

TRB ANF-20 Committee on Bicycling

Student Research Ideas – 2008, first quarter

General guidelines for student research projects:

- It is always a good idea to contact your local transportation planner or engineer early in the idea development stage about access to data, research plans etc. Local agency staff may have good practical suggestions for your research as well as advice on how the research may be applied.
- Contact the TRB bike committee to find out about others who have tried to answer the same research question. You might be able to use the same methods or experimental design.
- Consider submitting your paper to TRB for presentation/publication at the annual meeting, or let us know if your paper has been published elsewhere so your results may be shared with others with similar projects.

DEMAND/TRIPS/POLICIES

- 1) “Bike-friendliness” audit of your community/campus. (UNDERGRAD). Identify criteria of a bike-friendly campus/community from the literature. Then evaluate your campus based on these criteria. Criteria can include availability of (covered/secure) bike parking, connection to transit, connectivity of the bike network, existence of bike lanes, or paths, police on bikes, bike injuries/fatalities, dangerous intersections or a bike policy of the municipality/university. You could come up with suggestions to your municipal transport planner or the university transportation division based on your evaluation.
- 2) What motivates or discourages students, faculty and staff to bike to work/school? (GRADUATE, needs IRB approval). Conduct a survey of students, faculty and staff on their mode of transport to work/school. Construct a survey based on a literature review. In the survey ask why the respondents cycle/do not cycle. Identify the characteristics of cyclists, non-cyclists, and potential cyclists. Other questions for potential cyclists can include: What are the greatest impediments to cycle to work/school? What changes in the environment would induce the potential cyclists to use their bike?
- 3) Identify dangerous areas for cycling on campus, make suggestions for improvements/changes. (UNDERGRAD)
- 4) What makes a bikeable community? (GRADUATE, potentially IRB needed) Carry out a visual preference survey in the community (or with staff/students). Show pictures of different bike facilities to the respondents and have them to rate how attractive the facilities are to them (on a scale from one through five for example). You can then build an average score for every picture. Now go back to the pictures and analyze the characteristics of the bike facilities based on

textbooks and technical knowledge. These characteristics can include: How wide are the facilities, are there bike lanes, paths, or is a on- road facility. Is there protection from cars? Is it in a built-up area on a rural highway? Try to build several criteria and score each road from one to five on these criteria. Use regression analysis to determine which of your “professional/expert variables” help explain variability in the average score. Are the characteristics you (or the books) had considered to make good cycling facilities really what riders perceive as creating a good cycling environment?

- 5) Bike funding (GRADUATE) Review Federal and State funding sources potentially available for bike projects. Then survey your metropolitan state, region, or municipality and find out what share of potential funding is used for cycling. Find out why funds are used for cycling or why not.
- 6) Do certain organizational structures, policies, and practices produce better outcomes for bicyclists? (Review current institutional/decision-making structures, policies and practices and outcomes for bicycling environment. What outcome measures are feasible?)
- 7) *Explore recent experiences and current practices related to provision of bicycle lanes/paved shoulders as part of state highway projects.
- 8) Effects of weather/weather patterns on bicycle riding levels.
- 9) *Examine traffic patterns – personal vehicles, buses, transit, pedestrians and bicyclists – around schools and identify safety problems. Make recommendations for improvement.
- 10) What are the most effective bicycle facility maintenance policies and practices? Compare with local policies. (If they are built, are facilities maintained? Is maintenance institutionalized?)
- 11) * What percentage of current vehicle traffic must be shifted to other modes in order to reduce congestion? How does cost of shifting modes compare with new construction to achieve same congestion relief?
- 12) *Determine the feasibility of adding a surcharge on new car advertising in major metropolitan areas, and potential revenues for promoting alternative transportation modes.
- 13) Conduct a survey to learn whether, how/how much, and why people have actually shifted modes to/from bicycle travel over past twelve months.
- 14) Evaluate Safe Routes to School-related bicycle measures (education, enforcement, engineering, or encouragement) effects on:
 - a. riding to school
 - b. personal vehicles coming to/from school
 - c. air quality (traffic-related) around and inside school(s)

- 15) Evaluate parking management/constrained supply effects on bicycling levels.
- 16) Evaluate effects of free / reduced-fare bus/transit service on bicycling/walking levels.

SAFETY

- 17) Determine the extent of wrong-way riding on sidewalks and adjacent roadways with different types of accommodation for bicyclists, traffic volumes, speeds and no. of lanes. (If available, examine bike-motor vehicle crash data for same roads and positions/directions of bicyclists at the time of collision, type of collision, rider characteristics.)
- 18) [†]Study the legibility and comprehension of various bicycle-related signs, symbols, and markings by bicyclists and motorists; examples: Sharrow (shared-used pavement symbol), bike box/advanced stop lines, colored bike lanes, other innovative treatments.
- 19) Examine safety and health issues of recumbent and low-profile bikes.
- 20) *What are the comparative safety effects of requiring drivers to merge into a bike lane before making a right turn compared to making the turn across the bike lane from the adjacent lane?
- 21) *What is the impact of continuing to mark/dash bicycle lanes through an intersection?
- 22) Study individual health effects of changes in personal bicycling levels. (IRB)
- 23) What are the safety and operational impacts of raised medians on bicyclists? Identify issues and how bicyclists can best be accommodated.
- 24) Evaluate Safe Routes to School-related bicycle measures (education, enforcement, engineering, or encouragement) effects on safety of school-aged bicyclists and/or all ages, disaggregated.
- 25) Explore exposure measures of bicyclists to crashes: effects of distance, time, traffic volume, number of lanes, etc.
- 26) Explore measures of bicyclist exposure to non-motor vehicle crashes.

**Ideas from earlier list.*

[†]Adapted from earlier list.