

California State University, San Bernardino  
Institutional Review Board

Application to Use Human Subjects in Research

1. PROJECT REVIEW

All applicants complete CITI Course in Human Subjects Online Training before submitting IRB application (see policy at <http://irb.csusb.edu/>).

- New project (ID # assigned by IRB): IRB# 12060
  - Revised project (Enter IRB ID #):
  - Project Renewal (Enter IRB ID #):
- Date of most recent previous review:

**RECEIVED**  
APR 25 2013  
BY: [Signature]

2. DATA COLLECTION DATES: From 4/26/2013 to 4/25/2014  
Note: Required information; must be future dates, i.e., after IRB approval.

3. INVESTIGATOR(S):

(For Contact Info, faculty provide phone numbers and students provide CSUSB e-mail.)

Faculty Name: Nerea Marteache Department: Criminal Justice Contact: nmarte@csusb.edu  
 Student Name: Solans  
 Other

Faculty Name: Gisela Bichler Department: Criminal Justice Contact: gbichler@csusb.edu  
 Student  
 Other

Faculty Name: [Redacted] Department: Criminal Justice Contact: [Redacted]  
 Student  
 Other

Faculty Name: Department: Contact:  
 Student  
 Other

Faculty Name: Department: Contact:  
 Student  
 Other

Faculty Name: Department: Contact:  
 Student  
 Other

For student investigators, this research is for:

- Graduate Thesis or Project
- Honors Project
- Independent Study
- Course:
- Other:

4. **PROJECT TITLE:** Taming the Steel Horse I Ride: Using Geographically-based Social Network Analysis to Identify Risky Commuter Rail Hubs and Travel Segments

5. **PARTICIPANTS** (approximate number and all applicable categories):

Number: na

- Female     Male
- CSUSB students
- Children (17 or younger)
- Child Development Center
- Prisoners
- Patients in institutions
- Pregnant women
- Faculty or external reviewers

List any other individual or personal characteristics (e.g., race, ethnicity, age, sexuality, etc.) pertaining to the participants you are seeking.

Give a short justification based on empirical, theoretical, or practical reasons for the number of participants you are requesting.

The participants are not actually people. The subjects of interest are train stations and travel legs between stations.

6. **FUNDING:** Project period from 8/30/2013 to 6/30/2014

Are you seeking funding for this research?       no     yes  
If yes, submit one complete copy of your proposal as soon as available.

Provide the name of the funding agency. CSUSB- minigrant

Does the funding agency require IRB approval?       no     yes

If yes, provide all relevant forms, instructions, etc. with this application.

7. **REVIEW CATEGORY:** Please mark all items that apply.

Note: All research involving children must be reviewed by the full Board.

- Administrative Review** (based on the following categories):
- Research conducted in established or commonly accepted educational settings, involving normal educational practices
  - Research involving educational tests, if information is recorded so that participants cannot be identified in any way
  - Research involving surveys or interviews, if information is recorded so that participants cannot be identified in any way
  - Research involving observation of public behavior, if participants cannot be identified in any way
  - Research involving educational tests, if information is recorded so that participants cannot be identified in any way
  - Research involving collection or study of existing data, documents, records, or pathological or diagnostic specimens, where these sources are publicly available and participants cannot be identified in any way

- Expedited Review** (based on the following categories):  
Note: Submit original and one copy of all application materials.

- Collection of hair, nail clippings, teeth (if non-disfiguring)
- Collection of excreta or external secretions
- Recording data from adults using non-invasive procedures
- Collecting moderate blood samples from healthy adults
- Collecting supra- and sub-gingival dental plaque or calculus
- Voice recordings made for research purposes
- Moderate exercise by healthy volunteers
- Study of existing data, documents, records, or pathological or diagnostic specimens
- Non-manipulative, non-stressful research on individual or group behavior


- Full Board Review:** Submit original and one copy of all materials.


**8. AFFIRMATION OF COMPLIANCE:**

Investigators are required to notify the IRB of substantive changes to protocol, unanticipated adverse events, and project completion. Projects lasting longer than one year require an annual Request for Continuation or Notice of Project Ending – (<http://irb.csusb.edu>). Failure to submit may result in disciplinary action under CSUSB student or faculty misconduct policy. Consent / assent forms and data must be maintained at least three years.

*I agree to follow the procedures herein, as well as additional instructions from the IRB, and to ensure that the rights and welfare of human participants are properly protected. I will commence the study only after receiving approval from the IRB (or departmental Human Participants Review Board) and having complied with required modifications. I will promptly report additions, changes, or problems involving the rights or welfare of human participants to the IRB. If the project lasts more than one year, I will submit the required documentation.*

*I affirm the accuracy of this application and accept responsibility for the ethical conduct of this research, supervision of human participants, and maintenance of data and informed consent as required by the IRB. (Print more pages if needed)*

  
\_\_\_\_\_  
Signature of Investigator      nmarte@csusb.edu      CSUSB E-mail Address      4/22/2013      Date

  
\_\_\_\_\_  
Signature of Co-investigator      gbichler@csusb.edu      CSUSB E-mail Address      4/22/2013      Date

  
\_\_\_\_\_  
Signature of Co-investigator      franquej@coyote.csusb.edu      CSUSB E-mail Address      4/22/2013      Date

\_\_\_\_\_  
Signature of Co-investigator      CSUSB E-mail Address      Date

\_\_\_\_\_  
Signature of Co-investigator      CSUSB E-mail Address      Date

**APPROVAL OF FACULTY ADVISOR OR SPONSOR:**

*I affirm the accuracy of this application and accept responsibility for ethical research conduct, student supervision, and maintenance of documentation.*

\_\_\_\_\_  
Printed Name of Faculty Advisor      Phone      CSUSB Department

\_\_\_\_\_  
Signature of Faculty Advisor      Date      CSUSB E-mail Address

**APPROVAL OF LICENSED PHYSICIAN:**

This signature is required only if the project involves medical procedures and neither the investigator nor the faculty advisor is a licensed physician.

Printed Name of Physician	Phone	E-mail Address
Signature of Physician	Date	

**9. RECRUITMENT OF PARTICIPANTS:**

Describe sources of potential participants, how they will be selected and recruited, and how and where you will contact them. Include all relevant characteristics with regard to age, ethnicity, sex, institutional status (i.e., patients or prisoners), and general state of physical and mental health.

Note: Recruitment issues can be especially critical when any federally defined "vulnerable population" is involved. This includes children, pregnant women, prisoners, others who are institutionalized, and anyone who might be at particular risk or whose cooperation might be dependent on coercion, no matter how slight.

**Answer in the box below (it will expand to fit your text).**

This study will draw data from agency records; these secondary data are already devoid of personal identifiers. The 'subjects' of interest are actually train stations and travel segments between stations.

**10. DESCRIPTION OF THE PROJECT:**

Briefly describe the objectives and methodology of your research (including hypothesis and/or research questions), data collection procedures, and features of the research design that involve specific procedures or special conditions for participants (including frequency, duration, and location of participation).

It would be helpful to organize this section with these sub-headings:

- a. Objectives of the Study
- b. Hypothesis
- c. Methodology
- d. Data Collection
- e. Data Analysis
- f. Dissemination

**Answer in the box below (it will expand to fit your text).**

The use of public transportation has widely recognized benefits, at many levels. Public transit reduces traffic congestion and provides an eco-friendly commuting alternative. Recent state-level budgetary problems further increase public interest in the provision of convenient and affordable mass transit services. However, passengers will only take advantage of public transportation when systems run efficiently and are perceived to be safe. For this reason, transit crime incidents negatively impact public transportation systems. Studies in the U.S. and overseas (New York, Washington D.C., Chicago, London, Zurich, etc.) have shown that transit crime affects all large systems, reducing the number of passengers, creating service disruptions and decreasing revenue. Interestingly, the results of these studies show that crime does not happen evenly across the system; it concentrates in specific lines, segments and stations.

Metrolink is operated by the Southern California Regional Rail Authority (SCRRA). This regional commuter rail service is the 3rd largest commuter rail agency in the United States based on directional route (512 mile network) and the 7th largest based on annual ridership. It operates several lines across six counties. To date, no study has analyzed public safety issues of this rail system from a risky facilities approach. Metrolink authorities have expressed interest in exploring the utility of a situationally-based approach, especially at a time of budgetary constraints when effective deployment of the limited resources has become essential.

The goal of this study is to isolate the stations and the segments (portions of the train line between stations) that pose the most tangible public safety risk, in order to focus crime prevention efforts and resources to where they are most needed. It is anticipated that low level problems, such as fare evasion and public complaints, are predictive of more serious crime incidents.

#### Research Questions:

1. In what stations and segments do fare evasion and crime incidents concentrate?
2. What factors associated with service disruptions facilitate fare evasion (e.g., ticket machine dysfunctions, on-time performance, or line disruptions)?
3. Does fare evasion predict and/or precede more serious crime incidents?
4. Does passenger perception of safety coincide with real crime data?

Analysis of secondary data will be conducted. The riskiest stations and segments will be identified, and compared in their characteristics to low-risk stations and segments, following a risky facilities approach (Eck et al., 2007). Factors associated with increased risk will be examined. All data will be aggregated by time of day.

Data needs will include the following (per station and segment in the line): ridership levels, crime incidents, number of passengers' complaints, number of ticket machines dysfunctions, on-time train performance, and line disruptions.

The analytic process will involve use of a hybrid methodology merging analytic capabilities of geographic information systems (GIS) and network analysis software to estimate the criminogenic importance of each segment and station relative to the entire transportation network. Eigenvector centrality will be a critical variable.

#### 11. CONFIDENTIALITY OF DATA:

Clearly indicate specific procedures (e.g., coding of responses, aggregate reporting, etc.) that will protect the confidentiality of participants and safeguard identifiable records and data. If not possible, state why.

**Answer in the box below (it will expand to fit your text).**

All data used in this study are secondary and are classified within the parameters of public access documents. Raw data are aggregated to stations and segments. Since some sensitive results may emerge, Metrolink representatives will screen all findings prior to public dissemination. Confidentiality of subjects, i.e. in terms of people writing in complaints, is not at issue since no personal identifiable information is gathered. With hundreds, if not thousands of people riding each train, aggregated complaints and citations could not identify individuals.

While the confidentiality of data in regards to human subjects is not a direct issue, all data supplied by Metrolink and affiliates will be secured in a password protected, electronic storage area. Hard copy and paper copy of data will be secured in a locked filing cabinet. All raw data are only accessible to named research staff.

**12. RISKS AND BENEFITS:**

Describe in detail any immediate, short-term, or long-range risks that may arise for participants as a result of procedures associated with your study. Risks may be physical, psychological, social, legal, or economic; they would include side effects, risks of placebo, delay in customary treatment, etc. Indicate any precautions that will be taken to minimize risks. Also indicate any anticipated benefits to participants and/or society from the knowledge that may reasonably be expected to result from the study.

**Answer in the box below (it will expand to fit your text).**

There are no direct risks to individuals associated with the inspection of this data or the researcher.

**13. INFORMED CONSENT:**

Informed consent is usually written; however, in some circumstances it may be oral or electronic in nature. Waivers of informed consent may be granted under certain limited conditions, and any request for such should include explicit justification.

The IRB requires a text of the proposed statement to be used for oral or electronic consent. Like written consent, they should include

Identification of the researcher(s)

- The nature and purpose of the study
- Expected duration of participant involvement
- How confidentiality or anonymity will be maintained
- The voluntary nature of participation
- Participants' right to withdraw at any time without penalty
- Information about foreseeable risks and benefits (or none)
- Contact information for questions or additional information
- A statement that the project has been approved by the Institutional Review Board of California State University, San Bernardino (or the departmental board for exempt proposals).

A copy of the Informed Consent or text for oral consent (on CSUSB letterhead) must accompany this application. For non-English-speaking participants, include an accurate translation. See <http://irb.csusb.edu/> for consent checklist and other sample forms.

Note: Research involving minor children generally requires **Child Assent** as well as Informed Consent from a parent or guardian. If in doubt, include the Child Assent written clearly at age level of participants and printed on CSUSB letterhead. See IRB website for sample forms.

**Please paste all required consent and assent documents in the designated area at the end of this form.**

**14. DEBRIEFING STATEMENT:**

A debriefing statement is usually required only if any type of deception is used in the study. Participants may also be debriefed about their behavioral response(s) to the study. The two major goals of debriefing are de-hoaxing and de-sensitizing. Any undesirable influence the study may have on participants should be minimized or eliminated.

The debriefing statement should describe the reason(s) for conducting the research, how participants can obtain results of the study, and contact information for additional details or answers to questions. Any potential predictions about study outcomes should be non-directional. It would also be advisable, for methodological purposes, to request that participants not reveal the nature of the study to other potential participants.

**Please paste all required consent and assent documents in designated area at the end of this form.**

**15. ATTACHMENTS:** All relevant project materials and documents, including

- Letters of approval on letterhead from cooperating agencies, schools, boards of education, etc.



- Participant recruitment materials (e.g., fliers, advertisements)
- Informed Consent and Assent (if applicable) forms
- Surveys, questionnaires, interview instruments, etc.
- Debriefing statement or explanation sheet if applicable

**Please paste all your study materials in the order listed above into this document, starting on the next page.**

Paste letters of approval into the box below.  
Not applicable.

Paste participant recruitment materials into the box below.  
Not applicable.

Paste required informed consent and assent form(s) into the box below.  
Informed consent is not applicable as human subjects are not directly used and the data source involves information about public places (train stations and travel segments).

Paste research materials, e.g., data collection instrument(s), in the box below.  
Not applicable.

Paste any remaining research materials into the box below.

Paste debriefing or explanation form into the box below.

Paste any other supplementary materials into the box below.  
Attached is the mini-grant proposal.

  
**Objectives:**

The use of public transportation has widely recognized benefits, at many levels. Public transit reduces traffic congestion and provides an eco-friendly commuting alternative. Recent state-level budgetary problems further increase public interest in the provision of convenient and affordable mass transit services. However, passengers will only take advantage of public transportation when systems run efficiently and are *perceived to be safe*. For this reason, transit crime incidents negatively impact public transportation systems. Studies in the U.S. and overseas (New York, Washington D.C., Chicago, London, Zurich, etc.) have shown that transit crime affects all large systems, reducing the number of passengers, creating service disruptions and decreasing revenue. Interestingly, the results of these studies show that crime does not happen evenly across the system; it concentrates in specific lines, segments and stations.

Metrolink is operated by the Southern California Regional Rail Authority (SCRRA). This regional commuter rail service is the 3<sup>rd</sup> largest commuter rail agency in the United States based on directional route (512 mile network) and the 7<sup>th</sup> largest based on annual ridership. It operates several lines across six counties. To date, no study has analyzed public safety issues of this rail system from a *risky facilities approach* (Eck, Clarke and Guerette, 2007). Metrolink authorities have expressed interest in exploring the utility of a situationally-based approach, especially at a time of budgetary constraints when effective deployment of the limited resources has become essential.

The goal of this study is to isolate the stations and the segments (portions of the train line between stations) that pose the most tangible public safety risk, in order to focus crime prevention efforts and resources to where they are most needed. It is anticipated that low level problems, such as fare evasion and public complaints, are predictive of more serious crime incidents.

Although the long term objective is to conduct such analyses system-wide, this project will specifically focus on the San Bernardino line, which is the busiest one of the Metrolink rail system (Metrolink Fact Sheet, June 2012). This line provides public transportation between downtown Los Angeles and the city of San Bernardino, as well as access to two California State University campuses: CSU Los Angeles and CSU San Bernardino. As it will be explained below (see "Expected End Product"), this study is a demonstration project for a future, system-wide initiative.

**Research Questions:**

1. In what stations and segments do fare evasion and crime incidents concentrate?
2. What factors associated with service disruptions facilitate fare evasion (e.g., ticket machine dysfunctions, on-time performance, or line disruptions)?
3. Does fare evasion predict and/or precede more serious crime incidents?
4. Does passenger perception of safety coincide with real crime data?

**Methods:**

Analysis of secondary data will be conducted. The riskiest stations and segments will be identified, and compared in their characteristics to low-risk stations and segments, following a risky facilities approach (Eck et al., 2007). Factors associated with increased risk will be examined. All data will be aggregated by time of day, for the San Bernardino Line, by segment and station.

Data needs will include the following (per station and segment in the line):

- Ridership
- Crime incidents
- Passengers' complaints
- Ticket machines dysfunctions
- On-time train performance
- Line disruptions

**Feasibility:**

This faculty member has experience in applying the risky facilities framework to transportation systems (airports). With regards to the data needs, Metrolink authorities have already expressed their interest in exploring alternative methods of identifying public safety threats on their trains and in stations system-wide. To that end they have stated that they will provide access to any data necessary to conduct this study.

**Expected End Product:**

A research paper with the results of this study will be submitted to a peer-reviewed journal (i.e. Security Journal, Journal of Transportation Studies), which will also be presented at the American Society of Criminology Annual Conference.

If granted, this funding will be used to support a graduate research student (or senior undergraduate) to help organize the data, analyze findings, present results at the aforementioned conference, and develop the paper to be submitted to a peer-reviewed journal. The student will benefit greatly from the opportunity of engaging in hands-on research, and at the same time this faculty member will have the chance to establish contacts with local agencies and to develop an important, long-term project with an impact in the local community.

The findings of the study will be submitted to Metrolink authorities, as demonstration of an alternative model for problem identification and resource allocation. Not only Metrolink, but also the passengers that use the San Bernardino Line and the communities serviced by it (including two CSU campuses) will benefit from this project.

Finally, the present study will also serve as a demonstration project for a wider project including other Metrolink lines. Funding will be sought with the U.S. and California Departments of Transportation, as well as other agencies. Once external funding is obtained, this pilot study will serve as the basis for a system-wide research initiative targeting other factors potentially associated with crime incidents, such as: station design and management, train management (role of conductors and law enforcement), neighborhood socio-economic characteristics, etc.

[REDACTED]