

# the path to 5G and its impact on Internet of Things

Justin Blair

Verizon

# the vision of 5G

10,000x  
more traffic

>10 Gbps  
peak data  
rates

100 Mbps  
whenever  
needed



**High speed.**  
Extreme Mobile Broadband



Virtual presence



Real time  
work in  
cloud

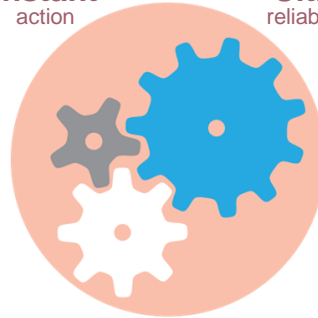


Augmented  
gaming

Instant  
action

<1 ms  
radio  
latency

Ultra  
reliability



**Low latency.**  
Critical Machine  
Communications



Factory  
automation



Real-time  
remote control



Autonomous  
delivery

10 years  
on battery

Ultra  
low cost

10-100x  
more devices



**Massive scale.**  
Massive IoT Communications



Smart  
grids



Infrastructure  
management



Smart  
clothes

## 5G

- Massive MIMO
- Millimeter wave spectrum
- Network slicing

### New technology

- Gbps peak speeds
- Millisecond latency
- End to End Quality of Service

### New capabilities

- Fixed wireless fiber
- Service continuity
- Hosted services
- Control systems

### New outcomes

## 4G

- More Carrier Aggregation
- More antennas
- New modulation schemes

### New technology

- Much faster peak speeds
- More resilient performance
- Dynamic Quality of Service

### New capabilities

- Better wireless backup
- Broader wireless primary
- New mobile experiences

### New outcomes

## 4G

- Machine Type Communications
- Category-M1, Category-1
- Better interference cancellation

- Smaller, cheaper devices
- Improved battery performance

- IoT growth from millions to billions
- Standard options over proprietary
- New connected use-cases

# an integrated, secure and reliable platform

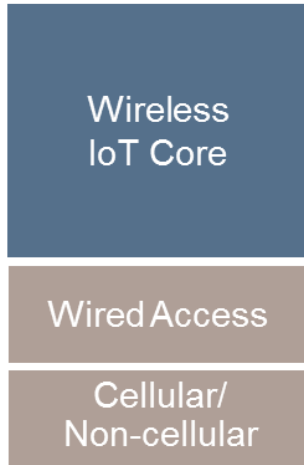
End-to-End Device, Platform and App Integration

## Devices

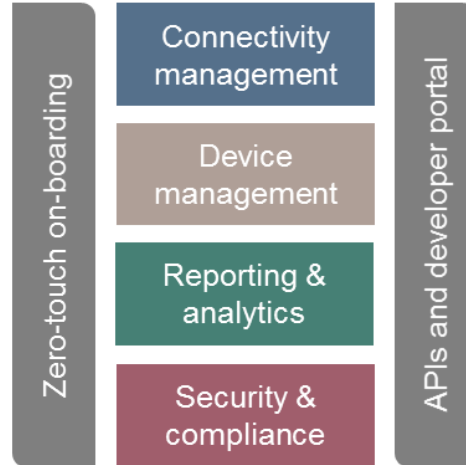


- Cat-1
- Cat-M
- NB-IoT

## Network



## ThingSpace Platform

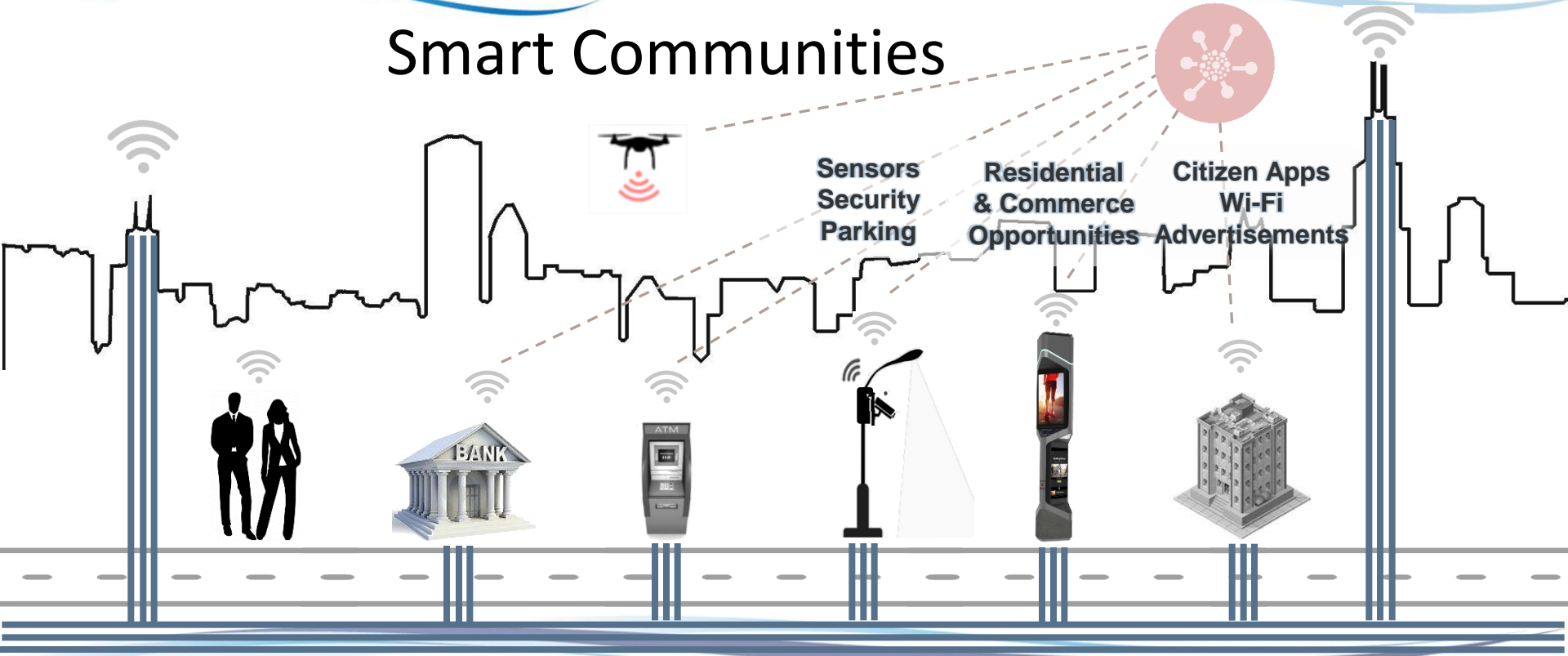


## Applications

**verizon**  
Owned & Operated



# Smart Communities



Creating the next ecosystem for commerce and citizen engagement