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**SANDIA BICYCLE COMMUTERS GROUP -
POLLUTION PREVENTION AT CONF-980654--
SANDIA NATIONAL LABORATORIES, NEW MEXICO (NM)**

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Ralph Wrons, P.E., CEM
Senior Member of Technical Staff
(505) 844-0601
(505) 844-9986 FAX
rjwrons@sandia.gov
Sandia National Laboratories

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ABSTRACT:

The Sandia Bicycle Commuters Group (SBCG) formed three years ago for the purpose of addressing issues that impact the bicycle commuting option. The meeting that launched the SBCG was scheduled in conjunction with National Bike-to-Work day in May 1995. Results from a survey handed out at the meeting solidly confirmed the issues and that an advocacy group was needed. The purpose statement for the Group headlines its web site and brochure: "Existing to assist and educate the SNL workforce bicyclist on issues regarding Kirtland Air Force Base (KAFB) access, safety and bicycle-supporting facilities, in order to promote bicycling as an effective and enjoyable means of commuting."

The SNL Pollution Prevention (P2) Team's challenge to the SNL workforce is to "prevent pollution, conserve natural resources, and save money". In the first winter of its existence, the SBCG sponsored a winter commute contest in conjunction with the City's Clean Air Campaign (CAC). The intent of the CAC is to promote alternative (to the single-occupant vehicle) commuting during the Winter Pollution Advisory Period (Oct. 1 -Feb. 28), when the City runs the greatest risk of exceeding federal pollution limits. Using solicited tallies, the SBCG estimated the avoided vehicle miles by its members as 135,000 miles during the five-month period. A City Air Pollution Division official converted that to 6100 pounds of pollution avoided. In the succeeding two winters, SBCG estimates its members rode over 210,000 miles, avoiding almost 10,000 pounds in pollution, conserving about 10,000 gallons gasoline and saving more than \$30,000 in automobile maintenance and operating costs. It is evident that SBCG members meet the P2 challenge every day.

Another event that SBCG promotes is National Bike-to-Work day, the third Tuesday of May each year. SBCG has participated in 1996, 1997 and again May 19, 1998. Since studies reveal that about 20% of first-time bicycle commuters continue with the practice, the intent is to encourage more pollution-preventing, safe, enjoyable commuting.

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KEYWORDS: Bicycle, Bicycle commuting, Sandia Bicycle Commuters Group, SBCG, Bicycle Users Group, Bike-to-Work Day, Pollution prevention (P2)

INTRODUCTION

Sandia National Laboratories (SNL) has two sites, both of which have sunny and mild climates -- ideal weather for bicycle riding. One site is in Livermore, CA (SNL/CA). The largest site is in Albuquerque, New Mexico (SNL/NM) and has a work population of more than 8,000 employees and contractors. SNL/NM, like most laboratories and campus-style settings, has a casual workplace environment. Through its Health Promotion Program, SALUD!, SNL/NM promotes fitness, good health practices and stress reduction activities. Even though SNL/NM is located on Kirtland Air Force Base, on the perimeter of the City of Albuquerque, the Base gates are reasonably well connected to the City's bike route network. It's not surprising, then, that a number of SNL/NM workforce would try bicycle commuting to work. In fact, a good number of Sandians have been bicycle commuting for at least the last 25 years (which probably answers why the Base is reasonably well connected to the City network). About ten SNL/NM buildings have lockers and showers available for use by bicyclists and most have some form of secure bicycle parking.

Due to the factors listed above, SNL/NM can be considered a bicycle-friendly employer. As a personal testimony, I started to bicycle commute about a month after starting to work here in 1990. Not by coincidence, I chose to buy a house in close proximity to KAFB. That, the casual workplace environment and the availability of secure parking, lockers and showers made the decision an easy one. I ride for several reasons: for the regular exercise it affords, the opportunity to avoid traffic congestion and prevent pollution, the sheer enjoyment and to save money and energy resources. After an accident, and some additional factors, I arranged an exploratory meeting ("discuss bicycle commuting") through the sponsorship of the SNL Health Promotion Program. The meeting was purposely held to coincide with National Bike-to-Work day, the third Tuesday of May every year, an event originated by the League of American Bicyclists 42 years ago.

The meeting followed close on the heels of an alternative commute contest, held as part of an SNL/NM Earth Day celebration, which was spearheaded by a Sandia bicycle commuter. There had also been recent problems with access at a major gate to KAFB, the particular gate which is the most bicycle-friendly connection between the City bicycle route network and the SNL/NM complex of buildings. With no advance notice, the Air Force Security Police began in January 1995 to require cyclists to cross two lanes of vehicle traffic to show identification. This galvanized cyclists to make phone calls of concern about their safety in crossing traffic lanes when it had not been required in the

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years previous. The controversy led, in short time, to the creation of a bright yellow "KAFB Bicycle Pass".

A survey was handed out at the meeting and results were collated during the next few weeks. Results indicated the attendees were strongly in favor of re-forming and revitalizing the past Sandia Bicyclists' Association. Previous inquiry had led to the discovery of this organization and their past success in designating a bike route from one KAFB entry point to SNL/NM. Most importantly, the survey results also confirmed what the issues were (safety was paramount) and why people choose to ride to work. Exercise and stress reduction was the top vote-getter, which may have been influenced by the meeting's sponsor. Next was "sheer pleasure of it", followed by "avoid traffic" and then "my part to reduce air pollution". Some research also uncovered a commuter survey, completed earlier for SNL/NM by an Albuquerque area transportation group, Ridepool. That survey related that 5-7 percent of the SNL workforce commuted by bicycle, a fact that was surprising to most of the attendees.

The ad hoc Bicyclists' Association elected officers the next month. After much investigation and with concurrence from the group, the officers decided not to be a recreation group, but rather an advocacy group. As good as the conditions may have been on the Base and at SNL, there was still a lot of room for improvement. Safety in entering and exiting the other major gates of the Base was the most oft-cited improvement needed, followed by the lack of lockers and showers.

Concurrently, cyclists were signing up for the KAFB bicycle pass. By the end of the summer, more than 1200 SNL workforce had been issued bicycle passes. This far surpassed anyone's expectations on how many bicycle commuters there might be. The officers sought approval for the official formation of the Group in a meeting with the Vice President of Laboratory Services Division 7000. The VP authorized the Group, on the basic premise that all SNL workforce must commute to work, they have a choice on transportation mode and safety is very important. The new Sandia Bicycle Commuters Group was recognized as an advisory group to Division 7000 in the areas of Sites Planning, Development, Operations and Traffic Safety, on issues pertaining to bicycle transportation. The SBCG officers agreed upon a purpose statement, "Existing to assist and educate the SNL workforce bicyclist on issues regarding KAFB access, safety and bicycle-supporting facilities, in order to promote bicycling as an effective and enjoyable means of commuting". The authorization by the Labs also allowed use of SNL computing resources to establish an electronic mail distribution list and to develop an SNL internal website.

ACCOMPLISHMENTS/CONTRIBUTIONS IN INAUGURAL YEAR

The very first activity of the ad hoc SBCG in summer 1995 was to review and comment on the draft version of SNL's first Campus Design/Development Guidelines (CD/DG). Many suggestions were incorporated into the final form of the CD/DG, aimed at

improving bicycling facilities to/from and around the Labs complex and at the buildings. The intent was to institutionalize bicycle facilities planning into the Facility planning process so as to improve conditions for existing cyclists and attract others to try bicycle commuting.

At the conclusion of the session seeking approval for formation of the SBCG, the Vice President encouraged SBCG to work through existing channels to make bicycle commuting safer on the Base and the Labs complex. Shortly afterward, SBCG began attending SNL Traffic Safety Committee (TSC) meetings and has since become a recognized member. Bicycles are now "defined" as vehicles in the TSC Charter and in the recently revised SNL Traffic Safety Rules. Many safety improvements have been gained through this membership. The SBCG has "leveraged" membership in the TSC to also have some influence in decisions made by the KAFB Traffic Working Group.

In addition to monthly meetings, SBCG started a website and an e-mail distribution list. The website is called,

Bicycle Commuting Resources

Brought to you by the

Sandia Bicycle Commuters Group

The website serves as a virtual meeting place, where information on new issues is often placed and updated as warranted. There were more than 4600 "hits" the inaugural year (October 1995-September 1996) and more than 5000 hits since then. The homepage has a number of links, including the Bicycle Helmet Safety Institute and the Consumer Product Safety Commission. It also announces meetings, both on-site and off-site, of interest to Sandia bicycle commuters.

In the first winter of its existence, at the suggestion of one of its members, the SBCG sponsored a winter commute contest in conjunction with the City's Clean Air Campaign. The intent of the Campaign is to promote alternative (to the single-occupant vehicle) commuting during the Winter Pollution Advisory Period (Oct. 1 -Feb. 28), when the City runs the greatest risk of exceeding federal pollution limits for carbon monoxide. Using tallies solicited from its membership, the SBCG estimated the avoided vehicle miles by its members at 135,000 miles during the five-month period. An official in the Air Pollution Division of the City's Environmental Health Department converted that to 6100 pounds of carbon monoxide pollution avoided by Sandia bicycle commuters and acknowledged the SBCG by saying, "We commend you and encourage you to maintain this commitment and acknowledge your group as a model for the community". Prizes donated by area bicycle shops were awarded to the commuters in three different categories. SBCG continues to solicit this information each year and posts the annual and cumulative pollution prevention figures at the heading of its website.

During this first year, SBCG began to attend and bring issues to the City's Bicycle Advisory Committee. The SBCG was acknowledged as the largest commuter group in the City, perhaps even in the State.

The SBCG capped the first year with a major effort to promote and celebrate National Bike-to-Work day. The group set a lofty goal of 1200 people biking to work, based on the number of passes issued. They arranged a forum for Base, SNL and City officials to address a lunchtime gathering on bicycle facilities planning issues and bicycle safety issues. They had a commitment from the Mayor of Albuquerque to ride in that morning with a group, but the organizer received a last-minute cancellation. Volunteers counted at each of the four gates into the base; the final tally came in just under 300 cyclists, much under the goal but a great turnout nonetheless. This count also gave the SBCG a breakdown of commuters per entrance gate.

RESULTS

Sandia National Laboratories has a Pollution Prevention (P2) Team with the charter to encourage the SNL workforce to "reduce pollution, conserve natural resources and save money" in their work practices. The existence and accomplishments of the SBCG prompted the P2 Team to ask for a presentation in January 1998 to learn more about the group and its accomplishments in preventing pollution in the work commute.

The bicycle is the first and simplest zero emissions vehicle (ZEV). But it is not zero energy, depending upon the level of effort expended. Consider the human body as powered by solar energy. A ten-mile roundtrip commute by bicycle mode requires 350 calories. The same trip by:

- an average American automobile requires 18,600 calories (equivalent to half-gallon of gasoline)
- a bus requires 9200 calories
- rail requires 8850 calories
- pedestrian mode requires 1000 calories

As cited earlier, the SBCG compiled commute miles by its members during the Winter Pollution Advisory Period (WPAP) in the first year of existence. That has also been done in the succeeding two years. The input received indicates there are about 50-75 hardy individuals who bicycle commute through the winter. The following estimate of vehicle miles avoided by the bicycle commuting option is based on 125-150 individual riders during the WPAP:

- low of 100,000 miles, this past winter ('97-'98)
- high of 135,000 miles, the first winter ('95-'96)
- cumulative over three years estimated to be 345,000 miles

The Air Pollution Division of the City of Albuquerque Environmental Health Department helped SBCG determine the avoided carbon monoxide (CO) pollution. (CO is the automobile tailpipe emission that historically caused Albuquerque to be in non-conformance with EPA regulations). For 135,000 miles, the total amount of CO pollution generated by an average American automobile is 6100 pounds. For the last three years' WPAP, then, the total avoided CO pollution is 15,600 pounds.

Sandia workforce bicyclists ride more often the rest of the year. Extrapolating WPAP data to the whole year, the avoided miles driven are casually estimated to be about 300,000 to 350,000 miles, which conserves about 15-17,000 gallons of gasoline each year and saves well over \$45,000 in automobile operating and maintenance costs. The following table summarizes the annual reduction in pollution by SBCG members.

Annual Pollution Prevention				
Miles	CO ₂ , tons	CO, tons	HC, pounds	NO _x , pounds
300,000	150	6.6	1700	1050
350,000	175	7.7	2000	1200

Bicycle commuting has exemplary life cycle impacts regarding pollution prevention, when compared to the automobile option. From cradle to grave, automobiles are prolific generators of pollution. According to Makower, for example, each year the landfill receives:

- nine million cars
- 80 million batteries
- 400 million oil filters
- 260 million used tires

This does not account for the pollution generated in the manufacturing process. It does not account for the millions of gallons of oil (equivalent to 35 Exxon Valdez spills) disposed of improperly each year by do-it-yourself mechanics.

Trends/Ongoing Efforts

Based on conversations with long-time SNL/NM bicycle commuters, there seems to be a continuing trend of fewer bicycle commuters since the heyday of the 80's. The reasons are many: retirement of long-time commuters, people re-locating to residences further from work, more demanding and/or changing work schedules. But one reason stands out: "there's more traffic on the streets and it doesn't seem safe to ride". The SBCG hopes to reverse the trend with the following efforts:

- continuing to work with the City Planning and Public Works Departments and the Bicycle/Pedestrian Safety Coordinator. One of the SBCG officers has now served as Chair of the City's Bicycle Advisory Committee (BAC) and is currently the Vice Chair. While the goal is a bicycle-friendly city, the SBCG focuses its efforts on urging and working with the City to improve key sections of routes to/from the Base. The primary issues are always safety and connectivity.
- The SBCG has promoted Bike-to-Work day each year of its existence and just finished another successful promotion on May 19, 1998. The SBCG officer cited

previously (Earth Day alternative commute contest, principal organizer of first SBCG Bike-to-Work day promotion and Vice Chair of City BAC) has been the primary motivator for the City of Albuquerque to hold Bike-to-Work day promotions the last two years. One study has revealed that about 20% of first-time bicycle commuters continue with the practice (a regular commuter is defined as one who rides two or more times per week, six months/year). The intent of these promotions is to encourage more pollution-preventing, safe and enjoyable bicycle commuting.

- Continuing to pursue approval for a secure, automated bicyclist/pedestrian gate in the KAFB boundary fence in close proximity to the existing City bike route. The proposal has been endorsed by the SNL Traffic Safety Committee on safety merits, but would also be a more direct connection, cutting off up to a mile of travel. SBCG believes this gate would encourage many SNL/NM workforce to try bicycle commuting.
- As SNL/NM Energy Manager, an opportunity exists to promote the increased use of company-owned bicycles for transportation within and between the laboratory complexes of buildings. There is some use now. At the SNL/CA site, the company-owned bicycles are used far more frequently (factors: bikes not locked, no helmet requirements, the Lab area is contiguous).
- Seeking employer-sponsored programs to promote bicycle commuting.

CONCLUSION

The role of the SBCG has been as an advocacy group for bicycling as a viable and important form of work commute transportation. The value of this commute mode as a way to gain daily exercise and prevent pollution is well known to all who read the newsletter and website. Feedback from SBCG members continues to be very positive; core members are frequently complimented on the valuable service they are providing by intervening in bicycling and bicycle facility issues. The SBCG has accomplished much during its existence, but still has a long haul to make bicycle commuting an attractive option to many more potential cyclists.

The Middle Rio Grande Council of Governments (MRGCOG), the Metropolitan Planning Organization for the four county area that includes City of Albuquerque and KAFB, is in the midst of preparing a long-range 2020 Metropolitan Transportation Plan (MTP). They have been seeking the input of many area bicycle commuters, including the SBCG officers. MRGCOG must determine the elements of a plan that enables the Metropolitan area to meet its transportation needs and stay within the air quality control limits. The City/County Air Quality Control Board will hold a public hearing on June 10, 1998 for input on the non-trivial decision whether or not to increase the carbon monoxide pollution budget for the area airshed; an increase in the "budget" for vehicle emissions may be

essential for the 2020 MTP to achieve conformity with EPA regulations. Bicycle commuting, and all the other alternative transportation modes, are increasingly seen as possible means to achieve the end and reduce the per capita air pollution.

Forming an employee bicycle commuter group is an excellent way to have a positive impact on Metropolitan and employer transportation issues and to improve employee fitness and well-being. The key is communication, active participation and advocacy for the bicycle commute option. Government sites, especially laboratories complexes, are good "seeding points" for such groups, because of the factors mentioned previously: casual workplace environment, health promotion programs and pollution prevention programs. While it is very helpful to have a bike-friendly situation, it is just as important to have a core group of bicycle commuters interested in improving the situation.

REFERENCES:

1. How to Commute by Bicycle, an employee's guide, Don Henry, for League of American Bicyclists, 1992
2. The Green Commuter, Joel Makower, Tilden Press, 1992
3. Commute Management Plan for Sandia National Laboratories, developed by City of Albuquerque Transit Department, 1995
4. Metropolitan Transportation Plan bulletin, Middle Rio Grande Council of Governments, May 22, 1998

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