

MODELING ADOPTION OF TECHNOLOGICAL INNOVATIONS AND INFRASTRUCTURE IMPACTS IN A SMART CITY

Project sponsored by City of Memphis and FedEx Institute of Technology

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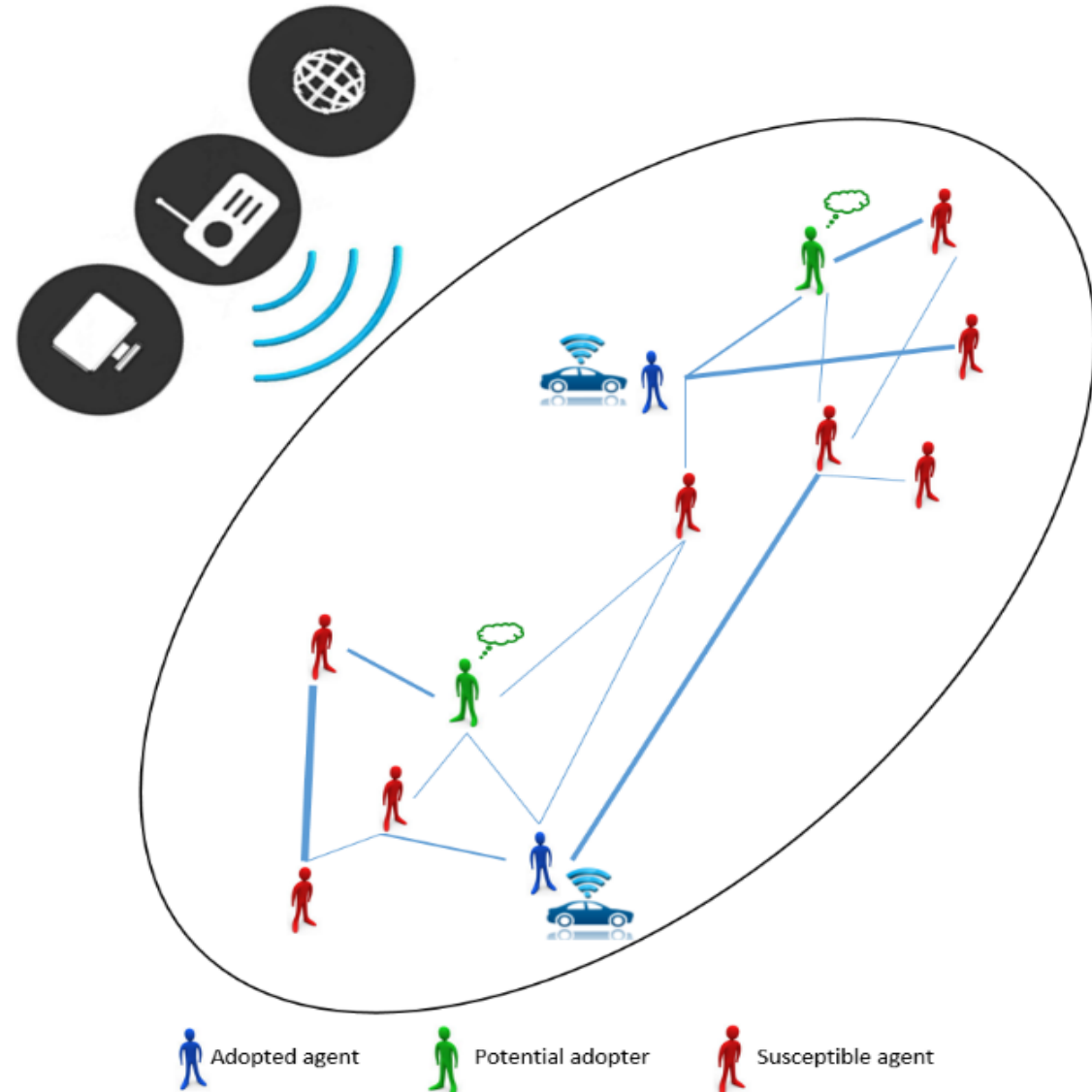
Motivation

- Connected autonomous vehicles (CAVs) are about to become a reality
- Key question: *how much will be the demand for ownership of CAVs and how will be the timing of adoption in long-term?*



Methodology

- The concept of resistance explains why individuals defer adoption
- Resistance is lowered by
 - Peer-to-peer communication
 - Exposure to media advertisement



Survey

- 327 complete responses received (13.3%)
- Reliability scores (on a seven-point scale)
 - Information received from peers: 5.58 ($\sigma = 1.08$)
 - Media: 3.79 ($\sigma = 1.36$)
 - Car dealership: 3.63 ($\sigma = 1.44$)
- Willingness to pay for full automation
 - \$5,000 or less: 69.1%
 - \$20,000: only 5%
- Using the sample, a synthetic population of UofM is developed. Then a synthetic network is developed

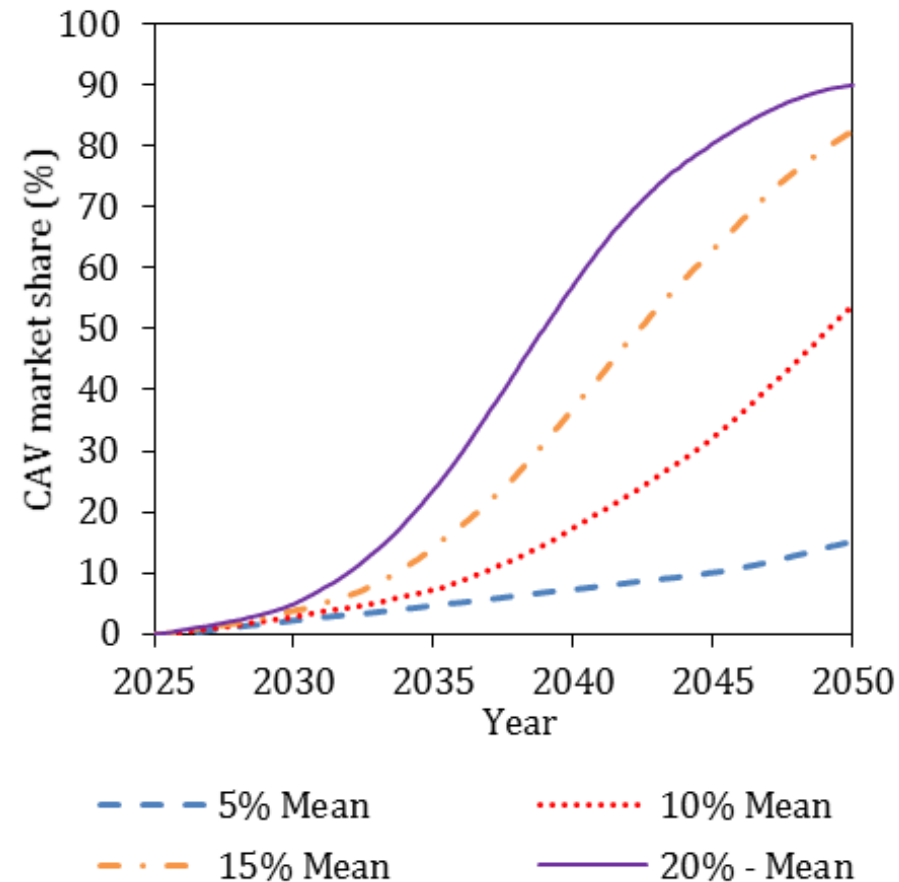


Survey



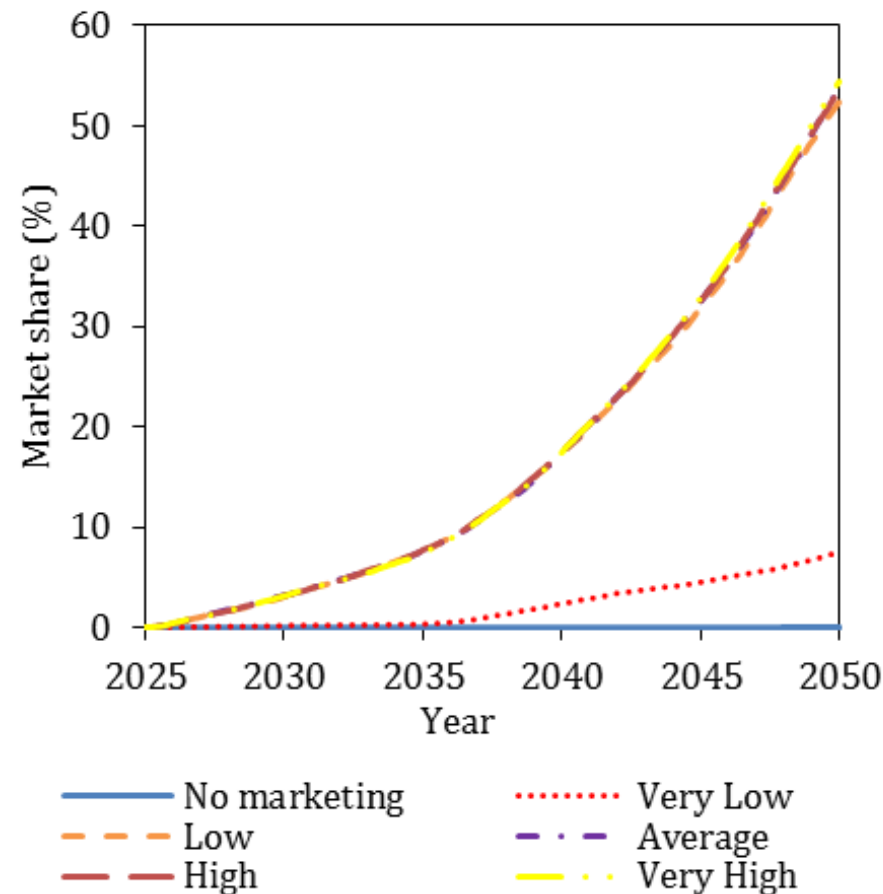
Major findings

- CAV price reduction rate increased from 5% to 20% with an increment of 5%
- With 5%, only some 15% of individuals will adopt by 2050
- The share will reach about 90% if price is reduced at 20%
- The share will be close to 100% only if all adopters are satisfied with their purchases



Selected findings

- DOI lit.: advertisement does initiate diffusion but its impact is limited
- Six levels of ad intensity
- No ad: CAV market share will be only 4% by 2050 (only innovators will adopt)
- There exist a cap for CAV share



Thank you for your time

Q/A?

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Acknowledgment

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