

SWATeam Recommendation

Name of SWATeam: SWAT Transportation Team

SWATeam Chair: Yanfeng Ouyang

Date Submitted to iSEE: February 1, 2016

Specific Actions/Policy Recommended (a few sentences):

Travel demand analysis on reducing air travel emissions. It was proposed that a travel demand study be conducted to find out quantitatively how university business travelers select air travel against other alternatives (such as web-conference, train, driving). The outcome will then be used to develop incentives or policies to reduce air travels and emissions. This study could be conducted in two phases:

Phase 1. Collect 1-2 years of data on individual travel decisions, including travelers' socio-economic characteristics, and the alternatives they have. This includes analysis of the current Travel and Expense Management (TEM) database (e.g., the reported travel purpose and funding source) to collect basic information about current air travel. Part of the effort can involve adding new questions to the current TEM reimbursement process. An additional survey to the general public might be necessary to account for those who choose not to travel.

Phase 2. Statistical/econometric models (e.g., discrete choice models) will be developed based on the data collected in Phase 1. The outcome will inform us what factors contribute to air travel versus other available options, and what it takes to change the travelers' decisions. Based on the findings, the researcher could recommend programs to (i) provide incentives for campus units to reduce their annual air travel emissions; and (ii) educate/support the campus community on alternatives to air travel, such as trains and video conferencing.

Rationale for Recommendation (a few sentences):

Air travel consistently accounts for over 70% of the total campus transportation eCO₂ emissions. Data from FY08-14 reveal that our campus' transportation emissions have increased by 30% in this 7-year period, mainly due to a 52% increase in air travel emissions. The 2015 iCAP report has correctly identified this problem and made the following statement: "Given the centrality of air travel to the academic mission of the university, it is unlikely that GHG neutrality can be achieved for transportation, without resorting to the purchase of carbon offsets to adjust for air travel emissions."

Connection to iCAP Goals (a few sentences):

The goal on reducing air travel emissions will be very impactful on a number of sustainability objectives (e.g., emissions reduction, financial cost reduction, promotion factor, resource conservation, behavior change). The proposed actions/policies directly address objectives listed in the 2015 iCAP report, and they are also relatively easy to implement.

Perceived Challenges (a few sentences):

It is perceived that the campus community would be willing to share additional business-related information on air travels. The campus has sufficient faculty members with suitable statistical/policy modeling skills to conduct the analysis. The remaining challenges might lie in the long duration of data collection and campus-level administrative support.

Suggested unit/department to address implementation:

Urban Planning, Civil & Environmental Engineering, Travel and Expense Management (TEM).

Anticipated level of budget and/or policy impact (low, medium, high):

For Phase I: a faculty member, a student intern, and a TEM staff could possibly get this done in six months (e.g., Spring and Summer 2016). Data collection may take at least a year (e.g., 2016-2017). For Phase II, an experienced faculty member and a graduate student could possibly conduct the study in a following year (e.g., 2017-2018 academic year). The total budget will approximately cover two months of faculty summer salary and one graduate student for 1.5 years.

Individual comments are required from each SWATeam member (can be brief, if member fully agrees):

Team Member Name	Team Member's Comments
Yanfeng Ouyang	I believe the proposed study will be highly cost-effective in reducing campus transportation emissions.
Pete Varney	Information is necessary in order to formulate any action to reduce this significant contributor to University eCO2 emissions. I believe this is a relatively low-cost effort that could have significant impact on future emissions.
Bumsoo Lee	This is the most critical study that should be conducted prior to any further actions to reduce transportation emissions on campus. I agree this will be a relatively low-cost project.
Claire Dodinval	As previously mentioned, air emissions are the largest contributor to UIUC transportation emissions, and as such, I have faith that this project could make a big impact.
Zhaodong Wang	I think this project is promising to reduce campus transportation emissions.

Comments from Consultation Group (if any; these can be anonymous):

Explanation and Background (can be supplied in an attachment):

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Specific Actions/Policy Recommended (a few sentences):

Differential parking pricing for shared vehicles. One identified venue to encourage car sharing among faculty/staff and students is via differential pricing of campus parking permits. The basic idea is to sell parking permits at different prices for different lots, different vehicle types, and different users. The spots in the popular lots shall be sold at higher prices, while those sharing cars (i.e., two or more persons purchasing one permit for one vehicle) or using low-emission vehicles shall receive discounts and/or priority for getting into a popular lot. It is proposed that a study could be performed in two phases, as follows:

Phase I: Feasibility study that

1. Conducts a series of surveys to (i) understand the attitude of the parking department, current users, and the general public toward the proposed differential pricing scheme; and (ii) collect information on the campus commute patterns (single vehicle vs. carpool vs. CUMTD transit, origin/destinations, and vehicle types).
2. Collects data on campus parking capacity, utilization pattern, and demand profile.
3. Develops statistical/econometric models based on the collected data to inform us about the likelihood for users to adapt their vehicle usage and parking preferences in the context of parking price change.

Phase II: Pilot implementation study that

4. Evaluates the effectiveness of differential pricing on enhancing parking capacity utilization and reducing single-occupancy vehicle usage, with possible field implementation on a small scale.

Rationale for Recommendation (a few sentences):

Commute travel consistently accounts for about 20% of the total campus transportation eCO₂ emissions. Data from FY08-14 reveal that our campus' commute travel emissions have increased in recent years. The 2015 iCAP report has correctly identified this problem and set a transportation goal on "reducing single-occupancy vehicle usage."

The current campus parking system has the following features: (i) the long-term parking permit fee is flat for all users (equitably proportional to the user's salary), all vehicle types, at all parking lots; (ii) users wait for years to get into some popular parking lots, while other lots are under-utilized in the meanwhile; and (iii) current parking permits are sold on a per-individual basis. It might be possible to use pricing as the leverage to balance demand across parking lots, increase parking revenue (and/or social welfare), and most importantly, encourage shared vehicle usage and reduce emissions. If designed properly, this system will lead to a win-win situation -- the increased revenue from high-price lots could be used to offset the reduced revenue from carpooling, the users may not wait as long for a desired parking space, while the campus as a whole reduces single-occupancy vehicle usage and emissions. The social equity issue would not be worse than the current status-quo because we can keep the permit price to be always a percentage of the user's salary.

Connection to iCAP Goals (a few sentences):

The goal on reducing single-vehicle commute travel emissions will be very impactful on a number of sustainability objectives (e.g., emissions reduction, financial cost reduction, resource conservation, behavior

change). The proposed actions/policies directly address objectives listed in the 2015 iCAP report, and they are also relatively easy to implement (despite potential resistance from the parking agency and users).

Perceived Challenges (a few sentences):

It is anticipated that the campus community and administration may need some adjustment period for the new parking pricing scheme. The policy and pricing scheme must be designed carefully for this system to yield a win-win-win outcome.

Suggested unit/department to address implementation:

College of Engineering (e.g., Civil and Environmental Engineering) , Urban Planning, Facilities & Services (F&S), and the Department of Parking.

Anticipated level of budget and/or policy impact (low, medium, high):

Phase I of the study may take a faculty member and a graduate student 1.5 years to complete (e.g., Spring 2016 – Summer 2017). Phase II may take at least another 1 year to complete (e.g., Fall 2017 – Summer 2018). The total budget will approximately cover two months of faculty summer salary and one graduate student for 2-2.5 years.

Individual comments are required from each SWATeam member (can be brief, if member fully agrees):

Team Member Name	Team Member's Comments
Yanfeng Ouyang	I believe the proposed study will be quite cost-effective in reducing campus transportation emissions. This will lead to long-term commuting behavioral changes.
Pete Varney	Parking can be a contentious issue and finding the proper balance between environment, economic and political concerns could be difficult.
Bumsoo Lee	This study is a relatively low cost project, but it can bring about a significant behavior change of the campus community. There is no better option to influence commuting mode choice than a well-designed parking policy.
Claire Dodinval	I think this study serves as a strong assessment of ways to lower transportation emissions and once implemented, constraints on parking availability would be easier to implement- and more trialable- than larger scale emission-reduction attempts to change the vehicles or fuels used on campus.
Zhaodong Wang	I think this project is promising to reduce campus transportation emissions.

Comments from Consultation Group (if any; these can be anonymous):

Explanation and Background (can be supplied in an attachment):

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Specific Actions/Policy Recommended (a few sentences):

Campus fleet analysis and planning. The campus fleet includes department-owned vehicles, the car and truck pool vehicles, and the heavy equipment pool (mainly diesel-fueled large construction equipment). It is proposed that a feasibility study be performed on campus that:

1. Reviews the campus sustainability goals in the context of the University fleet;
2. Analyzes existing fleet data (i.e., fleet composition, ownership, usage/mileage profile) and future demand;
3. Evaluates current vehicle technology, fleet size, fuel types and availability;
4. Proposes collection of additional data (if needed);
5. Identifies various plans and anticipated cost/benefit results. Some of the options include: converting regular fuels to compressed natural gas, electricity, or biodiesel, increasing the portion of low-emission hybrid vehicles.

Rationale for Recommendation (a few sentences):

The campus fleet consistently accounts for about 10% of the total campus transportation eCO₂ emissions. Data from FY08-14 have revealed disappointing numbers on our campus' fleet emissions in recent years. The 2015 iCAP report has correctly identified this problem and recommended studying the feasibility for the campus to use (i) low-emission vehicles, and (ii) renewable fuels such as "sustainably-produced biodiesel, compressed natural gas from anaerobic digestion of organic wastes, and electricity from zero-carbon sources such as solar and wind."

Connection to iCAP Goals (a few sentences):

The fleet contributes to about 10% of campus emissions in the transportation sector, and it also has a range of other implications on campus sustainability objectives (e.g., financial cost reduction, promotional factor, political factor, resource conservation). The proposed work directly addresses two objectives listed in the 2015 iCAP report; i.e., "reduce fleet emissions" and "develop scenarios for conversion to alternative fuels."

Perceived Challenges (a few sentences):

The proposed work requires detailed data collection and "accounting" work. There may be administrative and political issues associated with the ownership of the various types of fleet vehicles.

Suggested unit/department to address implementation:

Outside consultant (or any campus department), Facilities and Services (F&S).

Anticipated level of budget and/or policy impact (low, medium, high):

This study may take a faculty member and a graduate student, or an outside consultant, 1-2 years to complete.

Individual comments are required from each SWATeam member (can be brief, if member fully agrees):

Team Member Name	Team Member's Comments
Yanfeng Ouyang	I believe the proposed study will help significantly reduce campus transportation emissions.
Pete Varney	I strongly support this study to address two iCAP objectives, however I also support someone with significant industry knowledge to lead this study.
Bumsoo Lee	Promoting the sustainability of campus fleet will have some symbolic value and gain the attention from the campus community. I agree that hiring a consultant with industry knowledge is the way to proceed.
Claire Dodinval	I think there are many directions this could be taken that could reduce emissions and be an observable shift towards sustainability (on campus and beyond).
Zhaodong Wang	I think this project is promising to reduce campus transportation emissions.

Comments from Consultation Group (if any; these can be anonymous):

Explanation and Background (can be supplied in an attachment):