Societal and Ethical Dimensions of Emerging Technologies

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Outline

1. Overview of the project and the idea of societal dimensions (ELSI: ethical, legal, and social implications)

2. Overview of Connected Vehicles: Benefits and Societal Concerns

3. Overview of UAVs: Benefits and Societal Concerns

4. Overview of Transaction Energy: Benefits and Concerns

5. Summary of Hess Research of Smart Meter Opposition (as an example of how the public can mobilize)

1. ELSI Dimensions

- Benefits: how to maximize

- Concerns and risks: how to minimize
  - Privacy
  - Security
  - Health and environment
  - Equity

Privacy: Background

- No right to privacy in the U.S Constitution
  - It is a derived right (from other provisions)
  - Legislation (e.g., Health Insurance Portability and Privacy Act)
- Primary issue in the context of Internet
  - Data gathering by corporations
  - Data gathering by government

Security: Background

- Focus here: threats to personal and public safety (hacking)
  - Criminal
  - Terrorist

- Scale matters for this dimension more than for privacy (individual level)
  - Collective level security
  - Personal security (safety, crime)

Health & Environment: Background

- Health risk types
  - Pollution (air, water, soil)
  - Accidents

- Environmental risks
  - Natural environment
  - Built environment

Social Equity: Background

- Social structure: race, gender, class, ethnicity, geographical location

- Other kinds not discussed here

24 categories	Privacy	Security	HealthEnv	Equity
C Vehicles US				
T Energy US				
UAV Traffic US				
C Vehicles EU				
T Energy EU				
UAV Traffic EU				

2. Connected Vehicles

Definitions

- Connected vehicles can recognize their location and their status and can communicate with each other and the surrounding Intelligent Transportation System (ITS) infrastructure.

- Includes autonomous vehicles but not limited to that category (could include apps on phones or in the vehicle)

Benefits: Connected Vehicles

- Improved safety & accident prevention
  - Potential to save thousands of lives each year
- Improved access (for those who cannot drive)
- Reduced congestion
  - Better commute times
  - Savings on vehicle miles driven (fuel savings)
  - Air quality (health) and greenhouse-gas emissions benefits
- Long-term potential: better built environment
  - Reduced need for parking, new highways

Privacy: Connected Vehicles

- Both transit-related apps and connected vehicles
  - Tracking of transit modes
  - Tracking of trips and locations
  - Routines

- Ex. Legal implications (Restraining orders)
  - Vehicles that go through areas subjected to court restraining orders
  - Could require programming in restraining order information

Security: Connected Vehicles

- Collective level hacking risks:
  - creation of congestion, accidents
- Personal level hacking risks:
  - Data on trip records: knowing when people are not at home

Health & Env.: Connected Vehicles

- Health 1: Traffic shifting from high to low congestion pathways
  - Shift in air quality and accident risk in residential neighborhoods
  - Litigation potential: neighborhood right to low traffic
- Health 2: Accidents and autonomous vehicles
  - Unknown risks of interactions of autonomous and human-driver vehicles
  - Trolley problem revisited
- Built Environment
  - Potential need to reshape transportation systems
  - Separate systems for autonomous vehicles?
  - Potential end of peak-car phenomenon (new levels of demand)

Social Equity: Connected Vehicles

- Transit types
  - Do connected vehicles weaken support for public transit?
- Apps and equity:
  - Premium app—fastest pathway
  - Free app—more congestion.
- Costs
  - Increased cost of owning a connected vehicle
  - Increased insurance for human drivers
- Job security: employment disruptions (trucking industry)

3. Unmanned Aerial Vehicle Management

Definitions

- UAV management governs the rules and traffic of unmanned and remotely-controlled aerial vehicles (drones)

Benefits: UAVs

- Efficient delivery of materials
  - Potential reduction of ground traffic congestion
  - Potential reduction of greenhouse-gas emissions
- Risk reduction benefits
  - Monitor public gatherings for security threats
  - Monitor natural and technological sites for disaster threats (volcanoes, nuclear reactors)
- Disaster relief
  - Search and recovery, emergency supply delivery
- Business uses
  - Monitoring of sites (agriculture, construction)
  - Aerial spraying

Privacy: UAVs

- Camera-bearing UAVs can gather personal data even if above the 200-foot altitude
  - New level of exposure of private persons in formerly private spaces (backyards)
  - Potential to record private conversations
- Can vary by level of detail of photography and frequency of recording

Security: UAVs

- Attacks at public events
- Risks to airplanes landing and taking off
- Crime and Delivery
  - Threat of porch theft
  - Knowing schedules and when people are at home
  - Potential hacking an entrance to homes and buildings
- Corporate espionage
- Smuggling

Health & Environment: UAVs

- Health 1: Noise concerns as the population of UAVs increases

- Health 2: Accidents
  - Failure of individual drones
  - Interactions with pets

- Environment 1: Built Environment
  - Where to locate drone highways

- Environment 2: Natural Environment
  - Interactions with wildlife (birds)

Social Equity: UAVs

- Types of delivery and price premiums
  - Drone delivery—accessible to all residential building types?

- Use of drones in surveillance of low-income groups and ethnic minority groups