THE NORTHERN COLORADO TRANSPORTATION INTERNSHIP PROGRAM (NCTIP)

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ACKNOWLEDGEMENT

The Northern Colorado Transportation Internship Program began as an enterprising vision of Richard Gutkowski, professor of civil engineering at Colorado State University. In cooperation with officials from the City of Fort Collins and Larimer County, Gutkowski regularly has placed Colorado State University undergraduate students into internship positions in transportation organizations. Example organizations include the North Front Range Transportation and Air Quality Planning Council (NFRT&AQPC); the City of Fort Collins; the City of Loveland; Balloffet and Associates, Inc.; and Kimley-Horn, Inc. Two individuals from the City of Fort Collins, Vicky McLane and John Daggett, contributed valuable time and support at the inception of this project and continue to provide positions for students. Michelle Logsdon initially organized and oversaw the day-to-day operation of the internship program. Special acknowledgement is given to the students who wrote reports for this document: Jenny Rodgers, Alan Eckman, and Peter Marxhausen.

DISCLAIMER

ABSTRACT

The field of transportation is rapidly becoming a popular career choice for undergraduate engineering students. Many work opportunities are available in the area of transportation including computer software analysis, field testing, and consulting. Unfortunately, these opportunities are not always accessible to younger engineers without experience. Mountain Plains Consortium (MPC) at Colorado State University is bridging the gap between employers and students with the Northern Colorado Transportation Internship Program (NCTIP). Since its inception in January 1998, NCTIP has placed approximately 25 students into working environments across the Front Range.

This report includes writings of three interns summarizing their NCTIP experiences. The students completed internships between August and December 1998. All three students received different training while working on intriguing, and sometimes controversial, projects. Peter Marxhausen, who worked with the City of Loveland on a comprehensive traffic plan, wrote the first summary. Alan Eckman wrote the second summary on his experience at the NFRT&AQPC, studying transportation alternatives for major corridors in the Northern Front Range area of Colorado. Jenny Rodgers wrote the final summary about working with the engineering consulting firm Balloffet and Associates, Inc. Rodgers was hired as a full-time employee less than two months into her internship.

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EXECUTIVE SUMMARY

The Northern Colorado Transportation Internship Program (NCTIP) began in January 1998. Richard Gutkowski, civil engineering professor, wanted to provide Colorado State University (CSU) students more educational opportunities in the area of transportation.

Gutkowski approached several governmental agencies along the Front Range of Colorado asking them to hire an intern. The North Front Range Transportation and Air Quality Planning Council (NFRT&AQPC) volunteered to be the first employer. Along with the engineering consulting firm Kimley-Horn, Inc., the Council hired one student to work on a transportation alternatives feasibility study. Now in its fourth year, NCTIP has placed about 25 students in many different organizations and companies.

This report summarizes the work experiences of three earlier interns completing NCTIP in December 1998. Peter Marxhausen interned at the City of Loveland Transportation office.

Marxhausen completed field observations of pedestrian and vehicle movements at critical intersections. He used Microsoft Excel and Syncro software to analyze the data and create proposed intersection signal timings.

Marxhausen enjoyed his experience at the City of Loveland and said he learned valuable lessons about engineering practices. He recommends that employers consider more flexible hours to accommodate unpredictable student schedules.

The second intern, Alan Eckman, worked with NFRT&AQPC. Eckman often found himself in the public realm collecting opinions and recommendations for the transportation alternatives feasibility study. He also worked with engineering consulting firm Kimley-Horn, Inc. analyzing each mode of transportation technology suggested.

Eckman used his internship connections to land a job at an engineering consulting firm in Colorado. He said he benefited from experiencing the business side of engineering, but would like to have received more technical opportunities.

Jenny Rodgers was the third intern working during the 1998 fall semester. She was placed at the engineering consulting firm Balloffet and Associates, Inc. This company was working on several important projects throughout the city of Fort Collins. Rodgers' first assignment was completion of the Northeast Truck Route Study. Rodgers' duties changed when she became a full-time employee of Balloffet and Associates, Inc.

Rodgers says NCTIP is valuable to student engineers who need a connection to the employment world. She found the internship atmosphere less stressful when learning new software and starting new projects. She recommends advertising the internship positions earlier in the school year.

All three of the interns working with NCTIP in fall 1998 found full-time engineering positions immediately after graduating that year. These success stories explain the importance and the practicality of these types of internships. The goal of NCTIP is to introduce students to employers and help them gain the experience they need in the transportation arena before graduation.

As part of the internship experience, students are required to complete a final report at the conclusion of their work. The draft reports of Peter Marxhausen, Alan Eckman, and Jenny Rodgers are included as the body of this work. Michelle Logsdon edited the reports for grammar, content and organization before developing this document.

CHAPTER 1

NORTHERN COLORADO TRANSPORTATION INTERNSHIP PROGRAM INTRODUCTION

The Northern Colorado Transportation Internship Program (NCTIP) was created to fill a void. Richard Gutkowski, civil engineering professor at Colorado State University (CSU), recognized a lack of undergraduate transportation-related course options in the civil engineering curriculum at CSU. Accreditation constraints leave little room for such electives; however, many students were interested in that field of engineering. In an attempt to satisfy those needs, Gutkowski worked with local transportation agencies to create the NCTIP.

The first organization to hire an intern from CSU was the North Front Range Transportation and Air Quality Planning Council (NFRT&AQPC), a regional Metropolitan Planning Organization (MPO). Vicky McLane, the transportation program manager, hired Eric Eddy to build a web page that would inform the public about a transportation alternatives feasibility study. McLane was instrumental in the inception of NCTIP and continues to hire students and help with the advertising elements of the program. Another integral player in the successful startup of NCTIP was John Daggett, the senior transportation planner for the City of Fort Collins. Daggett helped mold the concept and introduced Gutkowski to relevant officials within several Front Range transportation agencies.

McLane and Daggett were impressed by Eddy's work and his professionalism. Eddy's success led to several more agencies requesting interns the following semester. Three internship positions were offered in Fall 1998. The first internship was conducted at the City of Loveland Transportation Office. CSU senior Peter Marxhausen was hired for the job.

Marxhausen was brought into the office a couple of months after the original start date of the internship because another intern left the position due to academic scheduling conflicts. Marxhausen worked with the city traffic engineer following up on a residential survey of living conditions throughout Loveland. The results showed residents were concerned with traffic volume and signal light timing.

In response to those concerns, the City of Loveland conducted traffic and pedestrian counts at crucial intersections. Marxhausen helped with this process. He also analyzed the data and created a virtual street map of Loveland to test signal-timing options.

The second intern, CSU senior Alan Eckman, was hired to follow-up on Eric Eddy's progress at NFRT&AQPC. Because Eckman worked on the second phase of the transportation alternatives feasibility study he spent most of his time talking to Fort Collins residents about traffic issues.

The third intern worked only a short time under the auspices of NCTIP. CSU senior Jenny Rodgers was hired by Balloffet and Associates, Inc. to help a team of engineers complete a long-standing truck route study for Fort Collins. Rodgers was quickly hired by the company to work as a full-time employee.

All three students completed their internships successfully. That led to more agencies and organizations coming to CSU for interns. The third semester of the program five students were hired to work in local companies. Now, typically about five to eight students are placed annually.

The following section describes the implementation and administrative requirements of the internship program.

CHAPTER 2

NORTHERN COLORADO TRANSPORTATION INTERNSHIP PROGRAM IMPLEMENTATION

The process of organizing NCTIP improves with each semester, but finding students for the positions was never difficult. Many students at CSU are interested in transportation experiences. To inform students of internship opportunities, flyers were distributed in engineering classes around the middle of the semester (Appendix A). Michelle Logsdon would make a brief presentation at the beginning of the class and distribute flyers to each student.

The flyer contained a short questionnaire for students to fill out and return to the Mountain Plains Consortium office. The forms had to be returned before a specific date to prepare an informational meeting for the students who were interested. Each student who returned a form was called and invited to the informational meeting. Students were asked to bring a resume and class schedule for the current and following semesters.

Approximately 10 to 15 students attended the informational meetings. Michelle Logsdon briefly described the opportunities available. Each internship was unique, but a few basic administrative requirements were expected from everyone. Students would work 20 hours a week during the semester and 10 hours a week during the summer session. A minimum (base) stipend of $350 was paid to each student during the semester and $500 during the summer. Employers have the option to provide higher pay and more working hours. Also, each student was required to complete a final report on his experience as an intern.

These requirements were explained to the students and each of them filled out an application for the internships (Appendix B). The students also answered several questions developed by Richard Gutkowski concerning their technological and academic experiences (Appendix C). After answering all of the questions, students returned the applications, resumes, and class schedules to Michelle Logsdon. The floor then was opened for any questions.

All information gathered during this meeting was disseminated to potential employers. Once they perused the documents, an interview schedule was determined. The interviews were conducted in two days. Each student was scheduled for one-half hour. All of the potential employers were present to ask questions as a panel. After meeting all of the students the employers were left to choose the appropriate candidate for their specific positions. Michelle Logsdon and Richard Gutkowski presented their opinions as well.

Once the selection process was complete each student received a letter stating the chosen interns. Michelle Logsdon coordinated an informal introductory meeting, but it was left to the employers to contact the students about start dates and payment. Employers and interns were introduced to each other and administrative requirements were addressed once again. This meeting provided a forum for the students and employers to ask questions about Mountain Plains Consortium or NCTIP. It also offered an opportunity to become familiar with others who were preparing for the same type of experience over the next several months.

Mountain Plains Consortium was less involved throughout the course of the internships. On occasion, Michelle Logsdon acted as liaison between the employers and students at the different locations. Otherwise, the communication was minimal until the end of the internships when students were required to complete their final reports. The following chapters include the final reports of Peter Marxhausen, Alan Eckman, and Jenny Rodgers describing their internship duties and their opinions of NCTIP.

CHAPTER 3

PETER D. MARXHAUSEN
CITY OF LOVELAND

Introduction

The City of Loveland is a rapidly growing part of the Front Range of Colorado. A rise in low density home building has increased sprawl, population, and traffic while at the same time making public transportation less feasible to the bulk of the population.

In May 1998 a citywide survey was distributed to residents to study approximately 45 issues. Items on the survey included crime, parks, pollution, street repair, traffic, traffic timing, growth, poverty, government, city services, etc. When the results of the survey were tabulated in September, the results pointed to traffic volume and light timing as being the highest of residential concern. The City of Loveland was using traffic timing techniques to relieve the heaviest burdened intersections but had not felt the pressure to move to a comprehensive citywide traffic management system. Knowing the concerns of the residents shifted the city's priorities and the Loveland Department of Traffic was challenged to make changes.

These changes required modern software and up-to-date information on the traffic patterns citywide. The traffic department of Loveland had completed turn studies of nearly all the signalized intersections in town, but most of the studies were one- to six-years-old. Clearly, using six-year-old data on critical intersections in a city growing at such a rapid rate was not adequate to the task.

The Internship

As a new member of the Loveland Traffic Department team, it was my charge to help get the citywide traffic plan under way. One of my first tasks consisted of making field visits to observe intersections where a proposed signal installation was imminent. It was at these intersections where careful observation of motorist and pedestrian interaction was crucial. The task was to tabulate the 12 principal turning possibilities of the vehicles, and the motion and location of the pedestrians. I also

needed to make a judgement on the difficulty of these movements, i.e. were specific left turn motions dangerous or time consuming, or were pedestrians intimidated by the traffic volume.

After the tabulation process was complete the Loveland Traffic Department interfaced the field computer with a PC and downloaded the information to generate a printout. The interface communication failed, therefore I generated a Microsoft Excel program to allow a manual dump of the field study results. I then calculated percent flows, principal traffic direction, total numbers of vehicles and pedestrians, and comments regarding the studied intersection (Figure 1.1).

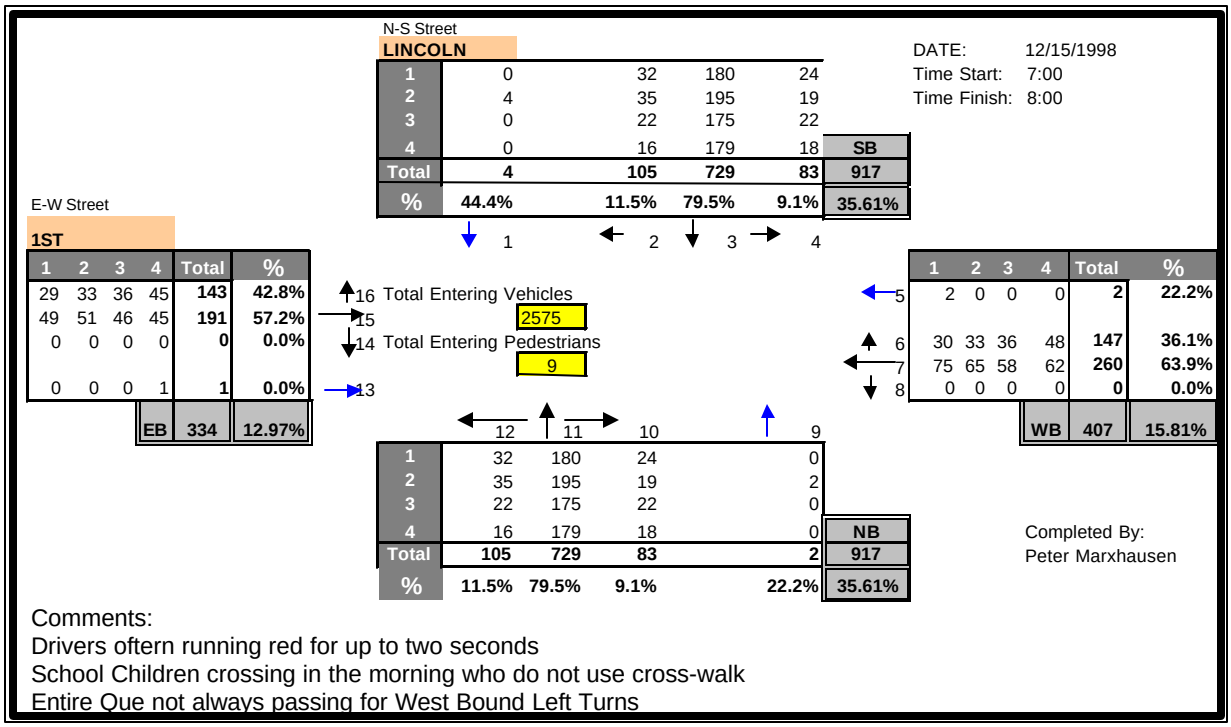


Figure 1.1 Excel Display for Presentation of Turn Studies

To transform this data to one complete document, Microsoft Excel was again used to tabulate all turning movements, make all necessary computations, check data lists for any invalid counts, and rearrange the sequence for easy data input into another software package called Syncro (Figure 2.1). Syncro, and one of its tools SimTraffic, would be used by the Loveland Traffic Department to move forward with the signalization program.

City Of Loveland Peak Traffic Counts Summary Table

Peak Hours: 4:30-5:30

12/23/98 TODAY'S DATE

1/1/96 RECENT HISTORY DEMARCATION

Land Traffic

Count	INT #	DATE	INTERSECTION	FROM NORTH RT	FROM NORTH THRU	FROM NORTH LT	FROM EAST RT	FROM EAST THRU	FROM EAST LT	FROM SOUTH RT	FROM SOUTH THRU	FROM SOUTH LT	FROM WEST RT	FROM WEST THRU	FROM WEST LT	PEDESTRIANS N	PEDESTRIANS E	PEDESTRIANS S	PEDESTRIANS W	TOTAL VEH.	TOTAL PEDS
1	21	7/9/98	Boise & Eisenhower	16	0	0	5	1220	0	3	1	2	1	1014	16					2278	0
2	8	7/10/96	Buchanan & 29th	37	703	228	292	548	145	60	866	222	90	436	130					3757	0
3	4	7/10/96	Buchanan & Garfield	0	846	25	34	59	45	73	1054	30	0	13	9					2188	0
4	35	10/27/98	Cleveland & 1st	161	692	56	0	96	24	0	0	0	83	359	0	0	0	0	1	1471	1
5	32	11/9/94	Cleveland & 4th	0	0	0	59	145	0	68	830	105	0	114	44	35	21	13	34	1365	103
6	29	6/14/94	Cleveland & 5th	23	1018	69	0	28	46	0	0	0	13	45	0	6	10	9	21	1242	46
7	27	5/26/94	Cleveland & 6th	29	582	22	0	38	21	0	0	0	21	43	0	10	30	8	2	756	50
8	24	5/3/94	Cleveland & 7th	95	1094	88	0	112	82	0	0	0	43	124	0	8	4	6	8	1638	26
9	17	7/9/96	Cleveland & Eisenhower	188	706	237	0	1015	201	0	0	0	136	746	0					3229	0
10	23	4/2/97	Colorado & 8th	42	52	20	22	161	4	5	45	14	20	125	64	1	1	10	0	574	12
11	54	12/5/95	Colorado & Eisenhower	0	0	0	0	994	132	99	0	54	65	711	0	0	0	1	2	2055	3
12	53	11/16/98	Denver & Eisenhower	20	1	12	43	1014	10	23	12	47	19	682	18	0	0	1	1	1901	2
13	3	11/30/94	Duffield & 37th	30	17	37	72	256	30	5	33	19	13	187	54	2	1	0	2	753	5
14	7	7/10/98	Garfield & 29th	253	256	26	26	707	74	99	191	106	60	531	88					2417	0
15	1	7/10/98	Garfield & 37th	264	1000	26	35	52	76	87	1126	297	222	31	204					3420	0
16	51	3/30/95	Garfield & 50th	38	1132	18	17	6	12	33	1137	90	71	6	16	0	1	0	0	2576	1

Figure 2.1 Partial Excel Display for Tabulation and Entry of Turn Studies

The first task was to set up a virtual city of Loveland (Figure 3.1) with all roads and intersections represented. To do this required referencing aerial photographs of Loveland and city records to find the following: street geometry, lane widths, number of lanes, storage lengths of turn lanes, distances between intersections, and current signal controls and phasing.

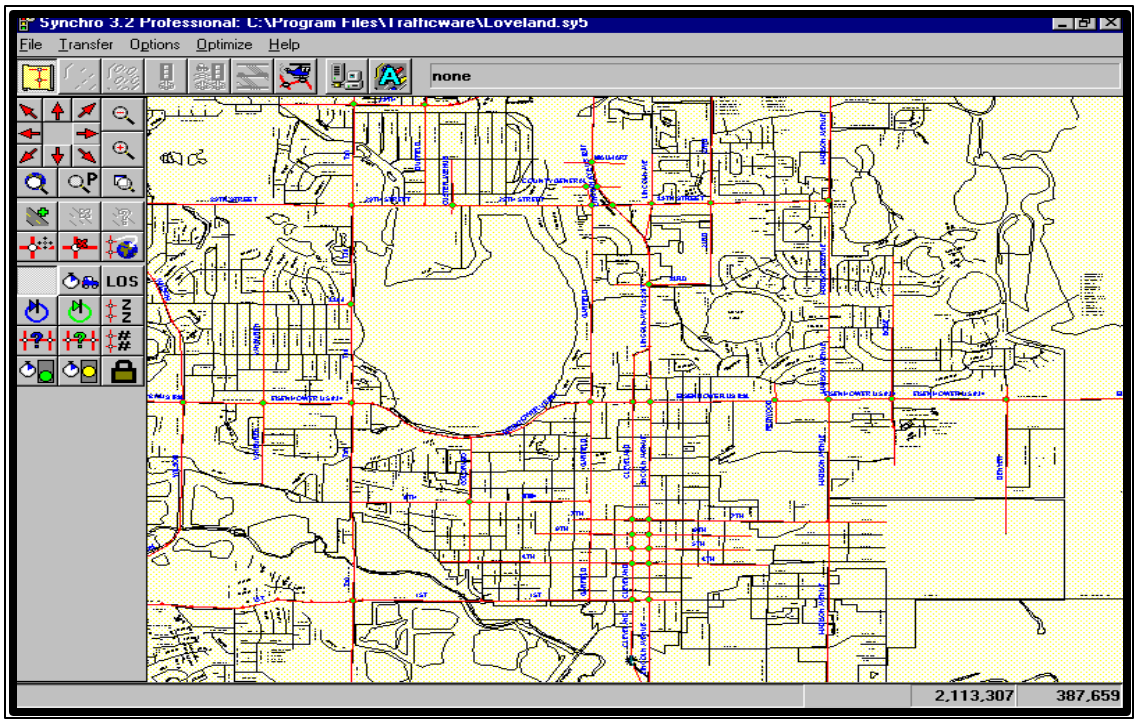


Figure 3.1 Creation of Virtual City in the Syncro Program

This task consumed the majority of the three-month internship with the City of Loveland. The research into this information was an excelle nt source of education on transportation design and infrastructure.

After I entered all the data into Syncro and it was reviewed by Traffic Engineer Bill Hange, the figures were transferred to SimTraffic (Figure 4.1) and animated to verify traffic movements were accurately modeled and to identify any immediate signalization problems.

This tool and new model can now be used to optimize signal progression and print out the results for immediate implementation, forecast effects of future traffic volumes, model proposed road construction or detours, and help lead a proficient engineer to a well-constructed traffic plan.

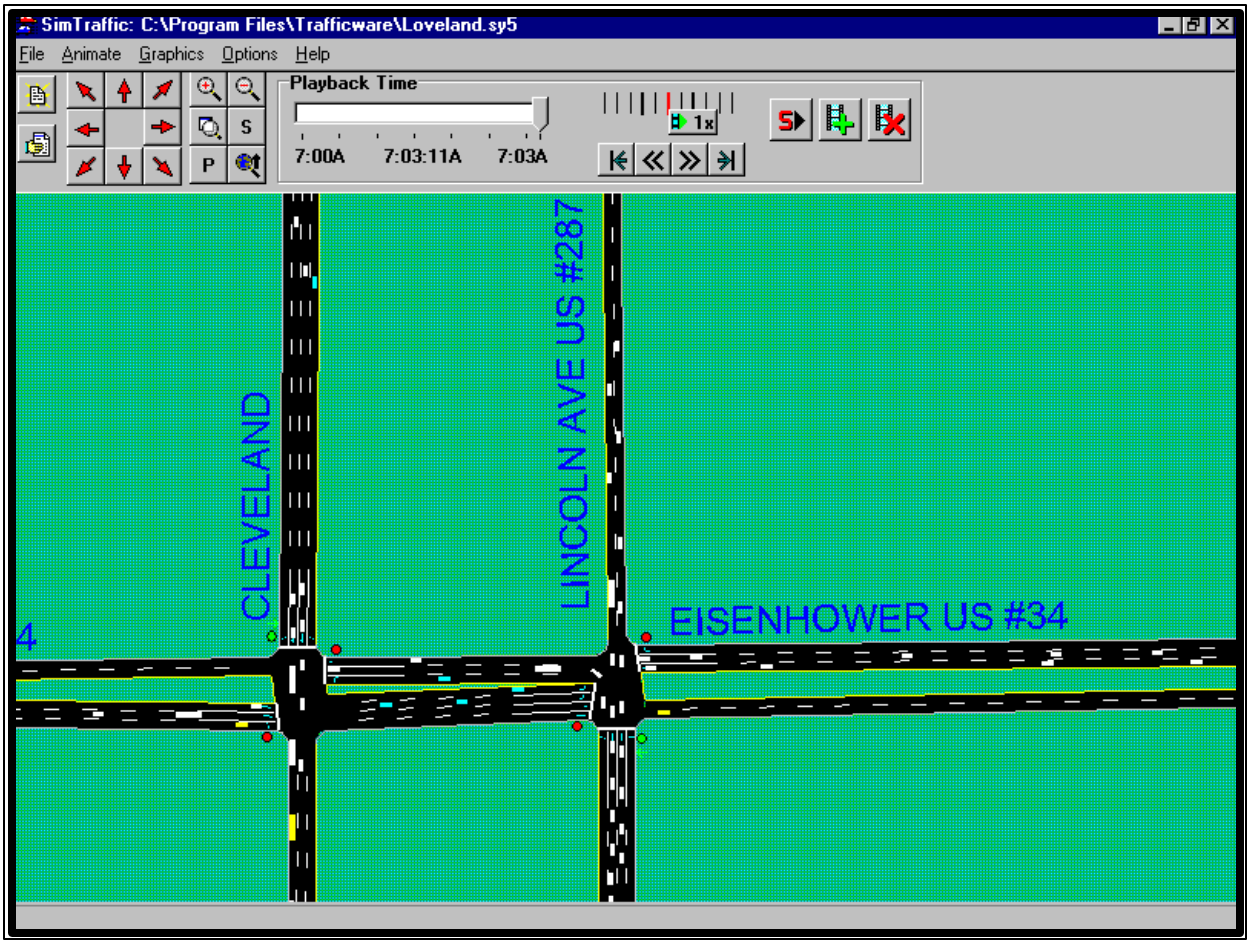


Figure 4.1 Traffic Model Animation of Virtual City in the SimTraffic Program

Other Encounters

My limited time was always filled on the days I worked. Other day-to-day tasks performed consisted of the following:

- speed limit sign mapping for the city attorney's office;
- reorganizing data submitted by a consulting engineer to a presentable and understandable format;
- aiding in format and creation of visuals for a city brochure to be distributed, informing the public about new roundabouts;
- field measurements of an intersection to locate buried cable, and geometry to help create and update city maps;
- and filing and review of resident complaints and action follow-up forms.

Personal Experience

When I was first awarded the transportation engineering internship I was excited for many reasons. I would gain working experience in transportation engineering and be employed in the same city in which I was living. By being a resident I also could personally relate to traffic problems.

After receiving confirmation that I was awarded the internship I shared my excitement with my wife and then with my aunt who has lived in Loveland for almost four years. The resulting conversation threw me into the world of transportation engineering as she said “Congratulations!” and then, "I have a traffic complaint."

Unsure if I could help, I offered to at least hear the problem. My aunt went on to describe that in the mornings from around 7 a.m. to 8 a.m. she could barely get out of her driveway because of an overwhelming volume of cars. The source of most of these cars was the new Erwin Middle School. My aunt’s street had drawn a lot of traffic as a shortcut. She was tired of the traffic and felt the volume was unsafe. She thought the street should be closed as originally designed.

This was my charge into my internship - a real problem that had personal ramifications, and I might have influence in fixing the problem. Taking to the challenge I discussed the problem my first day

with George Miller, the associate traffic engineer. When I suggested the idea of closing the road he said that doing so would isolate my aunt's street. In the event of an emergency, residents did not have alternative escape routes. It also would close off homes on the other side, lengthening fire response time by up to four minutes.

My eyes were opened. Transportation engineering is not a cut-and-dry science. Many alternatives, angles, and approaches must be considered before action is taken. Beyond that, even when a "best decision" or "best action" is taken, an individual or a group of people may not always view it the same way. This is the underlying challenge of transportation engineering.

Throughout the three months of my internship George Miller kept me abreast of the activities surrounding the complaint. The initial action was to study the extent of the problem by installing counters for 24 hours. The results showed that street was near its limit for intended use with peak volumes of 111 cars per hour. Consulting with the fire department about closing the street was greeted by strong opposition due to the increase in response time and the closure of alternate escape routes. Other means of alleviation had to be considered, all the while minding a reasonable budget. These solutions included surmountable barriers that only emergency vehicles could cross; razing homes to make 43rd run continuous from Wilson to Taft; or installing a signal at 43rd and Taft to offer drivers an easier way into traffic other than cutting through the neighborhood.

In an effort to maximize safety while favoring public opinion, it was ultimately determined that the installation of a signal at 43rd and Taft would best meet local needs; provide a safe crossing for school children; and be an anticipatory leap forward for future development of nearby areas.

My internship ended before implementation of the signal, but on all future visits with my aunt I anticipate updates on the traffic problem. It was an honor to accept the charge, and it will be a privilege to witness the effects of the design.

Conclusion

On the last day of my internship I had a feeling of accomplishment. All my objectives were met. The City of Loveland has a working model of the traffic modeling. Crucial traffic studies are up to date and represented in the model. Throughout the internship process internship I was bestowed with intangible benefits such as the friendship that was extended to me by the entire staff at Loveland Traffic; the patience offered if I did not immediately understand an assignment; and the overall positive learning environment created by my coworkers. Most importantly, as a new engineer I have expanded my horizons and my aptitude for aiding the public in a unique situation beneficial to not only myself, but also to the needs of the Loveland Traffic Department.

Recommendations

My overall experience with the program was positive and rewarding. I would, and have, recommended the program to my fellow students at CSU to get a jump on their careers while receiving the benefits of working. On that note I would only offer the following suggestions:

- A more defined time line: I was unprepared to crunch my remaining hours and report in at the end of the semester.
- Flexible hours: as a full-time student, the availability of evening and weekend hours is a plus to successful schoolwork and the internship.
  - While I realize my situation was unique in that I was assigned to finish the work of an intern that had departed before me and to no individual's fault, it is to the intern’s gain to complete the entire internship to receive the full advantage of the program. It was unfair for my coworkers to have to adjust to me, and for me to be limited to three months of exposure.

CHAPTER 4

ALAN R. ECKMAN
KIMLEY-HORN, INC. AND ASSOCIATES

Introduction

The Mountain Plains Consortium, in conjunction with The North Front Range Transportation and Air Quality Planning Council (NFRT&AQPC) offered an internship opportunity in the Spring of 1998. Through a process of interviews, I was selected to be the intern assigned to the North Front Range Transportation Alternatives Feasibility Study (NFRTAFS). This endeavor would prove to be a dynamic and rewarding experience. Working collectively with the staff of Kimley-Horn, Inc. and the many sub-consultants and public agencies contributing to the project was critical to the success of the internship.

Overview of NFRTAFS

The North Front Range Transportation Alternatives Feasibility Study is an effort to analyze and determine the most effective and feasible transportation alternatives to help reduce the growing traffic and development problems in the North Front Range. The study is funded as a major investment study (MIS). By being classified as a MIS the effort must conform to guidelines set for these types of studies. This study has a corridor boundary extending approximately from Fort Collins to Denver and from U.S. Highway 85 to U.S. Highway 287. The purpose of defining this corridor is to allow for focused solutions to be derived for problems and conditions specific to the areas enveloped by the boundaries of the corridor.

Kimley-Horn, Inc. was contracted as the primary consulting agency in charge of the alternative analysis for the study. Kimley-Horn, Inc. also was the contractor for the study's first preliminary stage. My internship coincided with the second phase of the study, which included alternative analysis. Sub-consultants were hired by Kimley-Horn, Inc. to bring specific expertise to each of the alternative technologies addressed.

Again, the goal of the project was to identify the most effective and feasible transportation alternatives to alleviate growing problems with traffic due to urban sprawl and the resulting development.

The constituents of the project were classified into several contributing acting bodies. The Consulting Management Team is comprised of representatives from each of the consultants working on the project and a representative from public agencies in the corridor. The Policy and Oversight Committee is comprised of public officials, community leaders, and other individuals instrumental to decision making in the corridor. The Stakeholders List includes citizens, professionals, and any interested and concerned persons or entities. These acting bodies were developed to help structure the effort to more effectively approach the primary goal of the study. The idea behind this structure is to accommodate needs and concerns of the people living in the corridor and those traveling through the corridor, while maintaining professional expertise and judgment.

Internship Duties

The duties of the internship were dynamic in nature. The intent, from my perspective, was to gain exposure to as much as possible while providing helpful services to the assignment. I was involved with varying aspects of the study, which included attending meetings, collecting and organizing data, and providing help with day-to-day operations.

Attending Meetings

By attending the Consulting Management Team, Policy and Oversight, and public meetings of the study, increased knowledge of issues and perspectives on problems and solutions unique to the corridor was gained. This exposure to political and economical considerations was a broadening experience. It allowed me to arrive at personal opinions and ideas on how to address transportation issues.

It is my thought that progress in solving any problem is first accomplished by increasing education about all perspectives of the problem. Then a carefully constructed solution is applied to reach a working solution. This solution also must take into consideration the changing times that are both

apparent at the onset of the applied solution and those that could become apparent later in the lifetime of the solution. In my opinion, the challenge of engineering problems is to successfully address advancement and sustainability in planning for the future. Being able to hear the opinions and directives of constituents of this study has helped me to advance my objectives to become an effective problem-solving engineer.

Collecting and Organizing Data

For this study, there are mass amounts of data that must be compiled and analyzed. My duties included working with origin/destination data that had been collected by means of traffic counts. This process included data entry, organization, and reformatting in a spatial representation provided by Geographic Information Systems (GIS) software. Spatial order of the data is accomplished by geocoding the origin/destination addresses for GIS software, which will then identify the addresses on a geographic map. This data can then be effectively used to determine the most significant problem areas in the corridor.

Data collection also was performed on environmental, archeological, and historical areas in the corridor. Through reviews of wetland, flood plain, archeological, and historical maps. The data is used in economical and environmental analysis for different transportation improvements along varying alignments in the corridor. The alignments could include improvements ranging from widening existing roadways, implementing transit in the form of bus or rail, and developing HOV or other traffic management systems.

Another type of data collection was performed by speaking with leaders of each municipality in the corridor. This data included present and forecasted figures on population, household, and commercial demographics for each municipality and can be used to better predict the future demands that will be placed on the transportation systems in the corridor.

Each of these types of data were used by varying specialists working on the project; therefore working closely with many different people was critical to collecting relevant and appropriate data in a usable format.

Assisting with Day-to-Day Operations

In addition to providing technical services to the project, it also was useful to apply myself to the internal operations of Kimley-Horn, Inc., public agencies, and sub-consultants. This work included preparing mailing lists and project updates, organizing the office, and preparing presentation materials. This type of work enabled me to better assimilate myself into the team of people working on the project. Working as a team and providing help wherever needed was instrumental in accomplishing efficient and productive results.

Internship Benefits

As an intern for the project, I was serving as a link between present and future generations of transportation engineers and planners. It was my part to learn from example and to prepare my thought process and skills to accommodate for the needs and challenges of transportation projects. An intern can also be utilized to benefit the employer in many ways. The intern position was a complete success and was of great benefit to all parties.

Technical Skills

Through technical tasks completed while working, a feeling of teamwork, importance, and accomplishment were observed. Technical skills that I had learned through academia were used in practical applications. Many skills were learned through the internship came easily due to the technical training and thought processes I had learned in school. The earlier the ability to link classroom knowledge to workplace application is realized, the better the odds for career success. This internship position allowed me to realize the magnitude of importance of this ability.

"Soft" Skills

Engineers often are faced with the challenge of effectively applying their technical skills. This challenge that has been a downfall to many engineers, who often are labeled as being too technically focused. A good deal of effort must be placed on communication skills to allow for the effective use of technical skills that engineers provide. Consulting engineering is a business; therefore all of the rules of business apply, and engineers must conform to be productive. This internship gave me a great deal of experience with social and professional interaction with coworkers and clients. Structuring and presenting ideas in a professional and understandable format is critical in the consulting business. I have had the chance to work on these skills and to develop a personal code of professional conduct.

Networking

It is not a revelation that having a foot in the door is an advantage to any career. This internship has opened doors for me in the consulting business. I have gained exceptional references and personal relationships with consultants and public officials. The search for a job was easier with the experience and skills I acquired through this position.

Public/Private Sector

Civil engineering is a practice that provides services for a variety of clients and constituents. Linking the public and private sectors often is necessary and also can be viewed as a skill in itself. Understanding the roles of these sectors is a great insight, which was gained by this experience. Working directly with the NFRT&AQPC and the Colorado Department of Transportation has been an educational experience. Understanding how the public sector and its agencies operate, and the way in which decisions are made will be useful knowledge in any civil engineering application.

I worked closely with the transportation staff in the North Front Range and I am confident that their efforts are of a clear and progressive nature. They have been instrumental in the success of this internship program. Their sincere acceptance of me made the position a delight. Important exposure to the private sector also was gained through this internship. Through working with the Kimley-Horn, Inc.

staff I have gained exceptional team and personal attributes. The examples of professional conduct set by the people in the North Front Range, Colorado Department of Transportation, and Kimley-Horn, Inc. have been exceptional. I truly have gained great vision in the role of transportation projects in maintaining a forward-moving and productive society and economy.

Suggestions

This internship position has been successful both in its operation and goals. I feel that exposure to this type of project is of great importance to engineers in training. The realization that technical design and theory are important in their function, but must be accompanied by the business and political gears that drive these projects, is evident after this internship.

Constructive suggestions include trying to integrate the intern into more technical roles of the project. The chance to cultivate communication and personal skills is a big plus of the position; however if more exposure to technical issues could be addressed the intern could be even better armed for future employment. It is realized that different projects have different technical demands, and that the stage of the project does have significant bearing on the amount of technical work available. I have no regrets as to the exposure I received during the internship.

I wish the program continued success and I am confident that the individuals controlling the program constantly are working toward bettering an existing stellar effort. I look forward to following the study's progress and the solutions chosen for this corridor.

CHAPTER 5

JENNY RODGERS
BALLOFFET AND ASSOCIATES, INC.

Introduction

The Fort Collins Northeast Truck Route Study was my internship project with Balloffet and Associates and the City of Fort Collins. As an intern, Balloffet and Associates also included me on the Fort Collins Comprehensive Signal Timing project. Transitioning to a full time employee by the end of the summer included more projects and responsibilities, including the preparation and completion of the Black Hawk Traffic Impact Study.

Northeast Truck Route Study

This project has been ongoing for the City of Fort Collins and is nearing completion. This study examines alternatives to the current truck route (Highway 14 - Riverside - Highway 287) through Fort Collins, and requires long-term forecast traffic volumes and adequate facility types to best determine the effects of a truck route. The project is concurrent with the Mountain Vista Subarea Plan (also by Balloffet and Associates), which is developing a neighborhood plan including parks, schools, business areas, a town center, and roadways.

The internship was designed to help with forecast modeling currently being performed in Denver using Minutp software. The intent of the internship was to allow the student to learn the Minutp modeling software and to help the project team try various alternatives and variations to the model. My tasks included making modifications to the forecasting model and adjusting the volumes to accurately represent forecasted volumes. I modified the network to show the effects of different lane configurations, facility types, and access points. Using this information, preferred truck route alternatives were evaluated.

A preferred alternative currently is being presented to city council, board members, and community members. This alternative is integrated with the Mountain Vista Subarea Plan. This

integration brings land use and transportation planning together to organize a future neighborhood before construction.

Fort Collins Comprehensive Signal Timing Project

In June 1998, Balloffet and Associates began a project with the City of Fort Collins Traffic Engineering Department to perform a comprehensive signal timing analysis for the city. This project began at the start of my internship with Balloffet and Associates and I was assigned to that project as an "internship-type" member. My initial tasks included inputting all the information into a new software program called Syncro. The tasks then evolved into performing Transyt-7F analyses and inputting new timings into the VMS Traffic Control System for the city. The outcome of this project includes new morning, noon, and night signal timings for the 140 signalized intersections in the City of Fort Collins.

Many obstacles had to be overcome during the signal-timing project. The traffic system operator for the City of Fort Collins accepted a position in a different city, leaving the project team without an expert on the 1970s control system. One member of our team, who had experience with a similar system, shared his knowledge with the traffic engineer and me. He later experienced health problems and was no longer able to be in the Fort Collins offices.

In the absence of a system operator, I became the system operator for this project. With the change of responsibility came many more changes to schedules and budgets. I experienced how changes are handled in professional situations. Learning the VMS Control system provided an opportunity to learn (hands-on) the machine that controls all signalized intersections in the city. This will be valuable, as I have learned that few people understand the functionality of these systems.

Black Hawk Traffic Impact Study

This study analyzed the effects of a proposed casino development in Black Hawk, Colo. Long-term forecast volumes were prepared, and the segment of State Highway 119 through Black Hawk was analyzed for operational levels of service and progression efficiencies. This study was my first

"individual" project where I developed traffic forecasts and analyzed the data. I composed the report and send it to the developer for review of the analysis.

Responsibilities and Supervision

My initial assignment was to learn the Minutp modeling software and to begin running the models and verifying model outputs. After completing that task, I modified the network to represent some new variations. Ray Moe, director of transportation at Balloffet and Associates, was my supervisor. Progress was reported periodically in meetings with Ray. New projects were assigned as my career with Balloffet and Associates progressed.

Evaluation of Internship Work

For the Northeast Truck Route Study, the early revisions to the network eventually were rejected due to a large change to the overall network that someone else completed. The findings from my early revisions were used as a reference and a learning tool. Later revisions — the current revisions — have been used to produce traffic volume estimates for the truck route. Adjustment formulas created by Ray Moe and me were used to modify the modeled volumes.

The Fort Collins signal system project is using most of the information I created. Modifications to the signal timings are processed through me for entry and verification in the system. My growing experience with the VMS system is becoming useful as the new traffic system operator learns the system in his new position, asking me questions he faces.

I am author of the report, which will be delivered to the City of Black Hawk and the developers. The information and analyses contained in the report are products of my research, study, and analysis.

Outcome of Internship

The internship with Balloffet and Associates was slightly different, in that the firm was in a position to hire a full time entry-level transportation engineer. I had graduated in May and needed to stay in Fort Collins, and this internship provided an entrance into a rewarding position with a growing, respected firm. The relationship between Balloffet and Associates and myself continued, and I became a full-time employee of the company by the end of the summer.

Benefits of Internship

The internship opportunity is a unique way to introduce young engineers to the professional world of transportation engineering. It has allowed me to become familiar with transportation philosophies and software in a less demanding environment. I have learned that professionals are willing to share their experiences and knowledge with young engineers, who are eager to learn. The Mountain Plains Consortium bridges the gap between civil engineering students with an interest in transportation and engineering firms, and government agencies in the Fort Collins area.

Suggestions/Recommendations for Internship Program

Advertising this internship early into the spring semester to all sophomore, junior, and senior level civil engineering classes with flyers posted in engineering hallways would encourage students to plan ahead. There would be more organization for all concerned parties to plan for this work. The introduction meeting was quite helpful to determining the desirability of the internship.

CHAPTER 6

NORTHERN COLORADO TRANSPORTATION INTERNSHIP PROGRAM CONCLUSION

Since its inception, NCTIP successfully has placed about 25 students into internship positions. Many of those students have gone on to work full time in transportation engineering. NCTIP provides the initial introduction to employers, which is critical to the job search success of new college graduates.

The program is growing each semester with new employers joining the ranks all the time. Many employers hire an intern each semester to continue the work of the previous student. That type of continuing commitment to the program is a testament to its success.

In 1999, CSU student Matt Salek was hired as an intern by Mountain Plains Consortium (MPC) to prepare a web site for MPC and NCTIP. The web site includes information about MPC and the process of applying for an NCTIP internship (Appendix D). The web site helps publicize the internships and provides students with an electronic alternative for obtaining and submitting an application. Since that time other student employees have maintained and upgraded the web site.

In the future, NCTIP plans to expand its list of employers and provide as many internships as possible for those students interested. Each semester there are many more applicants than there are internships. NCTIP would like to see every qualified student receive an internship and, eventually, full time employment in transportation engineering.

APPENDIX A

INTERNSHIP INFORMATION

ENGINEERING JUNIORS AND SENIORS –

ARE YOU LOOKING FOR AN INTERNSHIP?

The CSU University Transportation Center, in conjunction with city and county municipalities in Colorado, anticipates needing interns to work in the field of transportation. The types of projects being considered for these possible internships include:

- Fort Collins truck route study
- North Front Range Transportation Alternatives Feasibility Study – Phase II
- Transit in university communities

The internships would begin in the summer of 1997 and continue through Fall semester. Hours will be contingent on the scope and timing of each project. Compensation for the internship will be a modest monthly stipend. The interns would work at the site of the projects, possibly with a consultant.

CSU's University Transportation Center is in the process of arranging the internships in cooperation with local transportation agencies in order to promote an ongoing relationship between the university and government. At this time the internships are not certain, but very likely.

If you are interested in this opportunity please fill out the enclosed form and drop it off at the Civil Engineering office (Engineering Building AR204) in Professor Gutkowski's mailbox. You can also fax the form to 491-2788. Or give us your information over the phone by calling 491-8291, or by Email at gutkowsk@engr.colostate.edu. If you have questions about these internships please call 491-8291.

Reply form for CSU University Transportation Center internships

Name: _____

Mailing Address: _____

City, State, Zip: _____

Daytime Phone: _____

Email: _____

Major: _____

Return form to:

Civil Engineering Office

Engineering AR204

*Dr. Gutkowski's mailbox

Or call: (970) 491-8291

Or fax to: (970) 491-2788

Or Email to: gutkowsk@engr.colostate.edu

Please complete the following:

I am/am not interested in this intership.

I am continuing as a CSU student in Fall 1998 _____.
Spring 1999 _____.

I expect to graduate at the end of _____ semester, in year _____.

If selected, I expect to take _____ credits in Fall 1998 and _____ credits in Spring 1999.

I expect I could work _____ hours in Fall 1998 and _____ hours in Spring 1999.

I am graduating this semester but I am interested anyway _____.

I am available beginning _____, 1998.

APPENDIX B

STUDENT APPLICATION FORM

STUDENT APPLICATION FORM

Name: Darrell Alston Status (Freshman, etc.): Senior
Local Address: 227 Allison Hall
Phone: 495-3671 Earliest date you are available for employment: Last wk of May
Major: Civil Engineering Anticipated date of graduation: May 1999
Name of Advisor: Tom Sanders Department: Civil Engineering
Other academic activities, honors, etc.:

Job opening you are responding to: Internship

Skills pertinent to this opening: Ability to work well in stressful situations; strong will to succeed; good problem solving skills; good time management skills; ~~job experience and furthering my education~~

Career goal and how you plan to reach it: Career goal is to become a licensed professional structural engineer. I will reach this goal through job experience and furthering my education.

How does this job opportunity relate to your career goal? It will give me experience in the civil engineering field which will be necessary for success in the workplace. I would hope to be marketable in searching to employ me.

Reasons why you should be considered for this position: I have a good work ethic, am willing to learn new things, have strong time management skills, have made well contacts with past employers.

Previous Employers

Name of Company: Facilities Services (CSU)
Dates of Employment: October 97 - present
Reference: Bonnie Kuwer 491-5167
Responsibilities: Management of files, data entry, document organization

Name of Company: Kelly and Video
Dates of Employment: Summer 1992
Reference: N/A
Responsibilities: Customer services, store upkeep, organization of products

Other pertinent experience, hobbies, interests: Interest in radio-controlled aircraft, computer activities

Names and telephone numbers of two faculty references:

Darrell Alston

277 Allison Hall
Fort Collins, CO 80521
(970) 495-3671
dalston@users.fm.colostate.edu

Education

Civil Engineering
1994-present Colorado State University Fort Collins, CO

Work Experience

Office Assistant
Nov. 97-present CSU Facilities Services Fort Collins, CO
- Organization and upkeep of file system using Wordperfect and Quattro Pro; development of facilities services documents and presentations

Customer Service Representative
Summer, 1997 Hollywood Video Tacoma, WA
- Provided services to patrons in a pleasant manner; upkeep of store merchandise; management of money

Janitorial Services
Summer, 1997 Tacoma School District #10 Tacoma, WA
- Improved quality of schools in district under strict time constraints

Special Skills

Strong time management and organizational skills
Ability to work well without supervision
Strong oral and written skills gained through class projects
Ability to examine and solve difficult problems

Computer Skills

Experience with the following computer programs:

AutoCAD R13
Quattro Pro
Microsoft Excel
Microsoft Word
Wordperfect

Reply form for CSU University Transportation Center internships

Name: Darrell Akston

Mailing Address: 277 Allison Hall

City, State, Zip: Fort Collins, CO 80521

Daytime Phone: (970) 495-3671

Email: dakston@vines.colostate.edu

Major: Civil Engineering

Return form to:

Civil Engineering Office
Engineering AR204
*Dr. Gutkowski's mailbox

Or call: (970) 491-8291

Or fax to: (970) 491-2788

Or Email to: gutkowsk@engr.colostate.edu

Please complete the following:

I am / am not interested in this intership.

I am continuing as a CSU student in Fall 1998 ✓.
Spring 1999 ✓.

I expect to graduate at the end of SPRING semester, in year 1999.

If selected, I expect to take 13 credits in Fall 1998 and 7 credits in Spring 1999.

I expect I could work 10-15 hours in Fall 1998 and 20 hours in Spring 1999.

I am graduating this semester but I am interested anyway _____.

I am available beginning June 1, 1998.

APPENDIX C

ADDITIONAL QUESTIONS ADDRESSED BY THE INTERNS

Additional Questions Addressed by the Interns (answers are given on the following page):

1. Do you have an interest in:
   a) Autocad
   b) Engineering planning
   c) Spreadsheets
   d) Modeling transportation environments
   e) Internet/web page design

2. Rank your interest in:
   a) Public involvement
   b) Technical work
   c) Solitary work

3. Now rank your ability in the same areas.

4. Do you have your own transportation?

5. Do you prefer a lot of supervision, or not?

6. Have you had transportation classes yet? Which ones?

7. Have you had Senior Design yet?

8. Where will you be living next semester?

Carrie Cloud

1. I have more of an intrest in engineering planning, spreadsheets, and modeling transportation environments. I also have an intrest in autocad, but not much experience.

2. Most interesting – a
   b
   c

3. ability (most) – a
   c ?
   b

4. yes

5. Sometimes, mostly no

6. no, unless transportation labs within CE308 count

7. no

8. yes

APPENDIX D

WEB PAGES

Mountain-Plains Consortium

Colorado State University
University Transportation Center

At MPC:
TEL-8 Network
Internships

Related Sites:
Colorado State University
Civil Engr. Dept.
UGPTI
U.S. DOT

Mountain-Plains Consortium (MPC) is a cooperative organization of universities in Region 8 of the U.S. Department of Transportation. Region 8 consists of the states of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. MPC is headquartered at the Upper Great Plains Transportation Institute at North Dakota State University. Member Universities are Colorado State University, North Dakota State University, University of Utah, and University of Wyoming. The theme of MPC, due to the dominant characteristics of Region 8, is rural and multi-modal transportation, but transportation and transit needs of small urban cities are pertinent too.

MPC exists to facilitate education, research, and technology transfer among the member universities and state departments of highway. At Colorado State, research areas include low-volume roads and bridges, safety of railroad bridges, multi-modal public transportation, and environmental impacts, among others.

Select one of the following topics:

- Research Projects.
  CSU has facilities at the Engineering Research Center to conduct many projects associated with rural and multi-modal transportation and transit.
- TEL-8 Network.
  This terrestrial-based two-way interactive telecommunications network is used to facilitate communication among MPC member organizations, and also allows students at MPC universities to enroll in several distance learning courses offered over it.
- Internships.
  CSU manages the North Front Range Transportation Research Internship Program. This program develops internships through the North Front Range Transportation and Air Quality Planning Council and places students in northern Colorado transportation agencies and private industry to work with ongoing transportation projects.

The MPC University Program Director at CSU is:

Dr. Richard M. Gutkowski
Offices: A103 Engr. Research Center, or A205C Engr. Building
Phone: (970) 491-8291
E-mail: gutkowsk@engr.colostate.edu

Northern Colorado Transportation Internships

MPC - Colorado State University

CSU, in conjunction with city and county governments in northern Colorado is offering several internships in the field of transportation. The types of projects presently involves:

- Fort Collins truck route study,
- North Front Range Transportation Alternatives Feasibility Study - Phase II,
- Transit in university communities,
- Transportation planning for a small northern Colorado community,
- Mason Street corridor planning, and
- Bicycle and pedestrian planning.

The internships typically extend through one semester plus a summer. Hours are contingent on the scope and timing of each project. Usually this is 20 hours/week in summer and 10-12 hours/week during the semester. Compensation for the internship is on an hourly pay basis. The interns work at the site of the projects, in some cases with a consultant.

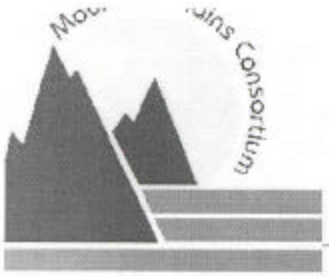
CSU and the North Front Range Transportation, Planning and Air Quality Counsel University Transportation Center organizes these internships. Internships are arranged in cooperation with local transportation agencies in order to promote an ongoing relationship between the university and the government.

If you have an interest in these positions, please fill out the accompanying form. Submit the information in one of the following ways:

- Electronically, by using the "submit" button,
- Fill out a printed out form and turn in to Professor Richard Gutkowski's mailbox in the Civil Engineering office, Room A203, Engineering Building
- Fill out a printed out form and fax to 970-491-2788, or
- E-mail the information requested to gutkowsk@engr.colostate.edu

If you have questions about these internships, please call Professor Gutkowski at 970-491-8291 or e-mail him at the above address.

Application Deadline is 4-23-01



Northern Colorado Transportation Internships

Application Request

Please complete the following survey. When you are done please click on the "Submit" button.

Name:

Street Address:

City, State, Zip:

E-mail Address:

Major:

Academic Advisor and his/her department:

I am continuing as a CSU student in: Summer 2001 ☐ Fall 2001 ☐

I expect to graduate: (semester, year)

Number of credits I expect to take if offered an internship: Summer 2001 Fall 2001

Hours I expect I could work per week during: Summer 2001 Fall 2001

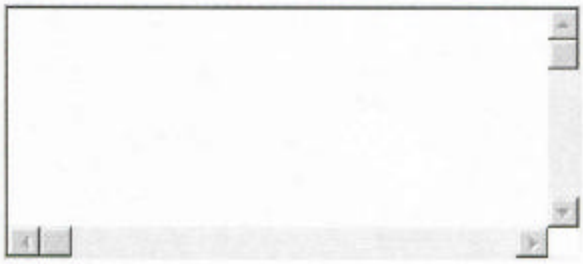
I am available beginning: , 2001

Academic activities, honors, etc.:

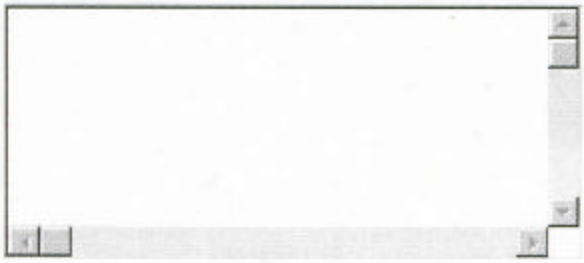
I have experience with:

AutoCAD ☐
Spreadsheets ☐
Fieldwork ☐

Skills pertinent to this position:



What my career goal is and how this internship applies to it:



I have my own transportation:

Yes ○
No ○