Problem and Solution Statement

Problem:

City infrastructure issues like potholes, broken water pipes, and malfunctioning streetlights are a daily concern in urban communities. While these problems are common, reporting and resolving them remains inefficient and frustrating for both citizens and city departments. Many municipalities still rely on siloed systems: residents must choose the correct department, complete outdated forms, or make phone calls just to report something as simple as a pothole. This leads to slow response times, missed or misrouted requests, and increased repair costs. For example, a water leak might be delayed because it was reported to the Roads Department instead of Water Services, compounding the damage and wasting resources. With citizens expecting fast, tech-enabled responses, cities must rethink how they manage infrastructure workflows.

Solution:

AIRA (AI Infrastructure Resilience Assistant)

AIRA is a multi-agent, AI-powered solution built using IBM watsonx Orchestrate and Watson Assistant. It offers a single, intelligent conversational interface where citizens can report any city infrastructure issue using natural language. Whether someone says “There’s a pipe leaking near the school” or “Streetlight out on 5th Ave,” AIRA can understand the issue, classify it, and trigger a simulated resolution process behind the scenes all without human intervention.

The user interacts with AIRA through a chatbot built in IBM Watson Assistant, which guides them through simple questions about the issue type, location, and time. Once collected, this data is passed to a Classification Agent, which interprets the issue using NLP-based logic and maps it to one of several departments: Road, Water, or Electrical. A Routing Agent then kicks in, using IBM watsonx Orchestrate to route the case, assign the right department, create a unique ticket ID, and simulate scheduling a repair crew.

The full workflow is orchestrated with IBM watsonx Orchestrate’s visual flow builder, where logic, variables, branching conditions, and custom actions are defined to simulate agent coordination. In a real-world deployment, these flows can be extended using watsonx Orchestrate Skills to trigger backend APIs, ticketing platforms, or municipal databases.

AIRA goes beyond issue intake. It closes the loop by offering a “Check status” option, where the user can follow up on their report and receive a real-time simulated status such as “In Progress” or “Completed.” This not only makes AIRA feel intelligent but also reflects a human-like workflow of classification → routing → resolution → confirmation.

What makes AIRA unique is its agentic AI architecture. Each agent (chat, classifier, orchestrator, status checker) operates with a clearly defined role and interacts autonomously within a shared orchestration flow. This design makes the system easy to scale, adapt to new cities, and extend across multiple infrastructure domains all with no code changes required.

With AIRA, cities can transform their infrastructure operations from reactive to proactive, reduce delays, and restore citizen confidence in their local government’s ability to respond swiftly and transparently.

Learn more about the tools behind AIRA:

- IBM watsonx Orchestrate: https://www.ibm.com/products/watsonx-orchestrate
- IBM Assistant Building: https://www.ibm.com/docs/en/watsonx/watson-orchestrate/base?topic=building-ai-assistants
- Call for Code 2025: https://developer.ibm.com/callforcode

This solution addresses **Track 2: Industry, Innovation & Infrastructure** by leveraging a fully orchestrated, agentic AI workflow, aligned with the principles of **Track 1: Agent Mode Activated** under Call for Code 2025.