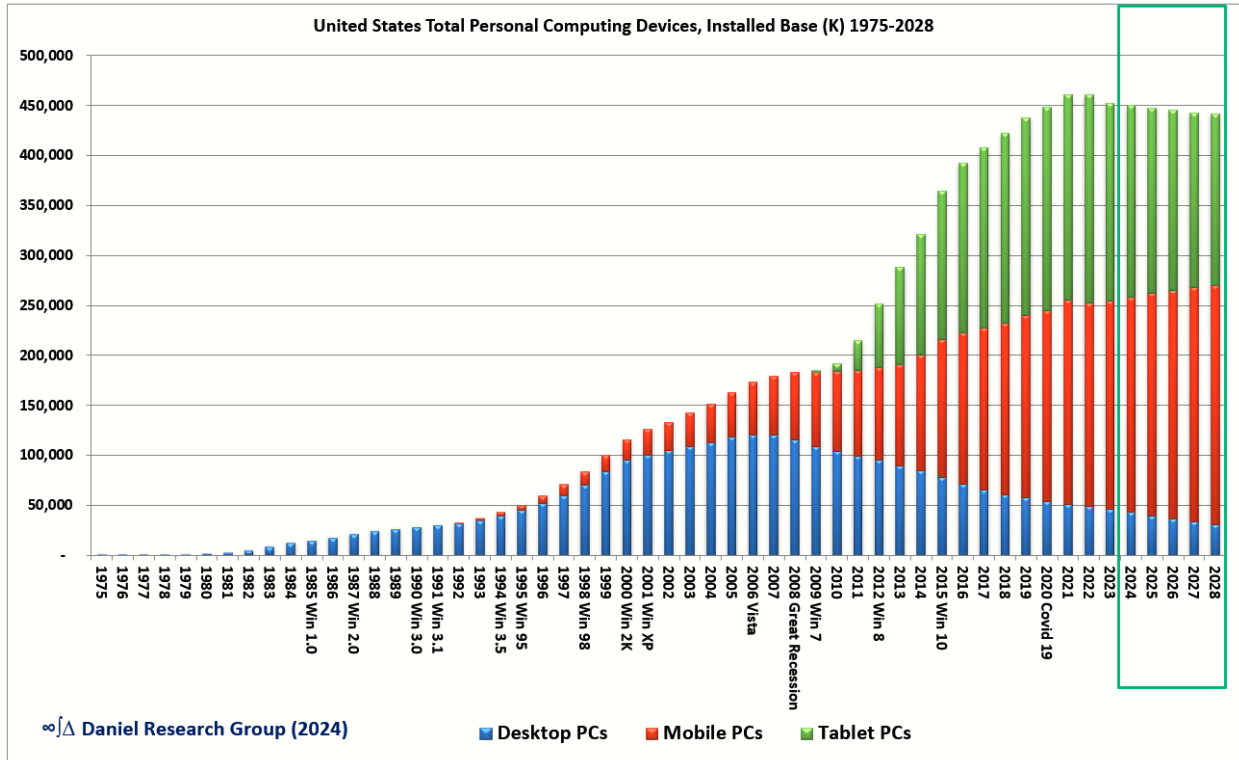
Enterprise



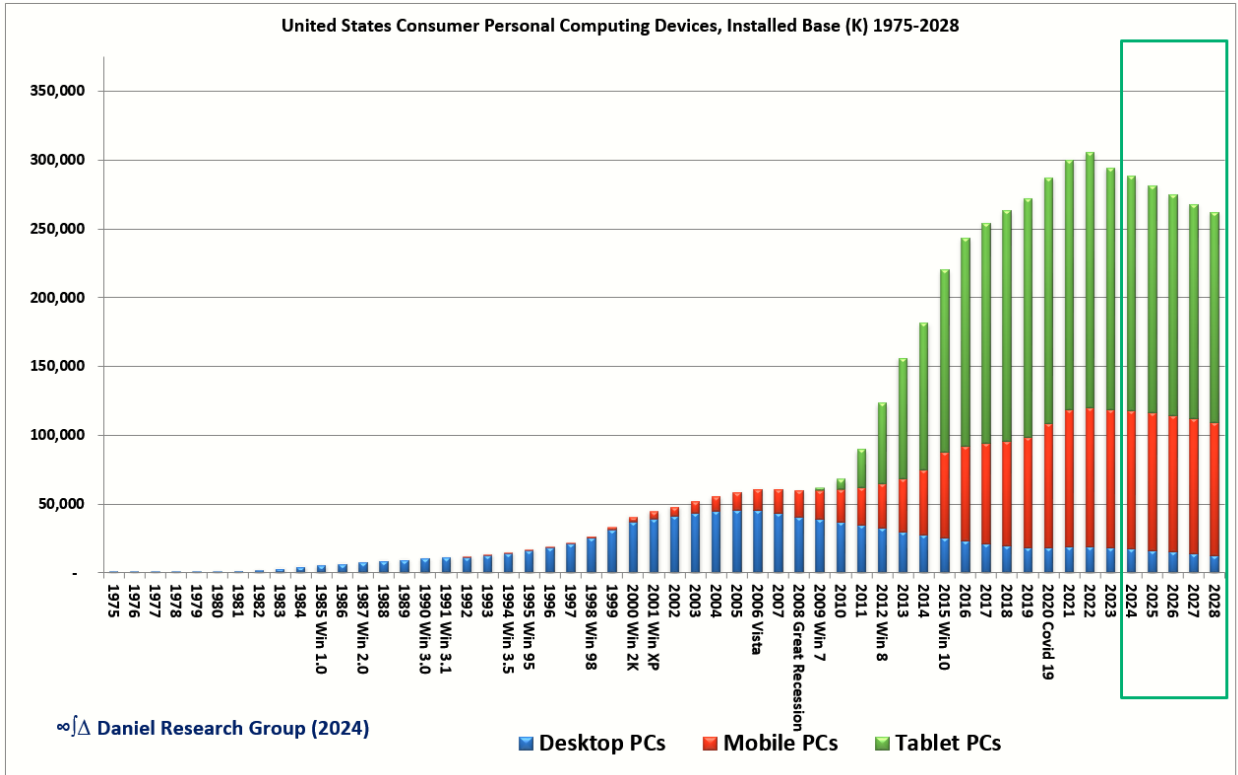
Mobile Phones



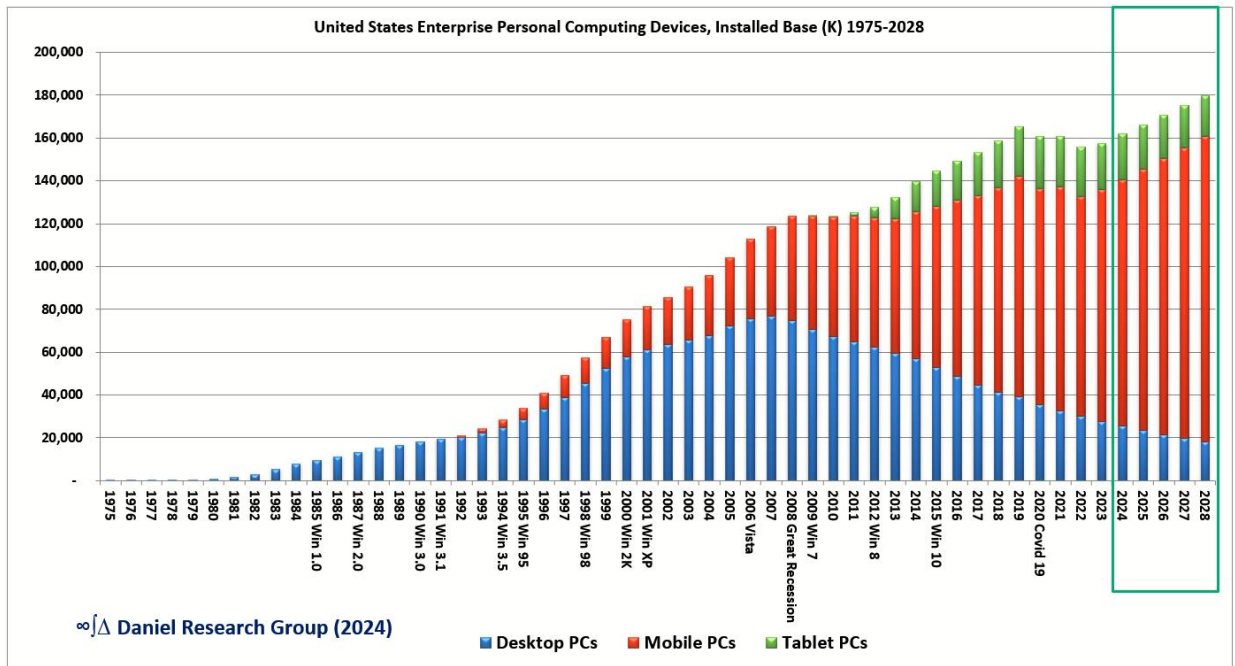
Installed Base Total



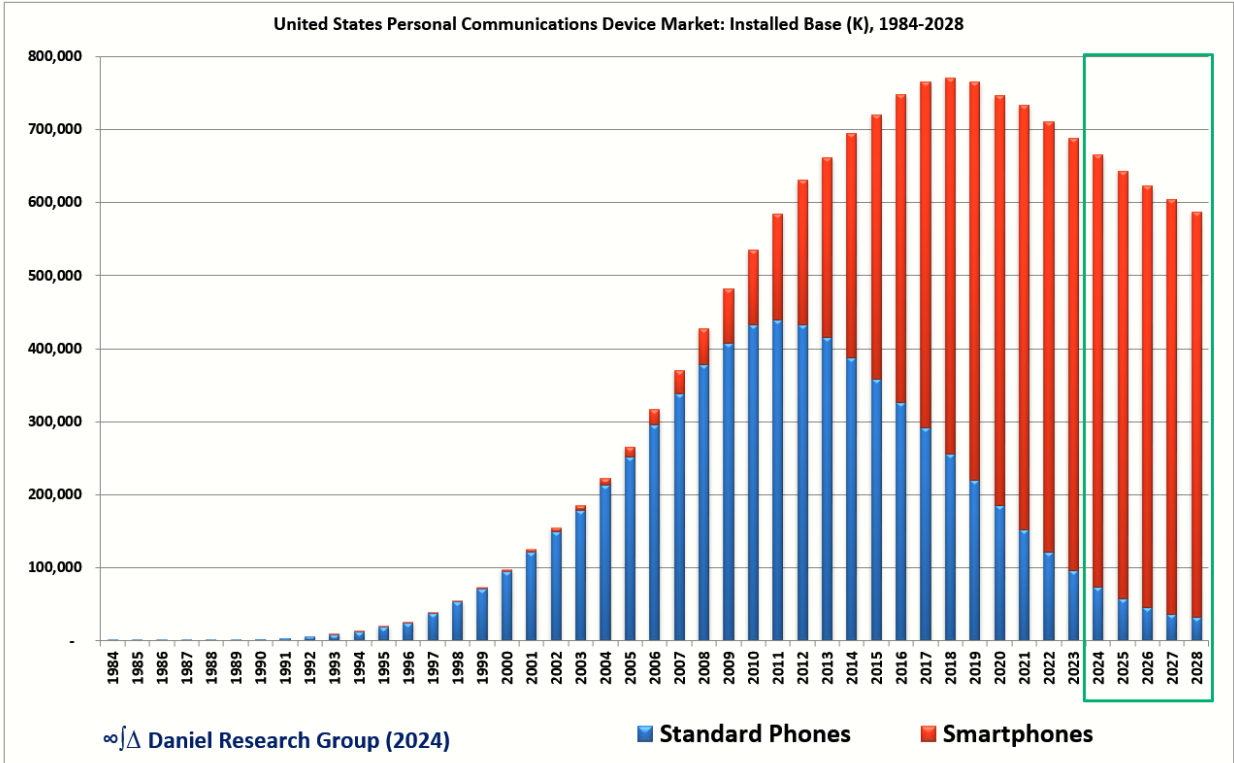
Consumer



Enterprise



Mobile Phones



Methodology

Forecasting Approach and Process

In order to understand our forecast conclusions, a review of our forecast approach is necessary. Although forecasts of Unit Shipments and Revenues are of most interest to our clients, we consider these to be output results with very little predictive properties in and of themselves. Rather we base our forecasts on understanding the trends and the influences on those trends of the following primary causal variables.

- **Total Available Market (TAM)** – The number of potential buyers in the Consumer and/or Enterprise Segments.
- **Penetration** – The percent of buyers, households, and/or businesses, that have, or will, purchase the product or service.
- **Density** – the number of product or service units in use per penetrated household and/or business.
- **Replacement Rate** – rate at which users are replacing older units with new ones. This is primarily measured in terms of the Replacement Cycle Length. The length of time it would take to replace all the current units in the Installed Base given the initial size of the Installed Base, the current year Unit Shipments, and the current year number of units removed from the Installed Base.

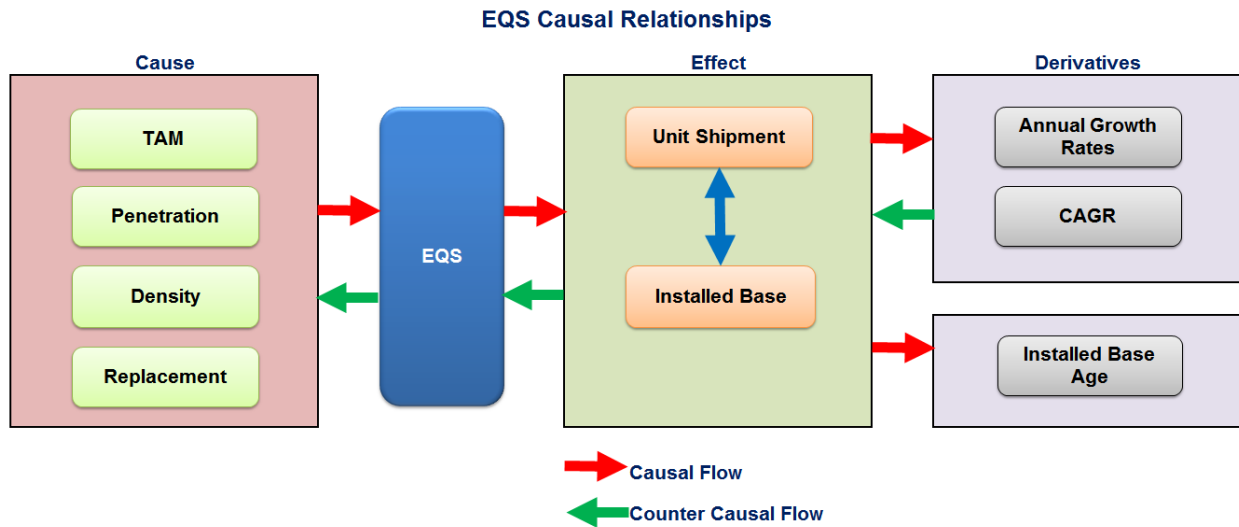
Our forecast approach proceeds in four modeling levels.

1. **Penetration** – Top-Down Long-Term models that forecast future market penetration of the primary major products categories based on long-terms historical trends.
2. **Top-Down** – The primary major products are split by segment (consumer and enterprise) and form factor, as needed.
3. **Base** – Each individual product/segment/form factor forecasts are adjusted to reflect our analysis of the economic, demographic, technological, market and user behavior influencing factors.

4. **Aggregation** – The base forecasts are rolled-up to higher levels. While some of the output metrics such as Unit Shipments, Revenues and Installed Bases are additive, other such as Density, Penetration, Replacement Cycle Length, and Installed Base Age can only be computed using DRG’s proprietary EQS methodology. In most models, the Base models are adjusted through a calibration step such that the roll-up matches the Top-Down for a specified metric.

Models are neat, but markets are messy. Any market model is at best an idealized simplistic version of a complex real world process. How useful any model can be is a function of how well it encapsulates the basic influencing relationships that drive cause and effect. When EQS models a **Causal Flow**, the four inputs compute the primary outputs: Unit Shipments and Installed Base, as well as the derivative metrics Annual Growth Rates, CAGRs, and the Installed Base Average Age. For example, an increase in the penetration rate will result in an increase in Unit Shipments and/or an increase in the Installed Base, as well as changing the derivative metrics.

When EQS models a **Counter Causal Flow**, the logic flows in the other direction. An increase in the Unit Shipments will require an increase in one or more of the Causal variables, as well as changing the derivative metrics.



The strength of EQS as a market modeling and forecasting tool derives from two attributes;

1. The ability to run both Causal and Counter Causal logic.
2. A closed system of relationships that can only produce outputs that meet real world constraints and criteria set by the user.

Supporting Models

The **DRG Business Demographic Baseline and Forecast (BEDD)** is a database of United States Firms, Primary Firms, Establishments, and Payrolls by Private and Public Sectors, by 2-Digit NAICS industries, from 1998 to 2027. It is derived from data obtained from the US Census Bureau, the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Department of Defense, and the Congressional Budget Office.

The **DRG United States AI Enabled Device Forecast 2024-2034** forecasts Unit Shipments, Revenues, Installed Base, Business and Household Penetration & Density, and Installed Base Age. Device end of life age, and Replacement Rates for Desktop and Mobile Personal Computer. Tablets and Smartphones. The models use currently available actual data within the **DRG** adoption model derived from similar historical device adoption statistics.

Forecast Updates

DRG will update its forecasts periodically as actual year-to-date results become available. Utilizing the **DRG ProjectionSolver and GrowthSolver** algorithms, new current year projections based on historic trended quarterly or monthly patterns are computed. Based on these projections, adjustments may be made to the primary **EQS** models.

Sources of Historical Data

Historical data was obtained from the following available sources including press releases, published reports and presentations, and publicly available databases.

Device or Metric	Unit Shipments	Installed Base/Penetration
Desktop PCs	Environmental Protection Agency IDC	Computer Almanac eTForecaster International Telecommunications Union Worldbank
Mobile PCs	Environmental Protection Agency IDC	Computer Almanac eTForecaster International Telecommunications Union Worldbank
Tablets	IDC	Pew Research Center
Mobile Phones	Consumer Technology Association Telecommunications Industry Association IDC	Cellular Telephone Industries Association Centers for Disease Control and Prevention GSMA International Telecommunications Union Organization for Economic Co-operation and Development Telecommunications Industry Association Worldbank
Households	US Census Bureau Congressional Budget Office	
Businesses	Bureau of Economic Analysis Bureau of Labor Statistics Congressional Budget Office Department of Defense US Census Bureau US Office of Personal Management	

Data obtained from a variety of sources, often using different definitions and methodologies are frequently inconsistent with each other. **DRG** employs **EQS** to identify and correct these differences and produce historic time-series of Unit Shipments, Installed Bases, Replacement Rates, Average Ages, Densities and Penetration Rates that are internally consistent with each other, and correlate highly with external quantitative data and qualitative data criteria. **DRG** believes the resulting historical baseline is the most accurate complete accounting of the US Personal Device Market from its inception in 1975.

About Daniel Research Group

Daniel Research Group is a market research and consulting firm servicing primarily technology clients. Our primary focus is developing custom market models and forecasts. We support clients three ways.

1. We work independently or collaboratively with the client's own analysts to **produce custom** technology product/service **market models and forecasts**.
2. We work collaboratively with the client's own analysts to **design and develop the modeling applications** that they will use to develop their own market models and forecasts.
3. We **train client's analysts** in the theory and practice of technology market modeling and forecasting.

Most of our work utilizes the inventory of proprietary methodologies and algorithms that we have developed over more than 35 years. We have built technology forecasting market models for many major technology vendors, market research firms, and industry organizations. While our core competency is forecasting, our subject experience covers the entire technology and technology-enabled product/service landscape. We also support our engagements with traditional qualitative and quantitative research, as well as tactical and strategic consulting services.

Stephen J. Daniel - President

With over four decades in the Information Technology Industry, Mr. Daniel has developed a unique blend of Market and Technology experience coupled with a deep understanding of Market Research Methodology. His primary strength is in understanding the decision-making context within which the results of his research will be applied. This is manifested by his ability to design and execute studies that precisely meet client objectives in a timely fashion and at reasonable costs.



Mr. Daniel received his BS in Finance from Northeastern University and earned an MBA in Quantitative Analysis from New York University. He is a member of the American Statistical Association, American Economic Association, The Market Research Association of America, the American Marketing Association, National Association for Business Economics, and the Qualitative Research Association of America.

Contact Information

<http://www.danielresearchgroup.com/>

Steve@DanielRG.com

(617) 484-6225

