**Scenario: Traffic Guidance TUI Objects**

**Context:**

A city’s traffic control center is managing the flow of vehicles during the morning rush hour, preparing for severe weather conditions and potential accidents. The map of the city is displayed on a screen, and traffic managers use tangible user interface (TUIO) objects in front of a camera to interact with the system. Each TUIO object corresponds to specific traffic-related factors like vehicles, accidents, and weather.

**Setup:**

The following TUIO objects are used:

- Car object: Represents regular car traffic.

- Bus object: Represents bus routes.

- Train object: Represents the train network.

- Accident object: Represents traffic incidents.

- Weather object: Represents weather events affecting traffic.

The camera detects these objects when placed in front of it, and the system updates the traffic map on the screen accordingly.

**Interaction and Actions:**

1. Monitoring Car Traffic:

- The traffic manager holds the car object in front of the camera, and the system highlights traffic density on the city’s main roads. Congested areas are shown in red, and the system provides real-time updates on delays.

- When the object is moved in front of the camera to another location, the map shifts focus, displaying traffic conditions in different parts of the city. This allows the manager to monitor traffic flow across the city with ease.

2. Checking Public Bus Routes:

- Holding the bus object in front of the camera switches the view to the bus network. The system overlays bus routes on the map and displays the current status of each route.

- For buses running late due to heavy traffic, the system highlights affected routes and suggests possible detours. If the bus object is rotated, the system simulates different bus schedule adjustments to explore ways to minimize delays.

3. Analyzing Train Network Performance:

- When the train object is shown to the camera, the system brings up the rail network on the map. It displays the location of trains and their current schedules, with delays and service interruptions clearly marked.

- Moving the object left or right prompts the system to visualize different train routes, and rotating the object simulates different scenarios, such as adding or removing train services to improve efficiency during rush hour.

4. Accident Response:

- In the event of a road accident, the manager places the accident object in front of the camera. The system immediately pinpoints the location on the map and analyzes its impact on nearby traffic.

- The system suggests alternative routes and emergency vehicle access, displaying the affected roads in red. Adjustments to bus and train schedules can be recommended based on the severity of the accident, with the goal of minimizing further disruption.

5. Weather Event Simulation:

- As a snowstorm is predicted to affect certain areas, the manager places the weather object in front of the camera. The system overlays a weather map onto the traffic display, showing how the storm will impact different roads and public transport routes.

- If the weather object is rotated or moved closer to the camera, the system adjusts the severity of the storm and updates its impact predictions. The system recommends which roads should be closed and alerts bus and train operators to potential service changes due to dangerous conditions.

6. Integrated Traffic Monitoring:

- By placing multiple TUIO objects in front of the camera sequentially (e.g., the car, bus, and accident objects), the system integrates all relevant data, showing real-time interactions between different transportation modes.

- The map on the screen becomes an evolving, dynamic view of the city’s traffic situation, allowing traffic managers to adjust routes, issue public advisories, and optimize traffic flow in response to accidents, weather, and rush hour congestion.

**Outcome:**

- Real-Time Traffic Adjustments: The camera-based system allows managers to use TUIO objects to rapidly assess and respond to live traffic conditions. By simply showing an object in front of the camera, key information is displayed, enabling informed decisions.

- Accident and Weather Response: Immediate updates regarding accidents and weather-related disruptions allow for efficient rerouting and resource allocation, minimizing the impact on traffic flow.

- Public Transport Optimization: Integrating car, bus, and train networks ensures that public transport can be optimized in real-time, reducing delays and improving commuter experiences.