



CAV Applications and Networks: Wireless Networked 3D Mapping for Public Safety

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Thanks: Chris Demos, Yu Chen, Pengfei Ren, Ling Wang, Wen Xiao, Matt Lessins, Carlo Musante, Brian Thompson, Bert Rossi
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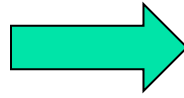


Detroit



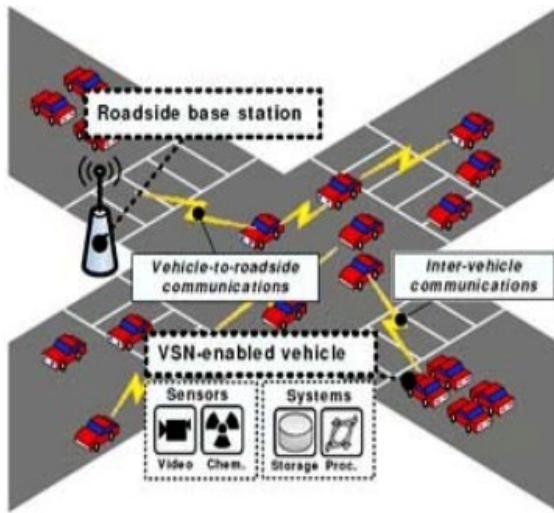


Individual, human-driven vehicles



Connected, automated vehicles (CAV)

Driving safety



Eliminate up to 90% accidents

- 1.2 millions lives saved per year
- \$460,000,000,000 cost saving per year
- 22% reduction in congestion

Networked fuel economy optimization



8-16% fuel consumption by simple strategies

- 4% reduction in world's energy use
- 11% reduction in world's ozone pollution

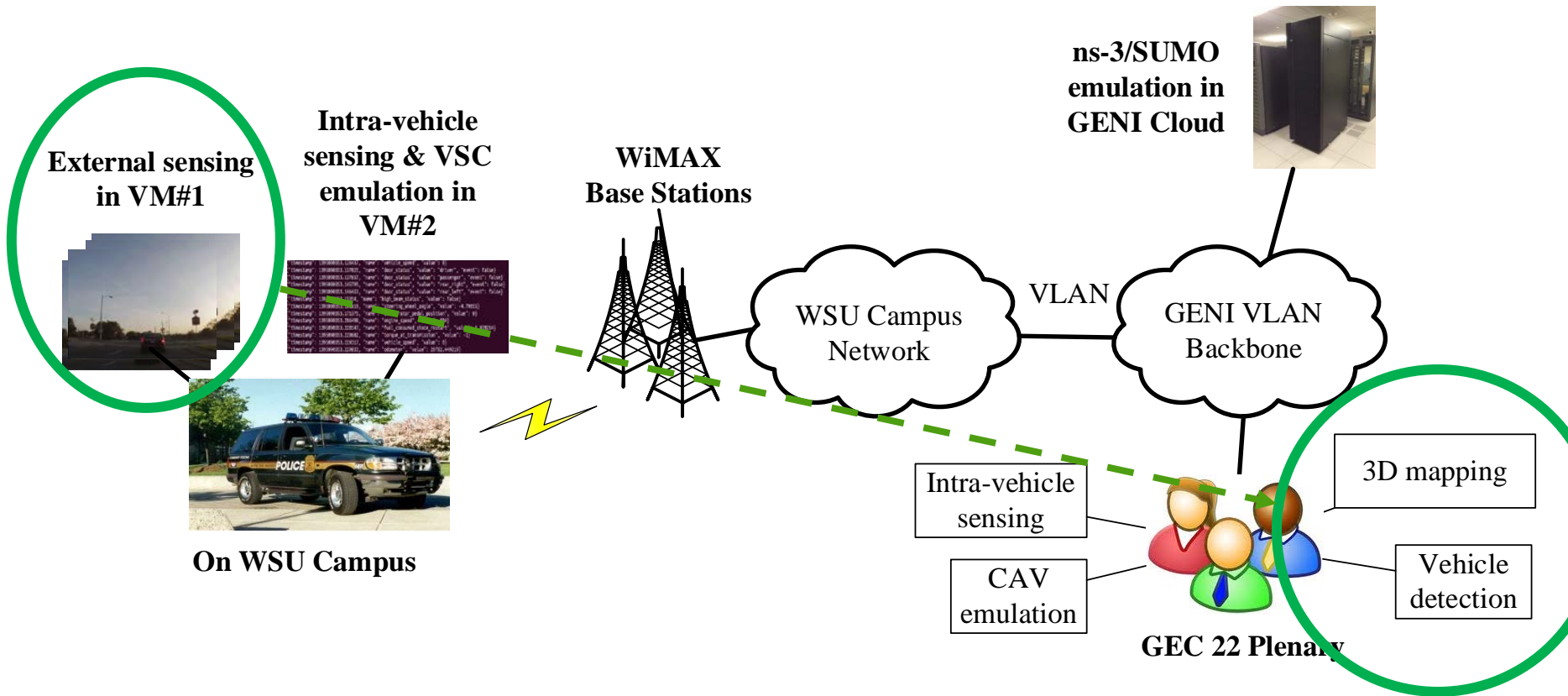


CAV applications in public safety

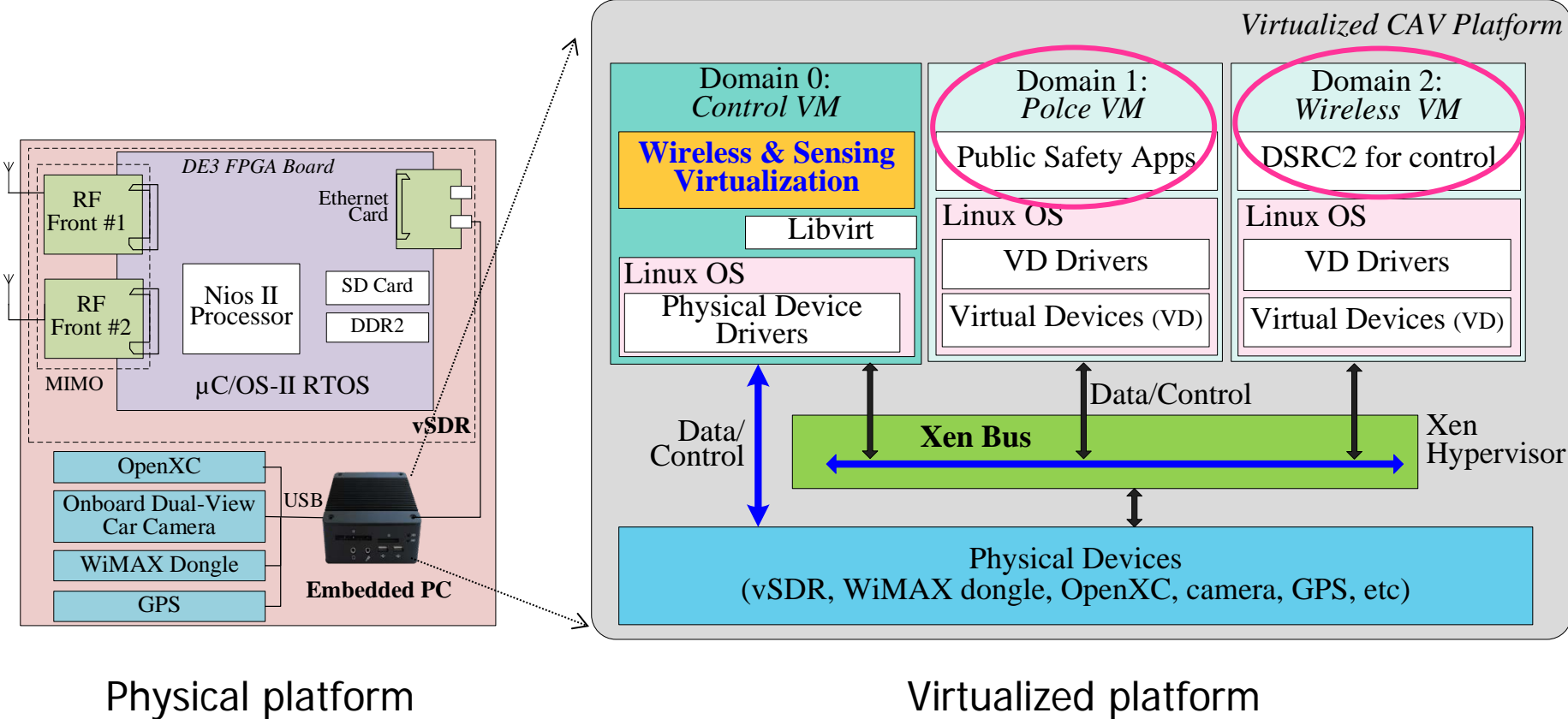


Anthony Holt
Chief of Police, Wayne State University

3D mapping & vehicle detection



Enabler (1): software-defined platform virtualization



Physical platform

Virtualized platform

Enabler (2): open platform for vehicular sensing



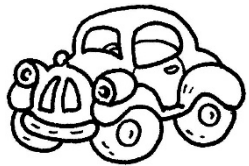
OpenXC-based internal sensing:
fuel consumption, emission ...



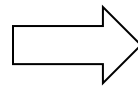
Camera-based external sensing:
surrounding vehicles, pedestrians ...



R&D



Deployment



Existing Deployments
+ R&D Experiments

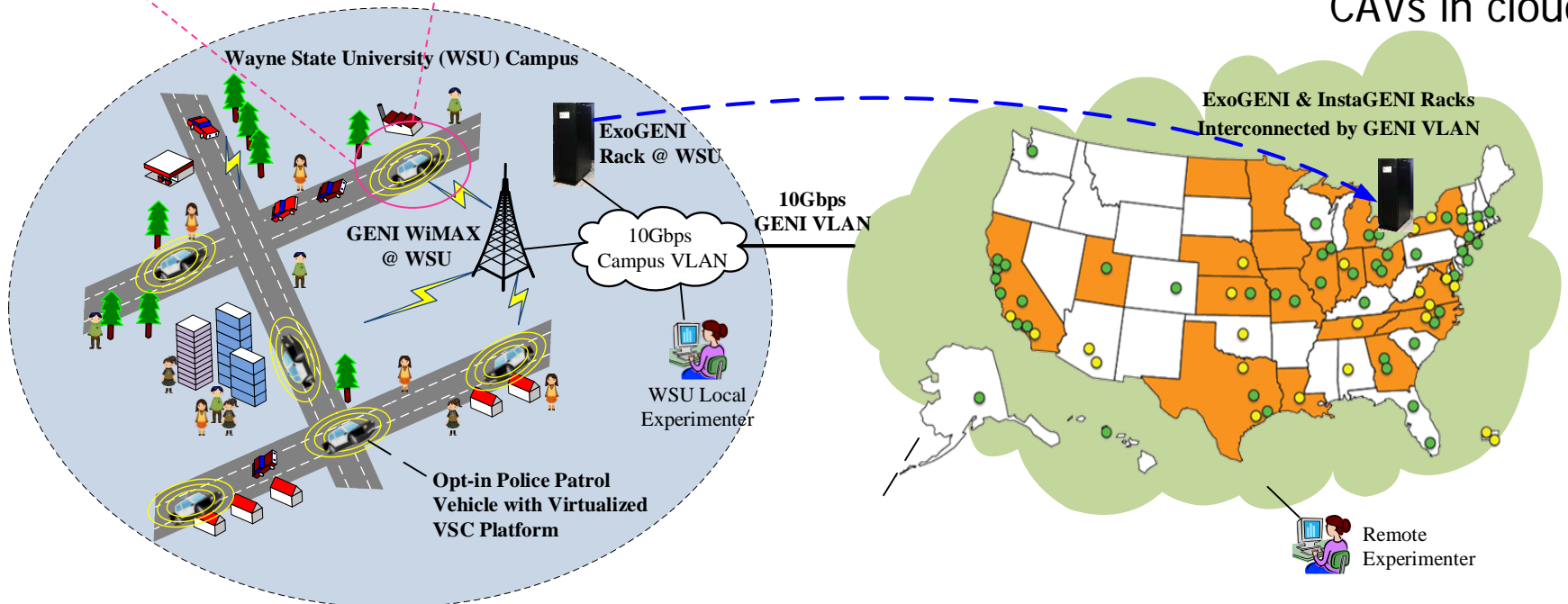


Not capturing networking
impact on CAVs

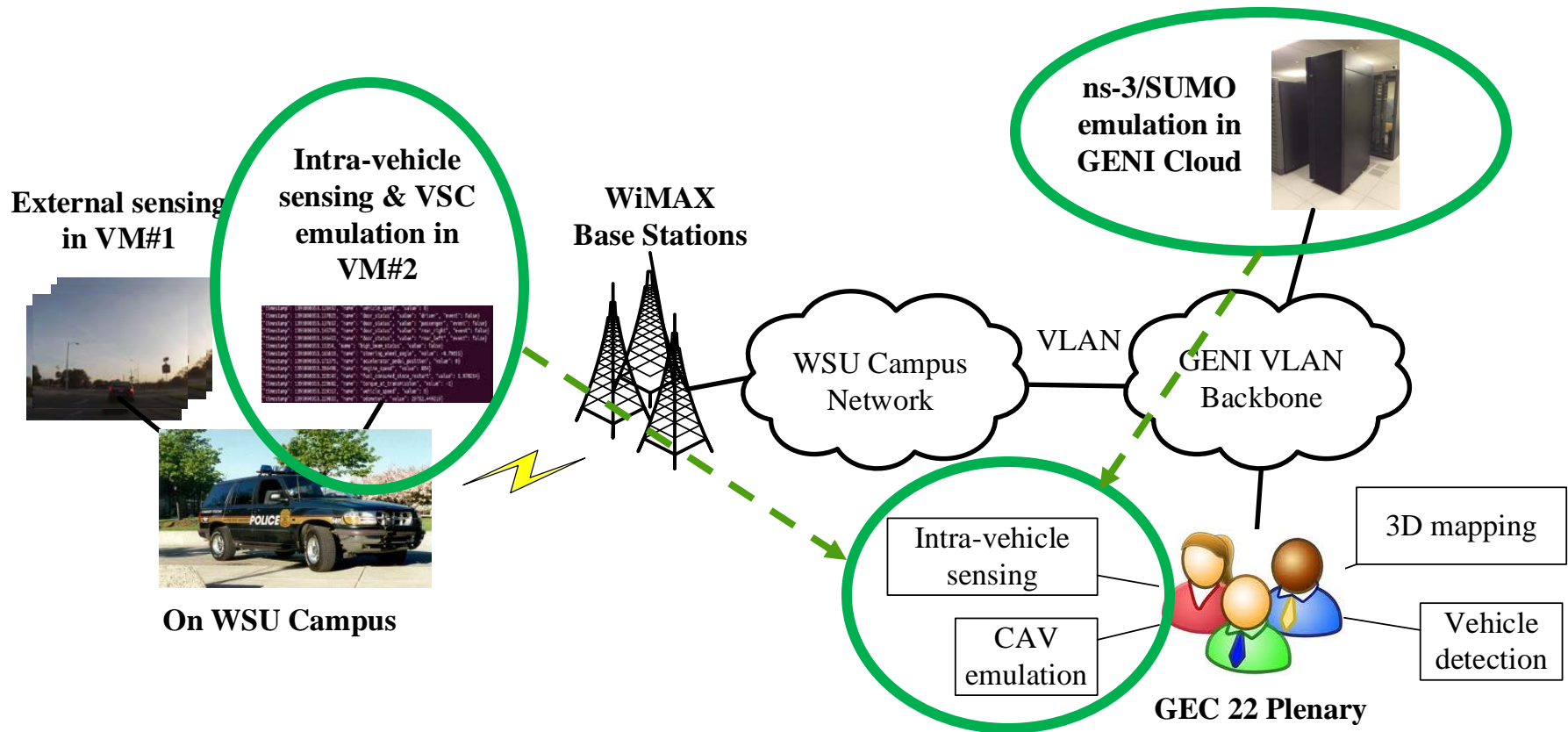
Long-term deployment of software-defined platforms on police patrol vehicles



At-scale, flexible emulation of CAVs in cloud

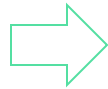


Vehicle state sensing & CAV network emulation



Glimpse into future:

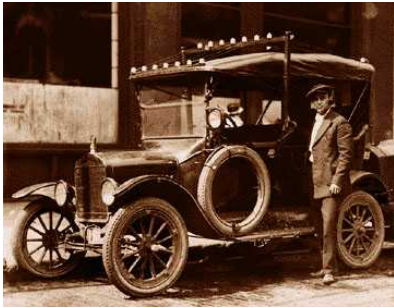
Immersive 3D surveillance via real-time networked vision





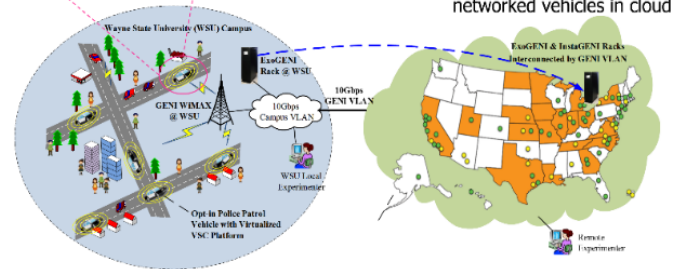
Deployment of Existing Apps & Networks
+ R&D Experiments





Detroit police radio car, 1921

Long-term deployment of software-defined platforms on police patrol vehicles



Symbiotic Evolution of CAV Applications and Networks!

— public safety, vehicle operation and beyond