Cisco Visual Networking Index (VNI) Global and Americas/EMEAR Mobile Data Traffic Forecast, 2017–2022 Cisco Knowledge Network (CKN) Session

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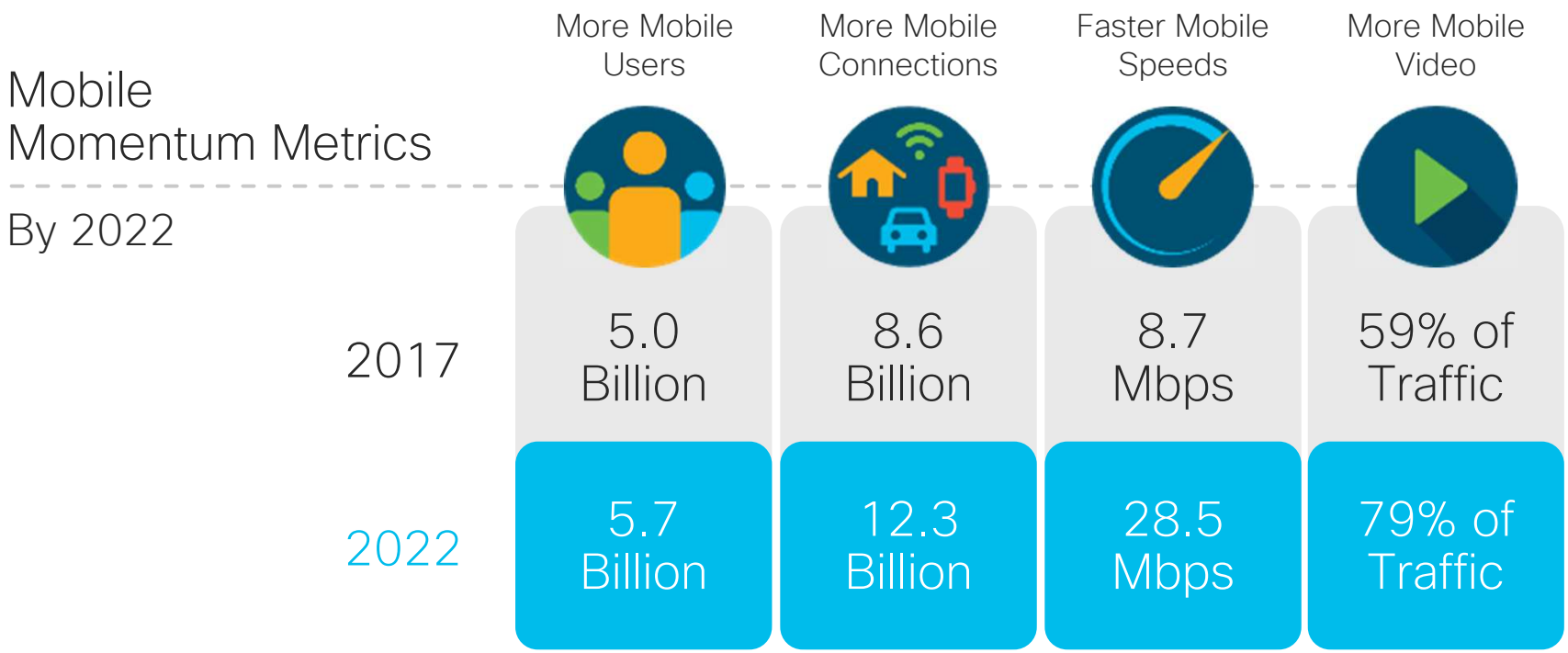
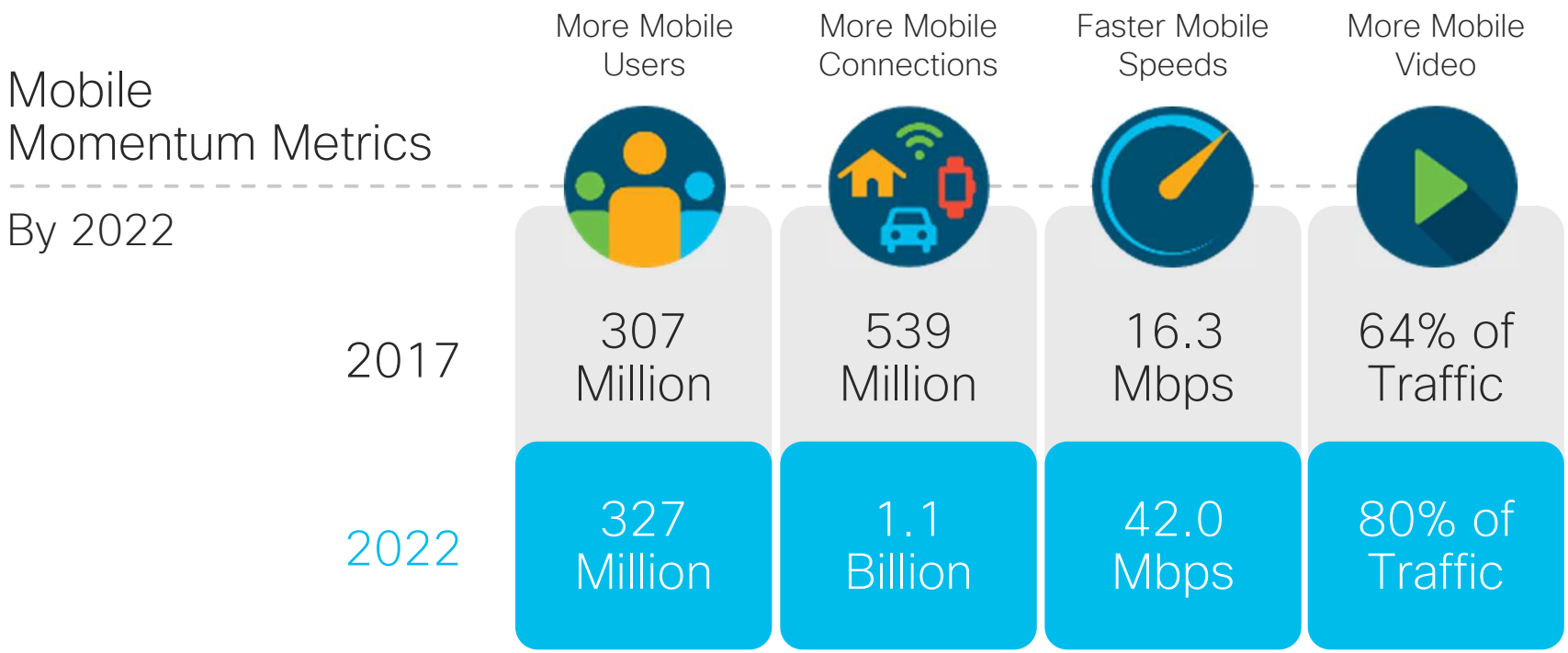
Global Mobile Data Drivers



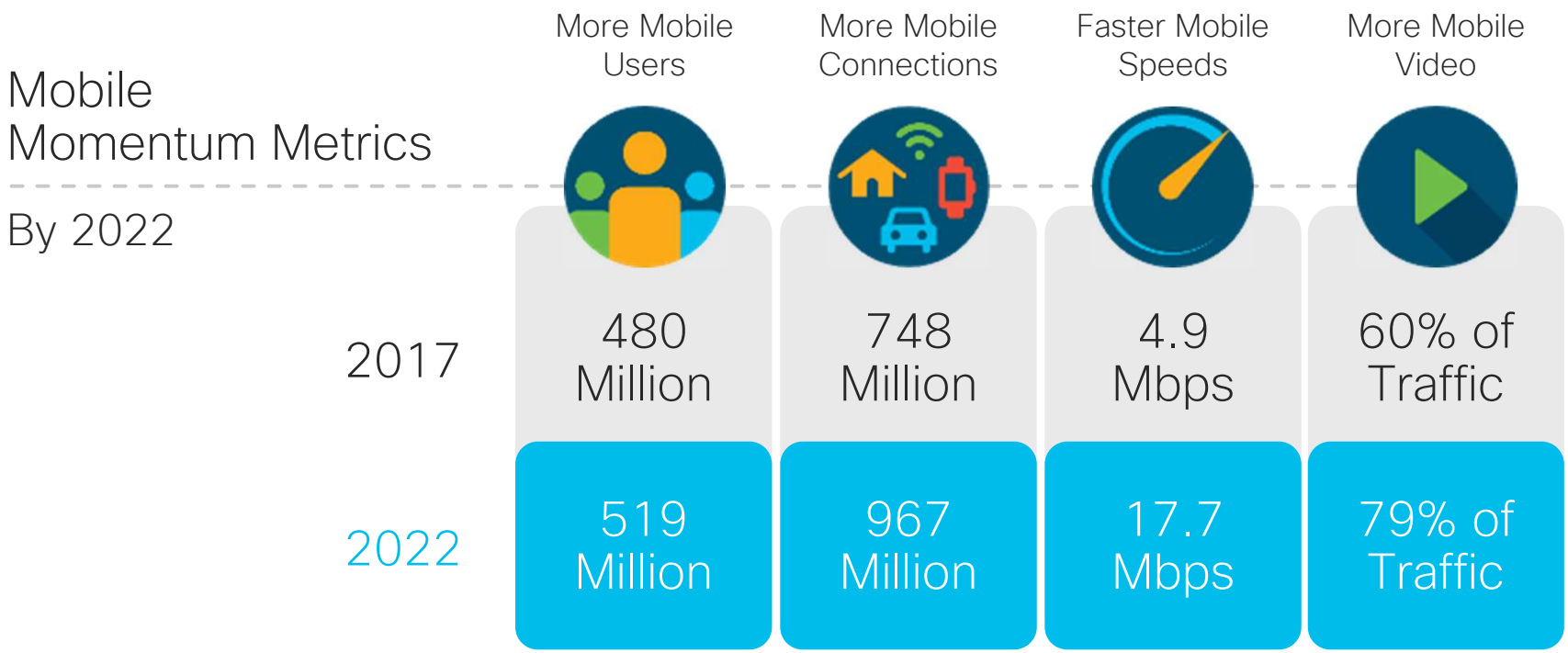
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Data Drivers



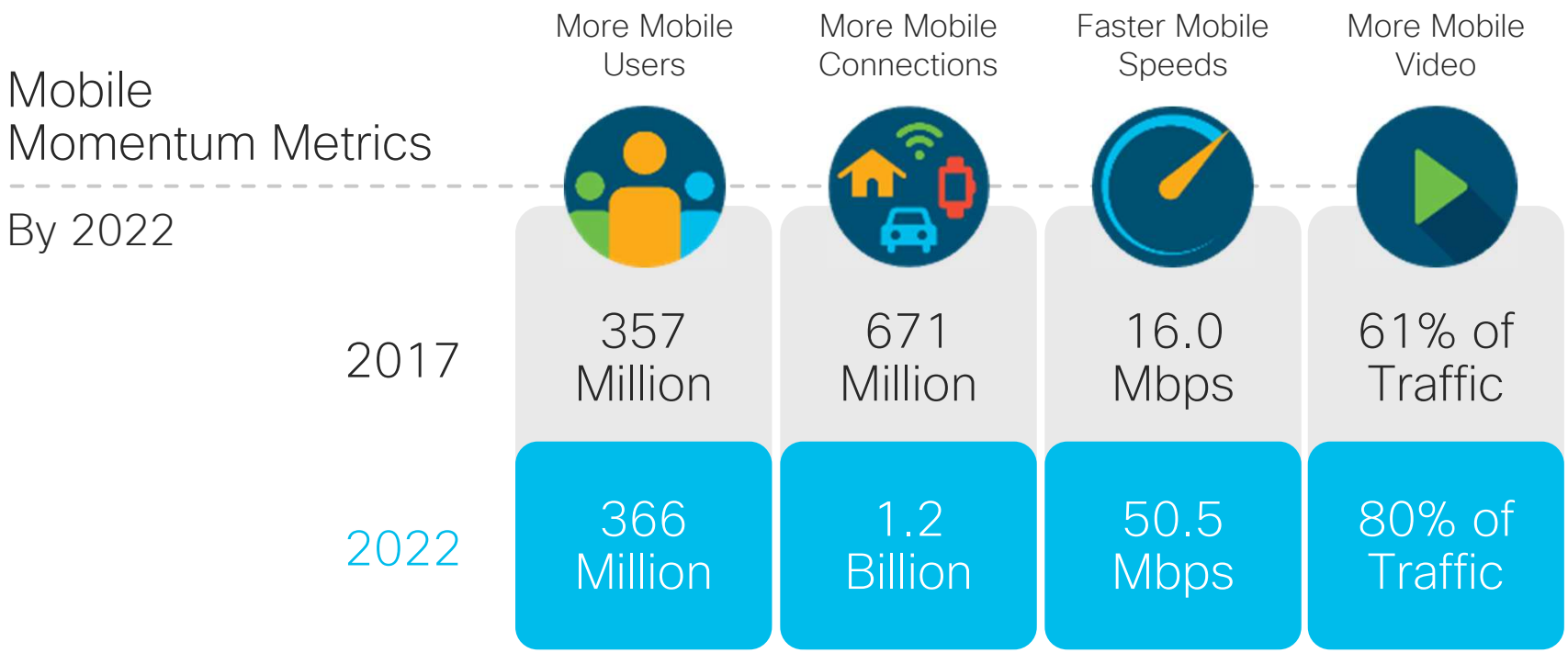
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America Mobile Data Drivers



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Western Europe Mobile Data Drivers



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Approaching the Mobile Zettabyte Era

By 2022, annual global mobile data will nearly reach the zettabyte milestone

By 2022, global mobile data traffic will reach an annual run rate of 930 exabytes per year

930 exabytes is equal to:

- Nearly 113X more than mobile traffic generated in 2012 (8.2 exabytes)
- All movies ever made crossing global mobile networks every 5 minutes

What is a zettabyte?

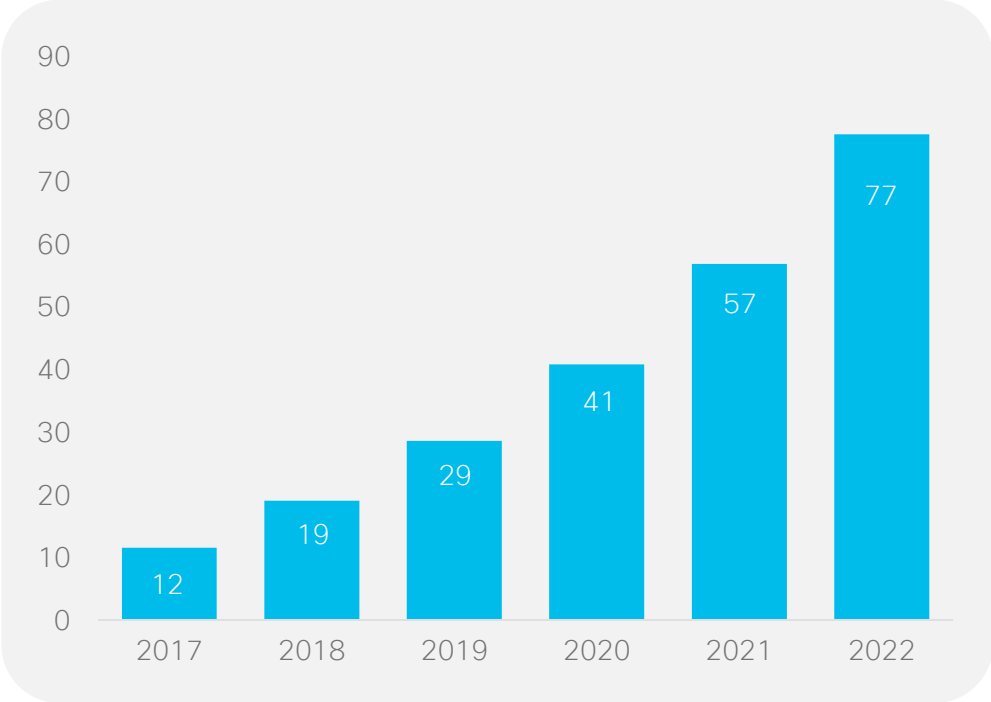
- One trillion gigabytes
- Approximately 10^{21} (1,000,000,000,000,000,000,000 bytes)

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Data Traffic Growth

Global mobile data traffic will increase 7-fold from 2017 to 2022

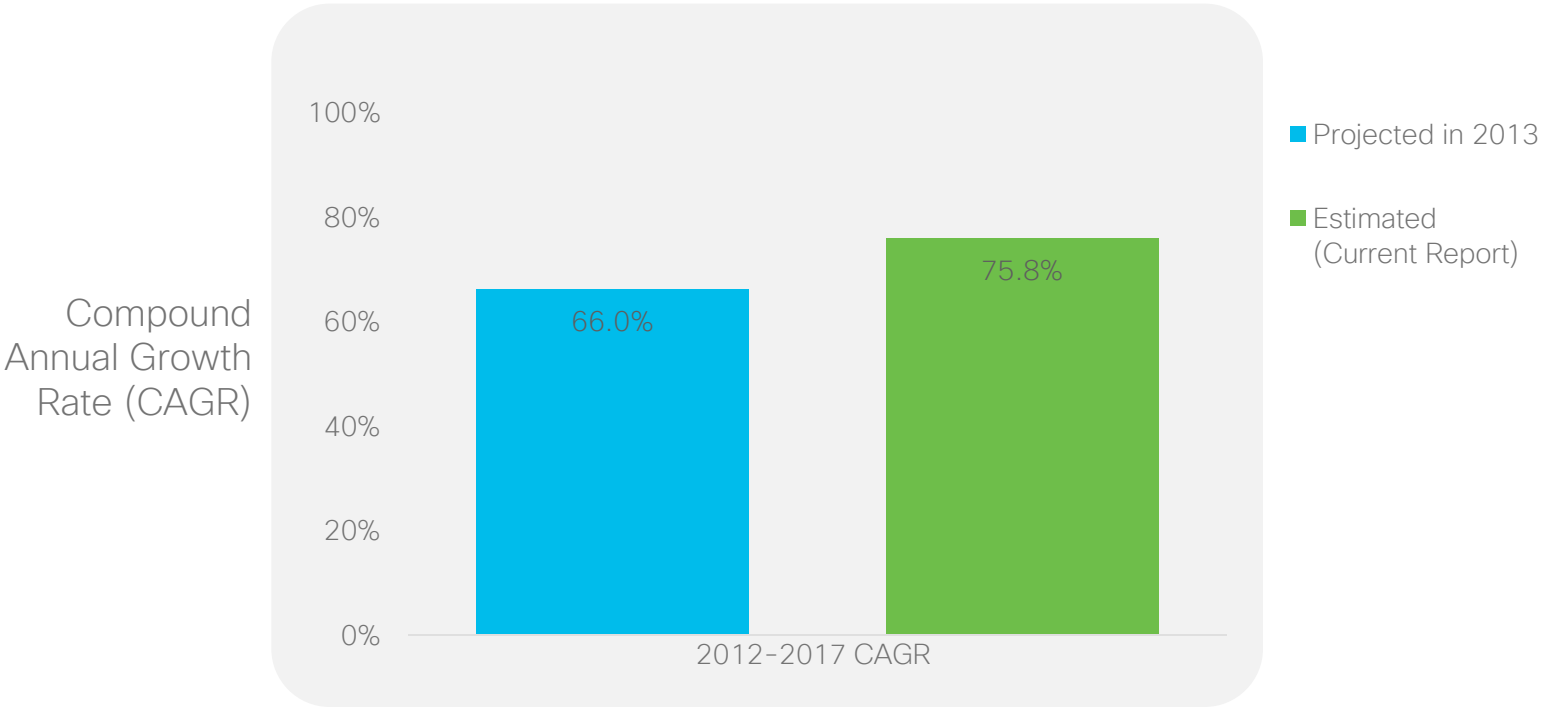
46% CAGR
2017–2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Data Traffic Forecast Accuracy

Actual growth has been within ±10% of projected growth

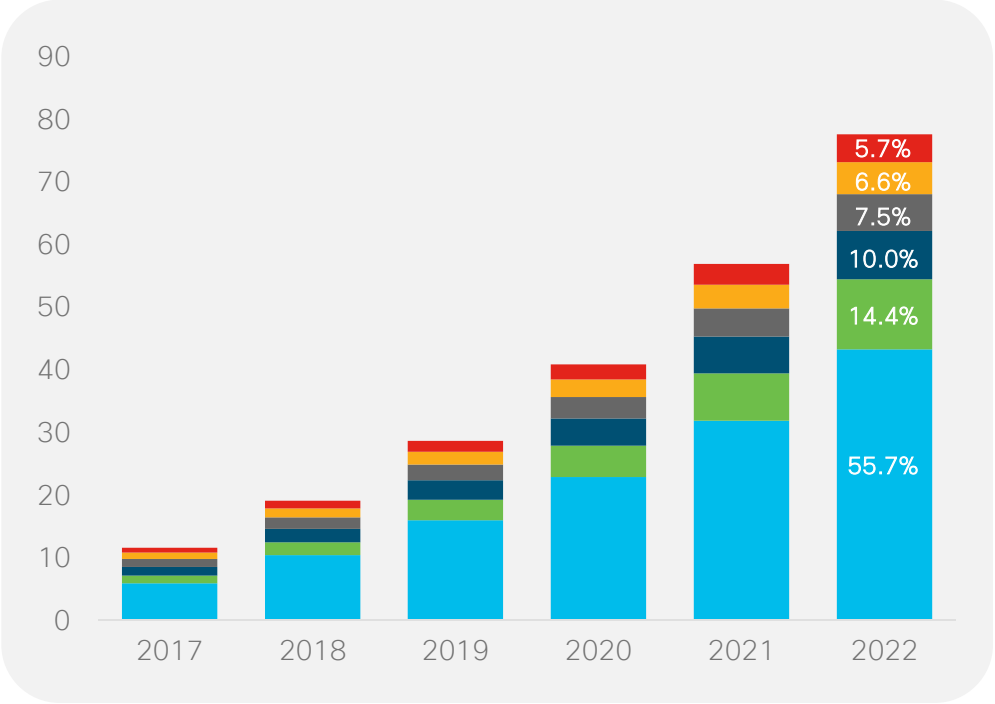


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Data Traffic Growth by Region

MEA has the highest growth rate (56%) from 2017 to 2022
APAC will generate 56% of all mobile data traffic by 2022

46% CAGR
2017–2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Average Mobile User and Connection

Cellular Traffic per Month

	2017	2022
Average Traffic per User	 2.3 GB per month	 13.3 GB per month
Average Traffic per Connection	 1.3 GB per month	 6.3 GB per month

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Average Mobile User and Connection

Cellular Traffic per Month

	2017	2022
Average Traffic per User	 4.0 GB per month	 17.0 GB per month
Average Traffic per Connection	 2.3 GB per month	 5.1 GB per month

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America Average Mobile User and Connection

Cellular Traffic per Month

	2017	2022
Average Traffic per User	 1.5 GB per month	 8.3 GB per month
Average Traffic per Connection	 1.0 GB per month	 4.6 GB per month

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Western Europe Average Mobile User and Connection

Cellular Traffic per Month

	2017	2022
Average Traffic per User	 2.7 GB per month	 13.1 GB per month
Average Traffic per Connection	 1.5 GB per month	 4.4 GB per month

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Top Trends

VNI Mobile Forecast Update, 2017–2022
Top Mobile Networking Trends

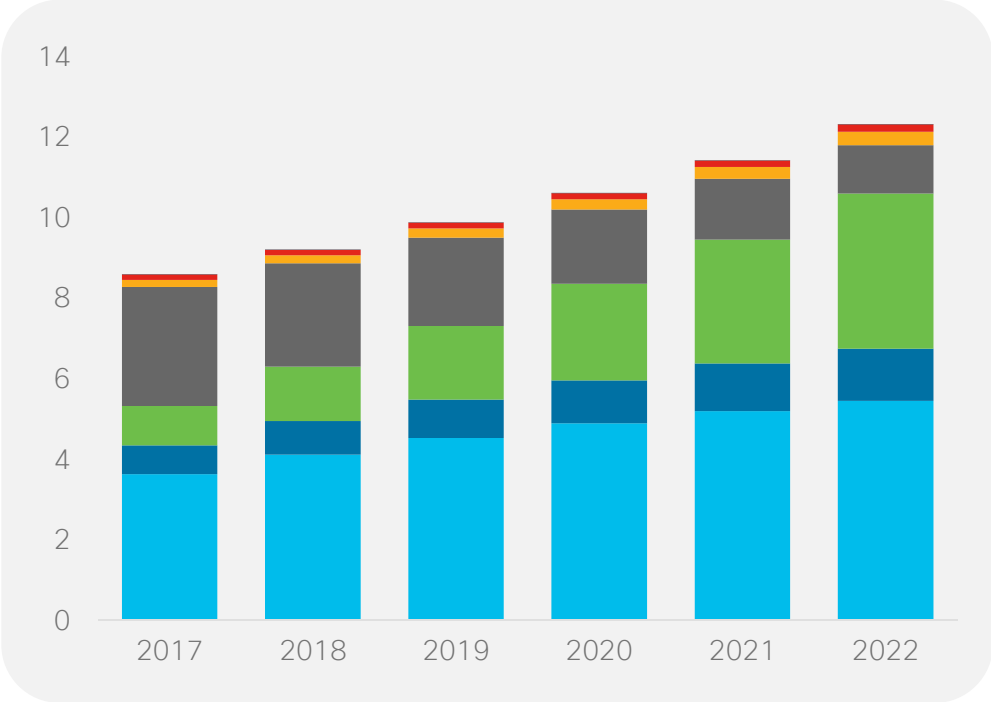
1. Evolving Toward Smarter Multimedia Mobile Devices
2. Defining Cell Network Advances—2G, 3G, 4G, 5G
3. Measuring Mobile IoT Adoption—M2M and Emerging Wearables
4. Identifying New Mobile Applications and Requirements
5. Comparing Mobile Network Speed Improvements
6. Analyzing the Expanding Role and Coverage of Wi-Fi
7. Reviewing Tiered Pricing—Unlimited Data and Shared Plans

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Device Growth

By 2022, smartphones* will exceed 50% share of total mobile devices/connections

7% CAGR
2017–2022



* Smartphone category including phablets

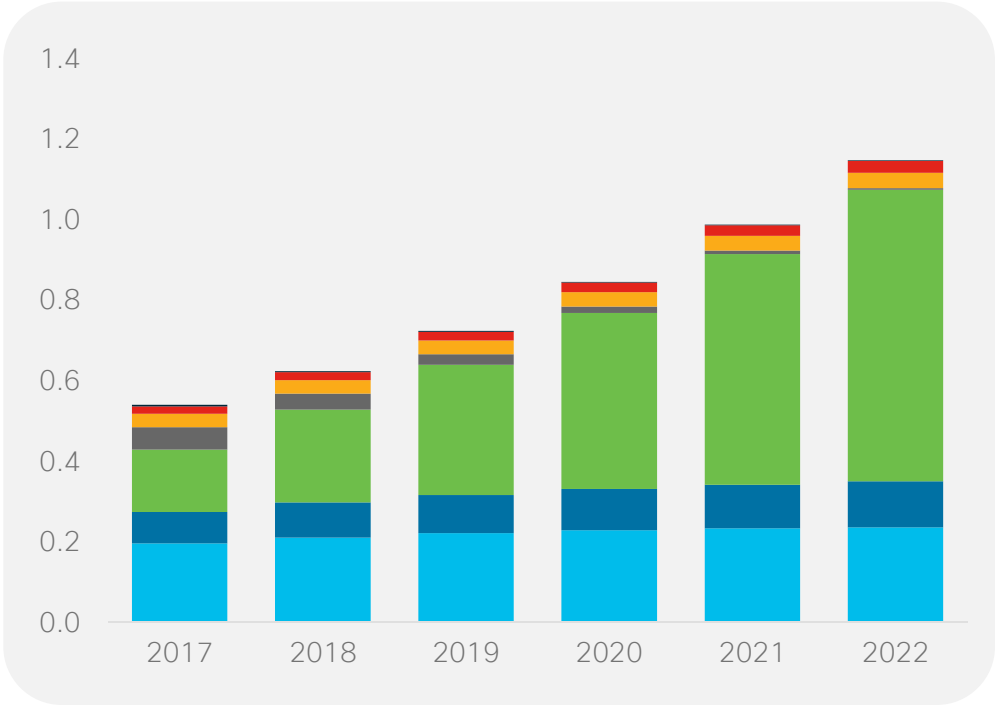
* Figures (n) refer to 2017, 2022 device share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Device Growth

By 2022, M2M will exceed 60% share of total mobile devices/connections

16% CAGR
2017–2022



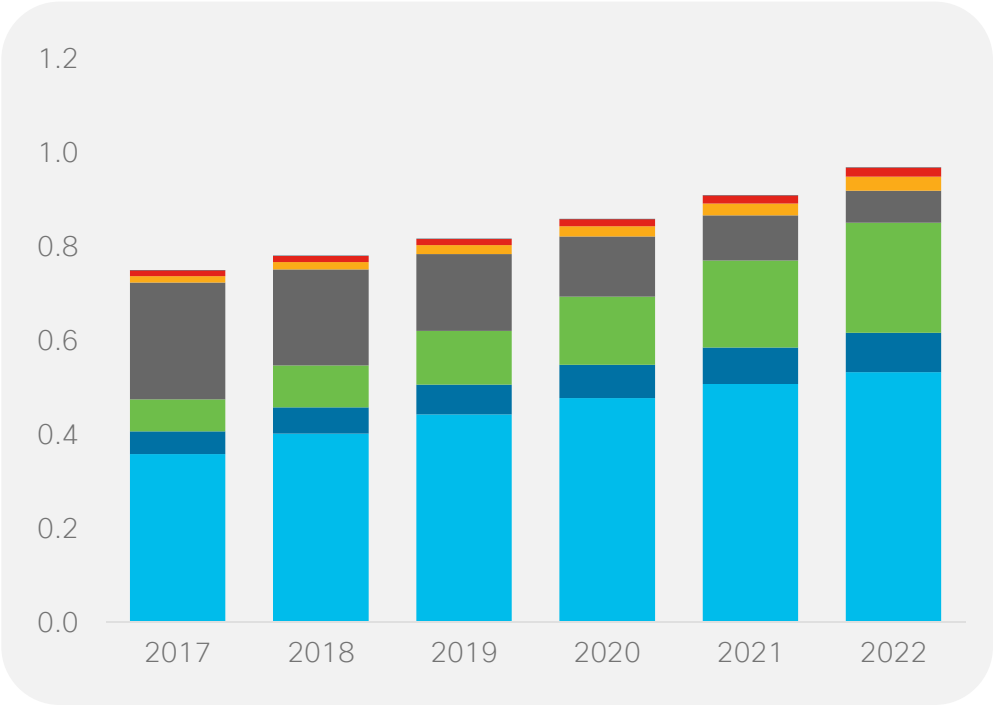
* Figures (n) refer to 2017, 2022 device share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America Mobile Device Growth

By 2022, smartphones* will exceed 60% share of total mobile devices/connections

5% CAGR
2017–2022



* Smartphone category including phablets

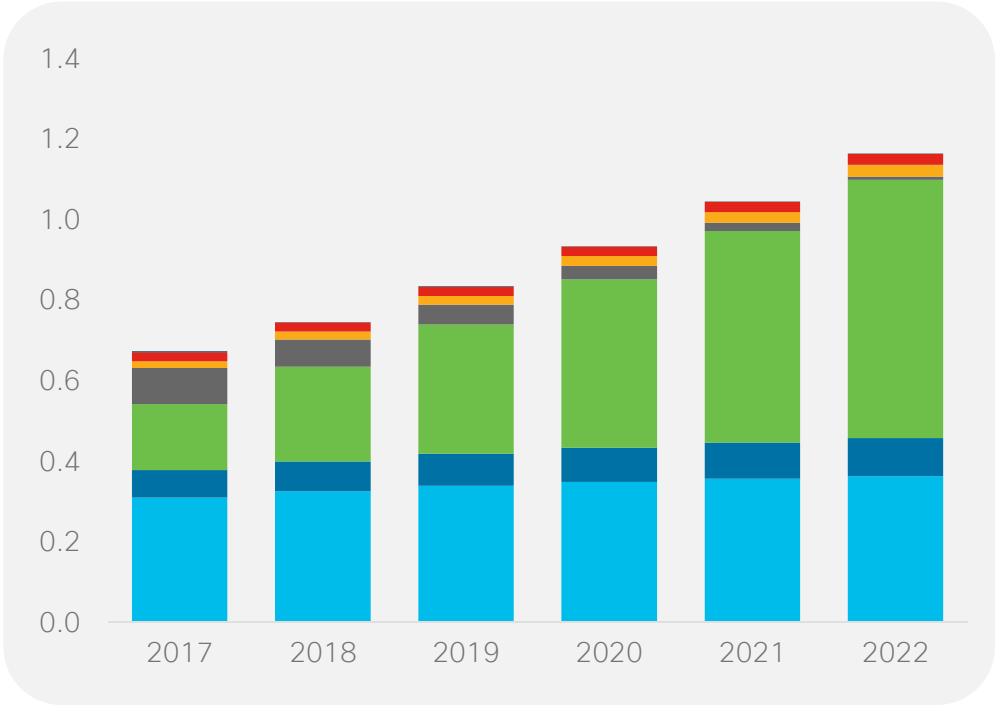
* Figures (n) refer to 2017, 2022 device share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Western Europe Mobile Device Growth

By 2022, M2M will exceed 50% share of total mobile devices/connections

12% CAGR
2017–2022



* Figures (n) refer to 2017, 2022 device share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Average Cellular Traffic Per Mobile Device

	2017 MBs per Month	2022 MBs per Month
Non-smartphone	50	224
M2M Module	216	448
Smartphone	2,336	10,697
Tablet	3,023	6,777
Laptop/PC	3,648	6,904

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Average Cellular Traffic Per Mobile Device

	2017	2022
	MBs per Month	MBs per Month
Non-smartphone	59	206
M2M Module	252	386
Smartphone	3,760	14,400
Tablet	3,460	8,310
Laptop/PC	4,130	7,560

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM Average Cellular Traffic Per Mobile Device

	2017 MBs per Month	2022 MBs per Month
Non-smartphone	17	51
M2M Module	175	484
Smartphone	1,590	6,440
Tablet	3,170	6,440
Laptop/PC	3,990	8,580

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE Average Cellular Traffic Per Mobile Device

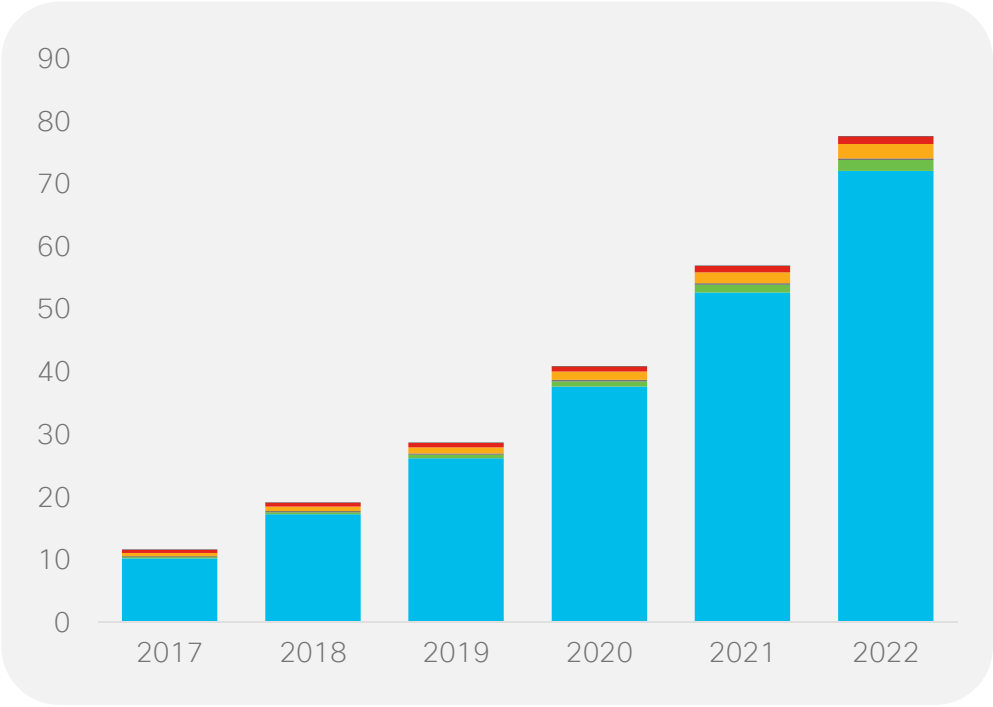
	2017 MBs per Month	2022 MBs per Month
Non-smartphone	40	120
M2M Module	273	505
Smartphone	2,310	9,790
Tablet	2,170	6,050
Laptop/PC	2,930	5,480

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Traffic Growth by Device

By 2022, smartphones will exceed 90% share of total mobile data traffic

46% CAGR
2017–2022



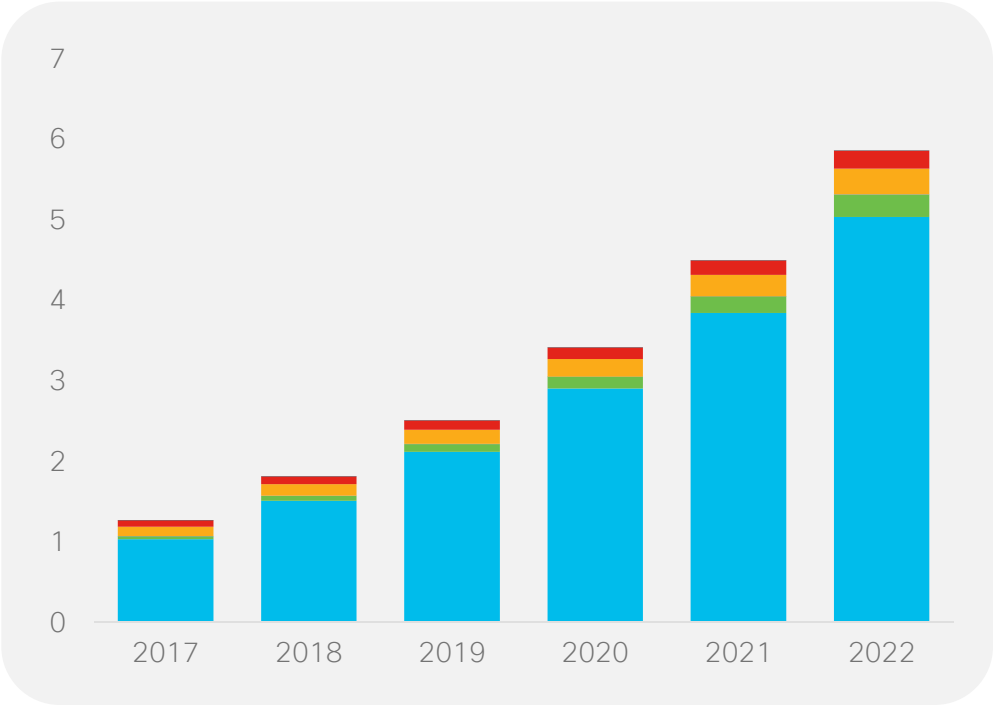
* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Traffic Growth by Device

By 2022, smartphones will exceed 85% share of total mobile data traffic

36% CAGR
2017–2022



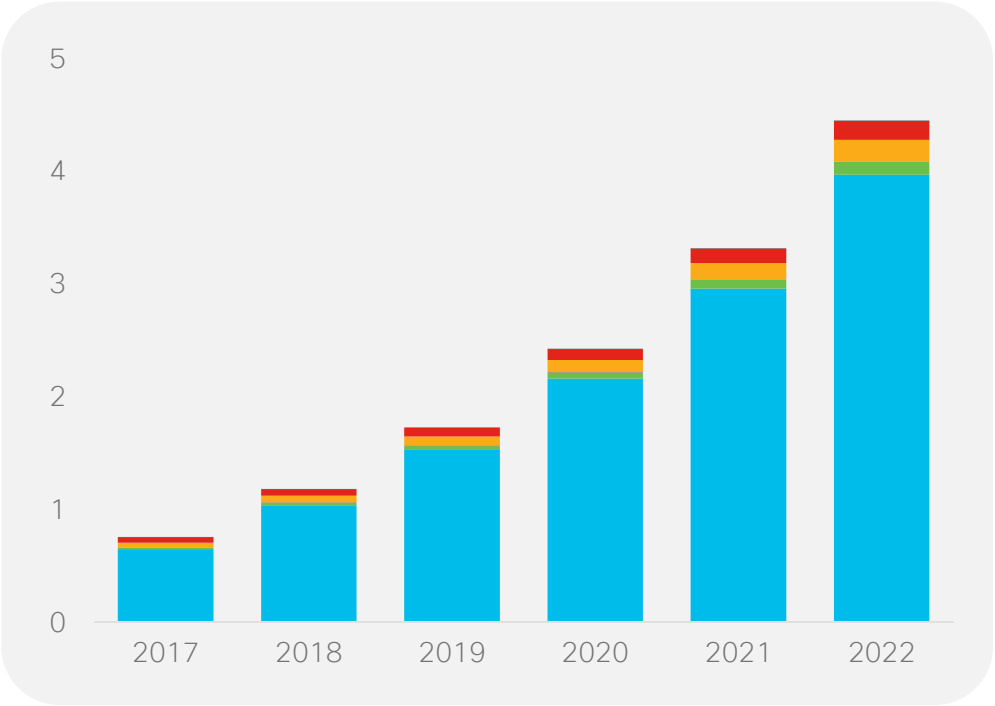
* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM Mobile Traffic Growth by Device

By 2022, smartphones will reach nearly 90% share of total mobile data traffic

43% CAGR
2017–2022



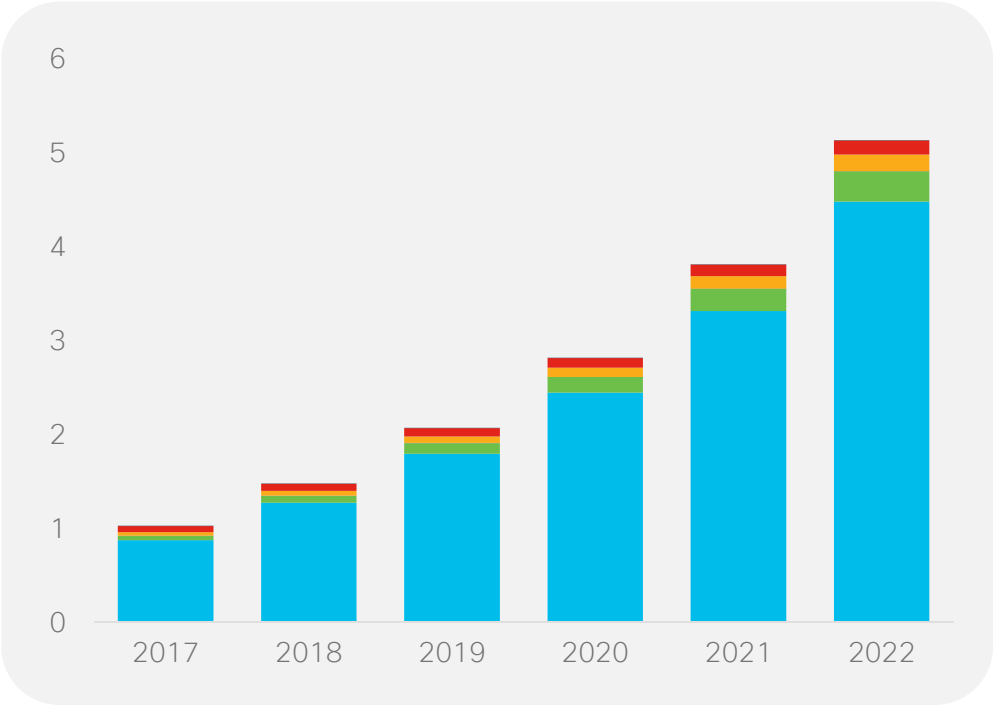
* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Western Europe Mobile Traffic Growth by Device

By 2022, smartphones will exceed 85% share of total mobile data traffic

38% CAGR
2017–2022



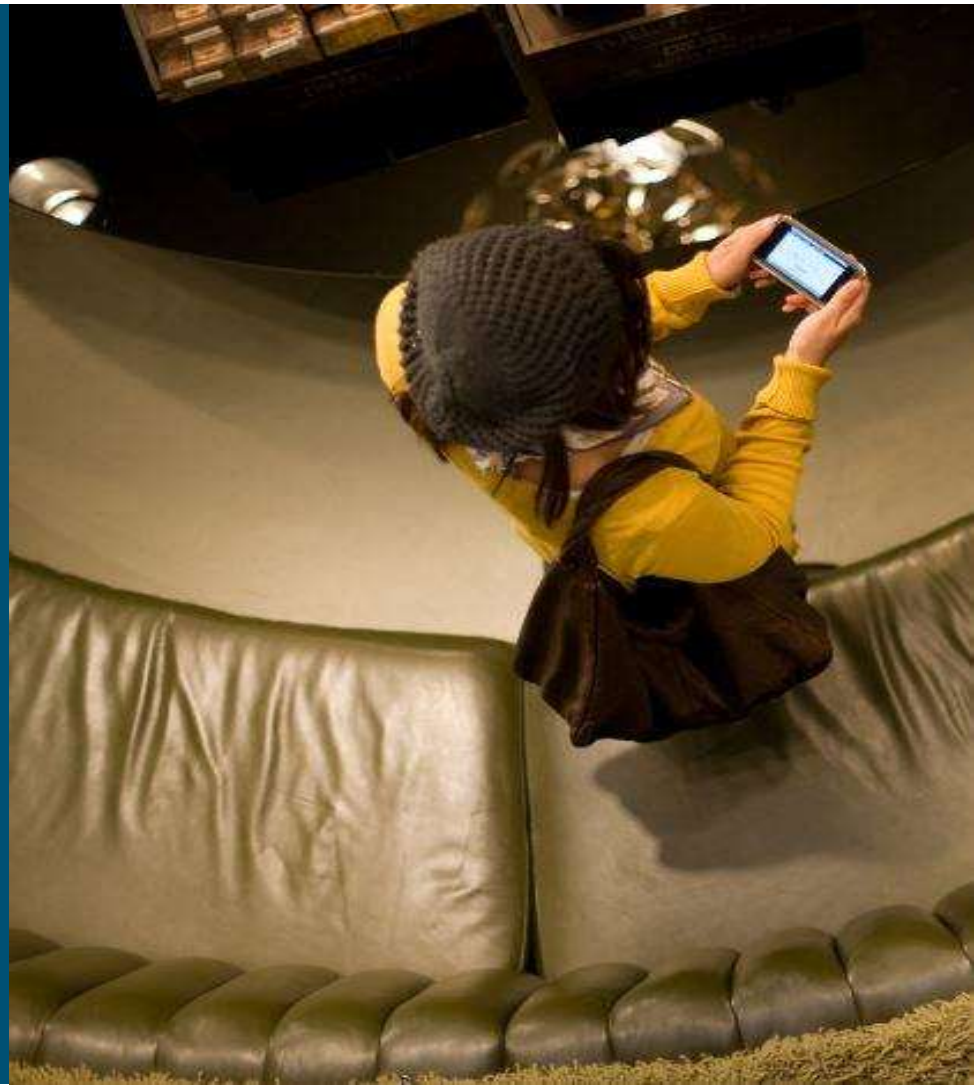
* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Globally, in 2017, a smart device generated 10 times more traffic than a non-smart device.

* Smart devices have advanced multimedia/computing capabilities and a minimum of 3G connectivity

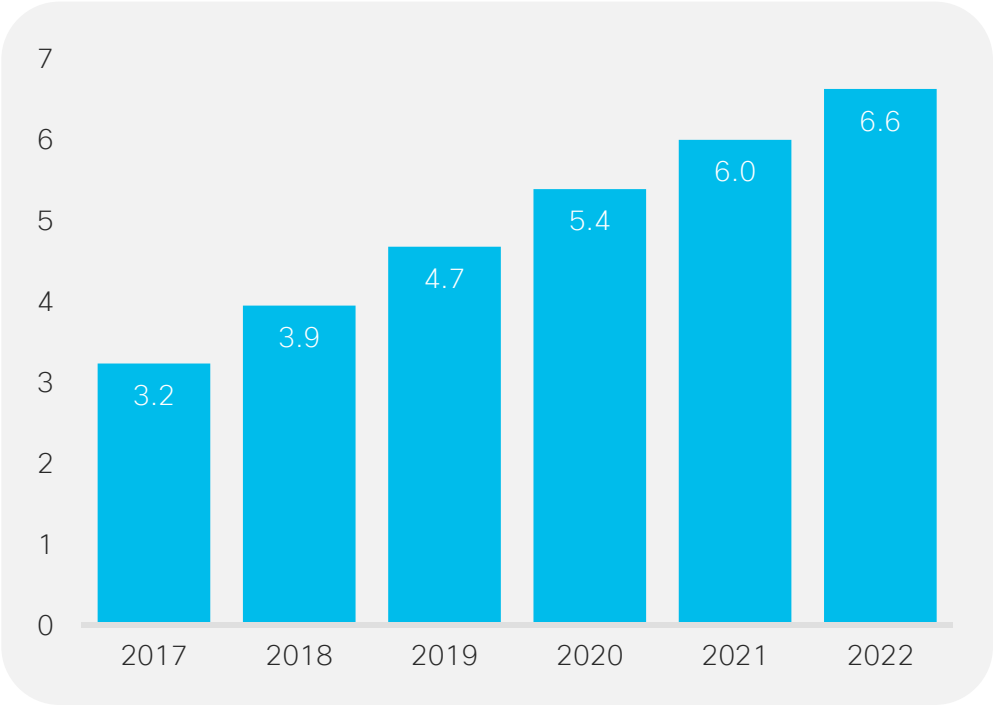
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



Global IPv6-Capable Smartphones and Tablets

By 2022, 94% of mobile smartphones and tablets will be IPv6-capable

15% CAGR
2017–2022

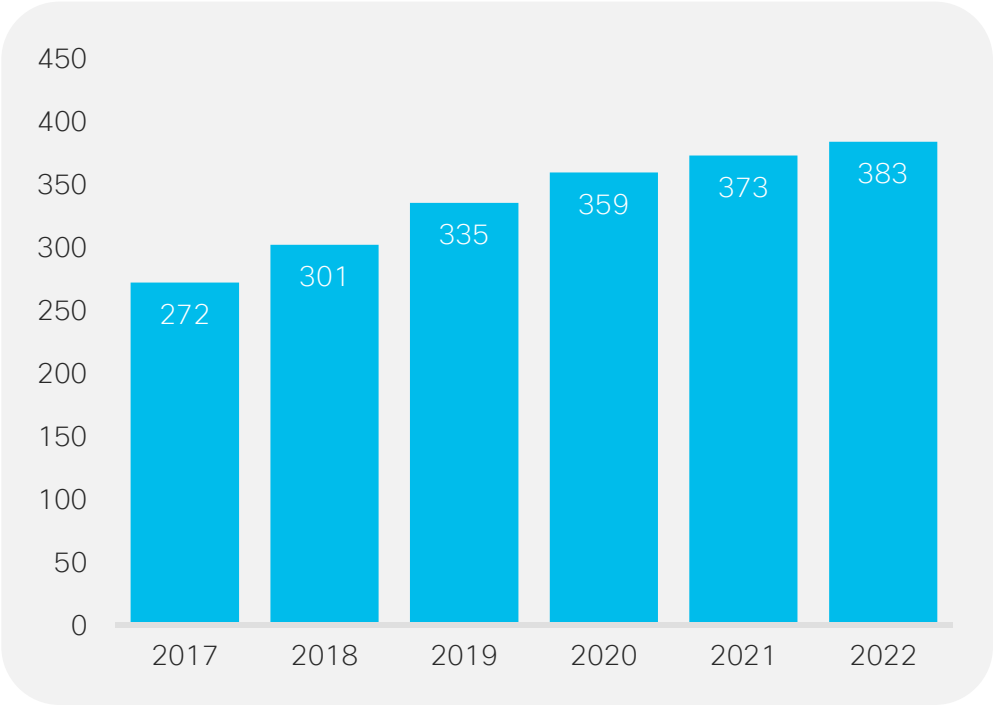


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

NA IPv6-Capable Smartphones and Tablets

By 2022, 99% of mobile smartphones and tablets will be IPv6-capable

7% CAGR
2017-2022

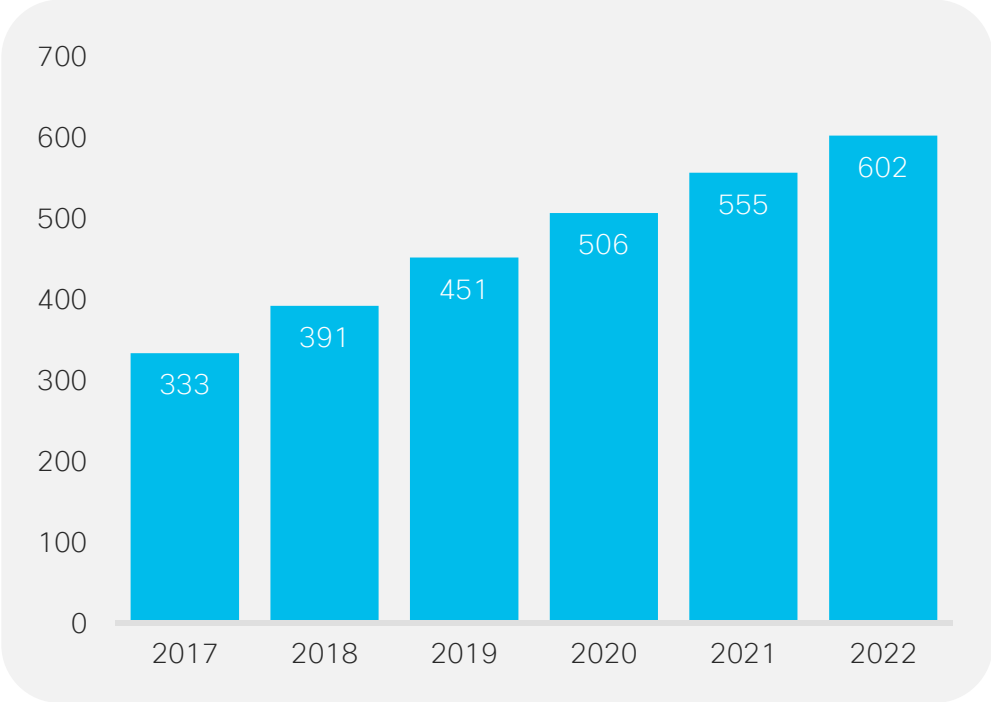


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017-2022

LATAM IPv6-Capable Smartphones and Tablets

By 2022, 93% of mobile smartphones and tablets will be IPv6-capable

13% CAGR
2017–2022

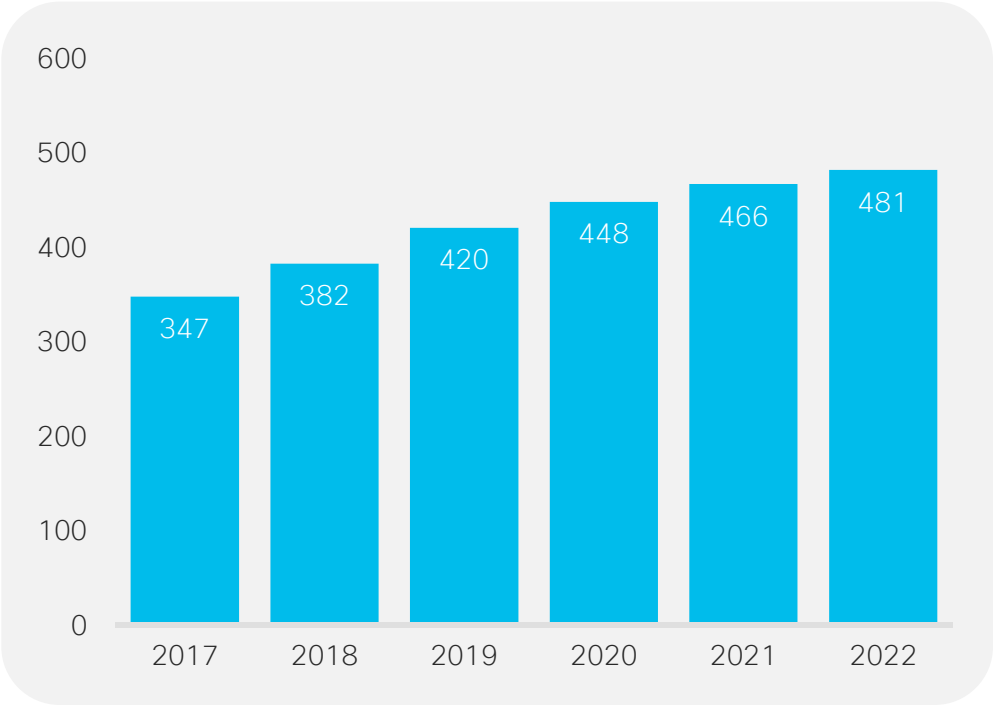


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE IPv6-Capable Smartphones and Tablets

By 2022, 99% of mobile smartphones and tablets will be IPv6-capable

7% CAGR
2017-2022

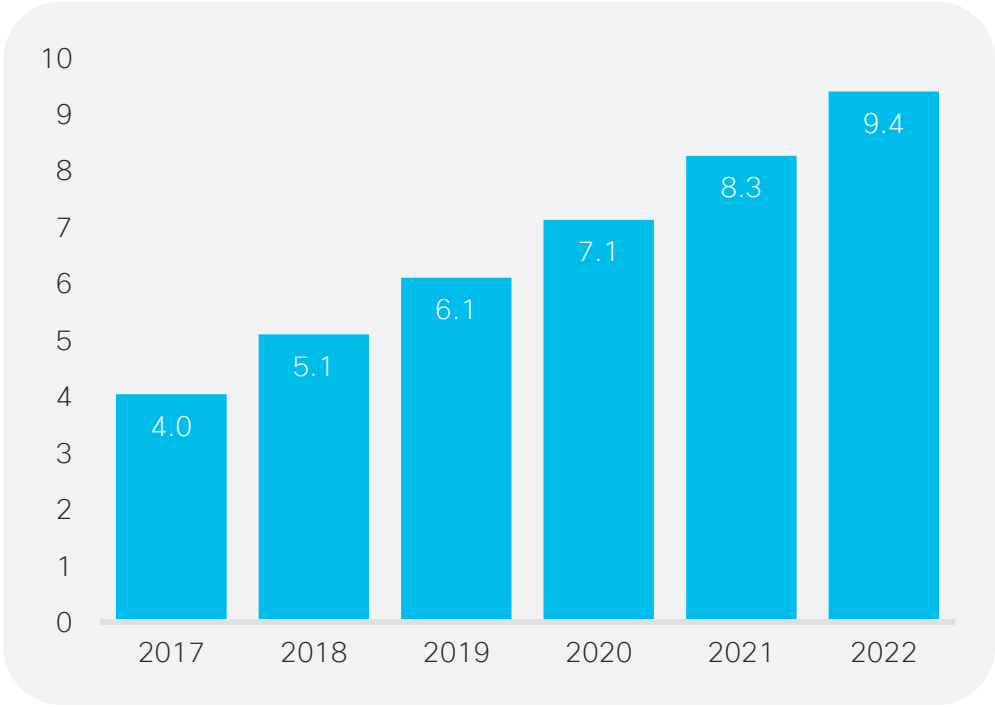


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017-2022

Global IPv6-Capable Mobile Devices/Connections

By 2022, 76% of all mobile devices/connections will be IPv6-capable

18% CAGR
2017-2022

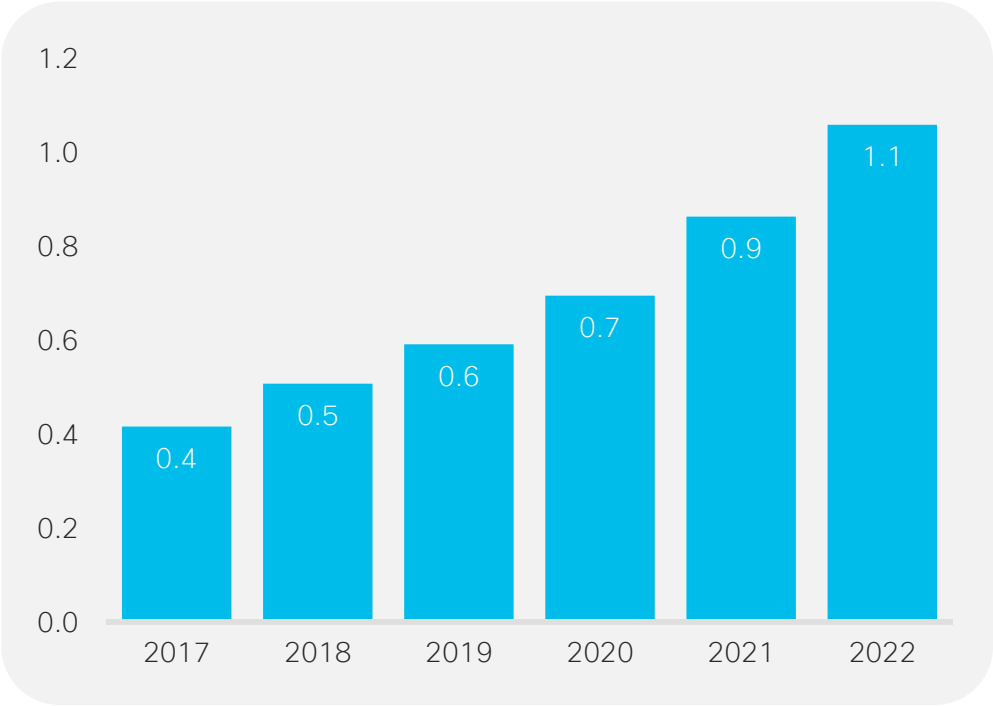


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017-2022

NA IPv6-Capable Mobile Devices/Connections

By 2022, 92% of all mobile devices/connections will be IPv6-capable

20% CAGR
2017–2022

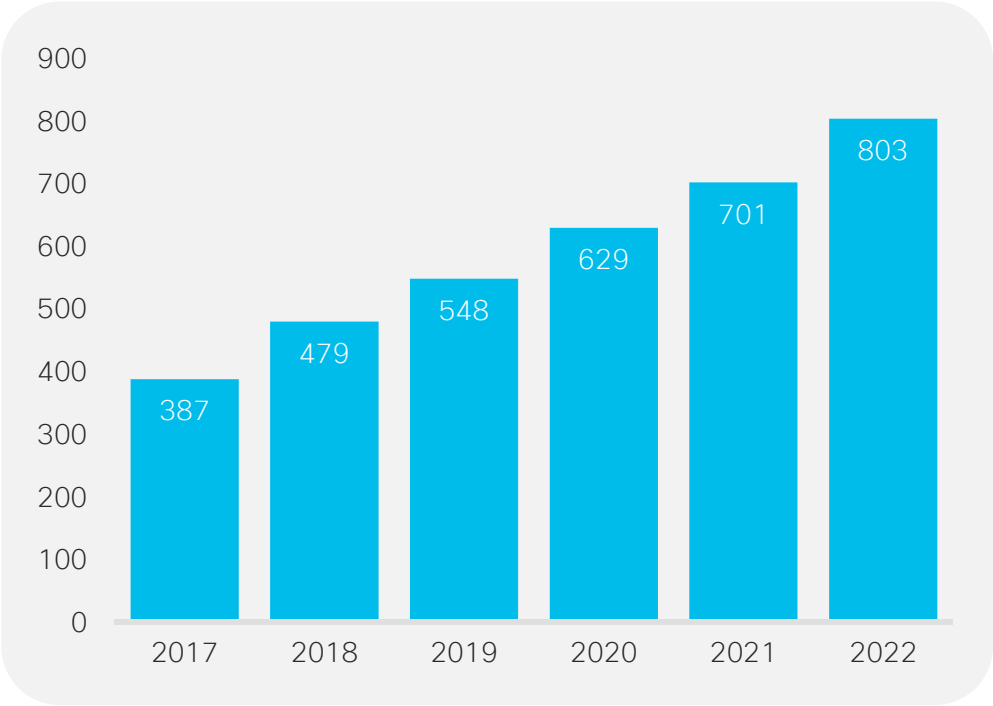


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM IPv6-Capable Mobile Devices/Connections

By 2022, 83% of all mobile devices/connections will be IPv6-capable

16% CAGR
2017–2022

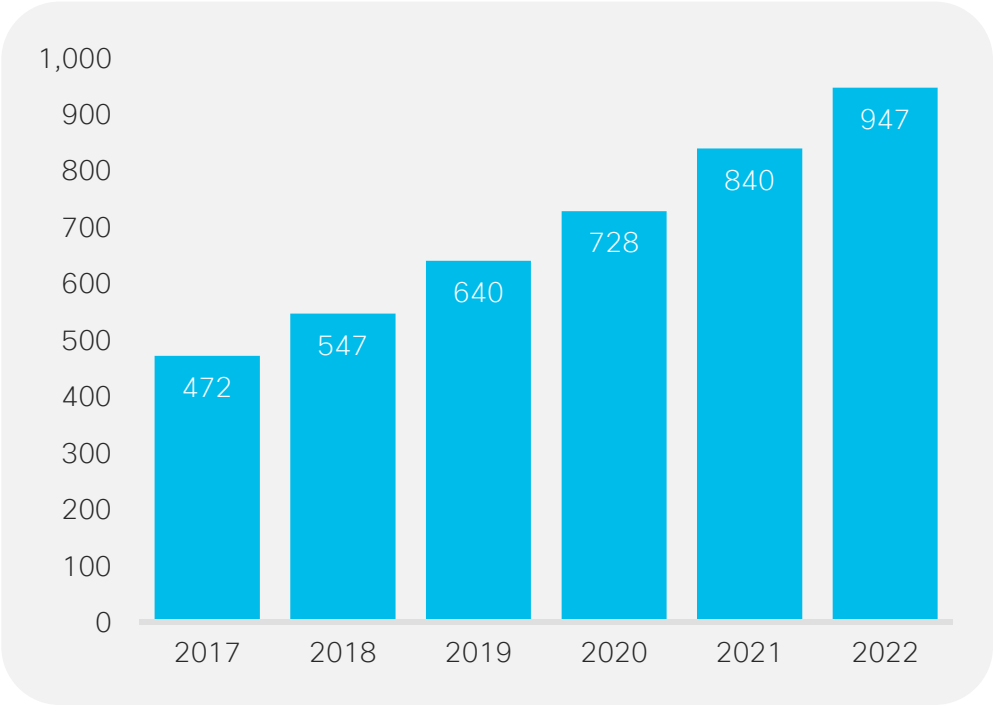


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE IPv6-Capable Mobile Devices/Connections

By 2022, 81% of all mobile devices/connections will be IPv6-capable

15% CAGR
2017–2022

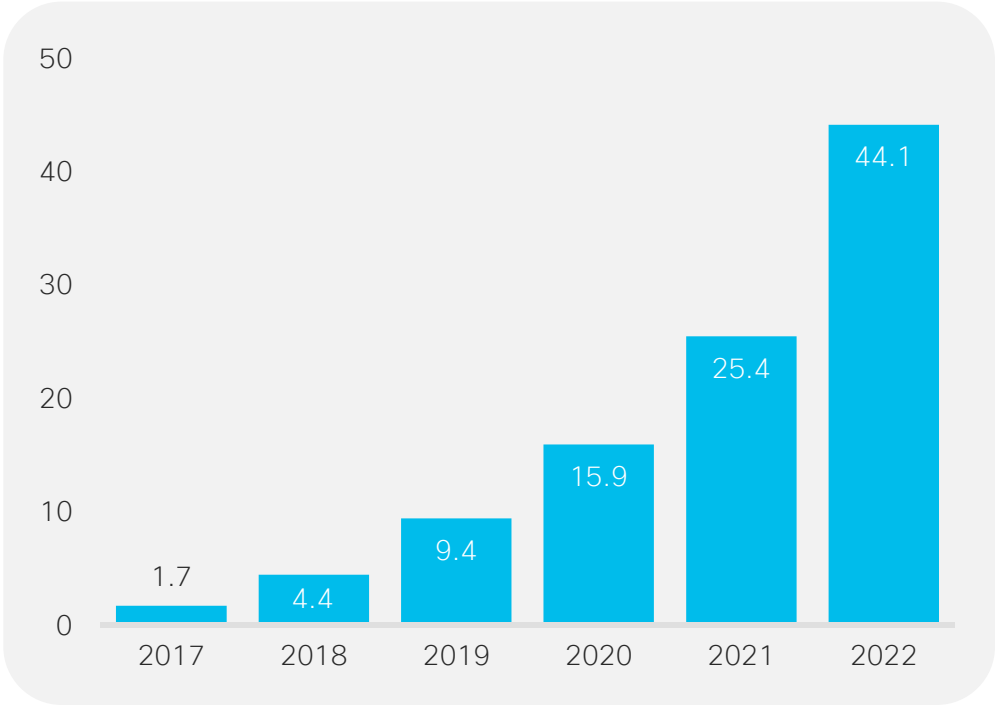


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global IPv6 Mobile Data Traffic

By 2022, IPv6 mobile traffic will generate 57% of the total mobile data traffic

92% CAGR
2017–2022

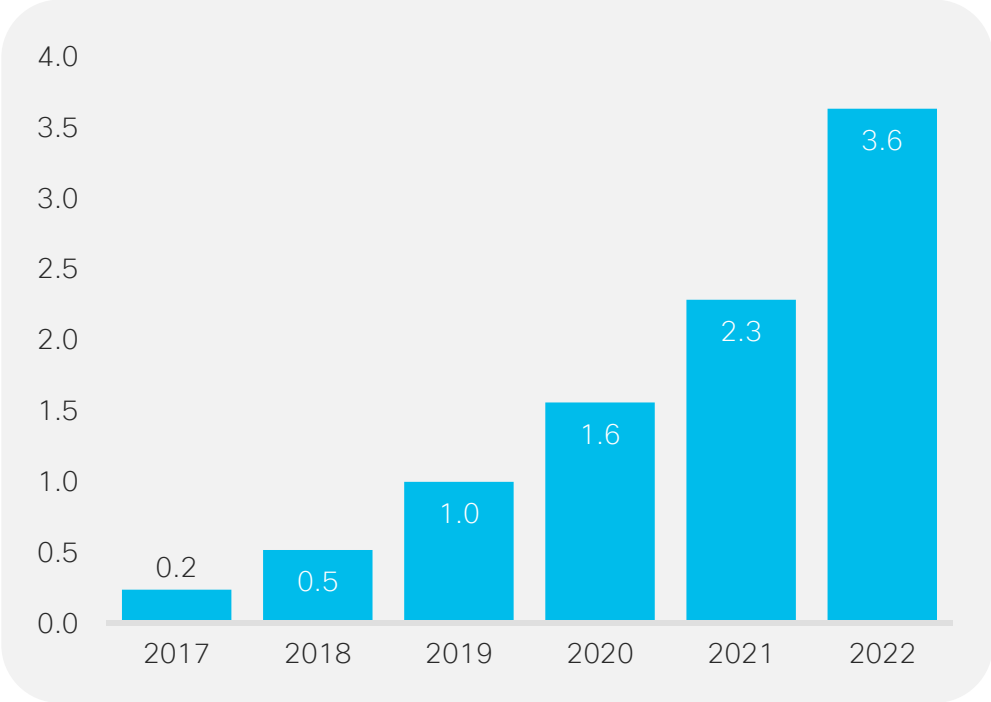


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

NA IPv6 Mobile Data Traffic

By 2022, IPv6 mobile traffic will generate 62% of the total mobile data traffic

73% CAGR
2017–2022

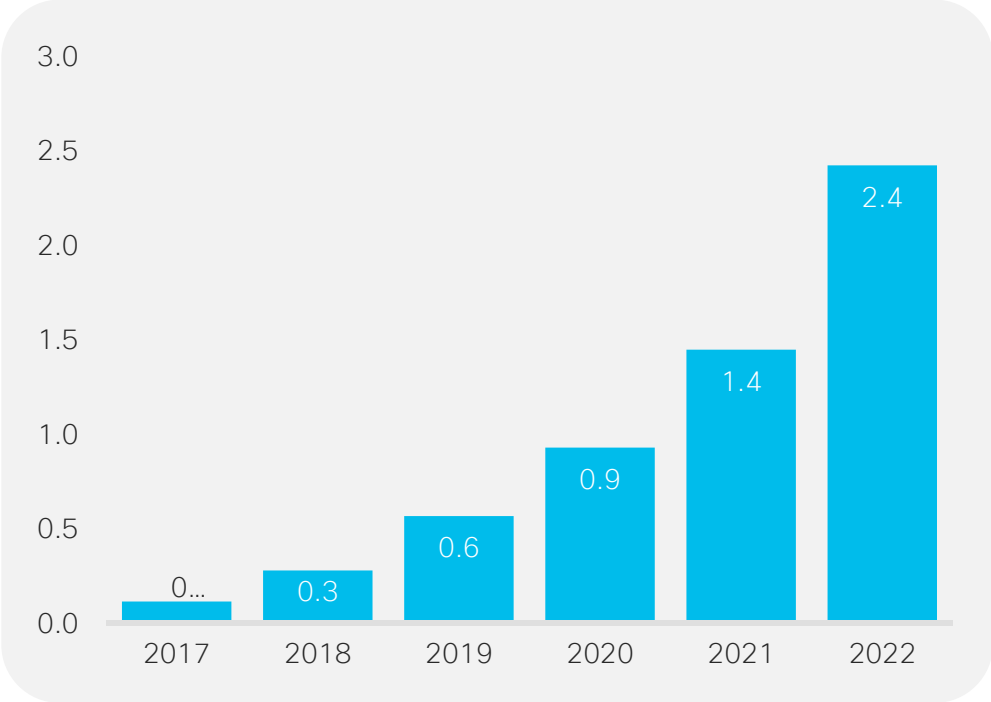


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM IPv6 Mobile Data Traffic

By 2022, IPv6 mobile traffic will generate 55% of the total mobile data traffic

85% CAGR
2017–2022

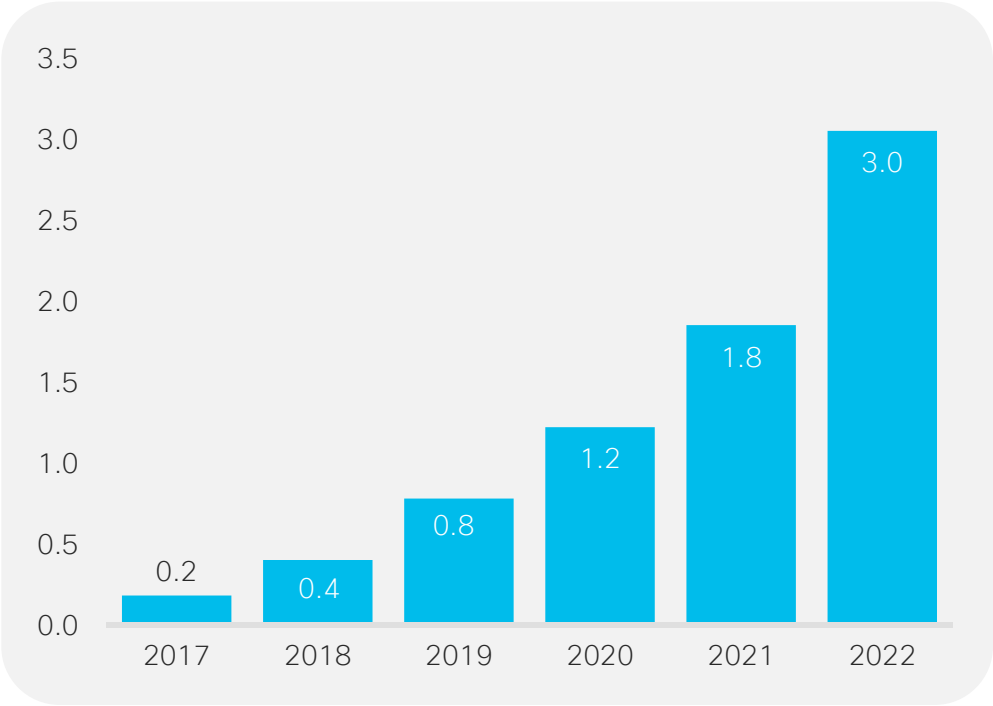


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE IPv6 Mobile Data Traffic

By 2022, IPv6 mobile traffic will generate 60% of the total mobile data traffic

76% CAGR
2017–2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

VNI Mobile Forecast Update, 2017–2022

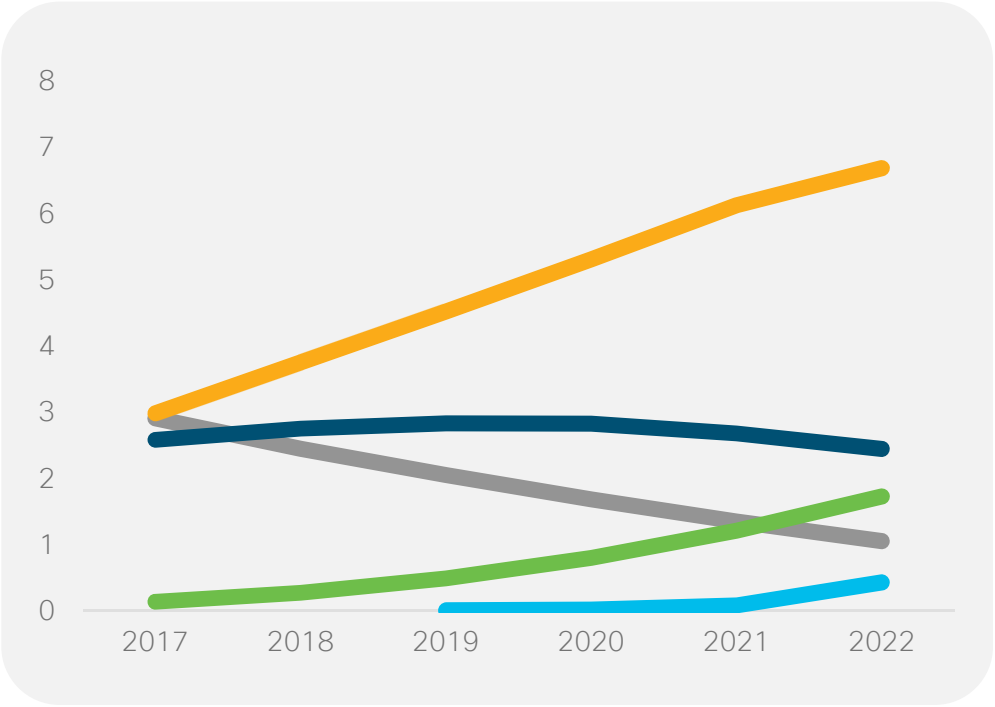
Top Mobile Networking Trends

1. Evolving Toward Smarter Multimedia Mobile Devices
2. Defining Cell Network Advances—2G, 3G, 4G, 5G
3. Measuring Mobile IoT Adoption—M2M and Emerging Wearables
4. Identifying New Mobile Applications and Requirements
5. Comparing Mobile Network Speed Improvements
6. Analyzing the Expanding Role and Coverage of Wi-Fi
7. Reviewing Tiered Pricing—Unlimited Data and Shared Plans

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Connections by Network Type

By 2022, 5G impact starts to emerge



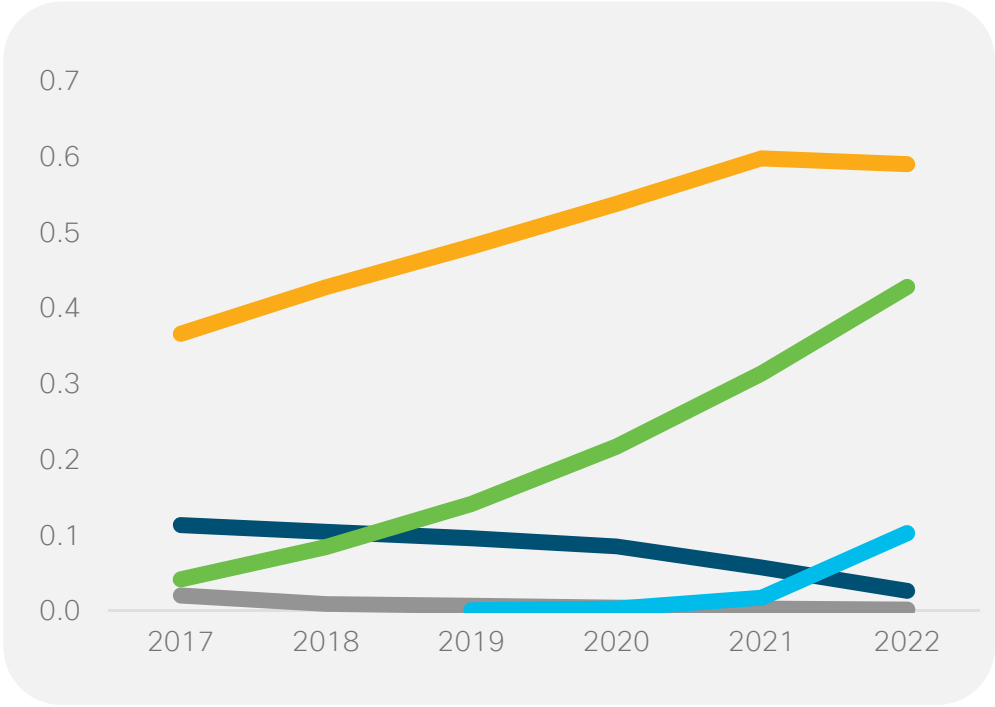
Note: This view includes M2M. LPWA includes cellular LPWA (e.g., NB-IOT) and non-cellular LPWA (e.g., LORA)

* Figures (n) refer to 2017, 2022 network connection type share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Connections by Network Type

By 2022, 5G impact starts to emerge



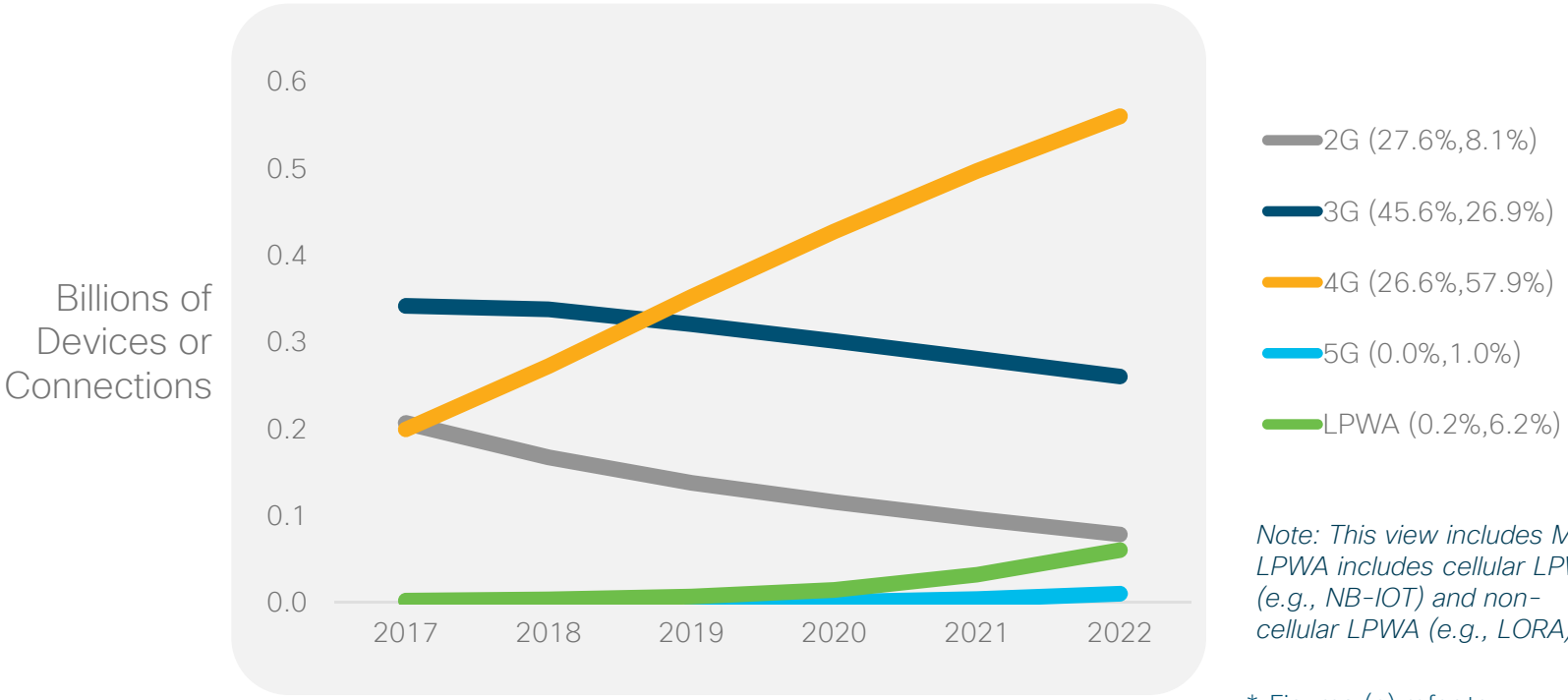
Note: This view includes M2M. LPWA includes cellular LPWA (e.g., NB-IOT) and non-cellular LPWA (e.g., LORA)

* Figures (n) refer to 2017, 2022 network connection type share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM Mobile Connections by Network Type

By 2022, 5G impact still nascent



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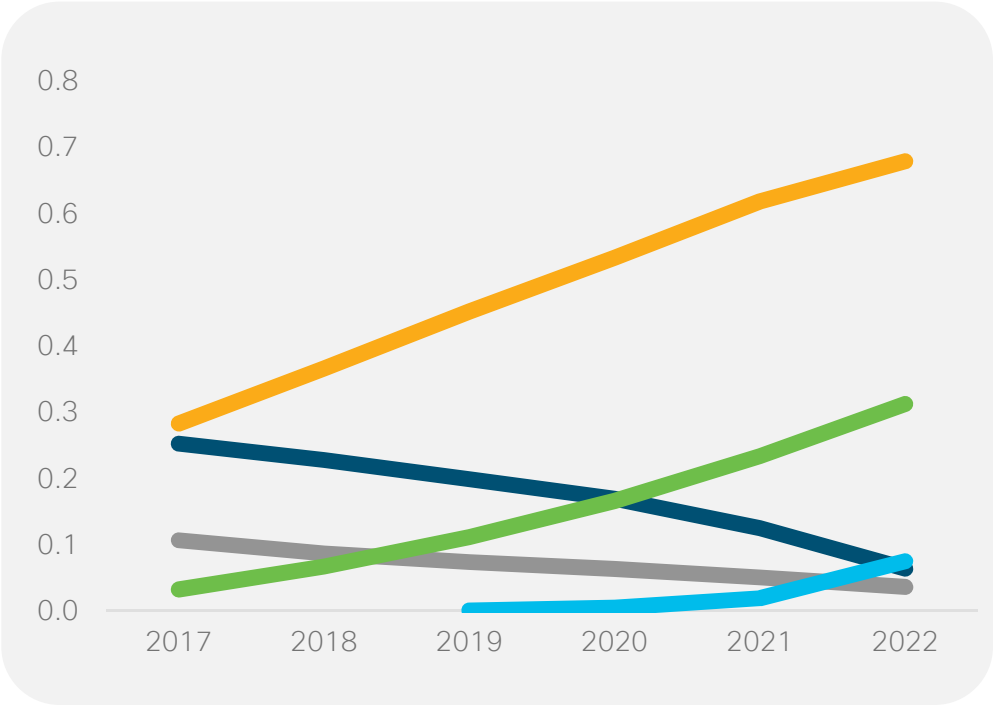
* Figures (n) refer to 2017, 2022 network connection type share

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE Mobile Connections by Network Type

By 2022, 5G impact starts to emerge



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Note: This view includes M2M. LPWA includes cellular LPWA (e.g., NB-IOT) and non-cellular LPWA (e.g., LORA)

* Figures (n) refer to 2017, 2022 network connection type share

LPWA vs. 5G: Comparative IoT Capabilities

LPWA

A highly efficient narrowband solution, purpose-built for low-end IoT

- Power efficient
- Low device cost
- Small, intermittent amounts of data over long distances
- Latency tolerant

Note: LPWA includes cellular LPWA (e.g., NB-IOT) and non-cellular LPWA (e.g., LORA)

5G

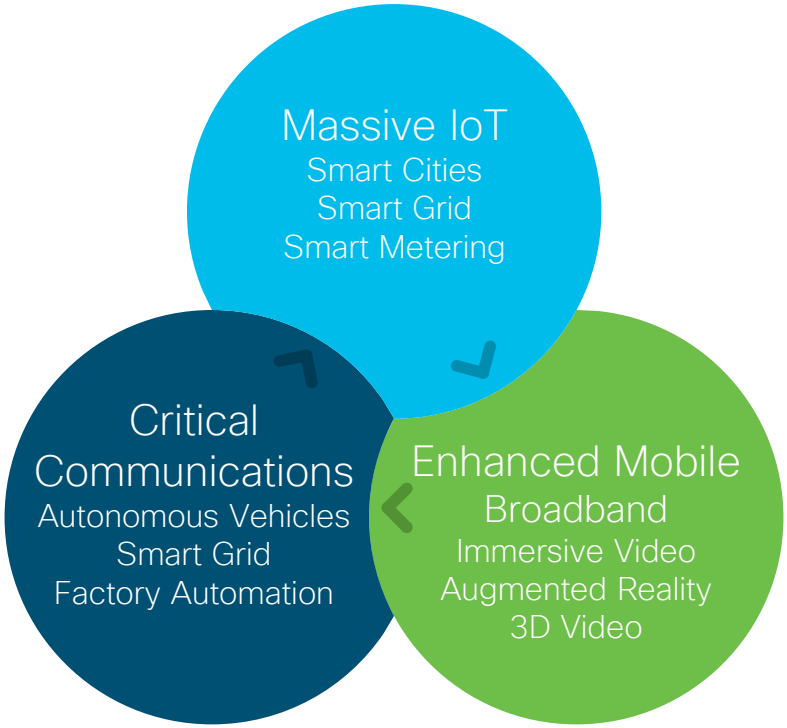
A highly flexible broadband solution, suitable for low- and high-end IoT

- Power efficient
- Cost optimized
- Massive IoT connection density
- High bandwidth & ultra-low latency
- Dynamic resource allocation per app

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

5G IoT Applications by Category

Diverse scale, network requirements, experience and business value



Source: GSMA

Mobile Connections by Network Type

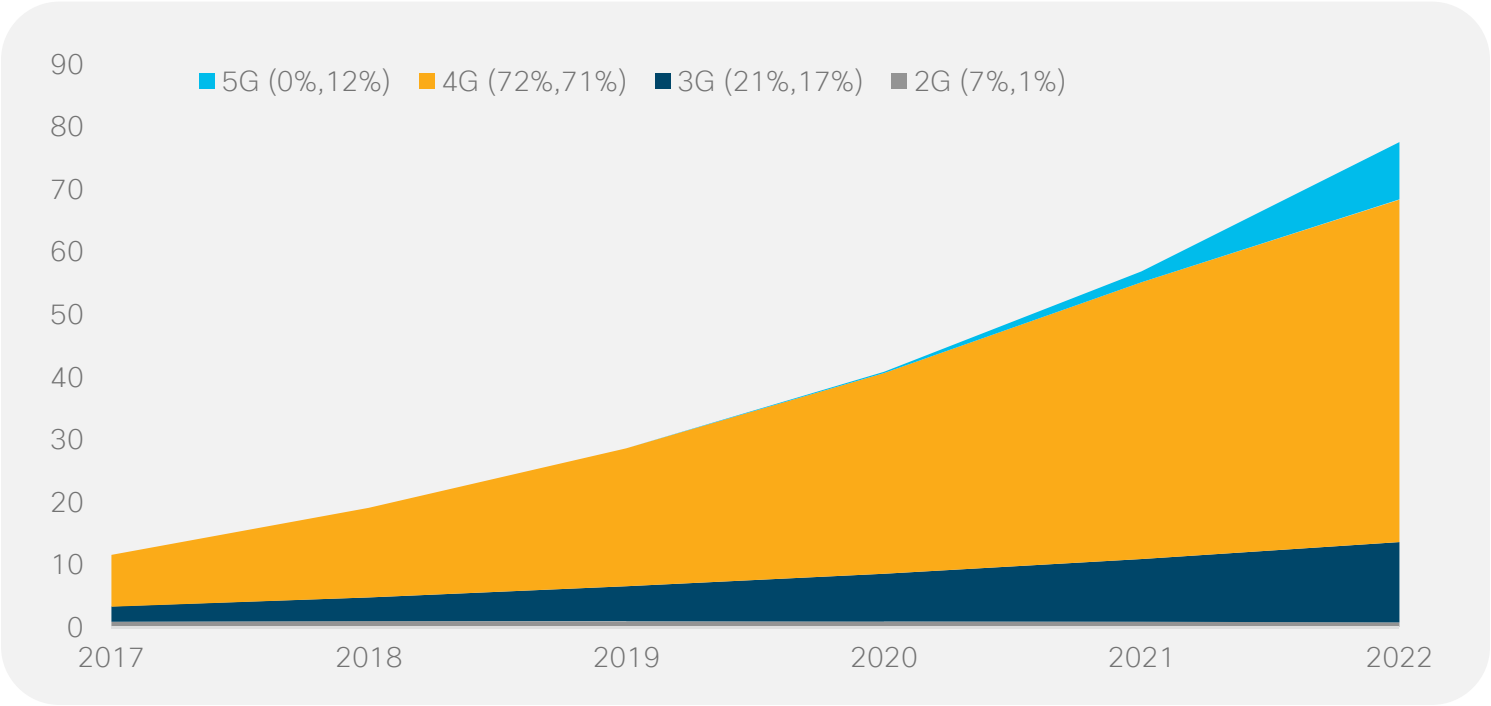
2022 – Regional share

% Share	2G	3G	4G	5G	LPWA
GLOBAL					
Global	8	20	54	3.4	14
BY REGION					
North America	0	2	51	8.9	37
Western Europe	3	5	58	6.4	27
Central and Eastern Europe	3	18	63	0.5	16
Asia Pacific	9	15	61	3.6	11
Latin America	8	27	58	1.0	6
Middle East & Africa	20	54	23	0.2	4

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Traffic by Network Type

By 2022, 5G will carry 12% of mobile data traffic

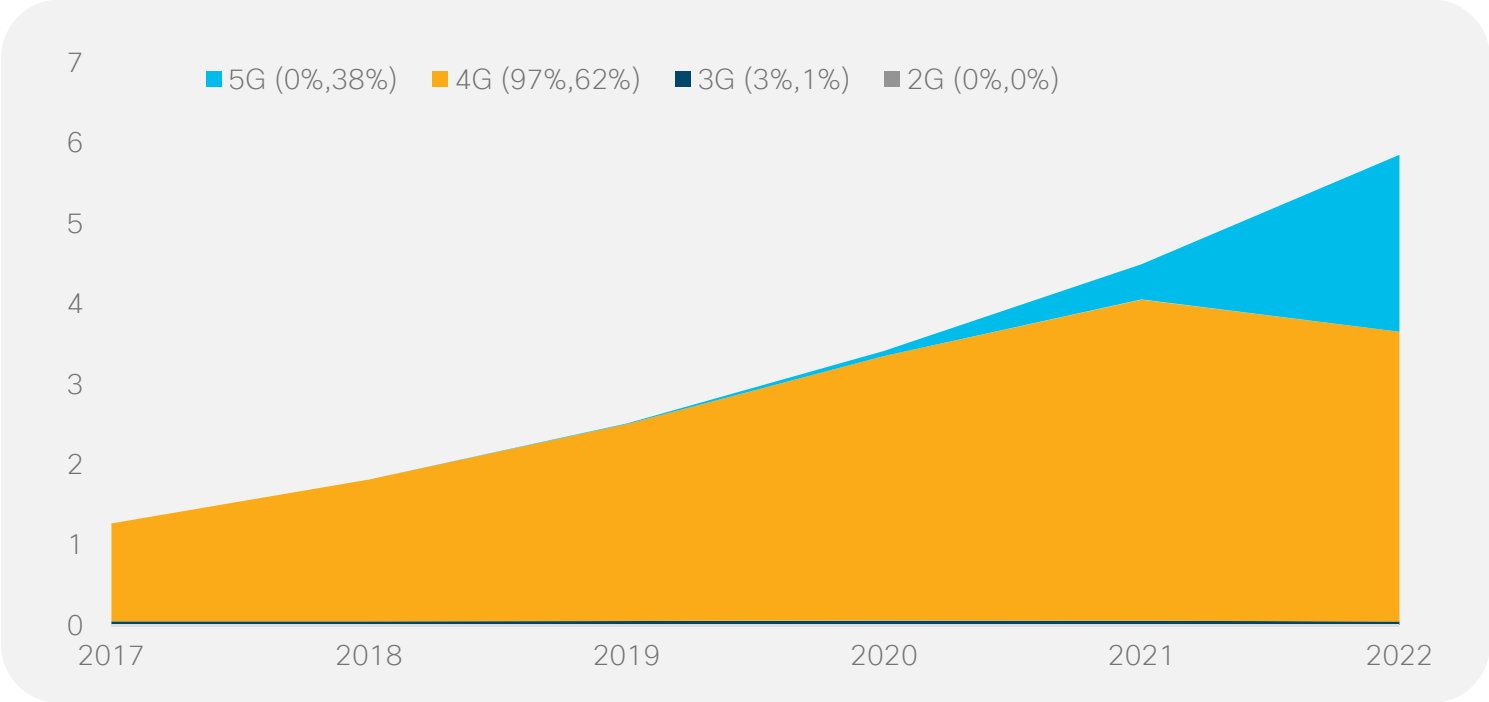


* Figures (n) refer to 2017, 2022 network type share of traffic

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Traffic by Network Type

By 2022, 5G will carry nearly 40% of mobile data traffic

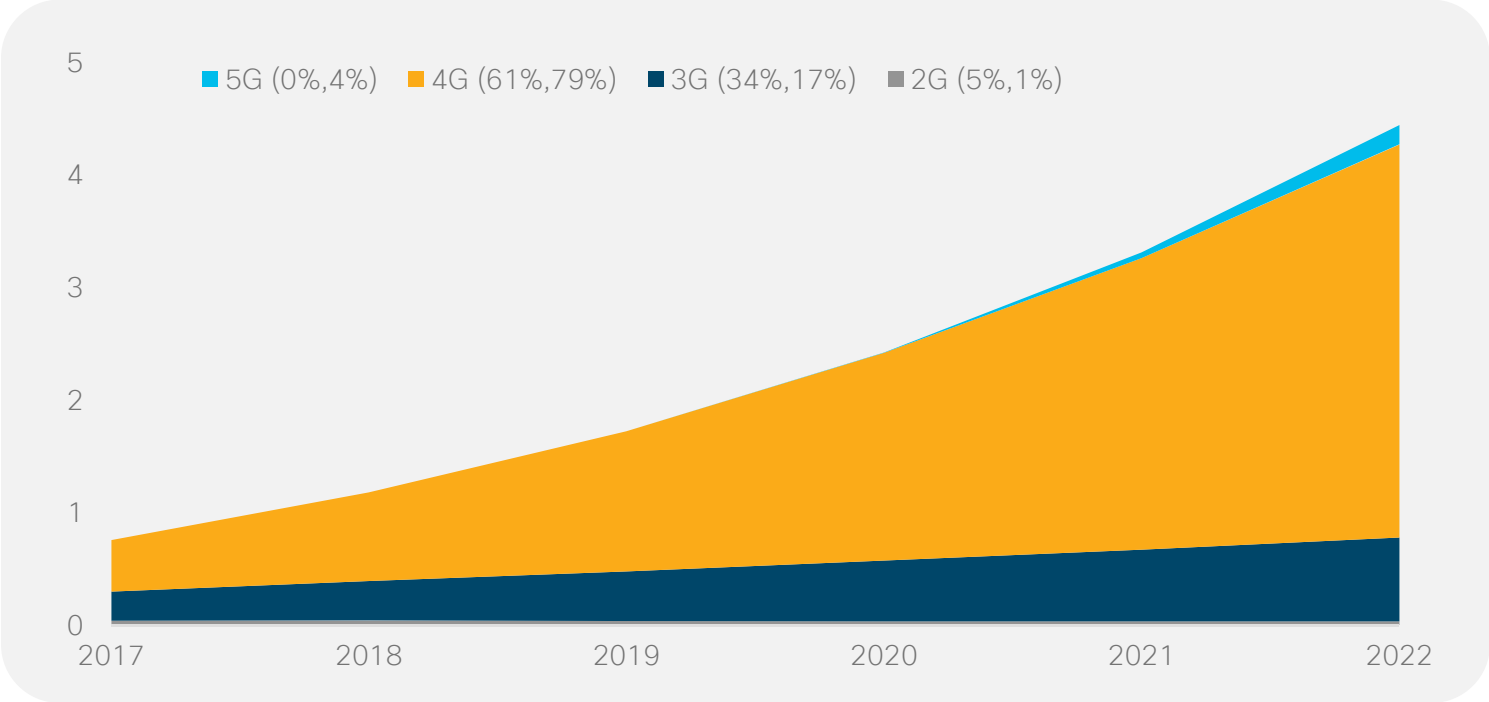


* Figures (n) refer to 2017, 2022 network type share of traffic

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM Mobile Traffic by Network Type

By 2022, 5G will carry nearly 4% of mobile data traffic

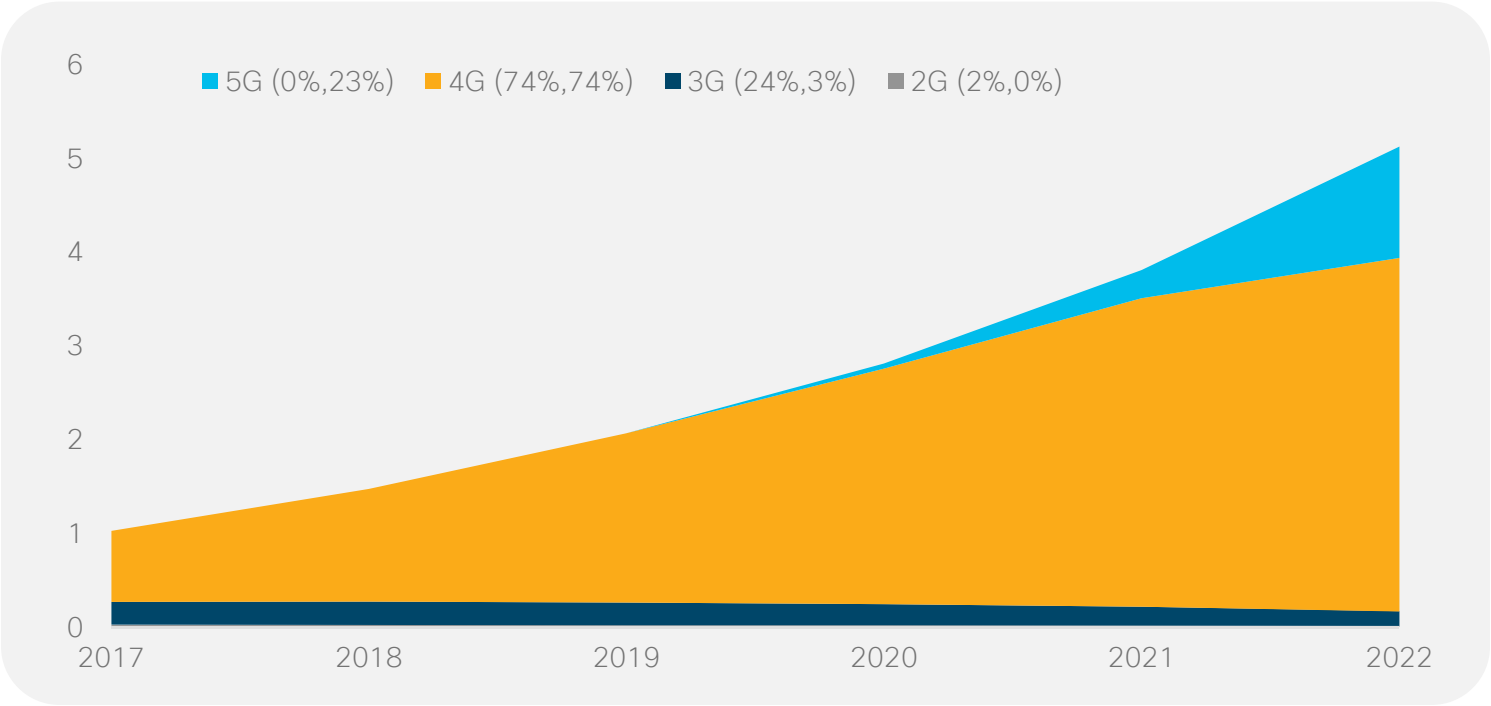


* Figures (n) refer to 2017, 2022 network type share of traffic

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE Mobile Traffic by Network Type

By 2022, 5G will carry over 20% of mobile data traffic



* Figures (n) refer to 2017, 2022 network type share of traffic

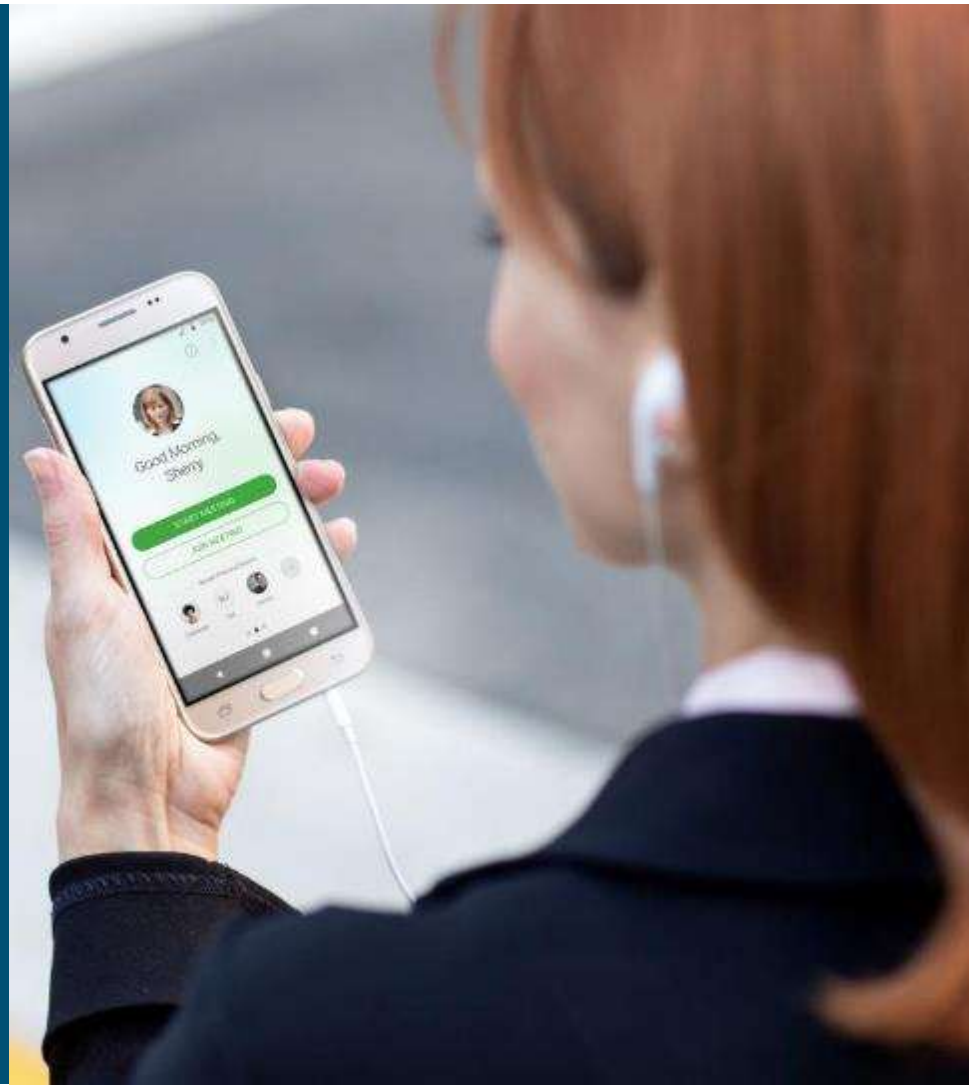
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

By 2022, 5G connections and devices will be 3% of global mobile devices and connections and will account for 12% (9.2 EBs/month) of mobile data traffic.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Globally, in 2017, a 4G connection generated 2.8 GB/month, nearly 3X more than a 3G connection (949 MB/month).

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



By 2022, a 5G connection will generate 22 GB/mo, nearly 3X more than a 4G connection (8.2 GB/month).

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

VNI Mobile Forecast Update, 2017–2022

Top Mobile Networking Trends

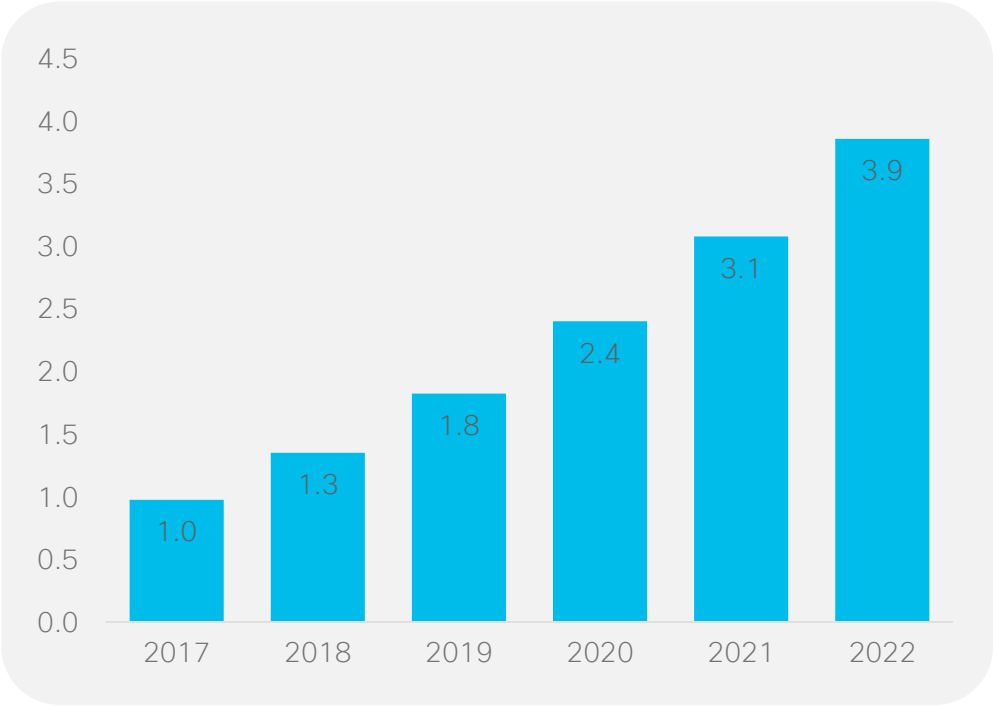
1. Evolving Toward Smarter Multimedia Mobile Devices
2. Defining Cell Network Advances—2G, 3G, 4G, 5G
3. **Measuring Mobile IoT Adoption—M2M and Emerging Wearables**
4. Identifying New Mobile Applications and Requirements
5. Comparing Mobile Network Speed Improvements
6. Analyzing the Expanding Role and Coverage of Wi-Fi
7. Reviewing Tiered Pricing—Unlimited Data and Shared Plans

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global M2M Connections Growth

M2M Connections will grow 4-fold from 2017 to 2022

32% CAGR
2017–2022

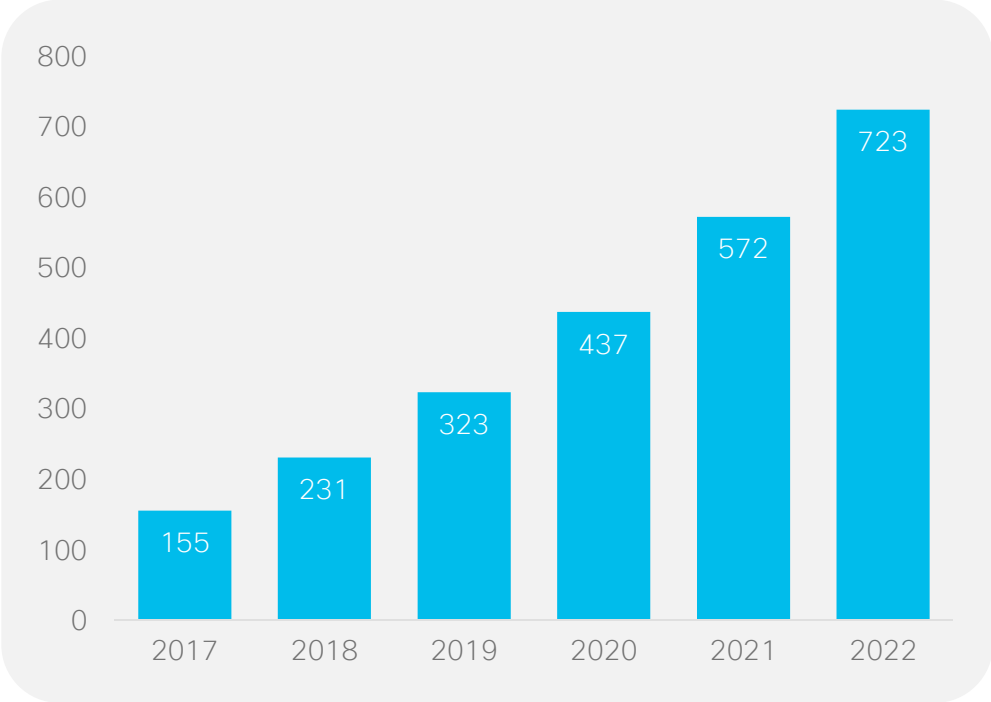


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America M2M Connections Growth

M2M Connections will grow 5-fold from 2017 to 2022

36% CAGR
2017–2022

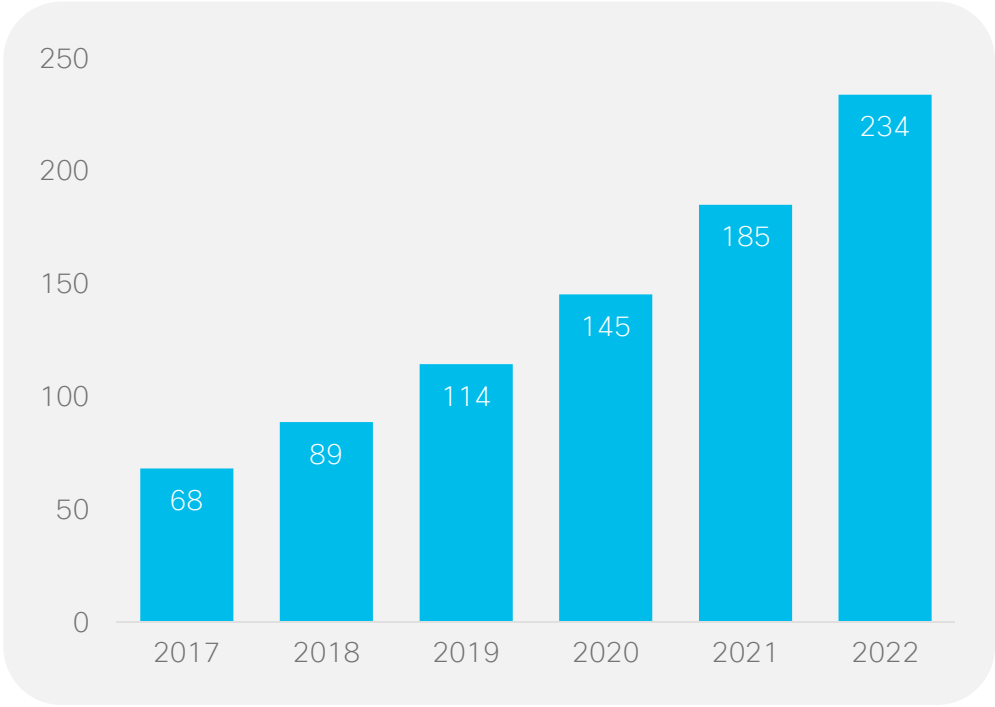


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM M2M Connections Growth

M2M Connections will grow 3-fold from 2017 to 2022

28% CAGR
2017–2022

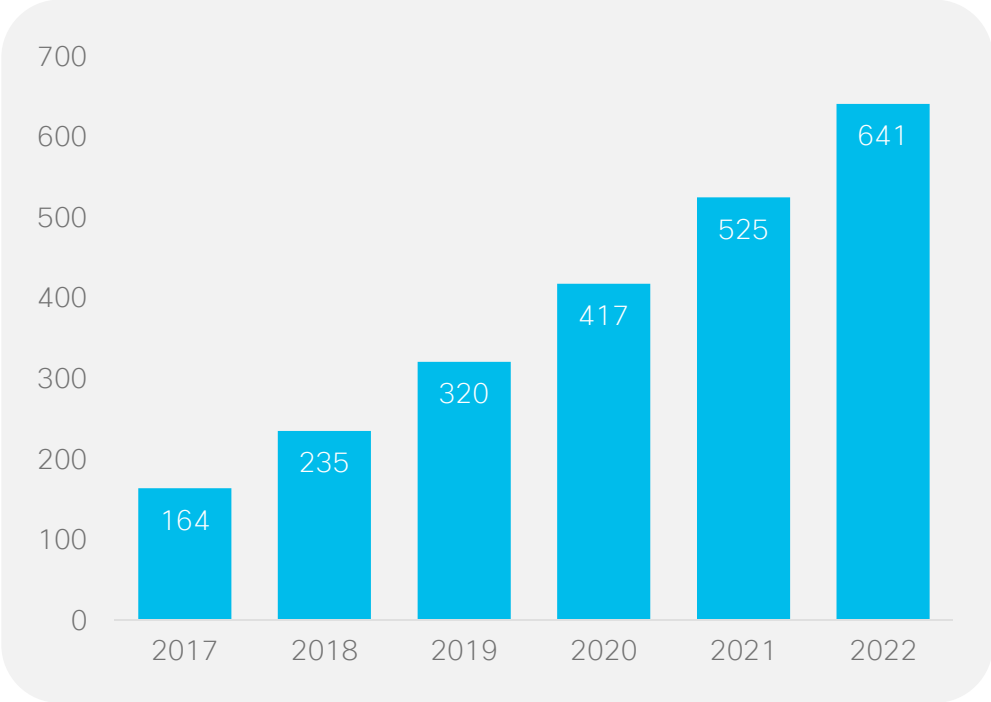


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE M2M Connections Growth

M2M Connections will grow 4-fold from 2017 to 2022

31% CAGR
2017–2022

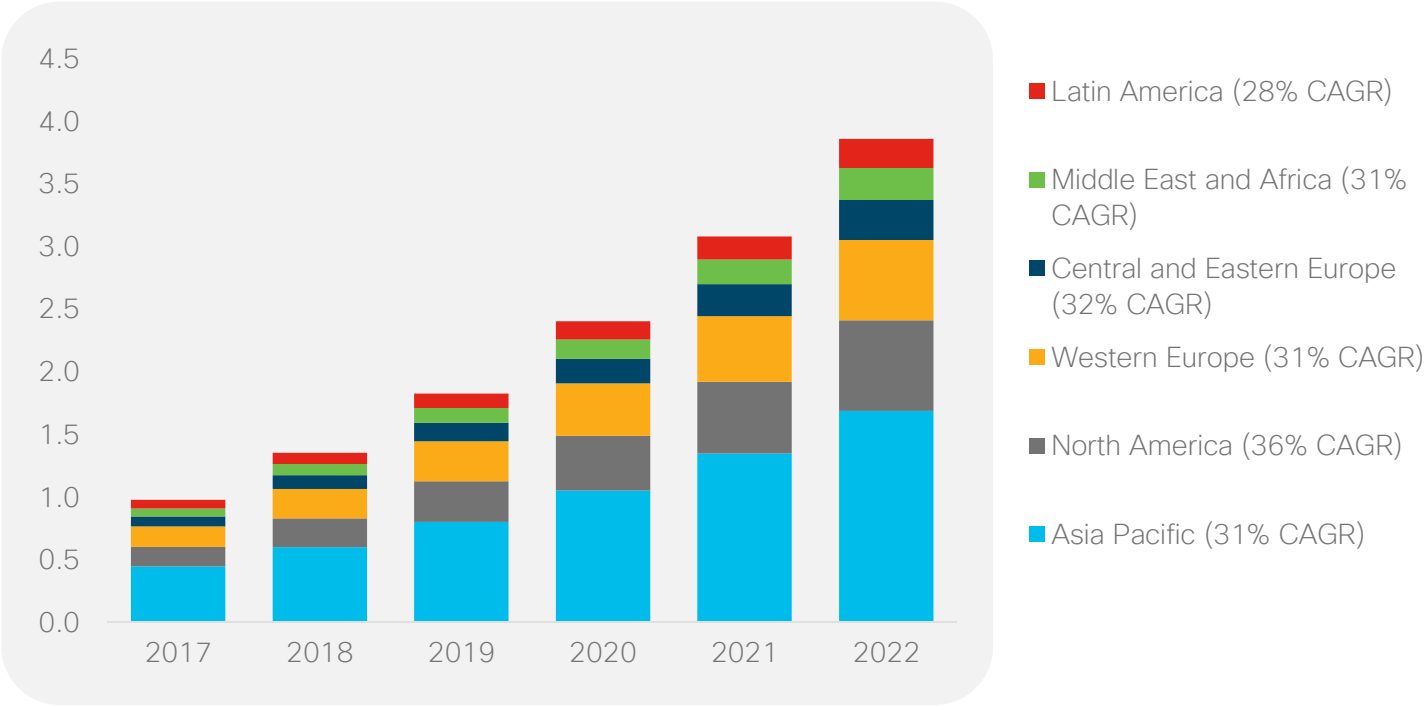


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile M2M Connections Growth

North America has the highest growth rate (36%) from 2017 to 2022

32% CAGR
2017–2022

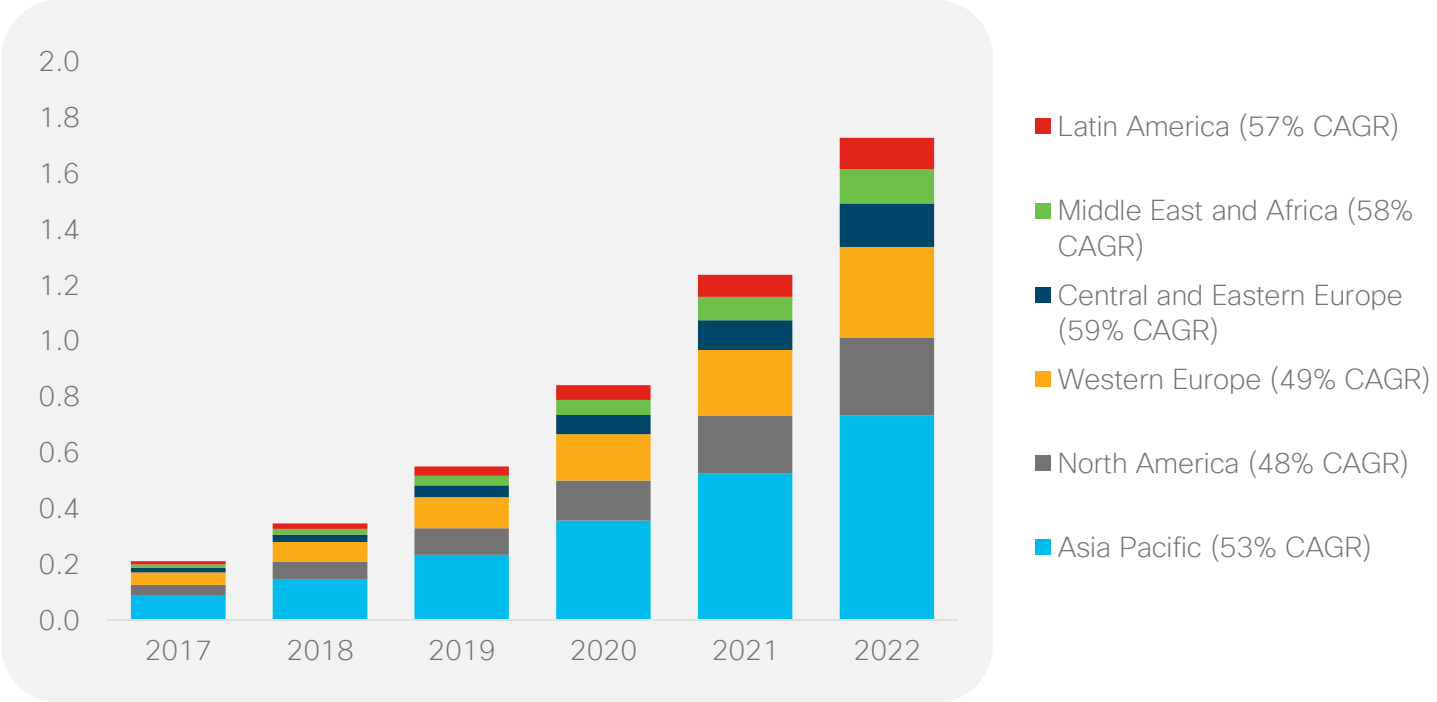


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile M2M Traffic Growth

M2M traffic will grow 8-fold from 2017 to 2022
Central & Eastern Europe will have the highest growth (10-fold)

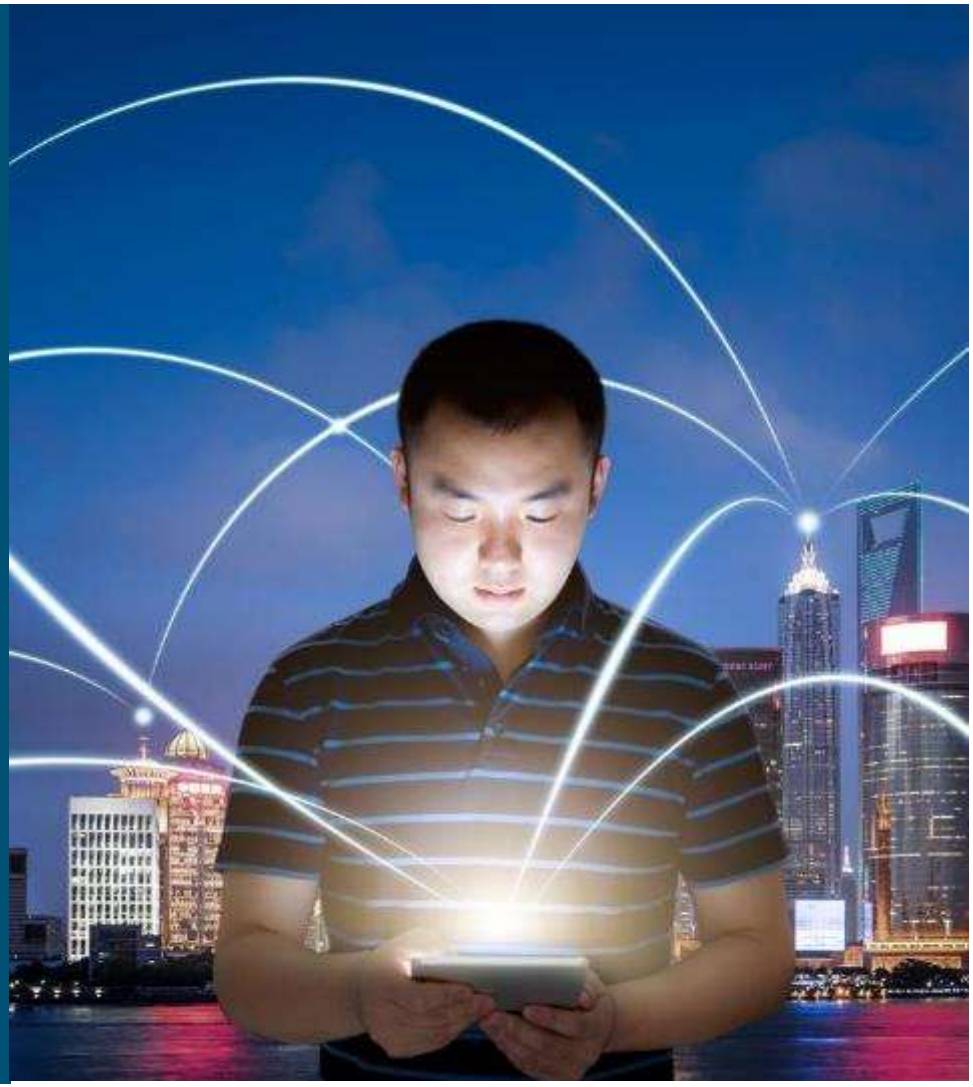
52% CAGR
2017–2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

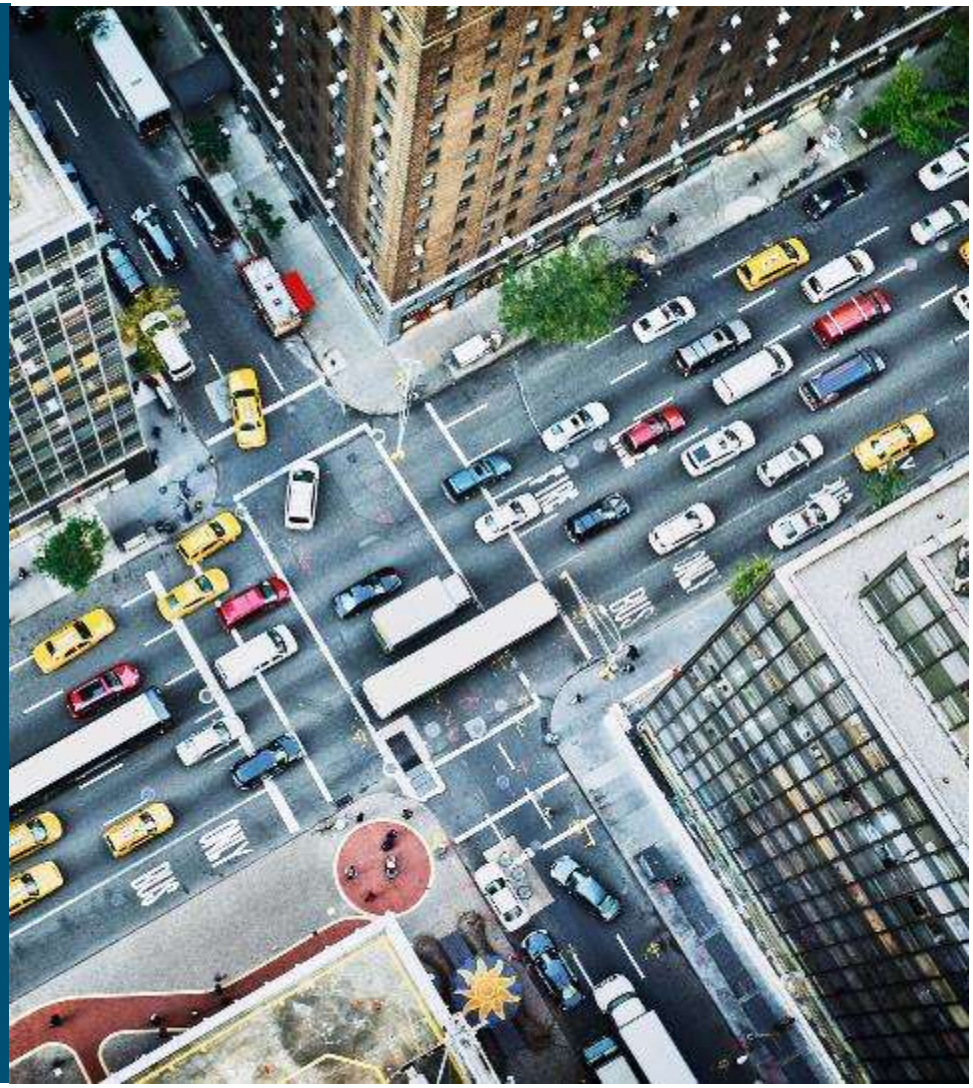
By 2022, M2M modules will be 31% of total global mobile devices and connections and will account for 2% (1.7 EBs/month) of mobile data traffic.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



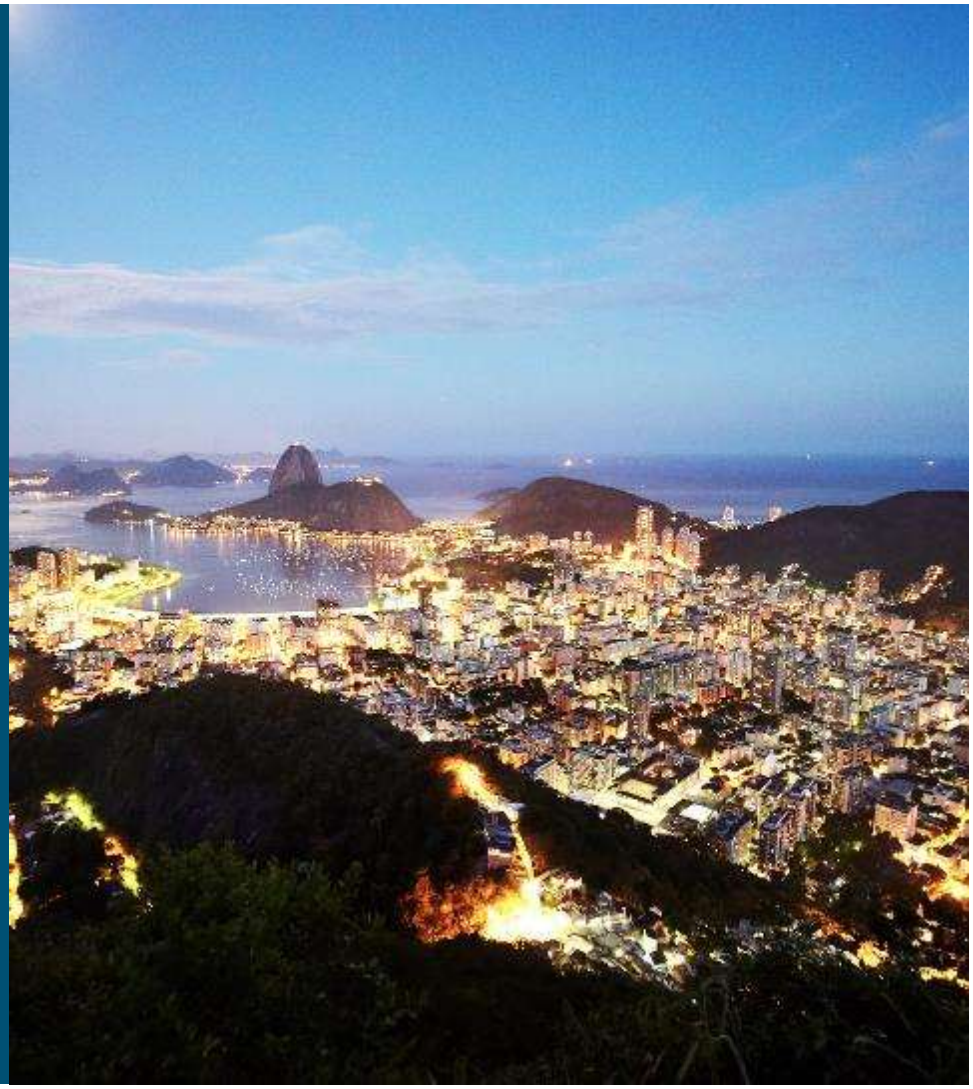
By 2022, M2M modules will be 63% of total North America mobile devices and connections and will account for 5% (279 PBs/month) of mobile data traffic.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



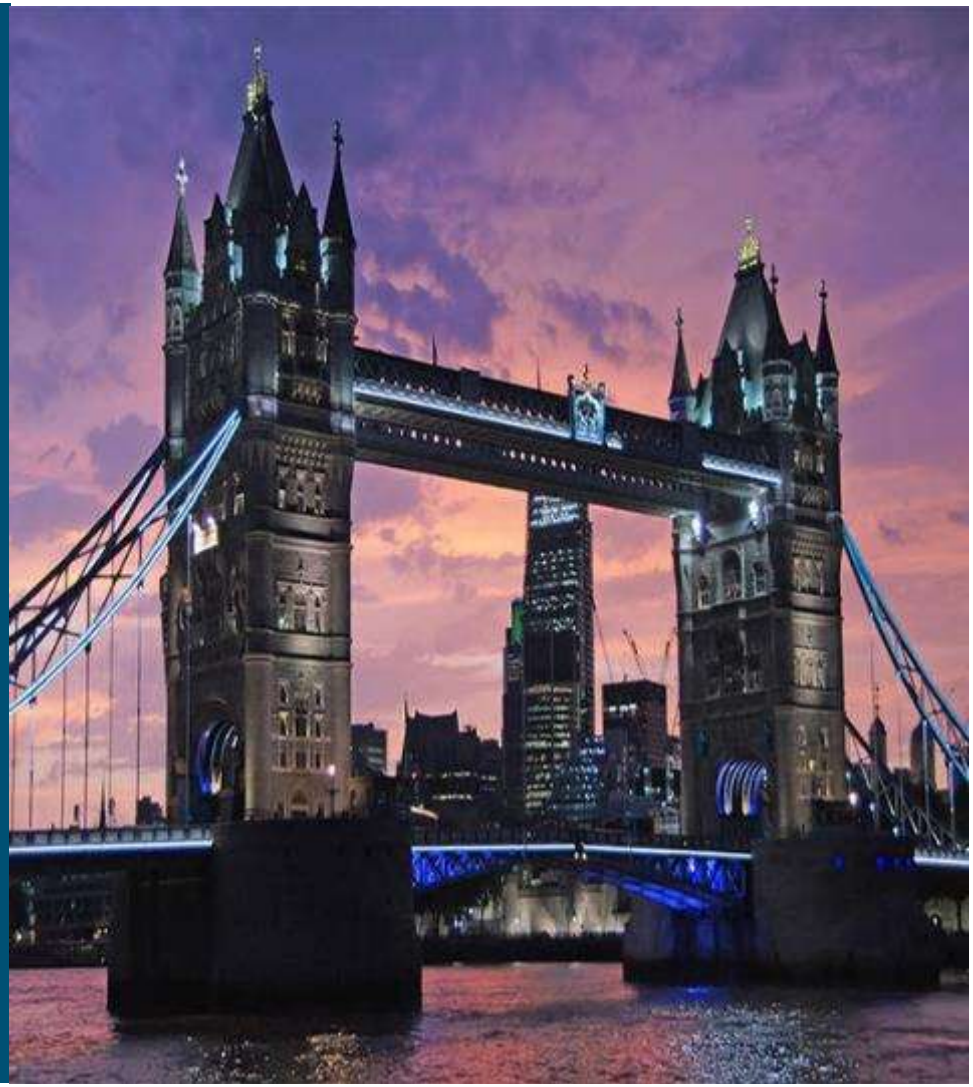
By 2022, M2M modules will be 24% of total Latin America mobile devices and connections and will account for 3% (113 PBs/month) of mobile data traffic.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



By 2022, M2M modules will be 55% of total Western Europe mobile devices and connections and will account for 6% (324 PBs/month) of mobile data traffic.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



Connected Home

- Home automation
- Building security
- Network equipment – printers +
- Network infrastructure – routers +
- White goods
- Tracking applications
- Household information devices

Connected Work

- Office building automation
- Building security
- Office equipment – printers +
- Routers +
- Commercial appliances

Connected Car

- Fleet management
- In-vehicle entertainment systems, emergency calling, Internet
- Vehicle diagnostics, navigation
- Stolen vehicle recovery
- Lease, rental, insurance management

Connected Health

- Health monitors
- Assisted living – medicine dispensers +
- Clinical trials
- First responder connectivity
- Telemedicine

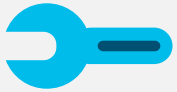
Connected Cities

- Environment and public safety – closed-circuit TV, street lighting, waste removal, information +
- Public space advertising
- Public transport
- Road traffic management

Retail

- Retail goods monitoring and payment
- Retail venue access and control
- Slot machines, vending machines

Manufacturing & Supply Chain



- Mining and extraction
- Manufacturing and processing
- Supply chain
- Warehousing and storage

Energy

- New energy sources – monitoring and power generation support apps
- Smart grid and distribution
- Micro-generation– generation of power, by residential, commercial and community users on their own property

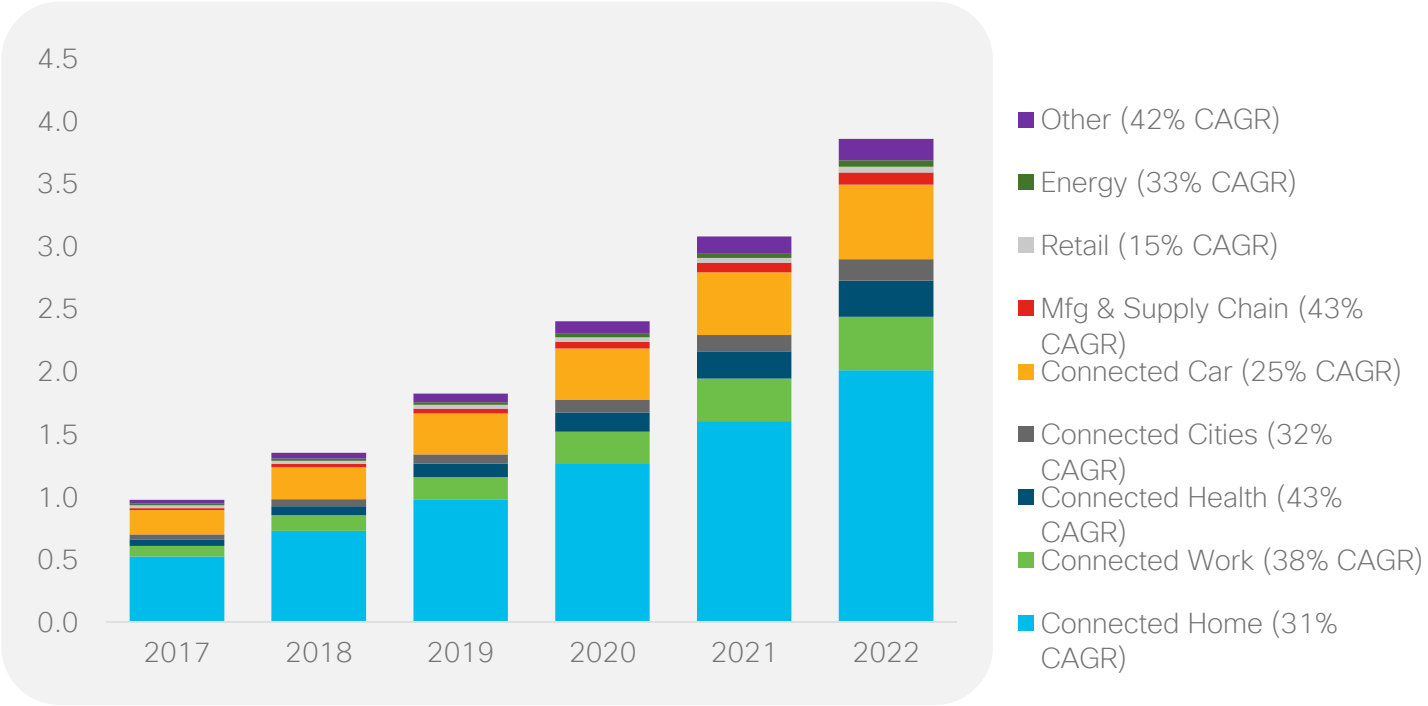
Other

- Agriculture – livestock, soil monitoring, water and resource conservation, temperature control for milk tanks +
- Construction: Site and equipment monitoring
- Emergency services and national security

Global Mobile M2M / IoT Growth by Vertical

By 2022, connected home largest, connected health fastest growth

32% CAGR
2017–2022

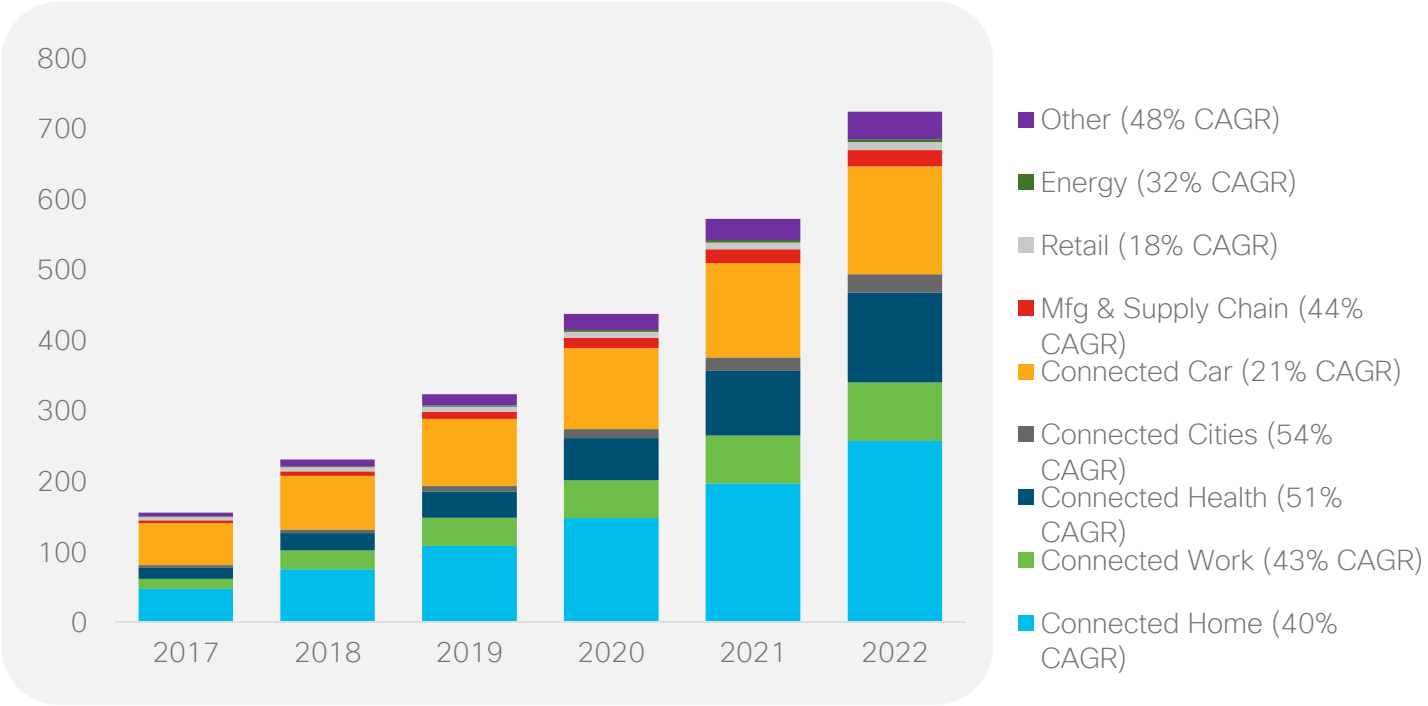


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile M2M / IoT Growth by Vertical

By 2022, connected home most connections, connected cities fastest growth

36% CAGR
2017–2022

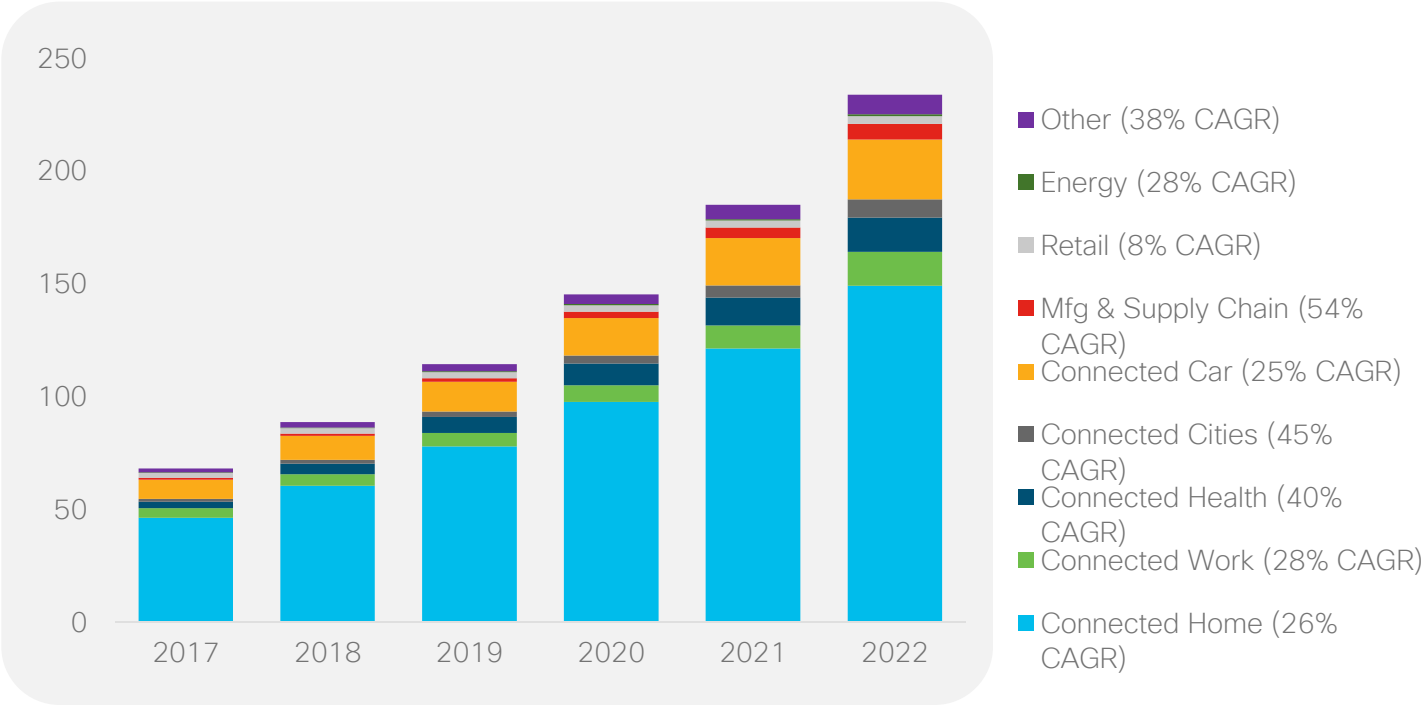


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM Mobile M2M / IoT Growth by Vertical

By 2022, connected home most connections, manufacturing & supply chain fastest growth

28% CAGR
2017–2022

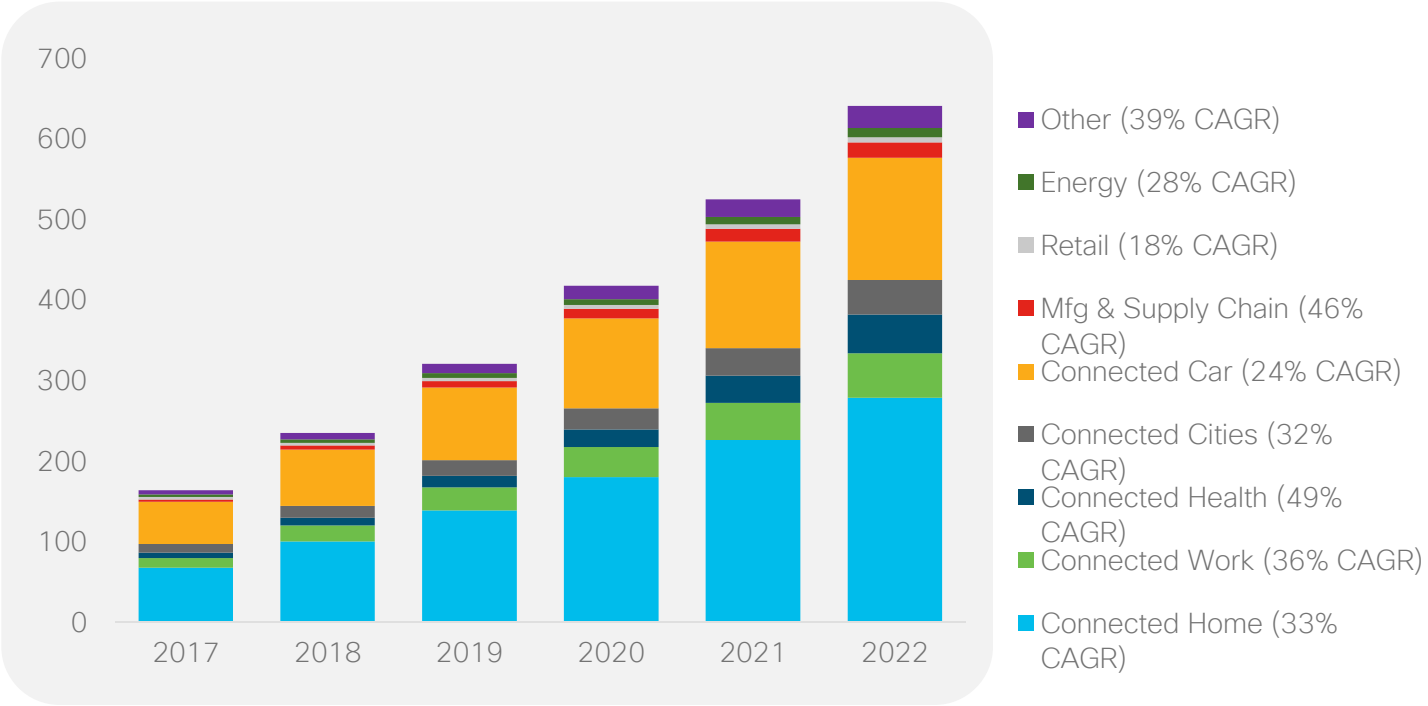


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE Mobile M2M / IoT Growth by Vertical

By 2022, connected home most connections, connected health fastest growth

31% CAGR
2017–2022

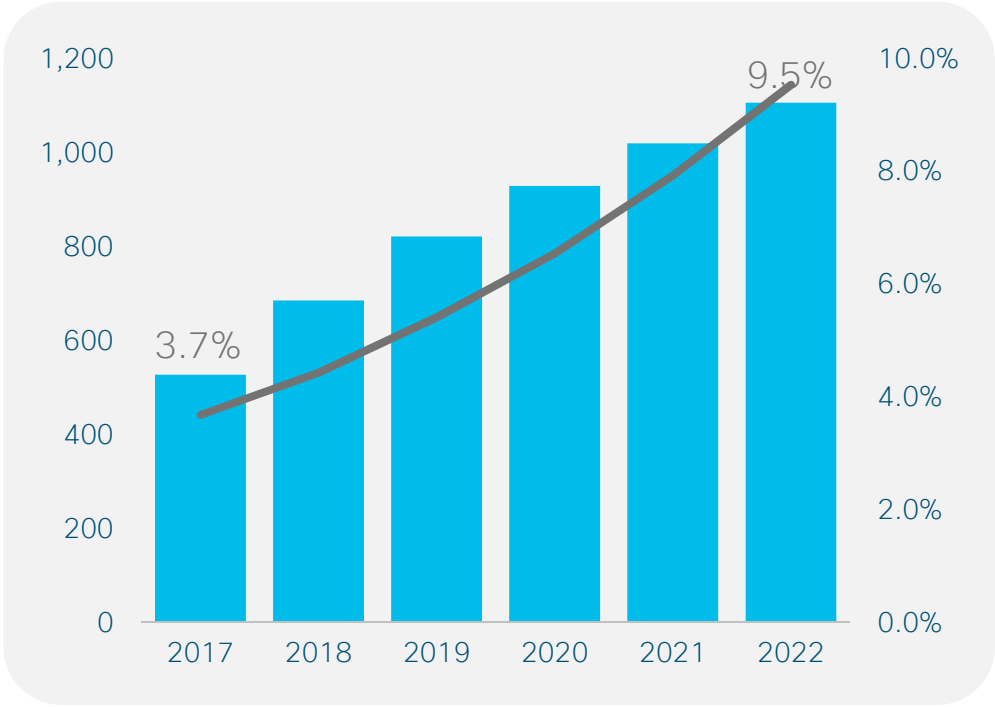


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Connected Wearable Devices

Global connected wearables will grow 2-fold from 2017-2022; By 2022, nearly 10% of wearables will have embedded cellular connectivity

16% CAGR
2017–2022

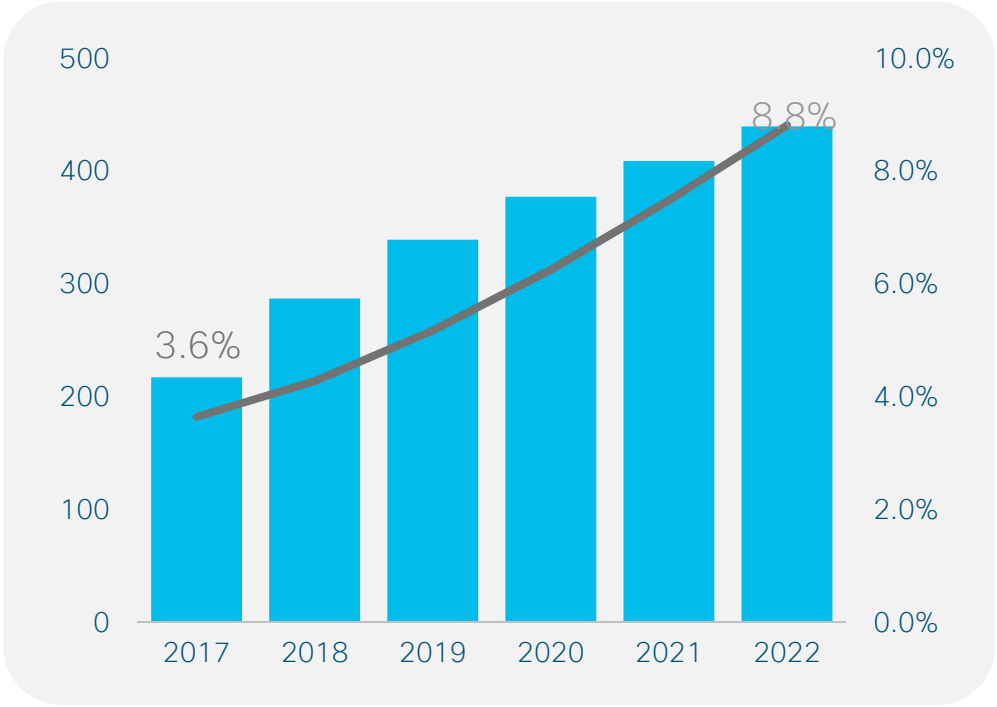


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Connected Wearable Devices

NA connected wearables will grow 2-fold from 2017-2022; By 2022, nearly 9% of wearables will have embedded cellular connectivity

15% CAGR
2017-2022

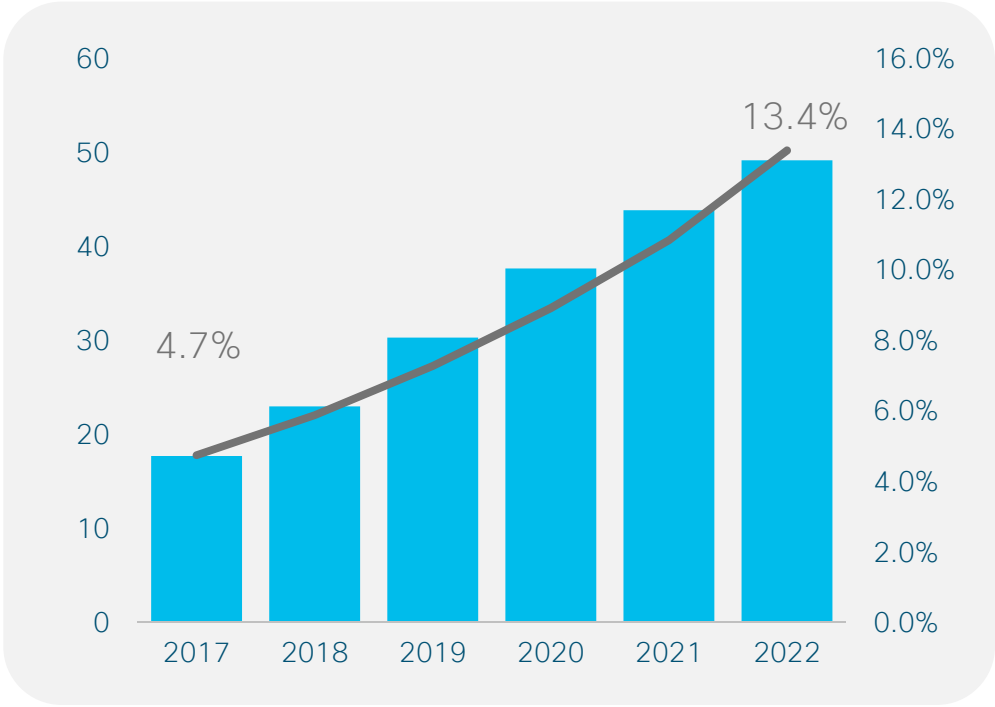


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017-2022

LATAM Connected Wearable Devices

LATAM connected wearables will grow nearly 3-fold from 2017-2022; By 2022, over 13% of wearables will have embedded cellular connectivity

23% CAGR
2017–2022

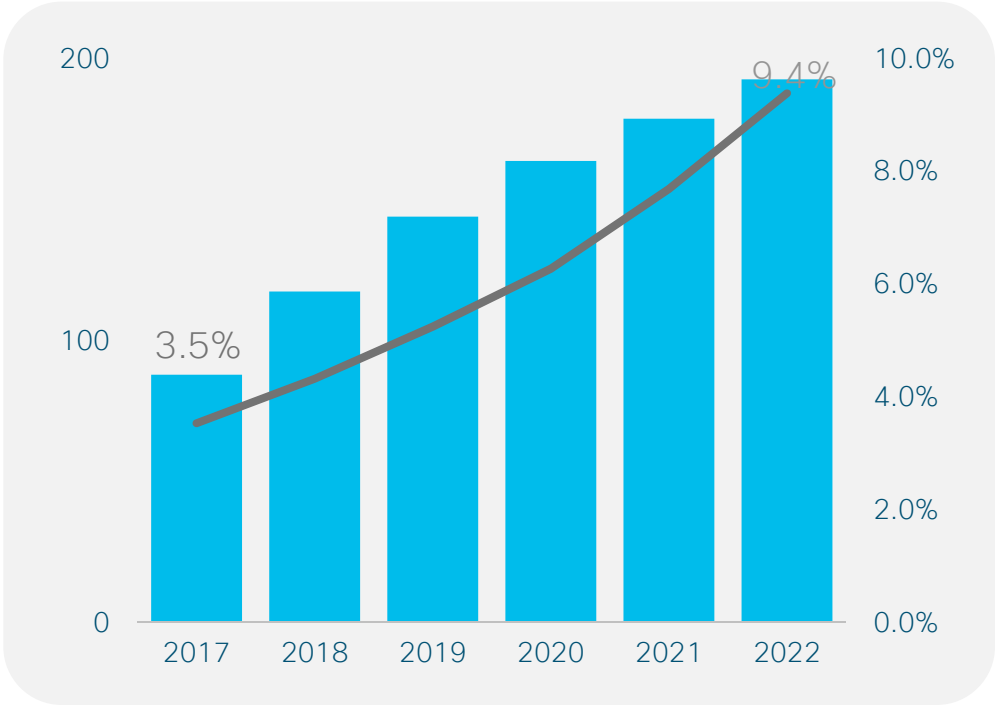


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE Connected Wearable Devices

WE connected wearables will grow 2-fold from 2017-2022; By 2022, over 9% of wearables will have embedded cellular connectivity

17% CAGR
2017-2022

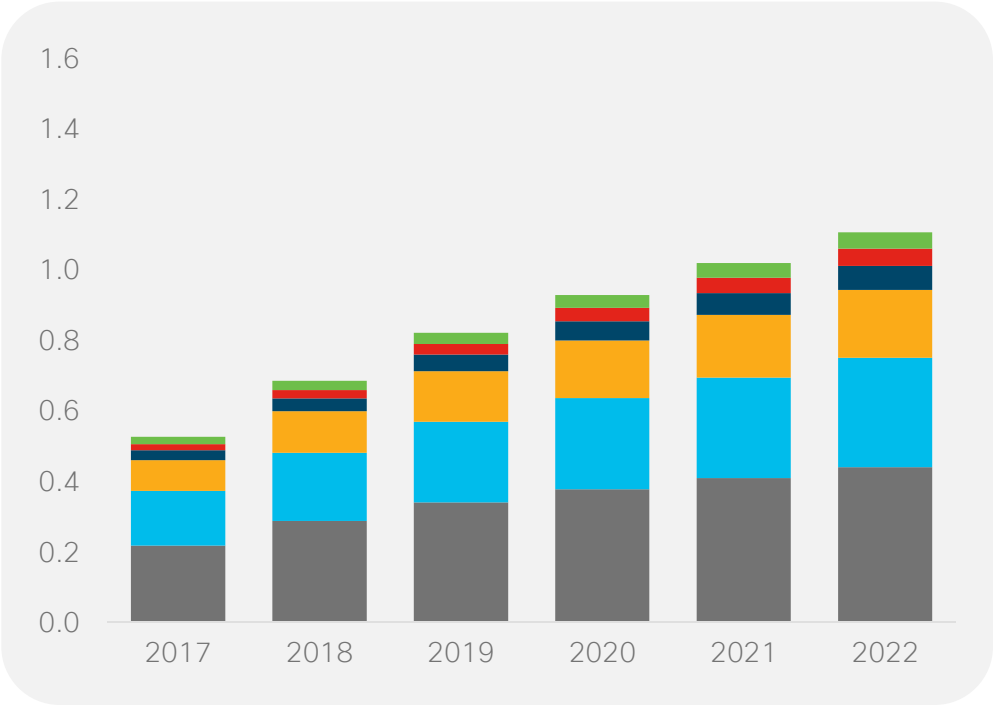


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017-2022

Regional Connected Wearables

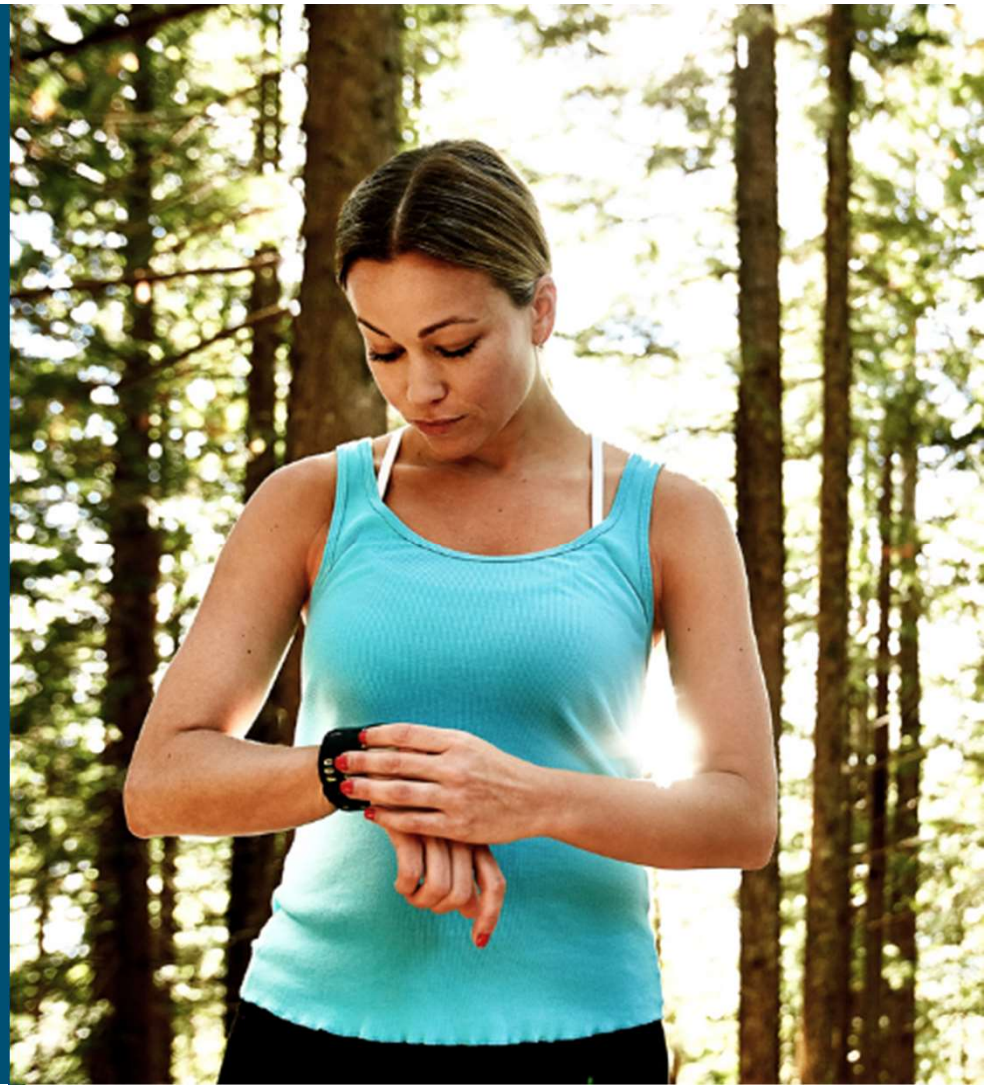
North America will maintain the largest share

16% CAGR
2017–2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

By 2022, 10% of total wearables globally will have embedded cellular connectivity.



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

VNI Mobile Forecast Update, 2017–2022
Top Mobile Networking Trends

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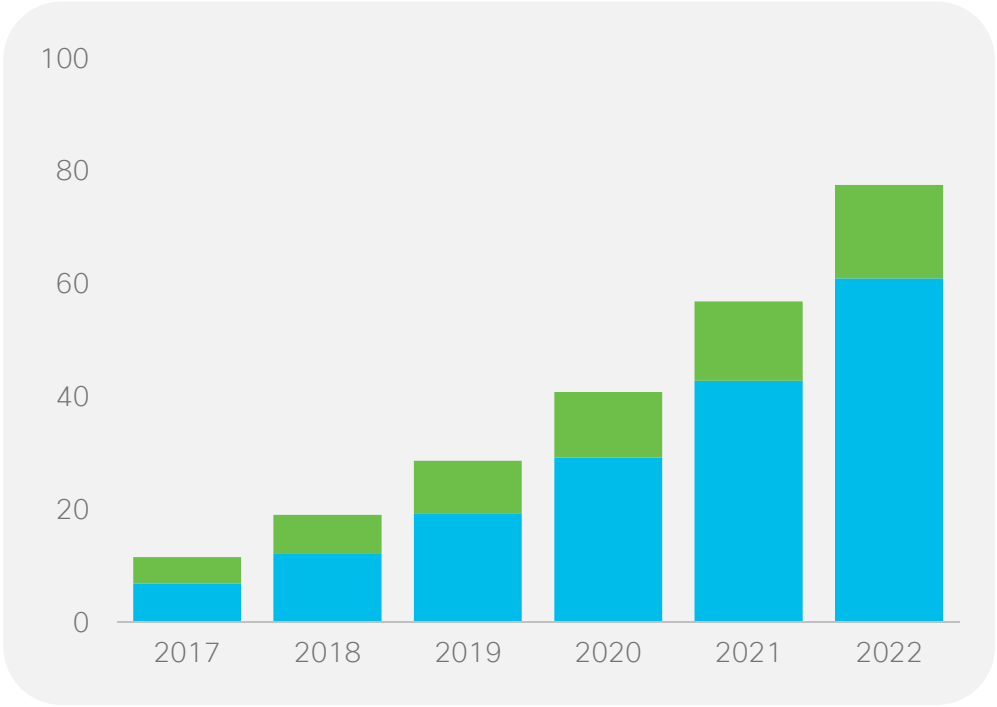
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Data Traffic Growth / Apps

By 2022, mobile video will be 79% of mobile data traffic

46% CAGR
2017–2022



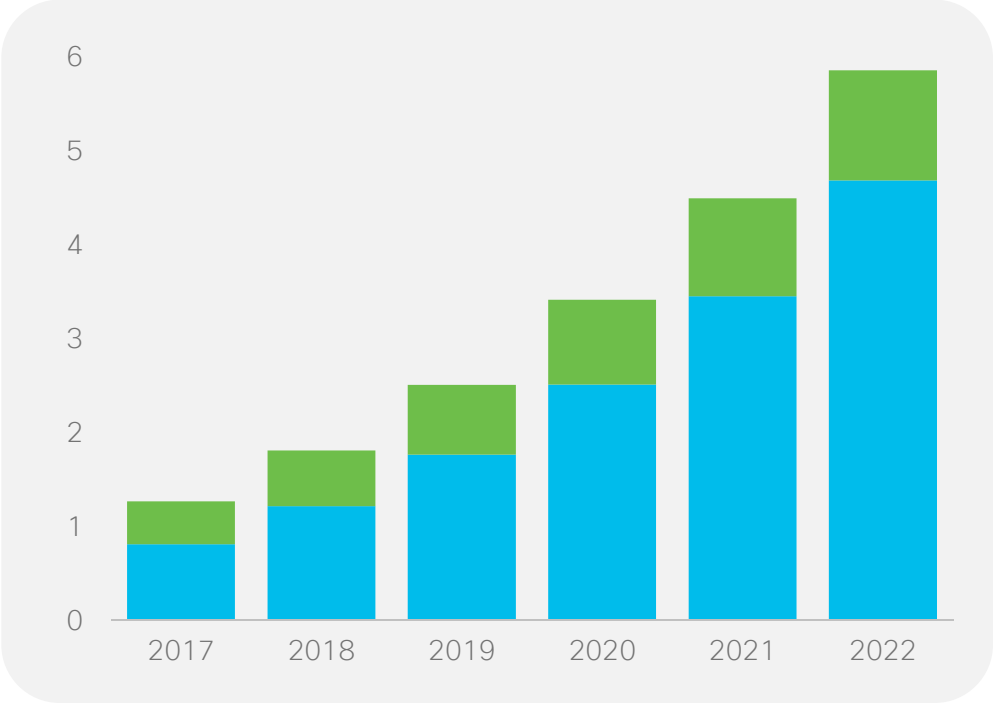
* Figures (n) refer to 2017 and 2022 mobile data traffic shares

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Data Traffic Growth / Apps

By 2022, mobile video will be 80% of mobile data traffic

36% CAGR
2017–2022



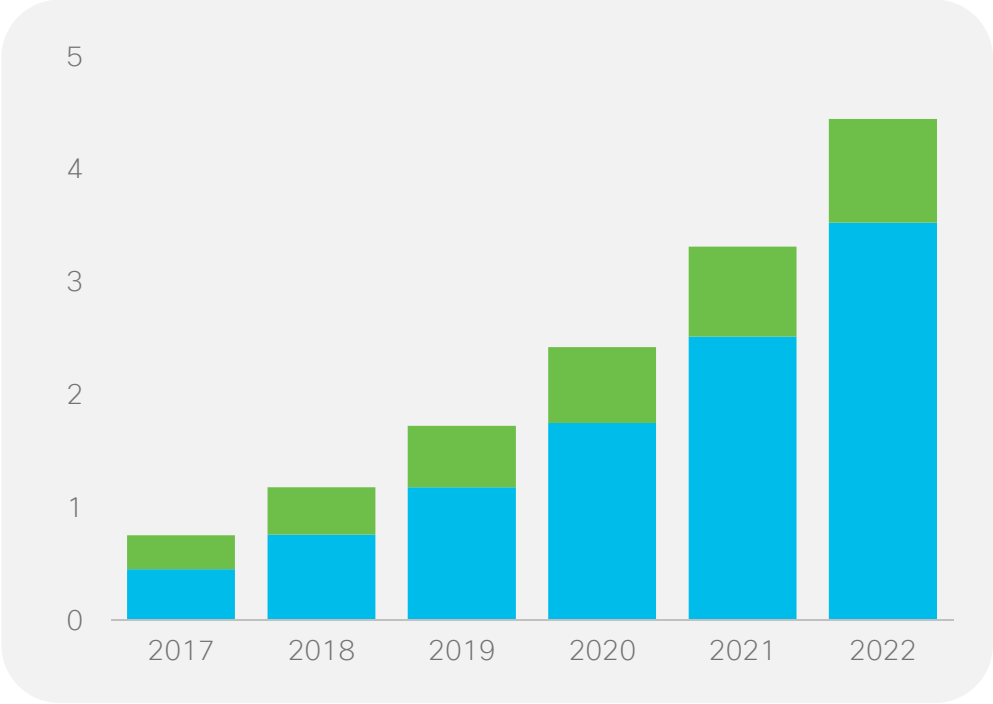
* Figures (n) refer to 2016 and 2021 mobile data traffic shares

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

LATAM Mobile Data Traffic Growth / Apps

By 2022, mobile video will be 79% of mobile data traffic

43% CAGR
2017–2022



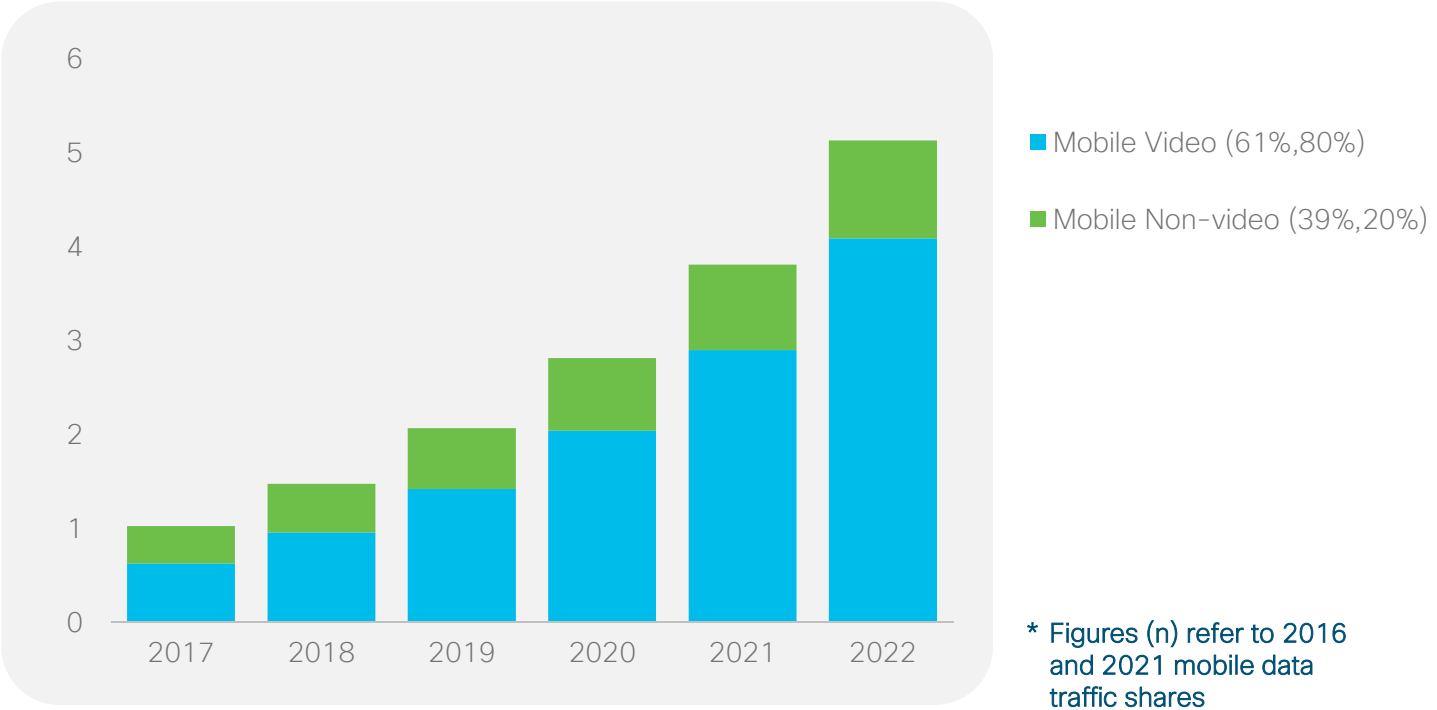
* Figures (n) refer to 2016 and 2021 mobile data traffic shares

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

WE Mobile Data Traffic Growth / Apps

By 2022, mobile video will be 80% of mobile data traffic

38% CAGR
2017–2022

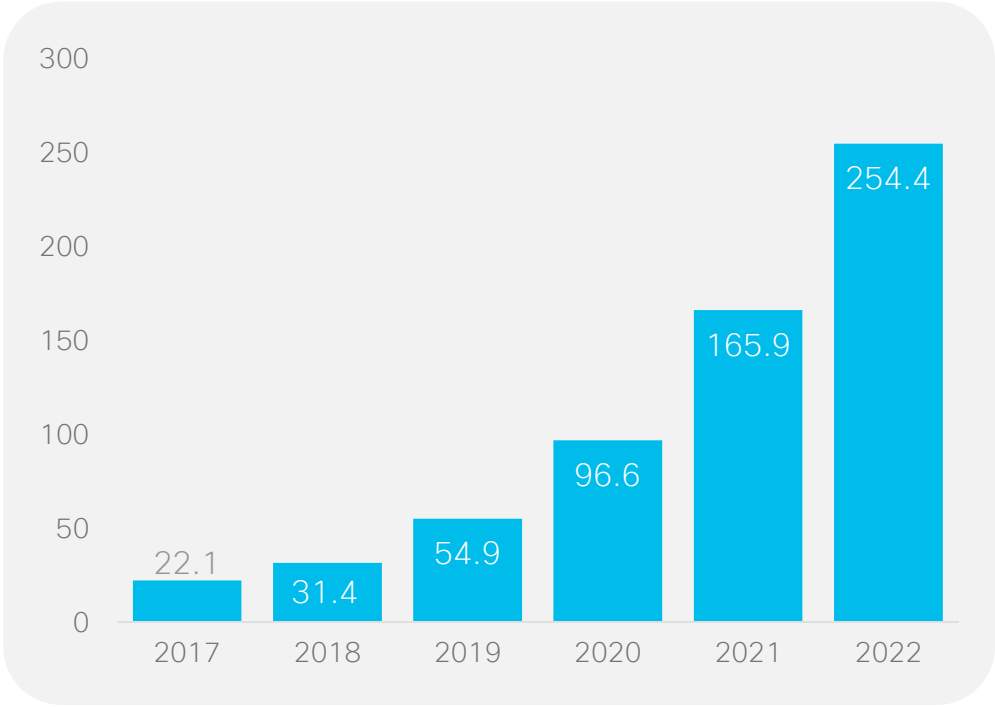


* Figures (n) refer to 2016 and 2021 mobile data traffic shares

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Augmented and Virtual Reality Mobile Traffic

63% CAGR
2017–2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

VNI Mobile Forecast Update, 2017–2022

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Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Average Cellular Speeds

Mobile/Cellular speeds will more than triple from 2017–2022

In Mbps	2017	2022
GLOBAL		
Global	8.7	28.5
BY REGION		
Asia Pacific	10.6	28.8
Latin America	4.9	17.7
North America	16.3	42.0
Western Europe	16.0	50.5
Central and Eastern Europe	10.1	26.2
Middle East & Africa	4.4	15.3

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Average Wi-Fi Speeds

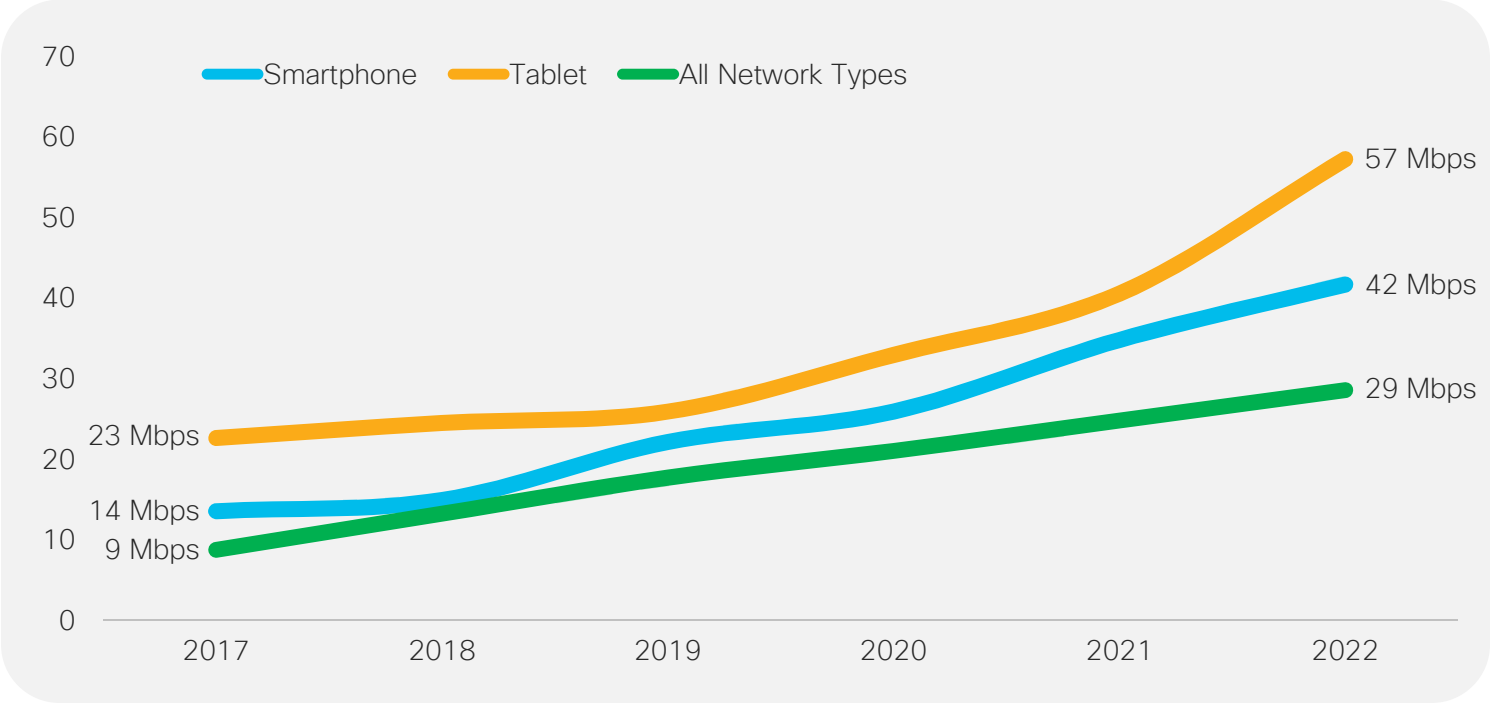
Wi-Fi speeds will more than double from 2017–2022

In Mbps	2017	2022
GLOBAL		
Global	24.4	54.2
BY REGION		
Asia Pacific	26.7	63.3
Latin America	9.0	16.8
North America	37.1	83.8
Western Europe	25.0	49.5
Central and Eastern Europe	19.5	32.8
Middle East & Africa	6.2	11.2

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Average Speeds by Device Type

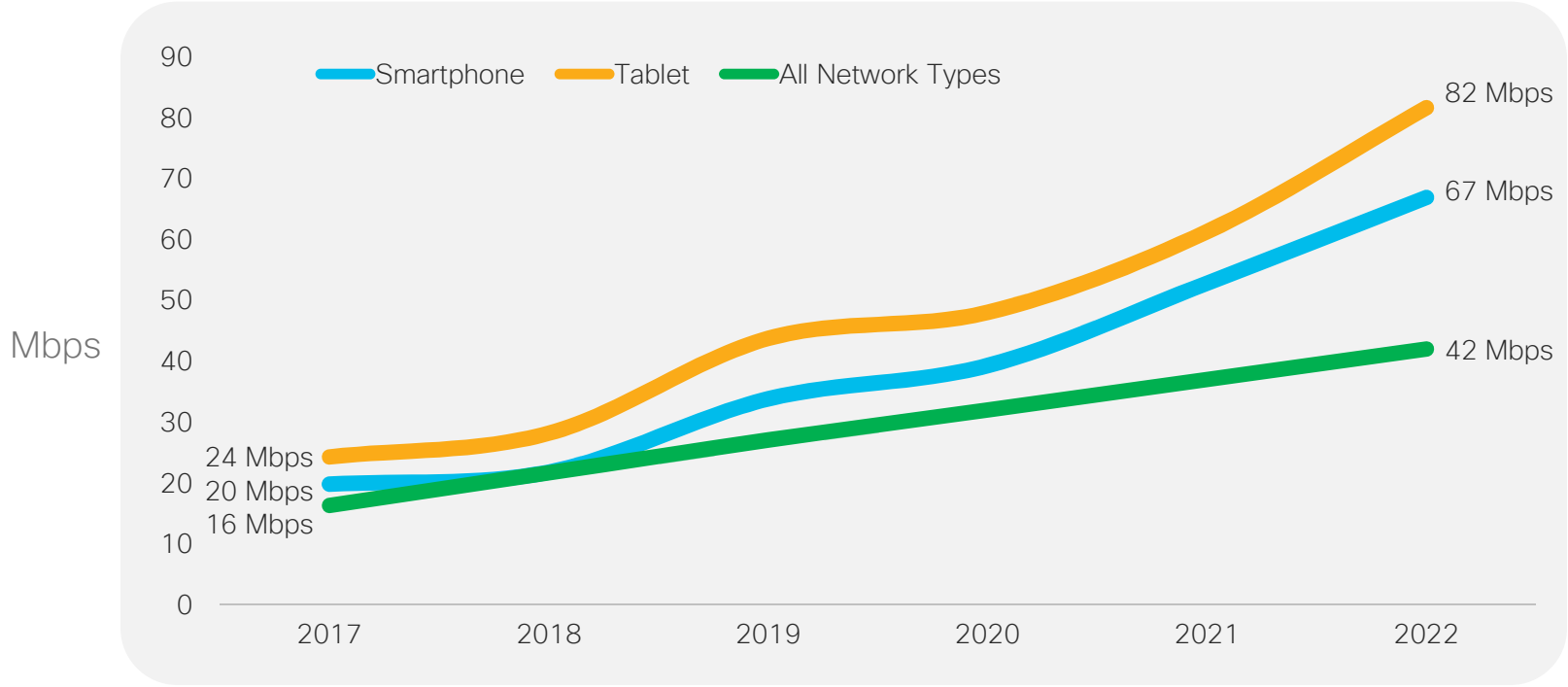
Tablet mobile speeds will be twice as fast as the average mobile speed by 2022
Smartphone mobile speeds will be faster than average by 2022 (due to 5G)



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Average Speeds by Device Type

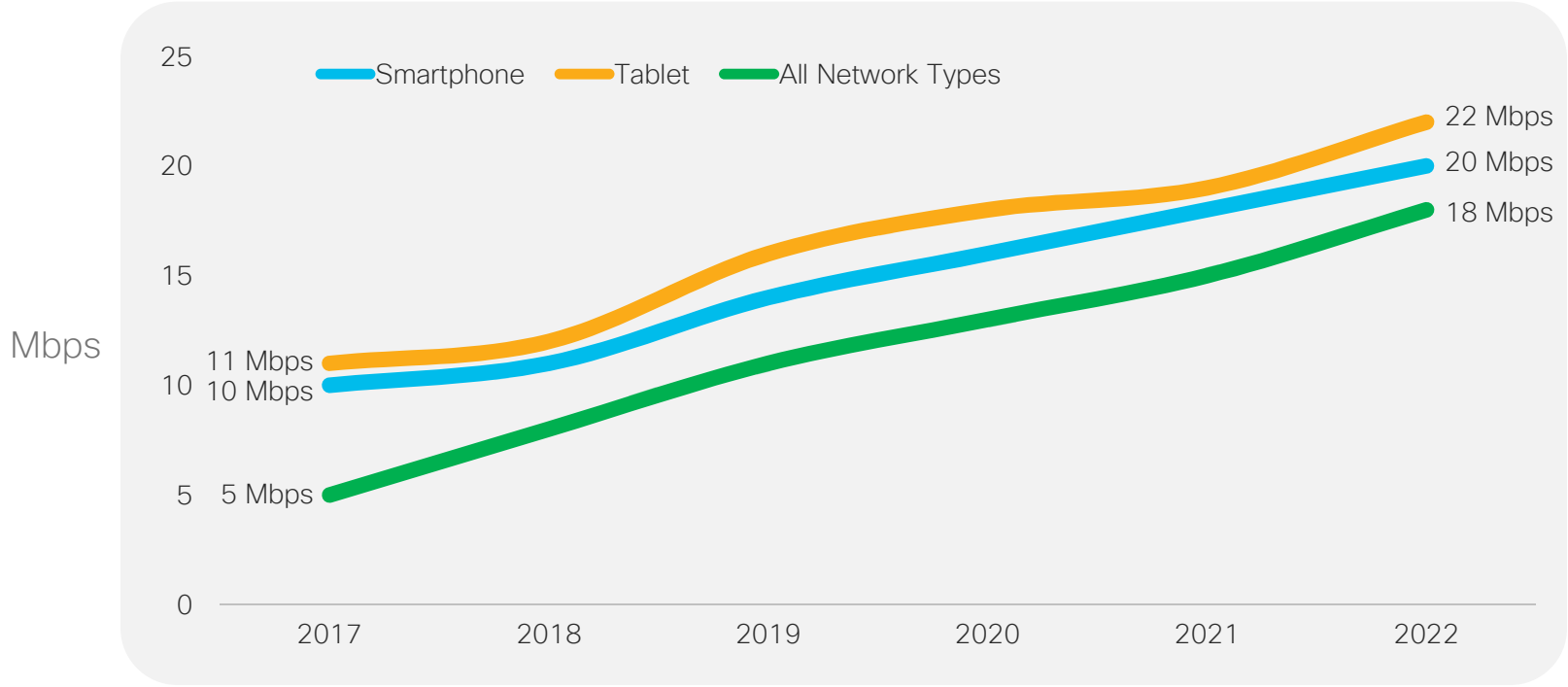
Tablet mobile speeds twice as fast as the average mobile speed by 2022
Smartphone mobile speeds will be faster than average by 2022 (due to 5G)



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America Mobile Average Speeds by Device Type

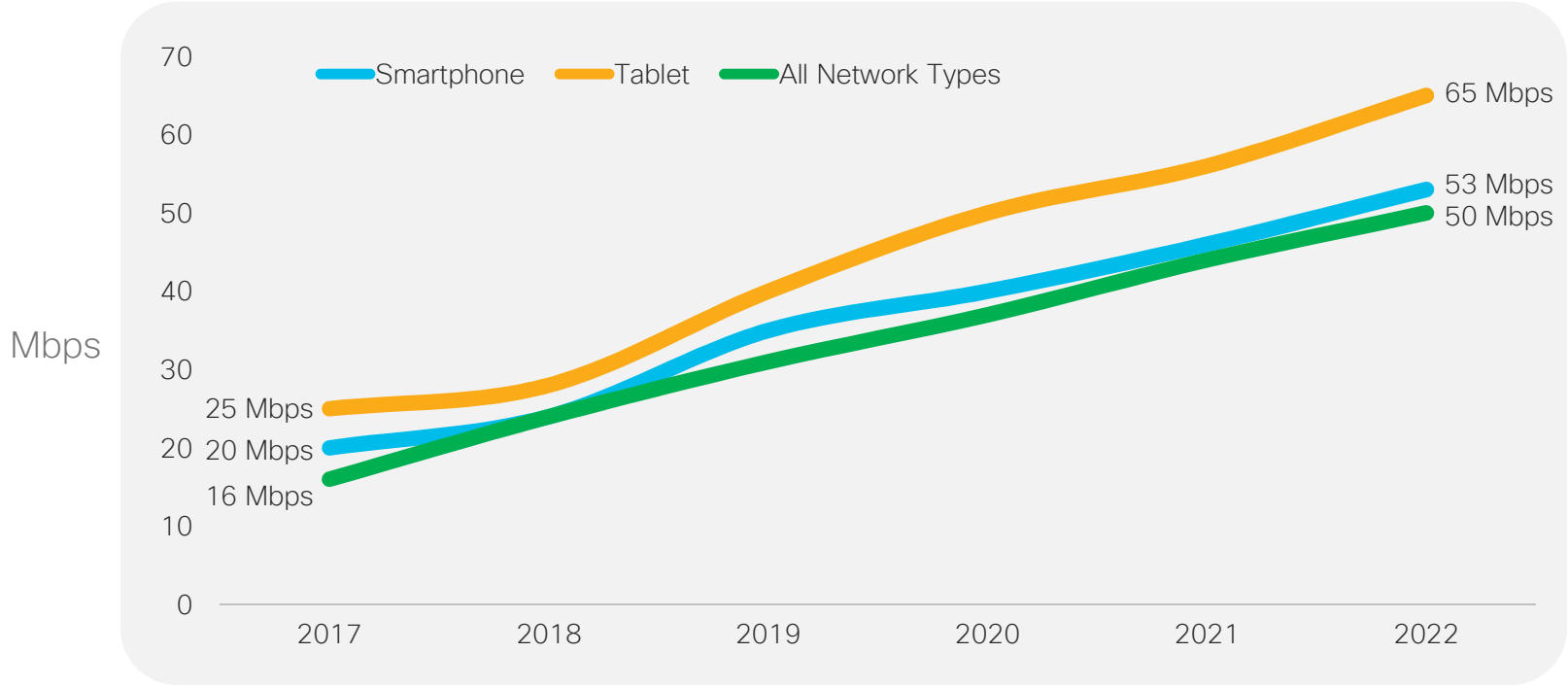
Tablet mobile speeds faster than average mobile speed by 2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Western Europe Mobile Average Speeds by Device Type

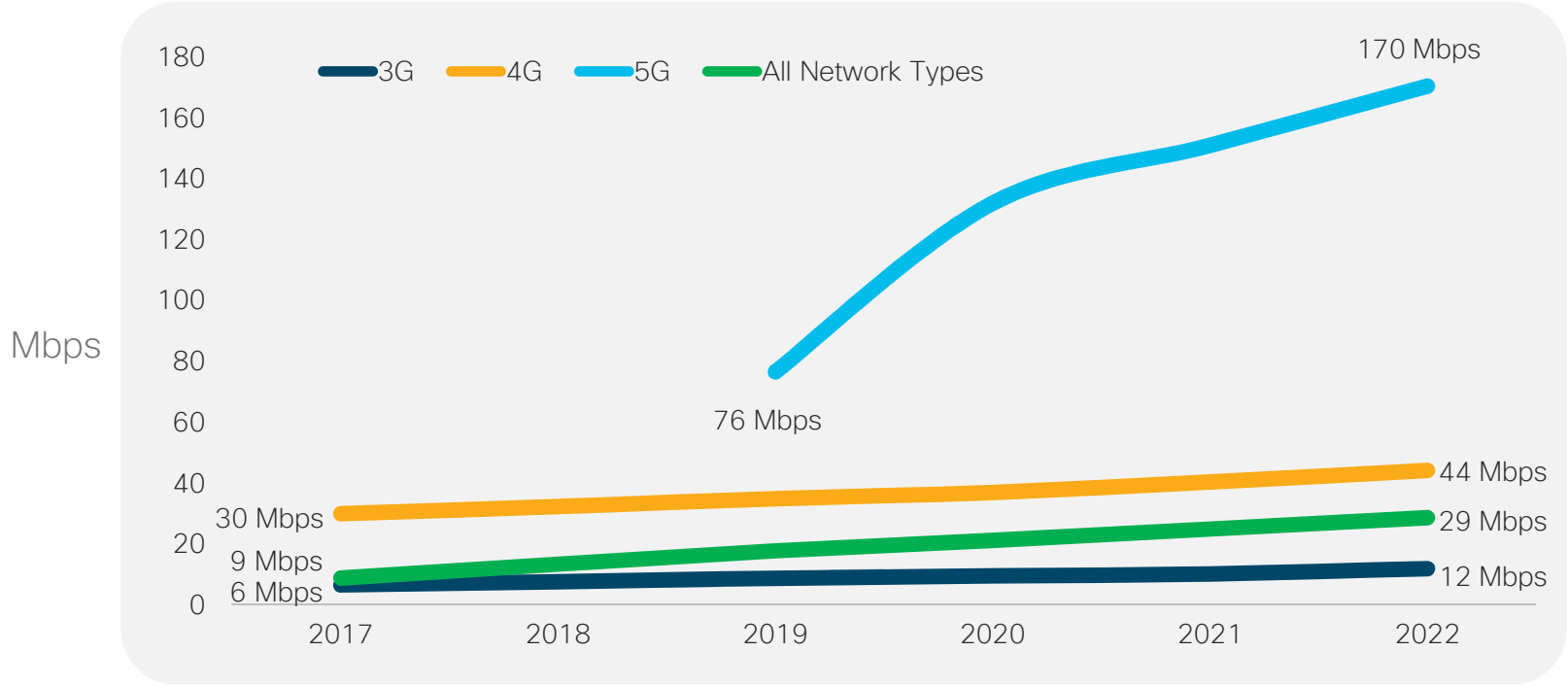
Tablet mobile speeds nearly twice as fast as the average mobile speed by 2022
Smartphone mobile speeds will be faster than average by 2022 (due to 5G)



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Average Speeds by Network Type

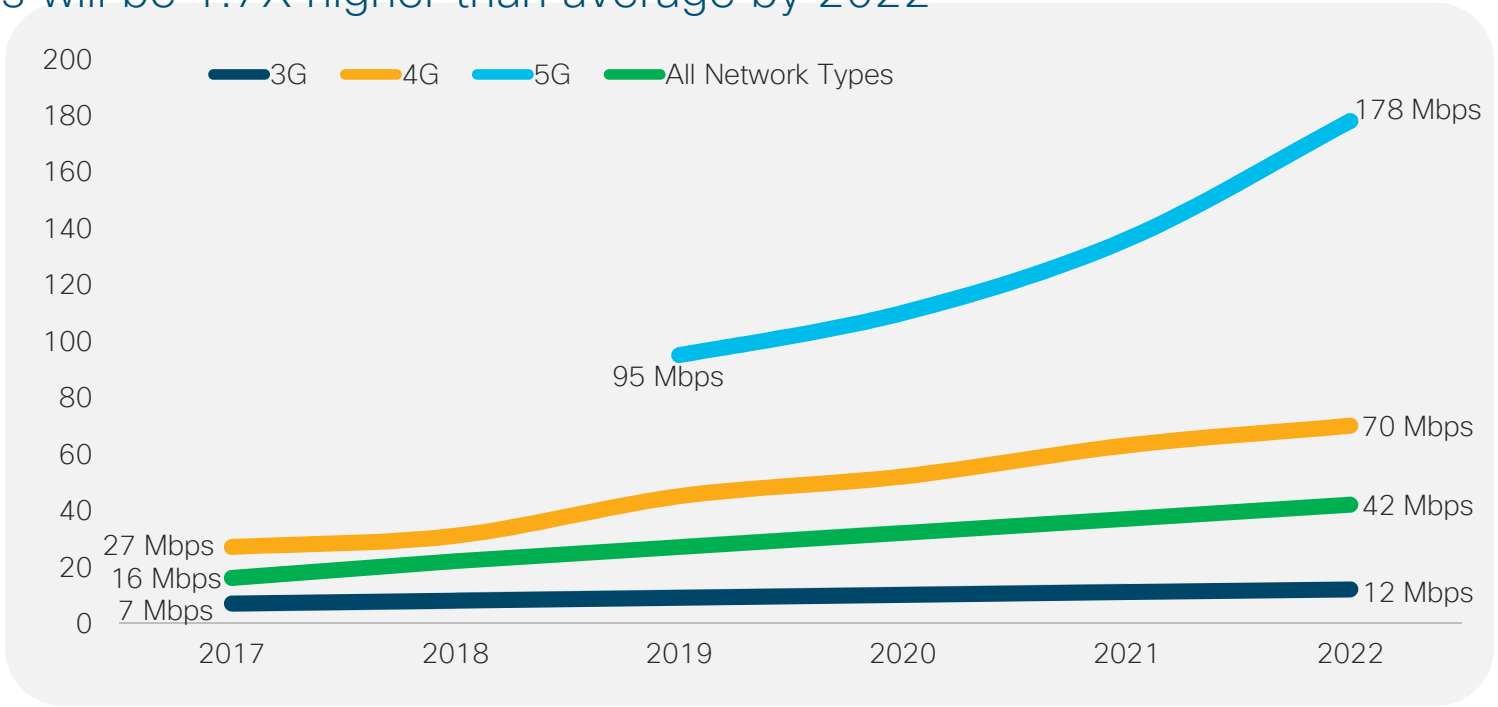
5G speeds will reach 170 Mbps by 2022
4G speeds will be 1.5X higher than average by 2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Average Speeds by Network Type

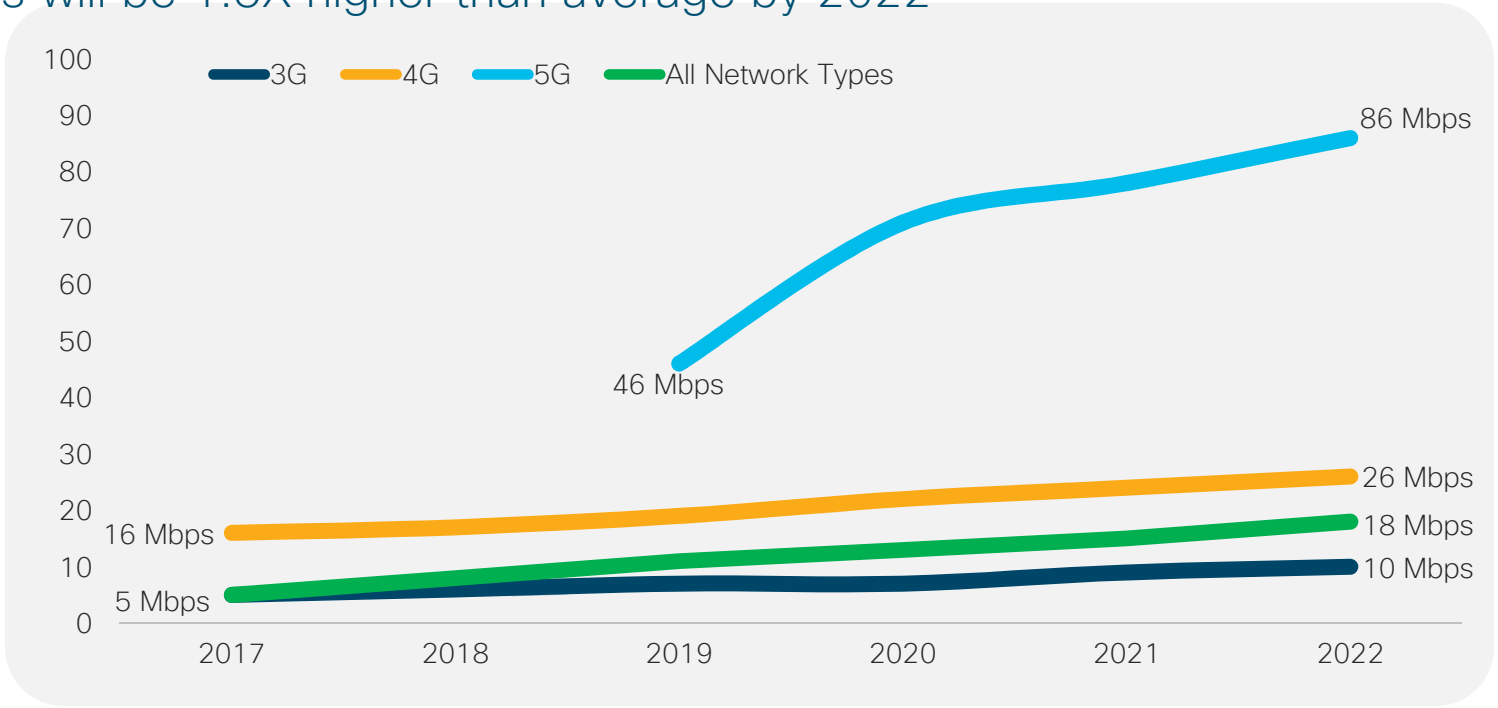
5G speeds will reach 178 Mbps by 2022
4G speeds will be 1.7X higher than average by 2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America Mobile Average Speeds by Network Type

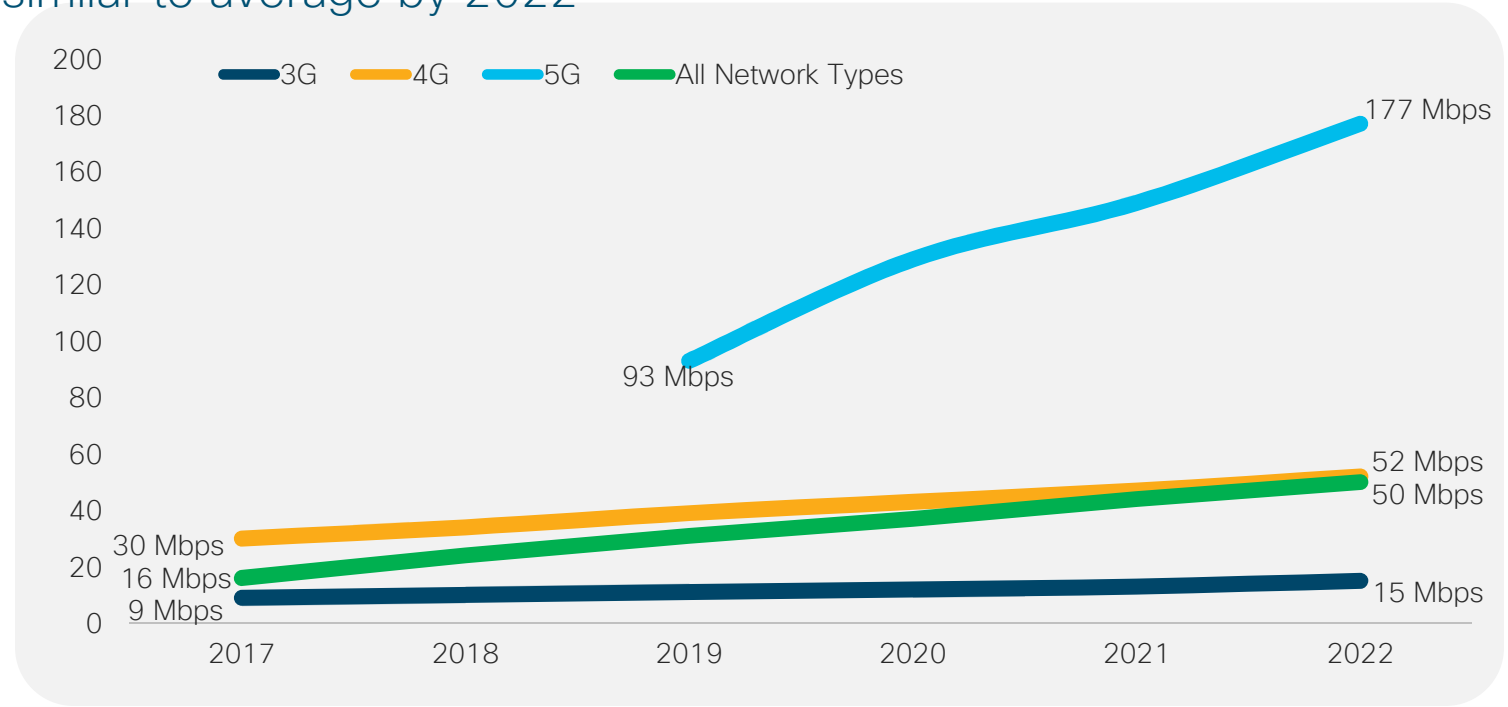
5G speeds will reach 86 Mbps by 2022
4G speeds will be 1.5X higher than average by 2022



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Western Europe Mobile Average Speeds by Network Type

5G speeds will reach 177 Mbps by 2022
4G speeds similar to average by 2022

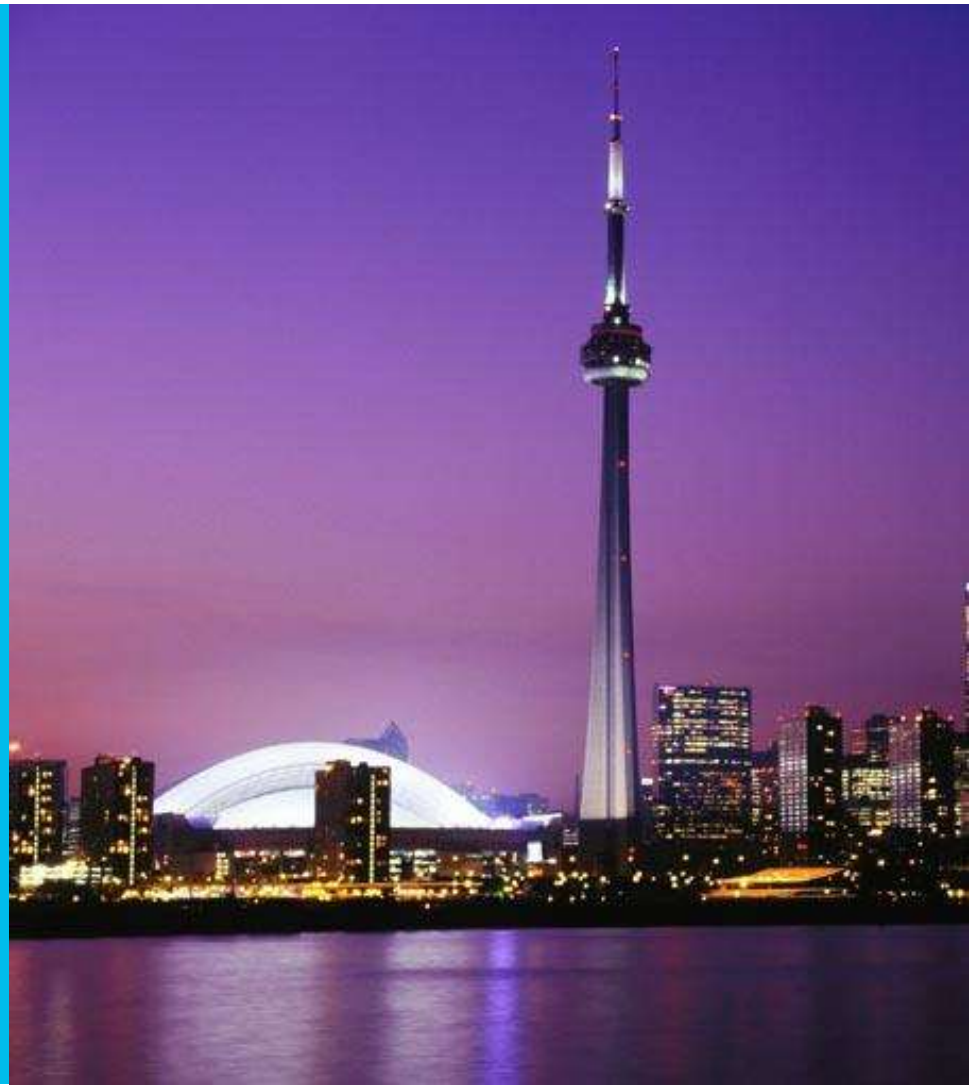


Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

In North America, Canada will have the highest 5G speeds by 2022 (187 Mbps*).

urce: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

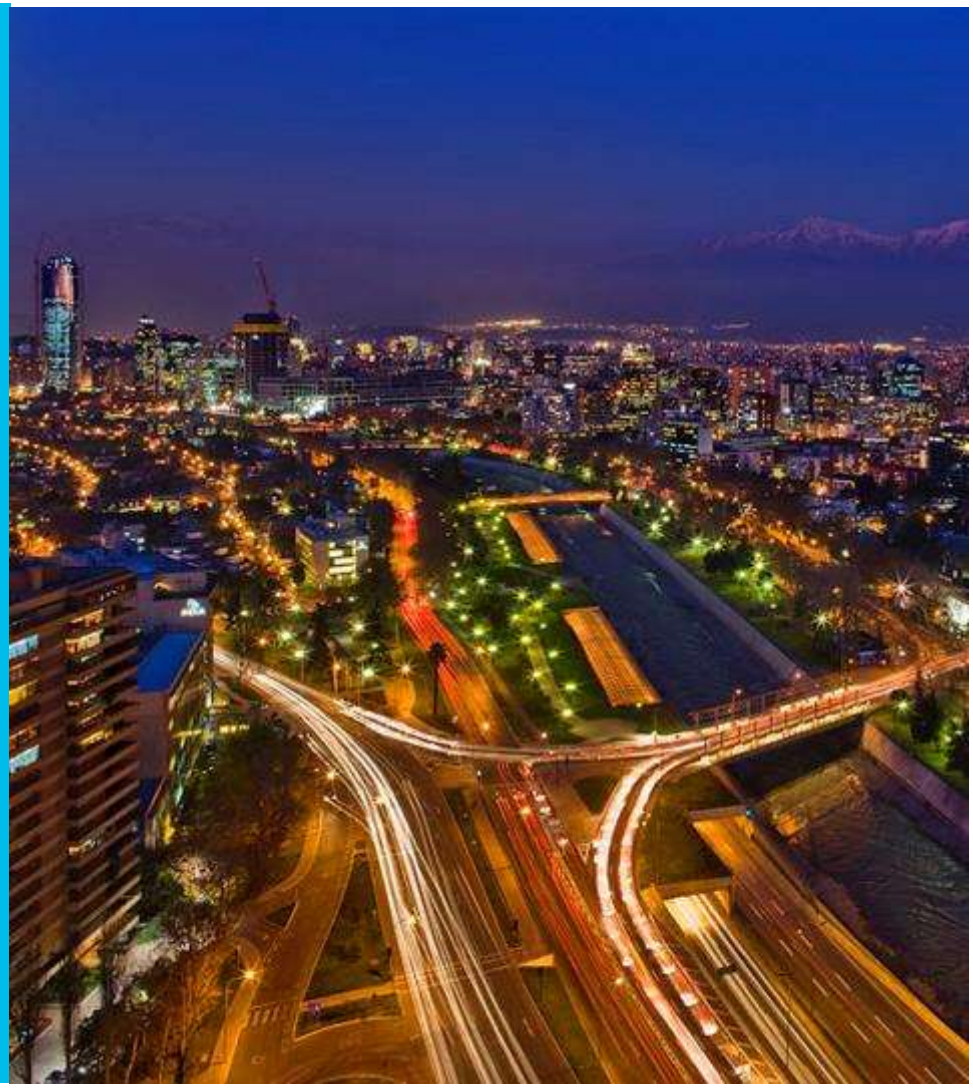
* Based on 24 VNI countries



In Latin America, Chile will have the highest 5G speeds by 2022 (74 Mbps*).

urce: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

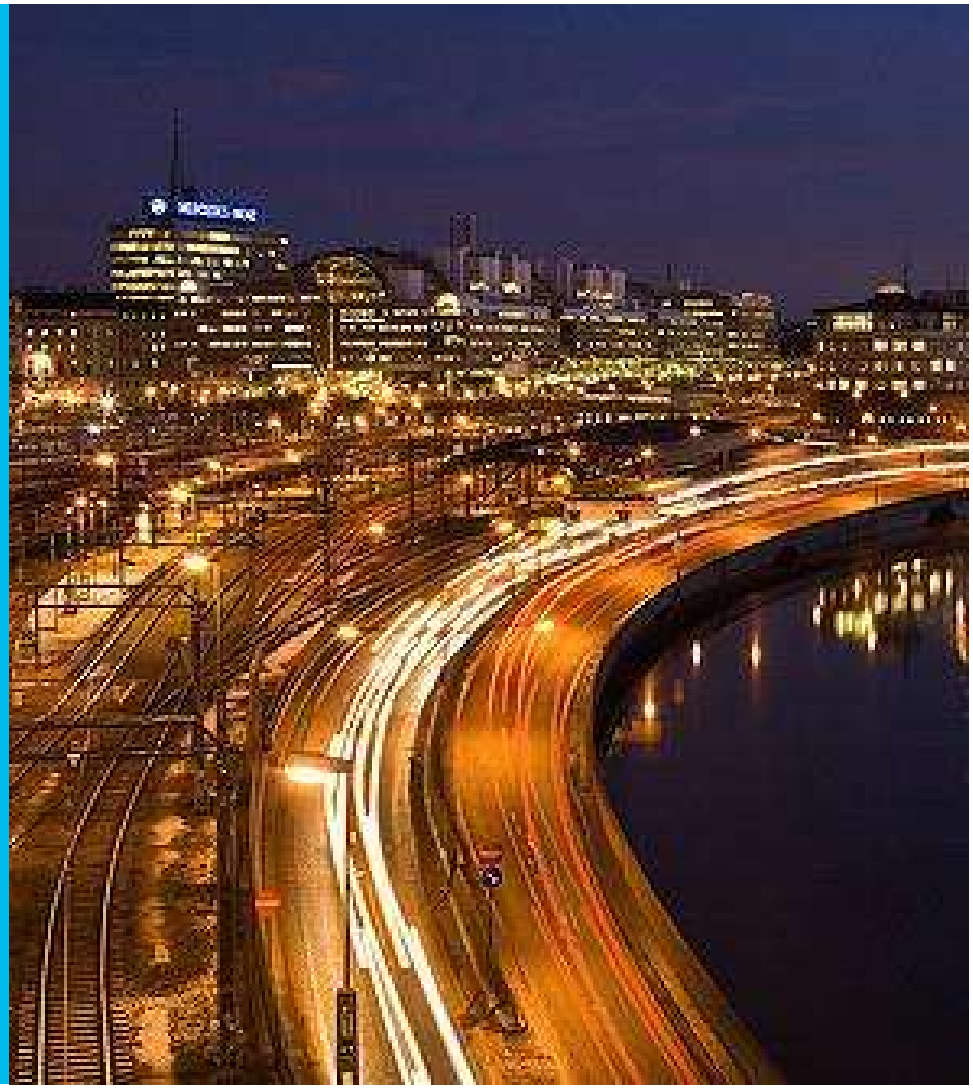
* Based on 24 VNI countries



In Western Europe, Sweden will have the highest 5G speeds by 2022 (211 Mbps*).

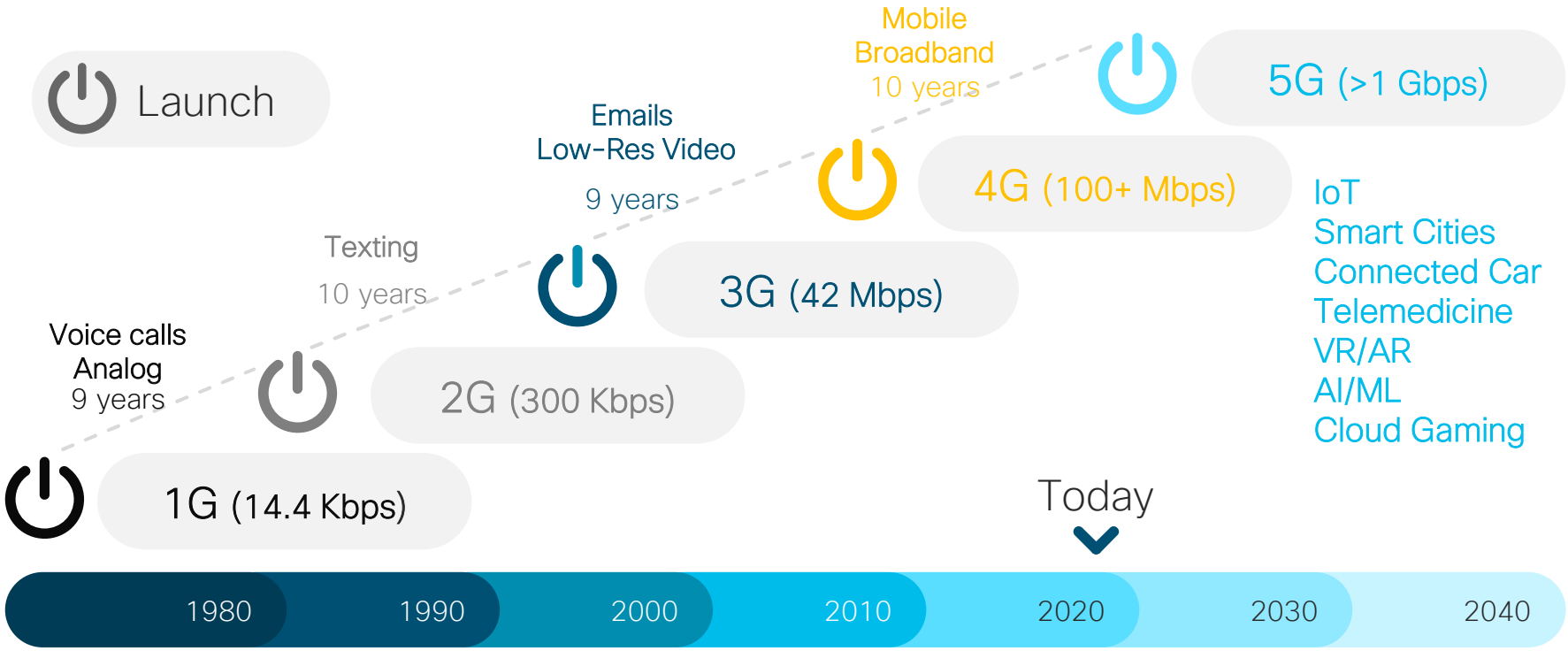
urce: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

* Based on 24 VNI countries



Mobile Speeds and Technology Evolution

New technology generations occur around every decade with more capabilities



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

VNI Mobile Forecast Update, 2017–2022

Top Mobile Networking Trends

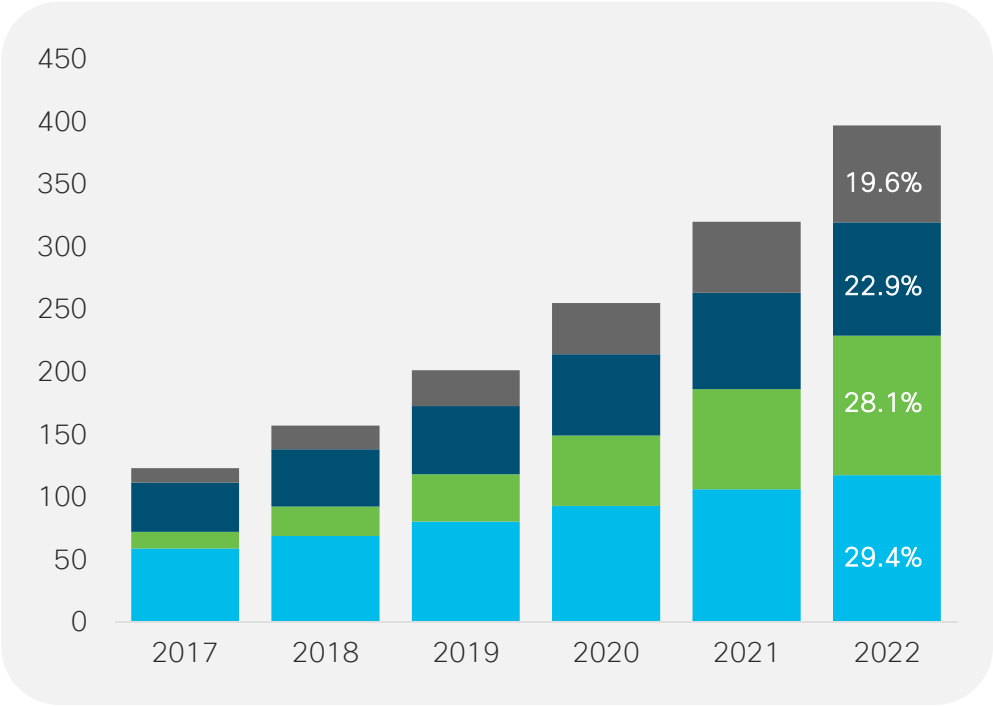
1. Evolving Toward Smarter Multimedia Mobile Devices
2. Defining Cell Network Advances—2G, 3G, 4G, 5G
3. Measuring Mobile IoT Adoption—M2M and Emerging Wearables
4. Identifying New Mobile Applications and Requirements
5. Comparing Mobile Network Speed Improvements
6. **Analyzing the Expanding Role and Coverage of Wi-Fi**
7. Reviewing Tiered Pricing—Unlimited Data and Shared Plans

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global IP Traffic by Local Access Technology

By 2022, 48% of total IP traffic will be driven by mobile*

26% CAGR
2017–2022



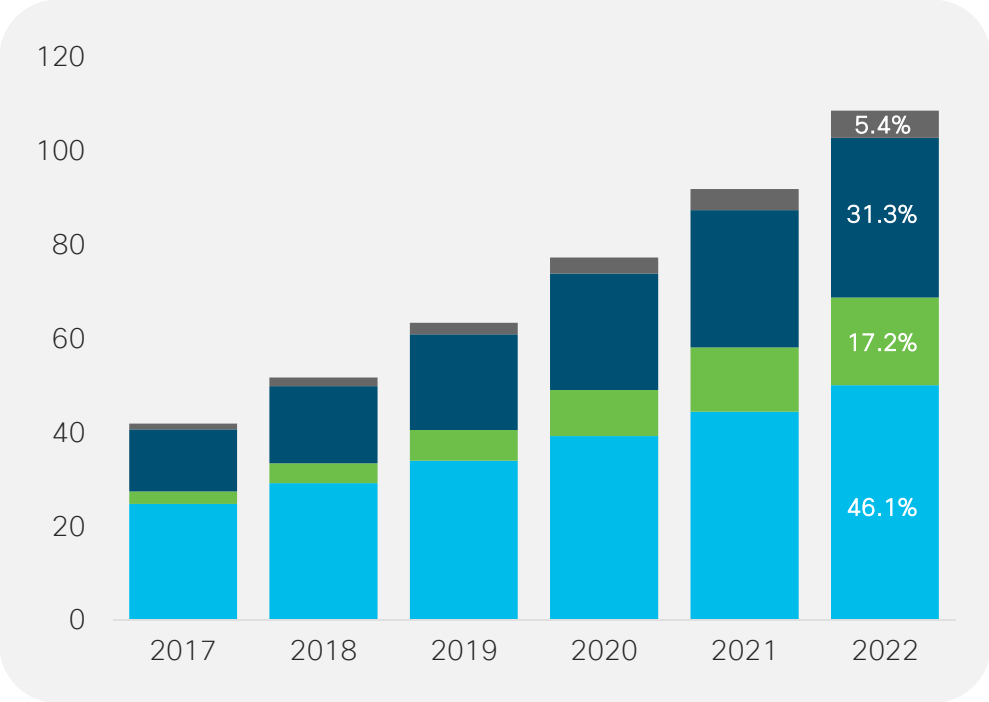
* Mobile driven traffic includes mobile/cellular traffic and Wi-Fi offload from mobile

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America IP Traffic by Local Access Technology

By 2022, 54% of total IP traffic will be driven by mobile*

21% CAGR
2017–2022



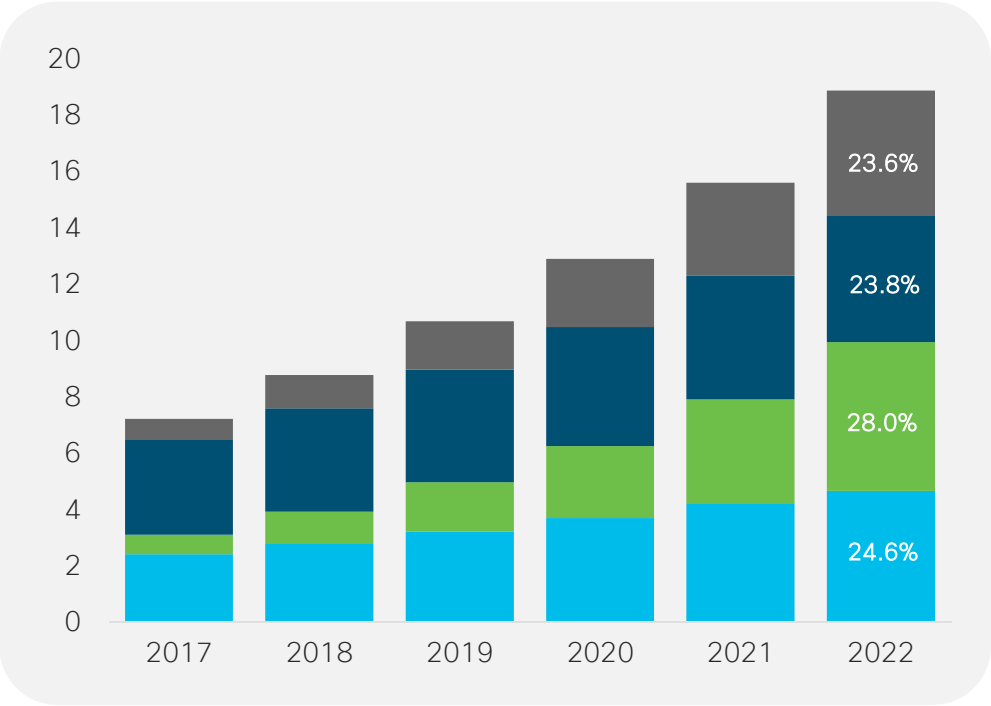
* Mobile driven traffic includes mobile/cellular traffic and Wi-Fi offload from mobile

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America IP Traffic by Local Access Technology

By 2022, 75% of total IP traffic will be driven by mobile*

21% CAGR
2017–2022



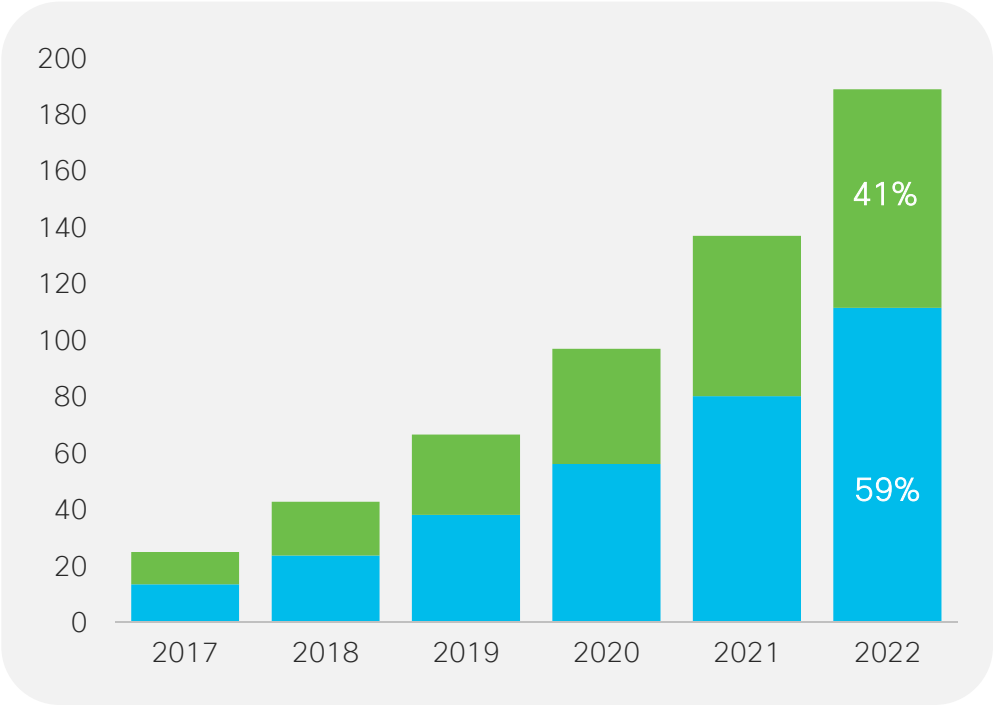
* Mobile driven traffic includes mobile/cellular traffic and Wi-Fi offload from mobile

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Data Traffic Offload to Wi-Fi*

59% of mobile traffic will be offloaded by 2022
54% of mobile traffic was offloaded in 2017

50% CAGR
2017–2022



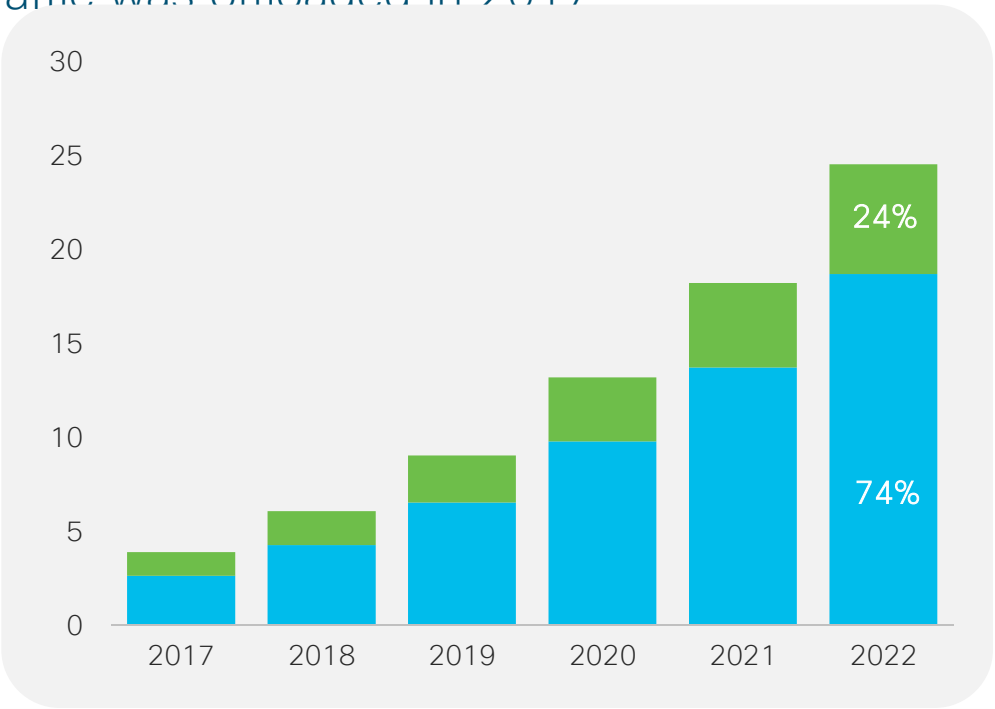
*Offload includes traffic from dual-mode devices (i.e., supports cell & Wi-Fi, excl. PCs) over Wi-Fi/small cell networks

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

North America Mobile Data Traffic Offload to Wi-Fi*

76% of mobile traffic will be offloaded by 2022
67% of mobile traffic was offloaded in 2017

45% CAGR
2017–2022



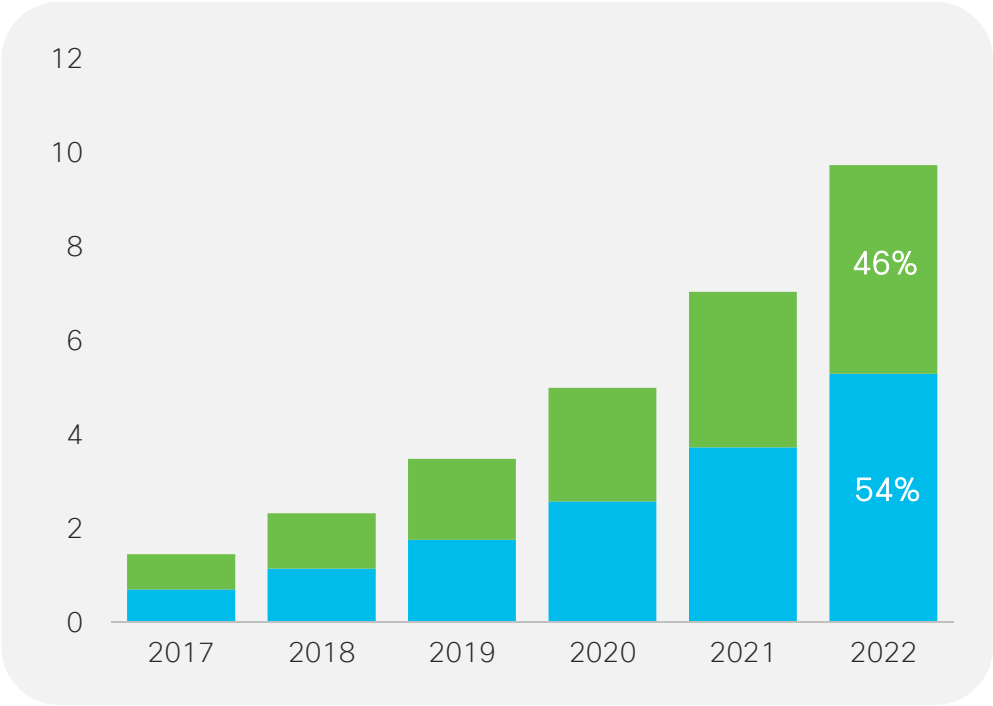
*Offload includes traffic from dual-mode devices (i.e., supports cell & Wi-Fi, excl. PCs) over Wi-Fi/small cell networks

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Latin America Mobile Data Traffic Offload to Wi-Fi*

54% of mobile traffic will be offloaded by 2022
48% of mobile traffic was offloaded in 2017

46% CAGR
2017–2022



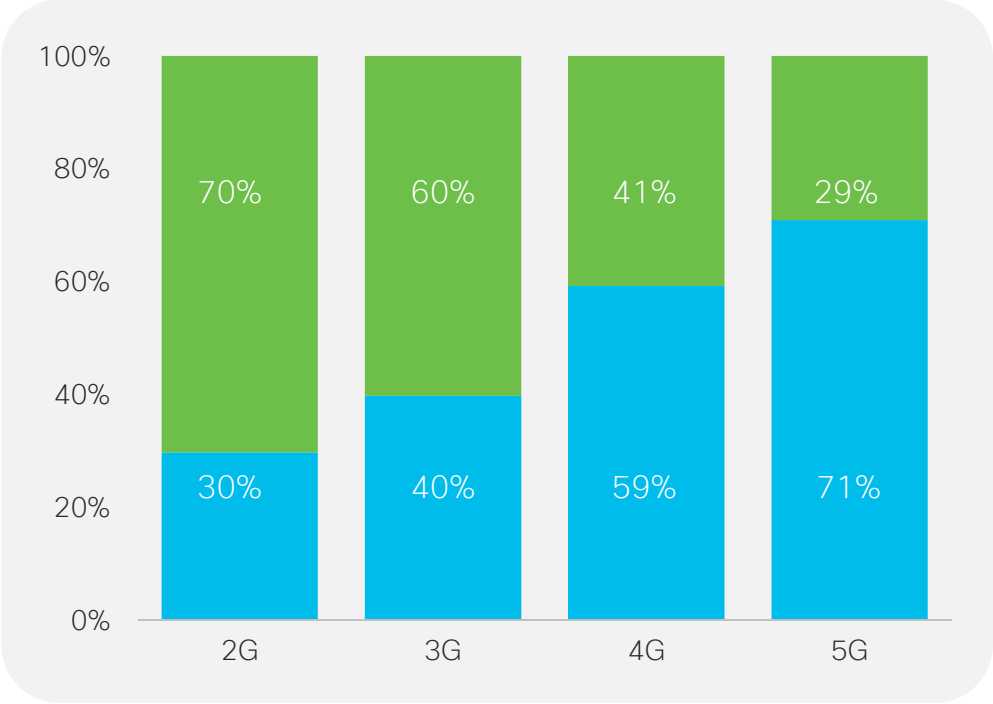
*Offload includes traffic from dual-mode devices (i.e., supports cell & Wi-Fi, excl. PCs) over Wi-Fi/small cell networks

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Mobile Data Traffic and Offload Traffic, 2022

4G and 5G devices offload more traffic than 3G and 2G

Mobile and Offload Traffic from Mobile-Connected Devices

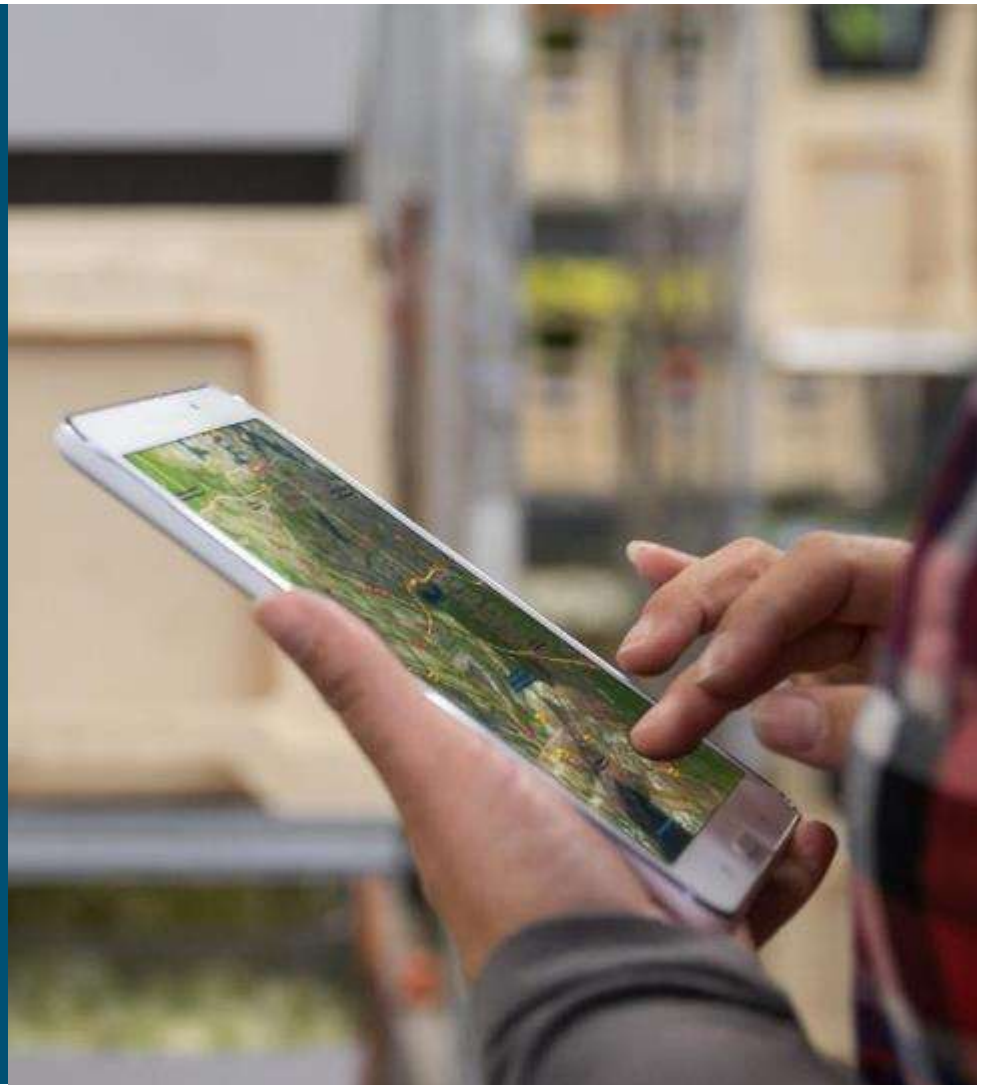


*Offload includes traffic from dual-mode devices (i.e., supports cell & Wi-Fi, excl. PCs) over Wi-Fi/small cell networks

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

By 2022, the amount of mobile traffic offloaded to Wi-Fi networks will reach 59% (111 EBs/mo).

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



Global Wi-Fi Hotspot Coverage and Availability

Existing

- Pay-as-you-go
- Free access promoting other services (Retail free Wi-Fi)
- Managed services (venues and outdoor)
- Cellular offload (user promoted)
- Added value for broadband subscription
- Advertising & sponsorship

Growth

- Cellular offload (carrier driven)
- Community Wi-Fi/ homespots
- Carrier-grade VoWiFi
- TV everywhere
- Large events
- Big data analytics
- Public transportation Wi-Fi

Future

- Wi-Fi Capacity trading
- Transaction platform
- Internet of things
- Context awareness
- HetNet Wi-Fi + mobile
- Connected car (in-car Wi-Fi)

Total Public WLAN + Community Hotspots	2017	2022
	124 M	549 M

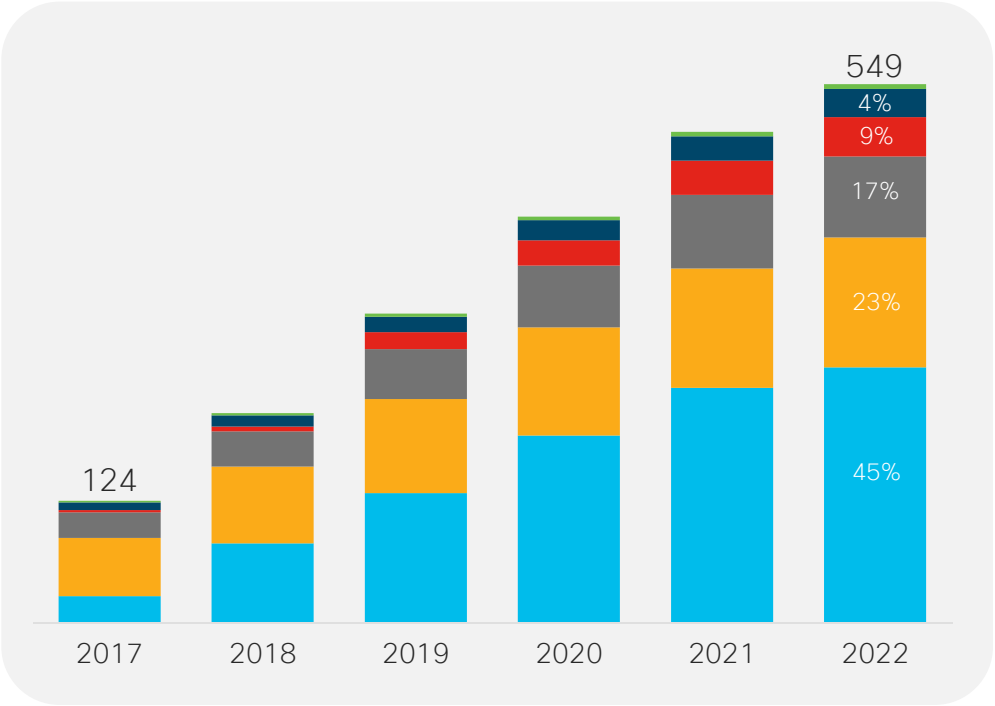
Total Incremental Hotspots

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Global Public Wi-Fi Hotspots

Asia Pacific leads with 261 million (47%) hotspots by 2022

35% CAGR
2017–2022



* Middle East and Africa represents 1% of global public Wi-Fi hotspots by 2022

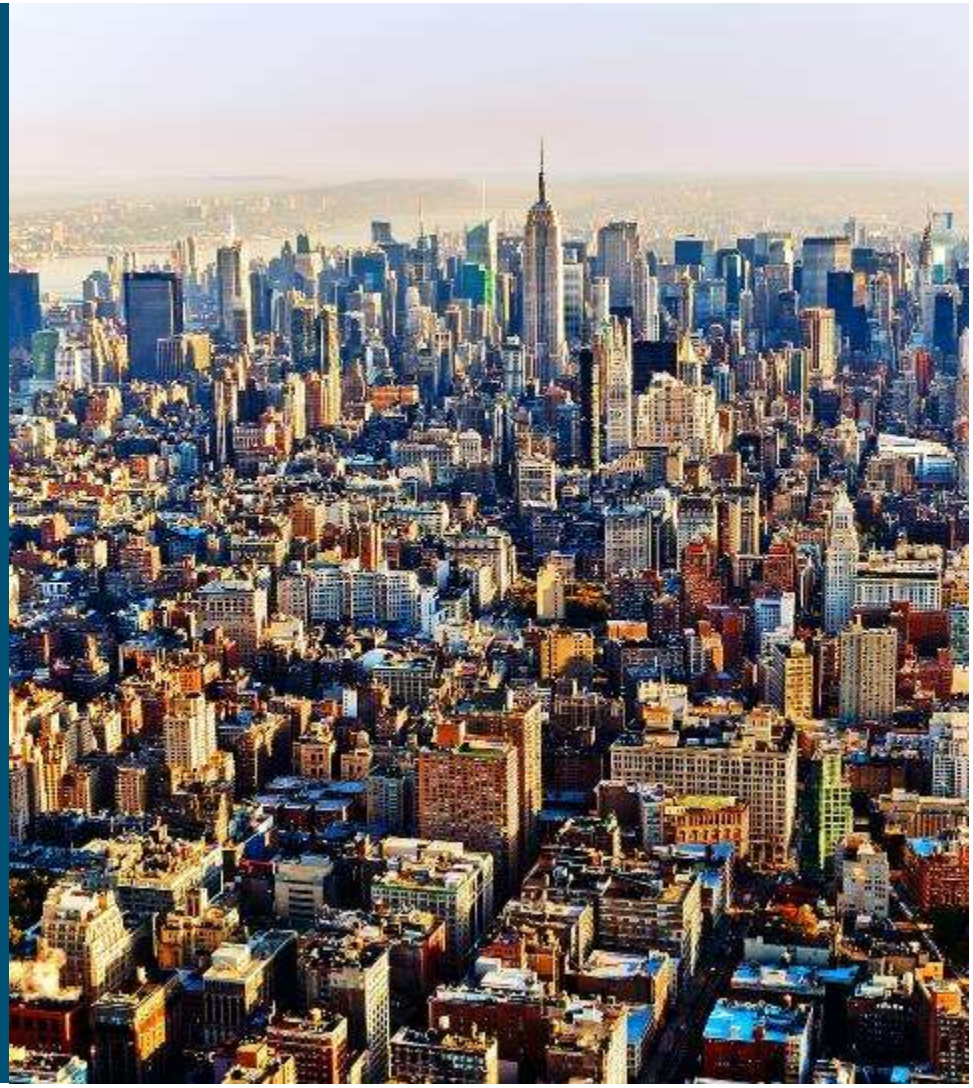
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

By 2022, China will have 34% of global hotspots, the most in the world (185 million).

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

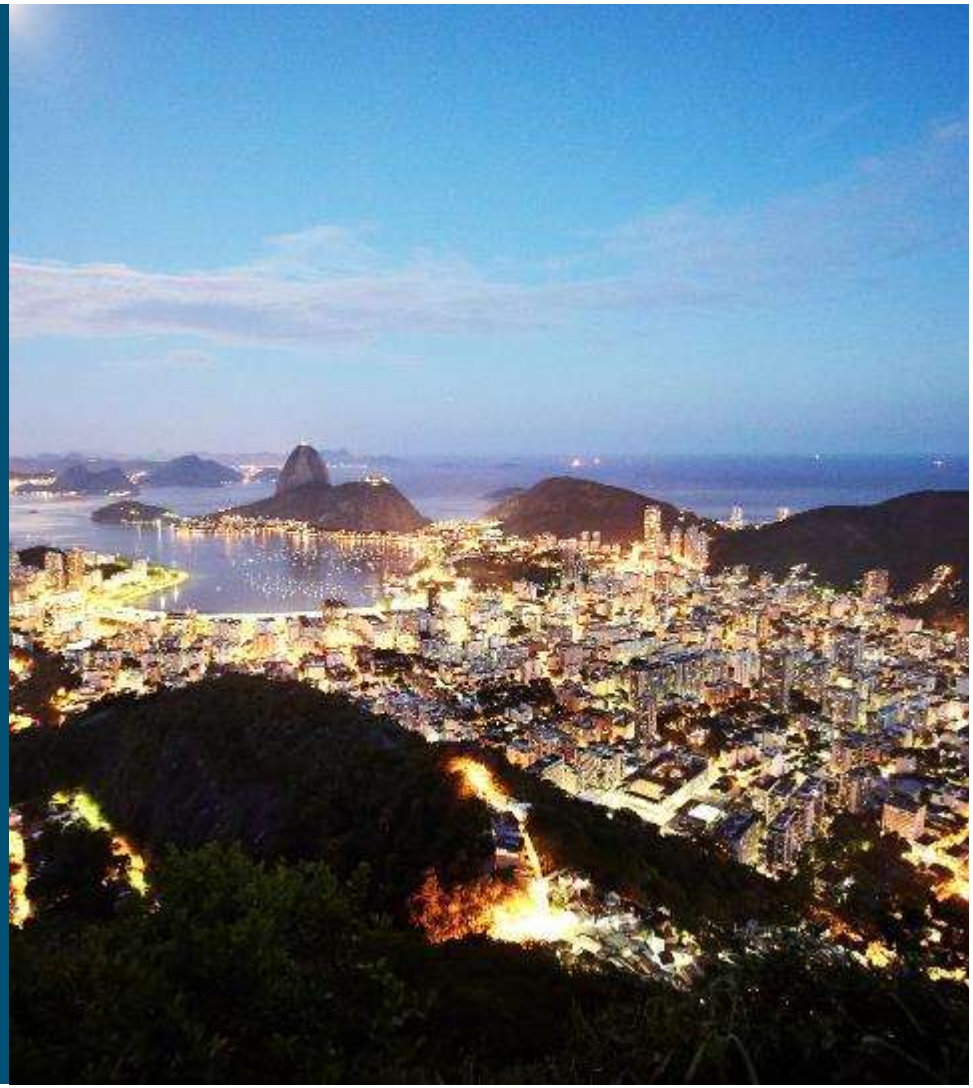
The United States will have 93% of NA hotspots, the most in the region, 77 million by 2022.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



Brazil will have 45% of LATAM hotspots, the most in the region, 18 million by 2022.

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022



VNI Mobile Forecast Update, 2017–2022

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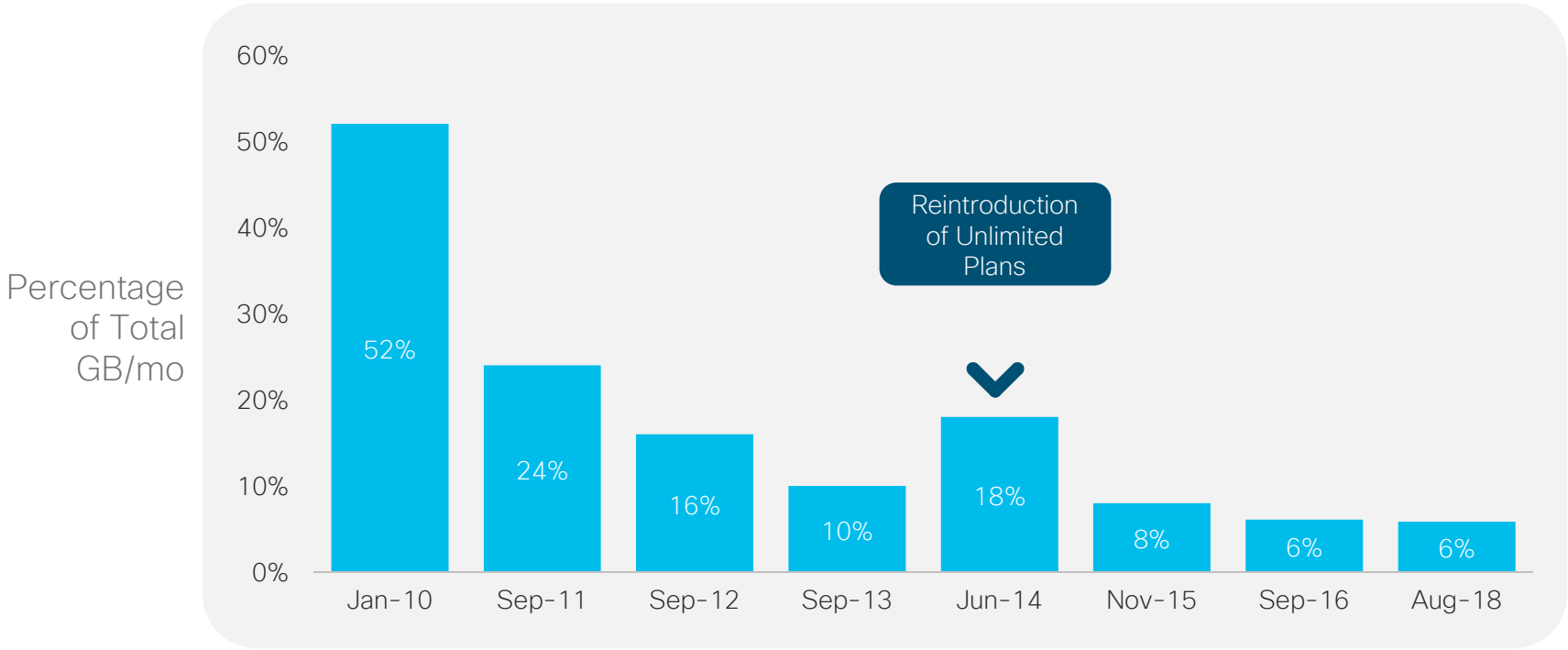
7. **Reviewing Tiered Pricing—Unlimited Data and Shared Plans**

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Top Mobile User Profiles

Top 1 % of mobile users generated 6 % of mobile traffic in August 2018

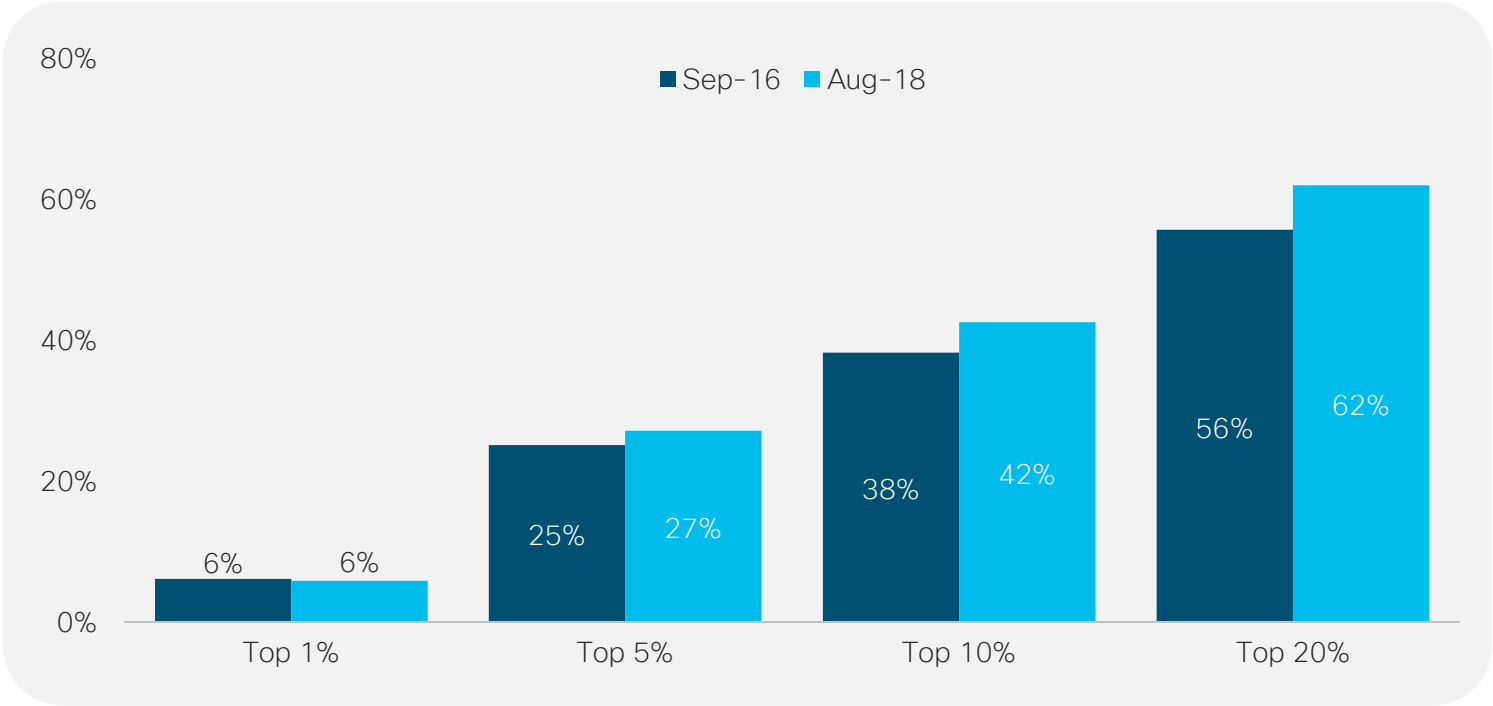


* Study based on North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Top Mobile User Profiles

Top 20% users consume majority (62%) of monthly traffic

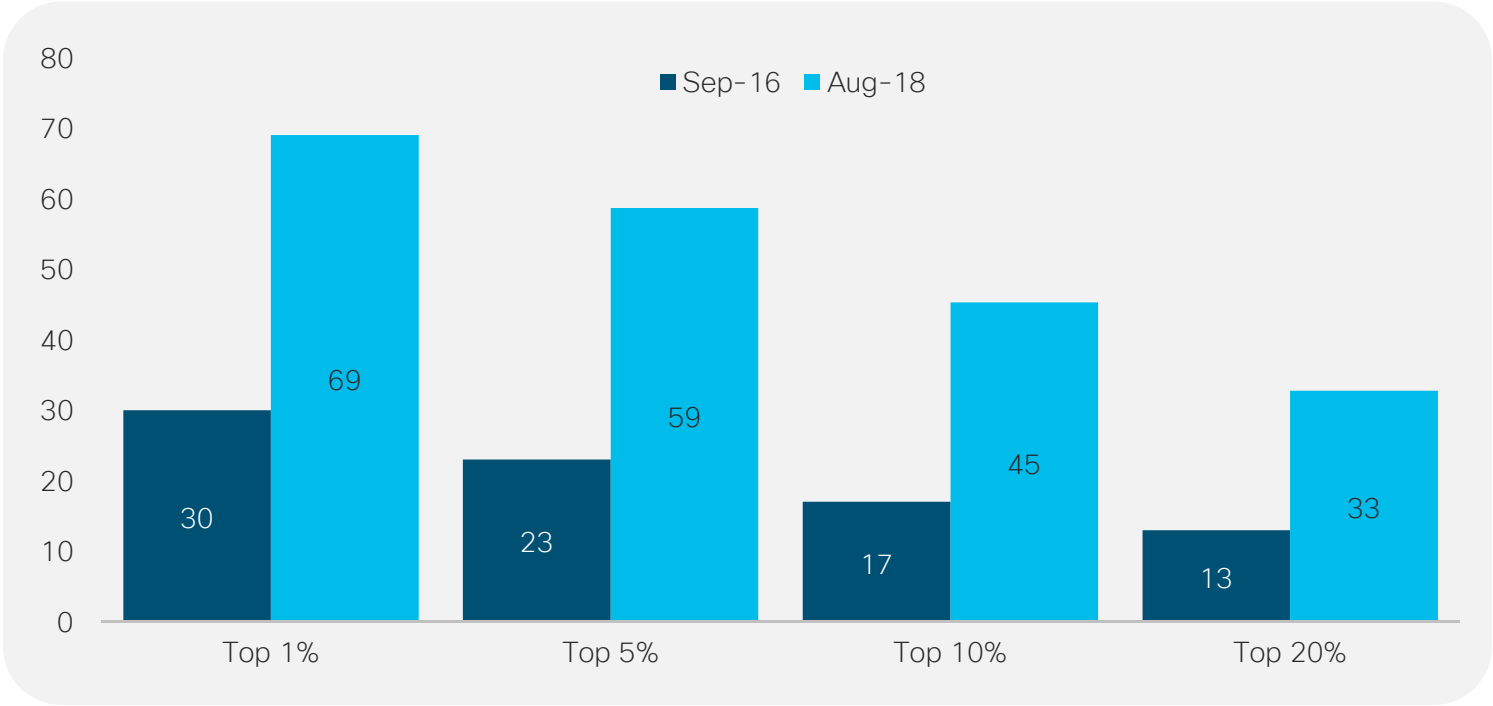


* Study based on North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Top Mobile User Profiles

Top 20% users consume nearly 33 gigabytes per month*

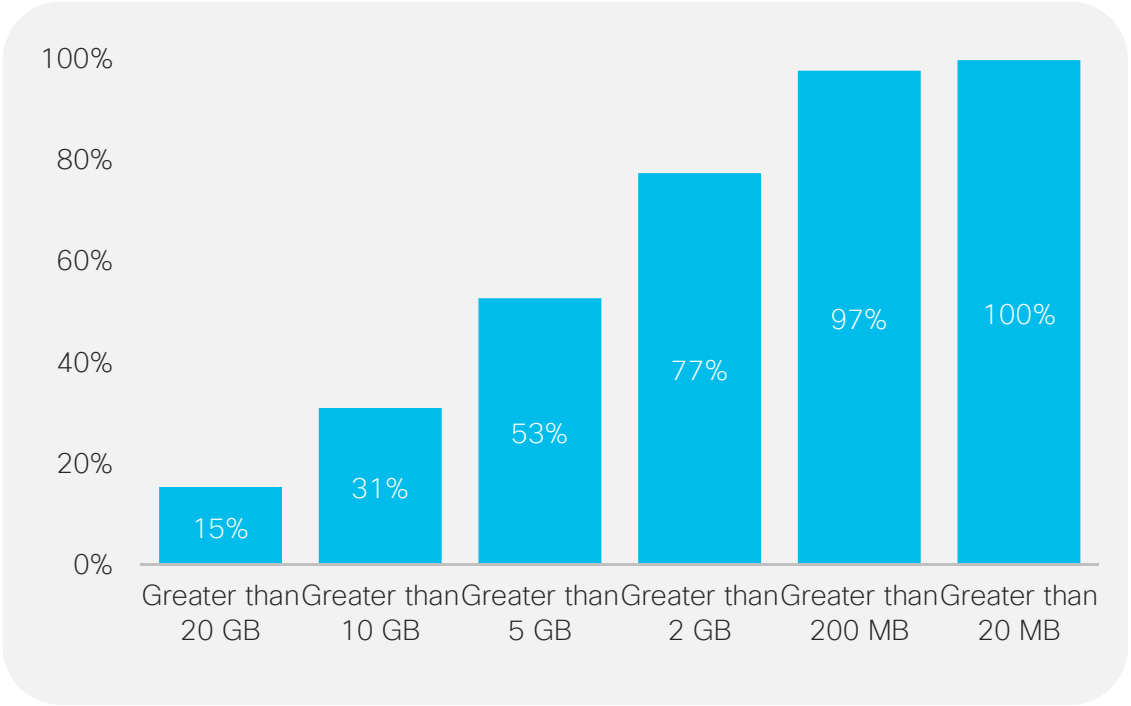


* Study based on North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Top Mobile User Profiles

31% of mobile users consume 10 GB per month
77% of mobile users consume over 2 GB per month *

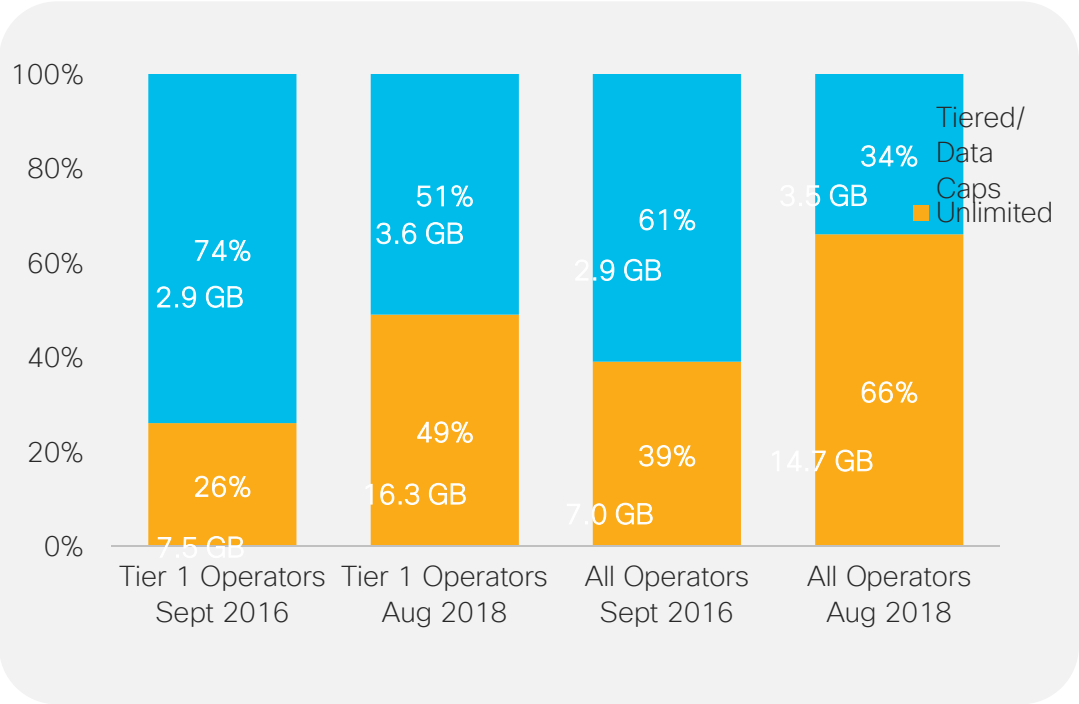


* Study based on North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Unlimited Plans Outnumber Tiered/Data Caps Plans

Unlimited plans continue to lead in data consumption, 4-fold higher *

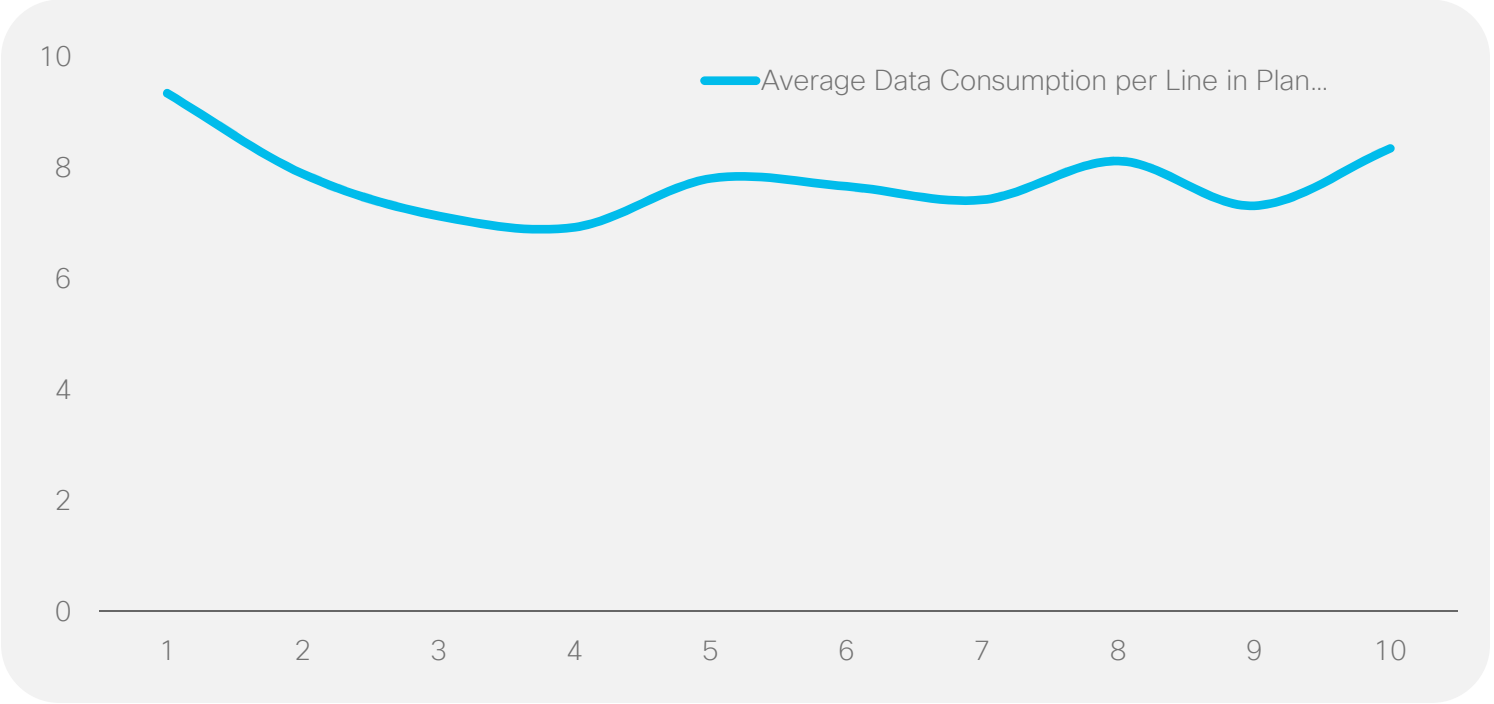


* Study based on to North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Data Consumption by Number of Lines per Plan/Subscription*

Average mobile data consumption per line consistent whether on shared or individual plan

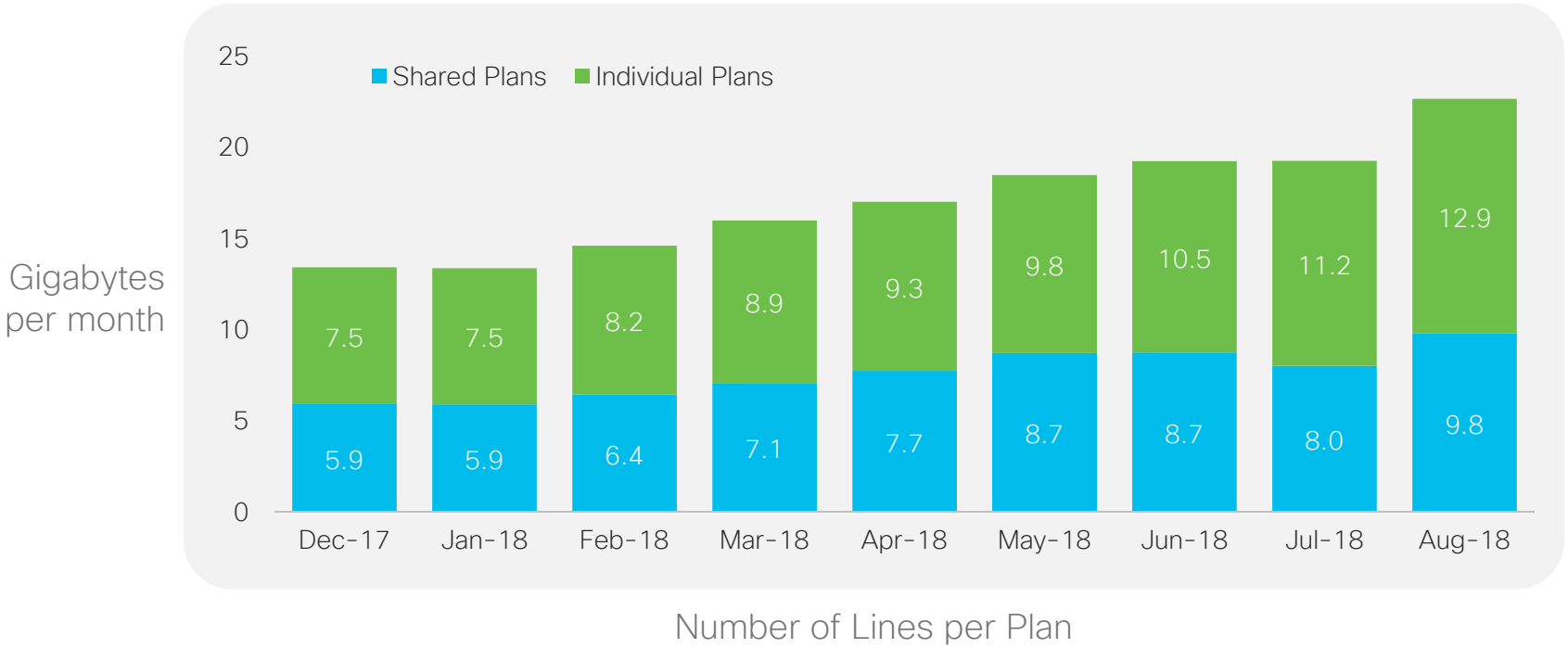


* Study based on to North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Mobile Shared Data Plans Average Data Usage

Number of mobile shared data plans now a majority (76%)



* Study based on to North American Tier 1 and Tier 2 operators

Source: Cisco VNI Global Mobile Data Traffic Forecast, 2017–2022

Conclusion

Cisco VNI Mobile Forecast: 2017–2022

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Submit questions/comments via our public VNI community page: https://community.cisco.com/t5/vni-and-gci/bd-p/4686j-discussions-vni-gci


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