Design of a MAS for emergency Response Simulation in Urban Environments: Task 2.

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Process Definition

Process definition (I): Firefighting Crew

Assign Task Force

Personnel Specialist Select Extinguishing Tools

Fire Type
Specialist

Assess Building
Structure

Building Structure Specialist Plan Victim Rescue

Rescue Specialist

Select Tools

Tool Specialist

Select Fire Trucks

Fire Truck Chief

Plan Route

Fire Truck Chief

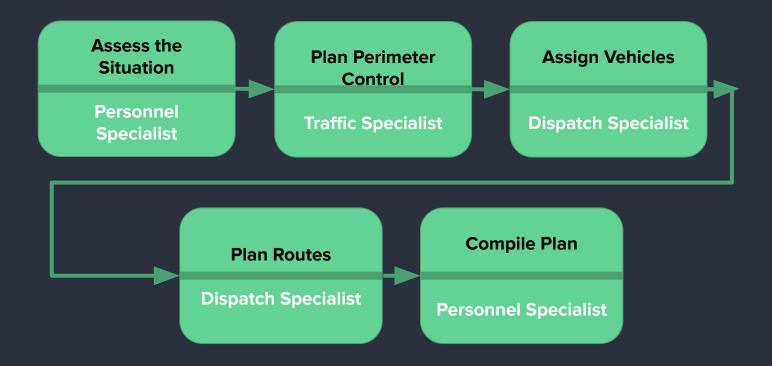
Compile Plan

Personnel Specialist

Process definition (II): Medical Crew

Assign Task Compile medical Check hospital Hospital Voting Force supplies capacity Rescue **Fire Type** Personnel **Building Structure Specialist Specialist Specialist Specialist** Select **Plan Route Compile Plan Victim Voting Ambulances** Personnel **Ambulance Ambulance Specialist Tool Specialist** Coordinator Coordinator

Process definition (III): Police Crew



Process definition (IV): Emergency Crew

Assess and Distribute
Emergency Alert

Distributor

Compile Situation
Report

Compile Situation
Report

Final Consultation /
Final Compilation

Philosopher

Pydantic Outputs

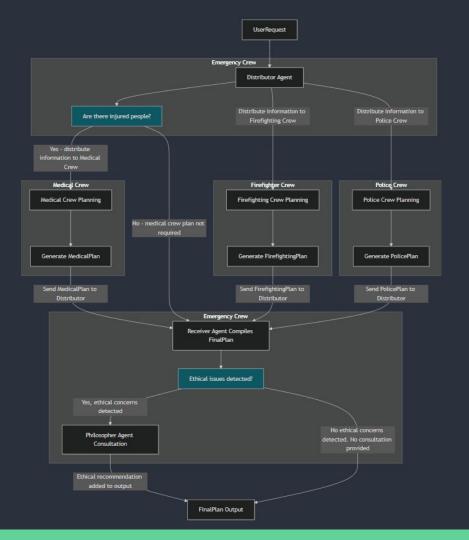
Example for Assign task force task

Example for Plan compilation task

```
class FirePlanCompilation(BaseModel):
    """Comprehensive output for compiling the final plan."""
   n firefighters: int = Field(..., description="Number of firefighters assigned.")
   extinguishing tools: List[str] = Field(
        ..., description="List of selected tools for extinguishing."
   rescue strategy: str = Field(..., description="Strategy for rescuing victims.")
   stop fire strategy: str = Field(..., description="Strategy for stopping the fire.")
   ordered victim rescue: List[str] = Field(
        ..., description="List of victims ordered by rescue priority."
   rescue tools: List[str] = Field(
        ..., description="List of tools used for rescue operations."
   fire trucks: List[str] = Field(..., description="List of selected fire trucks.")
   routes: List[List[int]] = Field(..., description="List of planned OSMnx routes.")
   ethical issues: Optional[str] = Field(
       None, description="Ethical issues considered in the plan."
   action details: str = Field(
        ..., description="Additional details of the overall plan."
```

Agent Interaction

Agent Interaction Diagram



Questions?