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Arizona's Metropolitan Travel Reduction Programs

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Abstract

This paper documents the short-term response to Arizona's metropolitan travel reduction programs. The Phoenix (Maricopa County) and Tucson (Pima County) programs were initiated in 1988. Their legislation, specifications of travel reduction, initial actions, and achievement to date of travel reduction objectives are presented. The Tucson program reports that major employers achieved an average 20.2 percent alternate mode usage by their employees for the program's first compliance year (1990). Preliminary findings from the Phoenix program indicate a 4.7 percent reduction in single occupant vehicle trips in this program's first compliance year (1991).

I. Overview

Travel reduction programs are an innovative approach to travel demand management. Their objectives of shifting commuter trips from single occupant vehicle trips to alternate modes or eliminating commuter trips through telecommuting and work schedule shifts require changes in employee and employer behavior. If successful, these programs can contribute to improved urban air quality as motor vehicle emissions are decreased from fewer work trips. The few active metropolitan programs with the goal of improved urban air quality deserve immediate documentation.

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This paper presents the current status of two regional travel reduction programs initiated in 1988 in Phoenix and Tucson, Arizona, the two largest metropolitan areas in this relatively small state with a 1990 population of 3.6 million. Each program reflects a different travel reduction approach, designed for local conditions. First, the legislative background for each program is reviewed. Program actions to date and initial aggregate travel reduction compliance results are then reported. While a direct comparison of the two programs is not feasible, this early experience shows that regional travel reduction programs develop differing approaches in different urban contexts.

I. The Phoenix and Tucson Legislation

Arizona's travel reduction ordinances (TROs) are part of a national trend requiring developer or employer participation in travel demand management. California communities dominate this trend with 67 percent of the 58 TROs identified nationally (Ferguson, 1990). Metropolitan Phoenix and Tucson programs were mandated in 1988 to improve metropolitan air quality, rather than to mitigate existing traffic congestion. These two metropolitan areas have over 70 percent of Arizona's population and have not been in compliance with the federal Clean Air Act. In 1988, Maricopa County and eastern Pima County were Federal non-attainment areas for carbon monoxide and ozone (Phoenix only). Phoenix's air quality problems affect a 1990 metropolitan population of 2,133,000, three times the size of Tucson.

The Phoenix and Tucson programs are both metropolitan programs, but have separate legislative sources and approaches to travel reduction. In Phoenix, the State legislature enacted the Maricopa County Travel Reduction Program as part of the state's Air Quality Bill in June, 1988 (Table 1). An intergovernmental agreement of April, 1988, between five local jurisdictions (Pima County, City of Tucson, City of South Tucson, Town of Marana and Town of Oro Valley) created the Pima Association of Governments (PAG) Travel Reduction Program (Table 2). The Phoenix program is administratively located in the Maricopa County Bureau of Air Pollution Control, while the Tucson program is located in the Pima Association of Governments, the local metropolitan planning organization. The Phoenix program is currently mandated for three years, while the Tucson program has been reviewed and extended until 1993. A policy board oversees each program and reviews the employer travel reduction plans.

TABLE 1
Phoenix Travel Reduction Program Characteristics

1988 Source	State Air Quality Bill
Administrative Location	Maricopa County Bureau of Air Pollution Control
Objectives	Reduction in single occupant vehicle (SOV) trips or vehicle miles traveled (VMT)
First Compliance Year:	5% reduction in SOV trips
Second Compliance Year:	5% reduction in SOV trips
Third Compliance Year:	To be decided
Policy Board Composition	15 members selected by County Board of Supervisors
Program Requirements For Major Employers	Conduct a survey of all employees Disseminate alternate mode information Appoint a transportation coordinator Produce a Travel Reduction Plan

Both programs have four similar requirements for the major employers who must participate. Major employers are defined as having over 100 full-time equivalent employees at a work site. Each employer must (1) conduct a baseline survey of all employees, (2) disseminate alternate mode information, (3) appoint a transportation coordinator, and (4) produce a travel reduction plan. Compliance procedures in both programs stress the voluntary nature of travel reduction. The yearly employee survey is required using the survey form approved by the program's policy board. While major employer participation is required, a major employer who does not meet the travel reduction goals may be in compliance by acting in good faith and completing the four general requirements. To date, no employers have been referred to the appropriate County or City attorney for noncompliance.

TABLE 2
Tucson Travel Reduction Program Characteristics

1988 Source	Local ordinances and intergovernmental agreement
Administrative Location	Pima Association of Governments
Objectives	Increase in alternate mode usage (AMU) or vehicle miles traveled (VMT) reduction
First Compliance Year:	15% in alternate mode usage
Second Compliance Year:	20% in alternate mode usage
Third Compliance Year:	25% in alternate mode usage
Policy Board Composition	12 of 19 members elected from among participating employers
Program Requirements For Major Employers	Conduct a survey of employees Disseminate alternate mode information Appoint a transportation coordinator Produce a Travel Reduction Plan

II. Program Objectives

Program travel reduction objectives and assumptions differ significantly. These differences in the two Arizona programs reflect the lack of national consensus on how travel reduction should be measured as well as local program choices. The field of demand management currently lacks an established terminology for measuring travel demand reduction. Pratt notes that vehicle trip reduction is the measure commonly used, but an additional measurement question must be addressed (Pratt, 1990). What is the initial value from which vehicle trip reduction is measured?

Both programs adopt a base case definition approach to reducing vehicle miles traveled. This approach means that travel reduction requirements are reductions relative to existing travel conditions, including current ridesharing, transit service and peak-hour congestion. Employers who have actively supported ridesharing

programs may already have high proportions of their employees involved in ridesharing or other alternatives to single occupant commuting. These employers are required to achieve percentage reductions that may become increasingly difficult to achieve. In later program years, fewer employees may be able to shift easily to alternate commuting options. A worst case analysis approach would show that these employers have already made progress in vehicle trip reduction relative to the least desirable situation of all single occupancy commuting occuring during peak hours.

The Tucson program requires an employer to meet travel reduction compliance in one of two ways. One approach is to reduce vehicle miles traveled by 15 percent in the first compliance survey, by 20 percent in the second compliance survey, and by 25 percent in the third compliance survey. A second compliance approach is to achieve increased alternate mode usage. Major employers must achieve alternate mode usage of 15 percent in the first year, 20 percent in the second year and 25 percent in the third year (Table 2). Alternate mode usage is defined as use of an alternate mode (non drive alone) for at least one day a week. For compliance purposes, an individual is only counted once, even if the employee indicates multiple days of alternate mode use. Alternate modes are defined as use of a carpool or vanpool, bus, bicycle, or walking.

This definition of alternate mode usage provides an easier way for employers to comply with the Tucson program than through reduction in vehicle miles traveled. An employee needs to travel only one day a week in an alternate mode to count toward an employer's compliance. The program allows employers to receive credit toward their baseline year survey level of alternate mode usage. Employers benefit if they were active in travel reduction efforts before the regional program's initiation. This approach recognizes the seventeen-year efforts of the metropolitan Tucson RideShare program and Tucson employers.

While the Phoenix program similarly uses a base case definition approach, travel reduction is achieved either through a reduction in the proportion of employees commuting by single occupant vehicles or by a reduction in vehicle miles traveled. Whichever measure is used, the reduction must be five percent in the first program compliance year and an additional five percent reduction in the second program year, with the third and later year reductions to be decided after a second program year

review. This approach includes all weekly employee commuting travel and requires travel reductions from a base level that is increasingly composed of alternate mode commuters.

III. Program Achievement

In 1991, the Phoenix and Tucson travel reduction programs affect a significant portion of metropolitan travel and daily commute miles traveled (Table 3). Commute trips are 30 percent of Phoenix daily trips and 27 percent of Tucson daily trips. Commute miles by participating Phoenix employees are 21 percent of the total daily miles traveled; Tucson participating employee commute trips are 13 percent of the total daily miles traveled. The Tucson program estimates that one third of the regional workforce participates in the program, 80,000 employees in 1991. In Phoenix, 298,000 employees and 84,000 students participate, a total of 382,000 participants.

These figures should be considered as estimates of the actual travel reduction program contributions. While the daily commute miles traveled by participating employees is known from the baseline year employee surveys, the total metropolitan daily miles traveled and total metropolitan daily commute miles traveled are estimates developed separately by the metropolitan transportation planning organizations.

TABLE 3
Travel Characteristics, March 1991

	Phoenix	Tucson
Total Metropolitan Daily Miles Traveled[A]	50,000,000	13,400,000
Total Metropolitan Daily Commute Miles Traveled	15,000,000	3,600,000
(% daily miles traveled)[A]	(30%)	(27%)
Total Daily Commute Miles Traveled by Participating Employees	12,300,000	1,700,000
(% daily miles traveled)[A]	(21%)	(13%)

[A]Maricopa Association of Governments Transportation & Planning Office; Pima Association of Governments Transportation Planning Division.

Arizona's metropolitan travel reduction programs have been active for over two years. The smaller Tucson program completed the initial activities of employee survey, employer plan submittal, and plan review in the 1989 calendar year, defined as the Baseline Year - Year 1 of the program. The First Compliance Year, defined as Year 2 of the program, documented alternate mode usage levels by December 1990. The large Phoenix program completed its Baseline Year - Year 1 actions in a nineteen-month period from June, 1989 to December, 1990. This period is defined as the period in which employers conducted their first baseline surveys. Phoenix employees are now being resurveyed to document employer achievement of the single occupant vehicle commuting and vehicle miles traveled goals.

Because these programs are mandated but rely on the good will of major employers to comply, staff efforts focus on making compliance possible. Major employer participation is shown as plans submitted and approved (Table 4). The Tucson program operates on a calendar year and reports actions for employers who completed the full program requirements through work site plan approval in that year. The Phoenix program phased employers into the program beginning in June, 1989, beginning with the largest employers (over 500 employees). Actions are reported for the nineteen-month period that covered the baseline employee survey period.

TABLE 4
Baseline Year - Year 1 Program Actions

	Phoenix[A]	Tucson[B]
Initial Number of Employers Expected to Participate	575	129
Plans Reviewed and Approved[C]	461	148
Plans Being Evaluated	10	0
Plan Denials	0	0

[A]Phoenix Program Year 1 = June, 1989 - December, 1990

[B]Tucson Program Year 1 = January, 1989 - December, 1989

[C]Phoenix employer plans cover multiple work sites; Tucson encourages the employer to develop individual work site plans.

Administrative activities vary between the programs. The Phoenix program reviewed and approved 461 employer plans; the Tucson program reviewed and approved 148 work site plans. Ten plans are still being reviewed by the Phoenix program staff for employers who were surveyed late in the baseline year. No plans have been denied. The program staff works with an employer until a plan is acceptable. Similarly, not all employers met the initial required employee survey response rate of 60 percent in the Phoenix program and 50 percent in the Tucson program. Both programs now require that an employer resurvey if the required employee survey response rate was not initially met.

Levels of program travel reduction achievement are summarized on Table 5. Here, compliance is reported as an average of all employee travel rather than the travel reduction achieved by individual employers. The Tucson 17.6 percent alternate mode usage shows that the program exceeded its Baseline Year - Year 1 goal of 15 percent alternate mode usage at a regional level. The 20.2 percent alternate mode usage reported for the First Compliance Year - Year 2 shows that the Tucson program achieved its travel reduction goal with a 14.8 percent increase in alternate mode usage. Ninety-five work sites that completed the Travel Reduction Program survey in both 1989 and 1990 showed an increase in alternate mode utilization (Pima Association of Governments, 1991).

TABLE 5
Program Achievement

	Year 1 Baseline Year	Year 2 First Compliance Year
Phoenix[A]	72% of weekly total commute trips are single occupant vehicle trips	Not available
Tucson[B]	17.6% alternate mode usage	20.2% alternate mode usage

[A]Phoenix Program Year 1 = June, 1989 - December, 1990. Year 2 = January, 1991 - continuing.
[B]Tucson Program Year 1 = January - December, 1989 Year 2 = January, 1990 - December, 1990

The 72 percent single occupant vehicle trips reported for Maricopa County is an average value calculated from all employee travel at the end of the first program year. Each employer's Baseline Year - Year 1 finding is the value against which compliance year levels of travel reduction will be measured. While employees typically have single occupant vehicle use rates of 80 percent or higher, student single occupant vehicle usage is closer to 40 percent. Limited results for the First Compliance Year - Year 2 for 153 resurveyed employers and work sites with 108,676 employees show a reduction in single occupant vehicle trips from 80.8 percent to 77.0 percent, a 4.7 percent reduction (Maricopa County Travel Reduction Program, July 17, 1991). The direction of change toward less single occupant vehicle commuting is a positive finding which needs to be confirmed through research involving a larger number of employeers and statistical validation.

V. Conclusions and Future Research

This report of the short-term response to travel reduction in metropolitan Arizona shows that both the Tucson and Phoenix travel reduction programs are administratively in place, although their sources and objectives differ. Both programs are mandated but rely on the good faith efforts of major employers to comply. As a group, major employers in the Tucson program exceed the goal of 20 percent alternate mode usage. While Phoenix participants are still being resurveyed to document their employees' and students' initial compliance, preliminary results show a reduction in single occupant vehicle commuting.

These findings leave unanswered questions about Arizona's travel reduction programs that are the basis for future research. Ideally, the yearly baseline employees could be used to identify aggregate and individual changes in the distance from employee residence to work site. Since the employee composition and size changes yearly and individual identifiers are not placed on surveys, a possible change in residential locations toward the work site can be assessed only at the aggregate employer level.

One current research project using Phoenix baseline year survey sample data examines the reported distance to work compared with minimum route distance through the street network. No commute route information is currently asked on the employee survey. This research extends the discussion of travel reduction measurement above by

verifying the reported distance values which create each employer's baseline for reductions in vehicle miles traveled.

Other crucial questions remain related to the role of these programs in improvement of air quality. The considerable effort expended to put these programs in place merits careful examination of the actual reduction in vehicle miles traveled not just by commuters but for the metropolitan area as a whole. Assuming that these programs achieve their travel reduction goals, the reduction commuter travel could be more than offset by growth in non-commuter trips and by additional trips associated with population growth in these fast-growing Southwestern metropolitan areas. These concerns merit investigation in other regional travel reduction programs across the nation.

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