Travel Model Improvements for Bike Facility Evaluation

The OCTA Experience

momo2025 BY ZEPHYR

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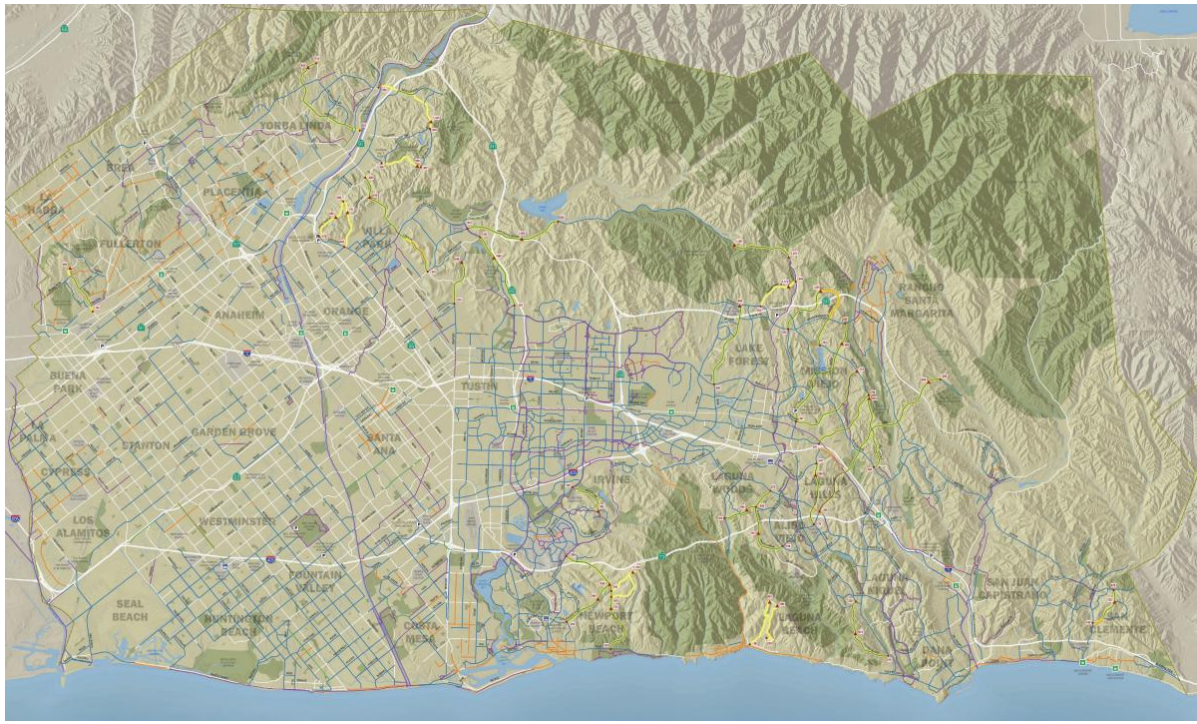
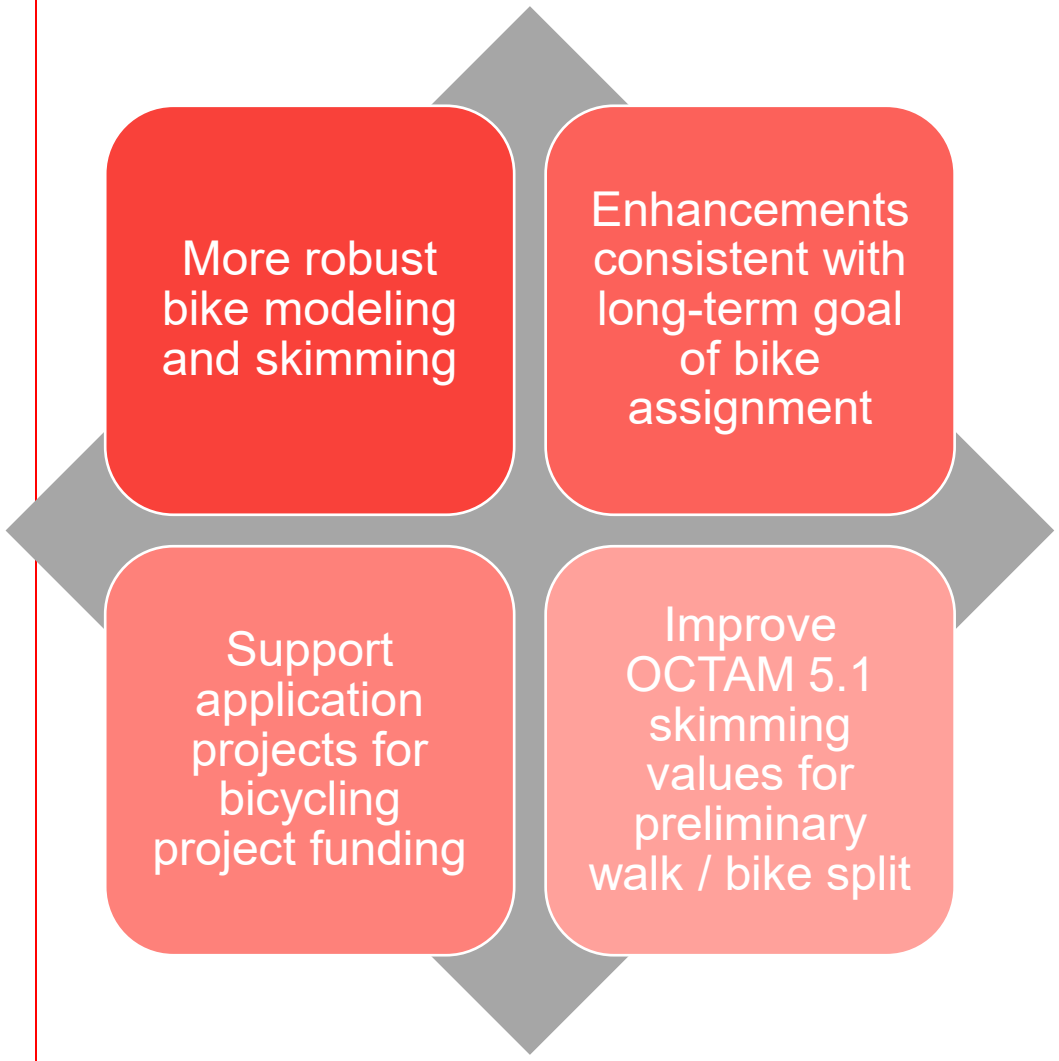
Biking in Orange County, CA

- **1,000** Miles of existing bikeways
- **400** Recommended miles of regional bikeway corridors
- **3.17M** Residents
- Model system insensitive to changes in bike infrastructure
- Beaches, universities, entertainment districts, flat & grided older communities, hilly newer suburbs



https://www.octa.net/pdf/OCBikewaysMap.pdf

Project Goals

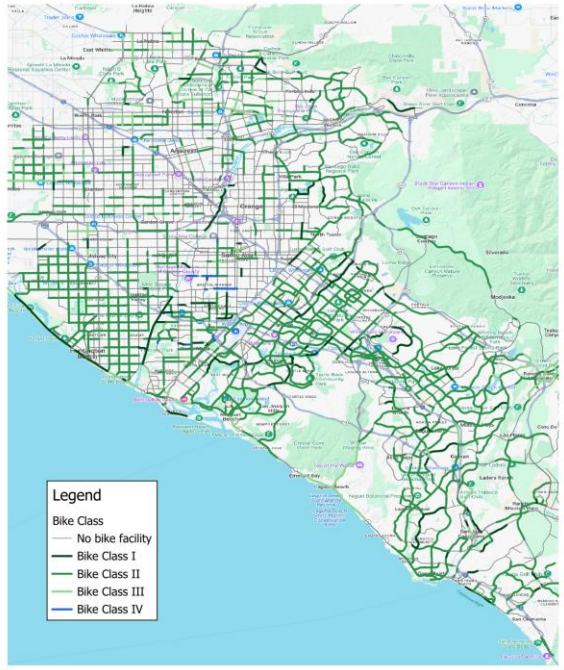


- Challenges
  - Low-cost proof-of-concept implementation
  - Use existing data
    - Bike maps
    - Collected bike counts
    - No route choice data
- First Version Path
  - Start towards more sophisticated bike assignment
  - Understand deficiencies
    - Network issues
    - Underrepresented travel markets
    - Identify demand issues
    - Identify other routing preferences / stresses

Bike Network Implementation – Bike Path Stress

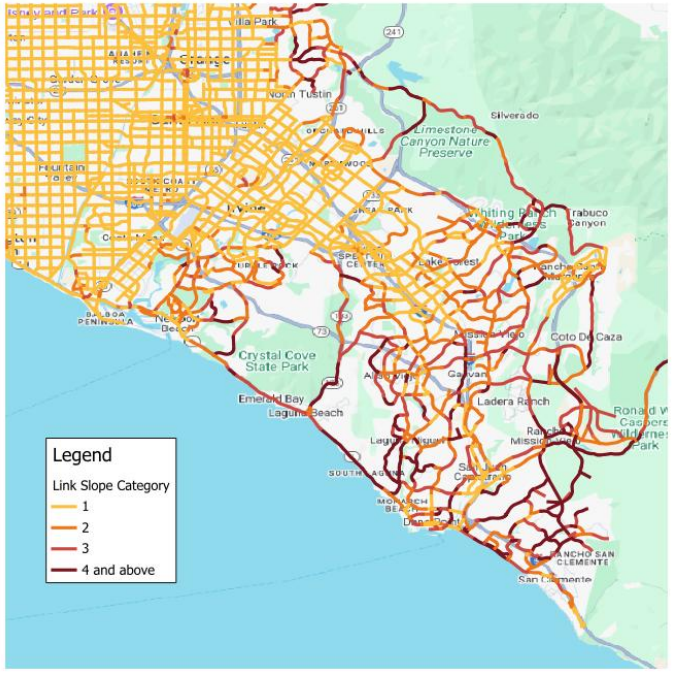
Safety

AWDT / Traffic



Comfort

Bike Facility Type



Effort

Bi-Directional Slope

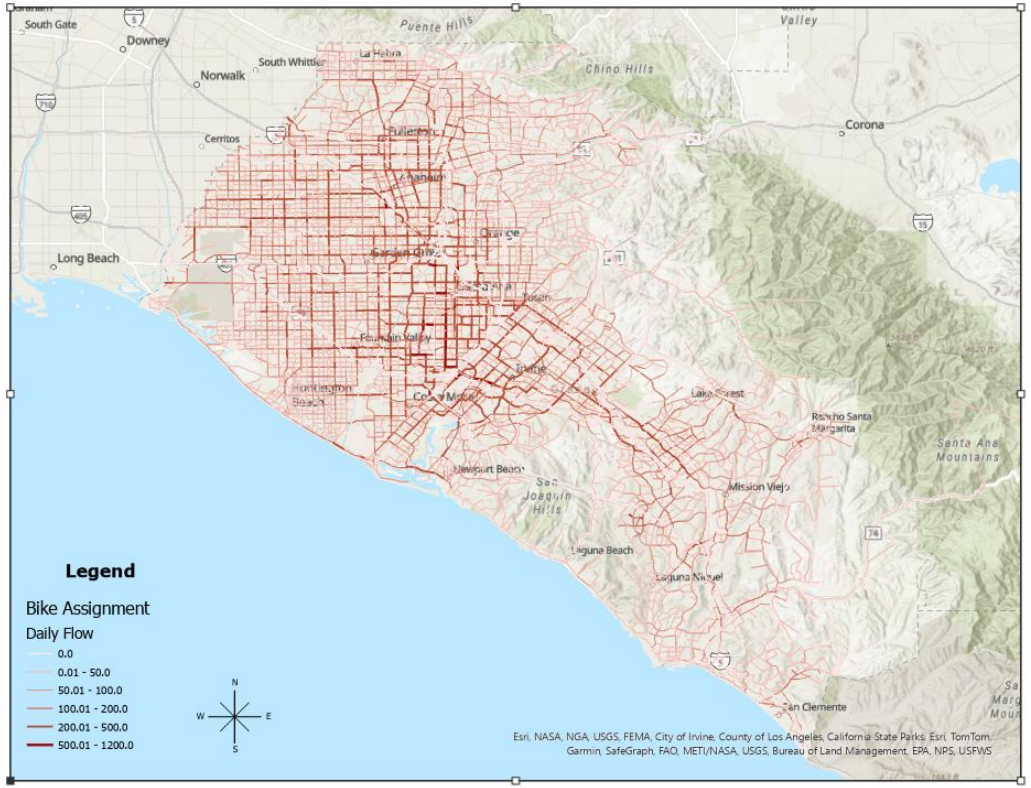
Bike Skimming

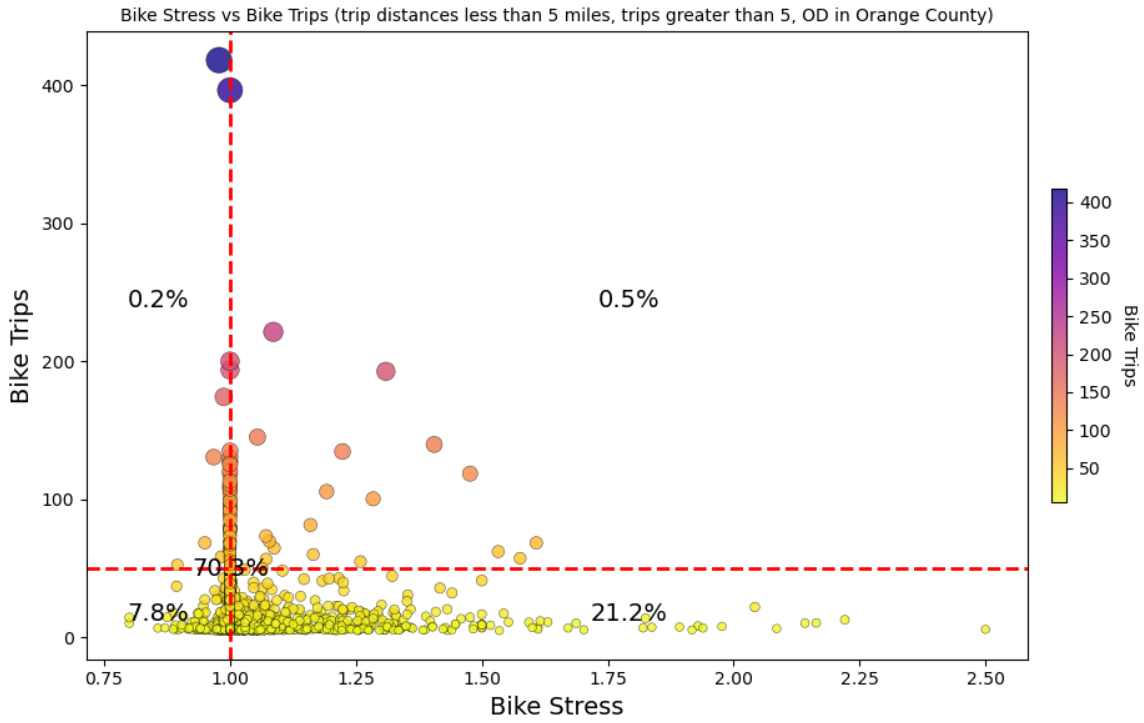
- Calculate directional factors where:
  - Link Length Factors = 1 + Length Weights
- Skimming by minimizing weighted length where:
  - Weighted Length = Link Length Factor X Length

VARIABLE	STRESS	CALIBRATED LENGTH WEIGHT
Mean Slope 2-6% (positive)	Effort	0.5
Mean Slope 6-10% (positive)		1.5
Mean Slope >10% (positive)		2.5
AADT > 20k/day	Safety	0.1
Off-road path (Class I facility)	Comfort	-0.2
Painted bike lane (Class II facility)		-0.05
Shared lane (Class III facility)		0
Separated bike lane (Class IV facility)		-0.2

Bike Assignment and Metrics

- AON bike assignment uses same link weights as skimming
- Cyclist stress on routes is a useful variable for evaluating infrastructure





Future Improvements

- Review of bike travel markets for
  - Appropriateness in other model steps (E.g. - Beach bike trips significantly underestimated)
  - Other stress factors
- Improved bike network coding
  - Intersection treatments
  - Parked vehicles
  - Bike facility barrier types
  - Bike parking stress
- Route choice survey / data purchase
  - Better calibration of stress factors
- Bike counts added based on model need
  - Add designation for other micromobility devices that can use bike lanes
  - E-bike counts

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Thank you!

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