Federal transportation legislation known as MAP-21 brought renewed attention to a proposed interstate corridor (I-11) connecting Las Vegas and Southern Arizona to complete a new Canada to Mexico, or CANAMEX, corridor. Using I-11 as a case study, our studio explored three key ways otherwise status quo infrastructure can be transformed into innovative, sustainable solutions: by intervening in the design and planning process, by transforming the existing mono-functional freeway prototype, and by evolving the freeway paradigm from an “engineering only” to a “sustainability first” model. Students and faculty from architecture, planning and landscape architecture investigated the possibilities of transforming the proposed I-11 freeway from a limited use, auto-dominant roadway (the “red arrow” scenario) into a sustainable, multi-functional, ecologically and socio-economically focused Supercorridor (the “green arrow” scenario). The results of this work, summed up on this poster, exhibit the advantages of infrastructure opportunism – leveraging investments intended for status quo infrastructure towards more broadly inclusive, design-centric, next generation proposals.

Capitalizing on a promising degree of agency interest, our team worked directly with ADOT and the Sonoran Institute to broaden the vision of this infrastructural opportunity. The studio worked alternatively in interdisciplinary and disciplinary-specific teams, alternating between the macro (network) and micro (node) scales of the I-11 route. Following introductory research, eleven prototype sites were selected, two of which – Marana and Tucson – are highlighted here. The redesign of Marana, based on the city’s actual plan, turned a sleepy suburban community into a higher education, multi-modal hub organized around a greenway developed from the re-use of water allocation rights and expansive water harvesting. The Tucson proposal, “Energy City”, captured maximum solar, kinetic and wind energy to power the existing streetcar system, new electric car share vehicles, housing units, restaurants, offices and hotels to create an innovation hub around a new renewable energy economy.

Some broad calculations show how small moves around large infrastructure projects can have major impact. Using state growth projections, our estimates show substantially less environmental impact with the next generation scenarios than the status quo options by encouraging smart growth patterns, transferring a percentage of car and truck traffic to rail, and increasing the use of electric vehicles. These changes – some happening already in other cities – would save an estimated 2.1 million metric tons of CO2 emissions per year, equal to roughly 180,000 households, or 540,000 people – a full twenty percent of the anticipated population growth in the region.

These numbers hint at the advantages of better planning, regardless of the proposed benefits of the design scenarios, which vastly expand the potential positive impacts by considering energy, water, data, housing, education, work, and mobility from an integrated, symbiotic perspective. Though design work is by nature speculative, the research that accompanied this studio was intended to prove that cost should not be purely assessed by a bottom line dollar figure, but is a result of long-term investment and value added. Because of our research, ADOT has adjusted their environmental impact review to more broadly include assessing the advantages and possibilities of next generation infrastructure design.
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**THE I-11 SUPERCORRIDOR: A NEXT GENERATION INFRASTRUCTURE CASE STUDY**

Design Research in the Studio Context

**INFRASTRUCTURAL OPPORTUNISM**

**WATER**

**SOLAR POTENTIAL**

**Traffic Projections**

**Population Growth Along I-11**

**Population Projections**

**ADDS 10.7 MIL metric tons CO₂, emissions/yr**

**SAVES 2.1 MIL metric tons CO₂, emissions/yr**

**TUCSON ARIZONA**

**NEW URBAN SUBURBIA**

- **$526,116**
- **20.4%**
- **$36,939**
- **1.0-1.7**
- **$153,700**
- **6 POOREST**
- **1.6-18.500**
- **WALK SCORE**
- **BIKE SCORE**
- **$71,723**
- **$222,200**
- **18-2.0**
- **21-26.000**

- **$38,290**
- **11.2%**
- **$7,123**
- **18-2.0**
- **21-26.000**
- **WALK SCORE**
- **BIKE SCORE**

**ECO ENERGY CITY**

**BANANA ARIZONA**

- **1.8-2.0**
- **21-26.000**
- **WALK SCORE**
- **BIKE SCORE**

- **1.8-2.0**
- **21-26.000**
- **WALK SCORE**
- **BIKE SCORE**

- **1.8-2.0**
- **21-26.000**
- **WALK SCORE**
- **BIKE SCORE**

- **1.8-2.0**
- **21-26.000**
- **WALK SCORE**
- **BIKE SCORE**