Anticipatory and Agile Governance of Emerging Technologies:
What Role for Scientists and Engineers?

Erik Fisher, Arizona State University

Agile Governance (OECD 2024)

- **Leverage the role that innovators can play in the governance of innovation**

- Engaging with…the **scientific community**, and **those with high innovation potential**

- Manage the opportunities and risks of technological changes at **their early stages**

- Enhance the skills and capabilities of their **workforce**

- Reskilling…**workforces**

- A continuous learning and adaptation process **throughout the policy cycle**

- **Along the entire** innovation value chain

- The decision-making process **in its entirety**

- **Throughout** the policy cycle

Anticipatory Governance (OECD 2024)

- **Engineering that focuses … on … social, legal and ethical implications and policy issues**

- **Align science and technology** with societal goals and needs

- Integrate values **throughout the innovation process**

- Embed values **throughout the innovation cycle**

- Engages societal stakeholders … directly in **the construction of science and technology**

- Targeting **the engineering phase** of product development to address social values

- Values-based **innovation culture**

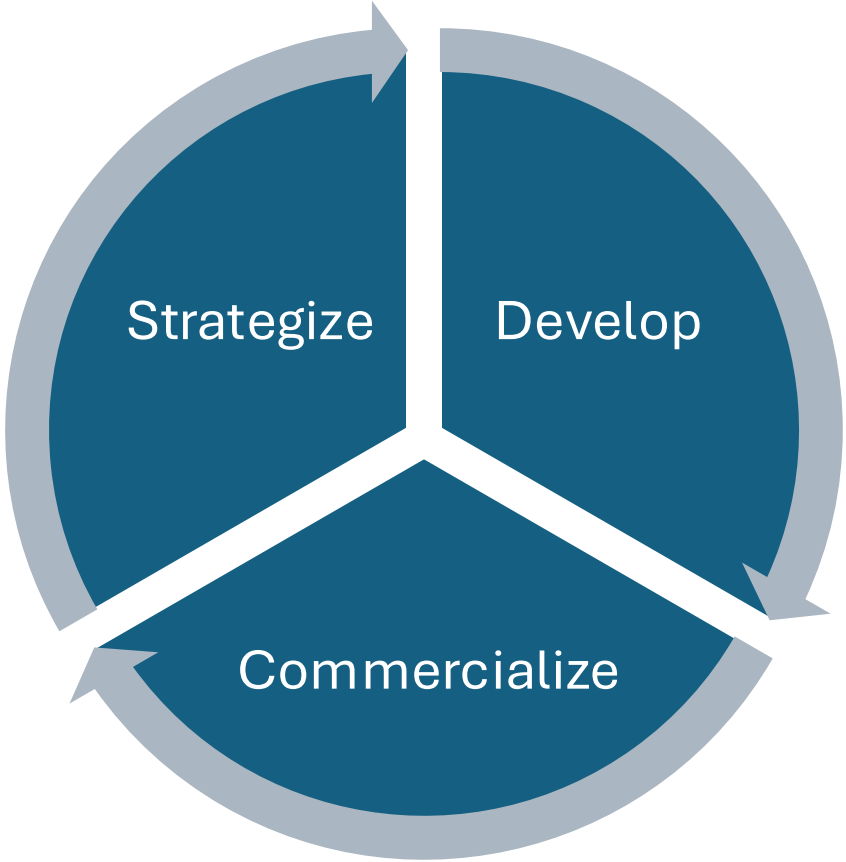- Uphold shared values **in the development of technology**
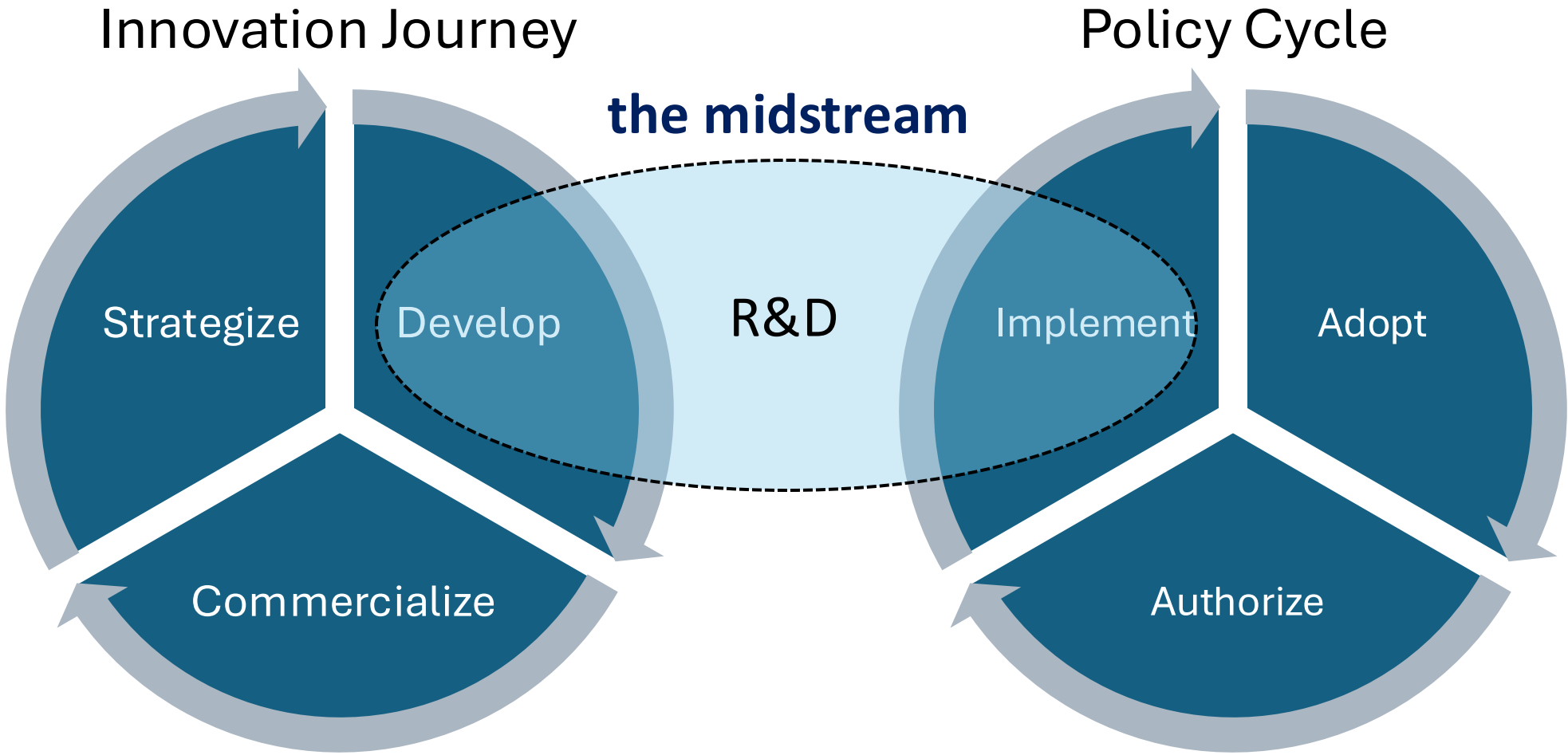
Socio-technical integration

A micro-foundation for responsible innovation
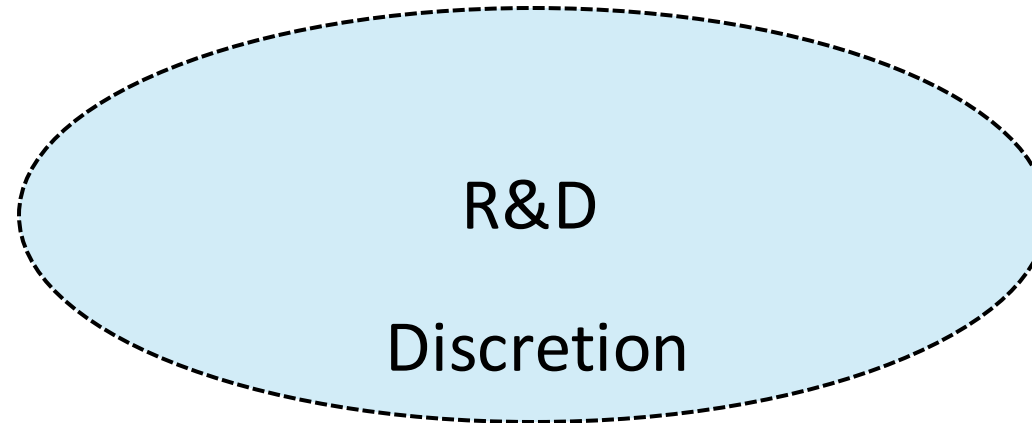
A Dual Role

Innovation Journey

Strategize

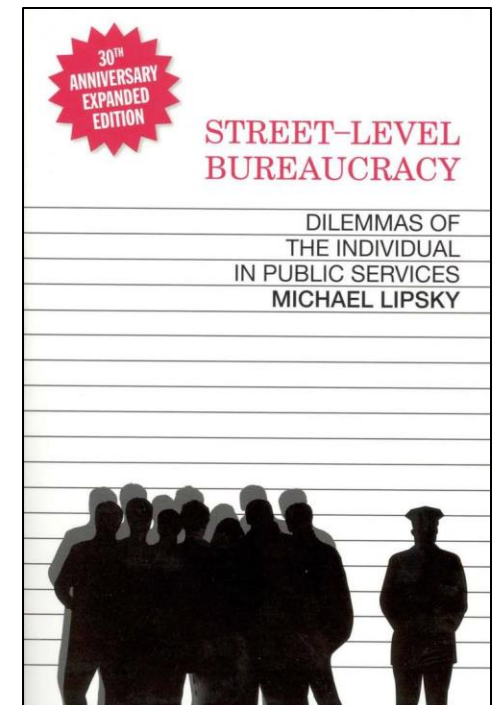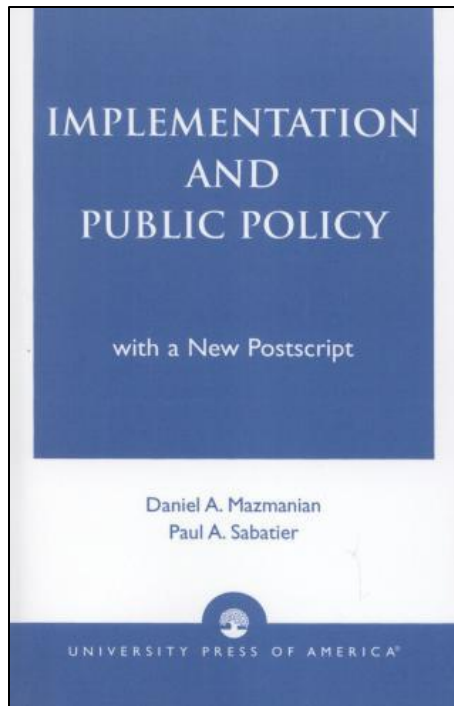Develop

Commercialize

A Dual Role

A Dual Role: Lab-Level Bureaucracy

the midstream

R&D

Discretion

- Individual choices aggregate over time in a dynamic sociotechnical context
- Develops *and shapes* technological trajectories
- Implements *and shapes* public policy & outcomes

IMPLEMENTATION AND PUBLIC POLICY

with a New Postscript

Daniel A. Mazmanian
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STREET-LEVEL BUREAUCRACY

DILEMMAS OF THE INDIVIDUAL IN PUBLIC SERVICES
MICHAEL LIPSKY

Governing Lab-Level Bureaucracy

Challenges

- Case-by-case basis
- Autonomy
- Expertise
  - *Speciality of focus*
  - *Cultural entrenchment*
- Potential costs of integration
  - *Time*
  - *Productivity*
  - *Cognitive overload*

Interventions

- Specific prescriptions
  - *Rule-based*
  - *Compliance-based*
  - *Process-based*
- General prescriptions
  - *BIC (USA)*
  - *NRDA (USA)*
  - *Digital Life (Norway)*
  - *RA/TA (The Netherlands)*
- Interdisciplinary collaboration
  - *Science Wars*
  - *Rare bird phenomenon*

Socio-Technical Integration Research Program

- Dialogic investigation of integrative capacity
- Nearly 100 in-depth, coordinated studies
- Integration capacity is routinely and productively exercised
- Observable only under certain conditions

Example

t_1 Will "put [battery stack] on side of house"

t_2 Could consider "preferences of homeowner"

t_3 Decision to talk with homeowner

t_4 Decision to locate stack *inside* garage

Cultivating Integrative Capacity

- Voluntary
  - Avoid coercing speech, culture, or behavior
- Guidelines, incentives, and interventions
  - *Synergistic* with local cultural problem-solving practices
  - Vetted and validated *internally*
- Develop and refine tools through collaborative experimentation and learning
- Disseminate and codify best practices
- Support *endogenous* capacity for widespread uptake and transformation

Thank you!