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WI-FI WORKS:
HOW THE SUCCESS OF WI-FI DRIVES U.S. JOB CREATION

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EXECUTIVE SUMMARY

In this study, we estimate the job creation impact generated by Wi-Fi technologies in the United States over the period from 2023 to 2032. Drawing upon previous comprehensive research quantifying Wi-Fi's economic benefits,[1] our analysis reveals that:

Wi-Fi technologies are fueling robust job growth:

- **Wi-Fi was responsible for more than 7 million American jobs in 2023.**
- **Wi-Fi's U.S. employment impact is projected to grow to more than 13 million jobs by 2027 and approximately 21 million jobs by 2032.**
- This growth is driven by significant direct employment derived from the economic value of Wi-Fi, coupled with substantial indirect employment from upstream supply chains and a Wi-Fi-facilitated boost in consumer spending.

This study also breaks out the employment impact of Wi-Fi technologies by spectrum bands:

- Employment supported by Wi-Fi technologies operating in the **2.4 GHz and 5 GHz bands** exhibits steady, incremental growth due to sustained demand and ongoing infrastructure improvements, rising from over **5 million jobs in 2023 to a projected nearly 5.5 million in 2027 and more than 6 million by 2032**.
- The **6 GHz band**, which the FCC opened for unlicensed Wi-Fi use just five years ago, is already demonstrating rapid employment expansion, – supporting **2 million jobs in 2023, and projected to reach just under 8 million by 2027 and more than 13.5 million by 2032**.

Comparative analysis further underscores the advantage of allocating additional mid-band spectrum to Wi-Fi technologies rather than to licensed mobile services. Specifically, allocating 500 megahertz of 7 GHz spectrum to **Wi-Fi 7 would generate an estimated annual employment gain of approximately 1.5 million jobs in the U.S. in 2032 alone**. In stark contrast, allocating a comparable mid-band spectrum of 400 megahertz to mobile services is projected by one analysis to generate 407,000 jobs by 2032.[2]

Given these findings, policymakers facing decisions about future commercial spectrum allocation should prioritize spectrum allocation strategies favoring Wi-Fi technologies to maximize employment growth and broader economic benefits. These policy measures will be essential to fully leverage Wi-Fi's substantial economic and social potential, ensuring sustained employment growth and inclusive economic prosperity in the United States.

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[1] Katz, R., et al. (2024). *Assessing the economic value of Wi-Fi in the United States*. New York: Telecom Advisory Services

[2] NERA Economic Consulting. (2025). *The economic impact of allocating mid-band spectrum to mobile.* Prepared for CTIA. As discussed below, this estimate appears to assume the immediate availability of spectrum for licensed use and thus may be negatively affected by time lags associated with spectrum clearing and other factors related to delayed use.

1. INTRODUCTION

Wi-Fi technology has become an essential component of the telecommunications infrastructure, underpinning substantial economic and social benefits globally. Our previous research extensively quantified the economic value derived from Wi-Fi technologies in the United States, highlighting their contributions in terms of GDP growth, consumer benefits, and producer surplus. Specifically, our prior report (Katz et al., 2024) estimated that Wi-Fi technologies contribute significantly to the U.S. economy, with GDP attributable to Wi-Fi expected to grow from $592 billion in 2023 to approximately $1.29 trillion by 2027. Notably, these effects reflect the substantial impact of additional spectrum allocations for unlicensed use, such as the 6 GHz band and the potential allocation of the 7 GHz band, each offering marked improvements in capacity, speed, and connectivity capabilities, thereby facilitating broader economic activity and innovation.

This report expands on our previous work to focus on assessing the employment effects associated with the allocation and utilization of spectrum bands for Wi-Fi in the U.S. over the period from 2023 to 2032. Our analysis is structured around three spectrum bands currently used for Wi-Fi: the traditional 2.4 GHz and 5 GHz bands, the 6 GHz band, allocated for unlicensed use five years ago and the potential future use of the 7 GHz band. This segmentation acknowledges that employment benefits vary according to the available spectrum capacity, adoption rates, quality improvements, and market dynamics associated with each band and the technology features of each Wi-Fi standard.

To establish a robust framework for the analysis, this study integrates data and findings from our earlier comprehensive evaluation of Wi-Fi's economic value. Specifically, results concerning GDP contribution, consumer benefits, and producer surplus have been incorporated into an input-output modeling approach, utilizing detailed data from the U.S. Bureau of Economic Analysis. This methodological integration ensures a comprehensive assessment of how Wi-Fi-driven economic activities cascade throughout the economy, affecting employment not only in the immediate telecommunications and technology sectors but also within broader industries supplying goods and services that support Wi-Fi deployment and utilization, and finally triggered by consumption by newly created workers.

Finally, we examine the comparative employment outcomes linked to the allocation of 7 GHz either for unlicensed or licensed use. Our findings show that allocating this spectrum for unlicensed use will generate more jobs than if approximately similar spectrum is allocated for licensed uses, underscoring the vital role that informed spectrum allocation policies, particularly those favoring unlicensed Wi-Fi bands, play in bolstering employment and sustaining economic growth in the United States.

2. METHODOLOGY[3]

This report employs a methodological framework specifically tailored to quantify the employment impacts resulting from Wi-Fi technology deployment in the U.S., leveraging economic values established in prior research. The primary goal of this analysis is to translate the previously determined contributions of Wi-Fi to Gross Domestic Product (GDP), consumer benefit, and producer surplus—outlined extensively by Katz, et al (2024)—into measurable employment outcomes. This approach provides a comprehensive view of how Wi-Fi directly and indirectly stimulates job creation across various economic sectors.

Following the data collection, the next critical methodological step involves applying input-output modeling, a widely recognized approach within national economic analyses. Utilizing the latest available national input-output data from the U.S. Bureau of Economic Analysis (BEA, 2023), this model identifies and quantifies how expenditures associated with Wi-Fi technologies ripple through various economic sectors.

Our methodology captures direct job creation within Wi-Fi-specific sectors in the U.S., indirect employment growth within supplier and ancillary industries, and induced employment stemming from increased economic activity due to higher consumer spending. The methodology starts by examining each of the use cases and application areas studied in our prior report, and allocates the economic effect across sectors depending on each case. For example, a portion of consumer benefit resulting from saving household data expenditures by relying on Wi-Fi at home is assumed to be spent across sectors, by relying on BEA data of personal consumption expenditures.

Direct and indirect employment creation is then calculated by adding the Gross Value Added (GVA) or Output generated by each sector, as estimated from the step above, and calculating the impact on jobs by relying on data from the Bureau of Labor Statistics that provides the ratio of GVA by employee for each economic sector.[4]

Direct employment refers to those jobs attributable to the economic value of Wi-Fi identified in our 2024 study that are directly stimulated by the economic value created by Wi-Fi technology as deployed across the economy. By quantifying these jobs, the analysis provides a precise understanding of Wi-Fi technology's direct contribution to labor market expansion.

Indirect employment effects are derived from upstream sectors supplying critical inputs for the direct economic value created by Wi-Fi technology across the economy. Businesses engaged in manufacturing components, logistics provision, and offering technical services benefit significantly from increased demand driven by Wi-Fi deployment. These secondary effects demonstrate how investments in Wi-Fi extend employment benefits well beyond

[3] For a detailed explanation of methodology please see Methodological Framework in the Appendix.
[4] The Bureau of Labor Statistics provides data on jobs per industrial sector; this data is matched with sector data from the Bureau of Economic Analysis.

the immediate technological domain into broader supply chain networks.

Once direct and indirect jobs are estimated, we calculate their induced effects by relying on employee compensation by sector as provided by the BEA. In all cases, spending was assumed to reflect 50% of compensation[5]. The induced employment effects further amplify the employment landscape. As direct and indirect employees spend their earnings, additional economic activity emerges across various sectors, such as retail, hospitality, healthcare, and real estate. These induced effects underscore the wide-ranging employment impact that originates from the initial economic stimuli provided by Wi-Fi technology deployments.

The deployment of new generations of Wi-Fi devices and the opening of additional spectrum bands to unlicensed use results in capacity enhancements as well as the introduction of new and more powerful features. This influences the respective capacities for job creation by each additional spectrum band allocated to unlicensed use and by the use of such frequencies by successive generations of Wi-Fi devices.

Therefore, to ensure a nuanced understanding of the job creation, our analysis disaggregates employment impacts according to distinct spectrum bands: the original Wi-Fi bands (2.4 GHz and 5 GHz), the 6 GHz band which was allocated for unlicensed use five years ago, and the potential allocation of additional spectrum in the 7 GHz band. We also largely tie generations of Wi-Fi standards to spectrum allocations: Wi-Fi 6 and its predecessor versions to the 2.4 GHz and 5 GHz bands; Wi-Fi 6E and Wi-Fi 7 to 6 GHz; and the potential use of Wi-Fi 7 in the 7 GHz band. This framework does not take into account the fact that Wi-Fi 6E and Wi-Fi 7 still operate in the 2.4 and 5 GHz bands, potentially ignoring additional job effects resulting from use of these frequencies by advanced Wi-Fi devices. However, this categorization allows us to more precisely evaluate how additional spectrum resources can distinctly drive employment generation.

By integrating GDP, consumer benefit, and producer surplus metrics from our prior research we can deliver a robust assessment of Wi-Fi's role as a catalyst for job creation. The detailed examination of direct, indirect, and induced employment impacts across different Wi-Fi standards equips policymakers and stakeholders with precise insights essential for strategic decision-making aimed at maximizing employment outcomes through effective spectrum allocation and technology deployment strategies.

[5] Based on Bivens (2019). “Updated employment multipliers for the U.S. economy”

3. OVERALL EMPLOYMENT GENERATION

The values shown in Table 3-1 indicate the cumulative direct, indirect and induced employment figures attributable to Wi-Fi investments and operations from 2023 to 2027, the period examined in our previous study. Over this period, there is a steady expansion of the workforce related to Wi-Fi technologies culminating in an estimated 13.59 million jobs in 2027.

Table 3-1. United States: Total Employment Supported by Wi-Fi (2023-2027)

Effect	2023	2024	2025	2026	2027
Direct	3,907,973	4,845,333	5,755,844	6,529,805	7,536,475
Indirect	1,550,487	1,911,519	2,270,792	2,574,747	2,958,643
Induced	1,624,907	2,002,475	2,375,756	2,693,632	3,096,498
TOTAL	**7,083,366**	**8,759,328**	**10,402,392**	**11,798,184**	**13,591,616**

Source: Telecom Advisory Services analysis based on United States I-O Matrix based on BEA and BLS data.

Direct employment is projected to grow from approximately 3.91 million in 2023 to about 7.54 million by 2027. Beyond the direct contribution, indirect employment is expected to exhibit a parallel trend of expansion. This growth—from roughly 1.55 million in 2023 to approximately 2.96 million in 2027—demonstrates the significance of the upstream supply chain in supporting Wi-Fi-related activities. Meanwhile, induced employment is forecast to rise from 1.62 million to around 3.10 million within the same time frame, underscoring the broader economic impact flowing from increased consumer spending by workers in both direct and indirect industries.

To illustrate the sustained employment impacts of Wi-Fi technologies beyond our original forecast horizon, we extended the analysis to cover the period 2028 to 2032. The extended forecast provides a clear view of the long-term employment potential of Wi-Fi in the United States (see Table 3-2).[6]

Table 3-2. United States: Total Employment Supported by Wi-Fi (2028-2032)[7]

Effect	2028	2029	2030	2031	2032
Direct	8,530,273	9,437,230	10,234,619	10,961,245	11,626,832
Indirect	3,345,161	3,701,418	4,019,037	4,311,816	4,583,311
Induced	3,500,776	3,872,163	4,201,834	4,504,732	4,784,852
TOTAL	**15,376,210**	**17,010,811**	**18,455,489**	**19,777,793**	**20,994,995**

NOTE: Employment projections for 2028-2032 were calculated based on the growth trends by Wi-Fi spectrum bands presented in the period 2023-2027 (for more details, see chapter 4).
Source: Telecom Advisory Services analysis

The extended analysis underscores Wi-Fi's continued role as a significant driver of employment well into the future. By 2032, cumulative employment related to Wi-Fi technologies is projected to reach approximately 20.99 million jobs, nearly tripling the initial 2023 figure.

[6] Our estimate does not account for future generations of Wi-Fi, such as Wi-Fi 8, and any potential employment impact that would be associated with such devices over the next decade.
[7] If the employment analysis is extended through 2035, the projected impacts would be as follows: Direct employment: 13,433,165; Indirect employment: 5,333,688; Induced employment: 5,556,823; for a total of 24,323,676 jobs.

4. JOB CREATION BY WI-FI STANDARD

In this section we refine the previous analysis by examining how Wi-Fi job creation differs according to distinct spectrum bands—specifically, the baseline bands below 6 GHz, the 6 GHz band, and the potential for additional job creation if new frequencies in the 7 GHz band are opened to support Wi-Fi devices. We also consider how the introduction of new Wi-Fi standards affects the pattern of job growth over time. Recognizing that each allocation of spectrum leads to the support of devices with different technical capabilities, adoption dynamics, and market trajectories, this disaggregated approach elucidates how variations in spectrum availability influence the degree of economic impact generated. By isolating employment effects according to spectrum bands, policymakers and industry stakeholders can more precisely assess the labor market implications associated with current and potential future allocations of unlicensed spectrum.

While the baseline bands (2.4 GHz and 5 GHz) continue to provide foundational connectivity supporting steady economic activity, newer allocations in the 6 GHz and 7 GHz bands enable advanced Wi-Fi technologies—such as Wi-Fi 6E and Wi-Fi 7—to leverage wider channels and higher throughput, potentially triggering additional downstream economic benefits. This granular analysis thus sheds light on how transitions toward broader spectrum allocations influence supply chain dynamics, consumer demand, and broader economic spillovers across the digital ecosystem.

The following section proceeds with a detailed discussion of employment contributions associated with each identified spectrum band. Separate subsections provide comprehensive data on total employment generated annually from 2023 to 2032, maintaining consistency with the analytical framework presented in the overall assessment.

4.1. Wi-Fi 6 and Predecessor Versions Used in the 2.4 GHz and 5 GHz Bands

Wi-Fi 6 and predecessor versions represent a core segment of the marketplace, serving as the foundational standard for wireless connectivity across numerous devices and applications. While ongoing advances in next-generation Wi-Fi standards capture much of the industry's attention, Wi-Fi 6 and predecessor versions, which operate in the 2.4 GHz and 5 GHz bands, continue to account for a significant portion of total connectivity in the U.S. Cumulative employment attributable to these legacy and current-generation standards is projected to rise over the period from 2023 to 2027, reflecting both sustained consumer demand and continued reliance on established infrastructure (See table 4-1).

Table 4-1. United States: Total Employment Supported by Wi-Fi 6 and Predecessor Versions in the 2.4 GHz and 5 GHz Bands (2023-2027)

Effect	2023	2024	2025	2026	2027
Direct	2,768,731	2,771,432	2,816,650	2,847,319	2,897,621
Indirect	1,129,858	1,154,167	1,199,926	1,234,011	1,271,415
Induced	1,180,600	1,198,649	1,237,485	1,267,039	1,301,058
TOTAL	**5,079,188**	**5,124,247**	**5,254,061**	**5,348,369**	**5,470,094**

Source: Telecom Advisory Services analysis based on United States I-O Matrix based on BEA and BLS data.

Total employment generated by Wi-Fi 6 and predecessor versions in the 2.4 and 5 GHz bands in 2023 stands at approximately 5.08 million jobs, rising to nearly 5.47 million jobs by 2027. This figure encompasses direct, indirect, and induced employment impacts, with direct employment contributing more than half of the total jobs supported by these Wi-Fi technologies.

To provide additional insight into the long-term employment impacts associated with Wi-Fi 6 and its predecessors in the 2.4 and 5 GHz bands, we extended our projections to cover the period from 2028 to 2032. This extended analysis builds upon observed employment growth trends specifically within the 2.4 GHz and 5 GHz bands between 2023 and 2027, capturing the ongoing steady expansion driven by continued consumer demand, infrastructure maintenance, and incremental network enhancements (see Table 4-2).

Table 4-2. United States: Total Employment Generation of Wi-Fi 6 and Predecessor Versions (2.4 GHz and 5 GHz) (2028-2032)[8]

Effect	2028	2029	2030	2031	2032
Direct	2,930,770	2,964,299	2,998,211	3,032,511	3,067,204
Indirect	1,309,493	1,348,712	1,389,105	1,430,708	1,473,556
Induced	1,333,045	1,365,820	1,399,400	1,433,806	1,469,057
TOTAL	**5,573,309**	**5,678,830**	**5,786,716**	**5,897,025**	**6,009,818**

NOTE: Employment projections for 2028-2032 were calculated by applying the employment growth rate observed within the 2.4 GHz and 5 GHz bands during the 2023-2027 period.
Source: Telecom Advisory Services analysis

The extended forecast highlights the enduring relevance of Wi-Fi 6 and predecessor versions in supporting employment in the 2.4 and 5 GHz bands, with total jobs projected to reach approximately 6.01 million by 2032. This persistent growth reflects the standard's established role as foundational wireless connectivity infrastructure, underscoring its importance in strategic considerations for spectrum allocation policies and sustained investments in network upgrades and maintenance.

4.2. Wi-Fi 6E and Wi-Fi 7 Operating in the 6 GHz Band

The deployment of Wi-Fi 6E and Wi-Fi 7 technologies, which can operate in the 6 GHz spectrum band as well as the 2.4 GHz and 5 GHz bands, represents a substantial evolution from earlier standards, primarily due to the availability of wider channels,

[8] Extending this analysis to 2035, projected employment impacts for Wi-Fi 6 or lower (2.4 GHz and 5 GHz) are as follows: Direct employment: 3,173,681; Indirect employment: 1,609,958; Induced employment: 1,580,098; totaling 6,363,737 jobs.

increased capacity, and lower latency. These improvements facilitate significantly greater economic activity and stimulate accelerated employment growth relative to the legacy standards. The cumulative employment attributable to these advanced Wi-Fi technologies in the 6 GHz band is projected to rise sharply over the period from 2023 to 2027, reflecting rapid infrastructure deployment and growing consumer and enterprise adoption (See Table 4-3).

Table 4-3. United States: Total Employment Supported by Wi-Fi 6E and Wi-Fi 7 Operating in the 6 GHz Band (2023-2027)

Effect	2023	2024	2025	2026	2027
Direct	1,139,242	2,073,902	2,906,905	3,606,420	4,466,834
Indirect	420,629	757,352	1,058,909	1,312,672	1,624,205
Induced	444,307	803,827	1,125,157	1,395,883	1,726,903
TOTAL	**2,004,177**	**3,635,081**	**5,090,971**	**6,314,975**	**7,817,942**

Source: Telecom Advisory Services analysis based on United States I-O Matrix based on BEA and BLS data.

In 2023, the total employment attributable to Wi-Fi 6E and Wi-Fi 7 operating within the 6 GHz band is approximately 2.0 million jobs. By 2027, direct employment, driven primarily by infrastructure deployment, equipment manufacturing, and network management, is projected to expand to nearly 4.47 million jobs. Indirect employment, linked to increased demand for supply chain inputs and supporting services, will reach more than 1.62 million jobs by 2027 and induced employment, driven by broader economic spending by direct and indirect employees, reaches approximately 1.73 million jobs in 2027. Collectively, these impacts reach nearly 7.82 million total jobs by 2027.

To evaluate the longer-term employment implications of Wi-Fi 6E and Wi-Fi 7 technologies operating in the 6 GHz band, our projections have been extended through 2032. (see Table 4-4).

Table 4-4. United States: Total Employment Supported by Wi-Fi 6E and Wi-Fi 7 Operating in the 6 GHz Band (2028-2032)[9]

Effect	2028	2029	2030	2031	2032
Direct	5,286,354	6,034,003	6,691,856	7,254,264	7,724,245
Indirect	1,922,194	2,194,050	2,433,255	2,637,755	2,808,647
Induced	2,043,734	2,332,780	2,587,109	2,804,540	2,986,237
TOTAL	**9,252,283**	**10,560,833**	**11,712,220**	**12,696,558**	**13,519,128**

NOTE: Employment projections for the 2028-2032 period were estimated applying a decreasing growth rate, consistent with the pattern observed between 2023 and 2027.
Source: Telecom Advisory Services analysis

It is clear from this extended forecast that there are substantial and sustained employment contributions associated with the continued rollout and adoption of Wi-Fi 6E and Wi-Fi 7 in the 6 GHz spectrum band, projecting to over 13.5 million total jobs by 2032. This long-term growth trajectory underlines the strategic economic value of ongoing spectrum policy support, ensuring that sufficient

[9] When extending the analysis to 2035, projected employment impacts for Wi-Fi 6E and Wi-Fi 7 (6 GHz) are as follows: Direct employment: 8,672,193; Indirect employment: 3,153,334; Induced employment: 3,352,719; totaling 15,178,246 jobs.

unlicensed spectrum remains available to sustain technological innovation and employment expansion across the broader digital economy.

4.3. Wi-Fi 7 Operating in 500 Megahertz of the 7 GHz Band

If 500 megahertz of spectrum in the lower 7 GHz band were allocated for unlicensed commercial use, employment attributable to Wi-Fi 7 could expand notably from 2025 onwards, driven by incremental infrastructure investments, equipment development, and increasing market penetration (See Table 4-5).[10]

Table 4-5. United States: Total Employment Supported by Wi-Fi 7 Operating in 500 Megahertz of the 7 GHz Band (2023-2027)

Effect	2023	2024	2025	2026	2027
Direct	0	0	32,289	76,066	172,020
Indirect	0	0	11,956	28,064	63,022
Induced	0	0	13,115	30,710	68,537
TOTAL	**0**	**0**	**57,360**	**134,841**	**303,580**

Source: Telecom Advisory Services analysis based on United States I-O Matrix based on BEA and BLS data.

From 2025 onwards when measuring the potential job impacts of 500 megahertz of additional spectrum in 7 GHz being available for unlicensed use, direct employment—primarily involving infrastructure deployment and related equipment manufacturing—starts to increase steadily, reaching approximately 172,000 jobs by 2027. Indirect employment, emerging from expanded upstream supply chains and related services, grows correspondingly, reaching approximately 63,000 jobs by 2027. Induced employment, reflecting additional economic activity due to increased spending by direct and indirect employees, similarly increases, surpassing 68,000 jobs by the end of the projection period. Overall, these effects result in nearly 304,000 total jobs attributed to Wi-Fi 7 within the 7 GHz spectrum band by 2027, a 430 percent increase since 2025.

As with the other spectrum bands, we extended our projections to cover the period from 2028 to 2032. These estimates, generated through a conservative approach, apply the growth rates observed for the more established 6 GHz band during the 2023-2027 period. (see Table 4-6). However, given the early stage of adoption in the 7 GHz band and the anticipated rapid expansion of use cases, actual employment impacts are likely to exceed these conservative projections substantially.[11]

[10] Given that Wi-Fi 6E and already deployed Wi-Fi 7 devices can be retuned to operate in the 7 GHz band, it is possible we are being conservative in our estimates of the job effects of making the lower portion of the 7 GHz band available for unlicensed use.
[11] The introduction of Wi-Fi 8 devices, with its additional features, during this time period might also lead to more rapid or more extensive employment growth than is reflected here.

Table 4-6. United States: Total Employment Supported by Wi-Fi 7 in the 7 GHz Band (2028-2032)[12]

Effect	2028	2029	2030	2031	2032
Direct	313,149	438,928	544,551	674,470	835,384
Indirect	113,473	158,655	196,677	243,353	301,108
Induced	123,996	173,563	215,325	266,387	329,558
TOTAL	**550,618**	**771,147**	**956,553**	**1,184,210**	**1,466,049**

NOTE: Employment projections for 2028-2032 were conservatively estimated based on the employment growth rate observed within the 6 GHz spectrum band from 2023 to 2027. However, given the initial growth trajectory specifically observed for the 7 GHz band and the expected increase in use-case diversity over the coming years, the actual impact is likely substantially greater.
Source: Telecom Advisory Services analysis

The extended forecast emphasizes the significant long-term employment potential of allocating spectrum within the 7 GHz band for Wi-Fi 7. By 2032, annual cumulative incremental employment related to the use of Wi-Fi 7 devices in the 7 GHz band *alone* is projected to surpass 1.46 million jobs. This growth trajectory underscores the strategic economic importance of proactively designating unlicensed spectrum to facilitate innovation, infrastructure expansion, and broader marketplace adoption of emerging Wi-Fi standards.

4.4. Future spectrum allocations and employment growth

Future spectrum allocations for Wi-Fi represent a substantial opportunity to generate additional employment growth in the United States. Historically, each incremental allocation of unlicensed spectrum for Wi-Fi has consistently translated into substantial increases in employment across direct, indirect, and induced channels, driven by infrastructure investment, device proliferation, and expanded use case scenarios. For example, the allocation of the 6 GHz band significantly accelerated employment growth due to increased capacity, broader adoption, and substantial infrastructure deployment.

Building upon this historical precedent, it is reasonable to anticipate that future allocations of unlicensed spectrum will yield comparable, if not greater, employment impacts. Recent market studies, such as the ABI Research report (2024), further underline this trend, projecting that demand for Wi-Fi services will continue to accelerate sharply over the next decade, driven by new consumer applications, enterprise solutions, and industry-specific innovations requiring advanced wireless connectivity standards. This rising demand underscores the importance of proactive spectrum management to accommodate emerging technological needs.

Given these insights, policymakers should view additional unlicensed spectrum allocations as strategic investments in sustained economic growth. As the experience with Wi-Fi 6E and Wi-Fi 7 in the 6 GHz band clearly demonstrates, each new generation of Wi-Fi standards enables a diverse range of innovative applications—including advanced augmented reality (AR), virtual reality (VR),

[12] Extending the projections through 2035, the anticipated employment impacts for Wi-Fi 7 (7 GHz) are as follows: Direct employment: 1,587,291; Indirect employment: 570,396; Induced employment: 624,006; totaling 2,781,693 jobs.

gaming, and industrial automation—that collectively drive job creation well beyond initial deployment phases. Consequently, continued investment in expanding available unlicensed spectrum can be expected to amplify employment generation and foster significant long-term economic and social benefits.

5. COMPARISON OF CURRENT STUDY WITH ALTERNATIVE SPECTRUM ALLOCATIONS

Spectrum allocation decisions play a critical role in shaping economic outcomes, particularly regarding job creation. Our study's findings demonstrate robust and sustained employment generation resulting from allocating mid-band spectrum to Wi-Fi technologies, notably Wi-Fi 6E and Wi-Fi 7 operating in the 6 GHz and 7 GHz bands. In comparison, employment estimates for allocating similar mid-band spectrum to licensed mobile services, as presented by NERA Economic Consulting (2025), suggest significantly lower and less sustained job impacts.

Specifically, our analysis indicates that allocating 500 megahertz of additional spectrum within the emerging 7 GHz band is projected to generate approximately 1.47 million additional jobs by 2032, with rapid growth likely to continue beyond this point.

In contrast, the NERA study estimates that allocating an additional 400 megahertz of mid-band spectrum to licensed mobile services is projected to generate 407,000 jobs by 2032. (see table 5-1). This estimate also appears to assume the immediate availability of licensed spectrum, which may not be practically possible in situations where incumbent relocation is required to support licensed use. This direct comparison underscores that Wi-Fi spectrum allocations generate higher overall job creation (3.6 times more jobs in 2032).

Table 5-1. United States: Total Employment Generation of mid band spectrum allocated for Mobile (400 Megahertz) (2025-2032)

Effect	2025	2026	2027	2028	2029	2030	2031	2032
Improving broadband with FWA[13]	96,300	190,000	187,200	164,100	141,500	119,600	98,200	77,400
Supporting industries that rely on mobile connectivity[14]	231,250	231,250	231,250	231,250	231,250	231,250	231,250	231,250
Supporting industries (CAPEX)[15]	40,518	40,518	40,518	40,518	40,518	40,518	40,518	0
Supporting industries (OPEX)[16]	98,152	98,152	98,152	98,152	98,152	98,152	98,152	98,152
TOTAL	**466,220**	**559,920**	**557,120**	**534,020**	**511,420**	**489,520**	**468,120**	**406,802**

Source: NERA Economic Consulting. (2025). *The economic impact of allocating mid-band spectrum to mobile.* Prepared for CTIA.

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13 Source: NERA Economic Consulting. (2025) – Table 9

14 According to the NERA Economic Consulting (2025) study—specifically Table 12—the estimated total employment impact associated with industries relying on mobile connectivity amounts to approximately 3.7 million job-years. Since these results come from an input-output framework, this figure reflects cumulative annual employment across the entire 16-year analysis period. Dividing the total impact of 3.7 million job-years evenly across 16 years yields approximately 231,250 jobs per year. Thus, rather than indicating a continuous expansion of new employment positions, this result represents 231,250 sustained annual jobs supported consistently throughout the 16-year timeframe.

15 According to the NERA Economic Consulting (2025) study—specifically Table 17—the employment impact associated with capital expenditures (CAPEX) totals 283,626 job-years over a 7-year deployment period. This figure translates into approximately 40,518 sustained annual jobs across these 7 years. Similar to the previous case, this indicates ongoing employment supported annually rather than new cumulative job creation each year.

16 Based on the NERA Economic Consulting (2025) study—specifically Table 17—OPEX employment impact is estimated at 981,520 job-years over a 10-year operational period. Using the most optimistic assumption, this results in approximately 98,152 sustained annual jobs throughout these 10 years. As in the previous cases, this number represents ongoing annual employment rather than cumulative annual increments. This approach differs from the 20-year assumption utilized in NERA's original table, reflecting a more favorable short-term employment scenario.

In summary, our study finds that allocating mid-band spectrum for unlicensed Wi-Fi technologies provides significantly greater and more enduring employment benefits compared to licensed mobile allocations. Policymakers should consider these long-term economic advantages when making strategic decisions about spectrum management to maximize employment generation and economic welfare.

6. CONCLUSIONS AND POLICY IMPLICATIONS

The findings presented in this report underscore the substantial employment-generating potential associated with allocating spectrum bands for Wi-Fi technologies in the United States, highlighting their critical role in bolstering the nation's economic landscape from 2023 to 2032. Our results illustrate robust and sustained employment growth stemming from the traditional Wi-Fi bands (2.4 GHz and 5 GHz), accelerated expansion in the newly allocated 6 GHz band, and notable substantial future employment gains anticipated from the potential allocation of 500 megahertz of the 7 GHz band for unlicensed use. The latter emerges clearly as a critical driver of future labor market expansion, emphasizing the importance of proactive spectrum allocation policies to maximize economic benefits.

Total employment generated by Wi-Fi 6 and predecessor versions in the 2.4 and 5 GHz bands in 2023 stands at approximately 5.08 million jobs, rising to nearly 5.47 million jobs by 2027. Employment attributable to Wi-Fi 6E and Wi-Fi 7 operating within the 6 GHz band is particularly robust, with total employment reaching approximately 7.82 million by 2027 and growing steadily thereafter, exceeding 13.5 million jobs by 2032. The potential allocation of 500 megahertz of the 7 GHz band for Wi-Fi 7 supports approximately 57,360 total jobs in 2025 and its potential expands rapidly to nearly 304,000 jobs by 2027, reaching approximately 1.47 million jobs by 2032. The combined impact of allocating the 6 GHz and 500 megahertz of the 7 GHz bands to Wi-Fi underscores the strategic economic advantage of prioritizing unlicensed spectrum allocations, providing both immediate and long-term employment benefits substantially greater than those derived from exclusively licensed mobile spectrum.

The comparative analysis between spectrum allocations for Wi-Fi technologies and those designated for exclusively licensed mobile services highlights significant differences in employment impacts. Specifically, Wi-Fi spectrum allocations not only generate higher overall job creation (3.6 times more jobs in 2032) but also offer sustained employment growth.

Wi-Fi technologies generate a sustained demand for skilled and semi-skilled labor across diverse geographic and economic contexts. Investments in Wi-Fi technology resonate throughout the supply chain, stimulating upstream industries such as equipment manufacturing, logistics, and technical support services. Concurrently, induced employment benefits materialize as increased earnings within Wi-Fi-related sectors translate into broader economic consumption, benefiting sectors like retail, hospitality, and personal services.

From a policy perspective, these findings underscore the necessity of balanced and informed spectrum management strategies. Policymakers must carefully weigh the employment implications of spectrum allocation decisions, recognizing that unlicensed spectrum allocations for Wi-Fi technologies have substantial advantages over licensed allocations for mobile services in terms of employment generation.

In conclusion, the employment impacts associated with Wi-Fi technologies represent a compelling case for policy prioritization of unlicensed spectrum allocations. The distinct employment advantages identified in this report highlight Wi-Fi's role as a powerful tool for economic stimulation, technological innovation, and inclusive growth. Strategic spectrum allocation, combined with proactive policy support for Wi-Fi technology deployment and workforce development, will be critical in harnessing the full economic and social potential of Wi-Fi in the United States.

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APPENDIX: METHODOLOGICAL FRAMEWORK

A. Introduction

This appendix provides a detailed, extended description of the methodological framework employed to quantify the employment impacts resulting from Wi-Fi technology deployment in the United States. Its primary objective is to translate the previously documented contributions of Wi-Fi to GDP, consumer benefit, and producer surplus[17] into measurable employment outcomes. By relying on input-output tables, this framework estimates direct, indirect, and induced employment effects, offering a comprehensive analysis of Wi-Fi's capacity to generate jobs.

Our previous research provided baseline estimations of Wi-Fi's contributions to GDP, consumer benefit, and producer surplus (See Table A). The current approach utilizes these foundational estimates to assess how such economic contributions translate into specific employment opportunities within various sectors.

Table A. Total Economic Value of Wi-Fi (in nominal $ billion)

	2023	2024	2025	2026	2027
Consumer benefit	$ 339	$ 392	$ 444	$ 483	$ 514
Producer surplus	$ 382	$ 441	$ 510	$ 570	$ 624
GDP	$ 592	$ 769	$ 935	$ 1,078	$ 1,286
Total	$ 1,314	$ 1,602	$ 1,889	$ 2,131	$ 2,424

Source: "Assessing the Economic Value of Wi-Fi in the United States", Katz et al., 2024.

Employment outcomes are quantified by our estimates of the economic contributions of distinct Wi-Fi-related use cases and applications. This enables the measurement of direct job creation, as well as indirect employment in sectors benefiting from the increased demand for goods and services as a result of Wi-Fi's direct economic contributions. Additionally, induced employment effects, resulting from higher consumer spending by workers directly and indirectly employed in Wi-Fi-related sectors, are estimated.

Furthermore, employment impacts are disaggregated by Wi-Fi spectrum bands: the traditional 2.4 GHz and 5 GHz bands, the recently allocated 6 GHz band, and the anticipated 7 GHz band. By accounting for the distinct characteristics, adoption rates, and associated economic activities of each spectrum band, the methodology provides a detailed analysis of how employment patterns vary across them.

B. Data Sources

To accurately assess the economic impact of Wi-Fi across the broader economy, we employ the most recent U.S. input-output tables published by the Bureau of Economic Analysis (BEA, 2023). These tables provide detailed representations of economic interactions, explicitly showing how the output from one industry becomes an essential input for another. By leveraging these input-output relationships, our study systematically captures the economic effects associated

[17] Katz, R., Jung, J., Callorda, F., & Valencia, A. (2024). *Assessing the economic value of Wi-Fi in the United States*. Telecom Advisory Services LLC. Commissioned by WiFi Forward.

with Wi-Fi and their subsequent consequences across interconnected supply chains, industry clusters, and various economic sectors, thereby offering a comprehensive understanding of Wi-Fi's extensive economic influence by sector.

We then use detailed labor market data provided by the U.S. Bureau of Labor Statistics (BLS, 2023) which includes employment figures across various economic sectors that can be matched with the information obtained from the BEA input-output tables to estimate average Gross Value Added per employee and compensation per employee by sector. Such comprehensive labor market data enables a direct link between changes in economic output and corresponding employment impacts, facilitating accurate estimation of direct, indirect, and induced employment effects. Additionally, the availability of detailed compensation data allows for the evaluation of how income fluctuations translate into increased consumer spending, driving further economic activity (induced effects).

Additionally, household-level consumption data from the BEA provides important insights into consumer spending patterns. This information is crucial for translating consumer benefit—such as cost savings resulting from reduced data expenditures due to Wi-Fi usage—into induced employment. Furthermore, the BEA data includes detailed aggregate-level information on investment by industrial sector. This additional data allows a precise evaluation of how Wi-Fi-related economic impacts propagate through sector-specific investment activities.

C. Methodological Steps

The methodology outlined here builds upon prior economic impact estimates provided by the report *Assessing the Economic Value of Wi-Fi in the United States* (Katz et al., 2024). This earlier research established comprehensive baseline estimations of Wi-Fi's contributions to GDP, consumer benefits, and producer surplus. In this study, we aim to translate these previously determined economic impacts into measurable employment outcomes across the U.S. economy.

To achieve accurate sectoral allocation of these economic effects, the analysis employs the detailed sector classifications provided by BEA, 2023, specifically through its Input-Output framework. These BEA tables comprehensively segment the United States economy into clearly defined industrial sectors, capturing intricate economic relationships and inter-sectoral dependencies. The sectoral allocation step is critical to precisely trace the pathways through which Wi-Fi-related economic benefits are distributed, thereby stimulating diverse industrial activities.

The industrial sectors utilized in this analysis correspond directly to those delineated by the U.S. Bureau of Economic Analysis (BEA, 2023). For the complete list of sectors and detailed classifications, please refer directly to the BEA Input-Output tables. By explicitly mapping each Wi-Fi-related economic contribution to these detailed BEA-defined sectors, the analysis establishes a robust and transparent basis for subsequent Input-Output modeling. This precise sectoral classification enables the model to comprehensively capture the economic ripple effects resulting from Wi-Fi technology, ensuring an accurate representation of the complex economic relationships within the U.S. economy. Consumer benefits, such as cost savings from reduced cellular data expenses, are thus allocated to these sectors following observed household spending patterns from BEA's Personal Consumption Expenditures (PCE) data. Producer surplus and GDP contributions from Wi-Fi are similarly mapped according to documented business investment behaviors within the BEA Input-Output framework. This systematic sectoral allocation forms the analytical foundation required to accurately quantify the employment and broader economic impacts attributable to Wi-Fi technologies.

Before examining each effect, it is crucial to clarify how the distribution of Wi-Fi's contributions across sectors is determined. In some cases, consumer benefits are reallocated based on Personal Consumption Expenditures (PCE) data from the BEA, which reflect how households typically distribute their spending among various goods and services. In other instances, the analysis uses a combination of PCE and Fixed Investment data to approximate where newly available funds (whether from cost savings or productivity gains) are invested. Meanwhile, certain producer surplus effects are assigned directly to a specific sector, such as "Broadcasting and telecommunications," "Computer and Electronic Products," or "Motor Vehicles, Bodies and Trailers, and Parts," depending on the origin of the revenue.

The first identified effect, "Benefit to Consumers of Free Wi-Fi Traffic Offered in Public Sites," previously estimated in Katz et al. (2024), underscores how free public Wi-Fi effectively relieves users of data costs, thereby increasing disposable income. Since these savings are assumed to be re-spent across various goods and services, the distribution is guided by PCE data. In practical terms, consumers might use the money they save on cellular data for retail purchases, dining, entertainment, or other personal needs. Given a conservative assumption that only 50% of these theoretical savings lead to actual re-spending, the net injection into consumer outlays still produces a notable demand stimulus, fostering job creation across numerous sectors, as identified in BEA consumption tables.

The second effect, "Deployment of Free Wi-Fi in Public Sites," affects GDP, encompassing direct, indirect, and induced effects in terms of Gross Value Added (GVA). To quantify the corresponding employment impacts, the analysis translates this GDP value into the total output required to generate such GVA. The distribution across industrial sectors relies on combined Personal Consumption Expenditures and Fixed Investment data, reflecting the dual nature of this economic effect—part stemming from infrastructure investment expenditures, and part resulting from increased economic activity due to consumer benefits accruing to new Wi-Fi users.

The third effect, "Benefit to Consumers of Faster Free Wi-Fi Under Wi-Fi 6E & Above," highlights incremental consumer surplus that arises from enhanced speed and capacity. Nonetheless, a conservative assumption of 0% re-spending is employed in this specific case, reflecting the view that certain faster-speed advantages may be implicitly capitalized rather than translated into immediate additional consumption.

The fourth effect, "Use of Wi-Fi in Educational Institutions," stems from the cost advantage of Wi-Fi over mobile broadband, particularly in large-scale deployments across schools and universities. These savings, once realized, free up budgets that can be repurposed. To reflect this, the distribution of the cost savings is guided by PCE data, aligning with the premise that freed funds eventually re-enter the economy through consumer-like spending on goods and services. A 50% re-spending assumption is applied here, being conservative.

The fifth effect, "Use in Highly Dense Heterogeneous Environments," applies to settings like stadiums, convention centers, and airports, where free Wi-Fi can reduce the expense of cellular usage for large crowds. This yields notable consumer benefit because users pay less to maintain connectivity. In turn, those savings—again dictated by PCE—are spent across the broader consumer goods spectrum. With a 50% re-spending assumption, the direct improvements in connectivity ripple out as incremental demand for diverse products and services, as indicated in the relevant BEA consumption categories.

The sixth effect, "Internet Access for Home Usage of Devices That Lack a Wired Port," focuses on households using Wi-Fi as the primary connectivity solution for modern devices. Consumers benefits are allocated according to PCE categories, with 50% assumed to be effectively re-spent. Consequently, while the direct impetus is technology-based, the ultimate beneficiaries span multiple consumer-facing sectors, from groceries to apparel, as documented in the BEA data.

The seventh effect, "Avoidance of Investment in In-House Wiring," closely parallels the previous case. Homes that opt for Wi-Fi over expensive wiring can devote those saved funds to other projects or consumption. PCE distribution is again relevant here. The 50% re-spending assumption, consistently employed for many consumer benefits, ensures the final multiplier effect is kept within conservative bounds.

The eighth effect, "Benefit to Consumers from Speed Increases," captures the enhanced consumer experience resulting from faster Wi-Fi speeds at home, which facilitate better streaming quality, improved gaming, and increased efficiency for teleworking. However, we adopt a conservative stance and assume a 0% re-spending rate. This reflects the cautious position that the perceived economic value from increased Wi-Fi speed may not necessarily translate into measurable new consumer expenditures. Consequently, no sector-specific employment impacts are derived from this particular effect.

The ninth effect, "Residential Wi-Fi Devices & Equipment" is also associated with consumer surplus. The net benefit (or incremental surplus) from such purchases is distributed according to PCE. This recognizes that while consumers pay for the devices, the overall savings gained (e.g., improved connectivity) may, in part, be re-spent on other goods. Still, the distribution logic must be tempered by the 50% re-spending assumption for a conservative estimate of the broader economic push.

The tenth effect, "Closing the Digital Divide: Use of Wi-Fi to Increase Coverage in Rural & Isolated Areas," was previously quantified as a direct GDP contribution by Katz et al. (2024), encompassing direct, indirect, and induced effects in terms of Gross Value Added. To determine the resulting employment impacts, this GDP contribution is translated into the corresponding total output necessary to achieve the observed GVA, utilizing sector-specific output-to-GVA ratios from the BEA Input-

Output framework. The allocation of this total output across industrial sectors combines Personal Consumption Expenditures and Fixed Investment distributions, as the economic effect arises from both infrastructure investments and increased household economic activity enabled by improved connectivity in previously underserved areas.

The eleventh effect, “Increasing Vehicular Use of Wi-Fi,” results in cost savings for consumers. The distribution relies on PCE data because the impetus is once again consumer savings. By employing a 50% re-spending assumption, the analysis underscores that while travelers may shift some portion of their budgets to other consumables, not all saved resources necessarily re-enter circulation as additional consumption.

The twelfth effect, “Business Internet Traffic Transmitted through Wi-Fi,” alters the distribution approach. It focuses on producer surplus, with businesses lowering operating expenses by substituting cellular traffic for Wi-Fi. This reduced expenditure is then partly reinvested, guided by the distribution of Fixed Investment from BEA data. The assumption is that around 63% of these savings are reinvested, reflecting the 2023 relationship between corporate profits and non-residential fixed investment in the United States.

The thirteenth effect, “Avoidance of Enterprise Inside Wiring Costs,” allows firms to turn avoided costs from Ethernet cabling into either immediate profit or funds available for strategic investments. As with the previous effect, a 63% reinvestment rate is used, capturing the partial conversion of saved resources into new capital deployment.

The fourteenth effect, "Return to Speed: Contribution to GDP," and the fifteenth effect, "Return to Speed: Contribution to GDP Derived from a Reduction in Average Latency," encompass direct, indirect, and induced economic contributions measured in terms of Gross Value Added. To derive employment outcomes from this GDP impact, the analysis translates the estimated GDP into the total economic output necessary to generate this level of GVA, using the sector-specific relationships provided in the BEA Input-Output tables. The allocation of the corresponding output across industrial sectors integrates both Personal Consumption Expenditures and Fixed Investment distributions, given that productivity gains from improved Wi-Fi speeds simultaneously stimulate consumer spending and business investments across multiple economic areas.

The sixteenth effect, "Wide Deployment of IoT," also has an aggregate GDP impact, incorporating direct, indirect, and induced contributions measured in terms of GVA, with the GDP value translated into the total economic output necessary to achieve this level of GVA, leveraging sector-specific output-to-GVA relationships from the BEA Input-Output framework. The allocation of total output across industrial sectors utilizes combined Personal Consumption Expenditures and Fixed Investment distributions, recognizing that economic growth driven by IoT deployment affects both consumer-oriented activities—such as household adoption of connected devices—and substantial investment in infrastructure, equipment, software, and services required for large-scale IoT ecosystems. This comprehensive sectoral allocation ensures that resulting employment impacts accurately reflect the full economic consequences of IoT proliferation.

The seventeenth effect, "Deployment of Augmented Reality (AR)/Virtual Reality (VR) Solutions," similarly represents an overall GDP contribution through increased economic productivity, driven by efficiency improvements, enhanced training capabilities, and expanded entertainment opportunities. AR and VR technologies have the potential to significantly transform business operations—from advanced product design and development to immersive retail interactions—while simultaneously reshaping consumer experiences. To quantify the employment impacts stemming from this GDP contribution, the methodology mirrors that described for the previous effect ("Wide Deployment of IoT.)

The eighteenth effect, "CAPEX & OPEX Savings Due to Cellular Off-Loading," again falls under producer surplus, though in this case for network operators. By offloading large volumes of traffic onto Wi-Fi networks, carriers can trim capital and operating expenditures. In this study, the saved resources are assumed to be reinvested exclusively in "Broadcasting and telecommunications,"[18] rather than across multiple industrial sectors. This approach recognizes that network operators typically reallocate resources within the same domain (e.g., upgrading networks, expanding coverage, or introducing new communication services) rather than diversifying widely. As with the previous producer surplus effect, a 63% reinvestment rate is used, capturing the partial conversion of saved resources into new capital deployment.

The nineteenth effect, "Revenues of Service Providers Offering Paid Wi-Fi Access in Public Places," is a straightforward assignment to "Broadcasting and telecommunications." Because these revenues are direct payments for connectivity services, they do not represent redistributed consumer surplus but rather a specific inflow to firms operating in that sector. Consequently, there is no partial re-spending assumption here; the full revenue figure is counted, since each dollar earned by these providers arises from a direct economic transaction.

The twentieth effect, "Aggregated Revenues of WISPs," follows a parallel logic. Wireless Internet Service Providers (WISPs) generate income by servicing underserved areas or offering unique wireless solutions. These revenues accrue entirely to "Broadcasting and telecommunications," because that is the sector best reflecting the activities of connectivity-oriented enterprises. No re-spending fraction is applied; the entire sum is recognized as an immediate injection of producer surplus in that domain.

The twenty-first effect, "Manufacturing of Residential Wi-Fi Devices & Equipment" pertains to hardware production. The increase in producer surplus for firms making advanced routers and other home connectivity devices is thus allocated to "Computer and Electronic Products" reflecting the specialized manufacturing nature of this activity. Here, each incremental dollar from product sales directly boosts the relevant manufacturing sector's output.

[18] Although 'Broadcasting and telecommunications' represents a broad category, it is the closest available classification within the BEA data to accurately reflect the intended sectoral allocation.

The twenty-second effect, “Manufacturing of Wi-Fi Enterprise Equipment” similarly belongs to “Computer and Electronic Products” The difference is that, instead of residential equipment, businesses purchase specialized access points, controllers, and enterprise networking devices. The effect remains a direct manufacturing boost, so no partial re-spending assumption is required. The entire surplus from these sales stays in the manufacturing sector, thereby stimulating production capacity and possibly supporting adjacent supplier industries.

The twenty-third effect, “Benefits of Firms of Internet of Things (IoT) Ecosystem” encompasses hardware and software solutions that hinge on strong Wi-Fi connectivity. The analysis attributes these producer surpluses to the “Computer and Electronic Products” sector, since it best captures both the device production and core technological services underlying IoT expansions. As with other manufacturing or technology-driven surpluses, the entire sum is allocated here with no partial discount. This underscores how product sales and service contracts in the IoT realm directly uplift the electronics industry.

The twenty-fourth effect, “Benefits of Firms of AR/VR Solutions Ecosystem,” follows the same rationale but for augmented and virtual reality hardware. As advanced headsets, sensors, and related computing equipment gain traction, producers realize surplus that remains within “Computer and Electronic Products.” Again, the entire surplus from these AR/VR solutions is recognized as directly boosting that sector’s output.

The twenty-fifth effect, “Benefits of Firms Developing Vehicular Technologies,” designates “Motor Vehicles, Bodies and Trailers, and Parts” as the recipient sector. Here, connectivity improvements, including in-vehicle Wi-Fi and sensor-laden systems, spur automotive innovations that yield direct benefits for vehicle manufacturers. Since these companies design, test, and deploy vehicular Wi-Fi components, their producer surplus is concentrated in the broader automotive sector. As in other cases, the total figure is credited to that sector, given the direct correlation to parts manufacturing.

Once the economic impacts have been thoroughly identified, classified, and allocated across industrial sectors as previously detailed, the methodology progresses to a crucial analytical phase involving Input-Output modeling. This stage leverages the comprehensive Input-Output tables provided by the U.S. Bureau of Economic Analysis to quantify the aggregate economic impacts—capturing direct, indirect, and subsequently induced effects—arising from Wi-Fi technology deployment.

Initially, the quantified economic effects associated with Wi-Fi—previously allocated by sector—are integrated as inputs into the I-O tables. Specifically, these inputs represent the incremental expenditure or additional demand introduced into each sector, determined by the earlier stages of this analysis. Utilizing the BEA’s Input-Output matrix, these inputs propagate across interrelated sectors, reflecting the economic linkages inherent in the U.S. economy. As these initial expenditures ripple through sectoral interactions, they create additional demand for intermediate goods and services from supplier industries, a process comprehensively captured by the I-O framework.

The result of this modeling exercise is the calculation of Type I multipliers, which quantify both direct and indirect economic effects. That is, Type I multipliers measure both how an initial expenditure in one sector generates direct activity and the additional economic activity across upstream supply-chain industries, thereby providing a clear representation of the total industrial output necessary to satisfy the initial incremental demand.

Having established the total output and GDP effects via Type I multipliers, the next step involves incorporating the induced effects to capture the full extent of economic impact. Induced effects reflect the additional economic activity generated by the spending of household income derived from newly created direct and indirect output.

A critical assumption at this juncture involves the Marginal Propensity to Consume (MPC), defined as the fraction of additional income that households spend on consumption rather than save or allocate to taxes and other non-consumption expenditures. As mentioned above, generally we conservatively assume an MPC of 50%[19], implying that half of the additional compensation earned through newly created jobs translates directly into increased consumption across the economy.

The increased household consumption resulting from this induced spending creates additional economic activity across various consumer-facing sectors—particularly retail trade, food services, healthcare, accommodation, and real estate. By applying these induced expenditures to the BEA's Input-Output model once more, a second round of economic activity emerges, further expanding total output and GDP impacts.

Following the calculation of Type II multipliers and associated incremental output, the final analytical step translates these expanded economic impacts into total employment figures encompassing direct, indirect, and induced jobs. The final employment estimates reflect the total job creation generated by Wi-Fi technology deployment across the economy, comprehensively capturing the interlinked economic dynamics among industries.

To generate these estimates, the total number of jobs directly and indirectly generated by the initial incremental output is estimated. This estimation employs sector-specific data from the Bureau of Labor Statistics (BLS), particularly the ratio between Gross Value Added and total employment per sector[20]. Specifically, the estimated incremental output for each sector, as calculated through Type I multipliers, is converted into GVA, and subsequently translated into employment by applying sector-specific GVA-per-employee ratios. For example, if a sector exhibits an average GVA per employee of $100,000, then an incremental GVA of $1 million

[19] Based on Bivens (2019). "Updated employment multipliers for the U.S. economy"

[20] The Bureau of Labor Statistics provides data on jobs per economic sector; this data is matched with sector data from the Bureau of Economic Analysis for Gross Value Added.

within that sector corresponds to the creation of approximately ten new full-time-equivalent jobs.

The newly estimated employment (direct plus indirect) is then further analyzed to estimate the induced employment effect. Each newly created direct and indirect job is associated with additional household income, captured by sector-specific compensation-per-employee data provided by the BEA.

Lastly, recognizing the diversity and technological evolution driven by distinct spectrum bands, the entire Input-Output and employment estimation analysis described above is conducted separately for specific Wi-Fi spectrum bands: namely, the traditional bands (2.4 GHz and 5 GHz), the recently allocated 6 GHz band, and the anticipated allocation of the 7 GHz band. Each spectrum band exhibits distinct economic characteristics, adoption dynamics, and capacity for innovation, warranting differentiated analyses. Conducting this granular breakdown allows the identification of nuanced variations in employment impacts across these bands, providing essential insights regarding the relative economic importance and employment potential associated with each segment of Wi-Fi spectrum.