PAS QUICKNOTES

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Agentic Artificial Intelligence

Artificial intelligence (AI) is increasingly being deployed across all levels of government in the United States and internationally, reshaping how public agencies conduct research, deliver services, and make decisions. AI itself is rapidly evolving beyond analytical and predictive tools toward generative models and now **agentic AI**: autonomous systems capable of acting independently to initiate tasks, coordinate across systems, and adapt to changing conditions with limited human input.

BACKGROUND

Agentic AI systems are designed to pursue goals with a high degree of independence. Unlike predictive or generative AI tools, which require human operators, agentic systems can plan sequences of actions, make decisions, interact with other systems or actors, and adapt their behavior based on feedback and changing conditions. Agentic AI combines the reasoning capabilities of large language models (LLMs), instructions, memory, and various tools such as search engines or external software systems and APIs (e.g., GIS) to create semiautonomous workflows that solve problems and achieve goals.

These systems can be deployed as **agentic workflows** or as **AI agents**. Agentic workflows are structured, machine-learning-enabled processes in which the system selects among predefined pathways, loops through steps, or adapts execution based on conditions and inputs. AI agents, by contrast, are more autonomous systems designed to pursue goals by continuously perceiving their environment, reasoning about options, and taking actions within an underlying orchestration framework.

LLMs by themselves can't directly interact with external tools or databases or set up systems to monitor and collect data in real time, but agents can. For example, an AI agent can search the web, call application programming interfaces (APIs), and query databases, then use this information to make decisions and take action.

HOW AGENTIC AI WORKS

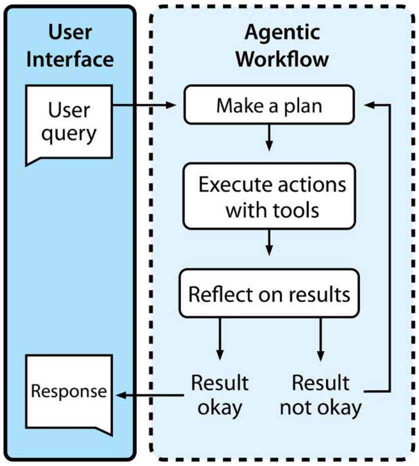
As an example of how agentic AI works, here is how an AI traffic-management agent moves through a core loop of perception, reasoning, and acting, using real-time monitoring to manage signals and related controls.

In the **perception** stage, the AI agent continuously gathers and processes information to understand current traffic conditions. It pulls live inputs from sources such as roadway sensors, connected systems, and CCTV analytics, then cleans and validates this data by filtering noise, identifying faulty detectors, and filling short gaps where possible. The agent translates raw inputs into interpretable indicators, such as queue lengths, approach delays, travel times, pedestrian wait times, and transit schedule adherence to build situational awareness and monitor patterns and anomalies across these indicators.

During the **reasoning** stage, the AI agent interprets observed conditions in light of predefined goals, policies, and operational constraints. It evaluates multiple response options by forecasting near-term outcomes and weighing trade-offs among objectives such as reducing delay, maintaining safety, supporting transit reliability, and protecting pedestrian movements. Rather than following fixed rules, the agent selects actions based on how well they align with these goals under current conditions, adjusting its decisions as new information becomes available. This allows the system to respond dynamically to evolving traffic patterns while remaining within established safety and policy guardrails.

In the **acting** stage, the AI agent implements selected interventions and monitors their effects. Actions may include adjusting signal timing by extending or shortening green phases, modifying coordination

Agentic Workflow



Agentic AI systems are able to plan, execute actions, reflect on results, and modify their actions if needed. Illustration adapted from Weaviate.

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across intersections, or activating priority for transit or emergency vehicles. After execution, the agent immediately observes resulting traffic conditions to determine whether objectives are being met. This feedback loop enables the agent to refine, maintain, or reverse actions as needed, ensuring that traffic management strategies remain responsive, adaptive, and aligned with planning and operational goals.

AI AGENTS IN PLANNING PRACTICE

Most current agentic AI deployments are experimental or narrowly scoped, but existing cases across U.S. state and local governments suggest three initial planning-related applications.

The first is **resident-facing service and intake systems** in which AI agents interact with constituents and initiate actions. Examples include virtual assistants embedded in 311 systems, such as those deployed in Phoenix and Montgomery County, Maryland, which answer questions, guide residents through service options, and route requests to the appropriate departments. While these systems operate within defined scripts and guardrails, they exhibit agentic characteristics by interpreting user intent, triggering workflows, and reducing staff intervention in routine cases.

A second major application area is **regulatory and administrative workflows**, particularly in permitting, zoning, and plan review. Jurisdictions in California, including San Jose and the County and City of Los Angeles, are piloting or rolling out AI-enabled tools that automatically review plans for code compliance, flag potential issues, and generate feedback before or alongside human review. These systems function as agentic workflows that follow structured processes but can adapt paths based on plan content, detected conflicts, or policy rules. Given the legal and equity implications of regulatory decision-making, these systems require strong emphasis on human oversight, transparency, and risk mitigation.

The third application involves **operational and infrastructure management**, in which AI agents are used to monitor conditions and dynamically adjust systems in near-real time. Examples include adaptive traffic signal control pilots in Maricopa County, Arizona, and ongoing transportation management deployments in Alexandria, Virginia. In these cases, AI systems continuously perceive traffic conditions, reason about performance goals, and act by modifying signal timing or coordination strategies.

AGENTIC AI RISKS AND CONSIDERATIONS

Agentic AI introduces risks beyond those associated with analytical or generative AI tools. Because agentic systems can initiate actions, coordinate across systems, and adapt over time, errors or biases may propagate more quickly and at greater scale. This raises concerns about transparency, due process, and equity, particularly if these systems may influence permitting decisions, service prioritization, or infrastructure investments. Data quality and representativeness are also critical, as agentic systems trained on incomplete or biased datasets may systematically disadvantage certain communities.

Governance and oversight play a central role in responsible deployment. Planners and public agencies must define clear boundaries for agent autonomy, including when human review is required, how overrides are handled, and which decisions remain firmly in human hands. Ongoing monitoring, performance evaluation, and periodic retraining are essential to ensure AI systems continue to align with policy goals and legal standards as conditions change. Procurement and vendor management also warrant special attention, as opaque proprietary systems can limit accountability and public trust.

CONCLUSIONS

Agentic AI represents the latest evolution of AI toward greater autonomy and decision-making capabilities. Incorporating AI agents into planning practice holds promise for increasing the efficiency and effectiveness of workflows and systems. However, using these systems will require planners to make deliberate choices about ethics, accountability, and evolving responsibilities in our increasingly technology-focused society.

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FURTHER READING

Published by the American Planning Association

Andrews, Clinton, Keith Cooke, Alexsandra Gomez, Petra Hurtado, Thomas Sanchez, Sagar Shah, and Norman Wright. 2022. *AI in Planning: Opportunities and Challenges and How to Prepare*. Chicago: American Planning Association.

Daniel, Claire. 2023. "ChatGPT: Implications for Planning." *PAS QuickNotes* 101.

Sanchez, Thomas. 2023. *Planning With Artificial Intelligence*. PAS Report 604. Chicago: American Planning Association.

Other Resources

Çelik, Tuana, and Prajjwal Yadav. 2025. "Agents Simplified: What We Mean in the Context of AI." *Weaviate Blog*, February 13.

Digital Twin Consortium. 2025. AI Agent Capabilities Periodic Table (AIA CPT) Interactive Framework and Toolkit.

IBM. n.d. What is Agentic AI?