

To: Audrey DeBarros, Executive Director, Commuting Solutions

From: Jonny Rotheram and Matthew Kaufman, AICP

Date: April 3, 2017

Re: US 36 Construction Mitigation End of Program Impacts Analysis

Commuting Solutions requested that UrbanTrans North America analyze the travel behavior benefits associated with congestion mitigation efforts on the US 36 corridor. Programs analyzed were: carpool incentives, vanpool incentives, transit incentives, and the US 36 Master EcoPass Pilot Program during the US 36 Express Lanes Project (September 2014 to March 2017).

The program resulted in a reduction of 122,000 vehicle trips and 3 million vehicle miles of travel (VMT) per year. Participation in the program was dominated by transit riders, who accounted for more than 85% of all participants. The greatest per person reductions in vehicle trips and VMT came from vanpool riders followed by carpoolers. However, their small numbers, due to the difficulty recruiting vanpool and carpool riders, meant that the great majority of vehicle trip and VMT reductions resulted from transit riders. The program exceeded anticipated VMT reductions but not vehicle trip reductions. This variation was likely due to limitations of the model used to estimate anticipated program impacts.

Incentives

As part of the congestion mitigation efforts implemented by Commuting Solutions, individuals who commuted along US 36 were eligible to receive incentives when they committed to trying a non-drive alone travel mode. Incentives were available to encourage travelers to join a carpool or vanpool or try transit. Before receiving an incentive, participants were required to complete a travel survey in which they reported how they commuted to work during the previous seven-day period. Approximately three months after participating in the program commuters are asked to again report how they commuted to work during the previous week.

UrbanTrans reviewed the survey data collected by Commuting Solutions staff to determine what impact the incentives had on vehicle trips and vehicle miles of travel (VMT). The data were analyzed in aggregate and by incentive type. Table 1 shows pre- and post-incentive commute behavior.

Table 1: Commute Behavior Before and After Receiving Incentive

Mode	All		Vanpool		Carpool		Transit	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Drive Alone	62%	41%	58%	21%	69%	38%	59%	44%
Bike	2%	4%	0%	3%	2%	2%	2%	5%
Ride the bus	15%	19%	8%	5%	8%	5%	19%	26%
Bus/Bike Combo	5%	5%	0%	0%	3%	3%	6%	6%
Ride light rail	2%	2%	2%	0%	2%	0%	2%	3%
Carpool or Vanpool	6%	19%	26%	68%	10%	41%	2%	5%
Walk	3%	2%	0%	0%	3%	0%	3%	3%
Work from Home	6%	8%	6%	3%	4%	10%	6%	8%

Table 2 shows estimates of vehicle trips reduced (VTR) and vehicle miles traveled reduced (VMTR) per participant and in aggregate. VTRs were estimated using reported mode split data. VMTR was estimated by multiplying average commute trip distances as reported by participants by the number of vehicle trips reduced. Annual reductions assume 240 commute days per year. All vehicle trip reductions are one-way trips.

Table 2: Incentive Impacts on Vehicle Travel

	VTR/Year/ Participant	VMTR/ Year/ Participant	Avg. Trip Distance	Program Participants	Annual Trips Reduced	Annual VMT Reduced
All	83	1,800	23	984	76,700	1,780,000
Vanpool	191	4,600	25	58	11,100	266,000
Carpool	80	1,840	23	188	15,000	345,000
Transit	69	1,580	23	738	50,600	1,160,000

US 36 Master EcoPass Pilot Program

Another element of the congestion mitigation effort was the subsidization of EcoPass purchases by employers within walking distance of three Bus Rapid Transit (BRT) stations along US 36. Prior to receiving their EcoPasses, employees at participating employers were asked to complete a travel survey in which they reported how they commuted to work during the previous seven-day period. Employees were also asked to report the distance they travel from home to work. Approximately nine months after the distribution of EcoPasses, employees were asked to complete a second survey in which they again reported how they got to work during the previous week.

UrbanTrans reviewed the survey data collected by Commuting Solutions staff to determine what impact the distribution of EcoPasses had on vehicle trips and VMT. Table 3 shows pre- and post-EcoPass commute behavior.

Table 3: EcoPass Mode Split Change

Mode	Pre	Post
Drive Alone	75%	64%
Bike	1%	2%
Ride the bus	11%	18%
Bus/Bike Combo	3%	3%
Ride light rail	1%	2%
Carpool or Vanpool	5%	4%
Walk	4%	4%
Work from Home	2%	4%

The program resulted in a 15 percent decrease in the drive alone rate and a 64 percent increase in transit use. Table 4 shows estimates of vehicle trips reduced (VTR) and vehicle miles of travel reduced (VMTR) per participant and in aggregate. The reductions are based on the distribution of 1,653 EcoPasses over the two years of the program. An average of 827 EcoPasses per year was assumed for the purpose of estimating annualized impacts.

VTRs were estimated using reported mode split data. VMTR were estimated by multiplying average commute trip distances as reported by participants by the number of vehicle trips reduced. Annual reductions assume 240 commute days per year. All vehicle trip reductions are one-way trips.

Table 4: EcoPass Impacts on Vehicle Travel

VTR/Year/Participant	VMTR/ Year/ Participant	Avg. Trip Distance	Program Participants	Annual Trips Reduced	Annual VMT Reduced
55	1,490	27	827	45,500	1,230,000

Combined Benefits

The combination of the incentives and EcoPass program resulted in an annual vehicle trip reduction of approximately 132,000, which is equivalent to 548 vehicle trips per weekday. The combined annual vehicle miles of travel reduction is 3,110,000, which is equivalent to approximately 13,000 miles per weekday. Table 5 provides a summary of the total program impacts on an annualized basis.

Table 5: Annual Combined Program Impacts on Vehicle Travel

	VTR/ Participant	VMTR/ Participant	Avg. Trip Distance	Participants	Daily Trips Reduced	Daily VMT Reduced	Annual Trips Reduced	Annual VMT Reduced
EcoPass	55	1,490	27	827	190	5,120	45,500	1,230,000
Vanpool	191	4,600	25	58	46	1,110	11,100	266,000
Carpool	80	1,840	23	188	63	1,440	15,000	345,000
Transit	69	1,580	23	738	211	4,850	50,600	1,160,000
Total	---	---	---	1,811	510	12,500	122,000	3,000,000

The US 36 TDM Construction Mitigation Plan included estimates regarding the likely impact the TDM mitigation efforts would have on vehicle travel. The estimates were developed utilizing the TRIMMS model and case study data. TDM efforts were expected to reduce daily vehicle trips by 1,520. Daily reductions in VMT were estimated to be 4,050. Table 6 summarizes program impacts as compared to anticipated impacts.

Table 6: Actual Versus Anticipated Program Impacts

	Actual		Anticipated	
	Daily Trips Reduced	Daily VMT Reduced	Daily Trips Reduced	Daily VMT Reduced
Combined	510	12,500	1,520	4,050

Actual program impacts appear to exceed VMT estimates but fall short of vehicle trip reduction estimates. The variation is due to the modeled impacts assuming a short trip distance as compared to actual results.

Key Takeaways and Lessons Learned

The program evaluation provides important takeaways and lessons learned that can inform future TDM efforts along US 36 and other corridors throughout the state and country.

- The program successfully exceeded anticipated VMT reductions but fell short of vehicle trip reductions. This is likely a result of limitations of the TRIMMS model that was used to predict program impacts. Future efforts should note the limitations of the model.
- The EcoPass program led to a 64 percent increase in transit ridership among pass holders as compared to a 30 percent increase in transit ridership among try transit participants. It can therefore be assumed that a transit pass program is likely to be more effective than providing a limited number of single-ride transit passes. However, when funding is limited, the provision of a limited number of single-ride transit passes will yield significant results.
- Recipients of vanpool incentives reduced their driving the most followed by recipients of carpool incentives. While these programs were highly effective, recruitment of vanpoolers and carpoolers was difficult. Any program that focuses solely on these modes is likely to have limited participation.
- The program evaluation methodology used to measure impacts worked well and yielded sufficient data to calculate VMT and vehicle trip reductions.