Commuting to UNLV:
The Daily Lesson and Action in Sustainability

Scott Nowicki - UNLV Department of Geoscience
Abstract

There are a number of programs operating in Las Vegas that have the look and feel of community efforts aimed at making life and business more sustainable, such as recycling, alternative energy, and trip reduction programs, but a serious effort is needed to gauge their effectiveness and plan for further development of these programs. The transportation system is an example of a potential significant decrease in greenhouse gas emissions, decrease in overall system costs, and increase in quality of life for residents. The Regional Transportation Commission’s plans for development of a comprehensive bike network, transit, and alternative mode integration are only likely to be successful if travel habits are viewed against the backdrop of the complex social/physical layout of the city. Participants in UNLV’s 400/600 GIS course are taking a systematic look at the way we use the transportation system in Las Vegas, as well as the physical layout and limitations of the bike and pedestrian network. Sociology students are focusing on the economic and social characteristics of the bike and public transportation system, while Geoscience students are mapping discrepancies between the publicly available map and the streets network. Using student researchers, these components are being brought together to discern what factors are limiting the Las Vegas metropolitan area from providing a sustainable way for people to get around.
Similar to UNLV:

Major Metropolitan University

Desert Environment

Growing

Tenuous Environmental Conditions
And different:

- Parking
- Bike Facilities
- Transit
- Community
Why transportation?

**Environment**

Greenhouse Gas Emissions by Sector

- United States, 2004
- Agriculture 8%
- Residential 17%
- Commercial 17%
- Industry 30%
- Transportation 28%

Total Emissions = 7,074 MMT CO₂E

* Net Emissions (Sources + Sinks) = 6,204 MMT CO₂E
** High GWP Gases include: HFCs, PFCs, and SF₆
Data expressed in Million Metric Tons of Carbon Dioxide Equivalents (MMT CO₂E)

Figure: Pew Center on Global Climate Change

**Economy**


- Food 15%
- Housing 38%
- Transportation 19%
- Health Care 6%
- Entertainment 5%
- Other 1%
- Retail 4%
- Insurance and Pensions 12%

Why transportation?

Society

Image: Carbusters, No 7, 2000
Sustainable Transport in Higher Education

1. Curriculum

2. Models

3. Infrastructure

4. Community
Incorporating topics on sustainability into existing Geoscience curriculum

Introductory Courses:

GEOG 101 – Physical Geography of the Earth’s Environment

GEOL 120 – Natural Disasters

Upper-Level Courses:

GEOL 430/630 – Geographic Information Systems (GIS)
GEOG 101 - Physical Geography of the Earth’s Environment

The Physics, Chemistry, Biology and Evolution of the Environment
The natural and anthropogenic forces behind disasters, and how we can prepare for them in the future
Lessons from Introductory Courses:

- UNLV undergraduates are local, and are accustomed to this environment
- Students are invested in the economics of Las Vegas
- Las Vegas provides few models of sustainability
- Students want Action
GEOL – 430/630 Geographic Information Systems (GIS)
Managing, Manipulating and Sharing Spatial Information

Opportunity to quantitatively test the local transportation network using sustainability as the context for inquiry

1. Survey and Route Map (>300 Students, Faculty, Staff)
2. Construct Geodatabase of people and resources
3. Evaluate the transportation network
4. Model and test new systems
GIS Class Project – Mapping how the UNLV Community Commutes
Applying the spatial database to other modes increases the understanding of choice, energy, and the local environment.

Can Las Vegas infrastructure accommodate a shift toward sustainable transport?
Curriculum in Sustainability

- Requires Lessons in Action as well as science
- Benefit from Role Models
- Influence Infrastructure Decisions
- Encourage Action
Curriculum in Sustainability

- Address the growing problems in Las Vegas
- Involve users, government, and UNLV administration
- Encourage changes
- Develop infrastructure
- Prepare for the economics of the future

We need to teach the science and practical “how to”

- Energy and finance calculations
- Navigation and safety
- Maintenance
Las Vegas has public campaigns
But few Role Models

Students have few models for sustainability,
Little encouragement to act,
Despite access to information

Can we both educate and inspire?

Infrastructure:

- Pedestrian-friendly development
- Transit Centers
- Bike Lanes
- Bike Coop
- Bike Sharing
- Multi-Use Paths
Transportation sustainability can build **Community** in Las Vegas that encourages other sustainable practices.
Daily Lesson and Action in Transportation Sustainability

- Educate in the classroom
- Provide examples
- Develop the infrastructure
- Encourage Community

Scott Nowicki
scott.nowicki@unlv.edu