

# A Strategic R&D Initiative for 5G

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## My Definition of 5G

- Post 2020 mobile network
  - Deployed in major markets: N. America, Europe, Asia
- Significant changes from the current
  - Technology and business

# Technology Roadmaps

- A roadmap is not an atlas
- Need strategic context and objectives
  - Directions and destinations
  - Likely pathways for development and deployment
- Business vision as important as technology vision, if not more
- Yesterday's markets + tomorrow's technology = roadmap to nowhere

## A U.S. Centric View

- U.S. probably the best 5G market for TW
  - Open, high price points, innovative markets
- Carriers will decide what to deploy
  - saturating consumer market, high capex
  - prefer LTE, defer 5G
  - Prefer virtualization over hardware
- Focus will be on new business markets
  - Mobile Internet of things
  - Healthcare, sensors, wearables, vehicles

## Topic Specific Research Funding

- Timely topics often present opportunities to achieve major socio-economic gains
  - but rarely realized
- Topic specific bottom-up R&D programs
  - create “me too” constituencies, and crowd out genuine creativity
  - roadmaps may serve to legitimize copycat research
- DARPA process a possible alternative
  - Problem solving, endpoint driven

## The DARPA Process

- Overarching Purpose
- Thematic Focus
- Critical Problems
- Endpoint(s)
- Active Management

# Examples from DARPA

	1970's	11/2013
purpose	<ul style="list-style-type: none"><li>• Reliable comm.</li></ul>	<ul style="list-style-type: none"><li>• Understand the brain</li></ul>
focus	<ul style="list-style-type: none"><li>• Computer comm.</li></ul>	<ul style="list-style-type: none"><li>• Deep brain stimulation</li></ul>
problems	<ul style="list-style-type: none"><li>• Min. redundancy (packet switch)</li><li>• Min. overhead (routers)</li></ul>	<ul style="list-style-type: none"><li>• Identify and relate identifiable defects to disease</li></ul>
endpoint	<ul style="list-style-type: none"><li>• Internet</li></ul>	<ul style="list-style-type: none"><li>• FDA approved device in 5 years</li></ul>

## An Example (not a proposal)

- Purpose: create a major economic opportunity for TW in 5G
- Focus: Mobile Internet of Things
- Endpoint: mobile medical wearables and implants
- Problems:
  - Requires ultra high reliability and security
  - High barriers to healthcare markets

# Summary

- Useful roadmaps need a clear business vision
  - More important than technology vision
- Topic specific R&D programs need to be focused and purposeful
  - problem solving and endpoint driven paradigm of DARPA