Postal Regulatory Commission
Submitted 4/21/2021 2:41:36 PM
Filing ID: 116646
Accepted 4/21/2021

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

FIRST-CLASS MAIL AND PERIODICALS SERVICE STANDARD CHANGES, 2021

Docket No. N2021-1

DIRECT TESTIMONY OF
STEPHEN B. HAGENSTEIN
ON BEHALF OF THE
UNITED STATES POSTAL SERVICE

(USPS-T-3)

TABLE OF CONTENTS

AUTOBIOGRAPHICAL SKETCH

My name is Stephen Hagenstein. Since February 2020, I have served as Director, Logistics Modeling and Analytics at the United States Postal Service. My office is responsible for providing analytics and insights to help the organization review scenarios, plan for future needs, and make strategic decisions. My team directly supports Surface Logistics, Air Transportation Operations, Processing Operations, and strategic teams.

I began my career with the Postal Service in 2004 as a Field Industrial Engineer where my responsibilities included implementing automation and mechanization equipment in a mail processing facility; forecasting volumes and scheduling processing equipment; and analyzing processes and recommending changes to improve efficiency.

In 2007, I was promoted to Area Operations Industrial Engineer. In this position, I served as the Material Handling and Processing Equipment Coordinator. In that role, my responsibilities included developing and reviewing material handling project requests and business cases. I also analyzed and managed equipment utilization through scheduling and reallocation of resources throughout the region. In that position I also led process improvement teams, and identified, analyzed, and reported key performance indicators to drive process improvement behaviors.

My next position with the Postal Service was as a Lead Operations Industrial Engineer beginning in 2011. As a Lead Operations Industrial Engineer, I played a key role in the planning and implementation of facility consolidations and restructuring, involving over 60 Processing and Distribution facilities in ten states. I also strategized with Postal Service senior management to develop service and productivity performance improvement programs, and coordinated staffing modeling to determine the authorized complements in Processing and Distribution Centers.

In 2018, immediately prior to assuming my current position, I was promoted to Plant Manager at the 315,000 square foot Pennwood Place, Pennsylvania Processing & Distribution Center, located just outside of Pittsburgh, Pennsylvania, with 470 employees, serving Western Pennsylvania, Ohio, and West Virginia. In this role I was directly responsible for all operations, including processing and distribution, facility and equipment maintenance, and transportation. I was also in charge of implementing a process to track and improve on-time trip departures, and a scanning visibility analysis and tracking process to improve container and bundle visibility.

Prior to joining the Postal Service, I worked as an Industrial Engineer for Thomas G. Faria Corporation from 2003 to 2004. In that role, I implemented Lean manufacturing principles, reducing inventory levels and improving production line efficiency; I also coordinated and balanced production lines and work-cells using time studies, among other duties.

I am a graduate of the University of Rhode Island’s International Engineering Program, from which I earned a Bachelor of Arts in French and a Bachelor of Science in Industrial and Manufacturing Engineering.

PURPOSE OF TESTIMONY

The purpose of my testimony is to provide an overview of the current transportation network and the modeling methodology used to evaluate the effects of the Postal Service's First-Class Mail and Periodicals Service Standard Changes to accommodate greater use of surface transportation in the network for First-Class Mail (FCM) letters and flats and end-to-end Periodicals in the contiguous 48 states, as a result of its proposed plan to change service standards for FCM and end-to-end Periodicals. My testimony, as demonstrated via the models described below, explains how the proposed service standard changes under review in this docket will enable the Postal Service to increase efficiency in the transportation network and lower unit transportation costs, while also enhancing service capability.

ASSOCIATED LIBRARY REFERENCES

I sponsor the following USPS Library References that are associated with my testimony: USPS-LR-N2021-1-1 through USPS-LR-N2021-1-3. I also am sponsoring the following non-public USPS Library Reference associated with my testimony: USPS-LR-N2021-1-NP1.

I. BACKGROUND

For decades, the Postal Service shaped its transportation network to accommodate significant mail volume growth, augmented to support the movement of increased mail volume among and between processing facilities and delivery offices. To comport with current economic realities and the continuing reduction in mail volume over the past decade, however, the Postal Service must adapt its transportation network in a different manner. As the employed models demonstrate, the changes proposed in this docket will provide the Postal Service with flexibility to increase efficiency in its transportation network and reduce transportation costs, while enhancing the reliability of the service that is provided.

My testimony begins with an overview of the structure of the transportation network here in Section I. In Section II, I explain the process utilized to analyze the effects of the proposed service changes on the transportation network. This includes an explanation of the modeler, assumptions, constraints and limitations, inputs, and refinements. Finally, I explain the results of the model in Section III.

A. The Structure of the Transportation Network

The transportation network must provide for safe, efficient, and timely movement of mail among postal processing facilities and between processing facilities and delivery offices. The size of the transportation network is dependent upon the size of the processing and distribution network and the need to move mail to and from Processing and Distribution Centers, International Service Centers, Network Distribution Centers, Distribution Delivery Units, annexes, airports, Post Offices, stations, and branches. To illustrate, when mail volumes were increasing between 1993 and 2006, the Postal Service added processing and distribution facilities to the processing network, thereby accommodating both higher volumes and the space necessary for additional mail processing equipment. As a result, the Postal Service also needed to augment the transportation network to move mail between these additional facilities.

The transportation network must be designed to ensure that mail volumes can be transported between postal facilities within certain transportation windows so that the mail can be processed and delivered in accordance with the applicable processing windows and service standards. A "transportation window" is the time period between the "clearance time" set by the origin processing plant and the "critical entry time" established by the destination processing plant. The clearance time (CT) is the time when the outgoing operations is completed at the origin. This time is used to establish the volume availability time, or earliest departure time at the origin. The Critical Entry Time (CET) is the latest time an operation or facility can accept volume without impacting the operating plan, or ability to successfully process the volume in a timely manner. The CTs and CETs set by the processing facilities and the distance between those postal facilities inform Postal Service decisions regarding the transportation mode(s) necessary to move respective classes of mail between those facilities.

B. Modes of Transportation

The primary transportation modes used by the Postal Service are surface and air. FCM, Priority Mail, and Priority Mail Express intended for carriage and delivery within the continental United States and between the contiguous United States and non-contiguous parts of the domestic service area are transported via air when necessary to achieve the applicable service standards. In contrast, Periodicals, USPS Marketing Mail, and Retail Ground are transported exclusively by surface within the contiguous United States because: (1) the applicable service standards generally provide more time for the delivery of these mail classes; and (2) surface transportation modes are typically less expensive than air transportation modes. Additionally, Periodicals, USPS Marketing Mail, and Retail Ground are transported by boat to reach non-contiguous states and territories.

1. Surface Transportation

The service changes under review in this docket will have direct implications for the surface and air transportation networks. Surface transportation is provided by (1) the Postal Vehicle Service (PVS), which is comprised of drivers who are USPS employees; or (2) Highway Contract Route (HCR) service providers. Air transportation is provided by third-party service providers.

i. Postal Vehicle Service

Network transportation using Postal Service vehicles and employees is called PVS. The functional responsibility of PVS is to transport large containers of mail between mail processing facilities, and to and from airports, Post Offices, stations, and branches. PVS drivers also provide services such as plant load pick-up. In general, PVS does not provide service to mail processing plants and retail locations that are designated for HCR service. PVS operations encompass drivers, vehicles, and administrative support such as supervisors and clerks. PVS transportation to Post Offices, stations, and branches will not be impacted by the proposed service changes under review in this docket.

ii. Highway Contract Route Service

HCR service transports all mail classes throughout the postal network and is the primary provider for long-haul surface transportation. On average, HCR transportation is less expensive than PVS. HCR service is contracted where PVS is absent.

iii. Short- and Long-Haul Transportation Networks

The surface network is segmented into two broad categories: the short-haul network and the long-haul network. "Short-haul network" generally refers to the transportation network that connects postal facilities that are less than 300 miles apart. The purpose of the short-haul network is to ensure timely transportation of mail subject to two-day service standards. The transportation of mail over short-haul networks may be provided by both PVS drivers or HCR providers.

"Long-haul network" refers to transportation by HCR providers that connects postal facilities more than 300 miles apart. Long-haul network transportation may entail "direct" trips between origin and destination facilities or "indirect" trips whereby a truck stops at a consolidation truck terminal or hub before continuing on to its destination. At a terminal or hub, a truck is filled with additional mail intended for transport to the destination facility. Generally, a truck run that is routinely less than 60 percent full is directed to a consolidation facility so that the Postal Service can take full advantage of the truck's carrying capacity. However, in some circumstances, that is not possible because CETs or service standards dictate a direct trip.

2. Air Transportation

The Postal Service uses air transportation (*i.e.*, passenger and cargo planes) to transport certain FCM, Priority Mail, and Priority Mail Express volumes between processing plants to ensure that such mail can be processed and delivered in accordance with applicable service standards. To select the optimal service provider, the Postal Service considers factors such as the service standards for the mail being transported, security requirements, contract terms (*e.g.*, weight and volume restrictions), price, and capacity. The Postal Service also contracts with third-party terminal handling suppliers which act as intermediaries between the Postal Service and the air transportation provider. These terminal handling suppliers prepare mail for air transport and receive mail from the air transportation provider for transfer to the Postal Service. As the proposed service standard changes under review in this docket extend the transportation window, a significant portion of FCM volume currently traveling by air would be diverted to surface transportation.

C. Challenges within the Transportation Network

Under the current service standards, both over- and under-utilized trips across the transportation network lack flexibility. Routing existing trips through consolidation points to increase utilization and decrease trips remains infeasible between many lanes because doing so requires an amount of time that is not available in the current transportation window.

Additionally, declining mail volume, which has resulted in changes in volume distribution across the network, has, over time, created an unbalanced transportation system. This had led to less efficient direct transportation of mail. Furthermore, differing CETs for FCM and packages, leading to separate networks for separate products, has reduced utilization efficiency.

II. PROCESS UTILIZED TO ANALYZE TRANSPORTATION CHANGES

This portion of my testimony describes the evaluation of how the proposed service standard modification allows for additional transport time and increased efficiencies across the network for FCM and end-to-end Periodicals. Adding one to two days to the service standard between certain origin Processing & Distribution Center or Facilities (P&DCF), destination Area Distribution Centers ADC), and destination Sectional Center Facilities (SCF) pairs (OD Pairs) will enable the percentage of First-Class Mail volume transported via surface to increase from approximately 79 percent to 88 percent.[1]

A. Overview

My analysis quantifies the potential shift of mail volume from the air network to the surface network, the impact to the surface network from the additional diverted volume, and the routing efficiencies gained to the existing surface network due to the increased transportation window. The network

[1] Section III below discusses the modeling results that led to this conclusion.

scenarios were modeled using logistics industry optimization software, Blue Yonder© Transportation Modeler (TMOD).[2]

The service standard changes reviewed in this docket will impact both OD Pairs that are currently served by surface transportation and those currently served by air transportation. Due to the impact to the current surface network and the introduction of new OD Pairs to the surface network, the modeling was an iterative process to maximize network efficiencies and ensure accurate comparative analysis of results. The iterative process first created a model to optimize the current surface pairs, then introduced current air OD Pairs into the model, and finally analyzed cost effectiveness of the model's routing results for current air OD Pairs.

The first iteration uses TMOD to optimize current surface OD Pairs using the proposed service standard changes. The result of this model is an optimized surface network which better maximizes transportation efficiencies. For the next model iteration, which introduces current air OD Pairs, the routings in the first model result are "locked" to ensure that the model would not create inefficient routings of current surface pairs to accommodate the air OD Pairs. This model then determines the optimized surface routings for current air OD Pairs either by utilizing the "locked" routings from the first iteration or developing new routings exclusively for the current air OD Pairs. Finally, the surface routes created exclusively for the current air OD Pairs are evaluated to determine if those new surface routes are more cost effective then transporting via the air network. The

[2] TMOD specializes in optimizing both large and small transportation networks by providing users with a vast array of customizable variables and inputs. Here, TMOD build 2019.1 and PC*Miler 30© were employed. The software ran on a virtual desktop server.

evaluation of a proposed air-to-surface lane compares the estimated cost for the surface trip to the estimated cost per cubic foot of transporting that volume via the air network.[3] The final surface routing model result is a combination of the new surface routings added exclusively for current air OD Pairs that are determined to be cost effective and the optimized surface routings that combined both current surface and air OD Pairs in the second model iteration.

B. Inputs

A number of inputs, appropriate to this type of modeling and described below, were utilized in the modeling. Package volume was derived from the Postal Service's Product Tracking & Reporting (PTR) System. The second highest Wednesday volume from October 2020 was selected. All other volume in the model is based on March 2019 WebODIN[4] (renamed from ODIS) data that is a monthly total by Origin 3-digit ZIP Code, Destination 3-digit ZIP Code, class, and shape. First-Class Mail volumes were compared and scaled to match the USPS monthly Revenue & Volume Comparison (RVC) report for March 2020. The volume used for the modeling represents the second-highest Wednesday in the month of March. To estimate the second-highest Wednesday volume, total container scans for the month of March were first pulled from the Surface Visibility (SV) database. The daily proportion of containers was determined by dividing the daily count by the total. The proportion of the second highest Wednesday containers to the total containers was applied to the ODIN piece-

---

[3] The model uses an estimated cost for surface trips of $2.50 per mile (rounded up from $2.48 per mile). *See ProcurementIQ Procurement Report: 52869612 National Trucking Services* (April 2020). A cost of $7.50 per cubic foot was assumed for air transportation.
[4] LR-N2021-1-1, 1_P.WEB_ODIN_MARCH_2019.txt; LR-N2021-1-NP1, NP1_NP.WEB_ODIN_MARCH_2019.txt.

level data to estimate the second highest Wednesday volume. This volume was further compared to data from the Informed Visibility (IV) system to ensure accuracy.

The volume mapping files consist of the Transportation Optimization Planning and Scheduling (TOPS) originating mapping file[5] and the National Distribution Labeling List (NDLL) file.[6] The TOPS file contains origin 3-digit ZIP Codes that are mapped to their corresponding processing facilities. This file provides a mapping for every Origin 3-digit ZIP Code, class, and shape to a processing facility. The NDLL file contains destination 3-digit ZIP Codes mapped to their corresponding destination processing facilities. The file provides all processing facilities across the country with the required separations and destination location for every 3-digit ZIP Code, class, and shape.

The Mode Mapping file,[7] a current state mode matrix, is pulled from the USPS Distribution Table Maintenance System (DTMS). The matrix is presented by Origin 3-digit ZIP Code, Destination 3-digit ZIP Code, class, shape, and day of the week. For the model the Wednesday mode matrix was used. This table designates the approved mode of transportation, air or surface, between every origin and destination pair in the country.

For the Containerization file,[8] volumes are converted to All Purpose Containers (APCs) using the USPS Management Operating Data System (MODS), Manual M-32, conversion rates by product. Pieces were converted to

[5] LR-N2021-1-1, 1_Transportation_Optimization_Planning_Scheduling_originating_mapping.xls.
[6] LR-N2021-1-1, 1_National_Distribution_Labeling_List.xlsx.
[7] LR-N2021-1-1, 1_P.Mode_Mapping.xlsx; LR-N2021-1-NP1, NP1_NP.Mode_Mapping.xlsx.
[8] LR-N2021-1-1, 1_Containerization_File.xlsx.

APCs to provide a universal unit of volume for the modeling software, since 10 letter pieces do not require the same space as 10 parcels. However, by converting all mail to equivalent APCs, the Postal Service can now accurately create shipments for the software to analyze using volume inputs that are directly comparable. This model assumes the average APC would be 75 percent full. Volume requiring more than a 75 percent full APC was rounded to the next highest number of containers. For example, if a lane converts piece volume to 1.2 APCs, this was modeled as 2 APCs. Performing the above conversions and calculations outside of the model significantly reduced the complexity of calculations that would have to take place inside the software.

The Shipment Table[9] contains the shipment data, or origin to destination pair volumes used in the model. Each shipment must consist of an origin, destination, transportation window, product, and volume. These are the minimum required inputs to run a model for optimization in TMOD. The model optimizes the routing of the shipments referenced in this table, with the objective of minimizing transportation miles while adhering to all parameters and constraints.

The Location Table[10] contains every location used in the model. Every origin and destination from the Shipment Table must be defined in this table. For this model, National Air and Surface System (NASS) facility codes from TOPS and the NDLL are used as locations. Surface Transfer Centers (STCs) are used as hub locations for the model. Every NASS location is associated with its

[9] LR-N2021-1-1, 1_P.Shipment_Table.xlsx; LR-N2021-1-NP1, NP1_NP.Shipment_Table.xlsx.
[10] LR-N2021-1-2, 2_Location_Table.xlsx.

current address and latitude and longitude coordinate from the Facilities Database (FDB).

By default, PC*Miler is used to calculate the time and distance between all pairs represented in the model. PC*Miler uses the road speed limits to determine transit time and does not currently adjust for traffic. The Transit Override Table[11] is an optional table that can be used in tandem with the results from PC*Miler to allow users to define a custom transit time between pairs in the model. For this model, we are using this table because it allows us to use USPS Supply Management's standard of 46.5 miles per hour for transportation planning.

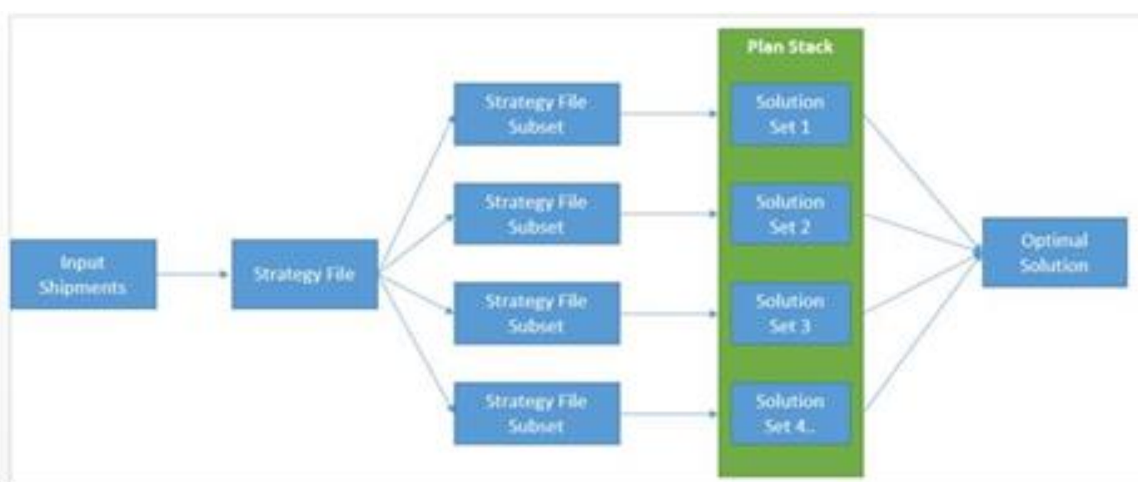
The Access Rating Tools (ART) Database[12] is a Microsoft Access file with a custom user interface. This file defines all valid paths of travel and associated assumed costs for that travel. While optimizing routings, the model checks proposed routings against the ART file to ensure they are valid and determine the cost incurred.

The Strategy File[13] is a TMOD-specific file that gives instructions to the software on how to perform the optimization. This file allows users to define the order in which certain optimizations are performed. For the modeling developed for this docket, the file was designed around the Postal Service's complex business rules. To achieve this, all the processes that the model must solve were mapped out, creating many different strategy files to test. The run time, solution, and complexity of each strategy file was taken into consideration when deciding on the final version.

[11] LR-N2021-1-2, 2_Transit_Override_Table.xlsx.
[12] LR-N2021-1-2, 2_Access_Rating_Tool.mdb.
[13] LR-N2021-1-2, 2_Strategy_File.strat.

The version used in this modeling effort gives the best solution without sacrificing the run time or being overly complex. Reducing the complexity is important, because small changes in the rules could require significant changes in a more complex strategy file, making comparisons across different model runs increasingly difficult. The strategy file used in this model builds the solution using a series of optimization functions within a PLAN STACK, or repository of saved solutions. The results are then reset, a new set of functions are run, and the results are saved to the PLAN STACK. Once all functions have run, the strategy file will then reference the PLAN STACK (which has all of the different solutions stored) and select the optimal solution from all saved solutions. The below diagram illustrates this process.

Figure 1: Optimization Functions Process



More specifically, the strategy file first builds the optimal direct routes and multi-stop routes and saves the solution to the PLAN STACK. It then builds the optimal hub routings and stores those in the PLAN STACK. It will then take the best of both of these solutions for the final resulting routings.

The Parameter File[14] is also a TMOD-specific file. It contains a set of global optimization parameters. Many of the parameters are also defined at a more granular level. They include maximum volume per trip, maximum stops in transit (for multi-stops), maximum allowed transit duration, and maximum legs per shipment (which controls multiple hub usage). TMOD uses the most granular level of each parameter, and the high-level global parameters are used to fill any gaps where specificity is not defined.

C. Proposed Service Standard Assignment Rules

The following proposed service standard assignment rules were utilized in the modeling. Two-day surface transportation was assigned to OD Pairs where the combined distance between the origin P&DCF, destination ADC, and destination SCF was between zero and 139.5 miles, or up to 3 hours of combined transit time at 46.5 miles per hour.[15] This distance was selected to add approximately 3 hours to the transit window to allow the volume to be massed in a transfer hub, or to allow additional time for dispatching from sites with later clearance times. Currently, in order to meet the 08:00 Critical Entry Time for letters and flats, the origin processing facility must dispatch as early as 02:00. Many facilities are not capable of dispatching that early, or this forces the origin locations to establish inefficient direct trips to the destination locations. The model's added slack time will allow more efficient transportation between two-day pairs and improve service capability.

[14] LR-N2021-1-2, 2_Parameter_File.param.
[15] The origin of this figure is discussed in section II.D below.

Three-day surface transportation was assigned to OD Pairs where the combined distance was greater than 139.5 miles and up to 930 miles, or up to 20 hours of transit time at 46.5 miles per hour. Similar to two-day, this distance and time was selected to add slack time to the transit window, allowing later departure from origin and transfer through a Surface Transfer Center. For example, the origin can depart a trip to a destination at the boundary of the three-day service area as late as 07:00 from origin, allow 4 hours for transfer at a hub facility, and arrive at destination one hour prior to a CET of 08:00, day-2, at destination.

Four-day service standards were assigned to OD Pairs where the combined distance was between 930 and 1,907 miles, or up to a combined 41 hours of drive time at 46.5 miles per hour. Five-day service standards were assigned to OD Pairs requiring greater than a combined 41 hours of drive time.

The intent of adding incrementally more slack time to the transit windows as distances increased was to encourage pairing of shipments at the origin locations, allow volume transfers via STCs, add buffer time to absorb transportation delays, and still enter letter and flat volume up to the destination CET of 08:00 the day prior to the delivery standard. Allowing such flexibility in the transit time between OD Pairs allows the model to test additional routings for optimization and build efficient routings.

D. Assumptions

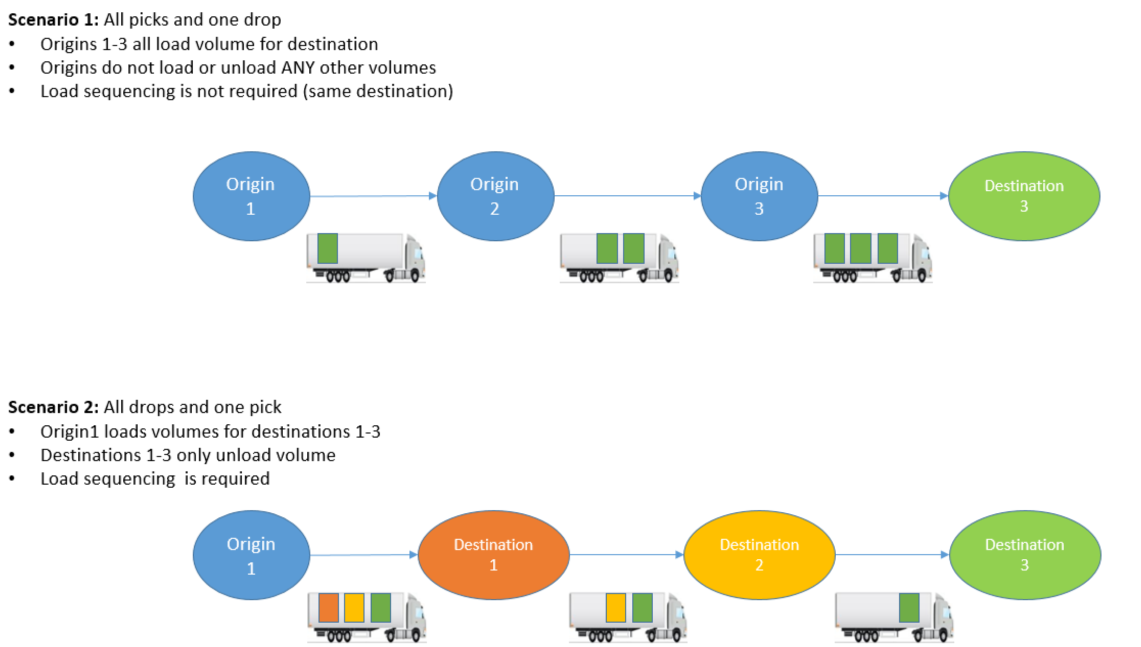
Several assumptions were made in the modeling. These assumptions, and the reasons for making them, are described below. They are categorized as transportation assumptions and general modeling assumptions.

For transportation, in order to generate transit times between pairs, 46.5 miles per hour was used. This rate was selected as a value accepted by Supply Management and used when planning and soliciting new transportation with suppliers. This general mile-per-hour rate for long haul trips accounts for breaks and driver changes.

Maximum volume per 53-foot trailers was modeled as 1,575 cubic feet. This reflects 42 APCs at 75 percent capacity (37.5 cu-ft) per trailer. Volume conversions to APCs were limited to 75 percent capacity to prevent unrealistic containerizations of 100 percent capacity.

Trips were not allowed to flow through more than one STC or hub. All transportation was either defined as a direct trip (from origin to destination, allowing stops to pick-up or drop-off shipments in-between) or a non-stop trip to a single STC. Volumes were aggregated at the STC from multiple origins to build trips to the final destination with improved utilization. Multi-stop trips were allowed with a maximum of two extra stops. In addition, trips were structured as "all picks and one drop" or as "all drops and one pick." "All picks and one drop" means the origin location loads volume for a single destination and the model allows the trip to pick up additional loads for that same destination (many-to-one). "All drops and one pick" means the model allows a single load at an origin location to be unloaded at multiple destinations. The load would be load-sequenced where the first stop would be loaded at the tail of the trailer and the final destination would be loaded at the nose of the trailer. The below diagram illustrates these trip structures.

Figure 2: Trip Structures



The model does not mix multiple loads and unloads on the same trip. For example, it will not allow an origin to load volume for multiple destinations and then allow it to load volume from the first stop along the way. Combining loads and unloads was not allowed in the model in order to simplify the operation at the receiving sites.

The following general modeling assumptions were also made. Origin Dispatch of Values (DOVs) were based on 95th percentile machine end times, plus an additional 90 minutes for dispatch preparation and staging, or 03:30, whichever was earlier. Machine end times were extracted from the USPS Web

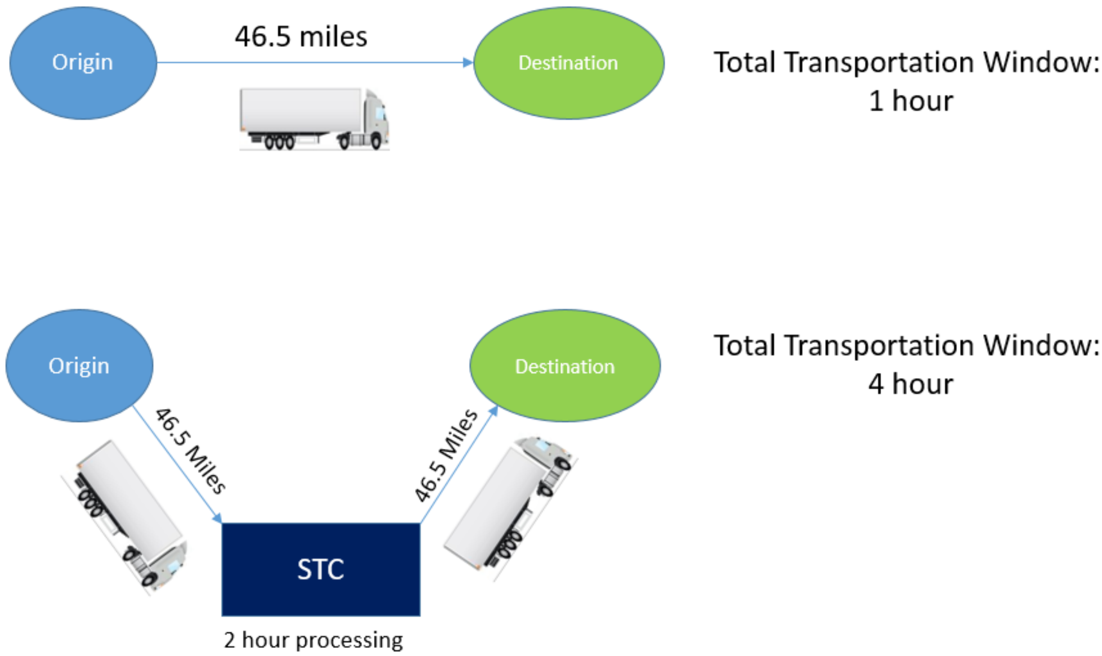
End-Of-Run (EOR) database. This database tracks the machine processing runs including start, end, and down times for the majority of mail processing machines in every facility. The 90 minutes added to the machine clearance times is the USPS-accepted expectation of when volume would be ready for dispatch following the completion of mail processing.[16] Additionally, origin locations flow outbound volumes through their designated aggregate facilities, which consolidate volumes to improve utilization of network trips. Destination CETs are based on product and shape:

- Letters and flats have a CET of 08:00 the day prior to the scheduled day of delivery, per the service standard; and
- Parcels have a CET of 20:00 the day prior to the scheduled day of delivery, per the service standard.

Finally, STCs are given a minimum of two hours to process volume and/or cross-dock containers. This two-hour minimum process time means that any shipment routed through an STC will have at least two hours added to the total transit time. The below diagram illustrates this process.

[16] The 90 minutes accounts for 30 minutes to clear secondary operations after primary operations, 30 minutes for manual operations, and 30 minutes for dispatch operations.

Figure 3: STC Transportation Windows



STCs are only able to service destinations within an eight-hour drive time from the STC. The range of certain STCs was increased to reduce the impact of the proposed transportation changes. Salt Lake City was increased from eight to fourteen hours to more accurately align with current state service reach, covering all the way to the Pacific Northwest coast. In addition, every destination was assigned to at least one STC. If a destination is not within eight hours of any STC (or within fourteen hours of Salt Lake City), then it was assigned to the closest STC. And if a destination is within the service area of multiple STCs, that destination is eligible to use whichever STC the model selects resulting in the best solution.

E. Constraints in the Modeling and Refinements

A number of constraints affect the modeling. As a general matter, the TMOD optimization model utilizes an advanced set of heuristics, and, as with all heuristic models, can produce results that are less than optimal. TMOD offers a variety of ways to approach many of our business rules, and seemingly small changes can sometimes have large unexpected impacts on the results due to the heuristic nature. To ensure we are using the best solution, each model is run multiple times to ensure similar results are obtained.

Several constraints of the modeling require manual input or post-processing refinement to mitigate the impact of these constraints. TMOD does not inherently support viable transit times based on traffic or other known factors. As such, known transit time adjustments are currently manually input into the model. Currently TMOD cannot support the complexity of our air network to completely model mode selection. To accommodate this factor, the model is used to identify air pairs that are eligible to be routed via surface transportation using time and distance data. The final mode selection for these eligible lanes is performed outside the model.

Significant post-processing is necessary to refine surface network routing results into actual routings that can be implemented. This is due to multiple factors including the TMOD software’s ability to build only one-way trips, potential relationships with transportation outside the scope of this model, site-specific operational nuances, and Department of Transportation requirements. The results of the model, being a decision-supporting rather than a decision-making tool, will therefore be analyzed by transportation planners to finalize specific lane transportation to account for limitations of the model prior to implementation.

III. MODELING RESULTS

The modeling yields the below results, which can be categorized as the expected change in the number of 3-digit ZIP Code to 3-digit ZIP Code OD Pairs[17] (3-digit OD Pairs) from a two-day[18] and three-day standard to a two- to five-day standard in the contiguous 48 states; the change in percentage of volume in the contiguous 48 states of FCM (including remittance mail) from a two-day and three-day standard to a two- to five-day standard and end-to-end Periodicals that will see an increase in service standard;[19] and the expected change in the number of 3-digit OD Pairs whose volume and percentage of volume that is transported via surface and air transportation in the contiguous 48 states. Greater detail on these results is located in LR-N2021-1-3, 3_SSD_5D_Vol_Impacts_CONUS.xlsx.

The modeling results in the following changes in 3-digit OD Pairs in the contiguous United States that are subject to two-, three-, four-, and five-day service standards. As compared to current service standards, the number of 3-digit OD Pairs subject to a one- or two-day service standard decreases from 63,587 to 22,277; the number of 3-digit OD Pairs subject to a three-day service standard decreases from 752,725 to 337,731; the number of 3-digit OD Pairs

[17] A 3-digit OD Pair is a pair of an origin 3-digit ZIP Code prefix that feeds to a P&DCF and 3-digit ZIP Codes prefix that is fed by a destination SCF. For example, 3-digit ZIP Code prefix 271 to 3-digit ZIP Code prefix 275 is one distinct 3-digit OD Pair; and 3-digit ZIP Code prefix 271 to 3-digit ZIP Code prefix 278 is another distinct 3-digit OD Pair.

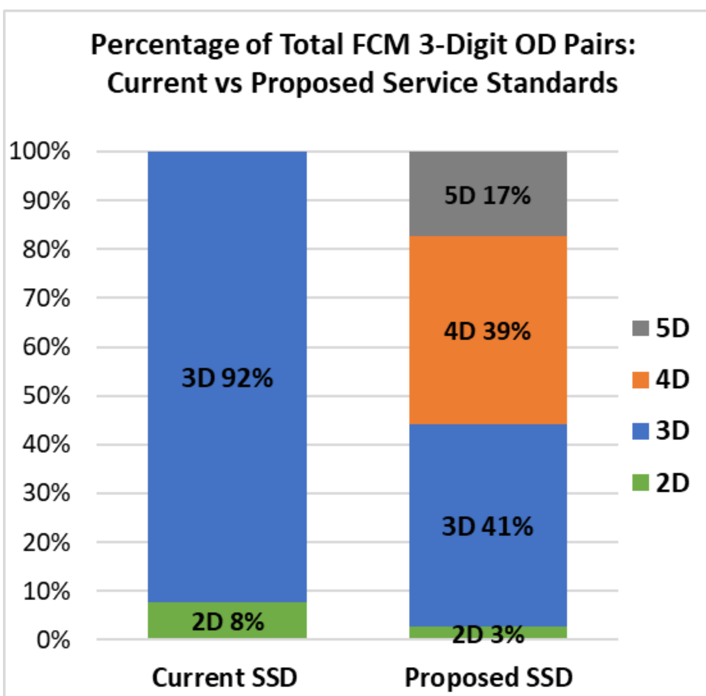
[18] Throughout this section, two-day figures include both one- and two-day values, whether that be the number or percentage of 3-digit OD Pairs whose volume is subject to one- or two-day service standards or mail volume subject to one- or two-day service standards. The exception is for remittance mail figures, which does not have a one-day service standard.

[19] The model projects that 0.2 percent of Marketing Mail pieces, which consists of a small percentage of Marketing Mail that travels through the First-Class network, will see an increase in transit time. However, by processing this volume at the entry location and thereby avoiding increased transit time, the Postal Service expects this volume to meet current Marketing Mail service standards.

subject to a four-day service standard increases from 0 to 315,051; and the number of 3-digit OD Pairs subject to a five-day service standards increases from 0 to 141,253.

In terms of percentages, the percentage of 3-digit OD Pairs subject to one-to-two-day and three-day service standards decreases from 8 and 92 percent to 3 and 41 percent, respectively. The percentage of 3-digit OD Pairs newly subject to four- and five-day service standards is 39 and 17 percent, respectively. The figure immediately below reflects these results. At the request of participants at the pre-filing conference, data regarding current and proposed service standards at the 3-Digit ZIP Code origin and destination pairs level is located in LR-N2021-1-3, 3_Zip3_OD_Pairs.xlsx.

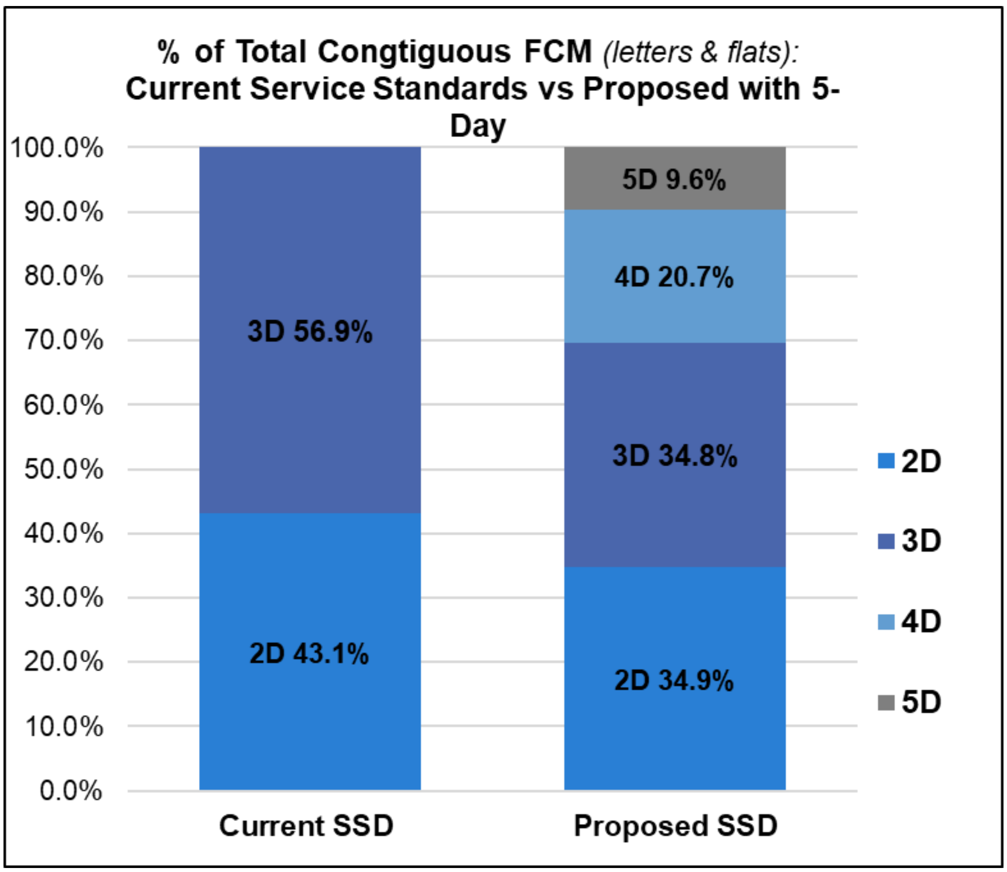
Figure 4: Service Standards Percentage by 3-Digit OD Pairs*



* Includes pairs where origin and destination are the same.
2D represents percentage of OD Pairs with a two-day-or-less service standard.

In turn, the percentage of volume of FCM in the contiguous United States subject to a one- or two-day service standard decreases from 43.1 percent to 34.9 percent; the percentage of volume subject to a three-day service standard decreases from 56.9 percent to 34.8 percent; 20.7 percent of volume is subject to changing to a four-day service standard; and 9.6 percent of volume is subject to changing to a five-day service standard. As such, approximately 81 percent of FCM presently subject to a one- or two-day service standard will maintain its current service standard; and approximately 47 percent of FCM presently subject to a three-day service standard will remain as three-day. The following figure reflects these results.

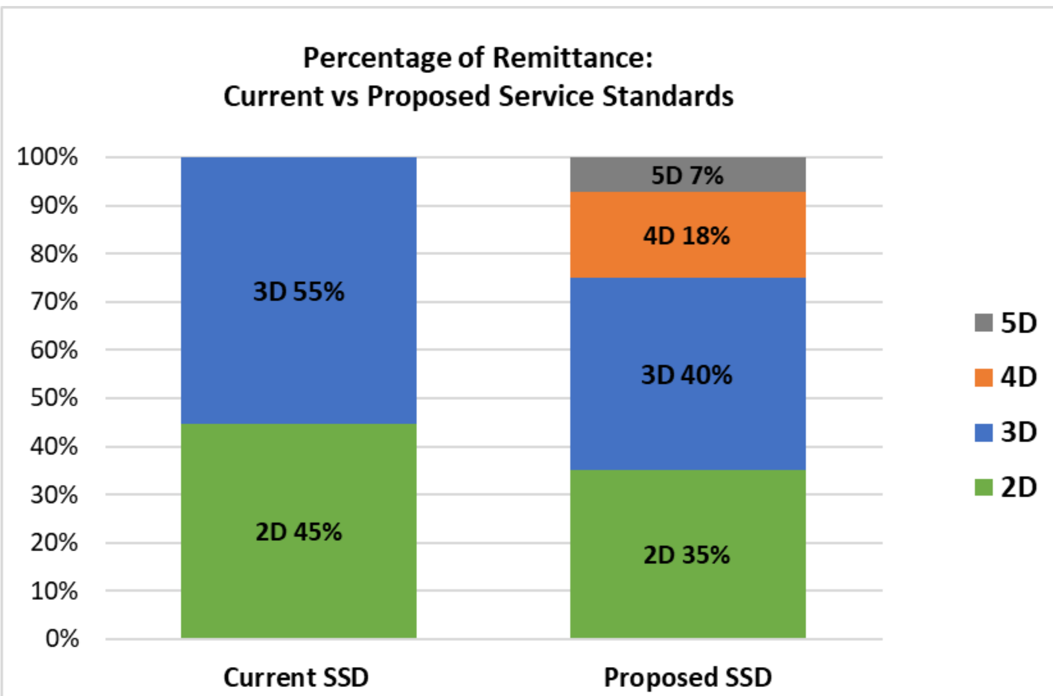
Figure 5: FCM Volume* by Service Standard (Contiguous U.S.)



* 2D represents volume with a two-day-or-less service standard

Within this FCM volume, the volume of remittance mail subject to a two-day service standard is projected to decrease from 45 percent to 35 percent and the volume of remittance mail subject to a three-day service standard is projected to decrease from 55 percent to 40 percent. As such, 79 percent of remittance mail presently subject to a two-day service standard is projected to remain as two-day, and 55 percent of volume presently subject to a three-day service standard is projected to remain as such. Additionally, 18 percent and 7 percent of remittance mail are projected to be subject to four- and five-day service standards, respectively. The following figure reflects these results.

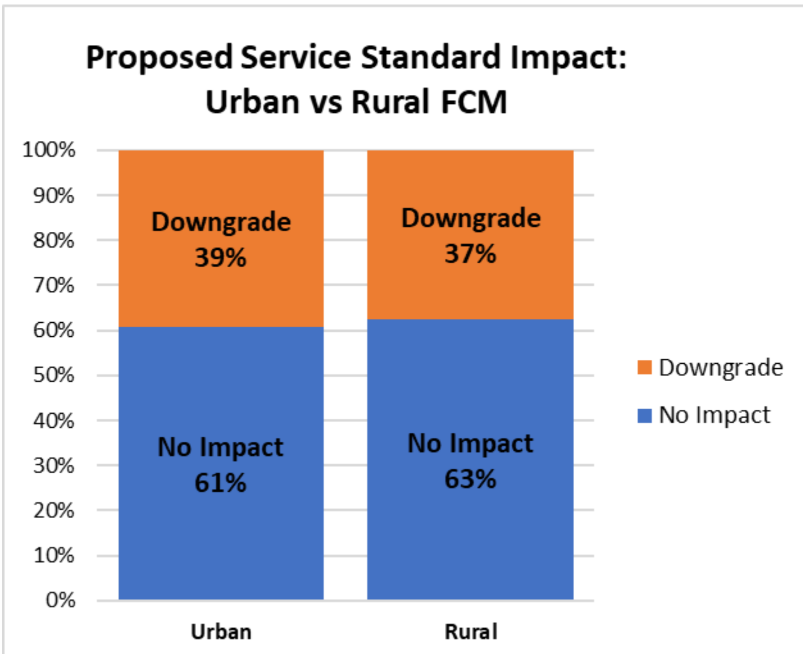
Figure 6: Percentage of Remittance by Service Standard* (Contiguous U.S.)



* Remittance does not have a one-day service standard

The model projects the proposed service changes to have a nearly proportional effect on urban and rural areas:[20] 39 percent of urban FCM is projected to be affected by the proposed service standards, while 37 percent of rural FCM is projected to be affected by the proposed service standards. The following figure reflects these results.

Figure 7: Percentage of Urban and Rural Mail Affected by Proposed Service Standards



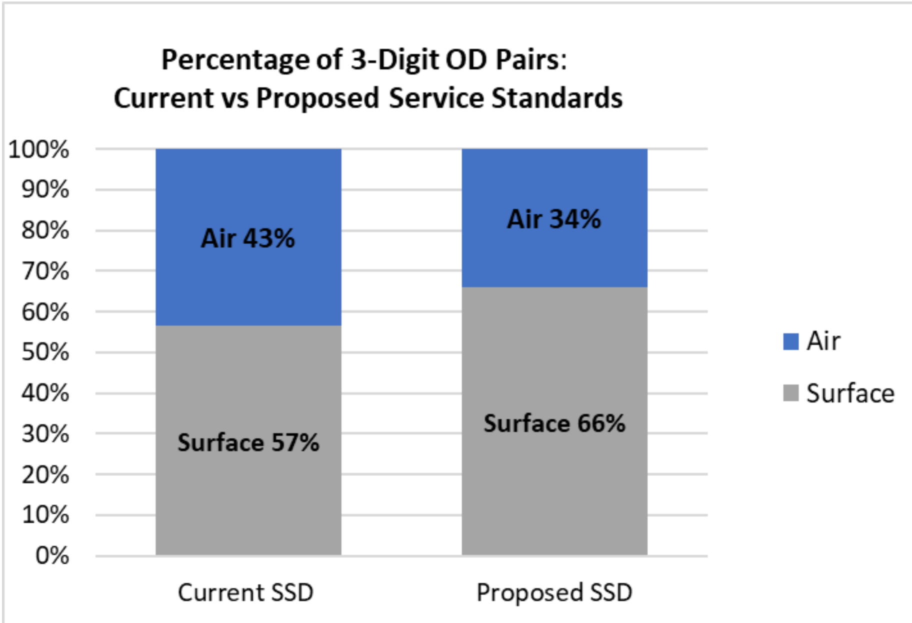
End-to-end Periodicals in the contiguous United States are modeled to experience the following change: 19 percent of end-to-end Periodicals (accounting for 7 percent of all Periodicals) are projected to have an increase in service standard.

[20] For purposes of the results, urban First-Class Mail is defined as First-Class Mail that, based on ZIP Code, is delivered to an Urbanized Area or an Urbanized Cluster; and rural First-Class Mail is defined as First-Class Mail that, based on ZIP Code, is delivered to a Rural area. Incorporating the Census's definitions, an Urbanized Area encompasses 50,000 or more people; an Urbanized Cluster encompasses at least 2,500 people and less than 50,000 people, and a Rural area encompasses areas not within an Urbanized Area or Urbanized Cluster.

A focus of the Thress Testimony (USPS-T-5) is the potential contribution impact that could result from implementing these proposed changes to the service standards, and the Monteith Testimony (USPS-T-4) contextualizes these findings and estimates how these changes may impact customer satisfaction.

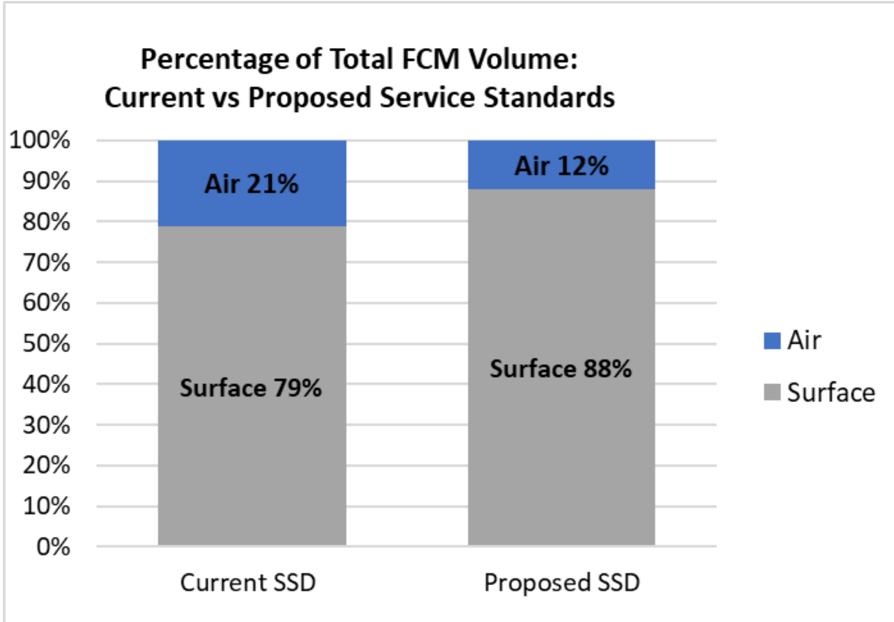
Also projected by the modeling is the change in the number of 3-digit OD Pairs and percentage of volume in the contiguous United States expected to utilize surface and air transportation. Compared to current service standards, the number of 3-digit OD Pairs that utilize surface transportation is expected to increase from 461,607 to 538,380, while the number of 3-digit OD Pairs that utilize air transportation is expected to decrease from 354,705 to 277,932. These figures convert to the following percentages: the percentage of 3-digit OD Pairs that utilize surface transportation is projected to increase from 57 percent to 66 percent; and the percentage of 3-digit OD Pairs that utilize air transportation is projected to decrease from 43 percent to 34 percent. The following figure reflects these results.

Figure 8: Transportation Mode* by 3-Digit OD Pair (Contiguous U.S.)



In turn, the percentage of FCM volume in the contiguous United States that is transported via surface is expected to increase from 79 percent to 88 percent, while the FCM volume that utilizes air is expected to decrease from 21 percent to 12 percent. The following figure reflects these results.

Figure 9: Percentage of Volume by Transportation Mode (Contiguous U.S.)



The focus of the Whiteman Testimony (USPS-T-2) is the estimated cost savings that result from the shifts in transportation method.

IV. CONCLUSION

The Postal Service has utilized appropriate data sources and modeling techniques to assess the proposed changes to the service standards for FCM and Periodicals and the effects that such changes will have on transportation time and efficiencies in the transportation network. The Postal Service envisions a transition to a more cost-effective transportation network that will allow it to improve the efficiency, cost-effectiveness, and reliability of its transportation network, while still providing its customers with valuable products and services. Although a model is not dispositive and should accordingly be considered a decision-support tool, rather than a decision-making tool, the modeling described in my testimony demonstrates that the proposed service changes would lead to a more reliable, cost-effective and efficient transportation network.