



# Connected Cars: What is the Impact on Radio?

**Roger C. Lanctot**  
Director, Automotive  
Connected Mobility

**STRATEGY ANALYTICS**



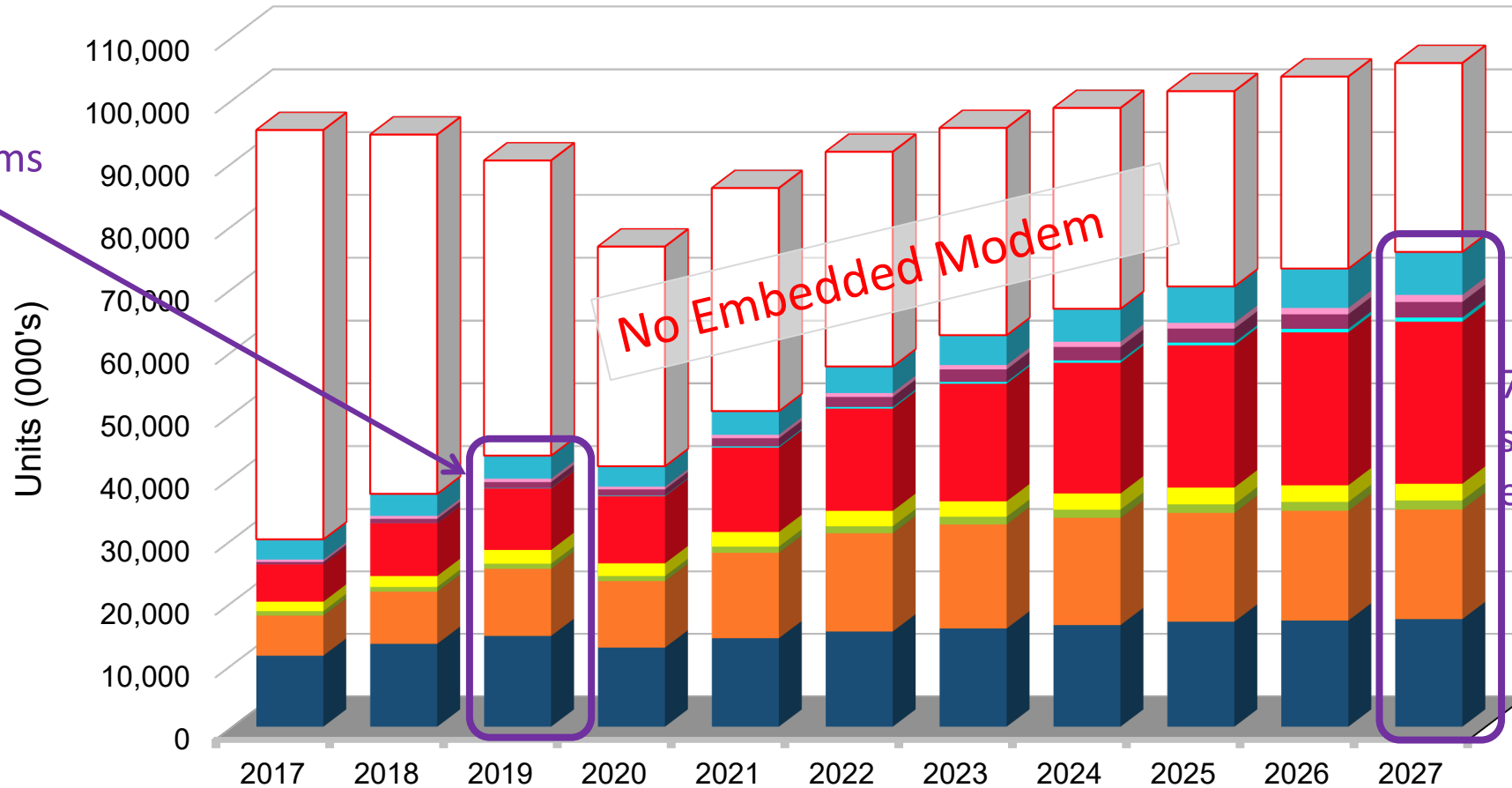
# WHAT WE NEED TO KNOW

- State of automotive connectivity
- A battle over user experiences/interfaces
- Impact of Google, Android, Apple (Amazon? Alibaba? Baidu?)
- Emerging role of digital assistants
- Driver monitoring – potential game changer
- Audience measurement on steroids
- Car as browser
  
- **Latest Strategy Analytics China in-vehicle listening research**

# AUTOMOTIVE EMBEDDED MODEMS GLOBAL ANNUAL SHIPMENTS



48.7% of vehicles shipped with embedded modems



No Embedded Modem

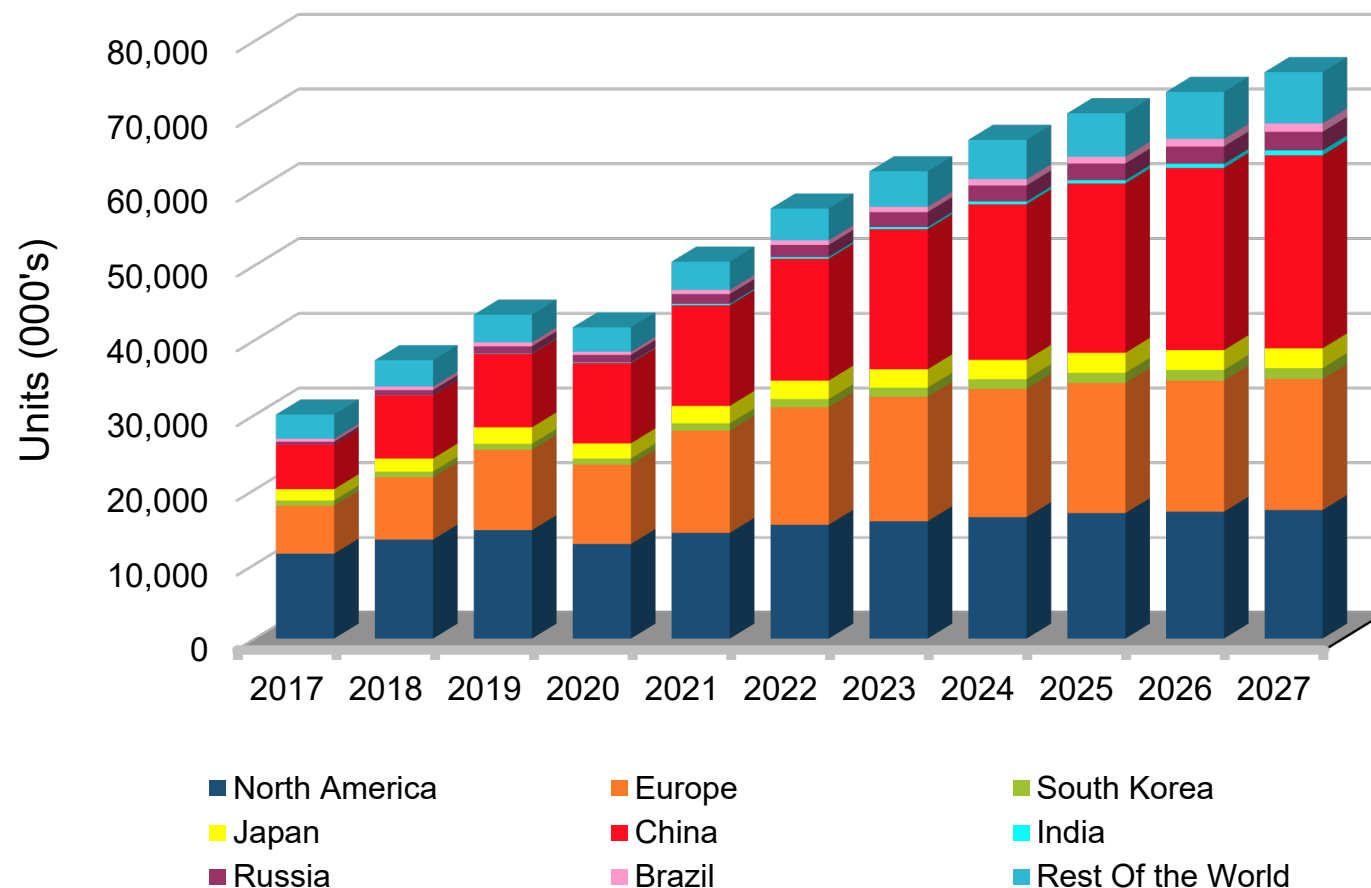
72% of vehicles shipped will have embedded modems

■ North America 
 ■ Europe 
 ■ South Korea 
 ■ Japan 
 ■ China 
 ■ India 
 ■ Russia 
 ■ Brazil 
 ■ Rest Of the World 
 ■ Not Connected

# EMBEDDED TELEMATICS OEM REGIONAL SHIPMENT VIEW

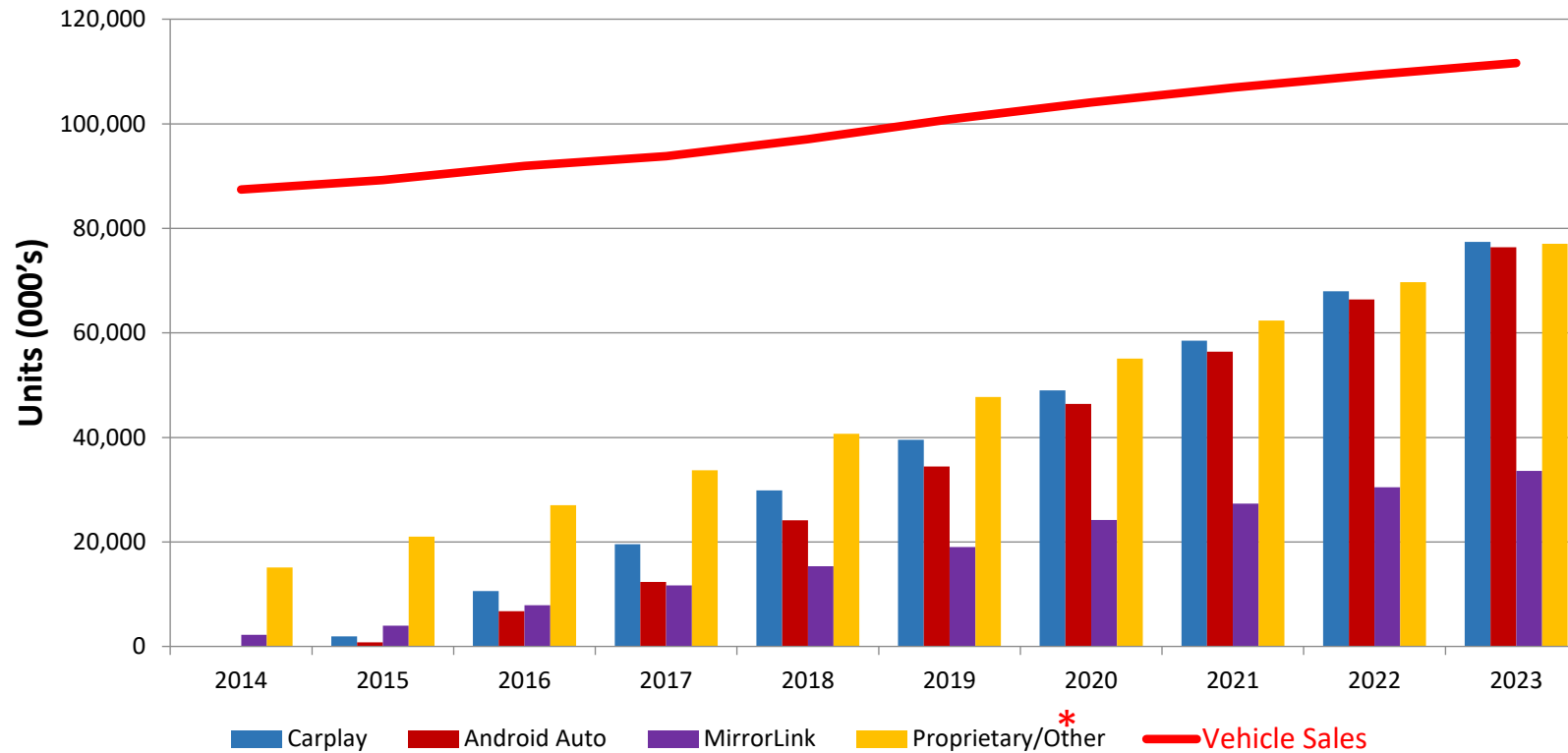


Telematics Shipments: 43.3 Million units in 2019 to 75.7 Million units in 2027



- **North America:** eCall/Telematics highly dependent on car maker strategies
- **Europe:** eCall telematics highly dependent on regulatory activity and selected OEMs
- **Japan:** Navigation is still dominant, Telematics roll-out is lead by Toyota
- **China:** Will be the #1 region for embedded Telematics shipments by 2021 (North America #2)

# BEING CONNECTED.... SMARTPHONE/GATEWAY CONNECTIONS



\* e.g. UVO, Entune, MyLink, etc.

Consumer Interest is High



...But...Limited Control of the  
IVI Environment!





# COMPETITIVE LANDSCAPE – MUSIC & MEDIA

## Hybrid Radio Solutions Multiplying

- Audi hybrid radio – bespoke, in-house design – integrating broadcast and streaming
- Radioline – Broadcast + streaming on Android (Panasonic)
- Radioplayer – Streaming only – Polestar + Aptiv
- RadioDNS – enabling standards platform
- Gracenote, Music Story – Metadata providers





# COMPETITIVE LANDSCAPE – MUSIC & MEDIA IN THE CAR

## Radioline

- **Android-based hybrid radio**
- **Global, scalable, multi-platform solution**
- **Multi-lingual voice commands**
- **Cross-platform integration**
- **Broadcast, streaming, podcasts**
- **Partnered with Panasonic**





# COMPETITIVE LANDSCAPE – MUSIC & MEDIA IN THE CAR

## Radioplayer

- Partnered with Audi
- Integrated with Polestar Streaming only
- Regional – 10 countries
- Ambitious: personalization, measurement, scale



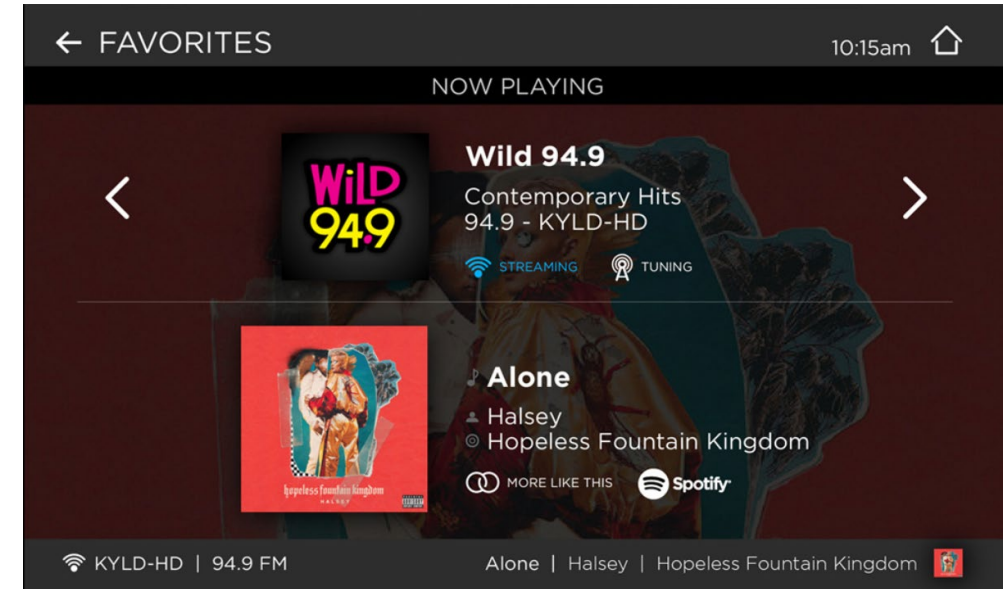




# COMPETITIVE LANDSCAPE – MUSIC & MEDIA IN THE CAR

## Gracenote

- **Global metadata platform**
- **History of successfully charging high license fees**
- **Refocusing on automotive industry**
- **Touting music ID, station ID, sports event info**
- **Targeting personalization, location relevance**
- **Broadcast and streaming solution**
- **Most direct competitor with Xperi**
- **Ownership by Nielsen something of a wild card – will they do measurement?**





Voice-based **digital assistants** are rapidly bringing limited types of AI to our cars and our homes – **AND access to streaming radio content.**

- **Amazon Alexa**-enabled devices, such as the Echo smart speaker (pictured at right) are selling in large volumes.
- Strategy Analytics' Smart Speaker service estimates that full-year (2017) shipments reached **32 million units** in the U.S., France, Germany, and China.
- That figure is up **more than 300%** year-on-year.
- **Google** and **Amazon** accounted for **9 out of every 10 smart speakers** sold during that period.



Source: Amazon



# OEMS' INFOTAINMENT AI PARTNERSHIPS

OEM	Digital Assistant	Status
<b>Audi</b>	Alibaba's Tmall Genie, PIA	Tmall Genie – Launch TBD PIA – Concept demonstration
<b>BMW/MINI</b>	<b>Amazon Alexa</b> , BMW Intelligent Personal Assistant	Alexa – Launched (BMW Connected mobile app integration), launching in MINI cars, this year BMW Intelligent Personal Assistant – Used cloud services from Microsoft that underpin Cortana to develop this solution, i.e. Microsoft white label solution provider
<b>Ford</b>	<b>Amazon Alexa</b>	Launched
<b>Honda</b>	HANA, Honda Personal Assistant	Hana – demonstrated, developed via SoftBank partnership Honda Personal Assistant – developed via partnership with SoundHound
<b>Hyundai</b>	<b>Amazon Alexa</b> , Google Assistant, SoundHound's Houndify	Alexa and Google Assistant launched, Houndify launched in Hyundai Venue in India
<b>Mercedes</b>	Google Assistant, <b>Amazon Alexa</b> , Tmall Genie, SoundHound	Google Assistant, Amazon Alexa launched April 2017 SoundHound to launch
<b>Nissan</b>	Google Assistant	Google Assistant – part of Google Automotive Services, which Renault-Nissan-Mitsubishi Alliance has adopted.
<b>PSA</b>	SoundHound's Houndify	Launch was planned for 2020
<b>SEAT</b>	<b>Amazon Alexa</b>	Launched in 2017
<b>Toyota/Lexus</b>	<b>Amazon Alexa</b> , YUI	Alexa – Launched in 2018 YUI – concept demonstration
<b>Volkswagen</b>	<b>Amazon Alexa</b>	Planned, launch date not yet announced
<b>Volvo</b>	<b>Amazon Alexa</b> , Google Assistant, Siri, Alibaba's Tmall Genie	Alexa, Google Assistant, Siri, works with OnCall App Tmall Genie- launch date not yet announced



# CoDriver for Driver Monitoring

## Sensor:

- Face detection
- Alignment
- Pose
- Eyes open/openness
- Gaze Tracking
- Person ID, Age, Gender
- Anti-spoofiness
- Emotion
- Multi-people
- ....



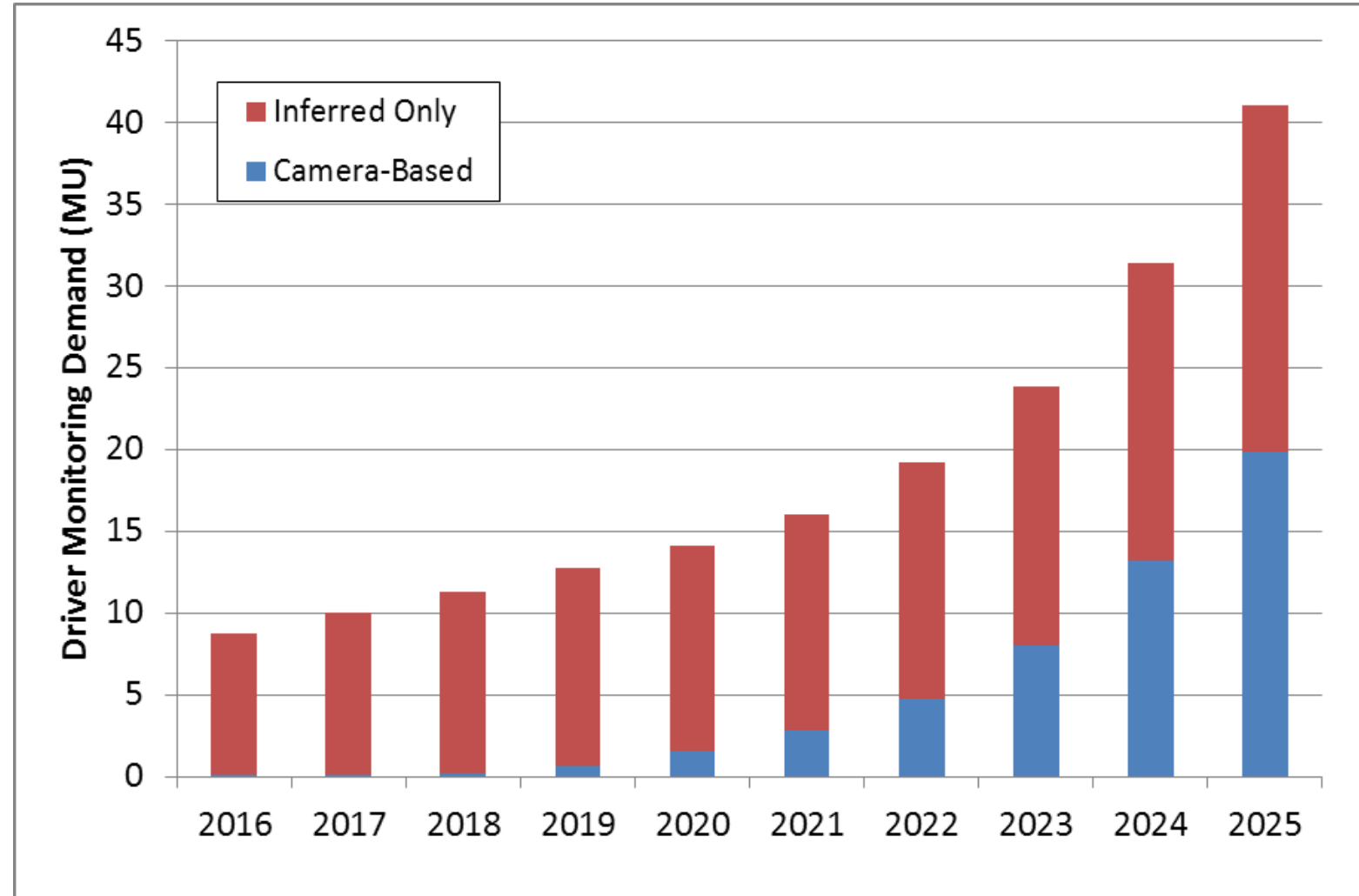
## States:

- Ready To Take Control
- Distraction
- Drowsiness
- Head bob/drop
- Distress
- Eye Blink, Sleep
- ....



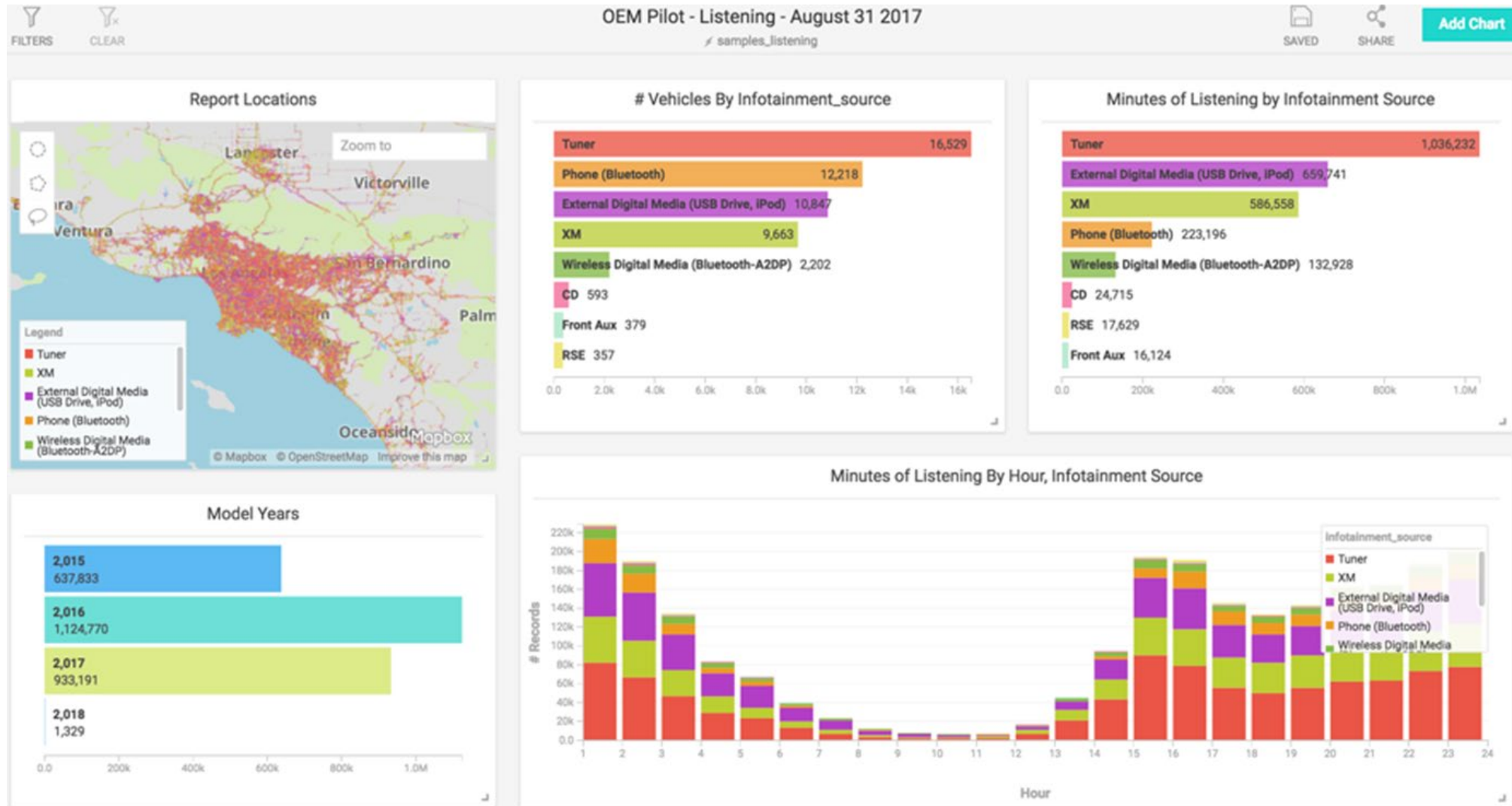
# DRIVER MONITORING FORECAST

- Camera-based solutions forecast to deploy rapidly starting around now
- Legislative / NCAP interest in US and Europe
  - Europe NCAP for driver monitoring
  - US potential legislation for occupants left in hot vehicles





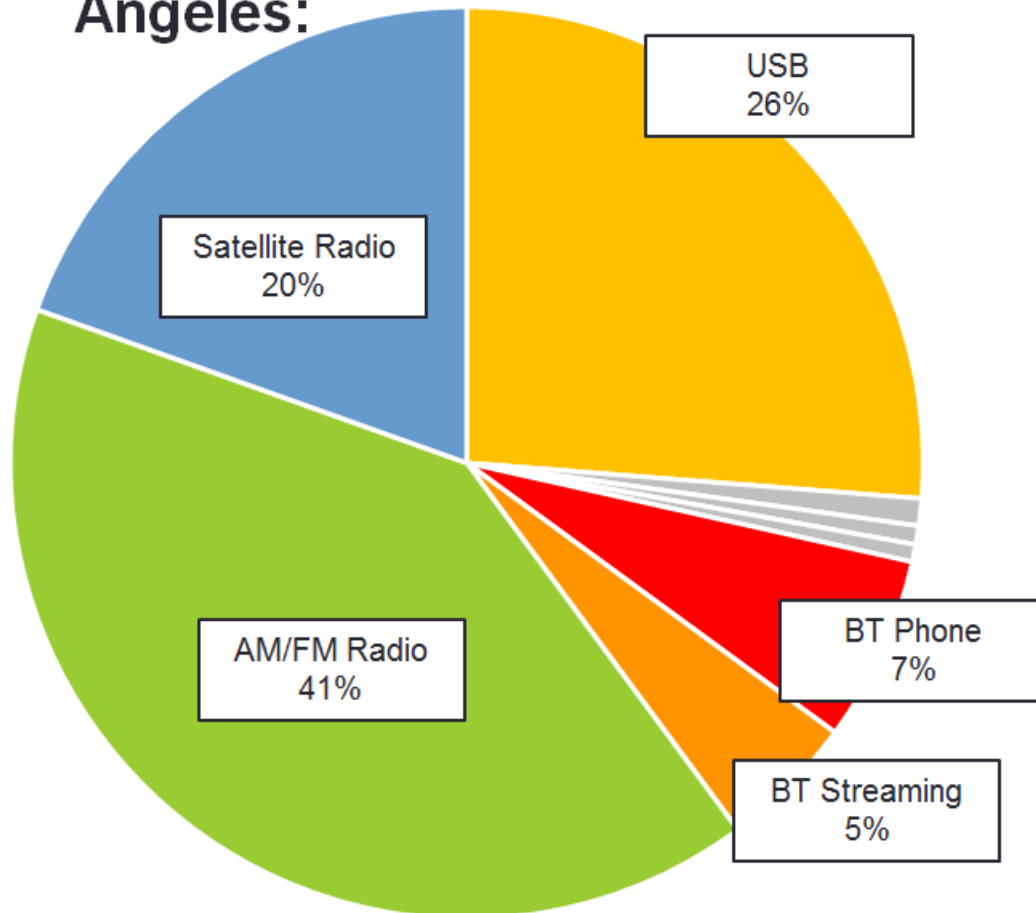
# PEERING INTO THE BLACK HOLE OF IN-VEHICLE LISTENING



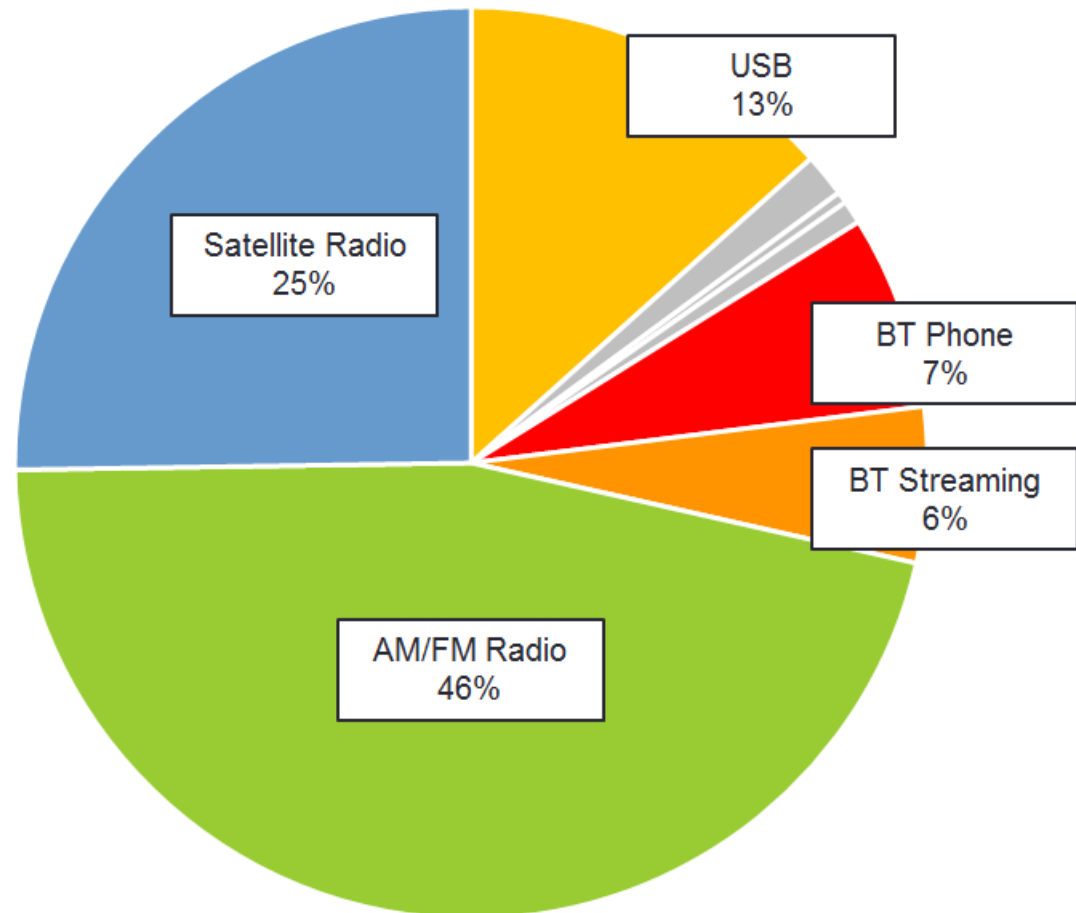


# TUNERS HOLDING THEIR OWN IN THE U.S.

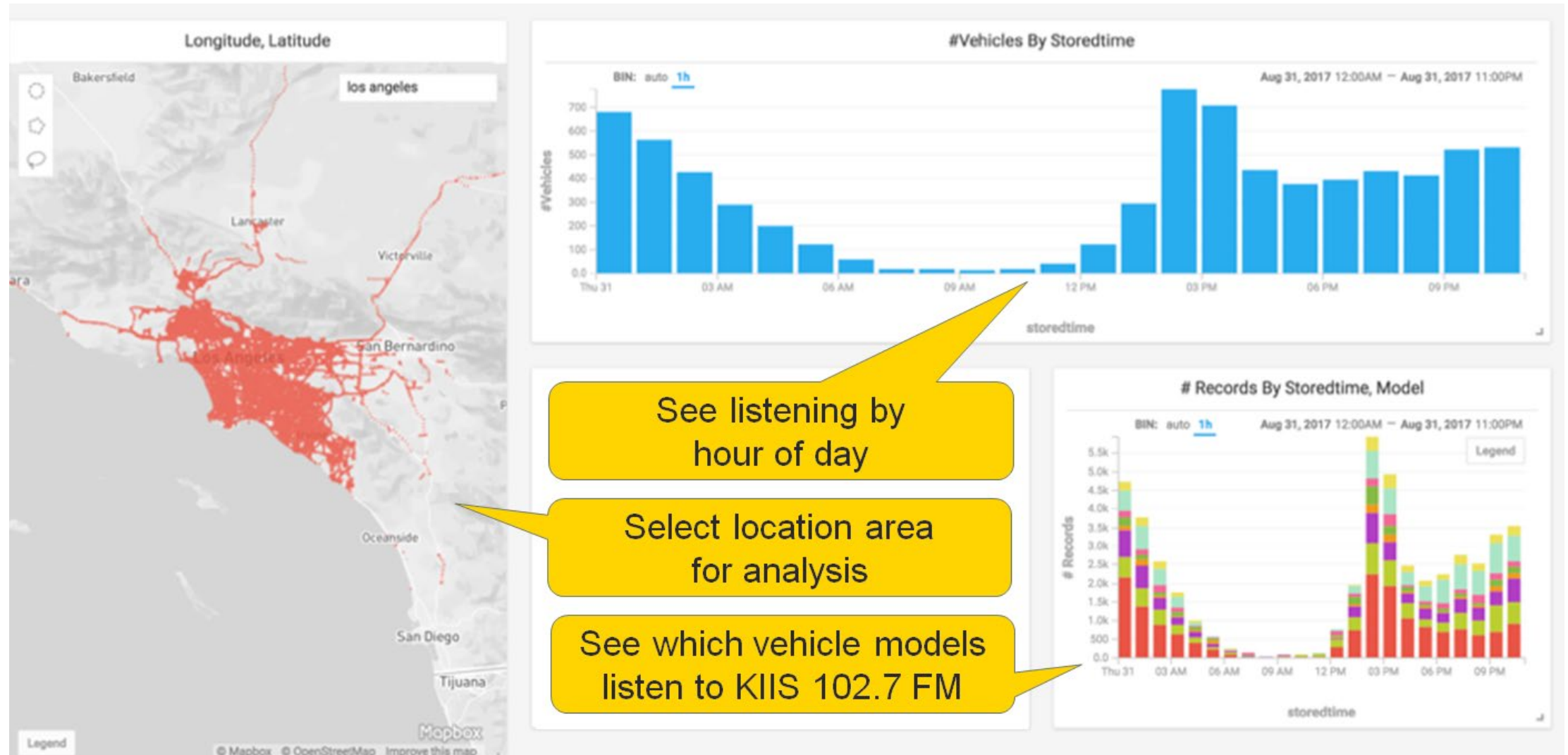
## Los Angeles:



## Chicago:



## ANSWERING Q'S FOR CAR MAKERS, BROADCASTERS, ADV'RS







# THE CAR IS A BROWSER

**Intent**



**Attribution**

**Audience Measurement**



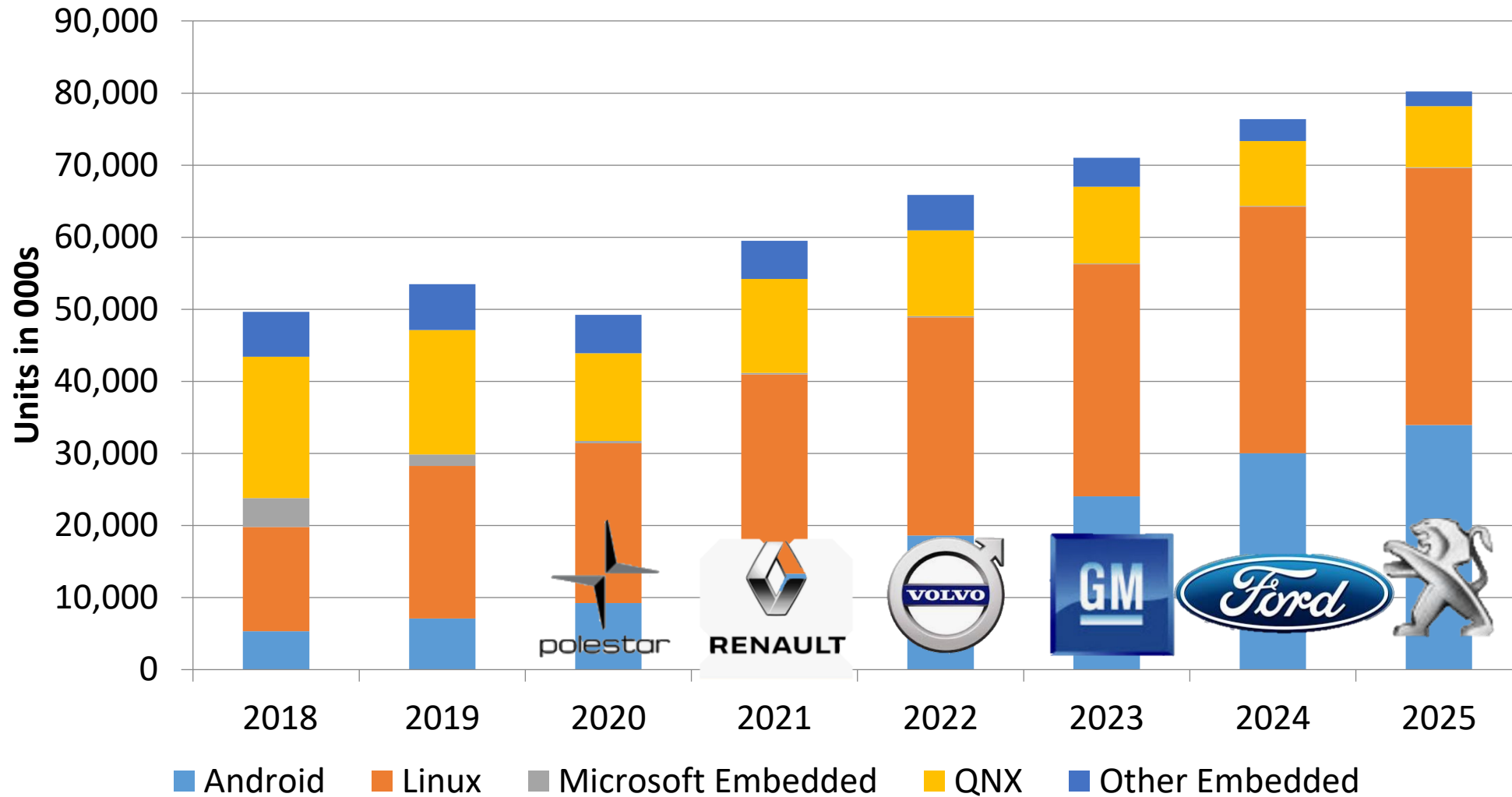
# GOOGLE, ANDROID ONSLAUGHT

## Understanding the impact of Google and Android adoption





# THE MARCH TOWARD ANDROID ADOPTION IN CARS



**Android OS:** 5.5M in 2018 to 33.9M by 2025

**Linux (incl. AGL and other Linux-based OSes):** 14.4M in 2018 to 35.6M by 2025

**Microsoft Embedded:** 4M in 2018 to 108,000 by 2025.

**QNX:** 19.6M in 2018 to 8.4M by 2025.

**Other Embedded:** 6.2M by 2018 to 2M by 2025.



# ANDROID AUTOMOTIVE OS AND GAS

- Polestar's Polestar 2 is the first vehicle to launch with the official version of Android Automotive OS and GAS, which provides Google Maps, search, and the Google Play Store.
- Over the next few years, Android Automotive OS is emerging as a standard due to the number of previously mentioned (GM, FCA/PSA, Volvo, Renault, etc.) OEMs adopting it.
- Android Automotive OS and GAS **require OTA update capabilities** and therefore reliable connectivity. An OEM can't outsource all aspects of the IVI system to Google and expect all their problems to be solved. Android Automotive OS + GAS, by itself, does not solve that problem.
- It also has hardware implications in terms of consumer expectations about display size, functionality, and access to Google's ecosystem.



Source: Polestar

The Polestar 2 is the first vehicle shipping with Android Automotive OS today. More OEMs (and vehicles) are set to follow.

# EXECUTIVE SUMMARY



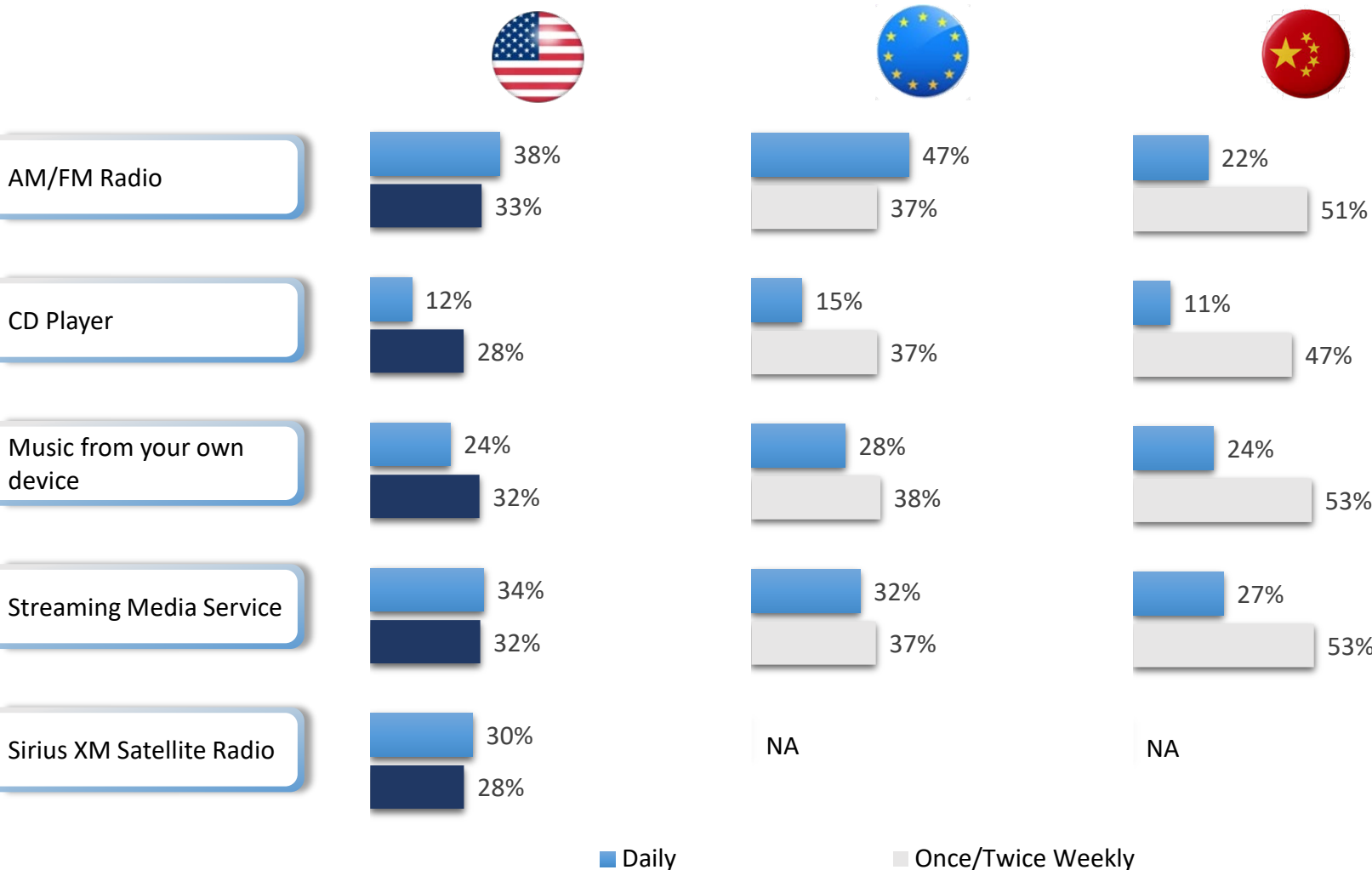
- **Strategy Analytics undertook a worldwide internet-based survey to investigate car owners' usage of, and interest in, audio infotainment sources in the car.**
  - A total of 4,705 car owners across the US, UK, France, Germany, Italy, and China were surveyed.
- **In terms of both usage and interest for in-car listening, AM/FM radio's dominance is now in danger.**
  - Streaming media has continued its steady year-over-year increase, both in terms of daily/weekly usage, and interest as a "must-have" for the next car purchase.
  - In China, streaming is now a clear #1 over AM/FM radio for usage and interest among car owners.
  - Increased adoption of streaming media has been accompanied by declines in usage and interest for AM/FM radio in all regions, including a steep decline in the US.
  - After a slight dip in 2019, interest in smartphone mirroring has rebounded in 2020.

# INFOTAINMENT SOURCE USAGE

## STREAMING USAGE PULLS CLEAR FROM RADIO IN CHINA, CLOSING FAST IN US



Q: How often do you use each of the following features in your vehicle?



- At least 38% of car owners in Western markets use AM/FM radio in the car daily, with a further 33% using it once/twice weekly.
  - Just 22% of car owners in China use AM/FM radio in the car daily.
- At least 27% of car owners in each market use streaming music services in the car daily.
- At least 24% of car owners in each market listen to owned music from a portable device in a car daily.

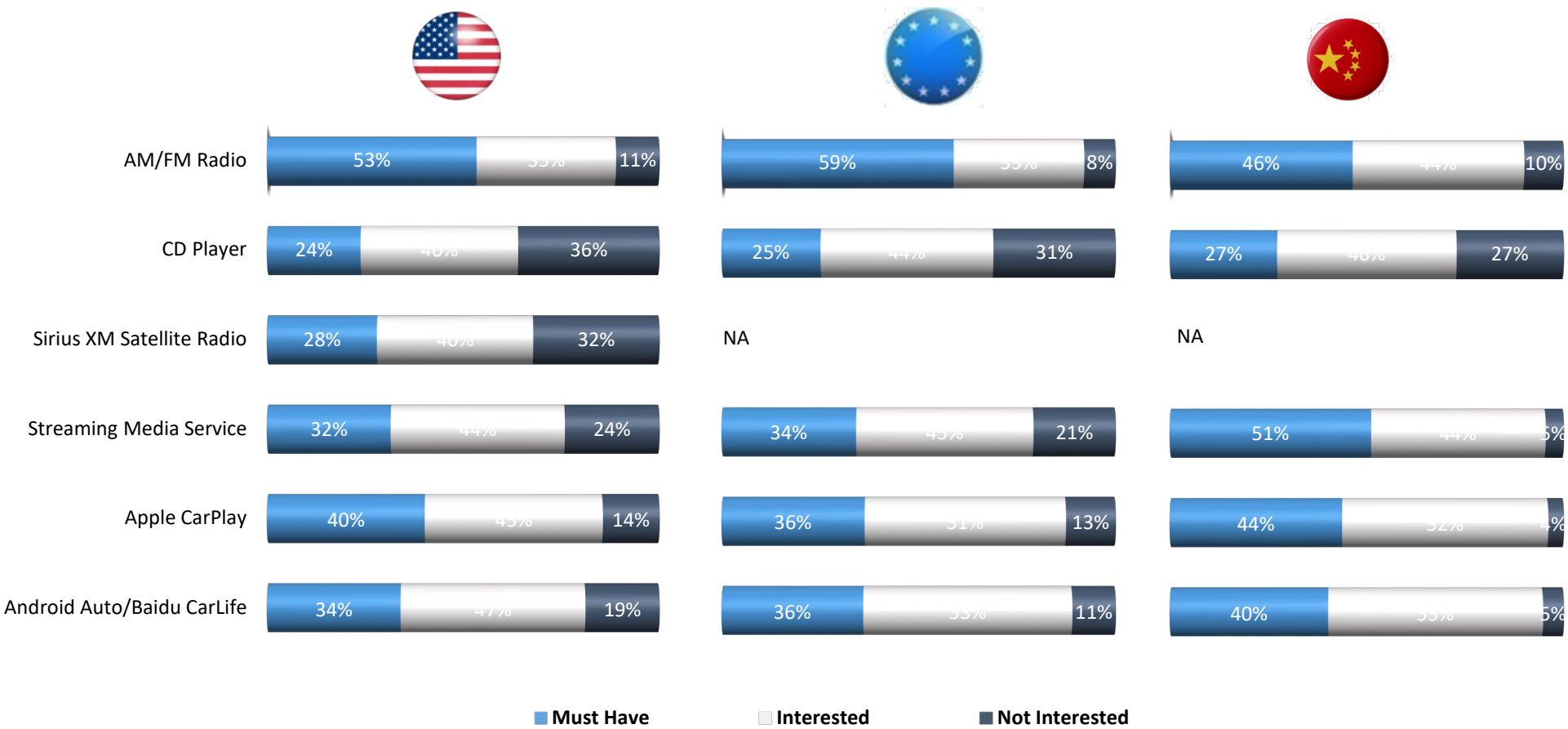
**Insight:** In terms of daily in-car use, streaming music services and portable owned music have overtaken AM/FM radio in China. In Western markets, AM/FM radio is still the most-used in-car source, though satellite radio and streaming music are close competitors in the US.

# INTEREST IN INFOTAINMENT SOURCES

## THE “NON-RADIO” PICTURE FOR INFOTAINMENT REMAINS UNCLEAR



Q: “Must-have” features for next vehicle



- At least 53% of car owners in Western markets consider AM/FM radio to be a “must-have,” while only 46% of car owners in China feel similarly about AM/FM radio.
- 51% of car owners in China consider streaming music to be a “must-have,” compared to just 32-34% of those in Western markets.
- 34-44% of car owners in all markets consider any smartphone mirroring system to be a “must-have.”

**Insight:** [Continuing a trend noted in 2019](#), consumers still send mixed signals on their “must haves” beyond AM/FM radio. As such, flat UI (for easy access to all sources) remains important for the next model turn.

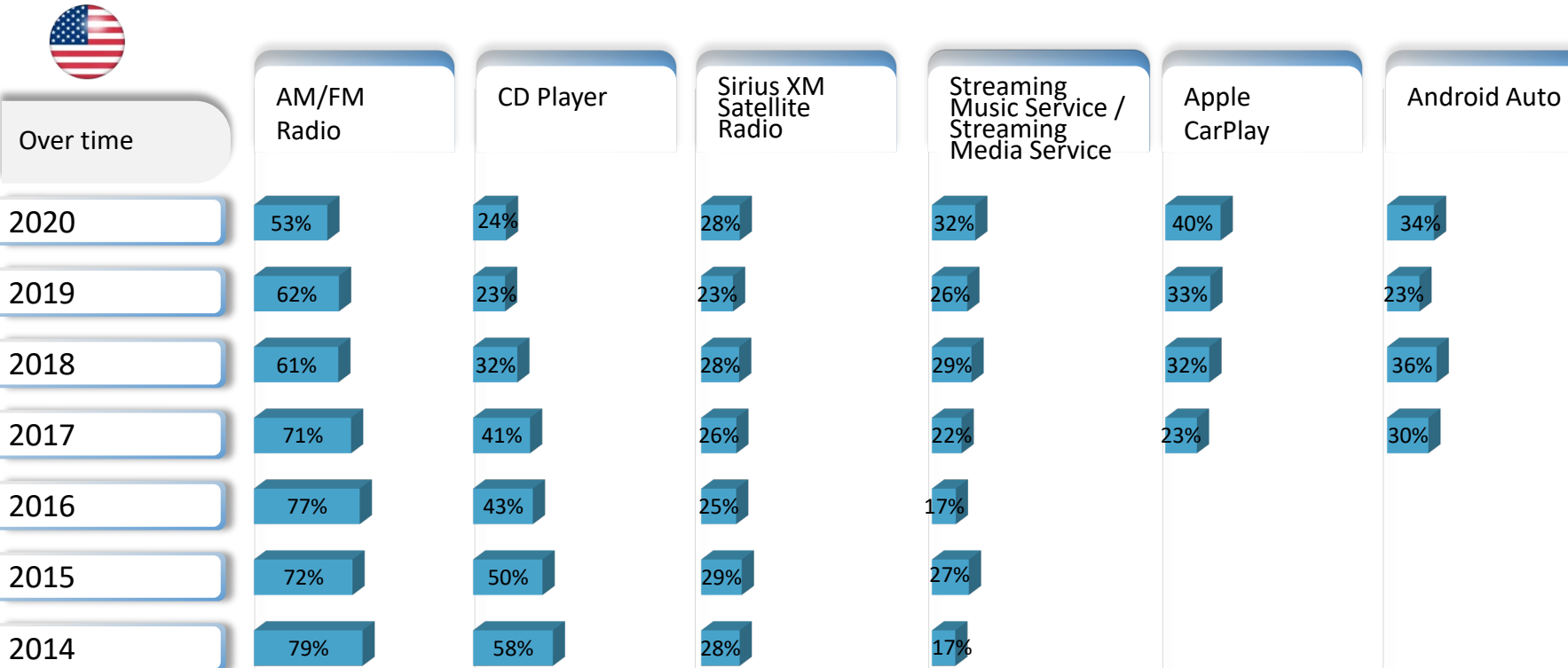
Base: (US/Western Europe/China) - AM/FM Radio, CD Player, Streaming Media Service (1513/1661/1531), Sirius XM Satellite Radio (1513/NA/NA), Apple CarPlay (913/609/453), Android Auto/Baidu CarLife (561/1024/1531)

# INTEREST IN INFOTAINMENT SOURCES

## SHARP DROP IN DEMAND FOR AM/FM IN THE US; REBOUNDS FOR ANDROID AUTO & CARPLAY



Q: "Must-have" features for next vehicle



In the US, when exploring the percentages of car owners who consider a feature a "must-have," and how these numbers changed from 2019 to 2020...

- ...AM/FM radio fell 9 percentage points.
- ...streaming media rose 6 percentage points.
- ...SiriusXM radio rose 5 percentage points.
- ...Apple CarPlay rose 7 percentage points.
- ...Android Auto rose 11 percentage points.

**Insight:** In the US, though usage of streaming music has passed usage owned brought-in media, fewer consumers consider streaming service access a "must-have" on the level of access to owned brought-in media. Furthermore, the exploding interest in CarPlay and Android Auto has levelled off and dropped (respectively) as penetration of those systems deepens and consumers become more aware of their benefits and limitations.

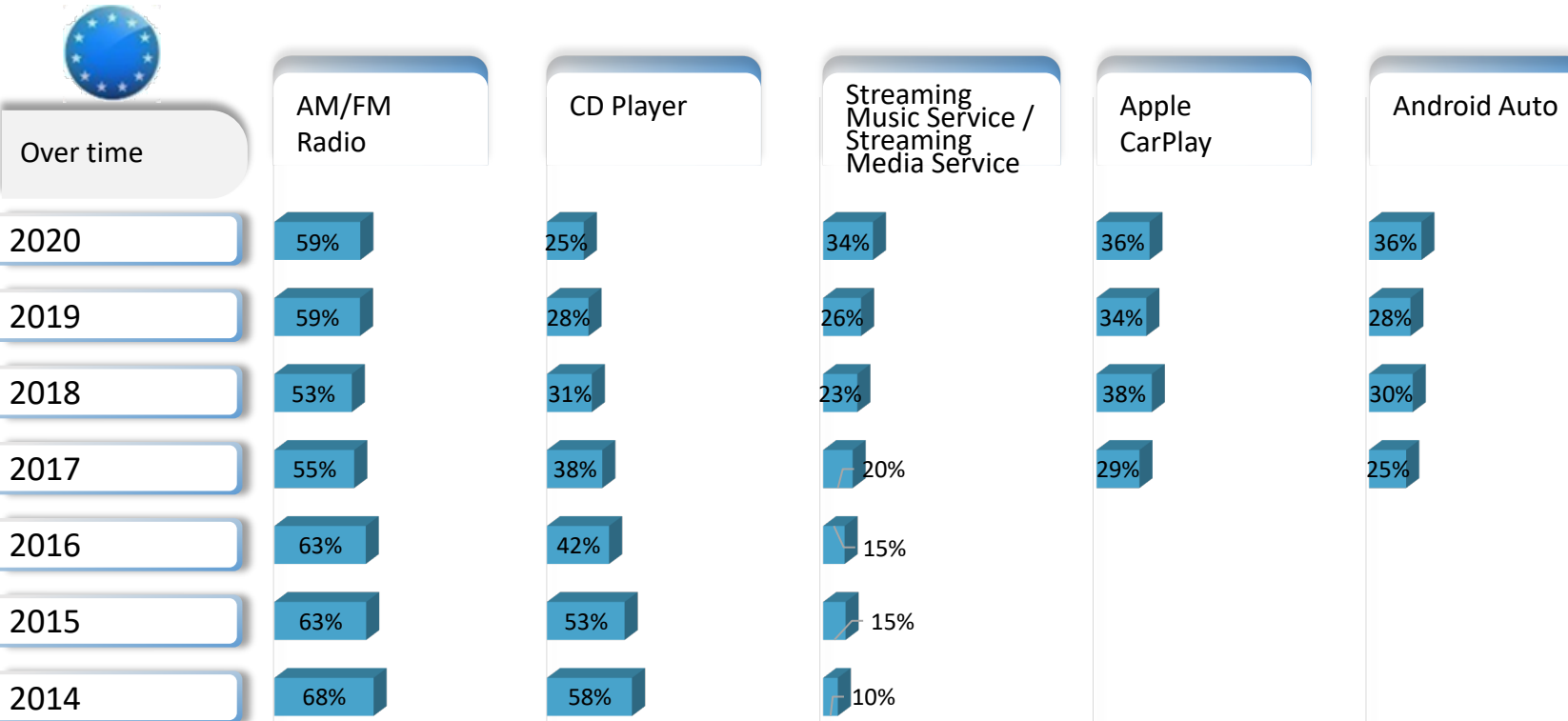


# INTEREST IN INFOTAINMENT SOURCES

## AM/FM STILL A MUST-HAVE; MIRRORING SYSTEM DESIRE HAS STABILIZED



Q: "Must-have" features for next vehicle



In Western Europe, when exploring the percentages of car owners who consider a feature a "must-have," and how these numbers changed from 2019 to 2020...

- ...AM/FM radio held steady.
- ...streaming media rose 8 percentage points.
- ...Apple CarPlay rose 2 percentage points.
- ...Android Auto rose 8 percentage points.

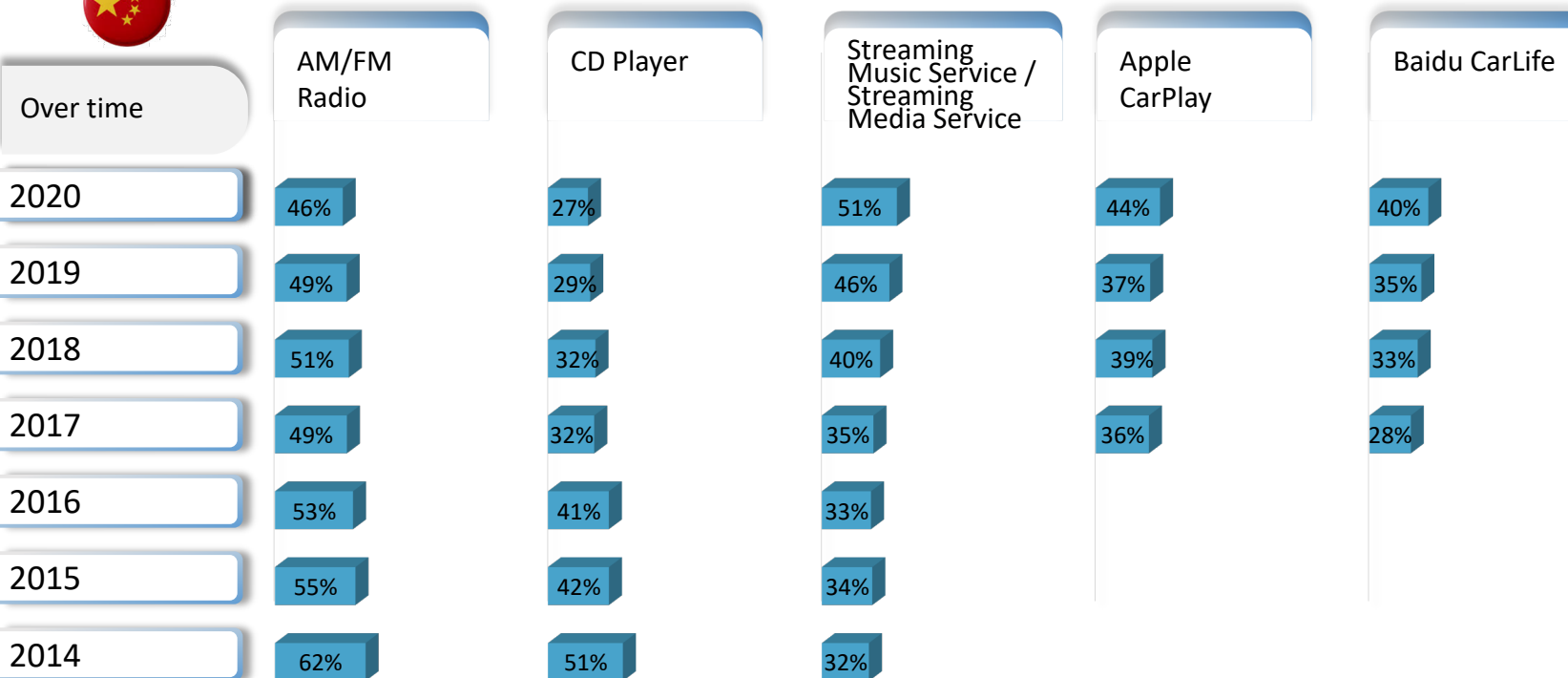
**Insight:** In a trend that is identical to one observed in the US, radio is still king in Western Europe, but the percentage of car owners who consider streaming media a "must-have" is sharply increasing. This is likely helping power a rebound in interest for smartphone mirroring, especially Android Auto, which made notable gains in interest among European car owners.

# INTEREST IN INFOTAINMENT SOURCES

## AM/FM RADIO CONTINUES TO SLIDE IN CHINA



Q: "Must-have" features for next vehicle



In China, when exploring the percentages of car owners who consider a "must-have," and how these numbers changed from 2019 to 2020...

- ...AM/FM radio fell 3 percentage points
- ...streaming media rose 85percentage points.
- ...Apple CarPlay rose 7 percentage points.

**Insight:** In China, interest in streaming music as a "must-have" for the next vehicle purchase has now overtaken AM/FM radio in importance. Interest in smartphone mirroring has resumed its rise, after levelling off in 2019. In the China market, flat UI is crucial for upcoming models, in order for users to access the streaming media and terrestrial radio sources they are clearly using in tandem.

# OVERALL INSIGHTS



- 2020 is the year that the in-car AM/FM radio hit the proverbial iceberg. Two trends (one long-running, one new) have combined forces against in-car radio:
  - Streaming media has continued its march into the dashboard, powered by strong usage and desirability among key car-buying groups in China, and increasing usage among key groups in the West.
  - The COVID-19 pandemic and its related lockdowns have severely curtailed regular commuting journeys, where Strategy Analytics has found [much of consumers' radio-listening originates](#). This has led to a marked decline in AM/FM usage, and a steep decline in interest as a "must-have" feature, particularly in the US.
    - Some radio providers in the West are reporting that [their ratings have tanked](#), because "many of those who listened on their commute have not rejoined from home."
    - While radio [still has unique advantages](#), the pandemic will only increase adoption of other media sources.
- The post-pandemic future of radio is even more uncertain, as Android Automotive and other systems embedding media apps will put additional pressure on radio.
  - Provided that these systems allow [quick and easy login](#), direct access to streamed content without having to deal with Bluetooth or device cables will result in further adoption and consumption.

# OVERALL INSIGHTS



- 2020 is also proving to be a minor renaissance for smartphone mirroring systems. [After levelling off in 2019](#), interest in these features as “must-haves” for the next car purchase has resumed the steady rise noted in prior years.
  - Car owners continue to express a strong desire not just for streaming media, but for advanced satnav functionality ([as noted in a recent report on connected car features](#)). And though they are still imperfect, [CarPlay](#), [Android Auto](#), and [their relatives in China](#) remain the best and most desirable way for drivers and passengers to access these connected features.
- In the coming years, media providers and product planners must resolve a number of long-open “tickets” to address changing consumer habits in the car.
  - Broadcast providers must double down on non-antenna strategies (podcasting, etc.) that augment broadcast radio.
  - Providers absolutely must know who their listeners are, and what meaningful content sounds like to their listeners across delivery modes.
    - “Measurement” of streaming listeners especially (in home and while mobile) has been notoriously difficult to accomplish. But this must be resolved to unlock the next generation of insights and advert revenue channels.

# NEXT STEPS FOR BROADCASTERS, DESIGNERS, AND MORE



As AM/FM radio continues its slow slide in usage and desirability (especially during the pandemic), and interest in streaming media continues to expand, designers and product planners must confront a number of issues:

- What are some **new ways broadcasters can reach car owners during the pandemic**?
- What are the **unmet needs for CarPlay users, or satellite radio users**?
- As **Level 4** semi-automated systems come online, **which infotainment sources will become more desirable**, and which will fade away?
- Should **cockpit screen design** change to accommodate different needs for **China**? If so, how?

These questions can be addressed from a variety of angles, dependent on the problem being addressed. Strategy Analytics is well-positioned to enable a number of problem-solving techniques, including:



# CONCLUSIONS

- Infotainment systems in cars are big business
- Google wants a piece of the action
- Connectivity is all about customer retention
- Radio plays an essential role and remains dominant, though at risk
- We are on the cusp of realizing new audience measurement tools and tech
  
- **Digital radio technology is the tool that is leveling the field of play – new content – new user experiences – more content – audience measurement and attribution in the works**