

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

EVOLUTIONARY NETWORK DEVELOPMENT
SERVICE CHANGES, 2006

Docket No. N2006-1

DIRECT TESTIMONY OF PRANAB M. SHAH
ON BEHALF OF
UNITED STATES POSTAL SERVICE

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I. Autobiographical Sketch

My name is Pranab M. Shah, I am the Manager of Network Operations Development at United States Postal Service headquarters. My office has responsibility for development of new strategies and concepts for postal mail processing and transportation networks, including Information Technology systems and solutions for supporting the day-to-day operations of these networks. The Network Operations Development group includes Network Modeling and Development, Logistics Systems, Integrated Network Development, Business Opportunity Development, and Logistics Quality Support.

I have been with the Postal Service in my current title and role since early 2001. Prior to joining the Postal Service, I was a senior executive in the private sector, with 10 years of international experience managing complex Operations and Information Technology programs. I have management consulting experience in the areas of business strategy, supply chain management, and emerging technologies across a wide array of industries including retail, manufacturing, high-tech, and health care.

I have a Bachelor of Science Degree in Industrial and Systems Engineering from Maharaja Sayajirao University, India; and a Masters in Business Administration from Cardiff Business School, University of Wales, United Kingdom.

1 II. Purpose of Testimony

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3 The purpose of my testimony is to provide an overview of the Postal
4 Services' Evolutionary Network Development (END) strategy, which is to aid in
5 developing a long term solution for its mail processing and transportation
6 networks that provides it with the flexibility to respond to the dynamics of current
7 and future mail trends. My testimony also explains how the END process will
8 interface with the Postal Service's Area Mail Processing guidelines to implement
9 specific elements of the overall Postal Service network redesign.

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1 III. Overview of Current Networks

2 Historically, First-Class Mail has been the primary source of mail volume
3 processed and delivered by the Postal Service.¹ Largely in order to meet the
4 demands of providing First-Class Mail service, the Postal Service has developed
5 many of the major components of its current highly complex and inter-connected
6 nationwide mail processing, transportation and distribution infrastructure.

7 Complexities are inherent in a system that provides service to billions of
8 mail pieces of different classes and shapes that are transported between 932
9 different 3-digit ZIP Code service areas spread among the 50 states. Currently,
10 over 450 facilities process and transport an average of 660 million pieces of mail
11 each day, nearly half of which is still First-Class Mail. Non-personnel-related
12 mail processing and distribution costs are a significant postal cost driver.

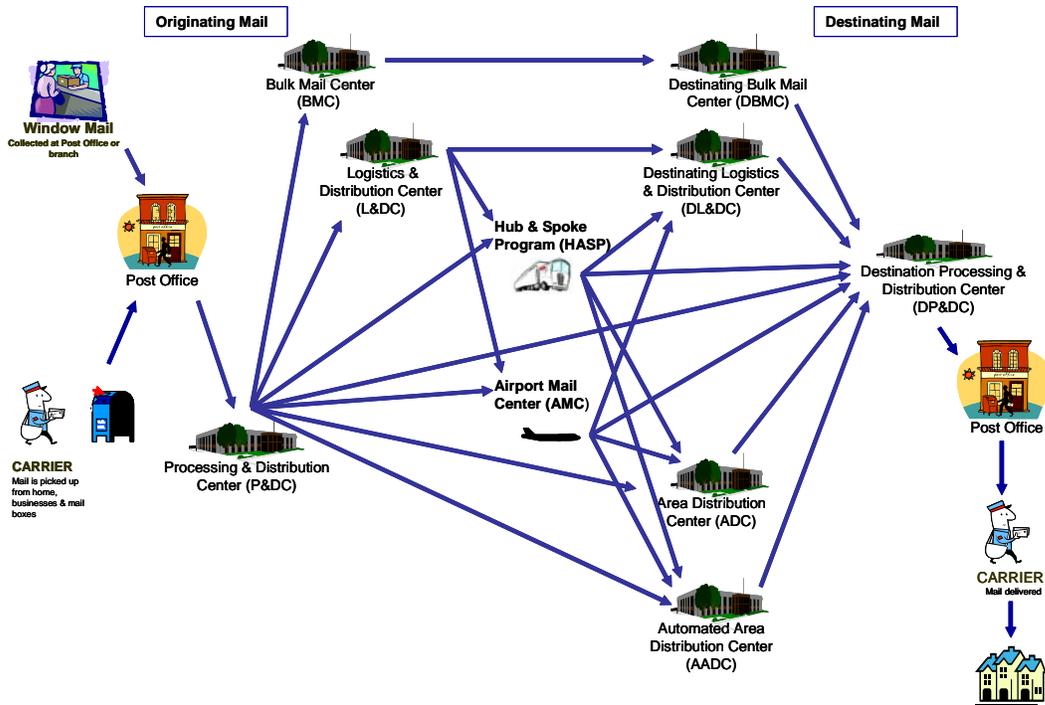
13 For the most part, the current mail processing network reflects decisions --
14 some going back many decades -- to locate, build and/or expand many major
15 facilities and operations, and to deploy equipment on the basis of factors that
16 were prevalent at the time that each capital investment was made. These factors
17 included population and mail volume growth, available processing and
18 distribution technology, and proximity to vital mail transportation modes and
19 routes. As a result, the mail distribution system has evolved over time as a
20 series of overlapping, single-product networks. Generally, most plants process all
21 classes of mail. However, some mail processing plants also have specialized
22 network responsibilities, linking transportation and distribution for specific classes

¹ See Docket No. R2005-1, USPS Library Reference K-74, Domestic Mail Revenue and Volume History.

1 or types of mail. Examples include facilities that serve as distribution centers for
 2 Periodicals, Bulk Mail Centers that process Standard Mail and Package Services,
 3 and automated Distribution Centers for automated letters. These networks often
 4 have separate transportation. These complexities and redundancies of today's
 5 network are illustrated below.

6 Figure 1: Current Network Complexities

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8 Using the illustration above as a guide, my testimony uses the term “mail
 9 processing” to refer to the distribution and materials handling activities that get
 10 mail from its origin processing facility to its destinating processing facility.²

² A Logistics & Distribution Center (L&DC) can perform a broad range of functions including: Priority Mail and First Class SPR processing; Letter/Flat tray/tub consolidation (all classes); Periodicals bundle processing; Standard Mail bundle processing; Hub and Spoke Project (HASP) operations; NMO parcel distribution; Parcel Post/Select processing; and Periodicals transfer operations. A functional definition of each of the other postal facilities depicted in Figure 1 may be found in the *Glossary of Postal Terms*,

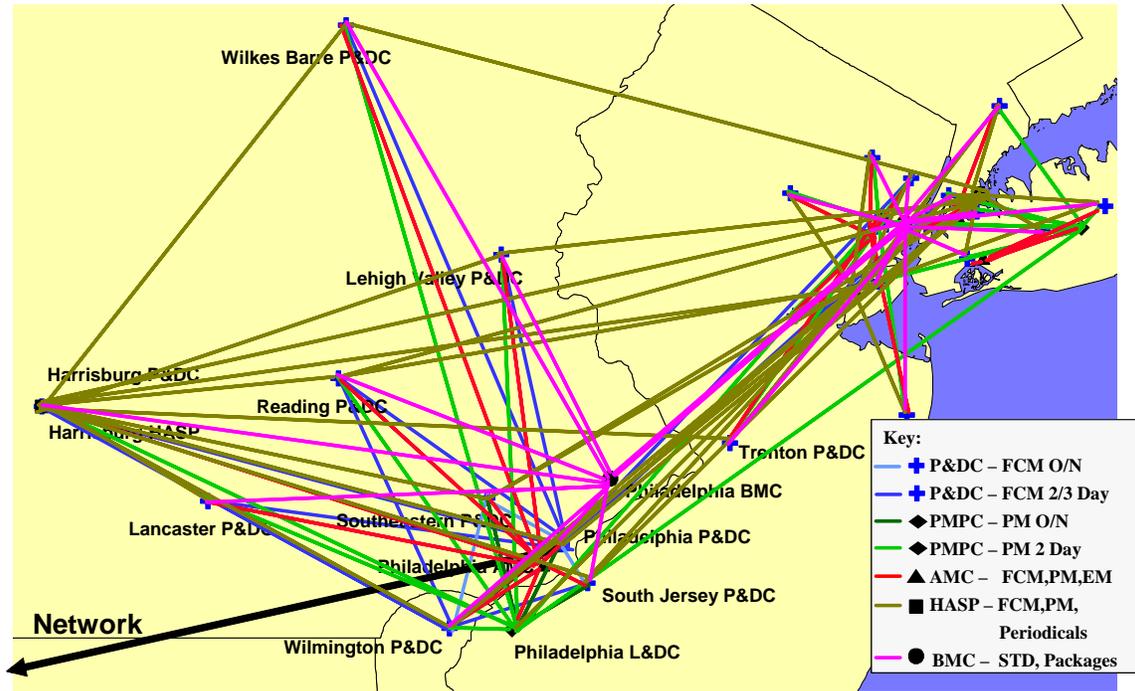
1 Single-piece First-Class Mail volume has been declining for most of the
2 past decade. Consequently, there are fewer cancellations and less processing at
3 originating processing centers. At the same time, prebarcoded and/or presorted
4 mail has increased as a share of total First-Class Mail. Much of this workshare
5 mail bypasses originating postal operations and is initially processed on
6 automation at destinating network facilities. In addition, the volume of Standard
7 Mail now exceeds First-Class Mail and the proportion of mail drop shipped into
8 the postal network in downstream locations continues to increase. The
9 combination of declining First-Class Mail volume and growth in Standard Mail
10 results in less revenue with which to support the Postal Service's current
11 dedicated class-based processing networks. Assuming current mail mix trends
12 continue, the Postal Service faces tremendous operational and fiscal challenges
13 today that are not expected to disappear soon.

14 In recent years, the Postal Service has implemented a number of tactical
15 initiatives to contain costs and improve efficiencies across the network.
16 Nevertheless, postal management considers that some redundancies created by
17 a class-based network built over many decades will linger until the Postal Service
18 expeditiously examines alternative network distribution concepts.

19 As an example, consider the illustration below. It is an approximate
20 representation of the overlapping network of mail class-based postal highway
21 transportation to and from facilities whose functions have been incrementally
22 established over time in a portion of the northeast United States.

USPS Publication 32 (1997 -- as amended, November 2003). USPS Library Reference N2006-1/1.

- 1 Figure 2 Example of Current Transportation Complexities
- 2 (best viewed in color from electronic version posted at PRC website or hard copy printed in color)



1 Without pre-judging the outcome of any future analysis, I believe that a review of
2 this portion of our processing and transportation networks could lead to a
3 proposal to alter the functions of some of the affected mail processing facilities
4 and to consolidate transportation runs among facilities in a new configuration.
5 Similar opportunities to improve transportation efficiency on a greater or lesser
6 scale are likely to exist throughout the entire postal network.

7

8 IV. Future Networks

9 Today and into the future, the Postal Service must continue to change its
10 mail processing network in ways that better recognize such factors as the
11 economies inherent in shaped-based processing and transportation;
12 demographic shifts within and between regions of the country, as well as
13 absolute population and household growth in some regions; a changing mail mix,
14 with an increasing share of Standard Mail and a decreasing share of preferential
15 First-Class Mail; the replacement of labor-intensive manual mail processing
16 operations with automation that is less labor-dependent and requires less plant
17 capacity; and the challenges of replacing aging and no longer optimally located
18 facilities.

19 The long-term operational needs of the Postal Service will be met best if
20 its mail processing network evolves into one in which excess capacity is reduced
21 and redundant operations and transportation are eliminated. There are
22 economies to be realized by disintegrating some of the mail class-based
23 distinctions among current postal processing facilities. More than ever, the

1 Postal Service's long-term viability depends upon its adherence to the mandate
2 to provide service in an efficient and economical manner. Accordingly, the Postal
3 Service has developed tools with which it intends to review and reconfigure its
4 processing and distribution network on an ongoing basis.

5 The Postal Service has developed a program called Evolutionary Network
6 Development (END). END involves the use of computer simulations as a tool in
7 the development of more efficient and flexible mail processing and transportation
8 networks that are better suited to current and future postal needs. In conjunction
9 with END, the Postal Service plans to apply features of its Area Mail Processing
10 review guidelines³ to conduct a systemwide review of mail processing and
11 transportation operations over the next several years. The primary objectives of
12 END are to identify potential operations and network changes that could:

- 13 • create a more flexible postal distribution and transportation network
- 14 • modify the postal surface transportation network to reduce overall
15 transportation costs
- 16
- 17 • reduce redundancy inherent in maintaining different transportation
18 networks for different mail classes; and
- 19
- 20 • reduce postal costs.

21 The END process uses a scientific, data-driven approach to provide the
22 Postal Service with the analytical means with which to drive the necessary
23 redesign of its existing network and to provide rapid response capability. END
24 review begins with a set of network optimization and simulation models that
25 objectively analyze costs, capacities, and volume flows for each mail processing

³ As described in the Direct Testimony of David Williams on Behalf of United States Postal Service (USPS-T-2).

1 facility. These models are used in an interactive process involving Headquarters
2 and affected Area Offices (1) to help assess which local facilities remain viable
3 and necessary within the future postal infrastructure and (2) to propose which
4 distribution and transportation functions could be performed by facilities that
5 would remain as part of an optimal, more fully integrated postal network.

6 Three principal criteria will be used in evaluating operational realignment
7 decisions pertinent to each facility review. Each criterion is summarized below:

8 ▪ Capacity: The Postal Service will analyze its current network to identify
9 the areas of and reasons for excess capacity. The future network design
10 will focus on minimizing the amount of excess capacity through better
11 utilization of existing facilities and equipment. This may result in
12 personnel, equipment and/or particular operations being transferred from
13 one plant to another. In some cases, it also could result in reductions in
14 personnel, equipment and operations.

15 ▪ Cost: Another goal is to minimize overall network cost through
16 alignment of postal mail processing and transportation capacity with mail
17 processing and transportation infrastructure. The Postal Service will
18 analyze the impact that each processing and distribution facility has on
19 overall network costs, including both fixed and volume-variable costs.
20 This information will be used to make more economical decisions.

21 ▪ Service: In consolidating operations, the Postal Service will give
22 consideration to the retention of those operations that can, to the greatest
23 extent practicable, permit retention of existing service standards for their

1 assigned 3-digit ZIP Code service areas. If there are opportunities for cost
2 reductions, the Postal Service will focus on selecting facilities that, to the
3 greatest extent practicable, will maintain existing service standards for
4 their assigned 3-digit ZIP Code service areas. When potential changes in
5 service -- in the form of upgrades or downgrades to the service standards
6 applicable to specific 3-digit ZIP Code pairs for any mail class -- are under
7 consideration, the Postal Service will utilize AMP review principles and
8 procedures to evaluate the impacts.

9 In addition, other facility-specific factors are taken into account, such as age and
10 condition of facilities, their proximity to airports and highways, and the status of
11 any applicable leases.

12 END's modeling approach is centered on two types of models: optimization
13 and simulation.

14 ■ Optimization models are used to calculate an optimal (best) solution, given
15 certain constraints, inputs, and an objective function. The Postal Service
16 will use optimization to determine and develop a potential network
17 solution.

18 ■ Simulation models are then used to test and understand the feasibility of
19 the optimization results from a service and capacity perspective.
20 Simulations also used to conduct "what if" scenarios, by modifying
21 selected inputs to a specific process in a simulated environment.

22 The optimization model simultaneously proposes which 3-digit ZIP Codes
23 should be processed at each origin and destination facility, and where each

1 origin and destination facility's network mail could be consolidated. These
2 determinations primarily are based on cost and available capacity.

3 Once the optimization models have produced an optimized network
4 alternative, the simulation models are used to test the feasibility of that
5 alternative. The simulation model uses more detailed facility-specific data to test
6 the feasibility of a network alternative derived from the optimization model, based
7 on service performance -- ability to meet Critical Entry Times and service
8 standards -- and resource utilization (based on processing capacity). For any
9 particular mail processing plant or cluster of related mail processing plants,
10 Headquarters and the affected Area Office may consider a number of alternative
11 scenarios during the iterative simulation process.

12 The END model is routinely updated with current volume, cost,
13 productivity and service standard data. However, the model is not designed to
14 incorporate all possible variables that are necessary to design the future mail
15 processing network. Thus, the Postal Service intends to use the END model
16 recommendations only as a framework for developing its longer-term network
17 strategy. Accordingly, it would be a mistake to say that the END model outputs
18 will dictate or determine specific outcomes. Those decisions will be made in
19 accordance with the principles and procedures described by witness Williams
20 (USPS-T-2), which take the END model outputs into consideration.

21 Using the END model as a tool in conjunction with Area Mail Processing
22 review principles and procedures, the Postal Service's goal is to develop a more

1 efficient network designed to handle multiple products, with a trend toward more
2 shape-based mail processing streams.

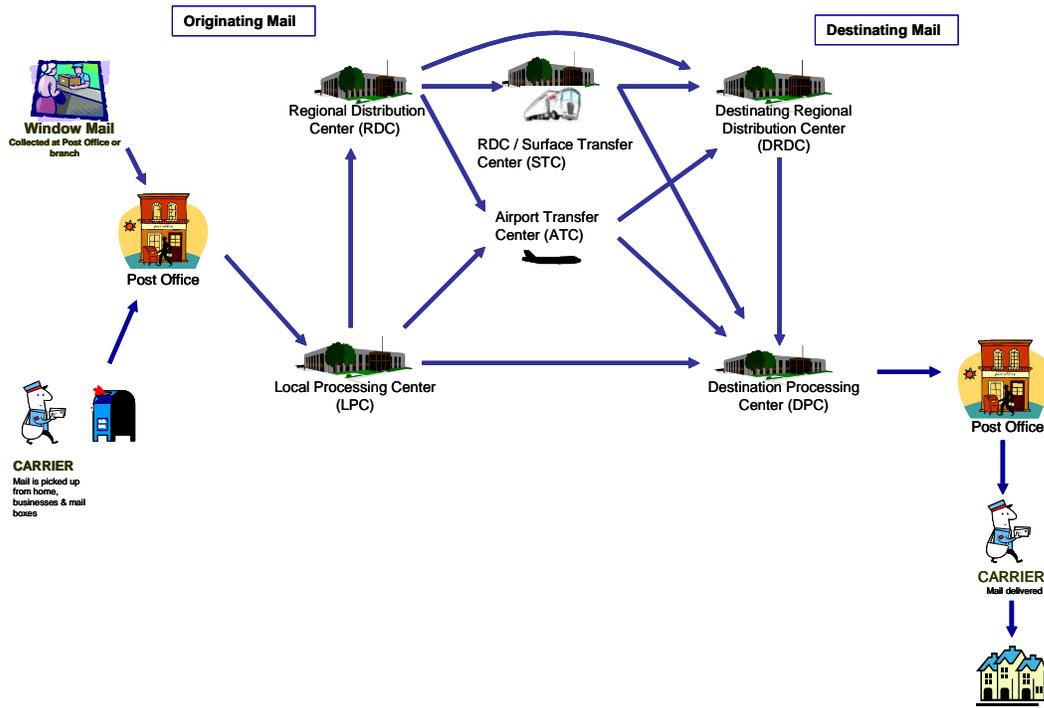
3 The initial objective of the Postal Service's END strategy is to build a
4 "backbone" network infrastructure of Regional Distribution Centers (RDCs). This
5 will enable the Postal Service to maintain stability in its network as it embarks on
6 further implementation of its network strategy. Regional Distribution Centers
7 (RDCs) will be created, for the most part, from existing facilities and will act as
8 concentration points for subordinate Local Processing Centers (LPCs).

9 In addition to other responsibilities, RDCs will consolidate parcel and
10 bundle distribution to take advantage of shape-based efficiencies. Currently,
11 packages are often processed on separate networks based on their class (i.e.,
12 Standard Mail in one location and Priority Mail in another). In the future, RDCs
13 will serve as mailer entry points and consolidation centers to enable shared
14 product transportation. Shape-based processing has already produced
15 substantial efficiency gains for letters. The transition to RDCs will extend shape-
16 based efficiencies to other types of mail. In the future network, LPCs will function
17 much like today's Sectional Center Facilities.

18 Flexibility needs to extend beyond our mail processing infrastructure; the
19 postal transportation network must also be flexible enough to provide low cost,
20 reliable service in a fluctuating market. The Postal Service plans to expand its
21 surface reach through the creation of Surface Transfer Centers (STCs), which
22 will provide consolidation opportunities to maximize vehicle capacity and

1 eliminate redundant transportation. This network design greatly simplifies both
2 our mail processing flows and transportation networks, as illustrated below.

3 Figure 3: Network Simplification
4



5
6 The illustration above depicts potential mail flows between different mail
7 processing functions in the future network. In visualizing the configuration of the
8 future network, one should remember that, in some instances, different functions
9 depicted in the illustration may end up being performed at the same location.

10

11 V Changes In Service Are Expected

12 It is difficult to implement a network realignment of this scale and scope
13 without some re-mapping of 3-digit ZIP Code service areas. As it realigns its
14 mail processing network for the reasons described above, the Postal Service

1 may find itself determining to either expand or contract specific 3-digit ZIP Code
2 areas, transferring responsibilities among mail processing facilities serving
3 adjoining service areas. In addition, the preservation of current service standard
4 definitions is expected to lead to changes in the service standards that apply to
5 numerous 3-digit ZIP Code origin-destination pairs for various mail classes.⁴

6 To be clear, the Postal Service is not now proposing to change the long-
7 standing service standard ranges for any particular mail class. Nor is the Postal
8 Service now proposing that different service standards apply to mail pieces within
9 any subclass on the basis of any distinguishing physical characteristics.

10 Service standard changes affecting particular 3-digit ZIP Code service
11 area origin-destination pairs will be made incrementally, if at all, as the modified
12 AMP review process described by witness Williams (USPS-T-2) is applied to
13 local mail processing facilities and operations. The overall magnitude and scope
14 of potential service standard upgrades and downgrades for any particular mail
15 class cannot be known until the numerous facility reviews have been conducted
16 and operational changes are implemented over the next several years.

17 Nevertheless, as mail processing network and transportation changes are
18 implemented, and the mail processing network evolves, most mail classes are
19 likely to experience varying levels of changes in service. To the extent that
20 changes occur, they will be in the form of upgrades or downgrades in service
21 applicable to specific 3-digit ZIP Code area pairs (e.g., from 3-day up to 2-day or

⁴ Existing service standard definitions for each mail class are reflected in Attachment A. The manner in which the service standards for each mail class currently apply to the matrix of approximately 850,000 3-digit ZIP Code origin-destination pairs in the postal network is reflected in the FY 06 Q1 USPS Service Standards CD-ROM, a copy of which has been filed in USPS Library Reference N2006-1/2.

1 from overnight down to 2-day service). At this time, the Postal Service expects
2 that service changes are likely to be most pronounced for First-Class Mail and
3 Priority Mail. In the lower end of the service standard range for Periodicals Mail,
4 where it overlaps with First-Class Mail (1-3 days), the service standards for
5 numerous 3-digit ZIP Code pairs are often linked to the standards for First-Class
6 Mail. Accordingly, for instance, many 3-digit ZIP Code origin-destination pairs
7 that experience a change in First-Class Mail service may also experience an
8 equivalent change for Periodicals.

9

10 VI. Conclusion

11 The Postal Service has all the components aligned to develop and
12 objectively evaluate network realignment proposals and their impact on the
13 service standards applicable to the numerous 3-digit ZIP Code origin-destination
14 pairs for affected mail classes. The Postal Service's vision is to transition to a
15 more flexible physical network composed of core distribution and air/surface
16 transfers centers that will enable it to keep its mail processing and transportation
17 networks efficient and affordable.

18 No one can accurately and reliably predict how the hard copy
19 communications and package delivery industry will change in the next five to ten
20 years. While some broad trends are certainly discernable, it is not possible, with
21 great precision, to say now what the optimal mail processing and delivery
22 infrastructure should look like a decade from now. The Postal Service's only
23 recourse is to continuously examine the network for inefficiencies and

1 redundancies, standardize the best operational practices, and -- where
2 appropriate -- consolidate, eliminate, expand or relocate processing functions.
3 The changes sought here, using END as a framework, cannot be accomplished
4 overnight. Of necessity, the changes will have to be implemented incrementally
5 and, as explained by witness Williams (USPS-T-2), there will be local public
6 notice each time a feasibility study of a local facility is undertaken as a part of this
7 process.

UNITED STATES POSTAL SERVICE SERVICE STANDARDS

Mail Class	Over night	2 nd Day	3 rd Day	4 th Day	5 th Day	6 th Day	7 th Day	8 th Day	9 th Day	10 th Day
Express Mail										
Priority Mail										
First-Class Mail										
Periodicals										
Package Servcies										
Standard Mail										

Class/Type or Subclass of Mail	Number of Days	Explanation of Applicable Delivery Standards
First-Class Mail	1-3 days to all ZIP Codes	<p>First-Class Mail: 1-3 days, depending on the 3-digit ZIP Code of acceptance and the destination address. As with all mail classes, the same standard applies to all mail originating or destinating in the same 3-digit ZIP Code area and applies to all mail within the class, irrespective of shape, size or weight.</p> <p>Current First-Class Service Standards were defined in PRC Docket No. N89-1, (USPS-T-2, Appendix A, at 7-8), as follows:</p> <p><u>Overnight Delivery Standard:</u> Overnight delivery standards must include all of the intra-SCF area. Other areas may be considered for overnight delivery, if significant business/mail volume relationships exist and they are within the reasonable reach of surface transportation.</p> <p><u>Two-Day Delivery Standard:</u> Two-day delivery standards apply to all SCF areas outside the overnight area that are within the home state and nearby states and that also are within the reasonable reach of surface transportation. In addition, two-day delivery standards may include other three-digit areas outside of the reasonable reach of surface transportation, if significant business/mail volume relationships exist and if dependable and timely air transportation is available.</p> <p><u>Three-Day Delivery Standard:</u> Three-day delivery standards should include all remaining destinations.</p> <p>Docket No. N89-1, USPS-T-2, Appendix A , page 16,section 5.3 outlined the criteria that should be used in formulating 1-day and 2-day delivery standards:</p> <p>Any single SCF or 3-digit ZIP destination within a 3-hour dock-to-dock transit time that receives more than 1.5% of a facility’s originating volume should be evaluated for inclusion in the overnight area, based upon operational and transportation feasibility, and customer needs.</p> <p>Any destination ADC that receives more than 0.5% of a facility’s total originating volume should be evaluated for inclusion, based upon operational and transportation feasibility, and customer needs.</p> <p>In 2000, the USPS defined “reasonable reach” to include the service areas of destinating Area Distribution Centers that were as far away as 12 hours drive time from the “parent” originating Processing and Distribution Center via surface transportation.</p>

Priority Mail:	1-3 days to all ZIP Codes	<p>Priority Mail: 1-3 days Delivery standards have existed for Priority Mail since its inception when it, essentially, replaced Air Mail in the late 1970's. The standards currently range from 1-day to 3-days to all ZIP Codes. However, Priority Mail is, primarily, a product that is targeted for delivery within 2-days (over 93% of Priority Mail 3-digit ZIP Code origin-destination pairs currently have either a 1-day or 2-day standard). These standards are determined on a case-by-case basis, based on processing times and available transportation. Priority Mail service standards are usually equal to, or faster than standards to/from the same domestic ZIP Code pairs in First-Class Mail.</p>

Standard Mail	3-10 days to all ZIP Codes	<p>These standards have been in effect since their inception in the 1970s. As an approximate overview, the number of days is loosely based on the number of Postal Zones that mail must travel, plus (+) 2 Days. The zones, in turn, are loosely based on a mileage radius from the origin P&DC to the destinating Sectional Center Facility.(DSCF).</p> <p>Usually, 3 days for mail within the same SCF, depending on the size of the intra-SCF area. All other non-intra-SCF destinations are 4 days or greater.</p> <p>The formula criteria:</p> <p>The number of the Postal Zone from Origin to Destination ZIP Code plus 2 days. (e.g., for mail to a Zone 5 destination, the standard is $5+2 = 7$ days.)</p> <p>The standard for 93.5% of domestic origin-destination pairs meets this test. The remaining pairs fall within either a "+1" or a "-1" range of the formula 99.976% of the time. (for example: mail to a Zone 5 destination, the range could be $5+2+1 = 8$ days or $5+2-1 = 6$ days).</p>
Periodicals	1-7 days to all ZIP Codes	<p>Delivery standards are 3-digit-to-3-digit ZIP Code based. Periodicals mail is a "preferential" product that travels, normally, by surface to all ZIP Codes.</p> <p>The standard range of 1-7 days is loosely equivalent to the 8 Postal Zones (which are also based on a Mileage Radius), minus (-) 1. The concept for these standards has not changed since the 1980's.</p> <p>The 1-day (overnight) Periodicals service standard usually applies to same 3-digit ZIP Code pairs as for First-Class Mail. Domestically, 2-3 day Periodicals service standards can be equal to the same 3-digit ZIP Code pair standard as for First-Class Mail, but are usually not faster than FCM.</p> <p>The service standard for 93.7% of domestic origin-destination pairs meets this test. The remaining pairs fall within either a "+1" or a "-1" range of the formula 99.982% of the time.</p>

<p>Package Services</p> <p>Including: Other Parcel Post Bound Printed Matter Media Mail Library Mail</p>	<p>2-9 days to most ZIP codes</p>	<p>2-9 days to all ZIP Codes within the contiguous 48 states. There are no established Package Services delivery standards to Alaska, Hawaii, or offshore destinations (e.g., Guam, Puerto Rico, Virgin Islands).</p> <p>The delivery standards are 3-digit-to-3-digit ZIP Code based. Package Services mail is a product that travels, normally, by surface to all ZIP Codes. The standards are therefore predicated on the current BMC network. The concept for Package Services service standards has remained constant since the 1970's.</p>
<p>Parcel Select</p>	<p>1-3 days.</p>	<p>1 day for Destination Delivery Unit entry by 4 p.m. 2 days for Destination SCF entry by 3 p.m. 2-3 days (generally 2 days) for Destination BMC entry by 3 p.m.</p> <p>2-day versus 3-day for DBMC entry is based on the Parcel Post standard for the 3-digit ZIP where the DBMC is physically located and the destination 3-digit ZIP of the parcel. These standards were determined as part of the Parcel Select product creation. Originally, all BMC entry was 3-day. The change to most 2-day was made in 2002.</p>
<p>Express Mail</p>	<p>1-2 days to designated ZIP codes.</p>	