Integrating Autonomous Drive into the New Automotive Reality

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Nissan’s Autonomous drive technology development

- **by 2016**
  - Highway
  - single-lane

- **by 2018**
  - Highway
  - multiple-lane

- **by 2020**
  - Urban roads
  - intersections

- **202X**
  - Urban roads
  - Fully Autonomous / Driverless

**EYES ON**

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Socially Acceptable Autonomy

- **Social** $\rightarrow$ Humans are SOCIAL

- **Interaction** $\rightarrow$ People INTERACT and COMMUNICATE

- **Inside the car**
  - Social $\rightarrow$ What services does the car provide to the human and vice-versa?
  - Interaction $\rightarrow$ People inside and the car interact

- **Outside the car**
  - Social $\rightarrow$ The car needs to understand other road users
  - Interaction $\rightarrow$ People outside and the car interact
Coping with real-life mobility situations
Air traffic controllers are personnel responsible for the safe, orderly, and expeditious flow of air traffic in the global air traffic control system.

Usually stationed in air traffic control centers and control towers on the ground, they monitor the position, speed, and altitude of aircraft in their assigned airspace visually and by radar, and give directions to the pilots by radio.

The position of air traffic controller is one that requires highly specialized knowledge, skills, and abilities.
SAM - Seamless Autonomous Mobility

Developed from NASA Technology

- Edge cases that need human perception, understanding and decision.
- No fully autonomous system works without **human-in-the-loop**
- **Human-robot teaming** brings the best of the two intelligences
- **Human safety net** is expected by users

**SAM concept**

- A human in the loop enhances the autonomous capabilities of an AV Fleet
- AI in the cloud assists operators and Avs to perform more efficiently
Mobility Managers are personnel responsible for the **safe, orderly, and expeditious flow** of **Autonomous Fleets** in the global traffic system.
Distributed Artificial Intelligence with Human-In-The-Loop

Individual Autonomous Systems

Human – Autonomous System

Human Intelligence

Artificial Intelligence
SAM Fleet Management

SAM VR Teleoperation

SAM CLOUD

4G Mobile Com
SAM Functions
Developed from NASA Technology

SAM Fleet Supervision
- Fleet status
- Tele-operation zones
- Vehicles requesting help
- Intervention history

SAM Vehicle Supervision
- Situational awareness
  - 3D Virtual view
  - Camera (zoom and frame-rate)
  - Lidar
- “Paint” a Solution

SAM AV
- Vehicle to cloud telemetry
- Tele-op request
- Solution execution
SAM – The Mobility Manager
Developed from NASA Technology
Thank you for your attention