Smart Commutes, Smarter Cities: A Government and Business Partnership

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OBJECTIVE

To develop an artificial intelligence (AI) driven traffic congestion mitigation system by analyzing corporate work-model policies (remote, hybrid, on-site) and predicting their impact on Utah's mobility. This operational plan demonstrates how a government-business partnership could leverage anonymized, aggregated employer data to optimize traffic flow, reduce peak hour congestion, and inform state planning while ensuring privacy, scalability, cross-city adaptability, and economic advancement.

OPERATIONAL OVERVIEW

The Utah Office of Artificial Intelligence Policy (OAIP) AI team should act as an intermediary between all responsible parties to ensure that this operational plan is effected as described in this document. They should interface with the Utah Department of Transportation (UDOT) to come up with the best strategy on how to engage with the individual companies and institutions to get their data while also ensuring privacy.

TABLE 1:

The operational flow of each stakeholder for the "Smart Commutes, Smarter Cities: A Government and Business Partnership" proposal. To encourage Utah's economic development, the operational system below would leverage existing partnerships to address traffic congestion issues.

Strategy	Action	Target	Responsibility
1. **Improve information sharing**	· Upload the company or institution's policies on its work model schedule (i.e., hybrid, remote, on-site, etc.) without revealing employees' sensitive information · Ensure rapid, real time access to updated work model policies for relevant stakeholders without revealing people's sensitive information · Ensure that all data are uploaded using standardized formats as approved by UDOT	· Increase information database by 50% · Increase data availability by 25%	Individual companies or institutions

2. Improve database	· Collate and regularize the database from data shared by companies and institutions · Use AI to eliminate duplicate or outdated entries, resulting in more optimized storage and data performance · Speed up data retrieval and analysis by maintaining a well structured and regularly updated database	· Reduce data redundancy by 15% · Enhance compliance and reporting accuracy by 10% · Increase data accuracy by 15% · Reduce processing time by 15%	UDOT
3. Improve the decisionmaking process using AI based predictive analysis	· Use AI and Machine Learning (ML) techniques to train-validate-test datasets from collated databank at UDOT · Provide reliable predictive analysis that ensures better: · Business insight and strategic planning on work models and schedules and · Real time traffic predictions on traffic congestions and alternative routes · Find trade-offs that allow people to make informed commute decisions · Simulate and identify trends that: · Make the automated traffic lights more operationally effective and · Provide more accurate information on best routes daily · Ensure faster real time access to updated predictive patterns to facilitate better decisionmaking processes	· Improve decisionmaking efficiency by 45% · Reduce traffic congestions on significant highways by 35%. · Increase data availability by 40%	OAIP AI team and data analyst
4. a) Improve productivity and operational standards/ practices b) Reduce costs	· Reorganize work models (wherever possible) to achieve Utah's goal of traffic congestion reduction · Use the outcome of OAIP AI's predictive analysis to: · Make better business insights and strategic planning and · Improve the decisionmaking process of commuters and automated systems (e.g., traffic lights, mapping systems, congestion pricing policies, routes rerouting platforms, etc.)	· Improve productivity by 30% · Reduce unnecessary operational costs by 15% · Improve decisionmaking efficiency by 15% · Improve the efficiency of automated traffic lights, etc. by 25% · Reduce traffic congestion by 30%	Individual companies and institutions UDOT

PRIVACY

When requesting that companies and institutions share their work model policies (hybrid, remote, on-site, etc.), privacy concerns primarily pertain to inadvertently exposing sensitive employee or organizational data. Some of Utah's privacy concerns revolve around:

1. **Personal Identifiable Information (PII) for Employees:**
   - There is a risk of accidentally disclosing employee names, roles, or schedules that could reveal personal routines.
2. **Company Confidentiality:**
   - Some firms may consider their work policies proprietary (e.g., competitive remote work advantages).
3. **Aggregate Data Misuse:**
   - Even anonymized data, when combined with other datasets, could reveal patterns about specific companies or groups.
4. **Compliance Risks:**
   - Violating CCPA, CPRA, or other privacy laws if data is mishandled.
   - Violation risk of S.B. 227 Consumer Privacy Act, S.B. 231 Public Surveillance Prohibition Amendments, and H.B. 491 Data Privacy Amendments.

To address these concerns while still collecting useful data, we suggest that the below be considered:

1. **Request Anonymized and Aggregate Data:**
   - Ask for statistical summaries (e.g., percent of employees hybrid vs. remote) rather than individual schedules.
   - Avoid requesting department or team level breakdowns unless necessary.
2. **Use Standardized, Non-Identifiable Formats: Provide templates where companies submit:**
   - Work model distribution (e.g., 60% hybrid, 30% remote, 10% on-site).
   - General policy trends (e.g., "3 days in-office required").
   - No employee specific data.
3. **Third Party Mediation:**
   - Partner with neutral entities such as industry associations and academic researchers to anonymize submissions.
   - Use differential privacy techniques to mask small-sample insights.
4. **Legal Safeguards & Transparency:**
   - **Data Use Agreements:** Clarify that responses will only be used for congestion analysis.
   - **Opt-In Participation:** Allow firms to exclude sensitive details.
   - **In-house collaboration:** Human Resources and their respective legal teams should work hand-in-hand to ensure that they adhere to the Utah Consumer Privacy Act (UCPA – S.B. 227), S.B. 231 Public Surveillance Prohibition Amendments, and H.B. 491 Data Privacy Amendments in sharing data.
5. **Incentivize Participation:**
   - Offer traffic insights or policy benchmarks in return.

- Highlight how their data will improve Utah's planning (e.g., reduced commute times).

Proactively addressing these privacy concerns would enable the tool to aid traffic congestion analysis by:

1. **Pattern Recognition:** Aggregate data reveals peak office days (e.g., higher Tuesday–Thursday congestion.)
2. **Policy Impact:** Correlate hybrid adoption with transit demand drops.
3. **Zoning Adjustments:** Guide infrastructure investments (e.g., more automated traffic light operations, efficient mapping rerouting system, fewer parking needs if remote work grows, etc.).
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IMPACT AND TECHNICAL FEASIBILITY

Using AI and ML to analyze work-model policies and predict traffic patterns offers significant potential to reduce Utah's congestion. However, its feasibility and impact depend on data quality, model selection, and implementation strategies.

Some of the potential impacts on traffic congestion are:

1. **Predictive Traffic Modeling:**
   - **Demand Forecasting:** AI can predict peak congestion days (e.g., higher traffic on "in-office" days like Tuesdays–Thursdays). For example, if 60% of companies mandate hybrid work, ML models can correlate this information with transit demand drops on Mondays and Fridays.
   - **Dynamic Routing:** OAIP could then work with navigation apps (e.g., Google Maps, Waze) to suggest alternate routes based on predicted office attendance.
2. **Policy Optimization:**
   - **"Staggered Work Hours" Testing:** Simulate how shifting work hours (e.g., 7 am – 3 pm vs. 10 am – 6 pm) affects rush hour bottlenecks.
   - **Incentive Design:** Identify companies contributing most to congestion (e.g., 100% on-site firms) and propose hybrid work subsidies.
3. **Public Transit Efficiency:**
   - **Service Adjustments:** Reduce bus and train frequency on low-commute days (e.g., Fridays) and reallocate resources.
   - **Dynamic Pricing:** AI driven congestion pricing (e.g., higher tolls on high-commute days).
4. **Infrastructure Planning:**
   - **Long-Term Investments:** Use trends to justify fewer parking structures or more bike lanes if remote work grows.

Some aspects of the technological feasibility of our operational plan are outlined below:

1. **Data Requirements:**
   - **Sufficient Coverage:** Need participation from a critical mass of employers (e.g., 30–50% of major firms).
   - **Temporal Granularity:** Require monthly updates to capture policy shifts (e.g., post-pandemic office returns).
2. **Model Selection:**
   - **Supervised Learning:**
   - **Regression models** predict traffic volume based on percent hybrid and remote policies.
   - **Classification models** identify "high risk" congestion days.
   - **Reinforcement Learning:** Optimize traffic light timing in real time using predicted demand.
   - **Generative AI:** Simulate "what if" scenarios (e.g., "What if 20% more firms go remote?").
3. **Integration Challenges:**
   - **Data Silos:** Companies may use inconsistent formats (e.g., "3 days in-office" vs. "50% remote").
   - **Real Time Processing:** Requires Internet of Things sensor fusion (e.g., combining policy data with live traffic cams).
4. **Privacy Preserving Techniques:**
   - **Federated Learning:** Train models on decentralized data without raw policy sharing.
   - **Synthetic Data:** Generate artificial datasets to protect company confidentiality.

Some aspects of the technological feasibility of our operational plan are outlined below:

Risks	Mitigations
Biased data: E.g., only tech firms share data	Stratified sampling by industry and size
Overfitting: Models fail in new cities	Cross-validation with multiple regions
Privacy breaches: Re-identification	Aggregated outputs and differential privacy

In conclusion, the impact and technological feasibility of our operational plan are viable.

- **Feasibility:** High if data is standardized and integrated with existing traffic systems.
- **Impact:** Potential for 10–30% congestion reduction in cities with high hybrid work adoption.
- **Next Steps:** Pilot with a volunteer consortium of firms and city transport agencies.

SCALABILITY

The goal would be to start with Salt Lake City and then extend the model to Provo. Thereafter, this operational plan could be adopted across surrounding cities to adequately address the climate issue of traffic congestion, thus supporting the economic development of the society at large.

Scalability is critical for deploying this solution across multiple cities or expanding its functionality. Some of the key scalability factors, challenges, and mitigation strategies include (but are not limited to):

Data Scalability

1. **Challenges**
   - **Variability in Data Structures**
     - Companies differ in how they define hybrid/remote policies (e.g., "3 days in-office" vs. "flexible").
     - Small businesses may lack structured policy data.
   - **Geographical Coverage**
     - Scaling requires participation from firms across all major employment hubs in a given city.
   - **Real Time Updates**
     - Static datasets become outdated as companies adjust policies.
2. **Solutions**
   - **Standardized Data Collection Templates**
     - Provide a simple form (e.g., "percent remote, hybrid, on-site") to ensure uniformity.
   - **Automated Data Aggregation**
     - Use APIs or web scraping (where permissible) to pull policy updates from company websites and LinkedIn pages.
   - **Incentivize Participation**
     - Offer benchmarking reports or tax incentives for companies sharing data.

Infrastructural and Integration Scalability

1. **Challenges**
   - **Legacy Traffic Systems**
     - Many cities use outdated signal control systems that don't support AI integration.
   - **Interoperability**
     - Combining data from employers, GPS apps (e.g., Google and Waze), and transit agencies is complex.

2. **Solutions**
   - **Middleware for Legacy Systems**
     - Use APIs to connect AI models with existing traffic management software.
   - **Public-Private Data Partnerships**
     - Collaborate with Uber, Waze, and transit agencies for real time flow data.
   - **Cloud Based Deployment**
     - Cloud services such as Amazon Web Services (AWS) and Google Cloud Platform (GCP) can handle spikes in computational demand during rush hours.

Governance and Adoption Scalability

2. **Challenges**
   - **Regulatory Barriers**
     - Some cities restrict data sharing due to privacy laws.
   - **Stakeholder Resistance**
     - Employers may fear being "penalized" for contributing to congestion.
3. **Solutions**
   - **Decentralized Data Governance**
     - Use blockchain (permissioned) for transparent yet confidential data sharing.
   - **Gamification and Public Dashboards**
     - Show companies how their policies reduce congestion (e.g., "Your hybrid work saved 500 commuter hours this month!").

EMAIL DRAFT REQUESTING DATA FROM ENTITIES

Subject: Request for Collaboration: Share Work Policy Data to Help Reduce Traffic Congestion in **[XYZ City]**

Dear [Recipient's Name/Company Team],

I hope this email finds you well.

We are reaching out as part of an ongoing initiative led by **[Your Organization/Institution]** in collaboration with **[Utah Government/Transport Authority/Partner Institutions]** to address traffic congestion in **[XYZ City]**. Our goal is to develop AI data driven solutions that optimize Utah's mobility while supporting sustainable work practices.

How You Can Help

We kindly request your organization to share anonymized, high-level data on your **work model policies** (e.g., percentage of employees working hybrid, remote, or on-site) to help us:

- **Understand commuting patterns** and their impact on traffic.
- **Predict peak congestion times** and improve infrastructure planning.
- **Design smarter policies** (e.g., staggered work hours, transit incentives).
- **Design infrastructures and automated predictive applications** to efficiently address and alleviate the impact of traffic congestion.

Our Commitment to Privacy

We take data confidentiality seriously. Your participation will involve:

- **Aggregate Data Only:** No individual employee information will be collected.
- **Standardized Templates:** Easy to use online forms (see attached example) to ensure minimal effort.
- **Controlled Access:** Data will be used solely for this project under strict governance.

Next Steps

If you are open to contributing, we would greatly appreciate:

1. A brief confirmation of your interest.
2. Complete the attached form (takes <5 minutes) or a short call to discuss further.

In return, we are happy to share **benchmark insights** on how your policies compare with peers, or provide a summary of the project's impact.

Deadline for Response: **[Optional: Specify if applicable]**

Thank you for considering this opportunity to make **[XYZ City]** more livable and efficient. Please let us know if you have any questions or would like additional details.

We look forward to your support!

Best regards,
[Your Full Name]
[Your Position]
[Your Organization]
[Your Contact Information]
[Project Website/Link, if available]

Policy Primer

OPERATIONAL PLAN

ABOUT THE ASPEN POLICY ACADEMY

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