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SAN DIEGO TRANSIT PLANNING INTERNSHIP PROGRAM

(FY2009/2010)

June 2010

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ABSTRACT

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ABSTRACT: Since 2004, the San Diego Association of Governments (SANDAG), in cooperation with San Diego State University (SDSU) and the Metropolitan Transit System (MTS), has coordinated the San Diego Transit Planning Internship Program. This program hired and trained masters-level students to work as part-time interns on transit planning and operations projects at SANDAG and MTS. This report summarizes the setup and evaluation of the program, and provides examples of projects completed. Funding for this program has been provided through Caltrans-sponsored Federal Transit Administration (FTA) grants.

ACKNOWLEDGEMENTS

SANDAG would like to thank Faculty and Staff in the Master of City Planning Program and the SDSU Foundation for partnering with us on this program. Thanks also to San Diego Transit Corporation and the Metropolitan Transit System for training and mentoring.

SANDAG thanks the Department of Transportation, both at Headquarters and District 11, for their knowledge of the federal discretionary grant process, awarding of grant funds to make this program possible, and monitoring of our efforts.

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OVERVIEW

INTRODUCTION

Since 2004, the San Diego Association of Governments (SANDAG), the Metropolitan Transit System (MTS)[1], and San Diego State University (SDSU) have coordinated the San Diego Transit Planning Internship Program. These organizations jointly developed a grant proposal for consideration by the California Department of Transportation (Caltrans) that subsequently has provided funding for the program.

This proposal called for a collaborative project between SDSU, MTS, and SANDAG to hire and train two interns in transit planning in a joint agency context. This consolidation of planning between MTS and SANDAG as a result of recent state consolidation legislation (SB 1703) was cited. The major benefit discussed was that the program would not only provide for state-of-the-art opportunities for professional development but also provide additional resources to the two agencies as they prepare for, and implement, this consolidation.

Master of City Planning (MCP) students at SDSU would receive internships to work on transit planning and implementation activities at SANDAG and MTS. The interns would be selected on a competitive basis. Each intern would work approximately 20 hours per week for one (1) year on a variety of transit planning and operational tasks, with daily supervision by Senior Regional Planners at SANDAG and MTS.

SANDAG hired one intern in the spring of 2004 to work exclusively at San Diego Transit Corporation, a subsidiary of MTS and the region's largest bus operator. Two interns were hired in the fall of 2004, one working at SANDAG in the transportation planning division and one working at MTS in the planning department. Two interns were hired in 2005. Also in 2005, one intern was also shared with the North San Diego County Transit District (NCTD), the bus and COASTER commuter rail operator in North San Diego County. Two interns were also hired in 2006, 2007, 2008, and 2009.

Program Benefits

This program helps facilitate the professional development of transit planners, provide resources for actual consolidation of transportation and transit planning and operations, and provide additional enhanced education for graduate students interested in pursuing careers in transit planning and

[1] The grant request identified the Metropolitan Transit Development Board (MTDB) as a participating agency. As a result of the consolidation of transit planning at SANDAG, MTDB later reorganized as the San Diego Metropolitan Transit System (MTS).

operations. The public education component of the program also enhances students and the general public's knowledge of the planning process and of specific transportation projects.

Organizational Benefits

Transit planning in a growing region like San Diego has taken on an increasingly important role as areas pursue regional smart growth policies. The role of transit, and its integration with land use, is a major focus of the region's 2030 Regional Transportation Plan, adopted by the SANDAG Board of Directors in 2007. As a result, SANDAG has a number of implementation strategies and projects underway. SB 1703 mandates SANDAG take on additional transit planning duties, including a Regional Short-Range Transit Plan. Additional emphasis has also recently been placed on SB 375, which requires that metropolitan planning organizations (MPOs) prepare a Sustainable Community Strategy (SCS) as part of the Regional Transportation Plan (RTP). The SCS must demonstrate how development patterns and the transportation network can work together to achieve the greenhouse gas (GHG) emission reduction targets for cars and light trucks established by the California Air Resources Board (CARB). SANDAG is in the process of developing its first Regional Transportation Plan subject to the provisions of SB 375. These recent developments have resulted in SANDAG's need to add members to its project teams who are familiar with transportation and land use concepts and have an interest in these projects.

For a number of years, SDSU and SANDAG have partnered on planning efforts. This internship program was the first effort for the two organizations to focus specifically on transit planning and the linkages to land use. The benefit to SDSU, and the MCP program in particular, is to provide real-world training and work opportunities to better prepare their students. It also allowed the department to add a new dimension to its graduate program. Building such a partnership will also help facilitate later efforts at joint cooperation.

Intern Benefits

This program is an excellent opportunity for students to obtain first-hand training in transit planning and operations at the local and regional levels. The students also receive concurrent graduate internship credit in the MCP Program at SDSU.

The internship also provides a unique professional development opportunity for the interns as a result of the specific role that they would play in the regional consolidation among transit agencies and SANDAG, as the MPO.

Interns are given the opportunity to interact with an extensive variety of planners, engineers, economists, stakeholders groups, technical working groups, etc., yielding direct involvement with MPO and transit agency processes. Interns are also given opportunities to enhance application skills such as Microsoft Office, ArcGIS, etc., through training courses and meetings. There are numerous occasions for interns to listen to speakers and professionals whom are from or have experience in other states and countries, allowing for a broad perspective on ideas and topics related to transit planning.

Public Education

Seminars have been held since 2004 to discuss regional topics with students. Topics included the 2030 Regional Transportation Plan and the status of bus rapid transit (BRT) projects in the region. At each workshop, students from planning and related fields were in attendance, held as part of evening planning classes on campus. During the fall of 2009, the topic was the 2050 Regional Transportation Plan.

In August 2009, SANDAG and MTS staff participated in the MCP student orientation session at SDSU to build awareness for the internship program.

Overall Goal

The overall goal of the program is to provide professional development opportunities for interns in the Graduate MCP program at SDSU interested in pursuing careers in transit. It also enables the MCP program to enhance transportation education and experiences to graduate students. The graduate students are provided training in transit planning and operations and are exposed to various facets of transit through field-work, reports, interviews, and work projects related to class curriculum.

PARTICIPATING AGENCIES

San Diego Association of Governments (SANDAG)

SANDAG is the regional planning agency as well as the technical and informational resource for the area's 18 incorporated cities and the county government, who collectively are the "Association of Governments." Through this Association, local governments work together to solve current problems and plan for the future. SANDAG builds consensus, creates strategic plans, obtains and allocates resources, and provides information on a broad range of topics pertinent to the San Diego region's quality of life.

SANDAG is governed by a board of directors composed of mayors, councilmembers, and a county supervisor from each of the region's 19 local governments. Current members include all the incorporated cities in the region—Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, and Vista—and the County of San Diego. Supplementing the voting members are advisory representatives from Imperial County, the California Department of Transportation (Caltrans), the Metropolitan Transit Development Board, the North San Diego County Transit Development Board, the U.S. Department of Defense, the San Diego Unified Port District, the San Diego County Water Authority, and Baja California.

San Diego State University (SDSU)

SDSU is the largest university in San Diego and the third largest in California. The campus community is home to nearly 31,500 students and approximately 5,100 faculty and staff.

The mission of SDSU is to provide well-balanced, high-quality education for undergraduate and graduate students and to contribute to knowledge and the solution of problems through excellence and distinction in teaching, research, and service. The University imparts an appreciation and broad understanding of human experience throughout the world and the ages. SDSU accomplishes this through its many and diverse departments and interdisciplinary programs in the creative and performing arts, the humanities, the natural and mathematical sciences, and the social and behavioral sciences.

The Masters in City Planning (MCP) program, in the School of Public Administration and Urban Studies, is designed to provide the students with the generalized skills and experience necessary to approach creatively and professionally the process and problems of urban and regional planning. A generalist background is provided by stressing a theoretical and historical understanding, critical thinking, and technical and methodological skills. Students are encouraged to pursue personal and special interests through course offerings from a variety of other departments in the University, through special studies courses, and the planning internship. The MCP program is highly integrated into San Diego's professional public, private, and non-profit sectors. It is felt that participation by students and faculty in ongoing planning concerns and local issues is critically important to the learning experience.

San Diego Metropolitan Transit System (MTS)

The San Diego Metropolitan Transit Development Board (MTDB) was created in 1975 by passage of California Senate Bill 101, and came into existence on January 1, 1976. In 1984, the Governor signed Senate Bill 1736, which expanded the MTD Board of Directors from eight to 15 members who are public officials from 10 service area cities and the County of San Diego. In 2005, in response to restructuring from Senate Bill 1703, MTDB was reorganized as the San Diego Metropolitan Transit System (MTS).

MTS owns the assets of San Diego Trolley, Inc. (SDTI), the light rail transit operating over more than 46 miles of track; San Diego Transit Corporation (SDTC), the region's major bus operator; and the San Diego & Arizona Eastern (SD&AE) Railway Company, a railroad covering over 108 miles of track and right-of-way.

The MTS service area is about 570 square miles, serving 1.93 million people in southwestern San Diego County. This area represents 71 percent of the region's 3 million residents. MTS consists of 15 express bus and 3 trolley routes, 74 local/urban bus routes, 6 demand-responsive services, and 2 Americans with Disabilities Act (ADA) complementary paratransit operators. MTS also regulates and licenses taxicab service in several cities. MTS contracts with the San Diego & Imperial Valley (SD&IV) Railroad to provide freight service to San Diego shippers over the SD&AE Railway right-of-way. SD&IV shares certain tracks with the San Diego Trolley, operating during nonservice trolley hours. More than 94 million local passengers are carried annually over 31.3 million revenue miles, with 35 percent of operations costs recovered through passenger fares.

ABOUT THIS REPORT

This report describes six years of the San Diego Transit Planning Internship. The introductory section describes the overall goal of the project, specific project benefits, and participating agencies. The scope of work for the program is discussed in section 2. Lessons Learned are identified in section 3 and a number of projects completed by the individual interns at either SANDAG or MTS are provided in the Appendix.

SCOPE OF WORK

SCOPE OF WORK

The San Diego Transit Planning Internship provides for two masters-level students to work part-time at SANDAG and/or MTS for a period of one year. There also are academic requirements coordinated with SDSU's Master in City Planning program faculty and the SDSU Foundation. A Memorandum of Understanding (MOU) was signed between SANDAG and the SDSU Foundation for this coordination.

Academic Requirements

SDSU faculty informs MCP students about the internship program annually (Figure 1).

Each intern signs up for either Research in Urban Planning or Directed Study. SDSU was responsible for developing the syllabus and other course materials (Figure 2).

The interns work under the supervision of an experienced faculty member. The faculty member serves as a general mentor in the area of research/study. SANDAG and MTS personnel also are involved in determining a work project and reviewing the products submitted to the faculty member. SDSU is responsible for this activity, with SANDAG and MTS personnel providing guidance and mentoring throughout the project. SDSU is also the lead for coordinating the public education portion of the program, with assistance from SANDAG.

Agency Requirements

SANDAG uses normal hiring procedures when screening, interviewing, and selecting qualified candidates. Sample interview questions used for this process are shown in Figure 3.

One senior planner from both SANDAG and MTS participate in the interviews and make a recommendation to the SANDAG Human Resources Department.

SANDAG requirements specify that interns may work for one year or up to 1,000 hours. The internship program budgeted for interns to work an average of 20-25 hours per week. A work program was developed including both long-term and short-term planning projects requiring assistance. This was reviewed by SANDAG, MTS, and SDSU staffs as well as the interns once they were hired.

Public Education

The program also includes seminars on various aspects of transit planning and operations, including the role of transit planning and operation in regional development, ADA compliance and transit planning, transportation demand management (TDM), transit-oriented development (TOD), providing transit information to consumers, transit safety, intergovernmental relations in transit planning, intelligent transportation systems, managing transit networks, evaluating transit programs, etc. The seminars are an excellent means of getting other students interested in transit planning.

Seminars are held annually to discuss regional topics with students. In the past, the focus has been on MOBILITY 2030, the long-range transportation plan for the San Diego region, and bus rapid transit (BRT) projects. In 2009, the seminar focused on the 2050 Regional Transportation Plan expected to be adopted by the summer of 2011.

Figure 1

NOTICE E-MAILED FROM MCP FACULTY TO STUDENTS
REGARDING INTERNSHIP PROGRAM

We have recently received a grant from the California Department of Transportation (CALTRANS) through the San Diego Association of Governments (SANDAG) that will provide two paid Internships to MCP students interested in pursuing education and a career in transit planning. The Internships will last one year. Two students will be selected to participate in this project. Interns will be paid approximately $13.50/hr. for 20-25 hrs/week. We anticipate one of the Internships to begin during the Spring 2004 semester. One student will work at SANDAG while the other student will work at Metropolitan Transit Services (MTS). Specific tasks are in the process of being finalized by the participating organizations. Each student will receive 6 hrs. of credit for the CP 796 Internship. Each student will also be required to enroll in the CP 730 Seminar in Transportation Planning and to include 3 hrs. of credit CP 797 on Transit Planning. Selected students will also be required to participate in a series of forums/workshops on issues surrounding transit planning. The two students selected for this program will work with Drs. Caves and Ryan. Internship credit will be coordinated through Dr. Calavita.

If you are interested in being considered for one of these two Internships, please send Drs. Caves and Ryan a letter with the following information:

1. Current Status in the MCP Program
2. Current GPA in the MCP Program
3. Reasons you are interested in an Internship in Transit Planning and why you should be selected
4. Career Goals

Figure 2

EXAMPLE COURSE SYLLABUS

Fall 2009**{**PRIVATE **}**
CP 630 Seminar in Urban Planning Implementation
Dr. Roger Caves
E-mail address -- (rcaves@mail.sdsu.edu)
Office: PSFA 121, PH# 594-6472
Office Hours: M,W 1-3p; By Appointment

OVERVIEW

Urban planning must deal with two separate, but interrelated steps: 1) plan and policy preparation, 2) plan and policy implementation. The first step of preparing a plan and its associated policies is important. The process involves a number of individuals, organizations, and other parties. It is a continuous process. The second step concerns the implementation or carrying out of a plan and its policies. This step involves a number of different individuals and organizations; each having different mandates and goals. Unfortunately, many individuals and agencies tend to ignore the critical importance of plan implementation. Whether by zoning, subdivision regulations, environmental impact reports, sanitation codes, capital improvements or tax policies, plans and their associated policies must be translated into definable actions. These are the so-called "nuts and bolts" discussions. **We must carry out or accomplish the intents of any given plan.** Ultimately, it is up to each municipality and its various departments to determine the appropriate mechanism(s) to implement/accomplish/effectuate a given plan.

A copy of the course syllabi can also be found on Blackboard – CP 630-01 Fall 2009 – Seminar in Urban Planning Implementation. Class PowerPoint presentations will also be put on Blackboard the day of the presentation. Students should check each week to see if anything has been added to the course or any new material has been added to the course.

LEARNING OBJECTIVES

- To understand the general tools of planning implementation
- To understand the concepts involved in comprehensive planning
- To understand the impacts of plan and policy implementation on various subgroups of the population
- To understand the regulatory environment of land use planning
- To understand the roles of the various participants involved in plan and policy implementation
- To understand the complexities involved processing permits
- To understand the importance of intergovernmental and intragovernmental cooperation and coordination
- To understand alternative means of mediating and resolving land use or environmental disputes
- To display knowledge in the above areas by research and writing a research paper on a planning or policy implementation topics

Assessment of Learning Objectives

Several means will be used to assess the student's ability to learn and assimilate the materials discussed in class.

1. Each student will be tested, through essay questions, to determine the student's ability to comprehend and synthesize materials discussed in class.
2. Active classroom participation will be used to determine the student's ability to phrase questions and to respond to questions covered on the materials discussed through the semester.
3. Each student will be responsible for researching and writing papers designed to show the student's ability to write in a clear and coherent fashion.
4. Each student will be asked to lead the class in discussions on various topics throughout the semester.

FORMAT AND REQUIREMENTS

This course will be conducted in a seminar format -- participation in class is imperative. Simply appearing in class is not enough. The course consists of readings, lectures, discussions, and guest speakers. Students are expected to have read the assigned materials by the scheduled date and to be prepared to discuss the materials. The instructor will provide an overview of the readings and act as moderator for class discussions. The instructor reserves the right to alter the class schedule as circumstances dictate – with advance notice.

Regular class participation is required. Specific members of the class will be asked to take the lead in class discussions. Students will, on occasion, be given additional readings to summarize for the class.

Tape recording class lectures and discussions are not permitted without expressed permission by me.

COURSE GRADING

1. Classroom participation is weighted 20% of the final grade. Participation is based on both quantity and quality. As noted above, students will be asked to take the lead in discussing various readings. Individual readings may be distributed throughout the semester.

2. One (1) test will be given during the semester covering any material contained in the text or covered in class. Information contained in videos or presented to the class by Guest Speakers may also appear on the tests. The test will be comprised of short answers, definitions, and essay questions. The test will be given on Nov. 2, 2009. Alternative dates are only given under rare circumstances (i.e., medical emergency). The test is weighted at 30% of the final grade.

3. All students are required to complete an applied planning implementation topic report. The report will require both library research and discussions with various professional planners. No group papers will be approved. Students must have consulted with me on their research projects and must submit a one-paged type description and overview of the paper (this includes your topic, why are you doing it, why is the topic important, what will you be covering, and what types of information sources will be used) no later than Oct. 26, 2009. Failure to submit this one page document will result in a grading penalty of five points off your paper grade. This report must analyze one of the topics covered in class and must examine at least one jurisdiction in the region. This report is weighted at 30% of the final grade and is due no later than Nov. 30, 2009 (there will be a 2 point per day penalty for late papers).

Students are required to present the findings of their research to the class. Provide **two** copies of your paper. One copy will be returned to you. The other copy must be submitted on-line to me at rcaves@mail.sdsu.edu. Use your time wisely and don't wait until the last moment to get the paper ready. SDSU Plagiarism policy will be enforced.

4. Each student is required to write a critical analysis of Jacobs' The Death and Life of Great American Cities. This assignment is designed to get students to think about her work and critique it to what is happening to today. The book is considered a classic that was written over 30 years ago. The report is weighted at 20% of the final grade and is due no later than Nov. 16, 2009.

Failure to meet the assigned deadlines will result in grading penalties.

Grades are based on the following + and - scale:

A	=	93.5 or higher
A-	=	90.0 - 93.4
B+	=	86.7 - 89.9
B	=	83.5 - 86.6
B-	=	80.5 - 83.4
etc.		

****There are no opportunities to do extra credit work to raise a grade for any particular assignment or to raise your overall grade.**

REQUIRED TEXTBOOKS AND READINGS

1. Cullingworth and Caves, Planning in the USA, 3rd edition, 2009 (Routledge)
2. Saunders, Urban Planning Today, 2006 (University of Minnesota)
3. Jacobs, The Death and Life of Great American Cities, 1961 (Vantage Books)
3. Readings on the Internet. These readings are denoted by the word "Internet."

Course Outline

Aug. 31	Distribute Syllabus and General Background Information What is Planning? What is Implementation? Who is involved in planning and plan implementation? Saunders, Ch 6, 7 (can read for later – supplements the video tonight) "Big Dig" Video and discussion
Sept. 7	Labor Day Holiday – NO CLASS
Sept. 14	Planning Process and Ethics C&C, Ch.1 What is ethical behavior? Internet -- http://www.planning.org/ethics/ethicscode.htm -- "AICP Code of Ethics and Professional Conduct" Saunders, 3, 5, 8

Sept. 21 General Plans/Comprehensive Plans/Master Plans – Development, Financing, and Implementation
C&C, Ch 7, 8
Internet -- A Citizen's Guide to Planning in California -- What is a General Plan? Why update the General Plan?
http://ceres.ca.gov/planning/planning_guide/plan_index.html

Sept. 28 Growth Pressures, Tools to Limit and Accommodate Growth and their Implementation
C&C, Ch 6, 9, 10
Internet – City of La Mesa Zoning Ordinance
http://www.bpcnet.com/codes/lamesa/ Click on Title 24 -- Zoning
Internet – City of La Mesa Subdivision Regulations
http://www.bpcnet.com/codes/lamesa/ Click on Title 22 – Subdivision Regulations
Internet – Form-Based Code Factsheet
http://www.lgc.org/freepub/docs/community_design/fact_sheets/form_based_codes.pdf
Internet – Smart Growth – http://www.smartgrowth.org/about/default.asp
Internet -- Ahwahnee Principles -- http://www.lgc.org/ahwahnee/principles.html
Saunders, 10

Oct. 5 To Be Announced

Oct. 12 Discretionary permits/map processing in the City of San Diego
Guest Speaker: Mike Westlake, Program Manager, City of San Diego, Development Services Department
Internet -- http://www.sandiego.gov/development-services/

Oct. 19 The Evolving Institutional Setting of Planning and the Role of the Planning Commission
C&C, Ch 4, 5
Saunders, 9
Internet – City of San Diego Planning Commission
http://www.sandiego.gov/planning-commission/
Guest Speaker: Tony Lettieri, Planning Consultant and former Chair, City of San Diego Planning Commission

Oct. 26 Environmental Planning: Planning and Implementation from a Practical Perspective
Guest Speaker: John Bridges, FAICP, Principal, EDAW/AECOM
C&C Ch 16, 17
Internet -- CEQA: Summary
http://ceres.ca.gov/topic/env_law/ceqa/summary.html
Internet -- CEQA: Statute
http://ceres.ca.gov/topic/env_law/ceqa/stat
Internet -- CEQA: Process Flow Chart
http://ceres.ca.gov/topic/env_law/ceqa/flowchart/index.html
Internet -- CEQ 40FAQs
http://ceq.eh.doe.gov/nepa/regs/40/40p3.htm

*** Research paper topic and outline due October 26, 2009***

Nov. 2 Test – no outside materials can be used for the test

Nov. 9 Planning and Development Issues
C&C, Ch. 11, 12, 13, 14
Saunders 1, 2

Nov. 16 Revisiting Jane Jacobs and The Death and Life of Great American Cities
You should have read the entire book by this date.
Saunders, Introduction

Students will be assigned various chapters/parts of this book to present in class

Jane Jacobs analysis due no later than Nov. 16

Nov. 23 Implementing the San Diego Regional Transportation Plan with an emphasis on Transit Planning
Guest Speaker – Dave Schumacher, Principal Transportation Planner, SANDAG

Nov. 30 No Class
Applied planning implementation topic report due to me no later than Nov. 30, 2009

Dec. 7 STUDENT PAPER PRESENTATIONS (10 MIN. EACH)

Dec. 14 STUDENT PAPER PRESENTATIONS (10 MIN. EACH)

RESEARCH PAPER ASSIGNMENT REQUIREMENTS

All papers must be related to a topic that we will be discussing in class this semester and must be approved by me. Students will be required to submit a one-page narrative/outline of what they want to do.

1. Length of Paper: Each paper must be a minimum of 20-25 double-spaced typed pages. Maps, footnotes/endnotes/bibliography, etc., are not considered typed pages. Students should consult with a style manual and be consistent. Two copies of your paper are to be submitted to me – one hard copy and one submitted on-line to me at rcaves@mail.sdsu.edu. One of the copies will be returned to you.

2. Grades will be based on the following:

   - Ability to focus the paper on a specific planning implementation topic;
   - Clear understanding of the issue(s) involved in the topic';
   - Ability to write in a clear and understandable fashion;
   - Evidence that you have clearly researched the topic in and out of the library. This is generally considered to be a review of past research that has been conducted on the topic. A great deal of information can also be found on the Internet;
   - Ability to use your viewpoint on the topic being discussed;
   - Ability to organize the paper in a clear and organized fashion;
   - Proper use and citations of footnotes and bibliography.

3. You must discuss your paper topic and have it approved by me and must submit a one-page description/outline of your paper by Oct. 26, 2009. Failure to do so will result in a penalty of 2 pts. per day.

4. You must discuss your paper topic and have it approved by me and must submit a one-page description/outline of your paper by Oct. 26, 2009. Failure to do so will result in a penalty of 2 pts. per day.

5. The final paper is due no later than Nov. 30, 2009. There will be a 2 pts. per day penalty for late papers. Submit two copies of the paper. One copy will be returned to you.

6. Students will present their papers on Dec. 7 and Dec. 14, 2009. Presentations will be no longer than 10 minutes each. More discussion to follow.

SAMPLES TOPICS FOR RESEARCH PAPERS

Alternative means of enforcing zoning codes
Alternative means of enforcing housing and noise codes
Planning for growth in the coastal zone
The Fairness of Impact Fees
Alternative mechanisms for regulating adult entertainment
Downtown development
Streamlining Subdivision regulations
Implementing Habitat Conservation Plans
Alternative means of controlling population growth
Citizen participation in the planning implementation process
Downzoning as a growth control technique
Regulating the Placement of Satellite Dish Antennas
Implementing Urban Design Guidelines
Inclusionary zoning in Southern California
PUD's as a zoning flexibility device
Implementing Smart Growth Policies
New Urbanism: Implementation Issues
Developing and Implementing a Transit-Oriented Development

CP 630 Paper Preparation

Papers must be configured as follows:

- **Software:** Use MS Word for PC (preferred) or Rich Text Format (RTF).
- **Type:** Use 12 point Times New Roman type or equivalent at **all times**.
- **Spacing:** Double-space ALL copy (including quoted matter, notes, references, tables, and captions). Left justify the main text and indent first lines of paragraphs.
- **Margins:** Use page margins of at least 1 inch left and right and 1 inch top and bottom.
- **Graphics:** Group tables or figures together, at the very end of the paper. Place each on a separate sheet and include a caption (number and title). Place captions above tables and below figures and keep them brief — locate explanations in the text. In the text, indicate the appropriate location for a figure or table centered on a separate line, after the first paragraph where it is mentioned. Use the form: [Figure 1 about here]

- **Notes:** Put numbered explanatory notes in endnote form. Use sparingly and keep them brief.

You can use the style manual of your choice. The idea is for you to be consistent throughout the research paper. However, **do not use the style where you put a citation at the end of each paragraph. This is very confusing and it can be interpreted that you are saying everything from the paragraph was taken from this citation.**

If you want a recommendation, for matters of style — especially text citations and references — I would recommend the *Publication Manual of the American Psychological Association*, Fifth Edition (American Psychological Association, 2001). More information is available at www.apastyle.org/pubmanual.html.

Examples of Reference Citations

Books

Ackerman, L. (2000). *Identity is destiny*. San Francisco: Berrett-Koehler.

Trout, J. & Miller, S. (2000). *Building brandwidt : Closing the sale online*. New York: HarperBusiness.

Article in Edited Book

Teitz, M. (2000). Reflections and research on the U.S. experience. L. Rodwin & B. Sanyal (Eds.), *The profession of city planning: Changes, images, and Challenges, 1950-2000* (pp.275-304). New Brunswick, NJ: Center for Urban Policy Research.

Article in Journal

Friedmann, J. (1994). The utility of non-Euclidian planning. *Journal of the American Planning Association*, 60, 377-379.

Internet Site

World Tourism Organization. (2002) *Facts and figures*. Retrieved November 8, 2002, from http://www.world-tourism.org

Government Publication

Department of Community Affairs. (1998). Affordable housing needs assessment -- state, regional and county summaries. Tallahassee, FL: author.

Article in Newspaper

Hernandez, R. (2002, April). Political battle looming over superfund plan. *New York Times* (national ed.). p. A22.

Paper Presented at a Conference

Rouse, J. (1963, September 26). *It can happen here: A paper on metropolitan Growth*. Paper presented at the Conference on the Metropolitan Future, Berkeley, CA.

Personal Interview

Caves, R. *Personal Interview*. 15 October 2002.

For other examples of reference citations, you will need to see me.

Citing materials within the text

Using the above reference citations, you would have something like the following two examples:

When simply referring the reader to materials that discuss this general area –

Ex. History is one of the keys to understanding a city (Caves, 2002; Friedmann, 1994; Teitz, 2000).

If you are quoting directly from material that someone else has said or published, you must give the individual(s) credit.

Ex. According to Teitz (2000), "the history of a city can be discussed in three major ways" (p.281).

Critical Analysis of Jane Jacobs' <u>The Death and Life of Great American Cities</u>

As you read Jane Jacobs' <u>The Death and Life of Great American Cities</u>, you undoubtedly know that her ideas and beliefs have evoked a great of discussion on the future of our cities. Many individuals feel her book is simply an attack on planners. Other individuals have broadened the discussion by suggesting it is an attack on decision-making.

Jacobs describes how a city can be made safe, how cities function, and why many efforts to improve cities have failed. She discusses the importance of density to a city, the importance of sidewalks, and the importance of diversity. She sees a city has more than just bricks and mortar. To her, they are a living entity. As such, cities are not static; they change for better or worse. Informed choices have to be made.

The purpose of this critical analysis is for you to discuss the book and the ideas contained it. You will need to examine the book in its entirety and then to examine its various sub-themes/parts. Jacobs' ideas continue to get students and the general public to think about what we have and what we want cities to look like. Whether or not you agree with Jacobs and ideas is not the issue or point. The issue or point is to have you start questioning things occurring in our cities and to start formulating your own views of planning and development.

Your analysis must correspond to the questions below. It should be written just like any other paper.

Questions to answer:

What are the main points made by Jacobs in the book? What does she see as problems of the cities? Do you agree or disagree with her? As a planning student, how would you respond to her ideas today? Justify your responses.

According to Jacobs, what conditions are needed to generate diversity? Discuss them.

Why are streets important to Jacobs? What qualities does she look for in a street?

What does she think about public housing? Do you agree or disagree?

Do you know of any cities or read of any cities that have incorporated some of her ideas? Provide some examples.

If this book was written today, how do you think planners would view it? Justify your answer.

Grading:

The paper will be graded using the following criteria:

- Clear understanding of the issue(s) discussed by Jacobs;
- Ability to write in a clear and understandable fashion;
- Ability to use your viewpoint; your views/opinions are important;
- Ability to organize the paper in a clear and organized fashion;
- If you quote anything from Jacobs, make sure you cite the specific page(s).

Length of Paper:

Your paper should be a maximum 6-8 pp. in length. It **must** be double-spaced with 12 pt. font. If you give me a single-spaced paper, I will return it to you.

Date Paper is Due:

The paper should be submitted to me on Nov. 16, 2009. Late papers will be penalized 2 pts./day. If you will be absent the date the paper is due, you should submit it to me before the required date, not after.

Figure 3

SAMPLE INTERN INTERVIEW QUESTIONS

SANDAG

INTERVIEW QUESTIONS

September 2009

TRANSIT PLANNING INTERN

_____ _____

Interviewer **Applicant Name**

Introductions and description of interview process

1. **Tell us what you did to prepare for your interview today?**

2. **Where did your interest in regional transportation or transit planning come from? How have you prepared yourself academically for a career in this field?**

3. **Tell us about a current issue or trend in the transportation or transit planning field that you are particularly interested in. What work would you like to do in this area?**

4. **Give us an example of a time where you had to research, analyze, and present the results of a complex assignment or project. Explain how you used computer software to analyze the research problem.**

5. **Based on your experience, what are some of the ways you ensure good coordination and cooperation among team members?**

6. **Give us an example of when you were able to learn something complex in a relatively short period of time.**

7. **What objectives have you set for yourself this year and what steps have you taken to ensure that you are on track to meet those objectives?**

8. **What are two or three things you specifically hope to achieve through an internship?**

9. **Is there anything else you would like to tell us about your qualifications for this position? Or do you have any questions you would like to ask us?**

EVALUATION

PROGRAM ACCOMPLISHMENTS

There are several successes worth discussion regarding the internship program:

Intern Performance. The caliber of the interns participating in the program has been excellent. Both SANDAG and MTS are fortunate to have hired students with a good knowledge of basic concepts in transportation and land use planning with excellent work attitudes.

Collaboration between Organizations. Working with SDSU faculty on this program has also been excellent, as has the continuing working relationship between SANDAG and MTS planning staffs. Caltrans staff monitoring the grant has also been key in launching the program and monitoring the specific aspects of the grant.

Opportunities for Work Experience. The interns hired through this program have been given the opportunity to work on a variety of projects in transit operations, short-range planning, and long-range transportation plans. Specific duties include field work to collect transit passenger count data, monitor on-time performance, or evaluate future transit park 'n ride sites, literature reviews and research, developing spreadsheets and analyzing data, invoice tracking, attending public meetings, assistance with agenda development, and basic analysis and report writing.

Intern Opinions. Each intern was asked to provide their opinion regarding the internship project. Each classified it as a success and specifically noted the interview/hiring process, the projects they work on, the variety of projects, and experience they have gained in the transportation and land use planning disciplines.

Interns feel that the project has provided a solid foundation in preparing students for a professional career in planning. Through the internship project, students have been well prepared for future interviews and acquired an understanding of the undertakings and expectations within a professional work environment. The internship project has been extremely beneficial in its multi-agency exposure and access to resources for interns to tap into allowing them to expand their planning knowledge and opportunities for success.

Public Education. SANDAG and SDSU have organized annual seminars for planning students.

LESSONS LEARNED

Grant Timing. SANDAG was informed in the fall of 2003 that the first grant application had been approved. However, this schedule missed the start of the fall semester at SDSU and, the internship

program did not officially kick off until Spring 2004. However, because these procedures were in place from 2004, this process has run much smoother in subsequent years.

Contracts Process. SANDAG and the SDSU Foundation developed and signed a Memorandum of Understanding (MOU) for the program. This process is now in place and can be amended for future internship programs.

APPENDICES

APPENDIX A

ANALYSIS OF TRANSIT RIDERSHIP TRENDS
FOR
SAN DIEGO TRANSIT CORPORATION
AND
MCS 900 SERIES & 800 SERIES ROUTES

JUNE 2004

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INTRODUCTION

This report presents analyses of ridership on San Diego Transit Corporation (SDTC) and Metropolitan Transit System Contract Services (MCS) 900 Series and 800 Series fixed bus routes in the San Diego region. SDTC registered a decrease in ridership of 12.3%. This analysis was completed to identify additional causes of the decline in SDTC bus ridership. Among the already known contributing factors was the fare increase that went into effect July 1st, 2003. This one variable explains only 1.75% of the ridership decline. Another factor was the transfer of one route segment to the MCS 900 Series routes that caused a decrease in SDTC ridership and an increase in the MCS 900 Series riders. In addition to these factors, there is a need to identify additional causes to fully explain the decline in SDTC ridership.

This analysis focuses on comparing ridership levels among the service providers and on comparing the economic and demographic variables of each provider's geographic vicinity. The demographic and economic data was collected for the San Diego region by subregional area. Each transit provider's data was also analyzed on the subregional level. Subregional areas were used as the geographical boundary in order to capture ridership trends as it follows routes within the subregional areas.

KEY FINDINGS

The analysis did not identify any new causes that help to understand the decrease in SDTC ridership. However, to reiterate what the data suggested, the following are the key findings of this analysis:

- SDTC ridership has decreased by at least 10% since 2001.[1]
- The 900 Series ridership increased slightly in 2002, but increased substantially (in comparison to previous years) in 2003.[1]
- The 800 Series routes have shown stable ridership patterns.
- The 900 Series routes serve geographic areas with a higher minority population.

[1] This is partially due to the transfer of routes and route segments from SDTC to MCS 900 Series services.

SUMMARY OF METHODOLOGY

SANDAG reports and databases were the primary sources of statistical information. The transit data was analyzed by looking at three different service areas of the three providers: San Diego Transit and MCS 900 Series and 800 Series. The 900 and 800 series routes were compared with the SDTC routes considering they both serve areas that SDTC serves. The use of geographical information system techniques were used to analyze the data and statistical methods.

The following sources were used in the preparation of this report:

1. SANDAG (San Diego Association of Governments) Transit Passenger Counting Program
2. SANDAG Data Warehouse
3. SANDAG Staff
5. U.S. Census Data

DEMOGRAPHIC AND RIDERSHIP COMPARISONS

The demographic profiles of the selected subregional areas were considered as possible indicators of transit ridership. This section presents some of those comparisons of transit ridership trends to regional demographic data and ethnicity.

This report draws comparisons between current and previous (2000-2003) year's data. The demographics of the region during this time period are shown in Table 1:

Table 1
Demographic and Transit Ridership (Bus) Data

	Ridership			Population			Income		
YEAR	**SDTC**	**900 Series**	**800 Series**	**SDTC**	**900 Series**	**800 Series**	**SDTC**	**900 Series**	**800 Series**
2000	116,475	33,454	14,252	1,294,696	1,327,505	1,184,310	$47,592	$46,649	$50,611
2001	121,395	36,461	15,141	1,309,114	1,342,092	1,197,221	$45,658	$44,703	$48,347
2002	118,874	35,913	16,062	1,320,948	1,358,202	1,206,010	$48,281	$47,495	$51,566
2003	106,149	40,137	16,750	1,340,238	1,381,136	1,218,487	$49,428	$48,797	$53,062

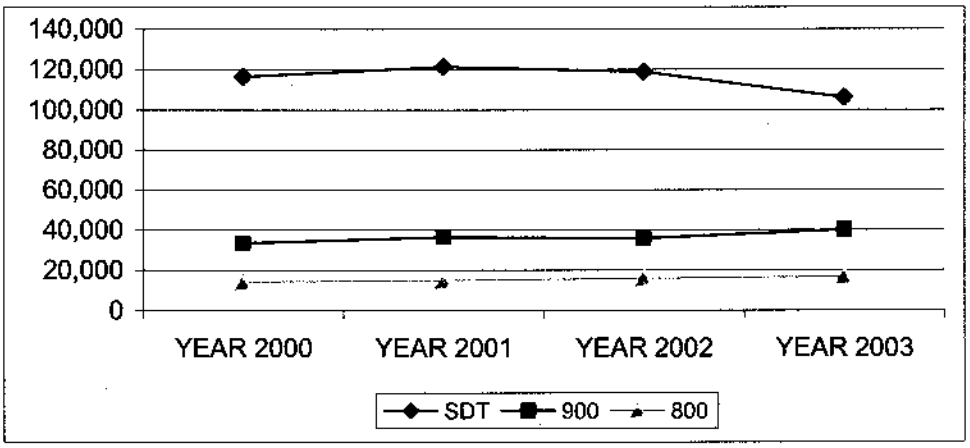
As Figure 1 shows, ridership increased for the MCS 900 and 800 Series routes, but not for San Diego Transit, while population grew steadily. However, median household income changed from year to year. Household income would normally be held as a strong predictor of transit ridership; therefore its stability would suggest that, exclusive of system adjustments related to transit availability, transit ridership should correlate with population changes.[2]

Several other variables are known as strong indicators of transit ridership; however, those variables, such as car availability and employment, were not available on a year-by-year basis for this analysis. According to the 2004 Onboard Transit Passenger Survey of the San Diego Region, car availability has not changed over the years, remaining at about one-quarter of the population (the survey was completed in 2003). Please refer to Appendix A for *2000* car availability table.

[2] This also assumes there are no dramatic system wide changes such as large fare increases.

Figure 1, below, shows the total ridership comparison of the three operators over the four-year period.

Figure 1
Transit Ridership by Service Provider



In 2001 all three service providers realized increases in total ridership. Ridership has not increased at the same rate since 2001 due to various factors such as the tragic events on September 11, 2001 and fare increases. This has resulted in a decline in transit ridership that is most prevalent at SDTC. Both MCS 900 Series and 800 Series routes have regained the ridership levels after 2001.[3]

[3] The 800 series actually never lost ridership levels in 2002, as seen in the previous figures.

ETHNICITY COMPARISONS

The following figures show the population ethnicities in the study areas over the four-year span. Hispanics, Asians, and African-Americans are most prevalent in the geographic vicinities that the 900 series routes serve. Hispanics are also prevalent in the regions that the 800 series routes serve.

Figure 2
Hispanic Population

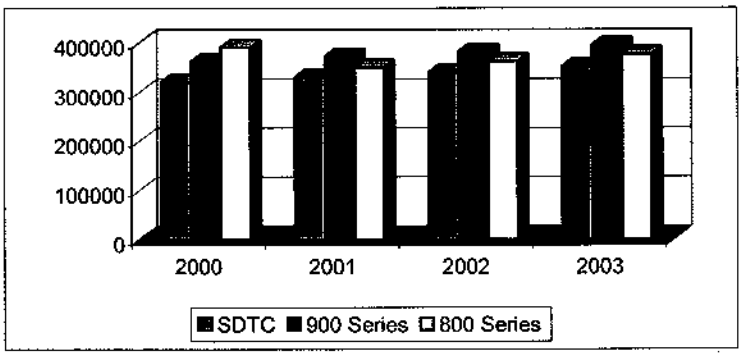


Figure 3
African American Population

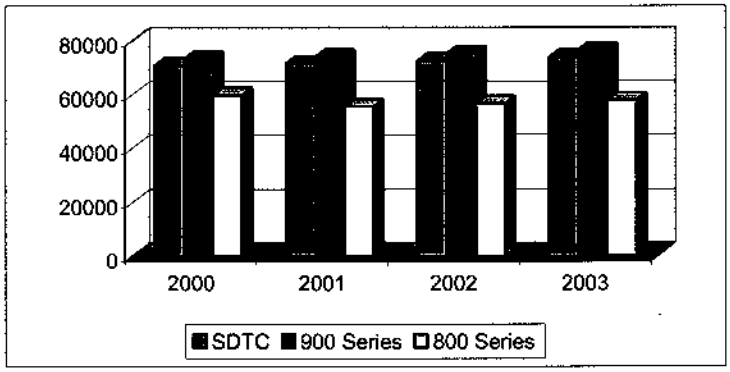
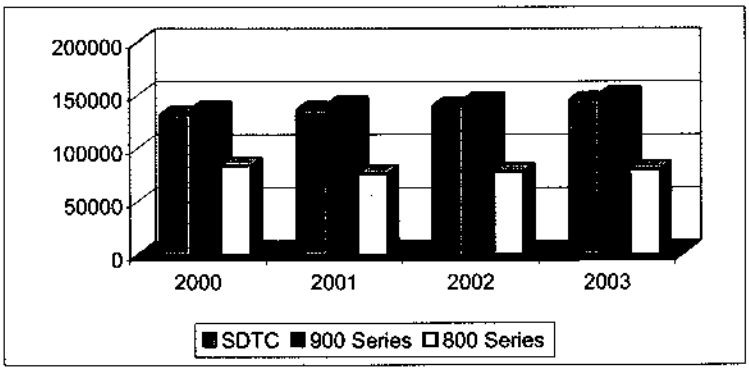


Figure 4
Asian Population

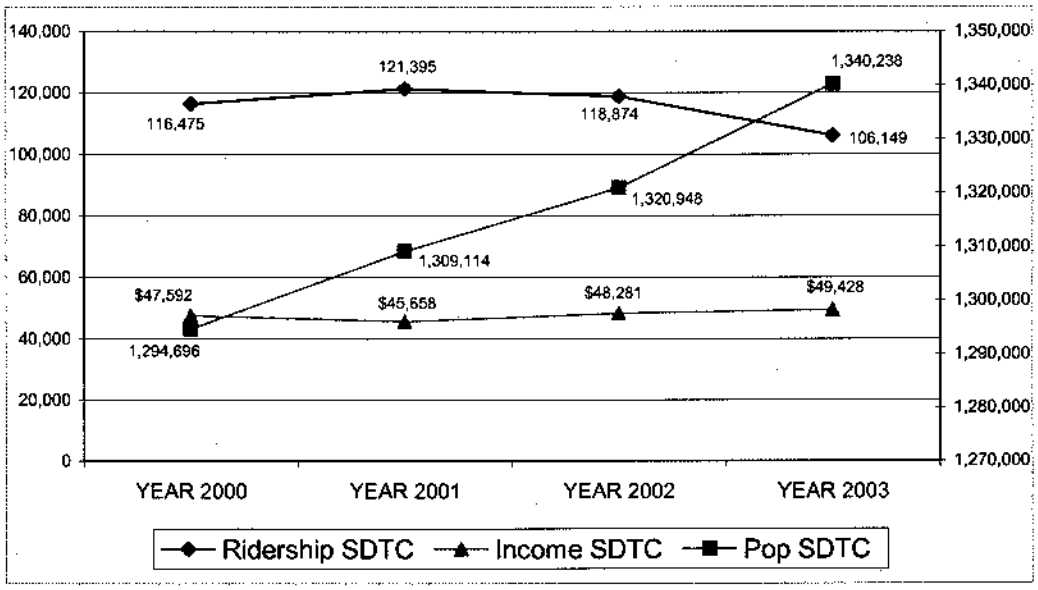


SERVICE PROVIDER COMPARISONS

The following figures illustrate each service provider's ridership totals, population totals, and average median household income for the years 2000 - 2003.

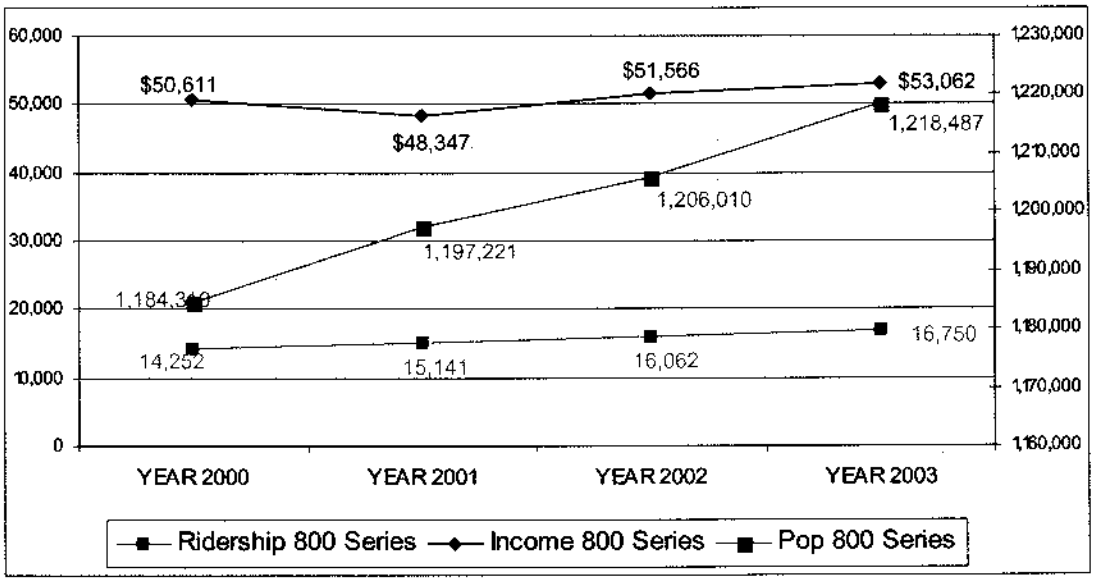
This chart displays for SDTC the three variables and their correlation. As shown, the general population that SDTC serves has increased over the years while ridership levels have not fallen suit.

Figure 5
San Diego Transit



The MCS 800 Series route did not show any information that could possibly explain the decline in SDTC ridership levels. Figure 6 shows the variables for the MCS 800 Series routes. The MCS 800 Series ridership levels have increased slightly every year. Population has grown with each year, while median household income has remained relatively constant.

Figure 6
800 Series



The MCS 900 Series routes have shown an increase in ridership, especially in 2003. This increase is due in part to the transfer of route segments and routes from SDTC. This results in a natural increase in the apparent number of riders. The population has maintained a steady increase in the regions that MCS 900 Series routes serve, as well as the median household income has sustained a small but steady increase over the years.

Figure 7
900 Series

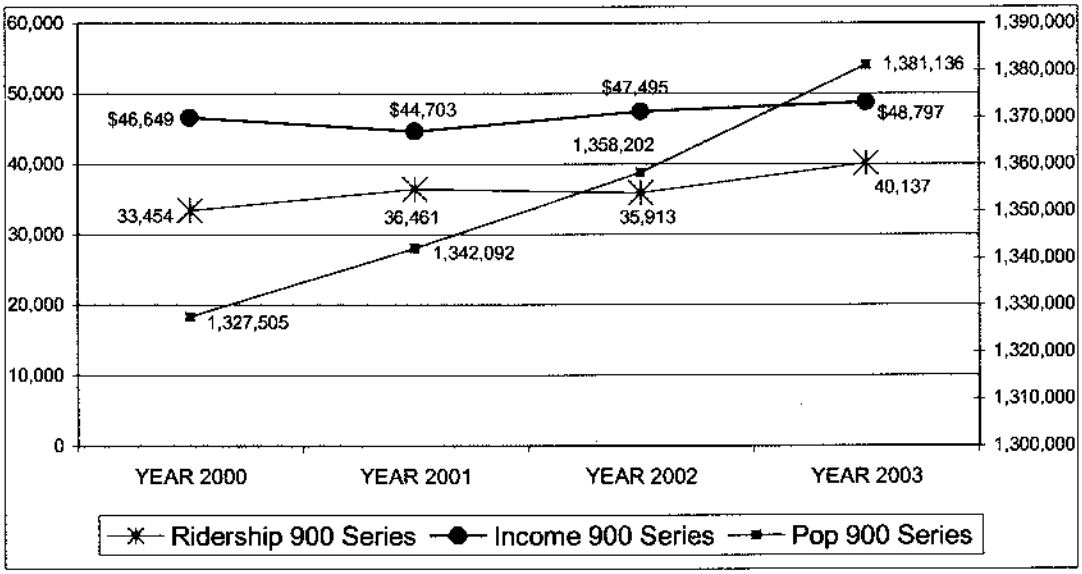
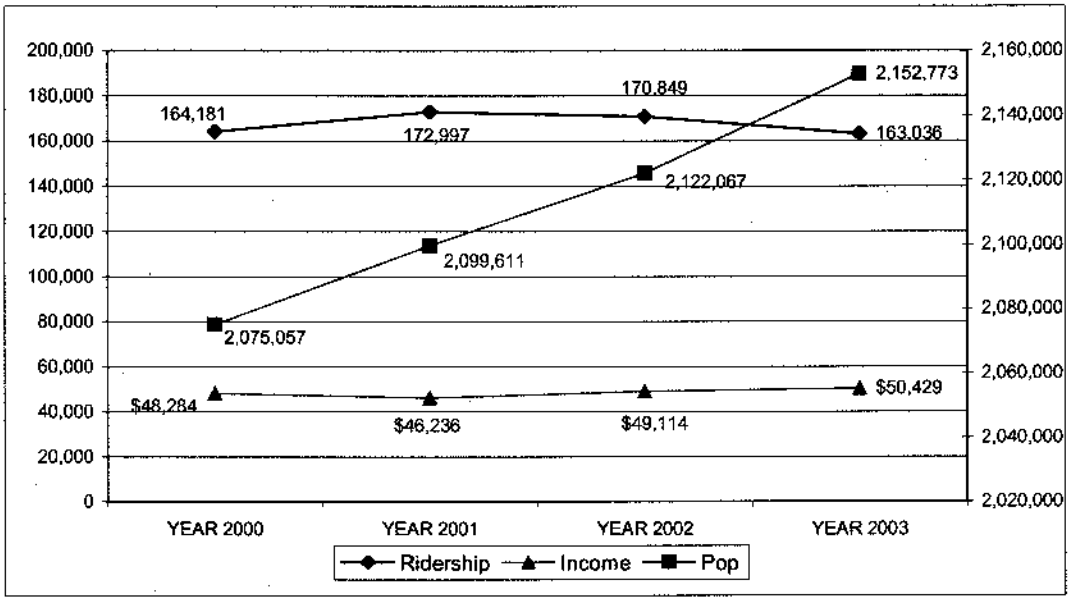


Figure 8 is the combined totals of the three service providers into one chart. This chart illustrates the overall performance of the three bus providers over the past several years. It is evident that overall bus ridership is not increasing. Individually, the only provider that has a ridership decline is SDTC.

Figure 8
Service Provider (Combined) Totals



The following two charts (Figure 9 & 10) compare the MCS 900 Series & 800 Series routes data to SDTC data. Both charts demonstrate the difficulty in making comparisons between the service providers, and suggest that there is no correlation among the variables.

Figure 9
SDTC/ 800 Series Comparison

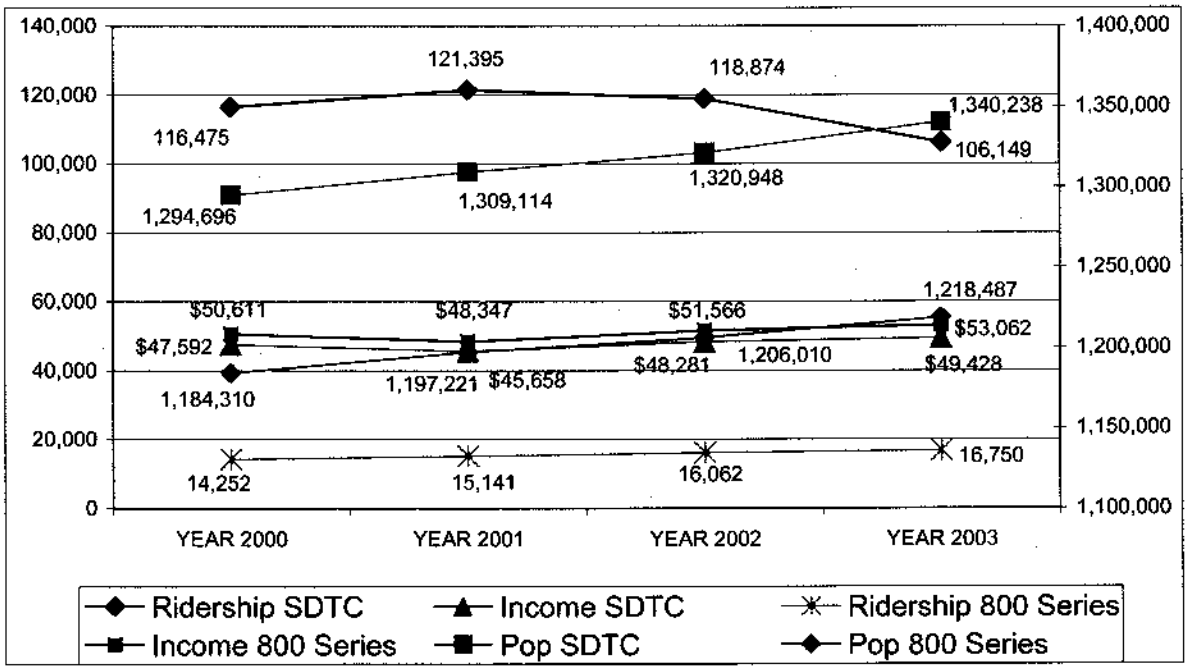
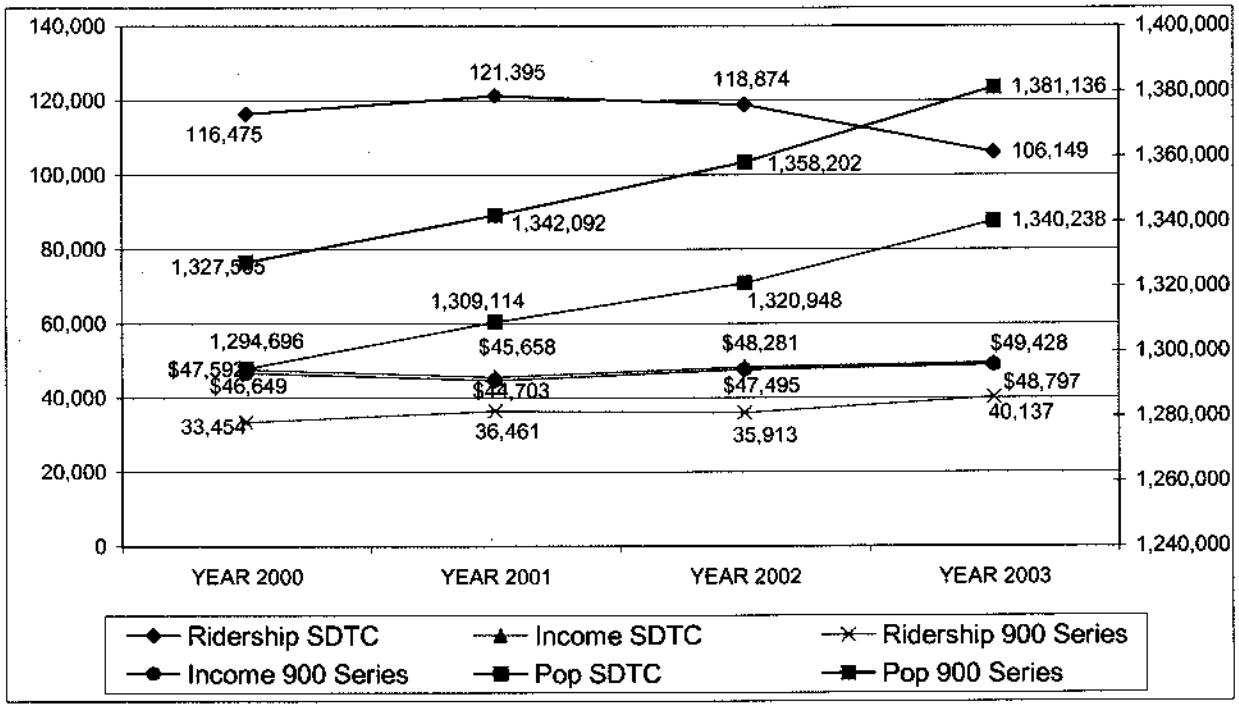


Figure 10
SDT/ 900 Series Comparison



As the figures demonstrate, there is very little correlation between bus ridership and median household income and population. The data results indicate that there is no reason to run regression or other analysis on the existing variables.
Such as being

CONCLUSIONS

The results of this study did not identify any additional causes for the decline in transit ridership at SDTC beyond those identified in earlier analyses.[4] Therefore, it is important to analyze other variables that were not available for this study. Continued research and analysis of other variables, such as car ownership and employment, could possibly close the gap in explaining the decline in bus ridership.

Despite the data shortcomings, this research offers a pretest strategy that takes the next step in the ability to quantify and understand variables that influence transit ridership. Even though these findings dissipated much of the enthusiasm that the decline in SDTC bus ridership could be quantified through research and analysis, hope should not be lost in continuing to use new or modified research efforts to further analyze transit ridership on a quantifiable level.

The use of geographical information systems was used in producing graphical displays of the service area boundaries. It is suggested that in further research and analysis that geographic information systems be relied upon to complete some stages of analysis and final product.

[4] Earlier analyses attributes portions of SDTC's ridership loss to the fare increase that went into effect July 1, 2003 and the loss of route segments.

The following charts present car ownership in the areas served for the year 2000 (this being the only year the data was available) by the individual service providers. Households within the San Diego Transit Corporation service boundaries tend to have more vehicle availability than households in the MCS Route 900 & 800 Series service areas. However, the population is greater in the SDTC and MCS 900 Series routes boundaries. Therefore, it may not be useful to compare SDTC to the MCS 800 Series route in terms of car availability by household.

Figure 13
Households with No Vehicle
By Service Provider (2000)

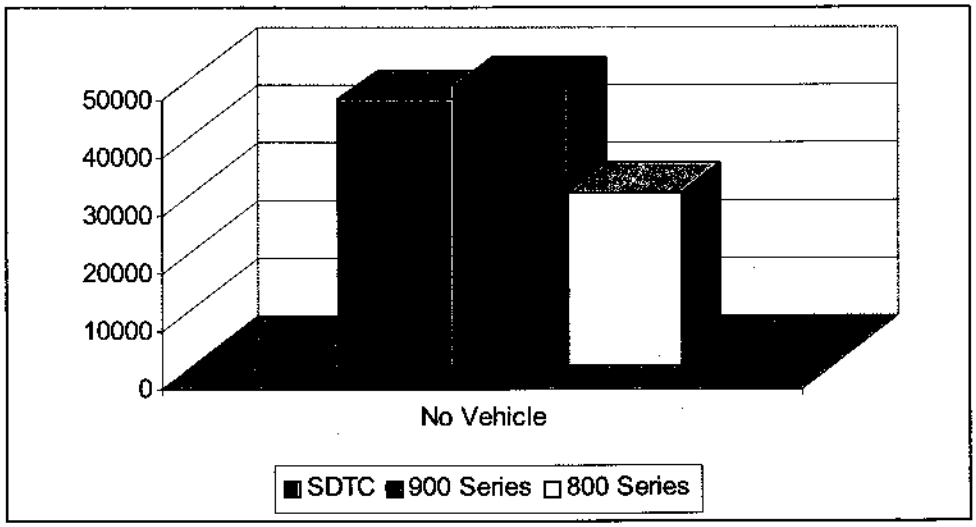


Figure 14
Households that Drive Alone
By Service Provider (2000)

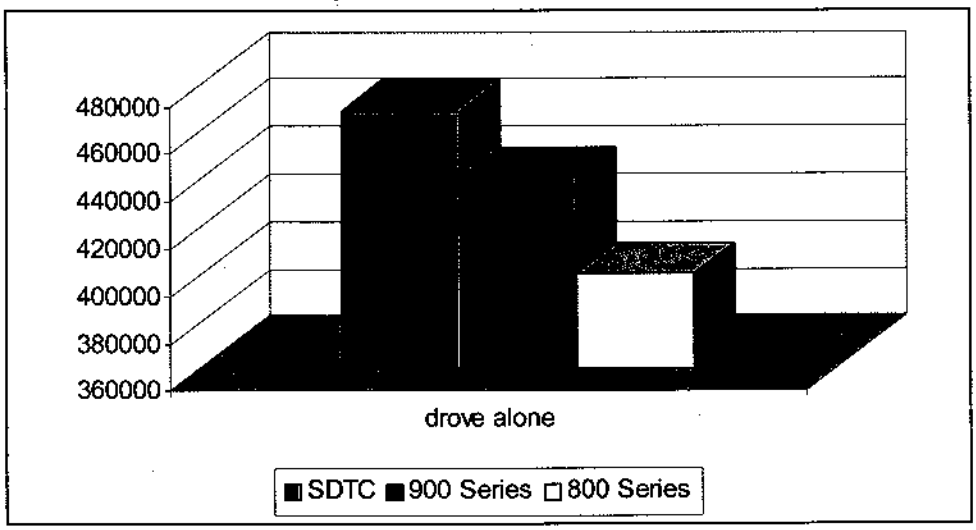
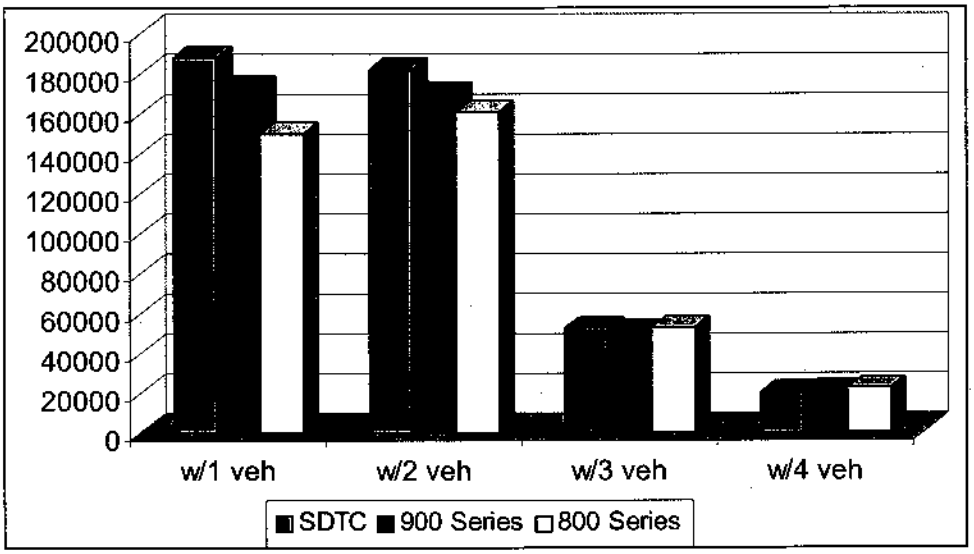


Figure 15
Number of Cars Available per Household
By Service Provider (2000)



APPENDIX B

Appendix B

An Analysis of Transit Shuttle Services

Nationwide Case Studies and Their Application to San Diego

May 2005

SDSU MCP Program – Final Paper Submittal

Introduction/ Context

> "Shuttle services are local shuttles that circulate through neighboring communities and employment centers to connect people with their homes and work sites and the Regional and Corridor networks. These services supply important feeder services to new Regional and Corridor services, serve many non-work and local trips, and are critical to the basic mobility service in many San Diego neighborhoods (SANDAG MOBILITY 2030)".

According to the San Diego Association of Governments (SANDAG), shuttles are a key element of the greater transit network. In order to recognize this importance it is essential to understand the history of transportation and shuttles in the U.S and how shuttle service can be applied to the cities of today. According to the definition above, SANDAG states that shuttles serve local communities and connect people to other forms of transportation. It is important to remember this definition so that it may be applied to modes which are not commonly referred to as 'shuttles.'

History

After 1850, the industrial revolution was well under way in the United States. Cities had become the center of commerce, manufacturing and trade. Along with the great financial boom of cities came the need for people to migrate into them from the countryside to be closer to work. As the population of industrial cities swelled, the quality of life began to diminish. Often times several

families crammed into one small apartment unit. The little bit of Infrastructure that was available was not capable of handling such large quantities of inhabitants. Sewage and drainage issues were common. Due to highly dense living conditions, disease was easily spread and death rates increased. Poverty was not uncommon, which lead to high crime rates and child labor. Children often worked as many hours as their fathers. Since living conditions in the industrial city had become unbearable, the country became more appealing. First, 'respectable inhabitants' moved to the outer limits of the city. Those that worked at factories and mills continued to live in the city center (Girouard 265-268).

The nouveaux riche population embraced the idea of showing wealth through the grand ornamentation that a country dwelling could provide. To demonstrate this idea they built manor houses in architectural styles ranging from neo-gothic to neo-renaissance. These expansive newly built homes represented a population that could afford to take refuge in the country but still remain close to activity in the city (Jackson 88-89).

The development of the industrial city was not the only reason for the birth of suburbs, advances in transportation technology allowed people to travel from outer areas to the city center. The electric street car was one of these inventions. By 1890 this innovation was present in several American cities. The electric cars allowed passengers to be carried up to 15 miles per hour by a car that ran off electrical wires. Based on the introduction of new modes of

transportation such as the street car, the suburbs expanded at an even greater rate. The street car not only allowed upper class citizens to commute to the city but gave the working the class the opportunity to do so as well. This was made possible through the low cost of land on the outer fringes of the city and the low fares of the street cars (Jackson 119).

The street car was built out to existing villages and development followed along the trolley lines, creating new villages (Jackson 119). As a result, the pattern of the city grew into a star shape with radial trolley corridors emanating from the city center into urban fringes. Eventually, the electric street car developed into elevated systems referred to as the “El” and underground subways. After the introduction of such innovations as the trolley and subway, the city has been said to have produced the most optimal workability for its residents. Traveling in and out of the city was efficient (Hanson and Guiliano 67-70).

In newer cities that did not posses electric trolley lines, the growth of rail lines greatly attributed to the phenomenon of the suburb. A Commuter population grew out of the use of the train to be transported from the suburban home to the workplace in the city center (Jackson 92-93).

Based on the definition of the word shuttle, it appears that the early trolley lines could be viewed as a shuttle service. Although not in line with a modern idea of a shuttle, the service provided transport from home to places of employment while circulating through communities.

Although suburbanization increased because of the desire to live in the country and advancements in transportation technology, land values also played a major role in the outward growth of the city. During the late seventeenth century, the amount of land accessible to each citizen was astounding. The terrain of much of the United States was habitable, making it appealing. Also, land was very affordable for the common worker because often times the cost of buying property was subsidized. The introduction of building and loan companies was prominent. These businesses provided long term loans at with modest interest amounts (Jackson 129-130). Undeveloped land on the outskirts of the metropolitan area became prime real estate. This was in part fueled by the continual thought that the urban core was a place where poverty and crime flourished (Jackson 174-175).

By the 1930s the mass transit that previously supported suburban growth could no longer maintain the needed effect. Suburbs no longer barely surrounded the city center, but they reached out further and further. The electric street cars that previously were seen as a sufficient means to get to needed destinations were now too slow and crowded. Suburban residents desired private transportation that allowed them to travel at their own leisure. This was to be obtained through the ownership of an automobile.

At first, farmers who lived in very rural areas needed cars to get into town. As a result, the first mass movement to pave roads was also in rural areas. In urban centers, cars were originally used for recreation purposes. The suburbs

were growing at a rate faster than the city and cars were a large part of that growth. Many suburbanites already owned cars. To accommodate them, undeveloped areas were open to automobile travel. This resulted in developers' focus on building away from the rail axis and into the newly accessible passages (Hanson Giuliano 70).

In reaction to the boom in automobile ownership and registration, the government subsidized the building of paved roadways. With time, even the wide thoroughfares became congested. Consequently, many urban areas planned express streets, built without stop lights or intersections. These parkways, as they were called, were built of concrete, had open speed limits, and were separated from any cross traffic. The parkways morphed into freeways and sprang up across the country (Jackson 163-165).

The movement quickly went from recreational usage of the car to the necessity to own one. Activities had begun to move away from the city center and into the suburbs, making them satellites of the urban core. Manufacturers and retailers moved out of the city to develop along the expressways. By 1956 the Interstate Highway Act, originally proposed to increase military mobility, created today's system of state highways (Hanson and Guiliano 75-79). Freeways continued to sprawl out across the landscape, bringing with it suburban growth and urban decentralization.

The growth of housing developments in the 1960's dominated the suburbs, but retail was not far behind. Shopping centers sprang up in suburban

locations, attracting the development of hotels, offices and restaurants. The 1980's marked a time of high-rise development in suburban areas. New downtowns spread out, further decentralizing markets. By 1990 the suburb has become the "leading geographic setting for the nation's new postindustrial service economy." Suburban downtowns continue to grow and are fast becoming urban centers, where social, cultural, and economic functions all take place (Hanson Guiliano 80).

Present Day

As mentioned before, it can be said that the electric street car of the late 1800's is the closest equivalent to the modern definition of a shuttle system. However, what are more important are the similarities between the necessity of and purpose of the electric street car and the shuttles of today. During the time of the street car, people were moving to the outer areas of the city. In order to perform their daily functions, they had to travel into the city. The invention of the street car made travel easier and gave those living in the early suburbs the means to reach areas of activity.

Now, we have come full circle, the suburbs have gone from a desired place to build housing to mature urban areas of their own. Shuttles are still necessary to move people from these suburban centers to other centers within the region. However, the difference is that shuttles are not the main mode of transport, but only a part of the entire transportation system. Shuttles serve as

ways for city or suburban inhabitants to get from home to a larger transit network. From that network, they can then travel to work or to perform other tasks.

The following case studies show three cities, Los Angeles, CA; Miami, FL, and Washington D.C. Each city has a shuttle service put into place. L.A and Washington D.C.'s services fit the definition given by SANDAG. They travel through local communities and act as feeder services to larger regional or corridor networks. In Miami, the shuttles serve as a way for visitors to the area to see local attractions and take part in leisure activities.

The information for each case study was gathered through internet research and telephone interviews with transportation planners at each of the agencies in charge of the shuttle services. In Los Angeles, the Metropolitan Transportation Agency (MTA) was called to ask for specific information on Downtown Area Short Hop routes. In Miami, the Miami Transportation Management was contacted, and was very helpful in gathering information on the Electrowave shuttle service. As a result of making contact with the agency, all of the statistics surrounding the Miami service was provided. In Washington D.C., the Washington Metropolitan Area Transit Authority provided the needed information on their Metrobus services. Each agency helped to provide information that was not provided on the organization websites.

Case Study #1: Los Angeles DASH (Downtown Area Short Hop)

Intro: The City of Los Angeles operates six downtown area shuttles, referred to as DASH. The service area for these shuttle services includes landmarks or larger destinations such as connections to major transit centers like the Los Angeles Union Station and the Metro Red Line. More than seven million riders use DASH in the Greater Los Angeles area each year.

Function: DASH provides an intra-community service in the City of Los Angeles.

Frequency	Span	Fare	Who Operates?	Type of Vehicle
5-12 Min	M-F 6:30a.m. to 6:30p.m.	$0.25	LADOT	El Dorado National

Route	FRR	Operating Cost	Length	FY 03 Ridership
C	8%	$54.25/hr	53,283 mi	18,196
F	14%	$46.86/hr	145,042 mi	594,393
DD	5%	$67.82/hr	21,315 mi	62,823
Venice	1%	45.71/hr	13,368 mi	9,233

Service Area: There are six DASH shuttles that serve the Downtown Los Angeles area but the overall service area is much larger and includes: Pacific Palisades, Fairfax, Hollywood, Midtown, Crenshaw, Van Nuys, Warner Center, and Southeast L.A.

Contact: (323) 222-0010 (General) Mike Griffin (213) 580-5434

Case Study #2: Miami Florida Electrowave

Intro: The ELECTROWAVE electric shuttle bus system, initiated in January 1998, allows residents and visitors to more conveniently enjoy the South Beach Miami area. ELECTROWAVE is the first electric shuttle bus system in Florida. Electric vehicles were chosen because of the transportation technology that them the cleanest, quietest, most cost-effective mass-transit alternative for South Beach.

Function: The Electrowave is an intercommunity service that travels along commercial corridors in South Beach with 36 stops in total.

Frequency	Span	Fare	Who Operates?	Type of Vehicle
10-15 min	M-S 8am-10pm	$0.25	Miami Transportation Management	Electric Buses

FRR	Operating Cost	Length	10/03-09/04 Ridership
14%	$15.00	3 miles	729,888

Service Area: The ELECRTROWAVE runs North and South along Washington Avenue to 17th Street and into the South Point area.

Contact: Jeff Bechtel (305)535-9160

Case Study #3: Washington D.C. Metro Bus

Intro: The metro bus is a fleet of 1,460 operating vehicles with 12,135 stops in and around the Washington D.C. area. The Route 98/Adams Morgan-U Street link bus acts as a feeder service to regional express service. Route 98 has stops at area attractions that double as Metrorail stations. The stops include the African American Civil War Memorial/Cardozo Station and the Woodley Park Zoo/Adams Morgan Station.

Function: Metrobus Route 98 is a feeder to Metrorail express services as well as an intra-community service to local restaurants and attractions.

Frequency	Span	Fare	Who Operates?	Type of Vehicle
15 min	M-F 6:15pm to 3:30am	$1.25	WMATA	Orion II

FRR	Operating Cost	Length	Ridership
9%	$5.67	3.7 Miles	165 people/day

Service Area: Route 98 serves the Adams Morgan community of Washington D.C.

Contact: Jack Riqua (202) 962-1319

As shown in the case studies, several cities institute shuttle services that help the population travel from one location to another. Some shuttles act as a connector service to corridor or regional transit services while others simply help visitors see area attractions. Despite these differences, each shuttle serves the purpose outlined in the definition, which is to provide intercommunity or feeder service. Through this common goal, the electric street cars of the turn of the 20th century and the modern buses of today manage to fulfill the needs of city inhabitants of two very different time periods.

Application to San Diego

It is safe to say that shuttles have been and continue to be important to our mobility; however, not all cities have such services. San Diego is one of those cities. Although the San Diego region does not have a vast amount of small feeder services, we do already have limited examples of shuttle services such as the Sorrento Valley Coaster Connection. In order to address this issue, SANDAG is looking at areas that can possibly be served by shuttle services. As

SANDAG moves to implement the transit goals of MOBILITY 2030, an emphasis on shuttle services will be critical to the success of major corridor projects like, I-15, South Bay, Mid-Coast, and Sprinter. With the information given by the successfully implemented shuttle services outlined in the case studies, the shuttle services will be easier to plan and execute. Shuttle services could play an important role in the implementation of both corridor and regional transit services in the San Diego area.

Works Cited

Girouard, Mark. Cities and People. Yale University Press. New Haven, 1987.

Hanson, Susan and Genevieve Guiliano. The Geography of Urban Transportation. Guilford Press. New York, 2004.

Jackson, Kenneth T. The Crabgrass Frontier: the Suburbanization of the United States. Oxford University, 1987.

APPENDIX C

Appendix C

MTS Planning Internship

Project Duties and Responsibilities

June 2005

MTS Planning Internship Duties and Responsibilities:

- Participate in region wide employee commute travel demand analysis identifying key employment centers through the San Diego Region with the purpose of discovering potential employee commute markets. (to be included as part of COA Phase II evaluation of transit services) Create database to organize and monitor trends in employer/employee zip code information.

- Bus Stop Consolidation program – Conduct ridership demand analysis to identify bus stops along routes to be eliminating for improving route on-time performance.

- Create and maintain database for as well as conduct analysis of comments related to COA public participation process and bus stop consolidation program.

- Assist in maintaining and creating monthly MTS operating reports and assist in preparing regular board presentations for these reports.

- Conduct system wide evaluation and update the Regional Transit Map to include all COA Phase I board adopted changes, Mission Valley East related changes and regular service updates/changes.

- Participate in all aspects of transit agency operations to include evaluating, eliminating, proposing and implementing transit services throughout the San Diego Region.

- Comprehensive Operational Analysis

    - Identify underutilized transit services to be included in COA service related proposals.

    - Assist in analysis of downtown bus terminal relocation, drastically improving on-time performance and relieving budget related constraints.

    - Participate in various meetings and brainstorming sessions with MTS Planning Staff and Consultant to establish service related changes as well as identifying system operating characteristics.

    - Assist in establishing and conducting community outreach and committee workshops for public participation during various phases of the COA.

        - Blue Ribbon Committee – Worked with key public officials, members of business, education, community and other interest groups. Established guidance and possible approval of methodologies for developing and sustaining appropriate types and levels of bus service. A series of workshops were planned and conducted throughout Phase I

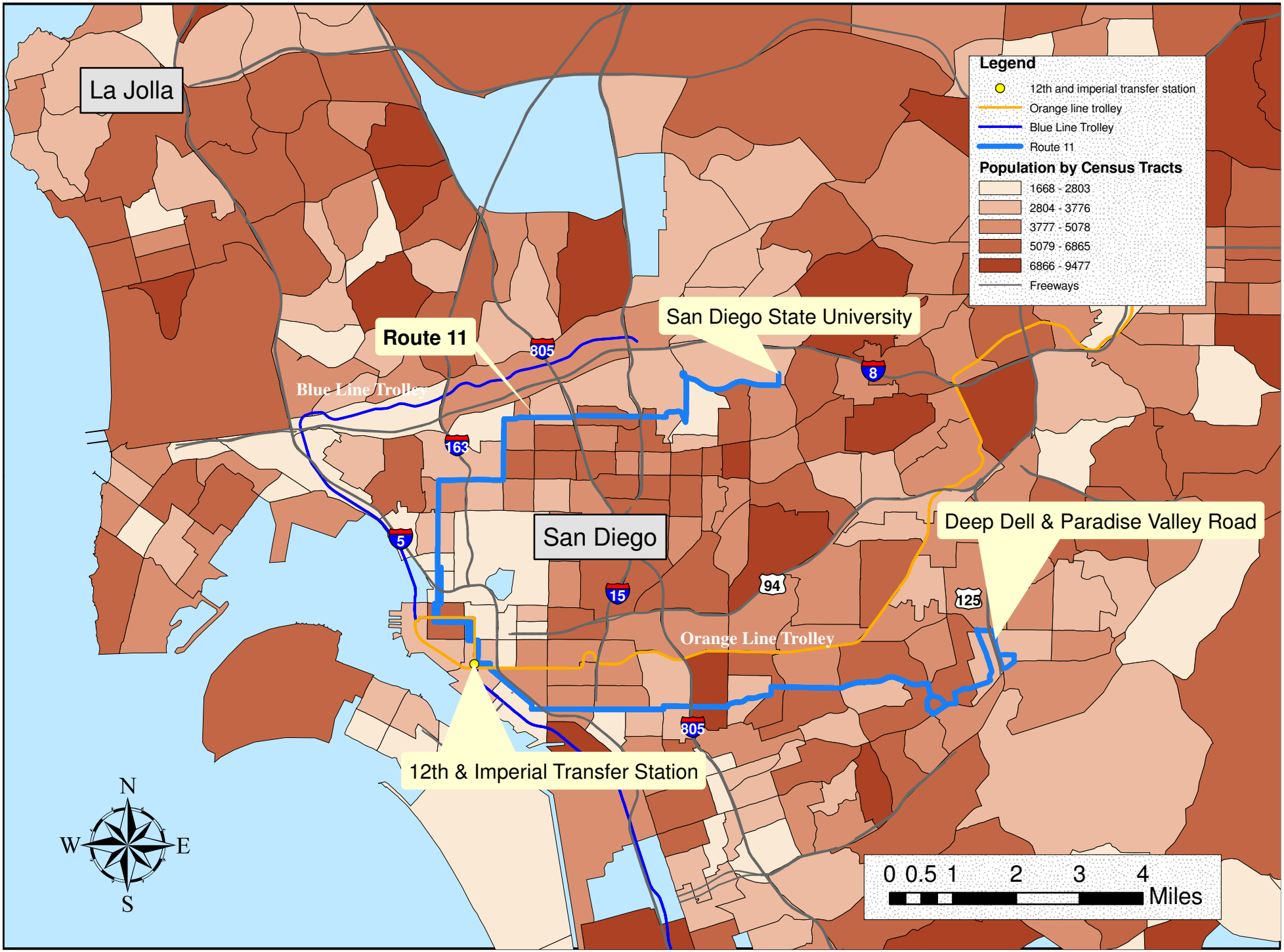
of the COA to assist and include BRC members in identifying key system characteristics for redesigning the regional MTS system.

- Citizen's Advisory Committee – Worked with a wide range of interested groups with various geographic interests. The purpose was also to conduct workshops to identify appropriate types and levels of bus service to establish during Phase II of the COA.

- Customer or Community Outreach – Planned and conducted various transit center and community center outreach sessions at various locations throughout the service area. The purpose was to present budget related service efficiencies, receive service related input in addition to general comments related to current MTS services.

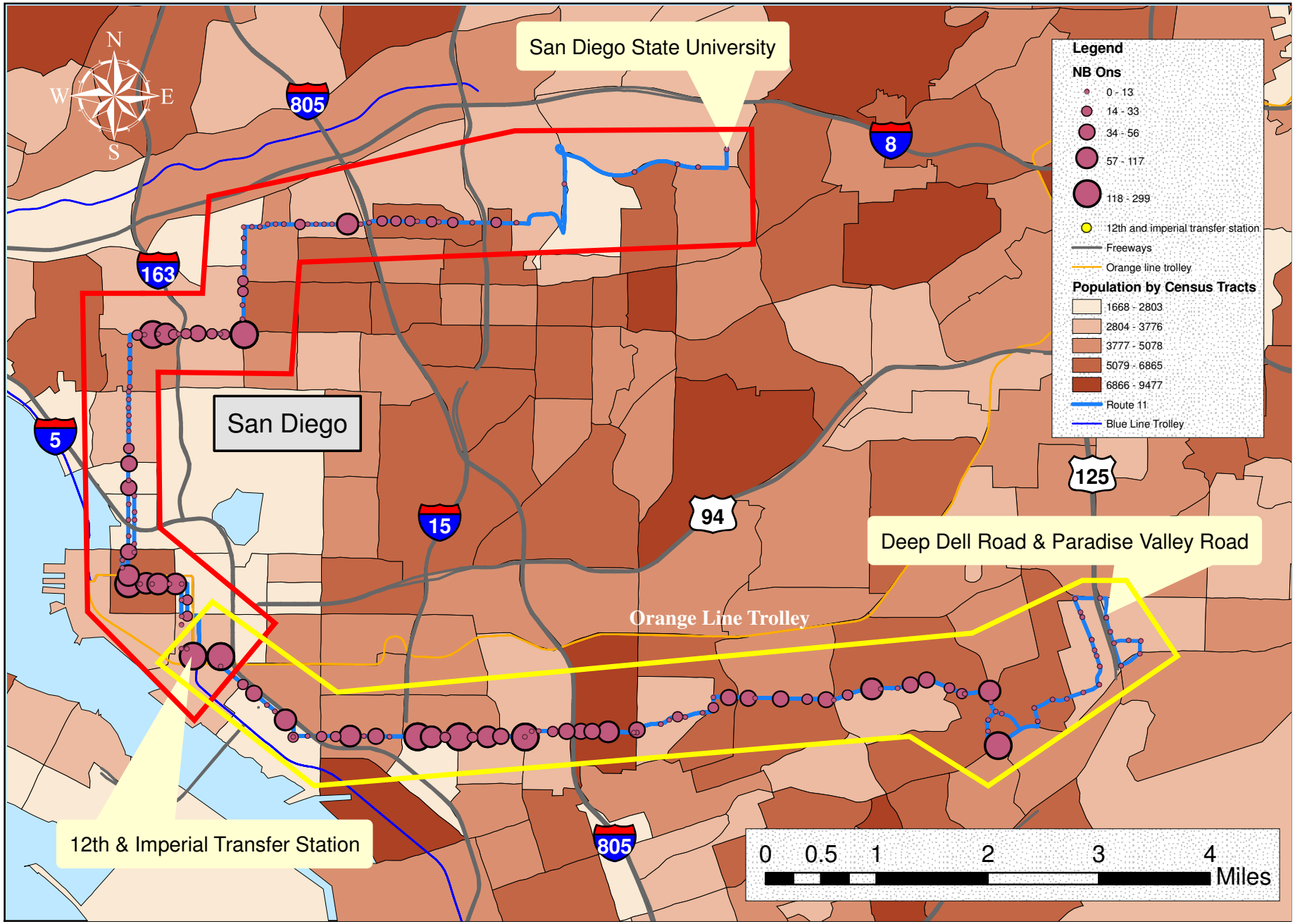
- Transit Operator Outreach – planned and conducted special outreach sessions with bus and trolley operators to present budget related efficiencies and receive input on the current MTS system in addition to potential system improvements.

(Map examples are attached.)



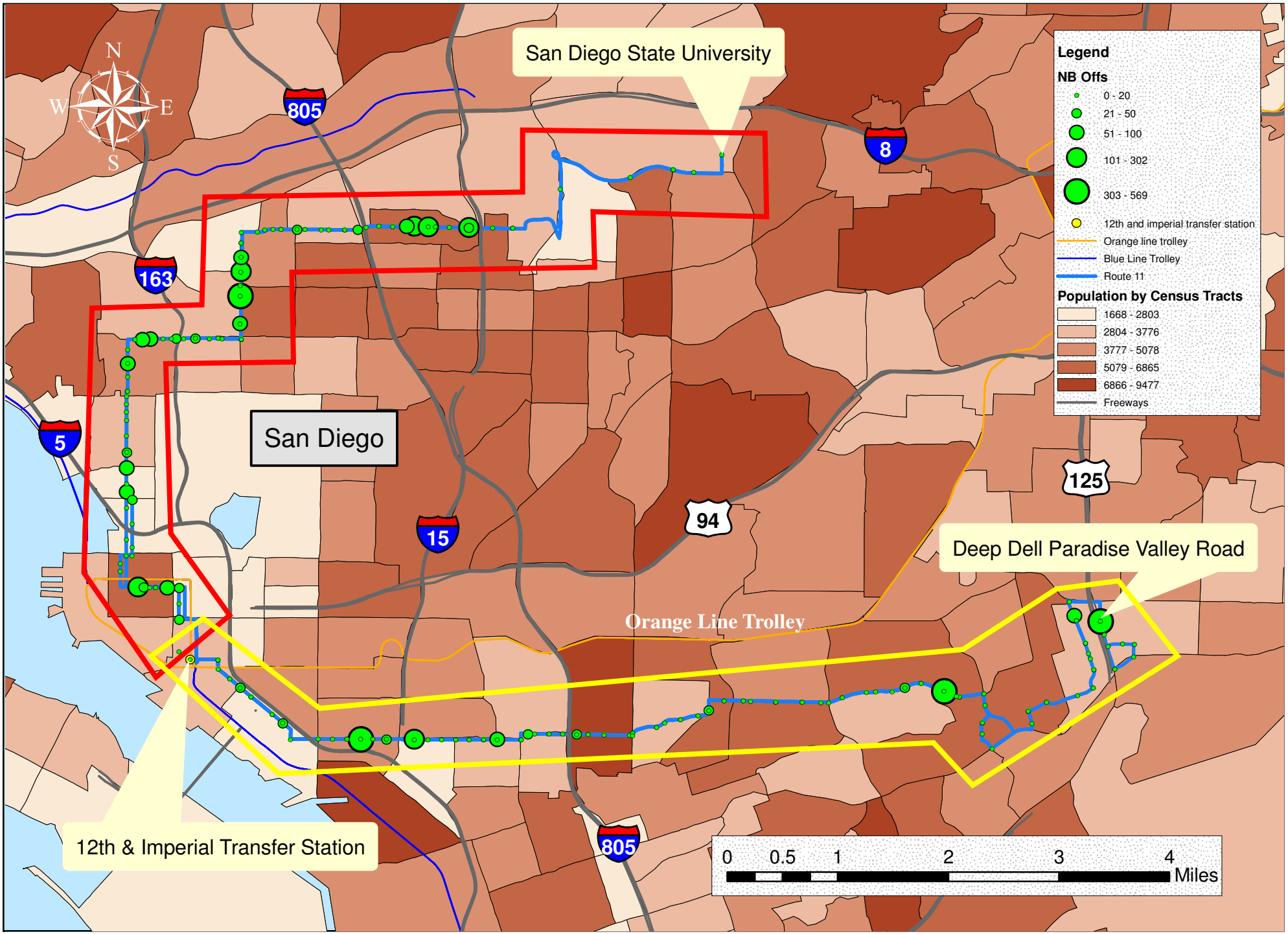
Greg Smith

MTS Route 11 Bus Service



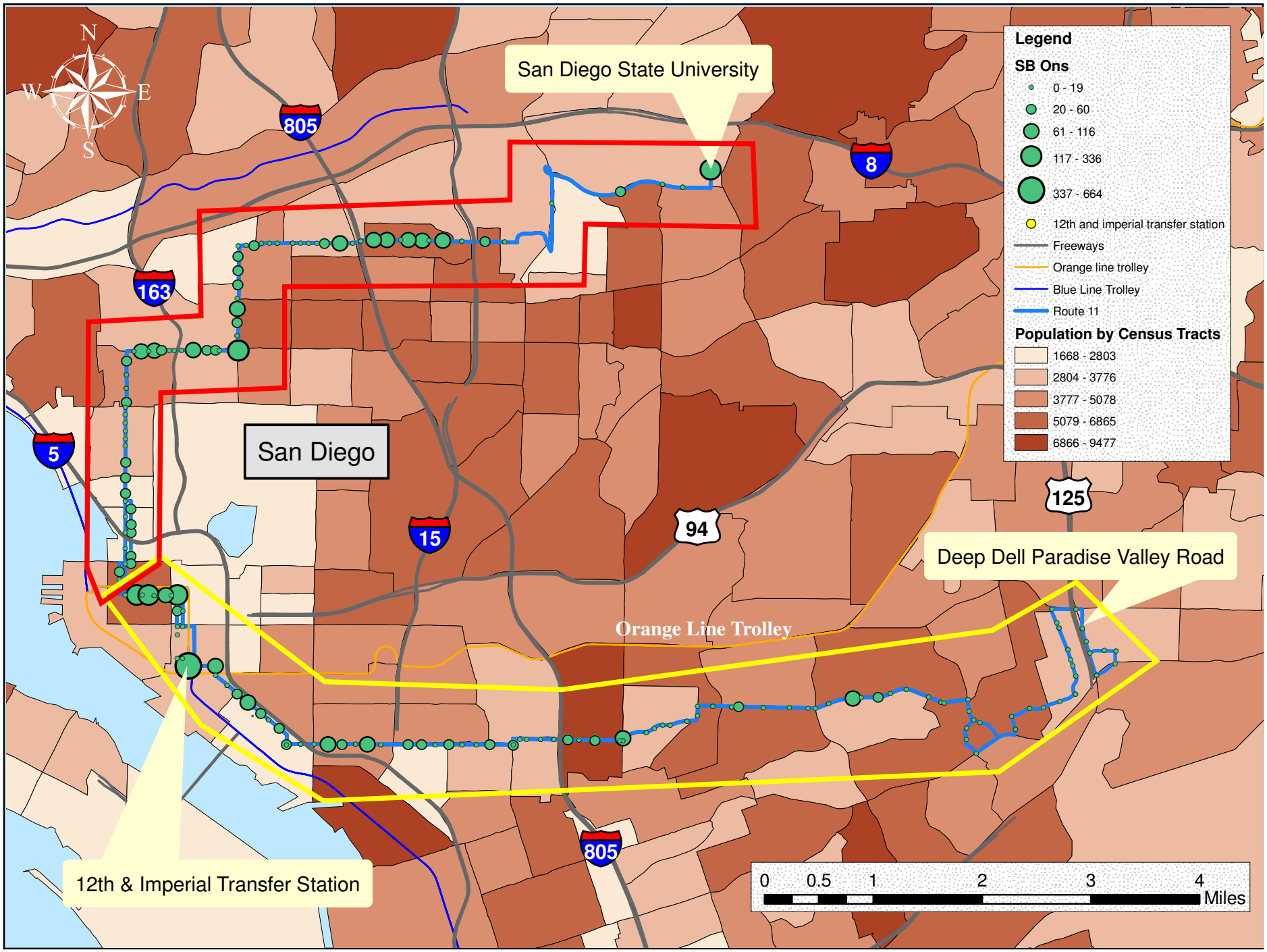
Greg Smith

MTS Route 11 Northbound Ons and Population Density



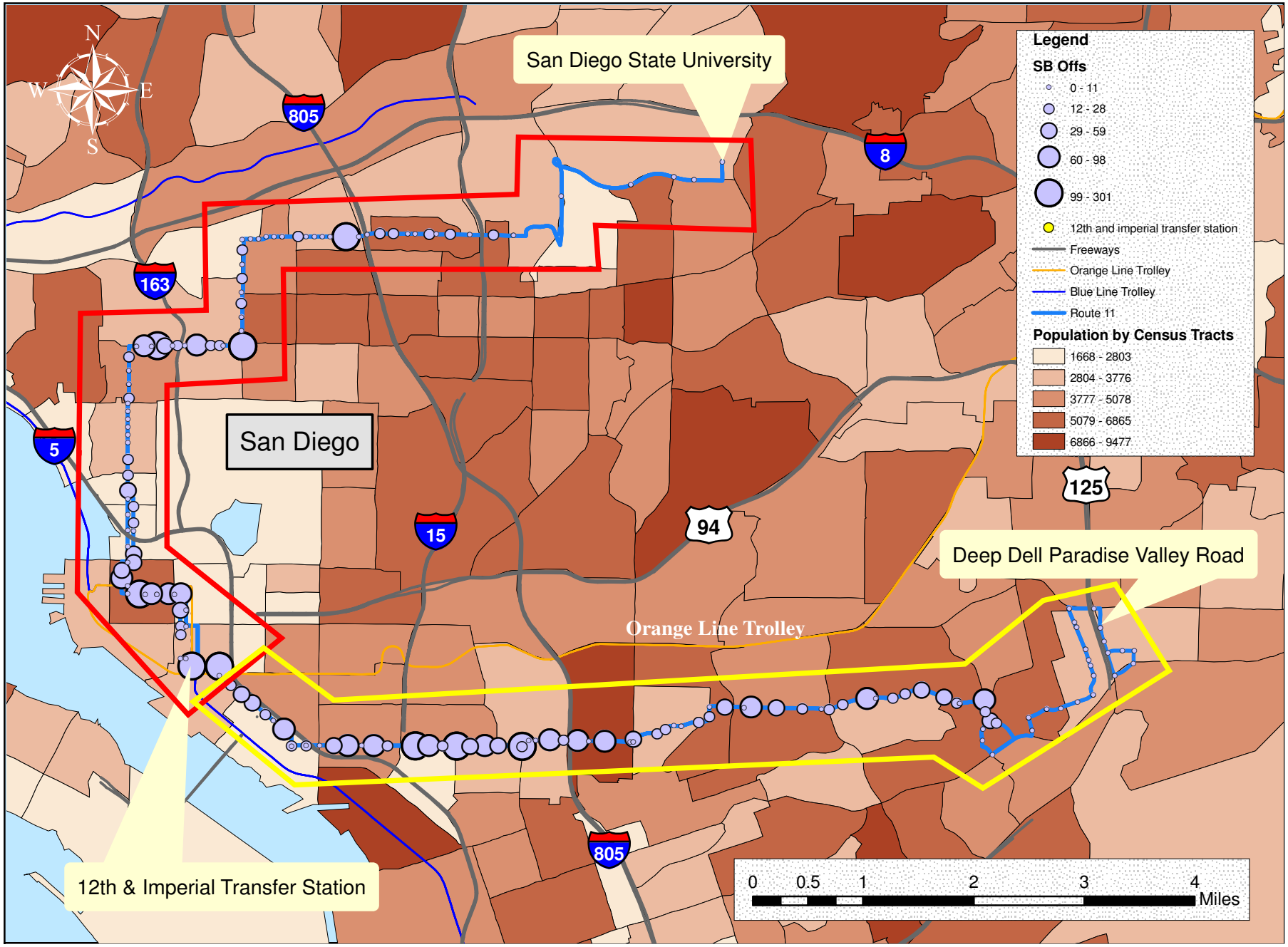
Greg Smith

MTS Route 11 Northbound Offs and Population Density



Greg Smith

MTS Route 11 Southbound Ons and Population Density



Greg Smith

MTS Route 11 Southbound Offs and Population Density

APPENDIX D

Appendix D

Bus Rapid Transit Implementation in San Diego

May 2006

SDSU MCP Program – Final Paper Submittal

Introduction/ Context

"Improvements to existing transit lines, connected with new innovative types of services serving new and different markets, are projected to make major improvements to our region's transportation system and overall quality of life." With this simple statement in the San Diego Association of Government's (SANDAG's) Regional Transit Vision, an entire region began to contemplate its collective transit future. The potential role of Bus Rapid Transit, or BRT, in this future is one whose merits have begun to receive long and serious looks. Numerous proposals for implementation of a BRT system have been explored within the past three years, and from these proposals have emerged a number of challenges and questions which will demand further study in order to fully realize the potential for a robust, successful BRT system within the San Diego region.

The following report will identify those challenges, and will compare our region's challenges with those of other BRT systems nationwide in an effort to propose solutions and refine the service prior to implementation.

SANDAG's Mobility 2030, the transportation blueprint for the region for the next twenty-five years, identifies a number of unique, yet interrelated projects as both feasible and necessary to implement as part of an "early action" program designed to provide better transportation mode choices for the region's residents. As part of this program, the Interstate 15 Managed Lanes project currently under construction between Interstate 78 and SR 163 will serve as the centerpiece of the eventual deployment of a full BRT system by 2012 and will serve an integral role in the gradual implementation of this program beginning in 2007. In addition to the managed lanes, the BRT system will make use of a number of Park and Ride lots currently at or near final design phase, due to be built immediately adjacent to I-15. Throughout the world, BRT systems share certain contextual similarities which often lead to BRT development. These include high population growth and accompanying traffic congestion, excessive time spent accessing jobs at major employment centers,

and a desire for both a more livable community and a desire to raise the person-carrying capacity of roadways. Nevertheless, the I-15 BRT system as designed will be unique to San Diego.

Corridor Conditions

The difficulties facing the implementation of full BRT within the I-15 corridor fall into a number of different categories. First and foremost is the nature of the corridor. As a primarily residential area, the service is faced with potentially inconvenient truths relating to the expected usage of BRT as a commute mode. Designed as a trunk model, the success of BRT in the corridor relies heavily on its ability to move quickly and efficiently to serve residents who would likely not be able to walk to the BRT stations located immediately off the Interstate. This aspect makes the competition BRT will face from the private automobile that much tougher, as a typical commuter will have already committed to the use of his automobile to reach the BRT station, and will require the service's travel experience, cost, or time to be of a substantial enough improvement over that provided by driving his automobile to warrant leaving his car at a BRT parking facility and utilizing the service. Currently, modeling data indicates that this will be a difficult hurdle to overcome in the initial phases of implementation.

In addition, cities like San Diego which currently have a running Light Rail Transit (LRT) have faced competition from other mass-transit system within their jurisdictions. In essence, transit riders are already familiar with the benefits of mass transit, yet oftentimes fail to grasp the financial realities associated with expanding an LRT system, and subsequently demand a ridership experience similar to LRT. This experience can often be difficult to replicate fully without a substantial capital investment, an investment which is often at odds with the reasons given for selecting BRT over LRT in the first place. Of the 29 cities throughout the world with some form of operational BRT, 17 can be found in the US and Canada alone- (with the remainder concentrated in Europe, Australia, and South America) and eight of these 17 co-exist with some form of LRT, generally in cities with more than 1 million residents.

In an effort to differentiate them from the competition- either LRT, traditional bus service, or the private automobile, a number of BRT's proposed design features have proven beneficial. The following chart illustrates physical characteristics present along each BRT system:

Table 1: Number of Facilities with Specific Features

FEATURE	US & CANADA	AUSTRALIA & EUROPE	SOUTH AMERICA	TOTAL SYSTEMS	PERCENT OF TOTAL
Running Way	13	5	6	24	83
Stations	12	4	3	19	66
Distinctive Vehicles	7	1	3	11	38
Off-vehicle Fare Collection	2	0	3	5	17
ITS	7	1	3	11	38
Frequent All-day Service	11	5	6	22	76
TOTAL SYSTEMS	**17**	**6**	**6**	**29**	**100**

Source: Transit Cooperative Research Report, Report 90, June 2003.

Running Ways:
BRT vehicles generally utilize the roadway in one or more of the following configurations- dedicated BRT-only busways designed to replicate LRT, HOV-lane compatible and able to provide high-frequency express service, or an arterial service which utilizes the arterial road network and takes advantage of signal-priority measures, distinctive branding, and wider stop spacing to differentiate it from existing traditional transit services. I-15 will likely employ a primarily HOV-lane based system; with an arterial element should the service utilize significant off-line Park and Ride lot resources or residential street networks.

Stations:
Ranging in distance anywhere from 1000 feet to around several miles apart, BRT stations allow buses to obtain and maintain consistently higher speeds and provide an experience similar to LRT in their stations' physical improvements over and above traditional bus stops. In addition, these stations often provide some type of time-saving off-board fare service such as smart cards. It is unknown if the I-15 service will feature these services. What is known, however, is that the corridor will feature upwards of 9 distinct stations, many of which will be located either directly on-line or immediately off the interstate and accessible via a special Direct Access Ramp, or DAR.

Distinctive Vehicles:
Standard buses and articulated diesel buses are widely used for BRT operations. Of increasing frequency, though, are compressed natural gas (CNG) vehicle fleets. Regardless of fuel type, buses should be low-floor and feature numerous doors for easy loading and unloading. In addition, buses may feature distinctive wraps and color schemes, as well as unique technological features, to be discussed further below. The fleet for I-15 is still under consideration, but will likely include both standard and articulated buses and low-floor designs.

Off-vehicle fare collection/ ITS:
As mentioned previously, off-vehicle fare collection allows riders to board quicker and minimizes the time a bus spends boarding passengers. ITS refers to

any of a number of state-of-the-art technologies designed to enhance the ridership experience. These can include, but are not limited to, real-time traffic information and AVL (automatic vehicle location) systems, and GPS-enabled buses able to request signal-priority measures. The I-15 corridor will likely feature some sort of advanced technology for both signal priority and expedited passenger boarding.

Frequent all-day service:
Services should generally run every 10 minutes during peak commute times, slightly less during the middle of the day. By minimizing wait times, the service is able to mimic LRT and provide certainty to the ridership experience. In addition, all-day service will be best utilized in cities with over 750,000 employees in a dense employment center. In instances with dedicated HOV lanes, service may be peak-only. San Diego will likely experience somewhat of a decline in frequency during non-peak periods, although timetables have obviously not yet been calculated.

Additional Lessons Learned

The BRT system along the I-15 corridor will be one of the longest in the country, with a 35-mile corridor catchment area. The catchment area contains numerous Park and Ride facilities, and the majority of the corridor's population resides within a reasonable 2.5 mile radius of at least one Park and Ride lot. These factors present a strong argument for limited branching of the service, and one that supports a strong trunk service at the expense of an extensive and time-consuming branching network of local service.

Further, travel attitudes identified in previous studies indicate a population extremely sensitive to travel experience and time, which may make any sort of branching service difficult to "sell" to residents.

In areas with entrenched commuter travel patterns and attitudes towards public transit, BRT must be marketed in a way that overcomes these attitudes. Desirable, high-frequency service is paramount, and limited stops must be utilized to shorten travel times to a point where it is competitive with the private automobile. When combined with HOV lane usage and unique, branded stations, the appearance and functionality of LRT can be mimicked by BRT for a fraction of the cost of LRT itself.

Once implemented, BRT service can have substantial time savings benefits. Depending on the corridor, savings of 2 to 3 minutes per miles compared to pre-BRT conditions are not uncommon. Should the I-15 BRT system be implemented in its most time-efficient variation[1], travel times could fall by as much as 44%.

[1] Many options are possible for station configurations, branching models, and route configurations, but preliminary modeling indicates an Escondido to SR-163 trip which currently takes an average of 52 minutes by car could take as little as 29 minutes with limited stops.

In addition, thousands of cars will be removed from the network, as other instances of BRT have seen ridership numbers over 20,000 an hour on a regular basis.[2]

The potential for BRT along the I-15 corridor is great, as is the need. It remains to be seen if these aspects are enough to lead to further development and implementation. If the experiences of other cities are any indication, the investment will have been well worth it.

[2] *Transit Cooperative Research Report, Report 90, June 2003.*

APPENDIX E

Appendix E

CONGESTION PRICING IN THE U.S.

May 2009

SDSU MCP Program – Final Paper Submittal

Figure 1: Cars Entering Downtown London

"Automobiles are often conveniently tagged as the villains responsible for the ills of cities and the disappointments and futilities of city planning."[1] Transportation planning has been under major scrutiny over the years with numerous attempts to figure out and correct congestion problem. After World War II, the United States has created one of the biggest forms of sprawl due to the creation of the freeway system. Currently the country has over 45,000 miles of freeway due to the 1954 Interstate Highway Act.[2] With the suburban growth, the freeways continued to grow out. This growth has put tremendous stress on all roadway systems especially entering the downtown core streets. Planners throughout the years have tried to figure out how to manage the amount of people that commute to the downtown on a daily basis. Many have decided to open up more freeways into the downtown with the hopes of making it an easier commute to work. Recently, a new idea has been tried which charges the users a fee to access the downtown, called congestion charging. Congestion charging makes fee prices depending on the traffic levels entering the downtown district. These fees go towards

[1] Jacobs, Jane "The Death and Life of Great American Cities" New York, New York. Random House. 1961
[2] Hanson, Susan and Giuliano Genevieve "The Geography of Urban Transportation" New York, New York. The Guilford Press, 2004

paying for improvements on the public transportation systems, allowing for improvements on the freeways and roads, and also for improvements to the downtown roadways.

The concept of looking at congestion charging in the United States has come about with the added stress related to vehicle miles traveled (VMT). VMT's have escalated in the United States for years, but with the added stress about the environment, lowering VMT's has been a major subject area. In California, finding a way to lower VMT has taken on a bigger stress with the passage of Assembly Bill (AB) 32 and Senate Bill (SB) 375. Each of these regulations requires the reduction of greenhouse gas emissions, which directly affects VMT levels. AB 32 "law requires that by 2020 the state's greenhouse gas emissions be reduced to 1990 levels, a roughly 25% reduction under business as usual estimates."[3] SB 375 Requires metropolitan planning organizations (MPOs) to include sustainable communities strategies, as defined, in their regional transportation plans (RTPs) for the purpose of reducing greenhouse gas emissions, aligns planning for transportation and housing, and creates specified incentivizes the implementation of the strategies."[4] These are extremely lofty goals, but need serious consideration. Each region in California has looked at the best way to lower VMT's and one solution is to examine congestion charging. This paper will review not only if the congestion charge works, but also if it could be a possible option in California to try to solve the environmental laws passed by the state Congress. Since London has already implemented a congestion charge, this city will be used as a case study in this paper.

Figure 2: ITS System in Stockholm, Finland

The Congestion Charging

Congestion charging is defined as "a system of surcharging users of a transport network in periods of peak demand to reduce traffic congestion.

[3] California State Assembly Bill 32 "California Global Warming Solutions Act of 2006" 4-15-2009 Available at http://www.arb.ca.gov/cc/docs/ab32text.pdf

[4] California State Senate Bill 375 "Transportation Planning: Travel Demand Models: Sustainable Communities Strategy: Environmental review. Accessed 4-15-2009. Available at http://info.sen.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_cfa_20080818_153416_asm_comm.html

Examples include some toll-like road pricing fees, and higher peak charges for utilities, public transport and slots in canals and airports. This variable pricing strategy regulates demand, making it possible to manage congestion without increasing supply."[5] In short, congestion charging, places a charge on users when using a freeway system. The goal of congestion charging is to try and solve congestion in the most efficient way as possible. Congestion charging on the downtown zone looks at charging the users to enter the downtown zone, which can have a great affect on the efficiency of getting people in and out of the community. To do this, the city first must define what the downtown zone would be. This will be the zone in which the rider will be charged to enter. It usually has an easy way to define, i.e. major natural landmarks (rivers) or roadways (freeways and bridges). The system can work as simple as a toll charge, similar to the New Jersey Turnpike, or it can be a state of the art system similar to the Bay Area or San Diego. Congestion charging works by the use of Intelligent Transportation System to manage the toll system. The most important item for congestion charging is the allocation of the money collected from the tolls. This money has a direct impact on enhancing and preserving the transportation/transit systems.

Congestion charging is a state of the art system that using Intelligent Transportation Systems (ITS) to charge automobile users in a safe and efficient manor using some of the news technology available. ITS "encompass a broad range of wireless and wire line communications-based information and electronics technologies. When integrated into the transportation system's infrastructure, and in vehicles themselves, these technologies relieve congestion, improve safety and enhance American productivity."[6] In short, ITS uses new technology to solve congestion problems associated with the freeways. This system uses the most advanced technology to monitor, report, and examine traffic. It reports back to a main office where the appropriate people or computers can make the correct decisions to relieve traffic. Congestion charging is using this system in its most advanced ways. Many of the current systems use an electronic device to deduce fees from user's accounts. Each customer is assigned a personal device that is placed on the car. Users can go online and can add money to this device. When they go through the toll section, the charge is automatically taken off the users account. Figure # 2 gives an

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[5] Federal Highway Administration "What is Congestion Charging" United States Department of Transportation May 30, 2008. Accessed on April 23, 2009 http://ops.fhwa.dot.gov/publications/congestionpricing/sec2.htm

[6] RITA Intelligent Transportation Systems. "Applications Overview" Research and Innovative Technology Administration. http://www.itsoverview.its.dot.gov/FM.asp Accessed 11/20/08

example of this device in Stockholm. This allows the traffic to move quicker because people no longer have to wait in line to pay cash to access the roads. This is a major advantage to the collection.

One of the most interesting parts of congestion charging is traffic demand charging. This is where prices are charged for real time situations. The system will charge the users a fee based on how the traffic is operating. The more users on the system the higher the fee is to enter the downtown zone. This will all for higher prices during rush hours or peak use time, and lower prices during times of decreased use. Figure # 3 shows the prices that the users pay per hour on the Stockholm congestion charging system. It shows what the highest price is during the rush hour, where the prices are almost double from the non-peak hours. This also shows that the prices are gradually increased or decreased throughout the day. This is a similar process that is currently used in San Diego on the managed lane system. Prices are charged for users to use the managed lane based on the traffic. For obvious reasons, the charges will be the highest during the peak rush hour in the mornings. This new technology allows the city to have a stronger control on cars entering the city streets which would mean that traffic would be reduced even further. This charge can be extremely high if the city does not want any more users to enter the zone. It can be an extremely useful device for planners to attempt to control traffic issues. Congestion charging is a complex solution to figure out the best possible way to get cars into the downtown zone without hurting the users travel times. To further examine congestion charging, it is important to understand what the public opinion is related to the congestion charge.

Figure 3: Typical pricing in Stockholm, Finland

Argument for Congestion Charging

Since this is such an issue, there is a lot of documentation available related to the charge to include advantages, disadvantages, and concerns. Many planners, and political leaders, believe

that the congestion charge is a great solution to the traffic problems in the inner city. Planners that argue for congestion charging in the downtown, state that the money generated can be used for two things (1) infrastructure financing (roads and transit) and (2) demand management purposes. The main argument for congestion charging is that it creates a large amount of money for the city to reinvest into the transportation system. Generally this money will go to create and enhance public transportation in the city. This added money is valuable, especially in today's society where transportation funding has been severally cut. For example, New York City reported that if they introduced congestion charging in the downtown, it would bring in revenue to the account of $380 million.[7] The money goes to such projects as: road repair, transit repair, road construction, transit construction, buying transportation equipment, and planning for future roadways and transit. All of the cities that use congestion charging have strict laws that state the revenue generated from the toll can only be spent on transportation planning. Getting additional funding for public transportation is key to many cities success, given much of the transportation money currently goes to freeways.

A further discussion of the revenue generated is important. As stated this money goes to transportation projects for both public transportation and freeway expansion. It is important to show where the majority of the money goes to. The money does go to expanding and enhancing the public transit systems in the area but a majority of this money goes to enhance public transit in the inner-city or most deprived areas. Every city that has proposed or implemented the congestion charge had strict language about the percentage of money that will be spent on public transportation and roadway improvements. In Manchester, England, it had public transportation projects that would be built with the congestion charge revenue. "A number of specific projects would be funded from the scheme, including extensions of the Manchester Metrolink to Oldham town centre, Rochdale town centre, East Didsbury, Ashton under Lyne, the Trafford Centre and Manchester Airport. A second line through the city centre would also be built. In total, 35 kilometers (22 mi) of new lines were planned. A Bus Rapid Transit system was proposed along the Oxford Road corridor and between the city centre and Bolton and Leigh."[8] Congestion charging has placed an added stress on improving poor/minority communities. Unfortunately

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[7] The City of New York. 2007. New York City Mobility Needs Assessment: 2007-2030. http://www.nyc.gov/html/planyc2030/downloads/pdf/tech_report_transportation.pdf p 14

[8] Kelly, Ruth "Greater Manchester TIF package unlocks up to £3 billion of investment" Accessed March 30, 2009 http://www.gmpte.com/news.cfm?news_id=6042551

some of this money also has to go to freeway and roadway expansion. Although it is important to improve freeways, expansion is not favorable. If the cities spend money on making it easier for people to get through the congestion zone, then it is not trying to improve the transportation systems of the city but rather use the charge as another tax base. If that is true, it is not what the congestion charge is meant for and the city should not be allowed to use the congestion charge.

Second, planners argue that congestion charging lower VMT levels. Many of the cities that have adopted the congestion charge have reported a lower VMT level after the charge was adopted. In London they state a 130% drop total over the entire congestion charge period, and San Francisco stated that there VMT would drop to 30%. The goal of the congestion charge is not only to reduce traffic, but to lower vehicle emissions throughout the community. With the added stress on the environment in the past decade, it is time that cities take a stronger role in reducing greenhouse gases. For several years countries have made the environment a major issue while building freeways at the same time. This system not only reduces the greenhouse emissions but it has put the added stress on the use of public transportation, as discussed above. Given the added stress on environmental laws having a 30% drop in VMT is a major accomplishment. In the same year that London saw 30% the biggest drop in any major United States City was in Tucson, Arizona with a 17% drop.[9] The congestion charge has dropped rates of VMT almost double of what any US city has done. This is an important part of the congestion charge because it has been a major reason for the proposal of the congestion charge. Although London has been implemented over several years, it shows that the system has a positive impact on VMT rates. It is also a major argument for cities in the United States looking into the congestion charge because this is one of the biggest reasons cities have looked into the congestion charge.

The third argument for the congestion charge is that it helps to reduce environmental damage that affects the communities surrounding high traffic. Although the results have shown a respectable amount of reduction, it is positive because it has been an unexpected advantage brought on by the congestion charge. "Scientist from two London colleges calculated that since

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[9]Collins, Carrie. Brookings Ranks 50 States, 100 Largest Metropolitan Areas for "Driving Footprint" Accessed April 28, 2009
http://www.brookings.edu/reports/2008/~/media/Files/rc/reports/2008/1216_transportation_tomer_puentes/press_release.pdf

2003 1,888 extra years of life had been saved among the city's seven million residents."[10] The most important data is that the air pollution level has dropped overall. "Overall levels of nitrogen dioxide dropped by 0.10 micrograms a cubic meter of air. The zone designated the city's most deprived saw a drop of 0.24 micrograms a cubic meter compared with a drop of 0.02 in the least-deprived zone."[11] Although these seem like small numbers, overall it has a major affect on the community. It is important to note that the area in the city's most deprived area saw the biggest improvement in air quality. Given an attack on environmental justice, this supports that the congestion charge because it has health benefits to the cities most affected areas. This was an unexpected result as of the congestion charge, but it could be argued that it will have the same affect on any city that introduces the congestion charge.

Argument Against Congestion Charging

Although the argument for congestion charging can be persuasive, the argument against it is just as strong. Even if congestion management in the downtown can generate revenue for the city and manage the roadway system, it can have a negative effect on the downtown core of the city. The first argument revolves around the fact that charging for something that was once free can be seen as unfair. This argument has a lot to do with social justice. If everyone is charged the same fee to access the downtown zone, the low-income community is going to have a greater hardship then the upper income communities. Many argue that the poor tend to live in the inner city and tend to have less automobiles, this argument cannot be validated. Poorer people live outside the downtown core and will have to pay a portion of their already small wages to travel to work. Looking at the average charge of Stockholm, similar to other charges, it cost a full-time, 9 to 5 worker, $4 a day. This is roughly $20 a week and roughly $1000 a year. This can be a substantial amount of money for the poor communities. The congestion charge needs to take into account social justice in order to be fair for the whole community.

Taking this injustice towards poor people, the argument for the congestion charge is that it will pay for new public transportation. The major problem with this is that by the time the money comes in several years will have passed. When the charge is passed, it causes billions of dollars to fund, and then the first revenue will go to repaying the fund. This means that all the

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[10] BBC News. "Congestion charge 'boosts health" February 2008. Accessed 4-29-2009 http://news.bbc.co.uk/2/hi/health/7266687.stm

[11] Bloomberg TV, "Congestion Charge Health Benefits Accessed 24, 2009 http://www.bloomberg/com/apps/news?pid=20601203&sid=aSD4EOCayd9c&refer=insurance

people who would struggle to pay for a congestion charge would have to do it for several years before public transportation improvements will be made. Having this issue has created a major flaw for the congestion charge system that needs to have planners examine this situation in detail before implementing a congestion charge. Given that a major argument to the congestion charge has been the poor and minorities, planners need to highly examine this issue along with all other environmental justice that may come about.

The biggest argument against the congestion charging is that the people in the community do not want this charge. It is true in London and in Manchester, England. Figure # 4 shows a survey conducted in Manchester asking the citizens what they thought of the idea of congestion charging in their city. This shows that almost 80% of the people overall do not support the congestion charge similar results were found in San Francisco and New York City. What is just as interesting is that the citizens that live in downtown Manchester, who complain about the traffic, still have 70% of its residents oppose the congestion charge. Similar results were found in Stockholm, only one city in the metropolitan area approved of the use of congestion charge, the City of Stockholm. This is expected because these people have to deal with the traffic problems on a daily basis. Although citizens are usually against paying more taxes, having roughly 80% disagree with what a metropolitan area is doing is a major issue. Citizens disagreeing with the congestion charge are a major argument against the congestion charge. Citizens are a major part of the planning process.

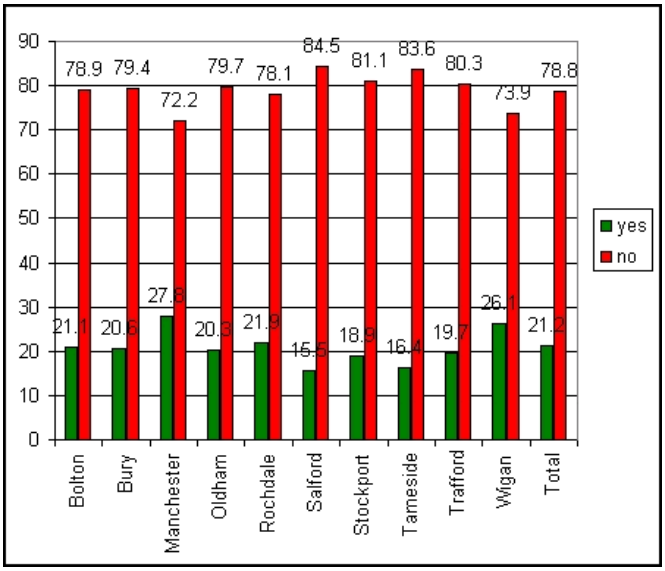

Figure 4: Poll showing Manchester, England negative reaction to congestion charge.

The final argument against the congestion charge is an economic attack. With people having to pay a charge to enter the zone, businesses located inside of the zone can lose customers who do not wish to pay the fee to visit the businesses. This has been a major fear of business owners when the congestion charge was originally discussed. Although London claims that the congestion charge has not effected business, other communities have not been as fortunate. In

Liverpool the leader of the Business community states "I must issue a stark warning to Liverpool that a congestion charging scheme risks seriously undermining the small business community."[12] He argues that is the case in London as well, that businesses lose customers because the cities charge too much for the customers to reach the store. Not only do they have to pay the toll, they would have to pay to park, costing up to £12 a trip. The Liverpool study also stated "But FPB research has found small firms are badly hurt by congestion charging with more than half – 58% – of our London members seeing a drop in profits since the congestion charge was introduced."[13] Although London claims business is up overall, it's the small businesses that cannot afford to stay open. This is a major attack on the congestion charge, and it makes a strong argument that it ends up hurting the community more then it helps the city. Congestion charging fails to take into account the small businesses community in mind.

The congestion charge is always going to be a point of debate throughout the planning world. Each side will continue to argue whether the congestion charge needs to be in place in the downtown core areas. The side that argues for the congestion charge claims that it provides much needed money for transportation, lowers VMT and controls traffic in a fluid manner. On the other hand, people arguing against congestion charge state that it doesn't follow environmental justice, goes against the citizens opinions, is not as environmentally friendly as it claims to be and hurts small businesses. Using a case study will show how congestion charging works is real time, and how the people argue for and against the charge.

Case Study: London, England

The concept of congestion management in the downtown districts of cities has been thrown around by planners for years. It has not been widely used so it is hard to see a real time system. The United States currently does not have this system but in Europe, London, England has conducted this system. In 2003 London decided to have a permanent congestion charge in its downtown district. The fee was introduced in 2003 with an initial fee of £5. "The daily charge must be paid by the registered keeper of a vehicle that is on public roads in the congestion charge zone between 7 a.m. and 6 p.m. Monday to Friday. Failure to pay the charge means a

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[12] The Forum of Private Business "Liverpool Congestion Charge Would be Commercial Suicide, Warns FPB" February 2006. Accessed 4-27-2009
http://www.fpb.org/news/1423/Liverpool_congestion_charge_would_be_commercial_suicide__warns_FPB.htm

[13] The Forum of Private Business "Liverpool Congestion Charge Would be Commercial Suicide, Warns FPB" February 2006. Accessed 4-27-2009
http://www.fpb.org/news/1423/Liverpool_congestion_charge_would_be_commercial_suicide__warns_FPB.htm

fine of at least £50."[14] The Mayor did this because the mayor had four transportation priorities to be resolved: (1) reduce congestion, (2) make radical improvements to bus services, (3) improve journey time reliability for car users, and (4) make distribution of goods and services more efficient. Figure # 5 shows the designated downtown zone for the city. It has been expanded over the years as the traffic has increased in the zone. A further look at how the London system operates and the success of the system will better solve the question of whether the congestion charging is successful.

Figure 5: London congestion charge zone as of 2007.

London decided to add the congestion charge for many different reasons. Given the history of London's congestion problem the Mayor of London Ken Livingstone, needed a change. "Proposals for congestion charging in London have been made since the early 1960s. New car registrations in the United Kingdom doubled from 500,000 in 1958 to over a million in 1963."[15] A report (1964) recommended the introduction of direct road user charges that would take into account the very different congestion costs of the different roads. In 1995 a city report "concluded that a congestion charge would reduce congestion, offer rapid payback of the initial setup cost, and generate net revenues as well as broader net economic benefit."[16] This report led to a working group for review and ultimately the congestion charge. In 1999 London had 90% of people interviewed on transportation state that the biggest issue in London was traffic.[17] In 2000 the Mayor stated (1) London suffered the worst traffic congestion in the UK and among Europe, (2) drivers in central London spent 50% of their time in queues (bumper to bumper traffic), (3) it was estimated that London lost between £2-4 million every week in terms of lost

[14] "Penalties and Enforcement:. *CCLondon.com*. Transportation for London. http://www.cclondon.com/Penalties-Enforcement.shtml.

[15] Leape, Jonathan "The London Congestion Charge" *Journal of Economic Perspectives* Volume 20, Number 4- Fall 2006 pg 157-176 http://online.org.wsj.com/documents/CongestionCharge.pdf

[16] Leape, Jonathan "The London Congestion Charge" *Journal of Economic Perspectives* Volume 20, Number 4- Fall 2006 pg 157-176 http://online.org.wsj.com/documents/CongestionCharge.pdf

[17] ROCOL, 2000 *Road Charging Options for London—A Technical Assessment. Review of Charging Options for London Group* Government Office for London, Riverwalk House, 157 – 161 Millbank, London SW1P 4RR

time caused by congestion.[18] The Mayor stated that something needed to be done to solve the congestion. After major research about the best option to solve this problem, the Mayor decided that a congestion charge to the downtown would be the best possible option. With much discussion the decision was decided to charge users to enter the downtown zone.

From the first day of the congestion charge, London already had a substantial public transportation system in place. London has an expansive subways system, the Underground has 11 lines serving 286 stations through 11 London boroughs counting for 3 million passengers per day.[19] Though London proposes more transit options from revenue generated by the congestion charge, having a system that is already efficient is half the battle. On the day of the first charge, "(an) extra 300 buses (out of a total of around 20,000) were introduced."[20] This has been a major advantage for London when implementing the congestion charge. Having an extensive and expansive public transportation system has allowed London to keep the users happy by providing the options to use public transit if chosen. London's public transportation system was well prepared for the added users that would affect the system when the congestion charge was implemented. London will also have the ability to enhance the system when it receives the revenue generated from the charges.

According to the City of London, this system has been extremely successful in reducing traffic. It has been so successful that in 2007 the downtown zone was extended further west, Western Extension. According to the Transportation for London website (operators of the

[18] Transportation For London "Congestion Charge: Background" Accessed 3-15-2009 http://www.tfl.gov.uk/roadusers/congestioncharging/6725.aspx

[19] Transportation For London "London Underground" Accessed 3-15-2009 http://www.tfl.gov.uk/modalpages/2625.aspx

[20] ^ "First congestion fines to go out". *BBC News* (British Broadcasting Corporation). 2003-02-18. http://news.bbc.co.uk/1/hi/england/2774271.stm. Retrieved on March 20, 2009.

congestion charge) the "traffic entering the original charge zone remains 21 percent lower than pre-charge levels (70,000 fewer cars per day).[21] This makes a strong argument that the congestion charging is doing just what it was placed in London to do. Given that London had one of the worst traffic problems in Europe, having this reduction greatly changes London's place with traffic in Europe. The reduction of cars can be contributed by the number of new users to the bus and subway systems. London saw an increase of 37% of people using bus the first year after the congestion charge was in place.[22] Figure # 6 shows that the bus ridership jumped dramatically when the congestion charge was put in place. The Underground subway only saw an increase of roughly 1%, in 2005 (year after charge). This number is misleading because the London subway system was bombed in July 2005 causing lower rider numbers. The reduction of traffic and increase of public transportation has been what the Mayor promised when he proposed the congestion charge. Although the underground only saw an increase of 1%, London already has a substantial amount of riders who use public transit already, discussed earlier.

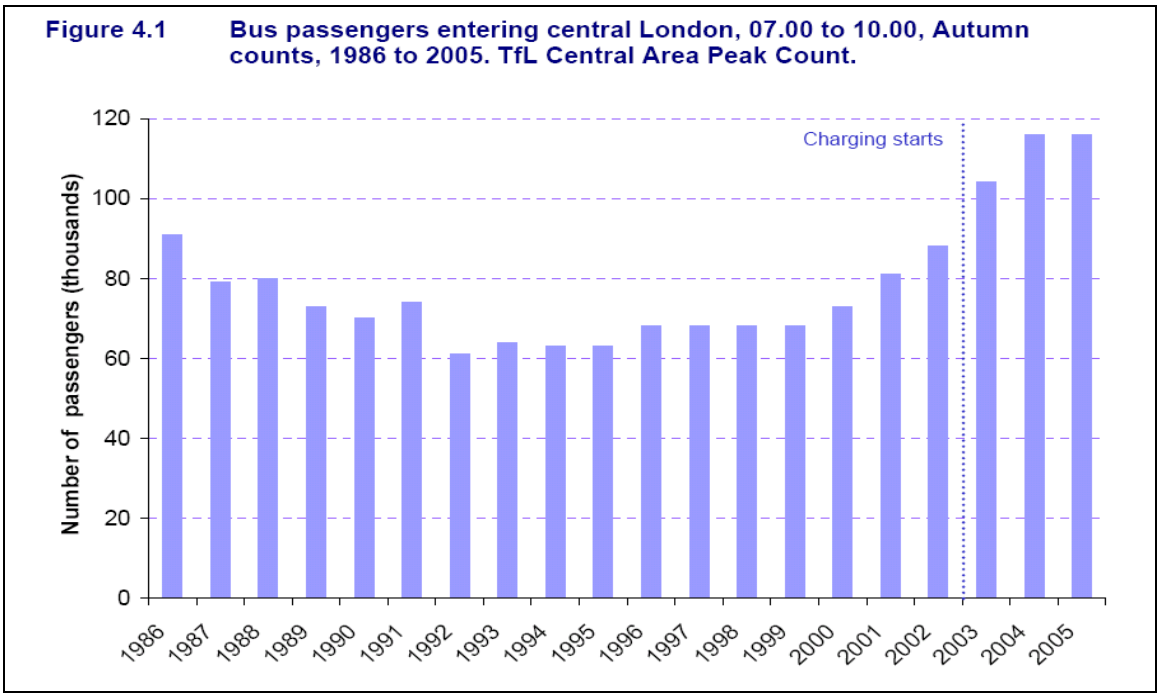

Figure 6: London bus rider numbers from 1986-2005

[21] Transportation for London "Benefits" Accessed 4-10-2009 http://www.tfl.gov.uk/roadusers/congestioncharging/6723.aspx

[22] "Central London Congestion Charge- Fourth Annual Report" Transportation for London June 2006 City of London.

The system also generates a substantial amount of money from charging the users to access the downtown zone. It is reported that last year alone (2007/2008) the charge brought in roughly £137 million. The most important rule is that "by law, all net revenue raised has to be invested in improving transport in London."[23] This is a major reason that the congestion charge is a good for London. Funding for transportation is a major issue in most cities and having a set way to get money is a good idea. Most cities have to add taxes to gain this revenue for public transportation. It seems that people should be more supportive of the congestion charge because everyone does not have to pay for the downtown zone, only the people who use the zone. London has used the roughly £137 on such transportation improvements as new illuminated bus stations, improvement of roadways and bridges, roadway safety (with a main focus on children safety), and enhancing walking and bicycling. The City of London yearly releases the exact amount of money each project receives. These improvements have greatly changed the transportation network in London making it easier for citizens to take public transportation. Without the congestion charge revenue, London would not be able to expand the Underground and bus system that feeds the city and surrounding communities. To further the expansion of public transportation, London should amend the law to encourage more public transportation spending.

Although the congestion charge in London has a great amount of statistics supporting its case, it also has a few that hinder its successes. London had a major traffic congestion issue and the Mayor acted in a correct manner. With what the city was going through anything could have helped lower congestion problems. London's success is not what it truly seems. "The absolute levels of congestion in 2007 were effectively identical to the representative values for conditions before the scheme was introduced in 2002."[24] This can be accounted because of the rise in population in London. Even though the numbers are close to the same, it is just that the numbers are not what were once projected. The numbers are continuing to be lower, but just not at any major significant levels (greater than 10% reduction). London's success might not be because congestion charging was the one size fits all solution but that it was the correct decision for what the cities needs were. Going further, London is a city that is made perfectly for a downtown congestion charge; it has such a large population that works in the downtown core. Many cities,

[23] "Central London Congestion Charge- Fourth Annual Report" Transportation for London June 2006 City of London.
[24] "Central London Congestion Charge- Sixth Annual Report" Transportation for London June 2008 City of London.

particularly in the United States, do not have its major employment core in the downtown zone anymore. Finally, London already had a public transportation system in line with its Tube subway and existing bus system. London has been the major pilot for the congestion charge. Other cities can take this model and alter it to fit their metropolitan area.

Congestion Charging in the United States

While Europe has taken the lead on applying the congestion charge, the United States has started to examine the use of the congestion charge. New York City and San Francisco are the two cities who have moved forward with research on the possibility of applying this technology. Both of these cities are set up for the congestion due to the large amount of cars that entire the downtown zones on a daily basis. Each city would also be able to have easy toll sections due to the large amounts of bridges that connect suburban cities to the downtown. New York City was the first American city to try and implement the congestion charge. This plan looked at using the congestion money for infrastructure needs and with the reduced congestion reducing the cities carbon emissions by about 30%. Unfortunately the charge failed for several reasons, the main being that some of the cities comments about the mass transportation were false. The City assumed that more people would use mass transportation, but the problem is that the subway lines are already at maximum capacity.[25] With New York City failing to go further with the congestion charge, San Francisco took the lead and received federal funding to implement the charge. "The study estimated that the congestion charge could rise between USD 35 million and USD 65 million a year. The study also found that congestion pricing could reduce peak-hour delays by 30% and reduced car-related greenhouse gases by 15%."[26] San Francisco would also use the technology to inform drivers entering the city where the available parking spaces are. Although each city did not pass the congestion charge, it has the country moving in the right direction to try and reduce greenhouse emissions brought on by the car and American suburban sprawl.

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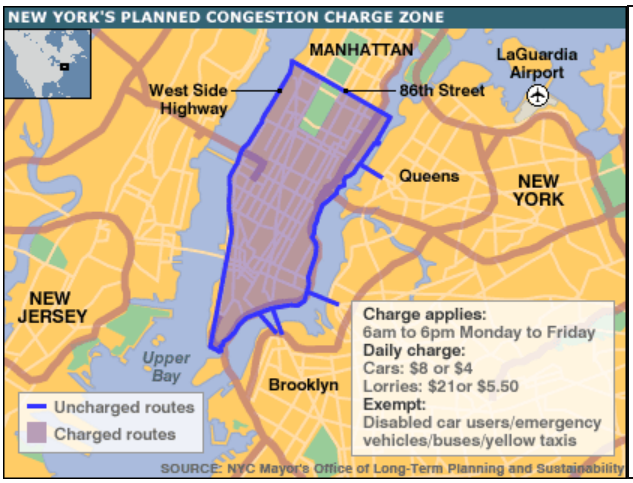
[25] Cardwell, Diane. "Mayor to Unvail 25-Year Outlook for Greener City." April 20, 2007 The New York Times: Mayor To Unveil 25-Year Outline For Greener City". http://query.nytimes.com/gst/fullpage.html?res=9C04E7DF163EF933A15757C0A9619C8B63. Retrieved on March 28, 2008

[26] Maria L. La Ganga (2008-12-30). "In San Francisco, 'congestion pricing' is something they're sneezing at". Los Angeles Times. http://www.latimes.com/news/printedition/front/la-me-sanfrancisco-traffic30-2008dec30,0,674932.story. Retrieved on 2009-02-23.



Conclusion

The congestion charge has a compelling argument in both directions. From my standpoint, that of a transportation planner, I think the congestion charge is a good idea. This finds a way of reducing greenhouse emissions as well as bringing in much needed funding for transportation issues, mainly public transportation. Although I do not believe the congestion charge works in every city in the world, it has brought great ideas of thinking about trying to fix the traffic issues in the country. The most important part about the congestion charge is the concepts, such as the real-time charging and reducing congestion. This can be adapted to different communities that might not have the biggest issue in the downtown core. The best example of this is San Diego, where the downtown does not have a large amount of traffic congestion. San Diego freeways on the other hand have a large amount of traffic that needed to be addressed. San Diego Association of Governments (SANDAG) alongside California Department of Transportation uses the real time charging on managed lanes. This means that users are charged a fee to use the lanes with the least amount of traffic. The system operates in the same way as the congestion charge in which it takes into account the number of users and bases the charge on the traffic. Currently the managed lane, or expressed lane, is 12.5 miles long with the complete extension being 20 miles long and completed by 2012.[27] The managed lanes will be four lanes. What is the unique is that the barrier can be moved so that during the morning commute the southbound lanes have 3 managed lanes, but when it is the evening, the northbound lane will have 3 managed lanes. This will allow for maximum usage of the managed lanes. As of

[27] San Diego Association of Governments ITS Department. "I-15 Expressed Lanes" San Diego Association of Governments. http://www.sandag.org/index.asp?projectid=34&fuseaction=projects.detail Accessed 12/1/08

2009, the system has been seen with wide success. San Diego has shown how an idea such as the congestion charge can be altered to make it fit the regions congestion issues.

Congestion charging in the downtown zone will continue to be an argument for planners as a solution to solving traffic issues in the downtown. Each argument has its strong points. With cities such as New York and San Francisco debating this congestion charge, it has dramatically helped to gain more understanding about issues. Cities, such as San Diego, need to further review how this could be effective in their city. When looking at the congestion charge there are a few things that need to be discussed before applying the charge. It needs to be decided the size of the downtown zone and what the cost will be. But it goes further, a detailed discussion needs to be placed on how much revenue will go to public transportation and what kind of projects the money will be spent on. For the congestion charge to work, planners and the city need to solve the public transportation issue first. Being a transit planner has taught me that funding for public transportation is vital. This means the city should provide more public transportation before the charge is implemented to avoid the issues of the minorities who will be most affected by the charge. After doing the research on the congestion charge and hearing the positives and negatives, I do not think that the congestion charge is the best solution for cities. It did work in London, but London has a city that is made up to handle this system. No systems in the United States have this setup quite yet besides San Francisco and New York City. I highly discourage cities from adopting the congestion charge as a revenue generator. It should only be used to solve traffic issues and not for political gain. Although congestion charging does not work in cities that do not have major downtown traffic problems it does help to bring the best idea to communities to solve congestion and reducing VMT levels. Congestion charging is an idea that has brought on new ideas for the way to think about transportation issues in the world.

Works Cited

1. Jacobs, Jane "The Death and Life of Great American Cities" New York, New York. Random House. 1961

2. Hanson, Susan and Giuliano Genevieve "The Geography of Urban Transportation" New York, New York. The Guilford Press, 2004

3.California State Assembly Bill 32 "California Global Warming Solutions Act of 2006" 4-15-2009 Available at http://www.arb.ca.gov/cc/docs/ab32text.pdf

4. California State Senate Bill 375 "Transportation Planning: Travel Demand Models: Sustainable Communities Strategy: Environmental review. Accessed 4-15-2009. Available at http://info.sen.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_cfa_20080818_153416_asm_comm.html

5. Federal Highway Administration "What is Congestion Charging" United States Department of Transportation May 30, 2008. Accessed on April 23, 2009 http://ops.fhwa.dot.gov/publications/congestionpricing/sec2.htm

6. RITA Intelligent Transportation Systems. "Applications Overview" Research and Innovative Technology Administration. http://www.itsoverview.its.dot.gov/FM.asp Accessed 11/20/08

7. The City of New York. 2007. New York City Mobility Needs Assessment: 2007-2030. http://www.nyc.gov/html/planyc2030/downloads/pdf/tech_report_transportation.pdf p 14

8. Kelly, Ruth **"**Greater Manchester TIF package unlocks up to £3 billion of investment" Accessed March 30, 2009 http://www.gmpte.com/news.cfm?news_id=6042551

[9]. Collins, Carrie. Brookings Ranks 50 States, 100 Largest Metropolitan Areas for "Driving Footprint" Accessed April 28, 2009 http://www.brookings.edu/reports/2008/~/media/Files/rc/reports/2008/1216_transportation_tomer_puentes/press_release.pdf

10. BBC News. "Congestion charge 'boosts health" February 2008. Accessed 4-29-2009 http://news.bbc.co.uk/2/hi/health/7266687.stm

11. Bloomberg TV, "Congestion Charge Health Benefits Accessed 24, 2009 http://www.bloomberg/com/apps/news?pid=20601203&sid=aSD4EOCayd9c&refer=insurance

12. The Forum of Private Business "Liverpool Congestion Charge Would be Commercial Suicide, Warns FPB" February 2006. Accessed 4-27-2009 http://www.fpb.org/news/1423/Liverpool_congestion_charge_would_be_commercial_suicide__warns_FPB.htm

13. The Forum of Private Business "Liverpool Congestion Charge Would be Commercial Suicide, Warns FPB" February 2006. Accessed 4-27-2009 http://www.fpb.org/news/1423/Liverpool_congestion_charge_would_be_commercial_suicide__warns_FPB.htm

14. "Penalties and Enforcement:. *CCLondon.com*. Transportation for London. http://www.cclondon.com/Penalties-Enforcement.shtml.

15. Leape, Jonathan "The London Congestion Charge" *Journal of Economic Perspectives* Volume 20, Number 4-Fall 2006 pg 157-176 http://online.org.wsj.com/documents/CongestionCharge.pdf

16. Leape, Jonathan "The London Congestion Charge" *Journal of Economic Perspectives* Volume 20, Number 4-Fall 2006 pg 157-176 http://online.org.wsj.com/documents/CongestionCharge.pdf

17. ROCOL, 2000 *Road Charging Options for London—A Technical Assessment. Review of Charging Options for London Group* Government Office for London, Riverwalk House, 157 – 161 Millbank, London SW1P 4RR

18. Transportation For London "Congestion Charge: Background" Accessed 3-15-2009 http://www.tfl.gov.uk/roadusers/congestioncharging/6725.aspx

19. Transportation For London "London Underground" Accessed 3-15-2009 http://www.tfl.gov.uk/modalpages/2625.aspx

20. ^ "First congestion fines to go out". *BBC News (British Broadcasting Corporation). 2003-02-18*. http://news.bbc.co.uk/1/hi/england/2774271.stm. Retrieved on March 20, 2009.

21. Transportation for London "Benefits" Accessed 4-10-2009 http://www.tfl.gov.uk/roadusers/congestioncharging/6723.aspx

22. "Central London Congestion Charge- Fourth Annual Report" Transportation for London June 2006 City of London.

23. "Central London Congestion Charge- Fourth Annual Report" Transportation for London June 2006 City of London.

24. "Central London Congestion Charge- Sixth Annual Report" Transportation for London June 2008 City of London.

25. Cardwell, Diane. "Mayor to Unvail 25-Year Outlook for Greener City." April 20, 2007 The New York Times: Mayor To Unveil 25-Year Outline For Greener City". http://query.nytimes.com/gst/fullpage.html?res=9C04E7DF163EF933A15757C0A9619C8B63. Retrieved on March 28, 2008

26. *Maria L. La Ganga (2008-12-30).* "In San Francisco, 'congestion pricing' is something they're sneezing at". Los Angeles Times. http://www.latimes.com/news/printedition/front/la-me-sanfrancisco-traffic30-2008dec30,0,674932.story. Retrieved on 2009-02-23.

27. San Diego Association of Governments ITS Department. "I-15 Expressed Lanes" San Diego Association of Governments. http://www.sandag.org/index.asp?projectid=34&fuseaction=projects.detail Accessed 12/1/08

APPENDIX F

Toni Abbey

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Dr. Caves

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Destination Lindbergh

The San Diego International Airport (SDIA) is located directly along the harbor in downtown San Diego. All bus and vehicle transportation must access the terminals along the south end of the property with the only access road being Harbor Drive. This single road access design, lack of direct freeway access to either terminal and inadequate public transportation access has created traffic congestion problems in the surrounding areas. There is only one bus route that goes to the terminals located at the SDIA and no trolley or train has a direct connection to either terminal. San Diego Association of Governments (SANDAG), the Airport Authority (the Authority), IBI consulting firm and Jacob's Consultancy are in the process of redesigning San Diego's airport, a project titled "Destination Lindbergh." A key component to this project is adding an Intermodal Transit Center (ITC) to the north side of the runway where train and trolley tracks are currently located increasing access points and the number of passengers able to be served. The reconfiguration of existing facilities, an added Direct Access Ramp (DAR) from the I-5 freeway and an increase in the number of transit options will turn the SDIA into a world class air-rail link capable of serving the county for many years to come.

In 2009, the San Diego County Airport Authority, SANDAG and the city of San Diego completed Destination Lindbergh, a plan to determine the ultimate build-out configuration of the SDIA. Additional steps then include evaluation and planning to minimize airport-related traffic impacts to adjacent communities. This study will incorporate improvements of intermodal access to the airport while considering the airport as a potential location for a regional transportation hub (Destination Lindbergh Executive Summary, pg. 1). The carrying capacity is able to be increased while working towards the eventual build-out of the SDIA and the traffic impacts lessened by providing for various access points and connections to other forms of transportation through the intermodal approach.

Goals and Objectives

Destination Lindbergh's primary goal is to provide a fundamental, long-range strategy to optimize the efficiency of SDIA's facilities and functions (Destination Lindbergh's Technical Report, pg. 4). This will include an effort focused on the potential development of an ITC to address ground transportation and intermodal facility goals. Future facility requirements for the airfield and passenger terminals have been evaluated within the broader context of the overall region's transportation needs, not just from the aviation perspective (Destination Lindbergh Executive Summary, pg. 1). Creating an ITC is central to improving and expanding the capabilities of the SDIA while simultaneously assisting with transit throughout the county and all areas of southern California through the possible future connection of the high-speed rail.

There are seven categories of goals and objectives that have been developed to complete Destination Lindbergh (Destination Lindbergh's Technical Report, pg. 7).

Categories	Goals	Objectives
Ground Transportation	Improve access for automobiles and transit while accommodating parking requirements	Added Direct Access Ramps from I-5 freeway and increase short and long term parking
Intermodal Facilities	Strengthening regional connectivity	Increase transit ridership by providing a single location for current and future transit modes
Improving the Passenger Terminal	Efficiently accommodating future activity levels and increasing user satisfaction	Maintaining appropriate levels of service, minimizing walking distances and providing passengers and personnel with an efficient and flexible terminal arrangement
Airfield/Airspace	Configuring the airport in the best possible way to accommodate future levels of activity	Minimizing airfield/airspace congestion while being flexible to aircraft, technological and industry changes
The Environment	Incorporating best practices for environmental stewardship in all components of the SDIA plan	Minimizing noise impacts, reducing emissions through improved transit access and using sustainable design
Financial Feasibility	Developing a feasible plan	New investments and maximizing existing funding through appropriate planning while expanding the pool of funding sources
Regional Development	Providing major direct and indirect social and	Accommodating necessary air service, providing improved surface

	economic benefits to the entire San Diego region	transportation access for both transit and automobiles while strengthening economic development in the region through associated commercial development

Destination Lindbergh's Regional Partnership

To gather all necessary data and perspectives on this project, an Ad Hoc committee was formed consisting of the Airport Authority, the City of San Diego (the City), and SANDAG and chaired by San Diego Mayor Jerry Sanders. Other key participants included policy makers from the Unified Port of San Diego, County of San Diego, Metropolitan Transit System, North County Transit District, Caltrans, the U.S. Department of Defense and existing key stakeholders such as business and community residents currently located around SDIA (Destination Lindbergh Technical Report, pg. 1).

Jacobs Consultancy has been hired by the Authority to manage the project layout and IBI is the consultant working with SANDAG on the ITC component. At a minimum, Jacob's Consultancy will develop three onsite ITC station layouts. The first layout includes service for the Coaster, San Diego Trolley, possibly Amtrak, MTS Bus Rapid Transit, a direct pedestrian link to a passenger processing facility with no provisions for the High-Speed Rail. The second layout is similar to the first except that High-Speed Rail facilities will be included but located off airport land. The third layout assumes all previously mentioned modes however High-Speed Rail passenger processing facilities will be co-located with airport passenger processing facilities. Except for the

tracks and platforms, all High-Speed Rail functions will be incorporated within the SDIA (Destination Lindbergh Technical Report, pg. 2).

2008 SDIA Transit Plan

The Authority adopted the Airport Master Plan in 2008 and as part of this document a Transit Plan was incorporated. The purpose of the Transit Plan is to ensure compatible, shared and orderly development of airport facilities while keeping transit access as a focus. A final Environmental Impact Report (EIR) was also developed as part of the analysis to accompany this plan in determining the long term impacts. In the SDIA Transit Plan the future build out of the north area is assumed including expansion of the air cargo and general aviation facilities with additional development of a consolidated rental car facility (CONRAC), construction of a parking structure and ITC. An identified transit corridor will link the new north area development to all terminals in the south allowing transportation between both sides of the airport to occur without having to drive on the Pacific Highway or North Harbor Drive (Airport Transit Plan, pg.1). The construction of a CONRAC facility has been identified by the Authority as a way of reducing the number of rental car shuttle trips. Individual company shuttles would be replaced by a consolidated shuttle serving all companies. The transit center would also provide a pedestrian corridor connecting the Washington Street Trolley station.

Only 1.2% percent of San Diego's airline passengers use transit to travel to and from the airport. The sole means of transit service is provided by Metropolitan Transit System's (MTS) Airport Flyer, Route 992, connecting the airport with downtown and

Santa Fe Depot. This statistic is well below the national average of 6% percent. The Authority has set a goal of increasing airline passenger public transit ridership between 4% and 6% percent over the next three to five years bringing San Diego up to the national average. Alternatives for this plan benefits both airline employees as well as airline passengers and serves to improve passenger level of service while increasing connectivity between the airport and the entire San Diego region (Airport Transit Plan, pg. 2).

The existing transit plazas and transit routes are at minimal levels when compared to other airports in the country. The transit plazas are insufficient in that they are small and only accommodate commercial vehicle passenger pick-up and drop-off activity located across from the private vehicle roadways in Terminal 1 and Terminal 2 West (Airport Transit Plan, pg.14). Additionally, the Airport Flyer provides the only public transit service directly to the airport terminals because San Diego's regional transit system is focused on downtown commuters, provides limited frequency and requires multiple mode changes to reach many destinations. Exact fair is required on the Airport Flyer service and all signage throughout downtown and on airport land is of low visibility (Airport Transit Plan, pg. 15).

Airport transit ridership is more closely linked to regional transit ridership and commute patterns because commute patterns tend to be related to the extent and robustness of the regional transit system (Airport Transit Plan, pg. 35). This means that the availability of a rail station within walking distance of airport terminal buildings,

express bus service from a regional park and ride facility located outside the immediate airport vicinity and minimizing the number of mode changes will have the greatest affect on airport passenger's use of public transit. San Diego resident passengers and the airport's approximately 4,900 employees are the easiest airport users to target services towards as they are the most regular users of the airport. Once infrastructure has been changed to accommodate more direct transit service the Authority would like to create an Airport Employee Transit Incentive Program to assist airport employees with utilizing public transportation (Airport Transit Plan, pg. 42).

Many recommendations or alternatives have been made by the Authority to accomplish their goal of increasing transit ridership. This includes the creation of an express bus service between the airport and a transit station to improve the connections by only stopping at the transit station and airport terminals providing a dedicated express airport service (Airport Transit Plan, pg. 46). The Authority's recommendation of creating an ITC on the north side in conjunction with a future consolidated rental car facility would also accommodate rail passengers, which would increase ridership by adding another mode of access. This is where the development of an intermodal transit center would connect Washington Street or Palm Street Stations with pedestrian walkways to better serve the north area (Airport Transit Plan, pg. 54). The Coaster and Amtrak do not currently stop at stations along the north end of the airport so schedules would need to be changed in order to connect all forms of transit to the ITC. The creation of dedicated transit lanes with signal priority for express busses has been recommended along with queue jump lanes at congested intersections

(Airport Transit Plan, pg. 49). A remote terminal and/or parking lot have also been recommended to capture passengers and airport employees before they drive all the way to the airport. Final recommendations by the Authority also include building an automated people mover to connect the consolidated rental car facility with the airport and transit center (Airport Transit Plan, pg. 53).

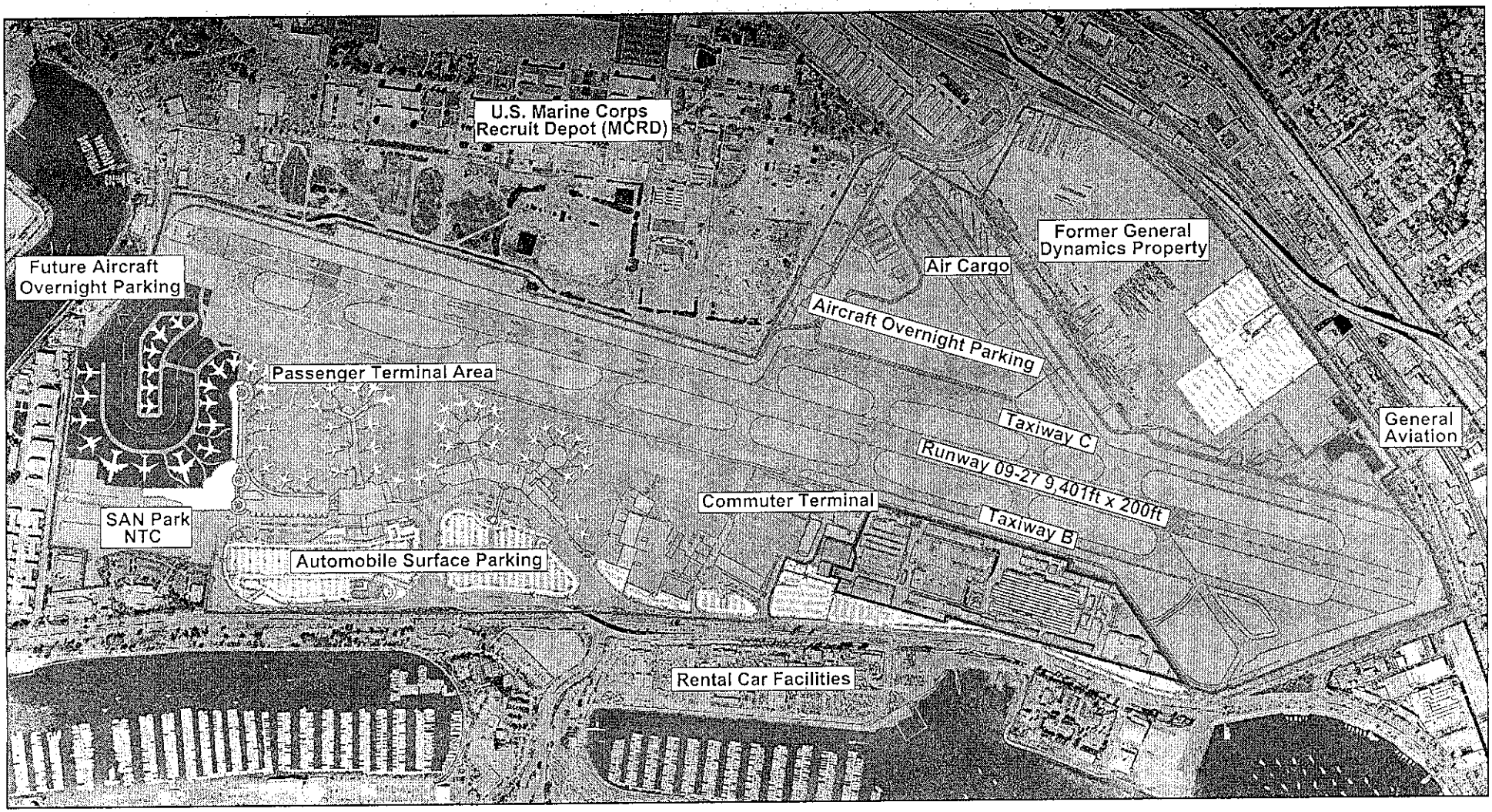
Baseline and Existing Conditions

Understanding the baseline conditions and physical constraints currently affecting the airport provides the development of alternatives needed to meet the established goals of Destination Lindbergh. Baseline conditions include all existing facilities in addition to those projects which have been previously planned. Also included are any plans that have received environmental approval or would have to be constructed regardless of the planning efforts associated with Destination Lindbergh. These conditions include the planned but not constructed Terminal 2 West Expansion project (Destination Lindbergh Technical Report, pg. 2-1).

SDIA is extremely compact when considering the volume of traffic handled at the airport. There is a single runway that is 9,401 feet long and 200 feet wide (Figure 1) bisecting the overall property. Several taxiways provide access between the runway and various aircraft parking aprons (Destination Lindbergh Technical Report, pg. 2-1). The operational configuration of the airport's runway and taxiway system is mostly dictated by the wind and weather conditions. The airport operates in a west flow 95.5% percent of the time with arrivals making the approach to the runway from the east and

departures taking off over the Pacific Ocean (Destination Lindbergh Technical Report, pg. 2-3).

Figure 1



LEGEND

- Airport property boundary
- Existing pavement
- Future pavement
- Existing terminal
- Future terminal
- Remain overnight aircraft parking
- Air cargo
- Airline/Airport support
- General aviation
- Automobile surface parking
- Teledyne Ryan property

DESTINATION LINDBERGH

NORTH

0 350 700 1400

Figure 2-1
BASELINE CONDITIONS

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San Diego International Airport
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The Authority is planning the expansion of Terminal 2 West possessing ten new aircraft gates. This would assist in relieving congestion within the existing terminals. The new and reconfigured terminal space would be expanded on three floors for passenger processing facilities including ticketing, security screening, departure hold rooms, restrooms, concessions, public circulation and the outbound baggage areas. This would accommodate passenger volumes forecasted through 2015 and reduce congestion in all terminals. This expansion is considered a baseline condition for the Destination Lindbergh planning purposes (Destination Lindbergh Technical Report, pg. 2-23).

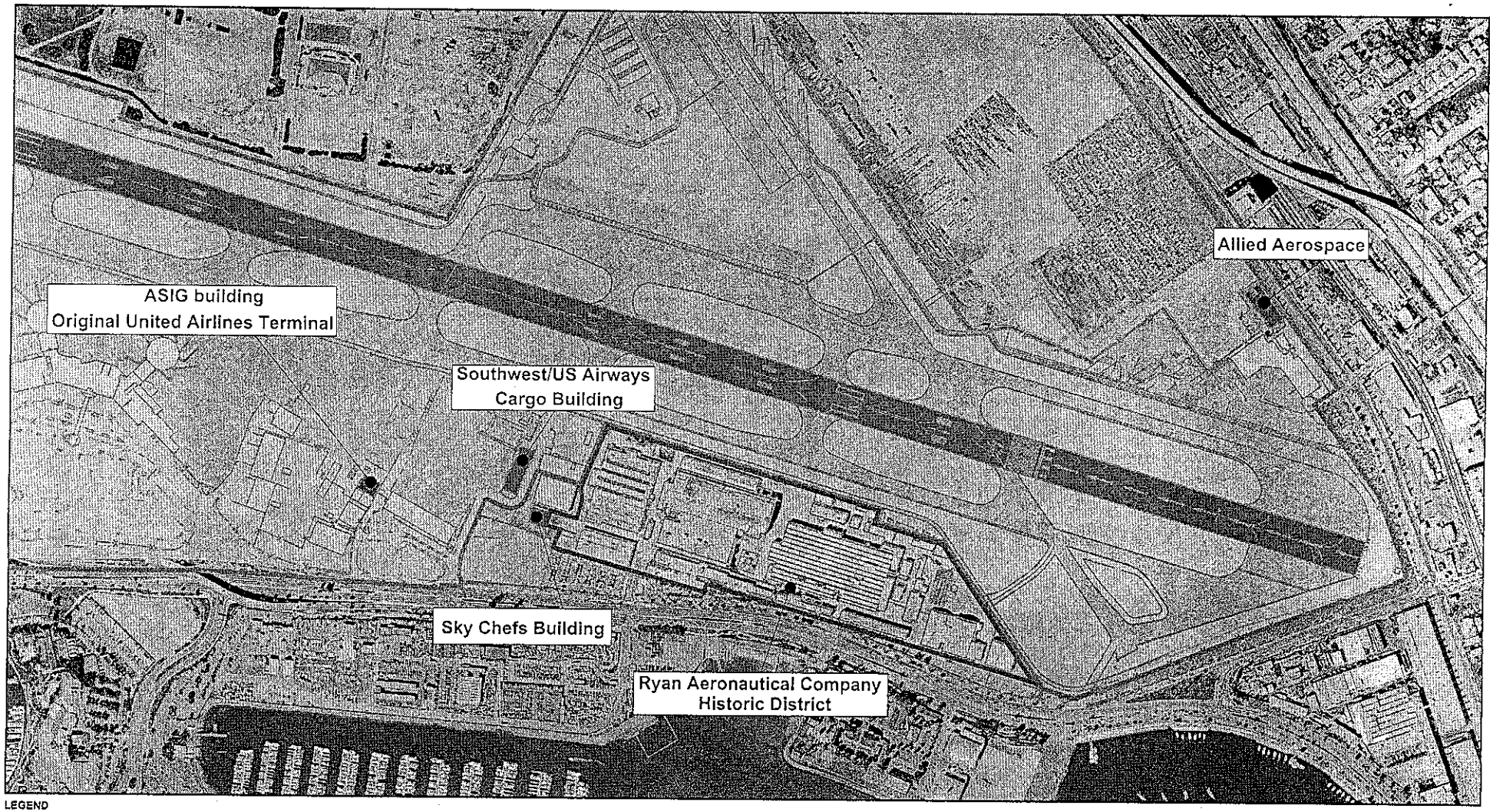
Constraints and Obstructions

Topography and high terrain located to the northeast and southwest of the airport imposes high takeoffs and landing minimums. This presents an obstacle clearance issue when taking flight or landing. In addition to terrain obstructions there are a number of man-made obstructions such as residential neighborhoods to the northeast, east and southeast of the airport also affecting aircraft approaches towards the runway. A noise curfew exists prohibiting departures by any aircraft during certain times of the day allowing departures between 6:30 a.m. and 11:30 p.m. only. Aircraft operators violating the curfew may be subject to a fine (Destination Lindbergh Technical Report, pg. 2-10). The hourly airfield capacity at the SDIA during optimal weather conditions can accommodate only 56 operations consisting of 28 departures and 28 arrivals. SDIA has only three passenger terminals that provide a total of 45 aircraft gates

consisting of Terminal 1, Terminal 2 and the commuter terminal (Destination Lindbergh Technical Report, pg. 2-11).

Due to the SDIA's close proximity to residential areas, endangered species, historical structures, military bases and many other environmental considerations, national environmental policies require that development plans be evaluated against 22 environmental resource categories. Seventeen of 22 categories identified by the National Environmental Policy Act (NEPA) and the California Environmental Policy Act (CEQA) have the potential for impacts related to future airport development (Destination Lindbergh Technical Report, pg. 2-46). For the purposes of this paper only, a few highlighted categories will be mentioned. Hydrology and water quality will be affected due to the airports proximity to the ocean. During storms, runoff leads to the San Diego Bay and any construction would be subject to a National Pollutant Discharge Elimination System permit requiring treatment before discharging into the bay. The Teledyne-Ryan Aeronautical Complex is shown in Figure 2 and is eligible for the National Register for Historic Places as a historic district (Destination Lindbergh Technical Report, pg. 2-50). The California Least Tern is an endangered species of bird that has nesting sites in the southeast corner of the airport (Destination Lindbergh Technical Report, pg. 2-52). Lastly, the U.S. Marine Corps Recruitment Depot (MCRD) is located along the North also contributing to constraints for expansion and environmental impacts that must be taken into consideration.

Figure 2



LEGEND

- Airport property boundary
- Teledyne Ryan property
- Existing building
- Historical building

Source : Affinis and Walter Enterprises, 2006

DESTINATION LINDBERGH

NORTH

0 250 500 1000

Scale: 1" = 500'

Figure 2-13
HISTORICAL RESOURCES

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Aside from the noise mitigation efforts mentioned above, traffic and circulation elements surrounding the SDIA must be addressed when attempting to improve infrastructure. Several roadways surrounding the SDIA operate at level of service that is marked with future need for capacity improvements during peak periods. This level of service is determined to be at grade of D during peak periods. These roadways include: India Street, Nimitz Boulevard and North Harbor Drive (Destination Lindbergh Technical Report, pg. 2-48). The types of development being recommended may result in significant shifts in local traffic patterns to and from the airport.

The SDIA is located completely within California's Coastal Zone, designated by the California Coastal Act of 1976. Communication with the California Coastal Commission (CCC) would be necessary to allow for their approval. The Authority would have to coordinate with the CCC as well as other entities to update the California Coastal Zone Plan to include improvements associated with the proposed Destination Lindbergh (Destination Lindbergh Technical Report, pg. 2-52). There are many constraints related to the SDIA that must be taken into consideration when improving the site in any way.

Aviation Demand Forecast

The SDIA is the busiest single-runway airport in the United States. It handled over 18 million passengers, 230,000 aircraft operations and around 155,000 tons of air cargo in 2007. The physical parameters of the airport are the smallest of any large commercial airport in the United States at 661 acres of land (Destination Lindbergh

Technical Report, pg. 3-1). As a result, the SDIA may not be able to accommodate all of its future demand. Two forecasts were developed for the planning effort associated with Destination Lindbergh, unconstrained and constrained.

The unconstrained forecast scenarios were developed to depict the broad range of potential aviation activity that could be experienced up through 2030 and are purely market-driven. This passenger forecast is driven primarily through the domestic origin and destination traffic accounting for almost 90% percent of enplanements at SDIA today. Regardless of increased fare levels, the enplanement forecast projects growth but at lower levels than experienced historically. This has produced a scenario wherein enplanements are forecasted to increase from 9.2 million in 2007 to 14.1 million in 2030 (Destination Lindbergh Technical Report, pg. 3-5). The price of jet fuel and oil will directly impact this passenger forecast as this in turn will affect airline ticket prices.

The constrained forecast takes into consideration that the SDIA may not be able to provide facilities necessary to accommodate the unconstrained forecast activity levels. The SDIA is constrained by location and it has been determined that 848 daily operations is the maximum level allowed predicted to occur in approximately 2026 (Destination Lindbergh Technical Report, pg. 3-17). In this forecast civil operations are held consistent and at the same 2007 level creating a no growth scenario. Airlines will need to increase aircraft size and passenger load factors to accommodate the demand in this scenario. With or without the introduction of an intermodal transit center, the SDIA is only able to process a certain level of planes daily.

Uncertainties are associated with long-term aviation demand forecasting so planning activity levels (PALs) were identified to represent future levels of activity upon which key airside and landside improvements would need to be completed. Activity levels could deviate from the forecasts but using PAL triggers allows for facility planning tied to actual activity levels as they occur. PAL1 and PAL2 scenarios were chosen to correspond to baseline aviation activity for 2020 and 2030 with PAL2 representing the constrained activity level that would be reached by 2030 (Destination Lindbergh Technical Report, pg. 4-1).

Concept Development

A north-centric scenario, a south-centric scenario and a hybrid scenario are the three chosen to deal with the expansion of the SDIA (Destination Lindbergh Technical Report, pg. 5-1). Three site scenarios have been developed for the ultimate build out of the SDIA. Given the current shape of the airport land in relation to surrounding facilities, these scenarios were the only means to improve accessibility. These three scenarios have been considered for the ultimate development of the airport working towards the inevitable build-out of the SDIA. Important to bear in mind is that to the North of the airport, existing rail lines and the Interstate-5 provide the opportunity for increasing accessibility by introducing new modes of transit connected to the airport.

The north-centric scenario is focused on providing all passenger services and accessibility to the north end of the property. A brand new Intermodal Transit Center (ITC) would be constructed between the airport and the I-5. The ITC will service the

Coaster, trolley, bus, high-speed rail, Amtrak and automobile access. Relocation of all support facilities would be incorporated into this scenario as they are currently located in the northern end of the airport property. This includes moving the air traffic control tower, aviation fuel facilities and general aviation facilities to the south side of the runway (Destination Lindbergh Technical Report, pg. 5-2).

In the south-centric scenario the focus maintains passenger processing facilities on the south side of the airport. There would be no creation of an ITC and improving intermodal access to the airport would not be possible given the location of rail infrastructure located on the North side of the airport. Support facilities would remain on the north side and the airport would continue to look the way it does today. Build-out of this kind of scenario would occur quicker as flights in and out of the airport would remain essentially unchanged (Destination Lindbergh Technical Report, pg. 5-3).

The hybrid scenario incorporates passenger terminal facilities in the north and in the south so that terminals would be located on both sides of the runway. Facilities would be connected by an Automated People Mover (APM) system so that passengers would be able to move between terminals. Primary access to the airport would be from the north including I-5 and intermodal accessibility. Due to the inability to know exactly where the location of the passenger terminals will be at this time, the relocation of the support facilities would be decided after locating the terminals. An ITC with parking access would be created along the north side were additional passenger terminals would be located. The Coaster, trolley, bus, high-speed rail, Amtrak and automobile

access would be located within or around the new ITC. All airline gates will continue to remain on the south side with this scenario (Destination Lindbergh Technical Report, pg. 5-2).

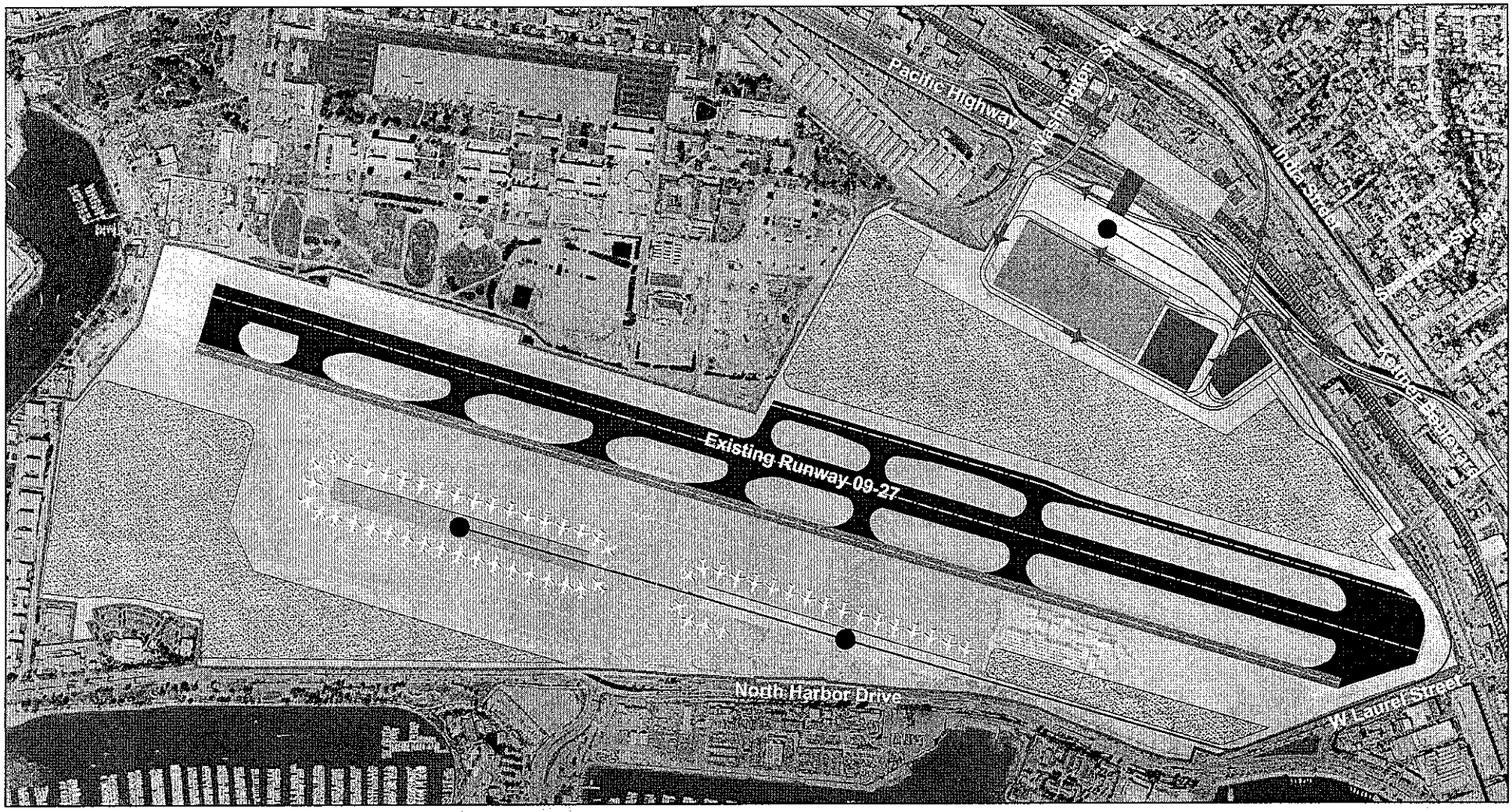
Six concepts were evaluated and ultimately selected to deal with the proposed scenarios. Concept 2 relocates all passenger processing facilities to the north side of the runway where an ITC would be developed near the existing rail corridor. This would consolidate ticketing and security screening within one facility and a secure APM would connect the ITC, passenger processing and security screening to a new remote concourse in the south. Structured parking and a CONRAC facility would be co-located with the ITC and support facilities would be able to remain where they are currently. Redevelopment of existing Terminal 1, Terminal 2 East and the Commuter Terminal site would need to occur to accommodate new concourses (Destination Lindbergh Technical Report, pg. 5-7).

Alternatives Evaluation

There were seven alternatives identified through extensive alternative analysis drawn from concept development scenarios for Destination Lindbergh. For the purposes of this paper only Alternative A2 will be discussed as this is the recommended plan by decision makers and elected officials. An example of this alternative is shown in Figure 3. This is a north-centric scenario with a single entrance to passenger processing facilities on the north side of the runway. An ITC with transit platforms would be located adjacent to the new processing facility containing rental car parking and public parking

(Destination Lindbergh Technical Report, pg. 6-1). Two satellite concourses containing 61 gates would be located south of the runway connected by an APM either in a tunnel under the runway or an at-grade alignment around the runway. All changes are shown in Figure 3. Further analysis will be conducted to determine configuration of the APM. Baggage would be transported to the south concourses by baggage carts or a conveyance system with dual aircraft taxi lanes provided around the satellite concourses allowing for efficient aircraft taxiing (Destination Lindbergh Technical Report, pg. 6-2).

Figure 3



LEGEND

- Airport property boundary
- Existing airfield
- Future taxiway
- Apron
- Support facilities
- Future Terminal/ Concourse - PAL1
- Future Terminal/ Concourse - PAL2
- Potential APM alignment
- APM station
- Rental car support
- Intermodal transit center/CONRAC
- Passenger gateway
- Public parking
- Inbound road
- Circulation road
- Outbound road
- Direction of travel
- Rail right-of-way

NORTH

0 350 700 1400

Scale: 1" = 700'

Figure 6-1
ALTERNATIVE A2

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San Diego International Airport
March 2009

DESTINATION LINDBERGH

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Airport Management Consulting

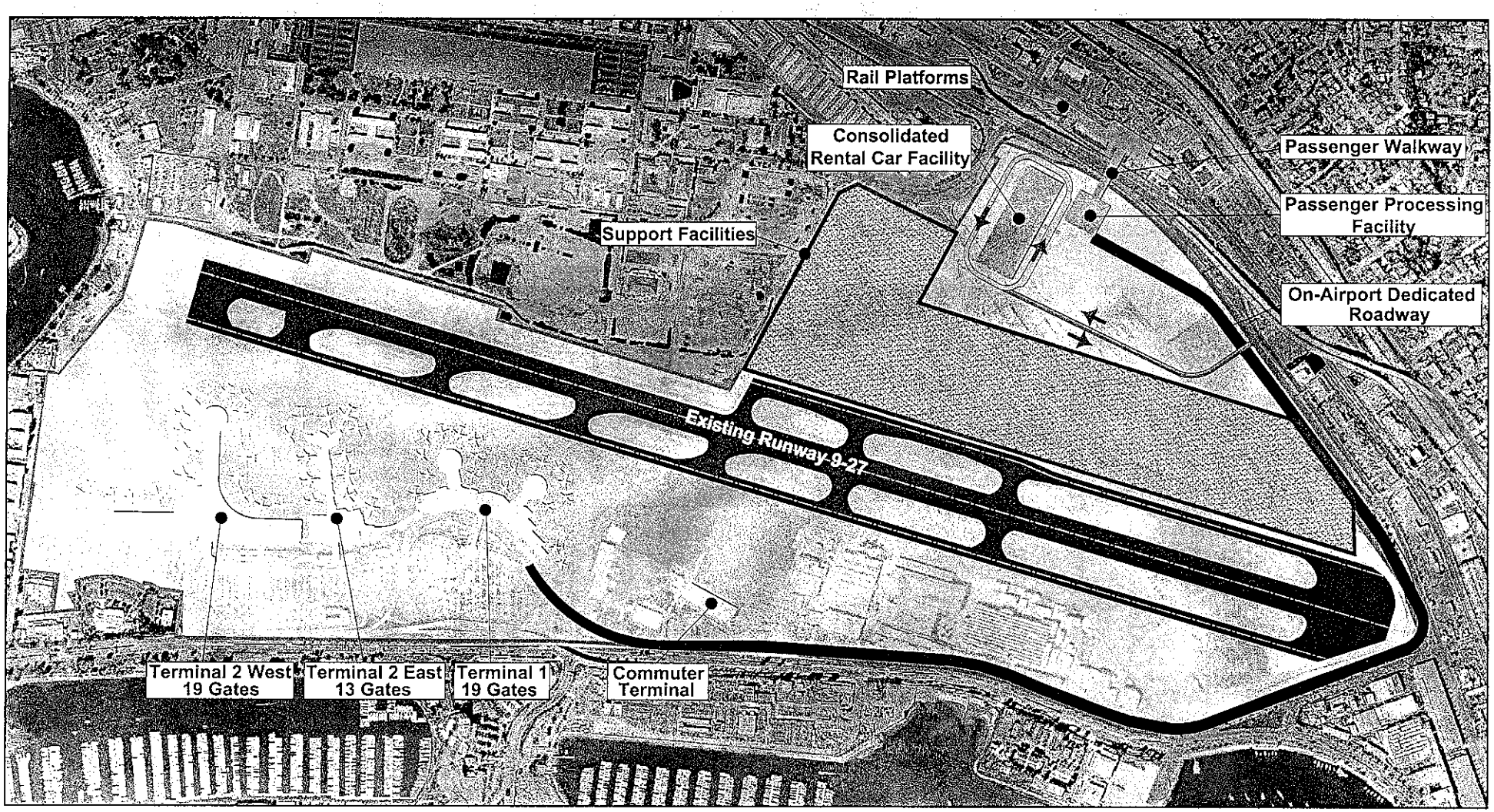
Recommended Development Plan

The recommended development plan combines several aspects of alternatives but most resembles alternative A2. After thorough screening, Alternative A2 provides the previously stated single-entrance in preparation for the ultimate build out of the SDIA. This plan consists of three phases producing incremental growth for airport activity starting at the baseline year of 2012 through the forecasted year of 2030. An opening day phase will be in place by 2015 projecting PAL1 planning activity levels at 2020 with final PAL2 development in year 2030. Throughout this time a balance of functional airport facilities will be maintained with minimal impacts to current operations (Destination Lindbergh Technical Report, pg. 7-1).

The decision to use the north terminal layout correlates to the many unique aspects of the land that the airport is located on. The constrained nature of the site, the unique characteristics of the Pacific Highway, adjacent rail corridor, close proximity to the I-5 and surrounding environmental situations caused Alternative A2 to be the best choice for this project. Figure 4 shows the Recommended Development Plan with the new facilities located to the north. The layout of the new design has all public transportation within close proximity to the main terminals. One of the most important factors was adequate vehicular access and functional circulation while phasing facilities over time. An organizing principle for the roadway system is based on an elevated primary access loop located above the Pacific Coast highway. Two secondary loops will be connected to this primary loop allowing for the two-level private and commercial

vehicle curbsides used for passenger pick-ups and drop-offs and continuous curb frontage on either side of the terminal (Destination Lindbergh Technical Report, pg. 7-2).

Figure 4



LEGEND

- Airport property boundary
- Existing airfield
- Apron
- Baseline facilities
- Opening day facilities
- Inbound road
- Circulation road
- Outbound road
- Direction of travel

DESTINATION LINDBERGH

NORTH

0 350 700 1400

Scale: 1" = 700'

Figure 7-1
RECOMMENDED DEVELOPMENT PLAN-
OPENING DAY FACILITIES

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The Passenger Experience

Passenger processing facilities in the north would be made up of airline ticketing, baggage claim and passenger security screening. After checking in for a flight a passenger would participate in security screening and then be transported to the south concourse using the secure APM proceeding to their gate. Conversely, arriving passengers would board the APM and proceed to the baggage claim located in the north terminal where a two-level private and commercial vehicle curbside would be included for passenger pick-ups and drop-offs (Destination Lindbergh Technical Report, pg. 6-2).

Transit passengers will find the ITC located in the north serving the Coaster, trolley, Amtrak, MTS bus operations, shared-ride vans, public airport parking, transit user parking and the CONRAC facility. The ITC will be connected to the CONRAC through a passenger gateway corridor. The improved CONRAC facility will serve the renting and returning of rental cars, storage parking spaces, customer service counters and quick turnaround facilities such as washing and fueling areas. Rail right of way would be preserved with this alternative for a future high-speed rail corridor with sufficient space for an associated rail station and parking facilities. Support facilities will remain in their current location (Destination Lindbergh Technical Report, pg. 6-2).

Opening Day Facilities- 2015

Planned opening day facilities are designed to accommodate 20 million annual passengers. The facilities used to accommodate these passengers include the ITC, CONRAC, a customer service building linked to the ITC using a pedestrian bridge and a

new dedicated airport road connecting the ITC and rental car garage to the terminals on the south side (Destination Lindbergh Technical Report, pg. 7-3). Opening day would begin the construction of the first phase of the ITC on the north end of the property. This would provide an airport link to the blue and orange trolley lines, MTS bus routes, the Coaster and Amtrak. Parking would be available for both transit users and airport passengers at the ITC (Destination Lindbergh Technical Report, pg. 7-3).

It is projected that anywhere from 90%-95% percent of passengers will continue to drive their private automobiles however this statistic does produce an increase in transit ridership overall as compared to current day. Terminals accessed using North Harbor Drive would continue to be available as well as the option to park at the ITC. Passengers arriving by transit with no luggage would check in at kiosks located at the customer service center and then take a shuttle to the terminals on the south side. Passengers with luggage would take the same shuttle as those without luggage to the south terminals to check in (Destination Lindbergh Technical Report, pg. 7-6).

A Technical Working Group attended on 2-25-2010 was developed from the Ad Hoc Committee previously mentioned. During this meeting it was explained that this phase is designed to be “stand-alone” meaning that if funding for the next two phases are not realized, this configuration will continue to be an improvement. Then as funding progresses the next two phases will be implemented. No new passenger processing facilities are planned for opening day. A dedicated on-airport roadway will be designed to connect the ITC with the south terminals. No new aircraft gates will be developed and

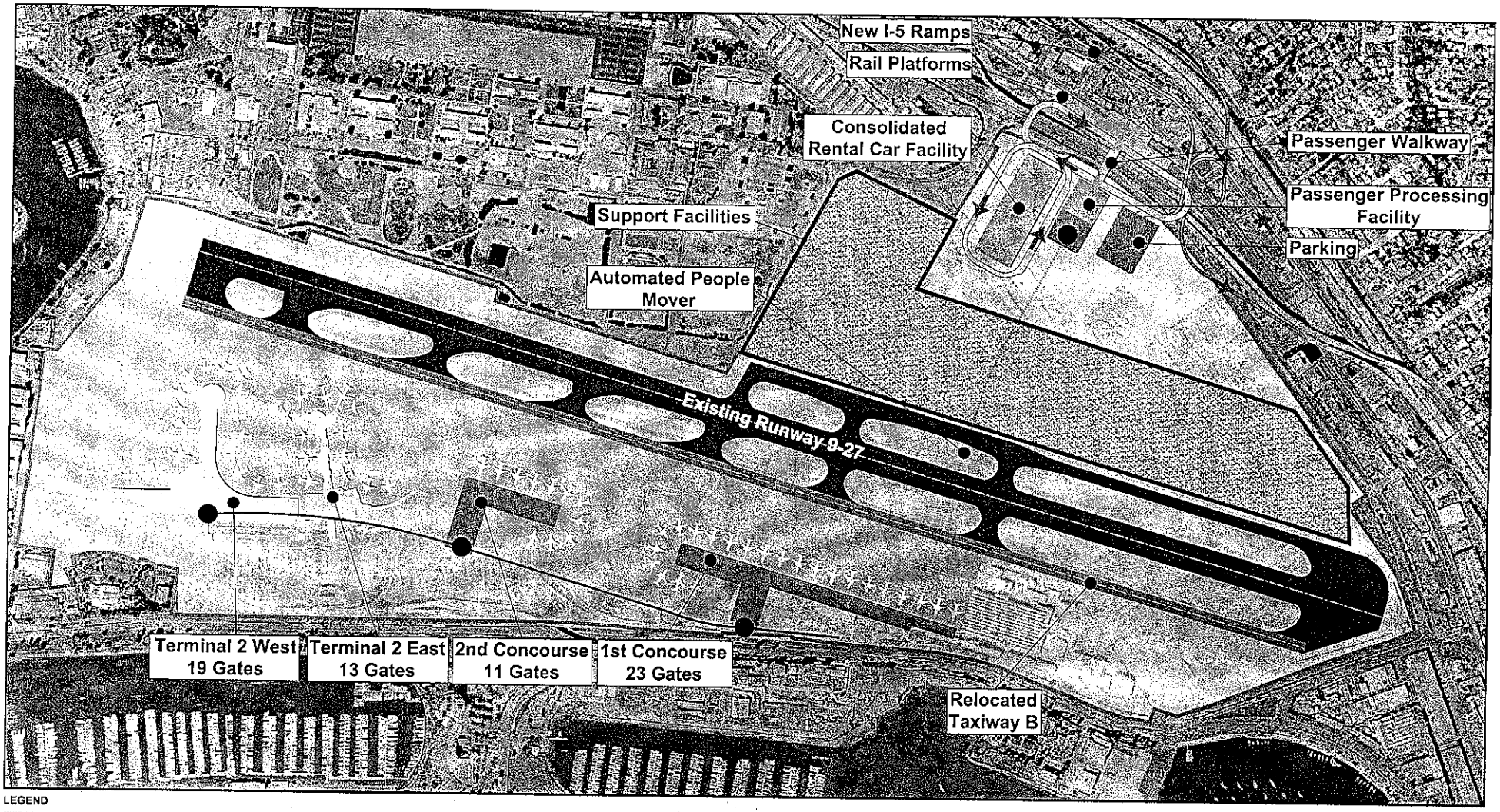
all airport support facilities will remain in their present locations (Destination Lindbergh Technical Report, pg. 7-5).

Phase Two Development (PAL1) - 2020

The facilities planned for this phase are designed to accommodate 22 million annual passengers. Existing Terminal 2 would operate as it does today as an independent terminal capable of ticketing and security requirements with baggage claim split between the north and south sides of the airport. Improvements to the ITC will occur, new passenger processing facilities will be developed along the north side, new structured parking will be developed and a new APM would connect both sides of the runway (Destination Lindbergh Technical Report, pg. 7-6).

It is projected that 85%-90% percent of passengers will be arriving in private vehicles during implementation of phase two. Passengers flying out of the new concourses would be required to check-in on the north side and use the APM to access their gates. All passengers flying out of Terminal 2 would have the option of parking at the north terminal, which will be directly connected to the I-5, and taking the APM to their gates or use North Harbor Drive to directly access their terminal. The location of a Direct Access Ramp (DAR) is shown in Figure 5 as well as the Automated People Mover needed to transport passengers to their gates during this hybrid stage of the project. Passengers using transit would arrive at the ITC, check-in and check their luggage on the north side terminal, then ride the APM to reach security screening at their concourse (Destination Lindbergh Technical Report, pg. 7-9).

Figure 5



LEGEND

- Airport property boundary
- Existing airfield
- Future taxiway
- Apron
- Existing facilities
- Opening day facilities
- PAL1 facilities
- Potential APM alignment
- APM station
- Inbound road
- Circulation road
- Outbound road
- Direction of travel

NORTH

0 350 700 1400

Scale: 1" = 700'

DESTINATION LINDBERGH

Figure 7-2
RECOMMENDED DEVELOPMENT PLAN-PAL1 FACILITIES

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March 2009

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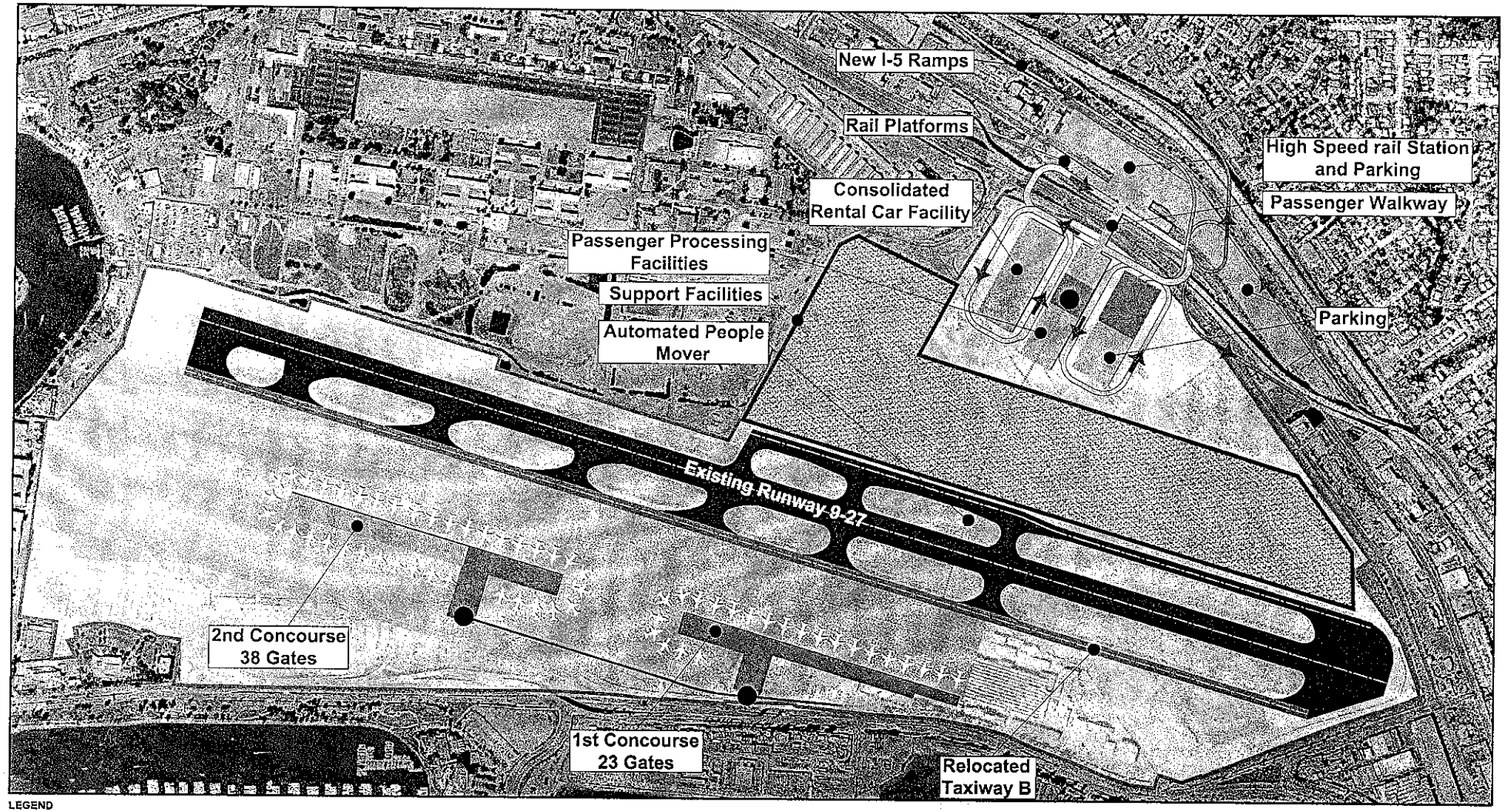
Phase Three (PAL2) Ultimate Build-out- 2030

The final phase of Destination Lindbergh is designed to accommodate 28 million annual passengers and all passenger processing facilities would occur on the north side of the runway. Overall improvements to the constructed parking garage, passenger processing functions and satellite concourse improvements would be completed. Terminal two would be removed in this phase to allow for concourse expansion making it necessary for all passengers to ride the APM to their prospective gates (Destination Lindbergh Technical Report, pg. 7-10). Figure 6 shows all check-in activity has moved to the north side of runway and gates located along the south will only be accessed by using the APM.

All passengers will now access the airport through the north terminal. All security screening, ticketing, passenger processing and baggage claim will be located in the north end. All passengers would board the APM traveling to the concourses because North Harbor Drive will no longer be available as an access route (Destination Lindbergh Technical Report, pg. 7-12). The ITC at this stage will be ready to accommodate 8.5%-13% percent transit ridership and with the addition of high-speed rail this has the potential to increase to as much as 9.5%-15% percent. High-speed rail will be located on an elevated track along the Pacific Highway possessing direct pedestrian connection to the ITC. Additional parking will be constructed for all facilities including the high-speed rail between Kettner Boulevard and Washington Street with an effort to maintain the historic San Diego Brewery (Destination Lindbergh Technical Report, pg. 7-10).

Figure 6



LEGEND

- Airport property boundary
- Existing airfield
- Future taxiway
- Apron
- Opening day facilities
- PAL1 facilities
- PAL2 facilities
- Potential APM alignment
- APM station
- Inbound road
- Circulation road
- Outbound road
- Direction of travel

DESTINATION LINDBERGH

NORTH

0 350 700 1400

Scale: 1" = 700'

Figure 7-3
RECOMMENDED DEVELOPMENT PLAN-
PAL2 FACILITIES

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March 2009

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Government and Legislative Goals

Due to environmental awareness of climate change and the contributing forces of green house gas (GHG) emissions, alternatively fueled transportation such as high-speed rail, light rail and public transit in general has become increasingly emphasized. The California Energy Commission (CEC) and the California Air Resources Board (CARB) has set a goal for our state that 20% percent of all transportation energy used by the year 2020 must come from alternative fuels. Today around 6% percent of our transportation energy comes from alternative fuels. Our state's demand for transportation fuels has increased by 53% over the last 20 years and if this goal was not set by concerned government agencies the projected level of consumption would have increased another 36% percent. Including the electrically powered high-speed rail in Destination Lindbergh will relieve inefficient short-haul aviation flights causing a decrease in overall fuel consumption. California refineries rely increasingly on imported petroleum products to meet our current demand and an increase would mean major reliance on other countries petroleum. This is unsustainable for our country as a whole and unsafe due to political barriers. If California successfully meets this goal through travel that uses alternative fuels such as high-speed rail, about 4.8 billion gallons of gasoline and diesel will be saved on an annual basis (2030 San Diego Regional Transportation Plan, pg. 5-24).

Senate Bill 10 (SB10) passed in 2007 requires airport multimodal planning to be conducted by SANDAG and the Authority regarding SDIA. Main aspects of this bill

require the development of a Regional Aviation Strategic Plan (RASP) along with an Airport Multimodal Accessibility Plan (AMAP). Components produced by the RASP will be incorporated into the AMAP. The results from this study will incorporate aviation and surface transportation infrastructure needs to provide inputs into the 2050 Regional Transportation Plan (San Diego Regional Air-Rail Network Study Scope of Work, pg. 1). High-speed rail will be studied as a means of finding out whether it can feasibly connect the capacity constrained SDIA to other southern California airports projected to have excess capacity. This will allow short haul aviation flights to move to nearby airports and the SDIA will have more space for long-haul aviation trips and hopefully the space for a new customs facility. Updates for this study are provided by the SANDAG Transportation Committee at their March 19, 2010 meeting.

Senate Bill 375 requires the next Regional Transportation Plan update to achieve GHG emission reduction targets from passenger cars and light-duty trucks by 2020 AND 2035. This legislation now requires a new section of the Regional Transportation Plan known as the Sustainable Communities Strategy. This section will show how regional GHG reduction targets established by the CARB will be achieved through transportation infrastructure investments, development patterns and transportation policies that are determined to be appropriate. For the next Regional Transportation Plan update SANDAG will be the first major Metropolitan Planning Organization (MPO) in the state to include the provisions of SB375 (Regional Energy Strategy Update, pg. 6).

Assembly Bill 32 (AB32) was passed in 2006 and is called the California Global Warming Solutions Act. This legislation established the 1990 emissions level as the statewide limit for the year 2020. This is an approximate reduction of the baseline levels examined in 2006. This bill goes as far as to call for regulatory market mechanisms to reduce emissions and achieve targets (Regional Energy Strategy Update, pg. 12). Destination Lindbergh is able to have multiple impacts on this legislative bill. Improving transit ridership connectivity to the airport will assist in reducing GHG emissions as people will now have another alternative to driving their car to the airport or having someone drop them off. The inclusion of the high-speed rail will not only allow for alternative fuel travel between cities in southern California but reduce air trips out of the SDIA that were formerly needed to access nearby cities. Congestion on the roads has reached levels wherein travelers pay to fly to cities that are close in proximity to San Diego.

An important issue incorporated into the 2030 Regional Transportation Plan is that one million more people will be arriving in the region causing San Diego to plan accordingly. Although the region's rate of population is slowing, continued growth is projected at around 1% percent per year (2030 Regional Transportation Plan Technical Appendix, pg. 2-1). This will put tremendous pressure on our circulation system including our airport so providing additional capacity to key transportation corridors and focusing investments towards infrastructure will benefit both transit riders and drivers through relieving congestion (2030 Regional Transportation Plan Technical Appendix, pg. 3-13). For this reason SANDAG has made refinements to our transportation and

transit network based on evidentiary findings. This includes a greater emphasis on serving the region's urban core areas, focusing on maximizing transit mode shares in key activity centers and investing in transit priority capital improvements such as station design providing reliable transit services (2030 Regional Transportation Plan Technical Appendix, pg. 3-14). The previous refinements made by SANDAG to our transit and transportation system support reasons why the SDIA should be turned into an ITC as it is located downtown and would incorporate all mode shares including air travel through redesigning infrastructure.

On the Federal side the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 focused on providing access to seaports and airports while simultaneously creating a transportation system that is both economically efficient and environmentally sound. Then in 1998 Congress created the Transportation Equity Act for the 21st Century (TEA-21) containing ISTEA's Intermodal concepts. Highlights of this Federal Act encourage and promote development of national intermodal transportation systems while strengthening the nation's ability to compete in the global economy by obtaining the optimum yield from the nation's transportation resources (Krockmalnic, Mickey, pg. 3).

Intermodal Transportation Centers (ITC) and Domestic Examples

Intermodal transportation centers are versatile facilities designed to offer travelers a variety of travel modes and can include everything from planes, trains, subway, bus, ferries and water taxis. Paramount to providing these options is that the

traveling public needs to be able to transfer from one mode to the next in an efficient and effective fashion. Directly below this is a needed component of providing sufficient parking for travelers so they are easily able to access whatever form of transportation conveniently gets them to their point of destination. Intermodal transportation centers are an integral part of reducing the amount of hours and money Americans spend on gasoline annually and by reducing transportation costs intermodal systems will enhance the capability of the United States to compete in the global market (Krockmalnic, Mickey, pg. 4).

Norwich, Connecticut recently opened an ITC and although no air-rail connection is included in this they have used the idea to incorporate other forms of transportation. Costing $14.5 million dollars to construct and has a 260 multi-level parking garage, bus station with intercity and local service and a shuttle and limousine service to nearby casinos. Future plans for a rail station and a water taxi service are planned as the facility is located next to a marina (Domenech Hicks & Krockmalnic Architects, pg.5).

The Bridgeport Intermodal Transportation Center is also located in Connecticut. Although this project cost an estimated $184 million the features contained in this project are all across the spectrum of transportation and redevelopment. The facility contains an enclosed lobby and pedestrian walkways, an office tower, water fairy and a ferry parking garage, boat slips, transit offices reside there, airport limousine and taxi service, intercity bus routes and finally Amtrak and Metro trains (Federal Transit Administration, pg.1).

The Warwick Intermodal Facility in Rhode Island will be opening for the first time in the later part of 2010. It is located next to T.F. Green Airport possesses the closest rail line to an airport in the country. Directly next to this $267 million dollar facility will be many options and other facilities. This includes a consolidated rental car facility, a six level parking garage for rental car operators and rail commuters, a bus hub for local and intercity busses and a structure with walkways and moving sidewalks to shuttle passengers to and from the airport. This intermodal transportation facility is expected to generate $127 million a year to the local economy (Green Airport Intermodal Transportation Facility, pg.1).

Senator Patricia McGovern Transportation Center is located in Lawrence, Massachusetts and is run by the Merrimack Valley Regional Transportation Authority. This center has bus and airport shuttles to the nearby Lawrence Municipal Airport and also includes a commuter rail station, a 900 car multi usage garage, bus terminal and train connections. This building cost around $26 million dollars to construct and is helping to revitalize a once flourishing rust belt town (Merrimack Valley Regional Transportation Authority, McGovern Center, pg.1).

There are numerous benefits associated with constructing an ITC. The obvious impact is that they reduce traffic congestion and other negative side effects such as air pollution. Intermodal Transportation Centers however improve the quality of life for all people inside the community, tourists from outside the community, transit users and drivers of private automobiles. This is accomplished by providing better public transit for

those who enjoy using it, thus assisting them first. This then causes less people to be on the roads making life easier for those whom must drive. Travelers will be able to pay less for transportation and the ever increasing cost of fuel while the residents in the community receive all of the previously stated advantages (Krockmalnic, Mickey, pg.3). Additional benefits include the potential to lure business investment and redevelopment providing additional sources of generated income for the city.

International Examples

Toronto, Canada has experienced dynamic growth and sprawling development over the years. For this reason Toronto has stated that it is critical to keep up with the city's transportation infrastructure and that public transit systems keep pace with the continued expansion. Beginning in 2001, Transport Canada (TC) began facilitating development of a rapid passenger rail service between Lester B. Pearson International Airport (LBPIA) and Union Station. This is considered an important element in the continued growth and expansion of the greater Toronto Area. This air-rail link will connect the biggest airport in Canada with the busiest surface passenger transportation hub in the country eliminating approximately over 1.5 million car trips in the first full year of operation. Called Blue 22, this rail service will deliver passengers between LBPIA and Union Station in 22 minutes starting in the early morning, operating for 19 hours and departing every 15 minutes (Air-Rail Link from Toronto-Lester B. Pearson International Airport to Toronto Union Station, pg.1). Funding is being broken up between private and public interests. The Canadian Federal Government is contributing

$385 million dollars from the Canada Strategic Infrastructure Fund with Ontario providing matching funds. The municipalities served by this area are contributing an additional $235 million dollars towards upgrades. A portion of this funding will be used to upgrade shared infrastructure on the Georgetown corridor and the Union Station corridor (Air-Rail Link from Toronto-Lester B. Pearson International Airport to Toronto Union Station, pg.2).

The Manchester Airport in the United Kingdom recently released an investment package totaling $530 million dollars cutting back journey times for passengers traveling to the airport. This plan would increase trains running through the north-east of England by 40% percent and increase passenger numbers by 3.5 million a year. There will be considerable investment in rail over the next ten years. It is expected that journey times between Newcastle, Durham and Darlington to Manchester Airport would decrease by a half of an hour. New inter-regional and trans-pennine services will be included that allow six trains every hour between Leeds and Manchester taking as little time as 43 minutes. Manchester's vision is to produce miles of new track, new platforms, electrification, keeping people off of the already congested roads (Faster Rail Connections for Manchester Airport, pg.1).

The country of Brazil has allowed international bidding for a $17.4 billion dollar bullet train project between major airports. Running between Campinas and Rio de Janeiro, this rail line will have stops at seven stations and smaller airports in between. The rail line connecting these airports will allow for travel at speeds of up to 350

km/hour and journey time between the two cities will be decreased to a total of 97 minutes. Brazilian officials say that they will award the project to the bidder that can guarantee the lowest fares and highest level of technological transfer for passengers. They have requested setting a fare ceiling of 28 cents per kilometer to ensure that the new rail line is competitive with existing passenger air service between Sao Paulo and Rio de Janeiro. The railway is anticipated to be finished with construction by the 2016 Summer Olympics (Consortia Gather for Brazilian Train Bid, pg.1). Construction is expected to begin in March of 2010 (Consortia Gather for Brazilian Train Bid, pg.2).

Conclusion

The proposed Intermodal Transit Center at the SDIA is a cooperative effort between the Authority, SANDAG, and the City of San Diego, in coordination with other transportation stakeholders, to address the future access needs of travel within the county. Many other cities in the United States and across the world are developing similar projects, all incorporating intermodal transportation links with an emphasis on connecting airports with other forms of transportation. The advantages to the public include saving money on transportation infrastructure, saving on costs of travel, saving time to travel with the option of using various modes of transportation. Additional benefits include environmental impacts causing a decrease in GHG emissions into the atmosphere and a decrease in traffic congestion throughout the surrounding area.

Destination Lindbergh is a project with three phases wherein all phases are capable of standing alone depending upon financial feasibility and community support.

For this reason completion of any phase will be an improvement. Effort has gone into defining the long-term goals for the County of San Diego while facilitating communication between all regional partners that may have a stake in the project. The aviation demand forecast for the county also supports reasons why this project should be carried through to completion as the existing conditions are not suitable for the expected growth by 2030. The concept chosen is one of careful alternative evaluation while considering the passenger experience and community character, all held to the highest standards. This is a project that will allow San Diego to continue to grow while meeting the transportation needs of the entire county.

Recommendations

In my opinion the concept development that was chosen for the final phase is not one that I agree with entirely. The second phase of the project that contains the option to access terminals on both sides of the runway seems to provide the most amount of options to the public verses the final option presented wherein only northern access is available for terminal entry. This is important because as Americans, we enjoy options and having a choice between accessing the northern or southern end of the runway will provide just that. Additionally, real-time updates can be available so that people traveling to the airport, whether by transit or by private automobile, will have the option of choosing the side that is less congested at that time decreasing congestion at busier terminals and increasing overall efficiency and effectiveness of the airport. The hybrid concept seems to make the most sense to me as more options usually means

that travelers will have an overall higher level of satisfaction as they had a choice of which entrance to access.

Hybrid Concept Five is my preferred concept. It allows multiple access points, more options for travelers, includes the ITC, has a non-secure APM and creates the least amount of reorganization allowing for current facilities to remain in place to the highest extent possible. This will produce the least amount of debris from construction materials to be sent to landfills due to relocation of buildings while simultaneously assisting with the preservation of historic resources and other sensitive relationships surrounding the airport.

Alternative A3 works in tandem with the hybrid concept 5 by possessing two passenger entrance points to the airport with passenger processing facilities located on both sides. One entrance would be from I-5 to the north terminal with the second entrance located along North Harbor Drive to the T2 West terminal or Baseline Terminal/ Concourse. The addition of two linear satellite concourses and T2 West would create a total of 61 aircraft gates. Passenger processing for the two satellite concourses with around 42 gates would be located in the north terminal while passenger processing for the existing Terminal 2 West would remain in the south with 19 gates. Both facilities would be connected with an APM that is non-secure allowing passengers, employees and others the option of entering into the least congested access point at the time while continuing to access all parts of the airport. Passengers would then pass through security screening checkpoints in the concourse after riding the APM. All baggage would

need to be transported from the north terminal to the south concourses either by baggage carts or a conveyance system. Lastly, rail right-of-way would be preserved for potential future high-speed rail facilities and primary support facilities would remain in their existing location north of the runway (Destination Lindbergh Technical Report, pg.6-4).

My recommendation, the recommendations of Jacobs Consultancy or elected officials and decision makers would be an enormous improvement for the region as long as intermodal transit is prioritized. The concept of an intermodal transit center has been well researched and is used all over the world. Benefits to the environment, the community and efficient transportation are all benefits that I would like to see brought to the San Diego International Airport. Our region will continue to grow and there must be a way to organize our transportation system in a more effective way than we are currently attempting. Intermodal Transportation Centers are in the process of becoming the standard for transportation systems and San Diego must be part of this movement. Lastly, government policies and standards have been set that we as a county must adhere to and Destination Lindbergh presents a way to assist in accomplishing these goals.

Works Cited

AirRail News. Consortia Gather for Brazilian Bullet Train Bid. April: 2010.

www.airrailnews.com/index.php?option=com_content&view=article&id=445:consortia

AirRail News. Faster Rail Connections for Manchester Airport. April: 2010.

www.airrailnews.com/index.php?option=com_content&view=article&id=443:faster-r

Culp, Linda. San Diego Association of Governments (SANDAG). Intermodal Transportation Center (ITC) at

San Diego International Airport. Consultant Task Order. San Diego:2005.Culp, Linda. San Diego Association of Governments (SANDAG). San Diego Regional Air-Rail Network

Study. Scope of Work. San Diego: 2007.

Domenech Hicks & Krockmalnic Architects. Hollyhock Island Transportation Center- Norwich, CT. 2010.

www.dhkinc.com/Transportation/Intermodal_stations/2505.asp

Green Airport. Intermodal Facility. Warrwick: 2010. www.pvdairport.com/main.aspx?sec_id=89

Jacobs Consultancy. Destination Lindbergh Executive Summary San Diego International Airport.

San Diego: Jacobs Consultancy, 2009.

Jacobs Consultancy. Destination Lindbergh Technical Report San Diego International Airport. San Diego:

Jacobs Consultancy, 2009.

Krockmalnic, Mickey. "Intermodal Transit Centers." MassTransitMag.com. April: 2010.

www.masstransitmag.com/online/article.jsp?siteSection=5&id=6600&pageNum=1

Merrimack Valley Regional Transit Authority. McGovern Center. Bradford, Massachusetts. 2010.

www.mvrta.com/homepagecontent/McGovern-Center.aspx

San Diego International Airport. Airport Transit Plan 2008. San Diego: Airport Transit/Roadway

Committee, 2008.

www.san.org/documents/airport_authority/transit_roadway/08Aug_Final_Report/SAN_Transit_Final_Aug08_report.pdf

Canada. Transport Canada. Air-Rail Link from Toronto-Lester B. Pearson International Airport to Toronto

Union Station. April: 2010.

www.tc.gc.ca/eng/mediaroom/backgrounders-b03-a047e-1610.htm

United States. U.S. Department of Transportation, Federal Transit Administration. Bridgeport

Intermodal Transportation Center Finding of No Significant Impact. Bridgeport: 2003.

www.fta.dot.gov/documents/BridgeportIntermodal.pdf

United States. San Diego Association of Governments (SANDAG). Regional Energy Strategy Update. San

Diego: 2009.

United States. San Diego Association of Governments (SANDAG). San Diego Regional Transportation Plan

Final 2030. San Diego: 2007.

United States. San Diego Association of Governments (SANDAG). San Diego Regional Transportation Plan

Final Technical Appendices. San Diego: 2007.

United States. San Diego Association of Governments (SANDAG). Update on the Regional Aviation

Strategic Plan (RASP) and the Airport Multimodal Accessibility Plan (AMAP). Transportation

Committee. San Diego: March 19, 2010.