

# MEMO

To: Juneau tourist council  
From: MCM Team #2518438  
Date: January 27, 2025  
Subject:

Dear Members of the Juneau Tourism Committee:

Juneau, a key tourist destination in Alaska, faces the challenge of balancing economic growth with environmental preservation. The growing number of visitors strains local infrastructure, resources, and community well-being. To ensure sustainable tourism, our team has analyzed current issues and proposed actionable recommendations. This memorandum outlines strategies for promoting sustainable tourism through data-driven planning and efficient management, aiming to protect Juneau's natural beauty and enhance resident welfare. We believe these recommendations form a solid foundation for the future growth and sustainability of Juneau's tourism industry. The memorandum is organized into three key sections:

## Part 1 : Predictions: Challenges and Opportunities

Based on the projections, if Juneau continues its current development trajectory, the number of tourists is expected to reach 2.95 million by 2028, generating tourism revenue of 216 million USD. However, carbon emissions are forecasted to rise to 440,000 tons, more than four times the level in 2019, which is inconsistent with sustainable development goals. Simultaneously, dissatisfaction is projected to increase to 19.57%, exceeding the 15% threshold, potentially causing significant disruptions for local residents. If the government fails to implement effective measures, the growth in tourist numbers, while yielding substantial economic benefits, will likely exacerbate environmental and social challenges.

## Part 2 : Revenue Reinvestment Plan

### (1) Carbon emission limits:

To align with sustainable tourism goals, it is crucial to limit the carbon footprint of Juneau's tourism industry. We have developed a mathematical model linking tourist numbers to carbon emissions, connecting emissions to revenue through visitor count. Our final model aims to minimize carbon emissions to effectively control the tourism sector's carbon footprint.

### (2) Resident satisfaction limit:

We established a mathematical relationship between resident satisfaction and tourist numbers, using threshold values from past data as constraints in the final model. This regulation of satisfaction is incorporated into the solution to achieve the optimal outcome.

### (3) Tax feedback mechanism:

We identified that Juneau imposes tourism sales and lodging taxes to alleviate pressures from high visitor volumes. These taxes, aimed at addressing tourism challenges, are incorporated into our model with the assumption that the revenue will be fully allocated to infrastructure and carbon reduction. By including this revenue stream, we ensure it directly impacts the model's outcomes, prioritizing solutions that balance economic benefits and sustainable tourism goals.

## Part 3 : Regional Diversification Strategy:

Based on initial forecasts, immediate action for sustainable tourism in Juneau was deemed necessary. Phase Two measures, incorporating mathematical models as constraints into a comprehensive planning framework, identified optimal tourist volume thresholds and tax policies with a compensation mechanism. The final outcomes propose three strategies: prioritizing tourism revenue with carbon control, balancing revenue and emissions reduction, or focusing on carbon emission control, each aligned with the city's evolving economic and environmental goals.

Based on the analysis above, the following recommendations are proposed for Juneau's sustainable tourism plan:

(1) Tourism development should maintain annual visitor numbers at approximately 2.35 million to ensure economic benefits while mitigating negative impacts.

(2) Roughly 71% of tourism-generated tax revenue should be allocated to sustainability measures, including energy conservation and emissions reduction initiatives, to reinforce long-term environmental and operational viability.

Yours sincerely  
Team #2518438 2025.1.27