

Subject: DES: ACCS Program Data

**FY 2023 Proposed Budget
Budget Work Session Follow-up**

3/24/2022

The following information is provided in response to a request made by Ms. Cristol at the work session on 03/03/2022, regarding the following question:

For ACCS, in addition to the inputs and outputs included in the performance measures (e.g. number of brochures distributed, number of pledges), what data are collected on outcomes or objectives of programs like ATP and Car-Free Diet, (e.g. the modal split of ATP clients' employees or residents, or survey data on the modal choices of individuals who participate in ACCS programs)?

Arlington County Commuter Services (ACCS) collects a large amount of data including site plan building studies, Arlington Transportation Partners (ATP) client surveys, Commuter Store surveys, and bike/walk studies. The resulting information is used to evaluate and model the effect of our transportation demand management programs. This analysis, reported in an annual impact evaluation provided in the attachment, estimates the travel and environmental outcomes of ACCS's collective services. For example, in the most recent report, for FY 2020, ACCS programs:

- Reduced daily drive alone vehicle trips by 48,695
- Reduced daily vehicle miles traveled by 811,860
- Reduced daily greenhouse gas emissions (carbon dioxide) by 301,244 kilograms

Travel surveys are used to capture outcomes on modal splits and choices. As part of regional surveys, ACCS/Mobility Lab commissions Arlington-specific surveys for additional insights on travel within the County. The most recent regional surveys include the [2019 State of the Commute](#) and [2017/2018 Regional Travel Survey](#).

ACCS also conducts an Arlington Resident Travel Survey Report every six years, which provides a profile of residents' commute patterns and non-work travel, their opinions and attitudes about travel, and the services they use to make travel easier. The latest report captures the mid-point of the pandemic in summer 2021, and it will be published later in 2022.

ARLINGTON COUNTY COMMUTER SERVICES

2020 IMPACT EVALUATION – SUMMARY REPORT

JULY 2019 – JUNE 2020



PREPARED BY:
LDA CONSULTING

JANUARY 20, 2021



TABLE OF CONTENTS

Section 1 – Evaluation Method	1
Overview	1
Performance Indicators	1
Section 2 – July 2019-June 2020 Program Impacts	5
Overall ACCS Program Impact Summary	5
Services Included in the Evaluation	6
Summary of Impacts by Key Program Category	8
Factors Used in the Calculation	10
Section 3 – Societal Benefit Cost Savings and ROI	16
Societal Benefits Estimated	16
Societal Benefit Cost Savings	17
ROI Calculation	17
Appendices	19
Appendix 1 Methodology Used to Calculate Impacts	
Appendices 2a, 2b, 2c – FY 2020 Impact Calculation Worksheets	
2a Impact Calculation – Core Commute Information/Assistance	
2b Impact Calculation – Financial Incentive/Commute Subsidies and New Mode Options	
2c Impact Calculation – Employer/Property TDM Assistance	
Appendix 3 Notes on Calculation Factor Data Sources	



SECTION 1 – EVALUATION METHOD AND PERFORMANCE INDICATORS

Overview

Arlington County Commuter Services (ACCS), Arlington County’s Transportation Demand Management (TDM) agency, was established in 1989 to enhance the economic vitality of Arlington County. Its mission involves reducing traffic congestion, decreasing parking demand, promoting maximum use of High Occupancy Vehicle (HOV) infrastructure, and improving air quality and mobility in and around Arlington.

ACCS implements a wide range of TDM services to support the travel needs of and provide travel mode options to Arlington County residents, employees, and visitors. ACCS provides access to comprehensive commute information and travel planners customized to help commuters find transit, shared-ride, and bike/walk travel mode options tailored to their travel needs. To make information conveniently accessible, ACCS disseminates information and other commute assistance services through Commuter Stores® located throughout Arlington County; to attendees at local fairs, festivals, and events; through websites and other digital media; through printed resources and newsletters; and at residential and commercial buildings in the County. To advance awareness of TDM methods, ACCS supports Mobility Lab, a research center and news source for transportation behavior and policy.

ACCS also encourages and enhances use of public transit and bicycle/pedestrian modes through its promotion and support of services such as the ART bus, distribution of transit schedule information, convenient access to transit fare media through the CommuteDirect services, and management of and/or partnership roles with services such as BikeArlington, WalkArlington, and the shared-bike Capital Bikeshare program.

And ACCS’s Arlington Transportation Partners (ATP) business unit works with employers, residential and commercial property managers, schools, and retail and tourism partners, encouraging them in a role as transportation service partners. The relationships fostered by ATP expand access and delivery of commute and travel services to workers, residents, and visitors throughout the county and leverage private influence and resources, particularly from employers, in meeting travel needs.



The TDM services implemented by ACCS are designed to reduce reliance on single-occupant vehicles (SOV) for travel. These actions can facilitate and encourage use of non-SOV travel mode options such as carpooling, vanpooling, public transit, biking or walking. Worksite TDM actions such as telework, compressed work schedules, and flexible schedules, can enable commuters to avoid a trip entirely or shift the time the trip is made to a less congested time of day.

ACCS’s TDM actions all work together to inform, assist, and motivate travelers to choose travel mode options that reduce the number of vehicles and vehicle miles traveled on local roads, resulting in personal cost and time savings to individual travelers, as well as emission reductions, fuel savings, and other benefits to society overall. This report documents these impacts generated through use of ACCS services in FY 2020, from July 2019 through June 2020.

Performance Indicators

The evaluation system developed for the ACCS program defines performance by a progression of actions that track with the behavior transformation continuum typically applied to consumer decision models:

- | | |
|-----------------------|--|
| • Awareness | Build initial awareness of options/concept |
| • Familiarity | Increase appreciation and understanding of specific options |
| • Consideration/Trial | Try one or more options/have a favorable experience |
| • Use/Loyalty | Adopt the behavior in everyday living/commit to repeated use of behavior |



The ACCS impact evaluation adapts this model for a seven-step “continuum” of behavior change, as shown below.

Travel Behavior Change Continuum	
<u>1 – Awareness of Modes/ACCS Services</u>	Assess commuters’ awareness of ACCS’s commuter program and services and familiarity with non-SOV travel mode options.
<u>2 – Attitudes Toward Travel Options and Willingness to Try Modes and Services</u>	Assess willingness to consider using ACCS services and non-SOV travel mode options and attitudes toward modes that are available. Attitude indicators also can assess the role of travel choices on perceptions of community vitality and business vitality.
<u>3 – Participation in ACCS Services</u>	Assess use of various ACCS services, by the targeted audience – e.g., commuters, residents, employees, employers, visitors, etc.
<u>4 – Satisfaction with Services and Repeated Use</u>	Assess service users’ satisfaction with ACCS services overall and with individual services/service features.
<u>5 – Utilization of Travel Options and Trial and Ongoing Travel Behavior Change</u>	Assess extent and duration of shifts to non-SOV travel mode options following use of ACCS services and the details of those changes in mode options used and frequency of use, and permanence of use (e.g., trial or continued use).
<u>6 – Influence on Mode Choice Decisions</u>	Assess the extent of influence of ACCS services on travel changes – did ACCS services assist or influence commuters and other travelers to start or increase use of travel mode options.
<u>7 – Impacts from Travel Changes</u>	Estimate the impacts of behavior change on the transportation system and utilization of transportation infrastructure and on air quality. This step also estimates the societal cost savings generated by reductions in SOV commuting, for benefits such as reduced traffic congestion and reduced vehicle crashes.

The first five steps mirror the consumer decision model described above. Steps one and two (awareness and attitudes) are the product of information and education actions generated by ACCS marketing and outreach. The third, fourth, and fifth elements (participation, satisfaction, and utilization) reflect program outcomes of behavior change, in essence the outcomes of the TDM services implemented by ACCS.

The sixth category assesses the factors influencing the behavioral changes. The final category defines external impacts resulting from behavior change. The 2020 ACCS evaluation estimates transportation and emission impacts, but also cost savings from social benefits, such as reduced hours of travel delay, generated by the transportation impacts.

This impact evaluation report primarily focuses on category 7, Program impacts of behavior change generated by the ACCS services. The report also presents details on indicators in categories 3 (Participation), 5 (Utilization), 6 (Influences), because they are used as components in the calculation of impacts.

The report does not specifically address the other three categories of performance indicators. They also are relevant to the success of the program, however, because they help to establish conditions under which the program generates impacts. For example, commuters can participate only in services if they are aware of them and willing to use the modes they support and will continue to use the services only if they are satisfied with them. ACCS has



undertaken numerous service-specific and county-level studies that have documented these other impacts. Reports documenting the study results are available through various Arlington County/ACCS sources.

Following are additional explanations of the performance indicators addressed in the impact evaluation and typical sources of data for the evaluation.

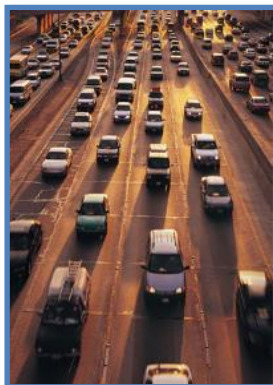
Participation (category 3) – Program participation refers to the number of customers who receive a TDM service from ACCS, for example, the number of employees at employer client sites or the number of program website users. Participation data are typically captured through user counts, service registration data, website statistics, and other methods that track the number of users at a point in time or cumulative count of users over a period of time. In most cases ACCS or one of its organizational partners collects this data.

Mode Utilization / Travel Change (category 5) – In the context of the ACCS impact evaluation, travel change refers to changes customers make in how or when they travel as a result of the ACCS services they received. In this evaluation travel changes are characterized by three indicators:

- 1) Continued placement rate – percentage of ACCS service users who made a travel change to a new travel mode option for commuting, e.g., to carpool, bus, or bike, and continued the change through the end of the evaluation period.
- 2) Temporary placement rate – percentage of service users who tried a new travel mode option after receiving an ACCS service, but did not continue using it; they used the new mode only temporarily. A related element is the duration of the new travel arrangement—how long did the temporary travel change last?
- 3) Travel mode options placements – the actual number of service users who shifted to a non-drive alone mode after using the ACCS service.

These indicators are assessed by surveying a sample of the targeted population to ask about their travel patterns during the evaluation period and identify commuters who made a travel change.

Influence on Change (category 6) – Because many factors influence travel behavior, the evaluation also examines the role the service played in influencing the travel change. Influence typically is assessed from survey questions that ask, “Did service X encourage or assist you to make this change?” or “How important was service X to your decision to make this change in your travel?” To ensure that the calculation does not over-estimate the role of the service, the service influence is factored into the calculation by discounting the travel mode options placements by the percentage of commuters who said the service had actually played a distinct role in motivating or assisting them to make the commute change.





Impacts (category 7) – The final set of performance indicators represent the contribution of the ACCS services to regional travel and air quality objectives, including:

- 1) Vehicle Trips Reduced – Measure of reduced single-occupant travel—e.g., “cars off the road.” This is typically measured by surveying a sample of ACCS service users about their current travel and their travel before they used the service. The survey data are used to derive a multiplier factor, the “Vehicle Trip Reduction (VTR) factor” that represents the average number of daily vehicle trips reduced per service user who made a travel change. This average VTR factor is multiplied by the number of placements to estimate the total number of vehicle trips reduced by all of the commuters who made travel changes.
- 2) Vehicle Miles Traveled (VMT) Reduced – A second measure is reduced single-occupant vehicle mileage, either by vehicle trips eliminated or reduced length of existing vehicle trips. VMT reduction also is typically measured through a survey of service users. In this case, survey data are used to derive the average one-way home to work travel distance for each commuter who starts or increases use of travel mode options. The average commute miles across all of these commuters is multiplied by the number of vehicle trips reduced to estimate the total VMT reduced.
- 3) Emission Reduction – Reductions in various pollutants emitted by vehicles. For the ACCS evaluation, this impact is calculated by multiplying the vehicle trips reduced and VMT reduced by emission factors that are specific to the Washington metropolitan region.
- 4) Energy Savings – Reduction in fuel used for travel purposes. This impact also is calculated using a multiplier factor related to the average fuel economy of the region’s vehicle fleet.

The factors noted above are applied in the impact calculation methodology to calculate TDM program impacts resulting from commuters’ travel changes. These calculations are briefly described in Appendix 1. Section 2, which presents the results of the impact calculation, documents how this basic approach was implemented in the ACCS evaluation.



SECTION 2 – FY 2020 PROGRAM IMPACTS

Overall ACCS Program Impact Summary

Using the method defined above, the analysis estimated the travel, air quality, and energy saving impacts of ACCS' collective services for FY 2020. Three levels of impacts were calculated, shown in the table below as “Influenced Changes (Lower Bound),” “All Changes (Upper Bound),” and “Mid-point.”

Table 1 – ACCS FY 2020 Program Impacts

Impact Indicator	Influenced Changes (Lower Bound)	Mid-point (Between Lower and Upper Bound)	All Changes (Upper Bound)
Placements (new non-SOV mode users)	41,715	56,611	71,506
Placements by new non-SOV mode:			
- Transit placements (71% of total)	29,645	40,307	50,969
- Bike placements (9%)	3,651	5,107	6,563
- Walk placements (3%)	1,104	1,491	1,879
- Carpool/vanpool placements (9%)	4,113	5,302	6,491
- Telework placement (8%)	3,202	4,404	5,604
Daily Drive Alone Vehicle Trips reduced	37,068	48,695	60,322
Daily Vehicle Miles Traveled reduced	609,939	811,860	1,013,781
Emissions reduced (daily kilograms)			
- Nitrogen Oxides (NO _x)	115.1	153.6	192.1
- Volatile Organic Compounds (VOC)	85.4	114.4	143.4
- Carbon Dioxide (greenhouse gases)	226,266	301,244	376,223

The “All Changes” impacts assume that all observed travel changes that occurred following use of ACCS program services were motivated or assisted by the services. This likely overstates the true impact, as service user surveys show that not all commuters who make travel changes attribute the changes to the services.

The more conservative “Influenced Changes” estimate includes only changes that commuters reported were directly influenced or assisted by the ACCS service. This estimate almost certainly undercounts the impacts, by excluding mode changes that commuter reported were motivated by other factors but that were facilitated by the ACCS service. For these changes, the service might have played a secondary or supporting role.





Both the high and conservative levels of potential impacts are reported in Table 1, but the actual impact likely falls somewhere between these two extremes. It is not possible to say what the “actual” impact is. A logical approach would be to take a mid-point between the upper and lower bounds as a reasonable single number for reporting purposes. For convenience, this mid-point is shown in Table 1 for each impact, in the column between the upper and lower bound numbers. Using this convention, ACCS helped at least 41,715 commuters make a travel change to a non-SOV travel mode option. The upper bound, assuming all mode changes were motivated by ACCS programs, would be for ACCS to have assisted 71,500 commuters. A reasonable mid-point would be to assume that ACCS programs helped about 56,600 commuters shift to travel mode options.

By a large margin, those who made a change to a travel mode option after using an ACCS service chose public transit for their travel to work. As shown in the mid-point column of Table 1, more than 40,300 commuters who reduced vehicle trips shifted to a bus or train for commuting, increasing transit ridership during the evaluation period. This accounted for about 71% of the total 56,600 new non-SOV mode users. Nine percent of the new mode users started or increased their use of biking and 3% started or increase use of walking for their commute. About one in ten (9%) shifted to carpool or vanpool and the same share (8%) made a change to telework, working at home or at a telecenter or co-working center.

Commuters who shifted to travel mode options eliminated between 37,068 and 60,322 daily vehicle trips through their access to ACCS services, with a mid-point of about 48,700 vehicle trips reduced. The VMT impact was between 609,939 and 1,013,781 daily VMT eliminated, with a mid-point of about 811,900. The lower bound, upper bound, and mid-point estimates for kilograms of NO_x, VOC, and greenhouse gas emissions also are shown.

Details of the impact calculations are presented in the appendices. These calculations also likely undercount ACCS’s impacts, in that they credit only impacts from commute travel. Additional services, such as tourism outreach and non-commute resident travel, are not specifically detailed in the calculation. Unlike commuting, non-commute travel does not follow regular, repeated patterns, thus is difficult to measure reliably with the survey instruments used in the ACCS evaluation.

Services Included in the FY 2020 Evaluation

The method used to calculate the impacts described above starts by estimating individual impacts for each ACCS service offered. To identify the services to be included in the ACCS calculation, the consultant reviewed ACCS background information and consulted with ACCS staff as needed to obtain a clear understanding of the activities undertaken in each service, the target population for each service, and the performance evaluation data that were available for the FY 2020 impact calculation.

Table 2 lists the services included in the FY 2020 impact calculation, with the services grouped into five categories:

- Core Commute Information/Assistance
- Marketing/Outreach
- Commute Financial Measures/Support
- Mode Options
- Employer/Property Support

Each of these service categories plays a distinct role in the comprehensive ACCS program.

- **Core Commute Information/Assistance** – This category includes services that facilitate commuters’ access to commute information, assist them to identify mode options that are available and feasible for their commute travel, and make it more convenient to use travel mode options.
- **Marketing/Outreach** – This category is comprised of marketing/outreach services and websites and other information portals that inform commuters of travel mode options that are available to Arlington residents and workers and of ACCS commute services that make it more convenient to use the mode options.
- **Commute Financial Measures/Support** – Services in this category reduce the cost of non-SOV travel mode options by providing financial benefits or payments to commuters who chose the targeted modes or facilitate the distribution of commute subsidies to commuters.



Table 2 – Services in ACCS FY 2020 Impact Calculation, with Evaluation Level Classification

ACCS Services – Key Program Categories	Evaluation Level
Core Commute Information/Assistance	
- Comprehensive commute assistance (Ridematch/Information)	Primary
- Guaranteed Ride Home	Secondary/Support
- Commuter Stores	Secondary/Support
Marketing/Outreach	
- CommuterPage.com Website	Secondary/Support
- General marketing (residents)	Secondary/Support
- Targeted marketing – Car-Free Diet (residents)	Primary
- ART bus marketing/website	Secondary/Support
- Street Teams/Community outreach events	Secondary/Support
Commuter Financial Measures/Support	
- Commuter Direct – Individual accounts	Secondary/Support
- Commuter Direct – Corporate accounts	Primary
Mode Options	
- BikeArlington – Bike commute	Primary
- Capital Bikeshare (Marketing/Promotion)	Primary
- Vanpool formation	Primary
- Carshare (Zipcar)	Secondary/Support
- WalkArlington – Walk commute	Secondary/Support
Employer/Property Support	
- Employer Services – Low/Moderate Programs (Levels 1-2)	Primary
- Employer Services – High/Very High Programs (Levels 3-4)	Primary
- School Employer Services (Arlington Public Schools)	Primary
- Commercial Property/Development Services	Primary
- Residential Property/Development Services	Primary
- ATP – ACCS core service promotion	Secondary/Support

- **Mode Options** – This category includes “on-the-street” travel mode options and services to expand the availability of non-SOV travel mode options for commuting. In the FY 2020 ACCS evaluation, this group currently includes services that support use of bicycle, walking, vanpool, and carshare travel options for commuting, but could also include mode support for public transit (e.g., new express bus, Park & Ride, etc.).
- **Employer/Property Support** – This final category is comprised of outreach and support services designed to encourage and assist employers and commercial and residential property managers to implement commute services at their worksites and office/residential buildings. While some of the activities undertaken in this group are provided directly to commuters, most represent a “wholesale” function, in which ACCS works with employers and property managers, leveraging both their resources and influence with commuters.



Service Evaluation Level – Table 2 also designates an evaluation “level” for each service: primary or secondary/support. This designation recognizes that ACCS’s services are designed to work together a package of services and there can be overlap among services. For example, a customer could be a Capital Bikeshare member and use a program website, or could use a core commute information service and also be employed by a company that participates in Employer Services activities. To ensure that the evaluation does not overestimate impacts, customers who participate in multiple services should be counted only once in the impact calculation.

ACCS staff assisted the consultant to estimate the degree of overlap between services and classified each service into one of two categories: primary or secondary/support. Primary services are defined as those that are likely to be used alone, or if they are used in combination with other services, are likely to have the greatest motivational impact of the services being considered.

Secondary/support services are expected to be used primarily in combination with other services, but with less direct influence than primary services. This group also includes services, such as ART bus marketing and community outreach events, which primarily inform customers of travel options or other ACCS services.

Arlington Transportation Partners’ (ATP) promotion of ACCS core services also falls into this category. ATP, which assists employer, developer, and property manager clients to implement worksite and residential building TDM services, also conducts informational outreach on all ACCS services directly to the employees and residents at client sites. ATP reaches many thousands of commuters through its work with employers and property managers, thus serves as a valuable marketing component of all ACCS programs.

Secondary/support services can directly motivate mode change with no intermediate contact but typically serve as a referral to the primary ACCS services, thus can have notable overlap with other ACCS services. Because they serve an important function in increasing awareness and encouraging use of other ACCS services, a portion of the impacts generated by the primary services is assigned to these secondary/support services as a “referred” impact.

The designation of primary versus secondary/support also took into account ease of data collection on use and impacts of the services. Eleven of the services were designated as primary for the 2020 evaluation and ten were classified as secondary/support.

Summary of Impacts by Key Program Category

Table 1 presented the lower bound, upper bound, and mid-point impact results for the ACCS program overall. Table 3 shows the ranges of impact results for each of the five key ACCS program areas individually.

The Marketing/Outreach and the Employer/Property Support program areas represent the largest share of the total impacts. For example, Marketing/Outreach contributes nearly half (24,001, 46%) of the total 48,695 Mid-point placements. Employer/Property Support contributes 24,650 placements, or about 38% of the total. Core Commute, Commute Financial Measures, and Mode Options account for 5%, 9% and 3%, respectively, of the total Mid-point placements. The large roles of Outreach/Marketing and Employer/Property Support stem from two key factors. First, these two categories account for 11 of the 20 ACCS services in the calculation and second, most of these services target large populations.

The percentage distributions of vehicle trip and VMT reductions across the five categories are different than for placements. For example, Marketing/Outreach represents a lower share (29%) of the total 48,695 Mid-point vehicle trips reduced than placements, while Employer/Property Support accounts for a higher percentage (51%) of the total trips reduced than it did for placements. Commute Financial Measures contributes 13% of vehicle trips reduced, Core Commute is responsible for 6% of the total, and the remaining 1% is contributed by Mode Options services. A similar distribution is noted for VMT reduced.



Table 3 – ACCS FY 2020 Program Impacts by Program Category – Lower Bound, Upper Bound, and Mid-point

Impact Indicator	All Program Areas	ACCS Program Category				
		Core Commute Info/Assist	Marketing/ Outreach	Financial Measures/ Support	Mode Options	Employer/ Property Support
<u>Placements</u>						
- Influenced chg (lower)	41,715	981	15,461	1,962	1,119	22,192
- Mid-point	56,611	2,255	24,001	4,239	1,466	24,650
- All chg (upper)	71,506	3,528	35,540	6,516	1,813	27,109
<u>Daily Vehicle Trips reduced</u>						
- Influenced chg (lower)	37,068	995	8,369	2,355	388	24,961
- Mid-point	48,695	2,349	12,880	5,087	542	27,837
- All chg (upper)	60,322	3,702	17,390	7,819	696	30,715
<u>Daily VMT reduced</u>						
- Influenced chg (lower)	609,939	17,881	130,456	53,546	4,118	403,938
- Mid-point	811,860	42,771	196,864	117,362	4,927	449,936
- All chg (upper)	1,013,781	67,661	263,272	181,178	5,735	495,935

The differences between percentage distributions of placements and vehicle trips and VMT reductions results from the specific user and travel characteristics targeted by each service. For example, a service that targets only shifts from driving alone will have higher levels of trip reduction than will one that offers services equally to drive alone commuters and commuters who already use travel mode options. And some services target longer-distance commutes, resulting in higher VMT reduced for the number of vehicle trips reduced.

In considering the figures in Table 3, it also is important to note that while the breakdown provides the relative contribution of each category to the total impacts, it does not suggest the relative importance or value of each category to the overall program.

The calculation system used to estimate the overall impacts first calculates a separate impact for each individual service as if it was the only service offered. But ACCS user surveys have clearly indicated that many commuters who use ACCS services use multiple services. As noted above, this requires an adjustment to avoid double or triple counting participating commuters and the calculation applies discount factors to reflect the estimated share of the service impact that is independent of other services.

Because most commuters will be included in at least one of the Core Commute and/or Marketing/Outreach services and many of these services are classified as secondary/support, their individual independent impacts are typically discounted more heavily than are the services in the other three categories, with a portion of their credit assigned to the primary services to which they refer commuters.

Finally, on a practical level, while general outreach and marketing messaging alone has not been found to motivate substantial mode shifts, it plays a vital role in acquainting commuters with the full range of available commute services. The most attractive package of subsidies, new mode options, and employer/worksites assistance will be effective only if commuters are aware that the services exist and know how to access them.



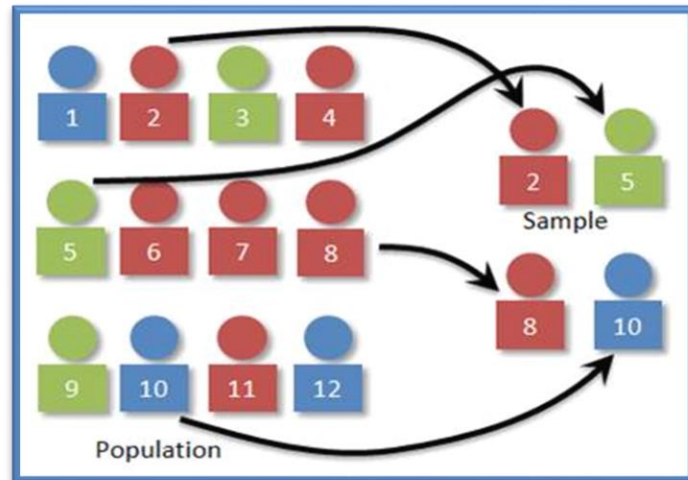
Factors Used in the Calculations

The evaluation method utilized factors related to participation in each service and behavioral change resulting from that participation. Three types of data serve as the basic factors for the impact measurement:

- 1) Level of participation in each service (population base)
- 2) Shifts to non-SOV travel mode options as a result of the program (placement rate)
- 3) Average trip and VMT reductions from individual mode shifts (VTR factor and average travel distance)

Service Participation / Population Base – Table 4 presents participation figures for each of the services included in the impact calculation. These figures were obtained from ACCS tracking sources. In defining the participation/population base, the impact calculation also considered that some participation counts reflected multiple uses of a service by a single user. For example, a customer might have used the website CommuterPage.com more than once during the year, to check schedules for various trips.

Additionally, while services are available to both employed and non-employed residents and to local and out-of-town users, the evaluation estimates only impacts resulting from commute to work trips made within or to the Washington metropolitan region, so the evaluation discounts the participation to measure behavior changes only for local employed users and for commute travel.



This discount is indicated by the two participation figures shown for some services, a total adult could and a count of employed adults. For example, the Commuter Stores participation shows that about 321,400 customers used the Stores at some time during FY 2020. But ACCS surveys of Store users indicated that about 16% were not employed. Thus, the employed share of customers was 84% or about 202,700 employed users. This lower employed user count was used to calculate the commute impacts of the service. Similar adjustments were made for other services that are used by both employed and non-employed users.

Impact Multiplier Factors – As noted in Section 1, the impact calculation applies a series of service-specific *multiplier factors* to the participation/population counts to estimate impacts. Following the listing of participation counts (Table 4), three additional tables, Tables 4a, 4b, and 4c, present the key multiplier factors for each service included in the 2020 calculation:

- Placement rate
- Influence factor
- VTR factor
- Travel distance
- Drive alone access.

For example, the continued placement rate for CommuterPage.com is 52.0%, the influence factor is 51%, and the continued vehicle trip reduction (VTR) factor is 0.56 trips reduced per day.



Table 4 – Program Participation in Individual Services in the FY 2020 Evaluation

ACCS Service	FY 2020 Participation/Users
Core Commute Information/Assistance	
- Comprehensive commute assistance	321 applicants
- Guaranteed Ride Home	624 registered users
- Commuter Stores	241,368 annual customers; 202,749 annual employed customers
Marketing/Outreach	
- CommuterPage.com Website	141,703 unique local users; 123,282 unique employed local users
- General marketing (residents)	194,447 adult residents; 155,558 employed adult residents
- Targeted marketing – Car-Free Diet (residents)	194,447 adult residents; 155,558 employed adult residents
- ART bus marketing/website	2,240,286 annual ridership Estimated 4,839 daily commute ridership
- Street Teams/Community outreach events	33,582 residents assisted; 26,866 employed residents assisted
Commuter Financial Measures/Support	
- Commuter Direct – Individual accounts	22,082 registered users
- Commuter Direct – Corporate accounts	2,450 employees at registered worksites
Mode Options	
- BikeArlington – Bike commute	54,941 annual service uses; 51,095 annual employed uses
- Capital Bikeshare (Marketing/Promotion)	2,430 registered annual members; 2,309 employed members
- Vanpool formation	30 vans; 162 vanpool riders
- Carshare (Zipcar)	3,341 registered members; 3,107 employed members
- WalkArlington – Walk commute	22,379 annual service uses; 18,350 annual employed uses
Employer/Property Support	
- Employer Services – Low/Moderate Programs (Levels 1-2)	12,213 employees at client sites
- Employer Services – High/Very High Programs (Levels 3-4)	148,956 employees at client sites
- School Employer Services (Arlington Public Schools)	706 employees at school clients
- Commercial Property/Development Services	97 buildings; Estimated 32,320 employees
- Residential Property/Development Services	74,044 residential units; Estimated 95,961 employed adult residents
- ATP – ACCS core service promotion	Varied by program; portion of referred impacts from other ACCS services

Table 4a – Multiplier Factors by Service – Core Commute Information/Assistance and Marketing/Outreach

Calculation Factor	Commute Assistance	GRH	Commuter Store		Com-muterPage.com	General Marketing	Car-Free Diet Target Marketing	ART Bus Marketing	Community Events
<u>Employed Percentage</u>	100%	100%	84%		87%	80%	80%	90%	80%
<u>Repeat Use Adjustment *</u>	1	1	12.2		1.1	1	1	417	1
<u>Placement rate</u>									
- Continued	49.0%	41.0%	30.0%		52.0%	0.7%	3.8%	30.0%	3.8%
- Temporary	6%	---	---		---	0.9%	---	---	---
<u>Influence Rate</u>	57%	50%	26%		51%	57%	26%	26%	26%
<u>VTR Factor</u>									
- Continued	0.54	0.53	1.10		0.56	0.73	0.40	0.52	0.40
- Temporary	0.52	---	---		---	1.00	---	---	---
- Temporary weeks	10	---	---		---	2	---	---	---
<u>Travel Distance (OW)</u>	8.3	9.7	19.5		17.1	7.9	7.9	7.2	7.9
<u>Drive alone Access</u>									
- DA access percentage	3%	2%	30%		32%	2%	2%	1%	2%
- DA access distance	1.5	0.6	2.7		2.8	0.6	0.6	0.5	0.6
<u>Adj. for Program Role</u>	100%	80%	100%		100%	100%	100%	10%	100%
<u>Adj. for Overlap</u>	75%	75%	68%		48%	50%	51%	52%	60%

* Repeat adjustment factor is used to convert service USES during the year into a count of unique service USERS. It accounts for repeat use by individual commuter.

Table 4b – Multiplier Factors by Service – Commute Financial Measures/Support and Mode Options

Calculation Factor	Commuter Direct - Individual	Commuter Direct - Corporate		Bike Arlington	Capital Bikeshare	Vanpool	Carshare	Walk Arlington
Employed Percentage	100%	100%		93%	95%	100%	93%	82%
Repeat Use Adjustment *	1	1		13.1	1	1	1	3.4
Placement rate								
- Continued	40.0%	10.1%		14.0%	44.0%	100.0%	18.0%	2.0%
- Temporary	---	---		---	---	---	---	---
Influence Rate	28%	90%		40%	100%	90%	40%	40%
VTR Factor								
- Continued	1.20	1.20		0.72	0.16	1.00	0.26	0.72
- Temporary	---	---		---	---	---	---	---
- Temporary weeks	---	---		---	---	---	---	---
Travel Distance (OW)	24.2	17.8		7.3	4.7	23.7	1.6	1.0
Drive alone Access								
- DA access percentage	30%	30%		---	---	90%	---	---
- DA access distance	2.7	2.7		---	---	3.0	---	---
Adj. for Program Role	100%	100%		100%	100%	100%	25%	100%
Adj. for Overlap	75%	100%		64%	80%	95%	85%	66%

* Repeat adjustment factor is used to convert service USES during the year into a count of unique service USERS. It accounts for repeat use by individual commuter.

Table 4c – Multiplier Factors by Service – Employer/Property TDM Assistance

Calculation Factor	Employer Services Levels 1-2	Employer Services Levels 3-4	Employer Services School	Commercial Property Services	Residential Property Services
<u>Employed Percentage</u>	100%	100%	100%	100%	90%
<u>Repeat Use Adjustment *</u>	1	1	1	1	1
<u>Placement rate</u>					
- Continued	3.0%	15.1%	9.1%	1.6%	1.0%
- Temporary	---	---	---	---	---
<u>Influence Rate</u>	50%	90%	70%	55%	85%
<u>VTR Factor</u>					
- Continued	0.90	1.20	0.90	0.90	1.20
- Temporary	---	---	---	---	---
- Temporary weeks	---	---	---	---	---
<u>Travel Distance (OW)</u>	17.8	17.8	17.8	17.8	7.9
<u>Drive alone Access</u>					
- DA access percentage	44%	44%	44%	44%	2%
- DA access distance	3.5	3.5	3.5	3.5	0.6
<u>Adj. for Program Role</u>	90%	90%	90%	90%	90%
<u>Adj. for Overlap</u>	100%	100%	100%	100%	70%

* Repeat adjustment factor is used to convert service USES during the year into a count of unique service USERS. It accounts for repeat use by individual commuter.



For most of the services, the evaluation derived multiplier factors from directly-collected data on service use and mode changes, through follow-up contacts with ACCS service users. If factors could not be derived directly, due to lack of data specific to a service, the evaluation used multiplier values derived for similar programs in other areas. Appendix 3 documents the sources of data for calculation factors.

The calculation first estimated impacts for individual services as if they were stand-alone services. To correct for the overlap and avoid multiple-counts of participating commuters, the evaluation derived discount factors to reflect the estimated share of the service impact that was independent of other services. These discount factors were multiplied by the trip, VMT, and emission impacts calculated for each service individually to reduce individual service impacts. Tables 4a, 4b, and 4c also show the percentage of service credit that was assigned uniquely to each service (Adj. for Overlap).



The final step in the calculation was to add all the discounted impacts for each program together, to produce the total aggregate impacts for all services combined. These impacts were presented in Table 1.



SECTION 3 – Societal Benefits and Return on Investment (ROI) of FY 2020 Impacts

Societal Benefits Estimated

The ACCS evaluation is undertaken primarily to estimate overall transportation impacts of the ACCS portfolio of services and report on the contribution of the services to ACCS’s mission to reduce traffic congestion, decrease parking demand, promote maximum use of High Occupancy Vehicle (HOV) infrastructure, and improve air quality and mobility in and around Arlington. But ACCS services also offer other benefits to residents and commuters of Arlington County and the greater Washington metropolitan region, in societal objectives such as Greenhouse gas emissions reductions, greater mobility, improved road safety, and transportation system performance. These benefits are joining congestion and air quality as forces shaping the County’s transportation policies, making them also issues relevant to ACCS. Documenting the types and magnitude of these benefits demonstrates the broad value of ACCS’ programs to the community and the value of investments made in the programs.

The ACCS evaluation thus includes an additional analysis component, estimating regional cost savings generated for selected societal benefits of the ACCS service impacts. These benefits include:

- Air pollution/emissions reductions in NOx and VOC pollutants
- Reduction in Greenhouse gas emissions/CO2
- Reduction in congestion (reduced hours of peak period travel delay)
- Reduction in fuel consumption (gasoline cost saving)
- Improved road safety (crashes reduced per 1 million VMT)
- Noise pollution reduction (reduced motor vehicle noise)

The societal cost savings for each of these benefits is calculated by defining a unit of benefit associated with each type of benefit (e.g., tons of CO2 reduced, and hours of delay reduced for reduction in congestion) and multiplying the benefit units by a unit cost factor (e.g., cost per ton of pollutant or cost per hour of delay). The conversion to benefit units and the unit cost factors for most benefits were calculated using the TDM-ROI Calculator developed under funding from the Federal Highway Administration. Table 5 defines the benefit units and cost per unit of benefit for each of the eight societal benefits. For example, the benefit unit for road construction deferred is the lane miles of limited access roadway not built and the societal cost saving per each unit of benefit is \$401 daily.

Table 5 – Societal Benefit Unit Definitions and Cost Saving per Unit of Benefit

Societal Benefit	Benefit Unit	Cost Saving per Unit of Benefit
Air pollution		
- NOx – oxides of nitrogen	Kg NOx reduced	\$1.78
- VOC – volatile organic compounds	Kg VOC reduced	\$0.15
Greenhouse gases (CO2)	Kg CO2 reduced	\$0.04
Congestion	Hours of delay eliminated	\$27.08
Road construction deferred	Lane miles	\$401
Excess fuel consumption	Gallons of fuel saved	\$2.73
Vehicle safety	Crashes avoided/1 M VMT	\$15,952
Vehicle noise pollution eliminated	Total VMT reduced	\$0.0223

1) Vehicle safety benefit base units and cost per unit are weighted averages of accident occurrences by severity.



Societal Benefit Cost Savings

Table 6 presents the estimated daily cost saving associated with each type of benefit and the overall societal cost saving for ACCS services overall. As with the impacts presented in Section 2, the results are shown as a range, with a lower bound (Influenced Changes) and an upper bound (All Changes).

Table 6 - Daily Societal Benefit Cost Savings Generated by ACCS Services

Societal Benefit	Influenced Changes (Lower Bound)		All Changes (Upper Bound)	
	Benefit Base Units	Total Daily Cost Saving	Benefit Base Units	Total Daily Cost Saving
Air pollution				
- NOx reduced	115.1 kg	\$205	192.1 kg	\$342
- VOC reduced	85.4 kg	\$13	143.4 kg	\$22
Greenhouse gases (CO2) reduced	226,266 kg	\$9,051	376,223 kg	\$15,049
Congestion (delay reduced)	1,095 hours	\$29,642	1,874 hours	\$50,752
Road construction deferred	11.8 miles	\$4,732	19.2 miles	\$7,699
Excess fuel consumption	33,886 gal.	\$92,507	56,321 gal.	\$153,757
Vehicle safety (crashes avoided)	0.617 acc.	\$9,842	1.025 acc.	\$16,351
Vehicle noise pollution eliminated	609,939 VMT	\$13,602	1,013,781 VMT	\$26,607
All benefits cost saving - daily		\$159,594		\$266,579
All benefits cost saving - annual		\$39,898,500		\$66,644,750

The ACCS services are estimated to generate a daily societal benefit cost saving of between \$159,594 per day and \$266,579 per day. On an annual basis, the cost saving would range between \$39.9 million and \$66.6 million. The mid-points for these values would be \$213,086 daily cost saving and an annual cost saving of \$53.3 million.

The largest share of the cost saving is in reduction of excess fuel used; for the lower bound, this benefit is valued at more than \$92,500 per day, or about 58% of the total daily benefits. Reduction in hours of travel delay generates the second highest benefit value; the lower bound value of this benefit is \$29,642, or about 18% of the total daily benefits. Noise pollution reduction generates about 9% and air pollution/Greenhouse gas reduction benefits and road safety accident reduction benefits each are responsible for about 6% of the total cost saving. Road construction deferred accounts for 3% of the total benefit cost saving.

ROI Calculation

Finally, Table 7 details the cost-effectiveness of the ACCS program, in terms of cost per vehicle trip reduced and VMT reduced, and the overall return on investment (ROI) for the program, for the total ACCS program cost. The overall annual program budget for FY 2020 was \$13,511,771. This cost, when divided by the vehicle trip and VMT impacts and by the societal benefit annual cost savings, results in the overall ROI and the cost-effectiveness.

The ROI for ACCS services overall is calculated to range between a lower bound of 3.0 and an upper bound of 4.9. The estimated program cost effectiveness ranges from \$1.46 (lower bound) to \$0.90 (upper bound) for the cost per vehicle trip reduced. The cost per VMT reduced ranges from \$0.09 (lower bound) to \$0.05 (upper bound).



Table 7 – ACCS Return on Investment and Program Cost-effectiveness

Societal Benefit	Influenced Changes (Lower Bound)	Mid-point (between Lower and Upper)	All Changes (Upper Bound)
Program Societal Cost Saving (annual)	\$39,898,500 per year	\$53,271,625 per year	\$66,644,750 per year
Program Cost - annual	\$13,511,771 per year	\$13,511,771 per year	\$13,511,771 per year
Program Cost - daily	\$51,968 per day	\$51,968 per day	\$51,968 per day
Program ROI	3.0	3.9	4.9
Program Cost-effectiveness (daily)			
- Total vehicle trips reduced	37,068	48,695	60,322
- Cost per vehicle trip reduced	\$1.46	\$1.11	\$0.90
- Total VMT reduced	609,939	811,860	1,013,781
- Cost per VMT reduced	\$0.09	\$0.07	\$0.05



Appendices

Appendix 1 Methodology Used to Calculate Impacts

2020 Impact Calculation Worksheets

Appendix 2a Impact Calculation – Core Commute Information/Assistance

Appendix 2b Impact Calculation – Financial Incentive/Commute Subsidies and New Mode Options

Appendix 2c Impact Calculation – Employer/Property TDM Assistance

Appendix 3 Notes on Calculation Factor Data Sources

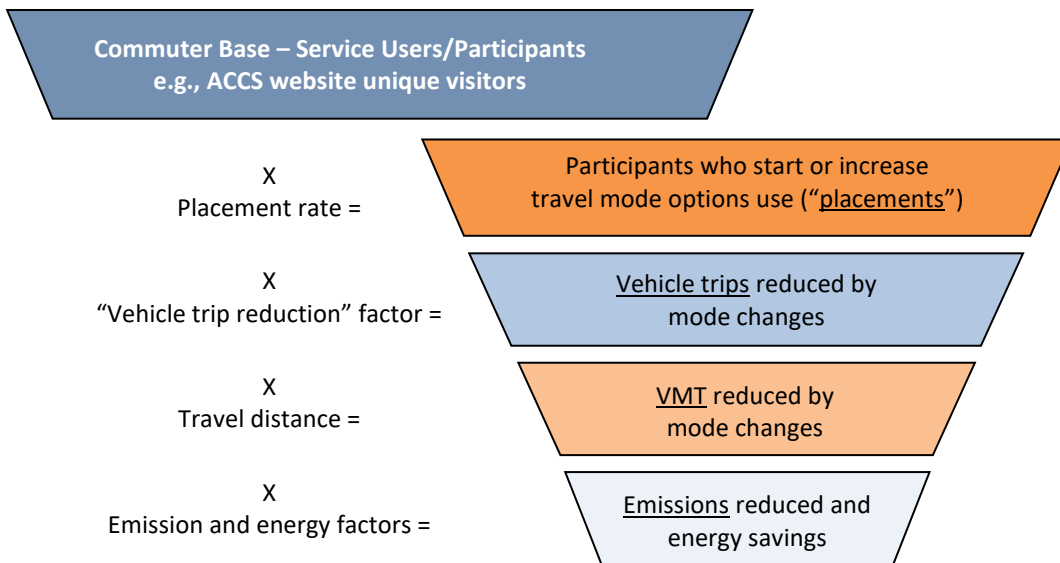


Appendix 1 Methodology Used to Calculate Impacts

Figure 1-a illustrates the method developed to calculate travel and air quality impacts for ACCS services. It consists of a series of calculation steps beginning with a definition of the population base for the service. A series of multiplier factors derived from a survey of users is then applied to the population base to calculate service impacts.

This method was applied for each ACCS service for which participation could be tracked and multiplier factors could be developed. Each service has a unique set of factors, depending on the characteristics of the service and users, but the basic calculation method is the same for all services.

Figure 1-a: Impact Calculation Multiplier Steps



A brief description of each of the steps is presented below.

1. Estimate commuter population “base” for the service
 A TDM service is designed to influence or encourage a targeted set of travelers to shift to non-drive alone modes. The population of travelers/customers/service users represent the *population base* for that service, for example, the population of an ACCS website users. Population base estimates were identified for each service from ACCS data.
2. Estimate “placement rate” and “influenced placement rate”
 Placement rate refers to the percentage of the population base “placed” in travel mode options after receiving a service. These commuters could be new carpoolers, vanpoolers, transit riders, bicyclists/walkers, or teleworkers, as well as commuters who increase use of these modes. Placement rates are typically estimated from survey data of a sample of the population and vary from one service to another, depending on the characteristics of the service and population.



To collect placement rate data, service users are asked several questions:

- How do you travel now—what modes do you use and how often do you use them?
- Did you make any changes in your travel since you received “X” service?
- How did you travel before you received this service?
- Did the service encourage or assist you to make this change?

Users who made a travel change are considered “placements.” For each ACCS service, a *Continued* placement rate is calculated, representing users who shifted to a new travel mode option and continued using the new mode. Some services also have a *Temporary* placement rate, representing users who tried a new travel mode option but returned to original mode within the evaluation period. Temporary changes are credited only for the duration of time the new mode was used.

The count of commuter placements is additionally discounted by an “influence factor,” which reflects the role the service played in influencing or assisting commuters’ mode change. For example, surveys have shown that commuters can be influenced by many factors to make mode changes, so it is unrealistic to assume that all mode shifts are entirely the result of TDM services. The influence factor is derived from survey questions that ask, “Did service X encourage or assist you to make this change?” or “How important was service X to your decision to make this change in your travel?”



The influence factor also addresses ACCS’s contribution in implementing the service. For some services, such as CommuterPage.com, ACCS is fully responsible for implementing the program element. But in other cases, such as Capital Bikeshare and ART bus marketing, ACCS performs a promotional or supporting role, with another entity operating the service. In these cases, the share of credit assigned to ACCS is less than 100%.

3. Estimate the number of new travel mode options placements

Step 3 estimates the number of service users who started or increased use of travel mode options as a result of the service. It is calculated for each service as:

$$\text{Total Population base (from Step 1)} \times \text{Placement rate (from Step 2)}$$

4. Estimate the vehicle trip reduction factor for new placements

Next, the vehicle trip reduction (VTR) factor is estimated for each service. The VTR factor is equal to the average daily vehicle trips reduced per placement, taking into account the following types of changes:

- 1) Drive alone applicants shifting to travel mode options
- 2) Travel mode options users shifting to different travel mode options (e.g., carpool to bus or bus to vanpool)
- 3) Travel mode options users increasing the number of days they use travel mode options or the number of occupants in carpools and vanpools

The VTR factor combines the trip reduction results of all placements into an average reduction per placement. As was indicated for placement rates, VTR factors might be different for different program elements. Note that shifts from travel mode options to drive alone are not included in the VTR factor, since these changes are typically unrelated to the services.



5. Estimate vehicle trips reduced

The number of daily vehicle trips reduced for the service is estimated by multiplying the number of travel mode options placements by the service’s VTR factor:

$$\text{Total placements (from Step 3)} \times \text{VTR factor (from Step 4)}$$

6. Estimate vehicle miles traveled (VMT) reduced

The daily VMT reduced is calculated by multiplying the number of daily vehicle trips reduced (Step 5) by the average one-way travel distance for service users who made a travel change.

$$\text{Total vehicle trips reduced (from Step 5)} \times \text{one-way travel distance}$$

7. Adjust vehicle trips and VMT for access mode

Emission reduction is calculated by multiplying vehicle trips reduced and VMT reduced by emission factors. But because commuters who drive-alone to a bus stop, train station, or rideshare meeting point create “cold starts,” the emission reduction analysis subtracts these access trips and the VMT driven to the meeting point from the vehicle trip and VMT reductions. It is these “adjusted” vehicle trips reduced and VMT reduced, rather than the initial totals, that are used to calculate emissions reduced.



8. Estimate emissions reduced

Daily emissions reduced by mode shifts were estimated by multiplying regional emission factors by the number of vehicle trips and VMT reduced. The emissions factors were obtained from the Metropolitan Washington Council of Governments, for 2020. The emissions factors account for emissions created from a “cold start,” when a vehicle is first started, a “hot soak,” that occur when the vehicle is later turned off, and the emissions generated per mile of travel by a warmed-up vehicle.

$$\begin{aligned} &\text{Vehicle trips reduced (from Step 5)} \times \text{Trip emission factor} \\ &\text{VMT reduced (from Step 7)} \times \text{VMT “running” emission factor} \end{aligned}$$

9. Estimate the energy savings

Energy savings is reported as gallons of gasoline saved and was estimated by multiplying the VMT reduced by an average fuel consumption factor for the regional mix of light duty vehicles.



2020 Impact Calculation Worksheets

- Appendix 2a Impact Calculation – Core Commute Information/Assistance and Marketing/Outreach
- Appendix 2b Impact Calculation – Commute Financial Measures/Support and Mode Options
- Appendix 2c Impact Calculation – Employer/Property TDM Assistance

The following three appendices display the results of the calculations for each individual service. The following information is presented:

Participation – Base users, employed users (if different from base), and unique users (if different from base)

Base impacts – placements, daily vehicle trips reduced, and daily VMT reduced; these impacts are calculated by multiplying the unique employer user participation count by the series of multiplier factors derived for the service.

Upper bound impacts, adjusting for overlap across programs; these impacts are calculated by multiplying the base impacts (no adjustments) by the “stand-alone” credit percentage assigned to the service, assigning the share of the service impact that is unique to that service.

Lower bound impacts, adjusting for influence of the service; these impacts are calculated by multiplying the upper bound impact by the “influence” credit percentage assigned to the service; this adjusts for the percentage of service users who said they were definitively influenced by the service to make a mode change.

Appendix 2a – Impact Calculation – Core Commute Information/Assistance and Marketing/Outreach

Calculation Factor	Commute Assistance	GRH	Commuter Store	Commuter Page.com	General Marketing	Car-Free Diet Target Marketing	ART Bus Marketing	Community Events
Participation								
- Base User/Use	321	624	241,368	141,703	194,447	194,447	2,240,286	33,582
- Employed User/Use	321	624	202,749	123,282	155,558	155,558	2,016,257	26,866
- Unique Users	321	624	16,619	112,074	155,558	155,558	4,839	26,866
Base Impacts (no adjust)								
- Placements	178	256	4,986	58,279	2,504	5,911	1,452	1,021
- Vehicle trips reduced	87	136	5,484	32,636	892	2,364	755	408
- VMT reduced (net of DA)	717	1,317	102,496	528,833	7,036	18,648	5,432	3,218
Upper Bound – applying Overlap Adjustment								
Service “stand alone” %	71%	71%	65%	47%	50%	48%	50%	60%
- Placements	125	182	3,221	27,135	1,252	2,808	732	613
- Vehicle trips reduced	62	97	3,543	15,195	446	1,123	381	245
- VMT reduced (net of DA)	511	938	66,212	246,225	3,518	8,858	2,740	1,931
Lower Bound – applying Influence Adjustment								
Service influence %	57%	40%	26%	51%	57%	26%	3%	26%
- Placements	71	73	837	13,839	714	730	19	159
- Vehicle trips reduced	35	39	921	7,749	254	292	10	64
- VMT reduced (net of DA)	291	375	17,215	125,575	2,005	2,303	71	502

Appendix 2b – Impact Calculation – Commute Financial Measures/Support and Mode Options

Calculation Factor	Commuter Direct - Individual	Commuter Direct - Corporate		Bike Arlington	Capital Bikeshare	Vanpool	Carshare	Walk Arlington
Participation								
- Base User/Use	22,082	2,450		54,941	2,430	162	3,341	22,379
- Employed User/Use	22,082	2,450		51,095	2,309	162	3,107	18,350
- Unique Users	22,082	2,450		3,900	2,309	162	3,107	5,397
Base Impacts (no adjust)								
- Placements	8,833	247		546	1,016	162	559	108
- Vehicle trips reduced	10,599	297		393	163	162	145	78
- VMT reduced (net of DA)	247,910	5,047		2,869	766	3,401	232	78
Upper Bound – applying Overlap Adjustment								
Service “stand alone” %	71%	90%		64%	76%	90%	85%	66%
- Placements	6,294	222		349	772	146	475	71
- Vehicle trips reduced	7,552	267		252	124	146	123	51
- VMT reduced (net of DA)	176,636	4,542		1,836	582	3,069	197	51
Lower Bound – applying Influence Adjustment								
Service influence %	28%	90%		40%	100%	90%	10%	40%
- Placements	1,762	200		140	772	131	48	28
- Vehicle trips reduced	2,115	240		101	124	131	12	20
- VMT reduced (net of DA)	49,458	4,088		734	582	2,762	20	20

Appendix 2c – Impact Calculation – Employer/Property TDM Assistance

Calculation Factor	Employer Services Levels 1-2	Employer Services Levels 3-4	Employer Services School	Commercial Property Services	Residential Property Services	ATP Support
<u>Participation</u>						
- Base User/Use	12,213	148,956	706	32,320	106,623	NA*
- Employed User/Use	12,213	148,956	706	32,320	95,961	NA*
- Unique Users	12,213	148,956	706	32,320	95,961	NA*
<u>Base Impacts (no adjust)</u>						
- Placements	366	22,492	64	517	960	2,998
- Vehicle trips reduced	330	26,991	58	465	1,152	2,065
- VMT reduced (net of DA)	5,366	438,874	941	7,559	9,087	36,834
<u>Upper Bound – applying Overlap Adjustment</u>						
Service “stand alone” %	100%	100%	100%	100%	70%	100%
- Placements	366	22,492	64	517	672	2,998
- Vehicle trips reduced	330	26,991	58	465	806	2,065
- VMT reduced (net of DA)	5,366	438,874	941	7,559	6,361	36,834
<u>Lower Bound – applying Influence Adjustment</u>						
Service influence %	45%	81%	63%	50%	77%	100%
- Placements	165	18,219	40	256	514	2,998
- Vehicle trips reduced	149	21,863	37	230	617	2,065
- VMT reduced (net of DA)	2,415	355,488	593	3,742	4,866	36,834

* ATP Support does not have independent “base users.” The impacts for this program component represent a composite of shares of placements, vehicle trips reduced, and VMT reduced by other program components that are supported by ATP. Small shares of the independent impact credits for those programs (e.g., 5% of GRH) are deducted from the supported programs and assigned to ATP Support. This acknowledges the assistance that ATP staff provide across the broad ACCS program without double-counting impacts.

Appendix 3

FY 2020 Impact Calculation – Notes on Calculation Factor Data Sources

The evaluation system applies a series of calculation factors (placement rate, vehicle trip reduction/VTR factor, travel distance, and drive-alone access percentage and distance) to estimate impacts for each service. These factors are derived from surveys of users of the specific services. Following is a summary of the most recent survey data for each service.

In cases for which specific-specific data were not available, a secondary source was used. One common secondary source was the regional State of Commute (SOC) survey conducted by the Metropolitan Washington Council of Governments (MWCOG) for the Washington metropolitan region. This survey includes Arlington County as one of the jurisdictions surveyed and provides data on travel patterns of employed Arlington residents as well as commuters who travel to Arlington for work.

Service	Calculation Factor Data Sources *
Core Commute Information/Assistance	
- Comprehensive commute assistance	2018 DRPT Placement survey; MWCOG 2019 SOC
- Guaranteed Ride Home	MWCOG 2019 GRH survey; 2019 SOC
- Commuter Stores	2018 Commuter Store survey; 2019 SOC
Marketing/Outreach	
- CommuterPage.com Website	ACCS 2009 CommuterPage.com survey; 2019 SOC
- General marketing (residents)	2015 Arlington resident survey; 2019 SOC
- Targeted marketing – Car-Free Diet (residents)	2015 Arlington resident survey; 2019 SOC
- ART bus marketing/website	2013 ART rider survey
- Street Teams/Community outreach events	2015 Arlington resident survey; 2019 SOC
Commute Financial Measures/Support	
- Commuter Direct – Individual accounts	2018 Commuter Direct survey; 2019 SOC
- Commuter Direct – Corporate accounts	2020 MWCOG TDM Program analysis
Mode Options	
- BikeArlington – Bike commute	2011 BikeArlington survey
- Capital Bikeshare (Marketing/Promotion)	2012/2014 Capital Bikeshare surveys
- Vanpool formation	TDM-ROI Calculator default (2018)
- Carshare (Zipcar)	2007 MWCOG Carshare survey
- WalkArlington – Walk commute	2011 WalkArlington survey
Employer/Property Support	
- Employer Services – Lev 1-2, Lev 3-4, School	2020 MWCOG TDM Program analysis (Arl employers)
- Commercial Property/Development Services	2016 Arlington Office Building Study
- Residential Property/Development Services	2018 Arlington Residential Building Study

* MWCOG 2019 SOC Survey – Used for commute distance, drive alone access