Final Determination
Rural Route Evaluated Compensation System (RRECS)

Submitted to USPS and NLRCA by:

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May 31, 2018

EXECUTIVE SUMMARY

- The NRLCA and USPS agreed to create the Rural Route Evaluated Compensation System (RRECS) in a memorandum of understanding (MOU) appended to the interest arbitration award issued by neutral chair Jack Clarke on July 3, 2012. This document and *Appendix: Panel Responses to Parties' Comments, and Appendix: Standards Documentation* together constitute the Panel Chairperson's *"final determination with regard to the Revised Evaluated Compensation System."* The tendering of the final determination by Chairperson Louis Martin-Vega fulfills the Panel's obligations under the MOU.

- Much of the content of this document is drawn from the Panel's Report of October 31, 2017. The October 31 report has been updated based on the Panel's responses to the detailed comments of the parties. Additional changes are the result of making improvements and correcting errors in the October 31 Panel recommendations.

- The Rural Route Evaluated Compensation System (RRECS) replaces the current evaluated compensation system with a mostly automated data capture system capable of generating daily counts of work activities, new engineered and statistical standards based on generally accepted industrial engineering principles, and an automated system of business logic that calculates and updates evaluations of rural routes. The main components of RRECS and their interaction is illustrated in the following schematic:

- The RRECS systems enables automation of almost all data capture necessary for accurate engineered route evaluations, which eliminates the need for comprehensive mail counts. (b)(3) Sec 410(c)(2) [redacted], as well as eliminating NRLCA concerns regarding the accuracy of mailcounts.

- RRECS draws on existing data from throughout USPS to count the work activities performed daily by rural carriers. These counts are largely automated and require minimal carrier intervention. The resulting database is used to calculate standard times for the work activities and routes and is also available for other essential management functions.

- Count data is also captured from mapping software developed by the project. Mapping customers and routes requires a significant up-front investment, but once they are mapped, future change will be captured in an automated updating process and remapping will be minimal. The mapping system provides an efficient mechanism to digitally capture the door, mailstop, mail box and direct door delivery stop associated with each customer address.

- RRECS engineered standards are based on generally accepted industrial engineering practices. They have been validated and are fully documented and available electronically in a uniform structure and format. Systematic procedures for creating, auditing, and changing standards, and resolving standards disputes are provided.

- A one-of-a-kind drive speed matrix has been generated based on millions of drive time samples. It will calculate accurate drive times based on specific route characteristics.

- The business logic in RRECS calculates daily standard time, current weekly evaluations and base hours in a system of automated data transfer and analytics. The system business logic has been independently validated and performs according to requirements.

- The business logic will generate route evaluations and update them as necessary on a pay period basis, according to rules to be negotiated by the parties.

- Since editing the line-of-travel using the mapping system is complex and time consuming, the Panel has proposed a simplified mapping approach that would reduce time requirements by about 75% while maintaining acceptable accuracy. This approach provides an efficient and effective pathway for scaling up RRECS. With minimal software changes this approach would allow RRECS to be implemented for all USPS rural routes in about 6 months. The Panel's recommendations for simplified mapping are contained in a separate document: *Panel Recommendations for Improving RRECS*

- RRECS provides an accurate and transparent system for enabling changes in engineered standards required by the dynamically changing USPS business environment.

- RRECS is a state-of-the art system that provides the digital foundation for a modern tool set for managing the USPS delivery system. Potential roles for RRECS include:
    - Maintaining current evaluations of carrier routes
    - Reducing efforts required for change management
    - (b)(3) Sec 410(c)(2)
    - Dramatically decreasing time required to perform route adjustments
    - Evaluating complex delivery strategies and equipment purchases
    - Justifying new USPS delivery initiatives to Congress

BACKGROUND ON THE RURAL ROUTE EVALUATED COMPENSATION SYSTEM

The Origin of RRECS

The NRLCA and USPS agreed to create the Rural Route Evaluated Compensation System (RRECS) in a memorandum of understanding (MOU) appended to the interest arbitration award issued by neutral chair Jack Clarke on July 3, 2012. The MOU specified the following procedure for selecting a Panel to oversee the project:

"The Project will be headed by a three-member Panel. Each party will appoint a member of its choosing, within 30 days of the signing of this Memorandum of Understanding. These individuals shall be professional industrial engineers with relevant experience in sound industrial engineering principles and modern computer technology related to work measurement and delivery route design. Within 60 days thereafter, those two Members will select and engage the Chairperson, who shall be a professional Industrial Engineer who possesses the same qualifications. In the event the two members are unable to agree on a Chairperson, a neutral arbitrator who is a member of the National Academy of Arbitrators will decide who will be the Chairperson." (Appendix Document 01, "Appendix B to the Opinion and Award Dated July 2, 2012")

The NRLCA appointed Ken Mericle, Professor Emeritus, University of Wisconsin-Extension, School for Workers, as its representative in August 2012, and USPS appointed Don Ratliff, Professor Emeritus of Industrial Engineering, Georgia Institute of Technology, to represent them in October 2012. Mericle and Ratliff selected Louis Martin-Vega, Dean of the College of Engineering at North Carolina State University, as the Panel Chairperson in December 2012, and the Panel commenced its work in January 2013.

Work Process

From January 2013 to the present, the Panel has worked with the USPS and the NRLCA to design and develop RRECS. Various development teams inside and outside USPS have contributed to this process. The teams and their main contributions are as follows: (b)(3) Sec 410(c)(2), (b)(5)

(b)(3) Sec 410(c)(2), (b)(5) [redacted]

Role of the Panel

The main role of the Panel has been to establish the technical requirements for RRECS. We have done this by circulating a series of documents to the teams, obtaining their feedback, and revising the requirements as necessary. Our role in the development process has been to advise, monitor progress, and assess outcomes. The teams are responsible for the actual design and development of the various components of the system. The Panel and its consultants have played a primary role in testing and validating the systems developed by the teams.

Scope of RRECS

RRECS covers all rural carrier work activities on all rural routes. It identifies the data elements required to count all work activities and creates a complex data-capture system to provide daily counts of each of the data elements. RRECS also includes standards, carefully developed from engineering and statistical data, that specify the time allowed to complete each work activity. The standards and the counts come together in RRECS business logic that computes base hours for purposes of establishing evaluations of rural routes for pay purposes. This system is described in detail in this report and in the appendix of support documents.[1]

Completion of RRECS

In partial fulfillment of its responsibilities under the MOU, the Panel submitted a version of this report to USPS and NRLCA on October 31, 2017. At that point in time, the basic design and development of the system had been completed, and the system had been tested on a representative sample of 1767 rural routes. The report contained a list of the remaining technical requirements to complete RRECS and Panel recommendations on several other prominent issues that were not requirements.

This report constitutes the Panel Chairperson's *"final determination with regard to the Revised Evaluated Compensation System."* The tendering of this final determination by Chairperson Louis Martin-Vega fulfills the Panel's obligations under the MOU. This document contains Panel responses to the Parties' comments on the October 31 Report, correction of errors in that document, and an updated listing of the remaining technical requirements not yet completed by the teams. This is the "document of

[1] A second appendix of standards documentation will be submitted with this report. We will refer to it as the Standards Appendix and to the appendix of support documents simply as the "Appendix" in the body of this report.

record" for all of the Panel Chairperson's determinations. The Panel recommendations regarding issues to be further negotiated by the parties, which were included in the October 31 Report, have been removed from this document and updated and will be issued as a separate report as a resource for the parties.

RRECS is Essential to the Future of USPS

The Necessity of a Modern System of Delivery Route Standards

USPS utilizes a base route structure to deliver mail to business and residential customers. The base is a fixed set of addresses that are specified in the Address Management System (AMS). While in the delivery unit, the carrier performs the activities (e.g., casing mail, sorting parcels and loading the delivery vehicle) necessary to prepare their route's mail for delivery. These "office" activities are similar in form each day but may require substantially different amounts of time because of differences in mail stream volumes. The "street" activities on the route include driving, servicing mailboxes and performing services at the customer's door (e.g., delivering large parcels). The line of travel should be the same each day, and the time required for this "basic" route approximately the same each day if: 1) all customers on the route receive mail; 2) there are no door services for the day; and 3) there are no driving disruptions (e.g., detours). However, variability in the at-door services, particularly parcel delivery, often causes both the street time and the line of travel to vary from day to day.

The concept of "standard time" for a delivery route refers to the time required by an experienced and motivated worker of normal skill and ability, working at a normal daywork pace, to perform a specific task under specific conditions with allowance time to meet personal needs, overcome the fatiguing aspects of work and compensate for unavoidable delays. This concept is critical both for designing good routes and for managing the carriers who service these routes. Without a reliable method for estimating the time required to service a route, there is no way to know if the route's required activities can all be performed within an acceptable workday. Also, since for the street portion of the route, a carrier is "out-of-sight" of any supervisor, and no two routes are the same, it is not possible to evaluate the performance of a carrier without some concept of standard time.

Basis for Pay System

For rural routes USPS uses standard route time to define the base hours used as the basis for carrier pay. The carrier is responsible for performing all required activities on his/her defined route. (b)(3) Sec 410(c)(2) [redacted]

(b)(3) Sec 410(c)(2) [redacted]

[redacted]

Constantly Changing Environment

Maintaining standard route times in the constantly changing USPS environment requires that the standard time calculations be based on current data. The existing USPS methodology for establishing standard times involves periodic manual counts of mail for each route during a "representative" period. However, given the variability in mail volume for the various streams, particularly parcels, it is extremely difficult to justify any period as representative of mail flows for the entire year. In order to adapt to the changing environment, standard time computations must be based on ongoing measurements of the various mail streams. (b)(5) [redacted].

Defining Delivery Route Activities

(b)(3) Sec 410(c)(2) [redacted]

5. (b)(3) Sec 410(c)(2), (b)(5) [redacted]

Developing Standard Times

(b)(3) Sec 410(c)(2), (b)(5) [redacted]

[redacted]

Management Tool Set

(b)(3) Sec 410(c)(2) [redacted]

[2] MTM is a family of predetermined motion-time systems. The specific system used in RRECS is MTM1, the original detailed version. We use the term MTM throughout this report when referring to the use of MTM1 in the development of RRECS standards.

Advances in Technology

Systems like RRECS are made possible by advances in digitized maps, GPS, automated data capture, transfer and storage, internet availability and cloud computing. While these technologies have caused a digital transformation of many industries as observed by the World Economic Forum, *"Logistics has introduced digital innovations at a slower pace than some other industries. This slower rate of digital adoption brings enormous risks that, if ignored, could be potentially catastrophic for even the biggest established players in the business."* [3]

The United Parcel Service (UPS) has been an exception to the slow pace of digital innovation in logistics. UPS announced their customer digitization process in 2008 and is currently implementing ORION (On-Road Integrated Optimization and Navigation) based on this digitization. ORION is expected to save UPS $300,000,000 to $400,000,000 per year when fully implemented.[4] The RRECS capability for digitization of customers and routes and automated capture of delivery data is a critical step in the digital transformation of USPS mail delivery. RRECS also provides the basis for route optimization technology comparable to the ORION system of UPS. This digital transformation is essential if USPS is to compete with companies like UPS that started the digital transformation of their delivery system 10 years ago.

RRECS Schematic

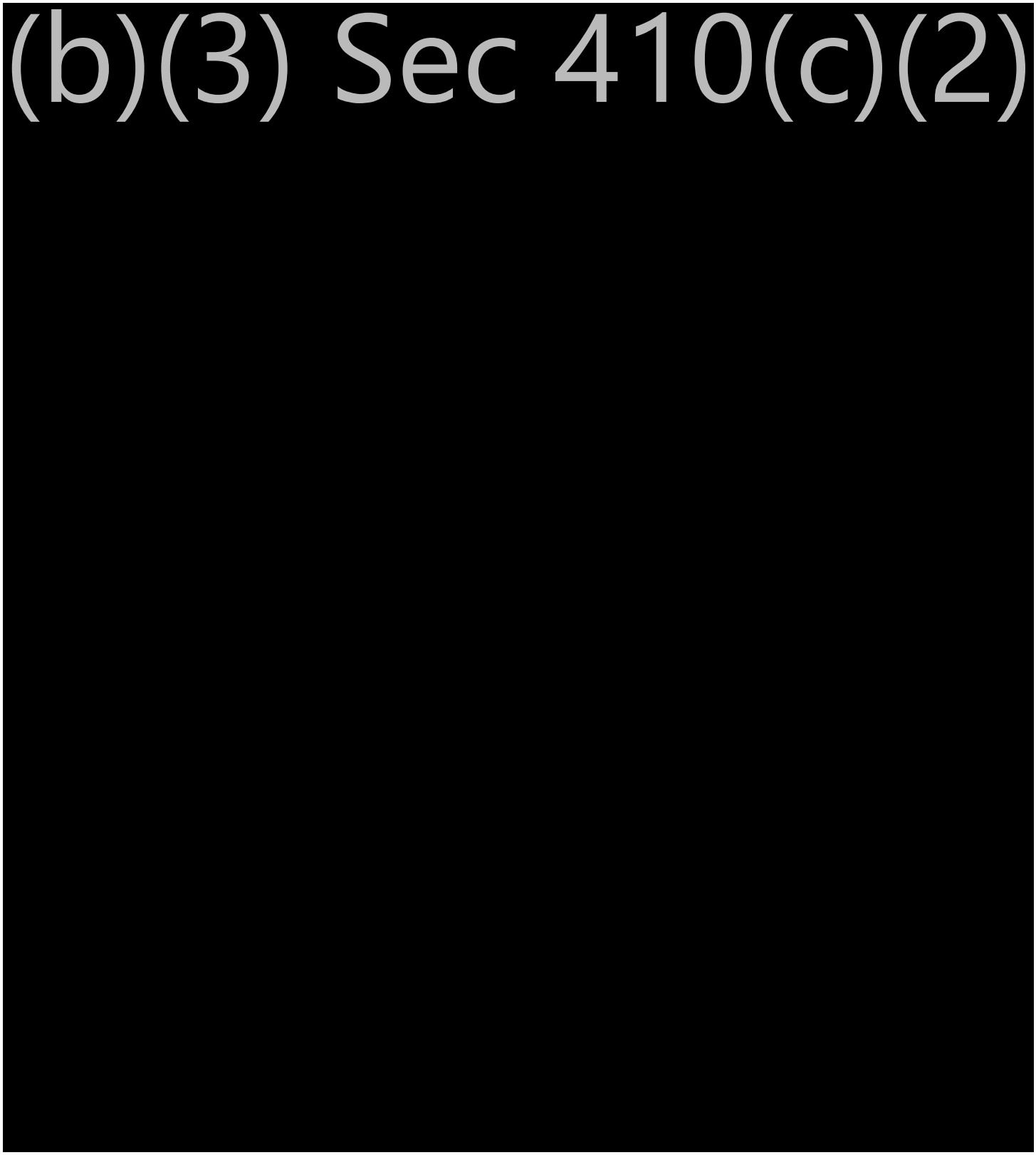
[3] [http://reports.weforum.org/digital-transformation/the-digital-transformation-of-logistics-threat-and-opportunity/]
[4] [https://compass.ups.com/ups-fleet-telematics-system/]

(b)(3) Sec 410(c)(2)

For the benefit of readers unfamiliar with RRECS concepts and USPS acronyms, the Glossary at the end of this report provides definitions of all items presented in the schematic.

THE DATA CAPTURE SYSTEM

Introduction



(b)(3) Sec 410(c)(2)

RRECS Data Capture Subsystems

Product Tracking and Reporting

(b)(3) Sec 410(c)(2)

A total of [redacted] RRECS data elements are captured by scans in a semi-automated process. Rural carriers are responsible for making the scans at the proper times and locations. The remainder of the process of capturing, identifying, transferring, ingesting and analyzing the scans is fully automated. The Appendix includes a document

covering the final set of scan modifications to complete RRECS requirements (Document 03, “Revision of RRECS Scans (Panel 07/23/17)”).

End-of-Run Reports

The Web End-of-Run (**WebEOR**) system is a pre-existing USPS reporting system that collects, stores, and reports mail volume data based on processing machine run reports. WebEOR data is available at the route level. (b)(3) Sec 410(c)(2)

Informed Visibility

Informed visibility (IV) is a newly organized USPS real-time, single source for all mail and mail aggregate information, leveraging data to provide business intelligence for USPS functional groups and the mailing industry. (b)(3) Sec 410(c)(2)

Rural Work Hour Tracker User Interface

(b)(3) Sec 410(c)(2)

Rural Street Database

The Rural Street Database (RSD) was created for RRECS to map routes digitally and collect information about the physical characteristics of the route not available elsewhere. The RSD route mapping process starts with the collection of daily breadcrumbs from the MDD collected over a 4 to 6-week period just prior to mapping.

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2)

[redacted]

RRECS Data Elements

(b)(3) Sec 410(c)(2)

[redacted]

Table 1. RRECS Data Elements, May 31, 2018

Data Element Number	Data Element Description	Source	System Status	Level of Automation	Data Element Status
[redacted]					


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)

Validation of Data Element Counts

The accuracy of standard times depends directly on the quality and completeness of data element counts; if the counts are not accurate, standard times cannot possibly be accurate. (b)(3) Sec 410(c)(2) [redacted]

Validation Techniques

System vs Manual Counts. This approach involves comparing the values of data elements in the system input files in RRECS with counts of the same data elements on the same days collected manually by a team from the Institute of Industrial and Systems Engineering (IISE). This approach depends on the ability to access and count the mail and other elements without substantially disrupting the work process. The Panel deemed this was appropriate in the office environment but not for street activities.

(b)(3) Sec 410(c)(2) [redacted]

Joint Review by NRLCA and USPS. This approach was used primarily to validate street activities. (b)(3) Sec 410(c)(2) [redacted] The validation procedure involves a step-by-step review of mapping and RSD data entry results conducted jointly by rural carriers and representatives of postal management. The most important data elements that were validated using this method include: 1) interval distances used in calculating drive time on the basic route; 2) out-of-route driving distances (OOR drive time); 3) and DDD stop to door walking distances (DDD walk time); 4) number of boxes, units and collection compartments (service time on the basic route). The activity times based on these data elements account for around [redacted] of total standard time.

Previous Approval by NRLCA and USPS. For mailcount purposes, NRLCA and USPS have agreed to accept WebEOR counts as a substitute for manual counts of DPS letters and DPS flats. This decision was based on studies conducted jointly by the

parties. IISE counts of these data elements during the Count Validation Study confirmed their accuracy. The Panel considers these data elements to be validated.

Visual and Statistical Observations. This approach is less formal than the three methods described above. In conducting its work, the Panel and its technical advisor, Dr. John Bartholdi, have had countless opportunities to observe RSD mapped results, including line of travel and locations of the 4 points and TCPs, in Google map. The overall impression developed from these observations is that the mapping results are largely accurate, and any inaccuracies that remain are likely to be off-setting and hence have little or no impact on standard times. Likewise, we had numerous opportunities to examine arrays of input data and sort them to identify outliers and other anomalous outcomes. The Panel reached the same conclusions based on these statistical observations. While our visual and statistical observations do not qualify as systematic validations, they do provide additional evidence of the validity of some of the key data elements.

Exception Handling

The Panel estimates that about 1.3 billion data element entries will be required annually in RRECS. Some entries are fully automated, most are semi-automated, and a few involve manual data capture. Inevitably there will be missing and incorrect data due to system problems, technology failures, and human errors. Given the volume of data in RRECS, it is essential that these data exceptions be identified and controlled programmatically. (b)(3) Sec 410(c)(2)

[redacted]

Remaining Data Capture Problems

As mentioned above, the Count Validation Study exposed problems in the data capture system that will have to be addressed. The Panel's specific requirements for dealing

(b)(3) Sec 410(c)(2)
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The most significant problem occurred with the new RRECS scans. The count validation data clearly shows that many scans were not performed according to instructions: specifically, some were made at incorrect times, some were missed entirely, and some were made incorrectly. In the case of all scanned data elements, a subset of carriers followed the instructions and scanned correctly. We believe this indicates that the scan requirements are realistic, and *with proper training and compliance monitoring*, they can consistently be done correctly. While the training materials have been substantially improved, they remain a work in progress and would benefit from more input from professional designers of training materials. (b)(3) Sec 410(c)(2)

A second category of problems consisted of data capture procedures that the Panel concluded were unlikely to ever produce satisfactory results. This group includes the following data elements: random letters, random flats, change of address/PARS labels, and carrier pickup events. New requirements for these data elements are found in the "Remaining RRECS Requirements" section of this report.

The third category of problems involved data capture procedures that failed to capture data correctly in specific situations. This group includes parcels deliveries and end-of-shift activities. In these cases, we believe the existing procedures can be modified to deal with the problem situations. New requirements that address these problems are also found in the "Remaining RRECS Requirements" section of this report.

Count Validation Conclusions

As indicated in Table 1 above, there are three levels of automation associated with the counts: full, semi and manual. For the fully-automated counts, we accepted the previous conclusions of NRLCA and USPS that the counts were valid.

For the semi-automated counts, our validation efforts focused on proper use of the MDD. As indicated in the previous section, we concluded there were problems with some scans. (b)(5), (b)(3) Sec 410(c)(2) For the remaining operations, a large number of the carriers appeared to execute the operations correctly, and the captured data seemed reasonable. This led us to conclude that, with (b)(5), (b)(3) Sec 410(c)(2) and continued emphasis on training and following up with carriers, the technology will provide the required data.

The daily manual counts required by the carriers and supervisors were inconsistent and inaccurate. We concluded that daily data capture was impractical. We modified these manual requirements by eliminating daily manual entries and substituting periodic mini mailcounts.

THE STANDARDS

Introduction

The role of standards within RRECS is to determine the amount of time allowed to perform a single occurrence of a standardized work activity. Technically, a standard is defined as the amount of time required by an experienced and motivated worker of normal skill and ability, working at a normal daywork pace, to perform a specific task under specific conditions. A standard is composed of normal time, or the amount of time required to perform the work, and allowance time, or the time allowed for personal time, recovery from fatigue, and unavoidable delays (PFD). Normal time is determined through the systematic application of work measurement techniques. Allowance time is sometimes set by direct measurement (especially fatigue and delay times) but more commonly through administrative application of industrial engineering norms.

RRECS establishes new standards for all rural carrier work activities that replace the standards in the current evaluated system. Many of the existing standards were negotiated, established through arbitration decisions, or developed by methods that do not conform to generally accepted industrial engineering practices. Indeed, much of the motivation to create RRECS arose from disputes between the parties over the accuracy of existing standards. Conflicts also occurred because of poor and incomplete documentation. In some cases, the parties disagreed over exactly which work activities were covered by a standard. It is very difficult to resolve disputes over the adequacy of time allowed to perform an activity if there is no agreement over the scope of the activity. These problems generated intense labor relations disputes and costly arbitrations. They also made it very difficult to manage change associated with introduction of new technology, new products and services, and innovations in work process.

RRECS addresses these problems by developing new standards based on the systematic application of industrial engineering techniques. The RRECS standards are transparent in that the coverage of each standard is clearly defined, and the step-by-step work measurement process for developing normal time is fully documented.

RRECS has three categories of standards: engineered standards, statistical standards and standards based on actual time. In total RRECS includes 122 standards. The most important category is engineering standards, (b)(3) Sec 410(c)(2)

The Panel chose to base the standards for these activities on actual time because of the great variation in work content due to vehicle characteristics, mail volumes, activities performed, etc., that made it impossible to develop a standard method and engineered standards for the activities. Significant inter-route variation in the activities rule out the statistical standard approach.

(b)(3) Sec 410(c)(2)

[redacted]

Developing, Documenting, Validating, and Maintaining Engineered Standards

Developing Engineered Standards

1. Clearly define the work activity covered by each standard. The content of each activity was determined by: a) direct observation of rural carriers performing the work; b) consulting USPS standard operating procedures, the labor agreement and other relevant documents; and, c) interviewing rural carriers, postal managers and other subject matter experts.
2. Determine the starting and ending point of each work activity. To avoid double counting, the work activities must be mutually exclusive. In aggregate, the work activities should cover all the work performed by rural carriers.
3. Establish a standard method for performing the work activity and use it to develop the standard. The work activity is divided into a series of work elements each with a discrete starting and ending point. The elements are then arranged into an efficient and safe method that can be mastered by an experienced and motivated worker of normal skill and ability. The standard method is written in plain English and presented in a standard format and writing style. The standard method is important for three reasons. First, it serves as the blueprint on which the engineered standard is based. Second, it serves as a record of work content at the time the standard was set, and as such, is available as a reference point to determine if the work has evolved in response to changes in materials, equipment, layout, product changes, etc. that may require a revision of the method and standard. Third, the standard method is available for training new carriers and retraining experienced carriers. It is important to note that the standard method is not the only way the work can be satisfactorily performed. This is especially true in long-cycled, varied work performed in varied conditions

(b)(3) Sec 410(c)(2), (b)(5)

4. Apply MTM work measurement techniques to the standard method of each work activity. (b)(3) Sec 410(c)(2), (b)(5)
.
5. Construct normal times for work activities using application spreadsheets that reference the MTM detail sheets. (b)(3) Sec 410(c)(2), (b)(5)
6. Add allowance time for personal, fatigue and delays (PFD) to arrive at standard time for the work activity. (b)(3) Sec 410(c)(2)

Documenting Engineered Standards

Documentation of all engineered standards is available in the Standards Appendix. Each standard has a separate folder which contains four subfolders labelled: a) Method, b) MTM Summary, c) MTM Detail, and d) Support. (b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2)

[redacted]

Validating Engineered Standards

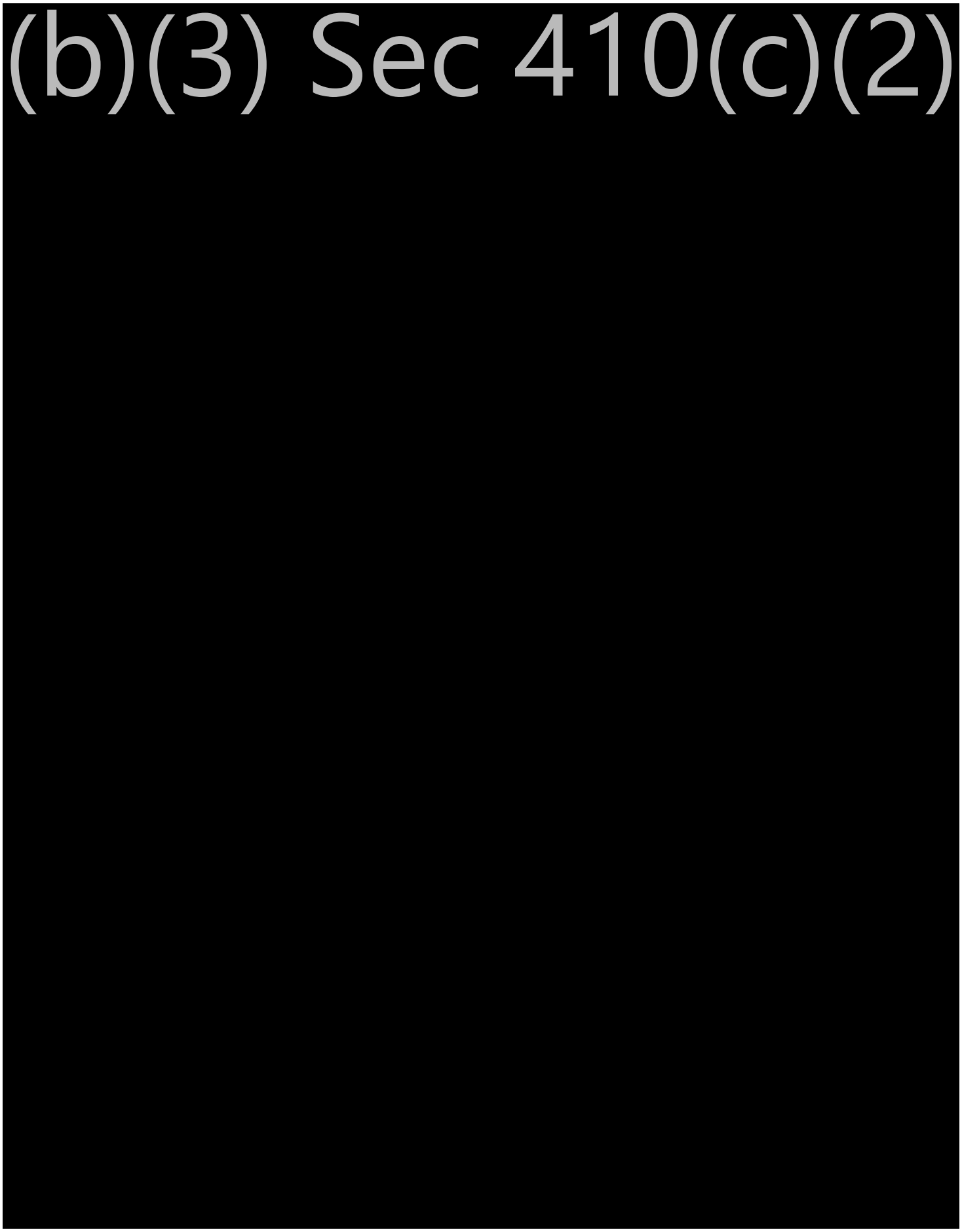
Independent Review. (b)(3) Sec 410(c)(2)

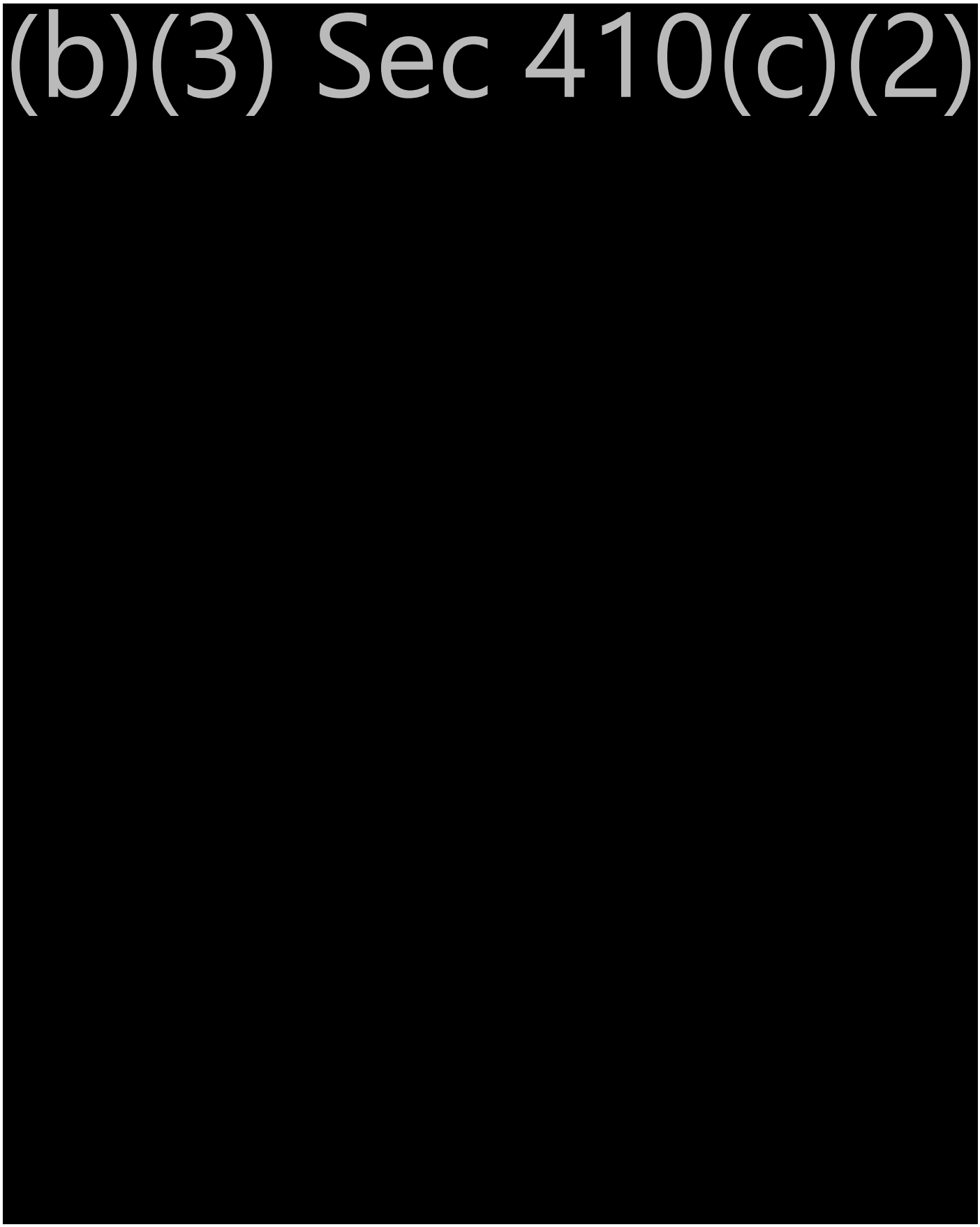
[redacted]

Statistical Review. (b)(3) Sec 410(c)(2)

[redacted]

[redacted]


(b)(3) Sec 410(c)(2)



Time Study Review. The third level of validation compares the actual time required to perform the activity with the normal and standard times developed by IISE and reviewed

by the panel. The purpose of this validation was to determine how well carriers trained in the standard method would perform against normal and standard times. It is a rough validation in that carrier performance will also reflect the work pace of the carrier. Nevertheless, these comparisons are frequently made, and they provide a reasonable basis for validating new standards. The third level of validation focused on the most important standards in terms of their contribution to route evaluations. A complete list of these high priority standards and the validation results for each is included in Appendix Document 12, “Priority Standards_101017”.

The steps involved in time study validation process were as follows:

normal and standard times falls in the expected range. This indicates that the standards provide a fair amount of time to do the work, **when carriers follow the standard method**. We believe this indicates that the large gaps between actual time and normal time observed in the statistical validation are largely the result of the differences between the standard method and the shortcut procedures many carriers use in performing the work. The standard methods are based on USPS standard operating procedures and safe work practices: however, they may also contain motions and elements that are unnecessary for the safe and efficient performance of the work. In order to explore this possibility, we reviewed the standard method and MTM application for all remaining activities where the gap was large. When unnecessary motions and elements were found, the standard methods and standards were adjusted accordingly.

(b)(3) Sec 410(c)(2)

Developing and Documenting Statistical Standards

GPS Data Capture

The evolution of GPS technology has enabled the tracking of carriers as they service their routes. (b)(3) Sec 410(c)(2)

Developing Statistical Standards

RRECS has two groups of statistical standards: drive speeds and traffic control points. Both are based on statistical analysis of elapsed times calculated from GPS breadcrumb data. However, the procedures and outcomes differ, so they will be described separately below.

Drive Speed Standards. The basic premise of the drive speed standards is that drive speed is governed primarily by the length of the distance driven from one full stop to the next full stop. With this as an organizing principle, drive speed standards are calculated as follows:

1. (b)(3) Sec 410(c)(2), (b)(5) [redacted]

[redacted]

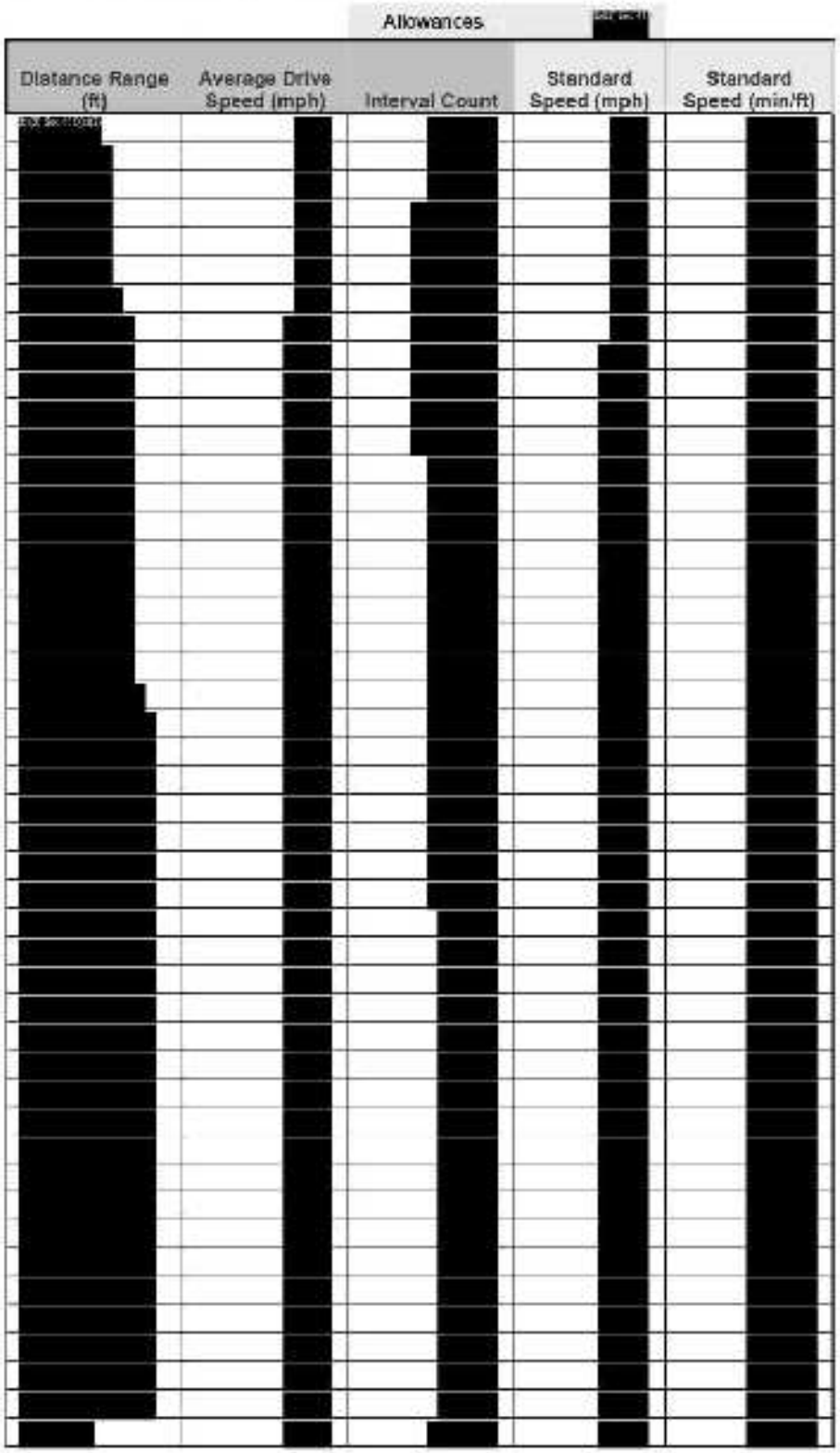
Unavoidable Delays in Driving. (b)(3) Sec 410(c)(2), (b)(5) [redacted]

(b)(3) Sec 410(c)(2)

Table 2 summarizes the Panel Chairperson's final determination of the RRECS Drive Speed Matrix and standard drive speeds.

(b)(3) Sec 410(c)(2)

Table 2. Drive Speed Matrix



Changes in Table 2. Drive Speed Matrix		
	Tracker: adjust values in drive speed matrix to reflect elimination of break and substitution of new allowance percentages.	USPS 04

TCP Standards. TCP standards are based on: 1) the vehicle stop time at the TCP measured from GPS breadcrumb data; and 2) the frequency that the vehicle stops, calculated by dividing the number of actual stops by the number of eligible stops. Following is the step-by-step procedure used to calculate TCP standards:

1. (b)(3) Sec 410(c)(2) [redacted]

(b)(3) Sec 410(c)(2)

Direct Measurement of Actual Time

(b)(3) Sec 410(c)(2)

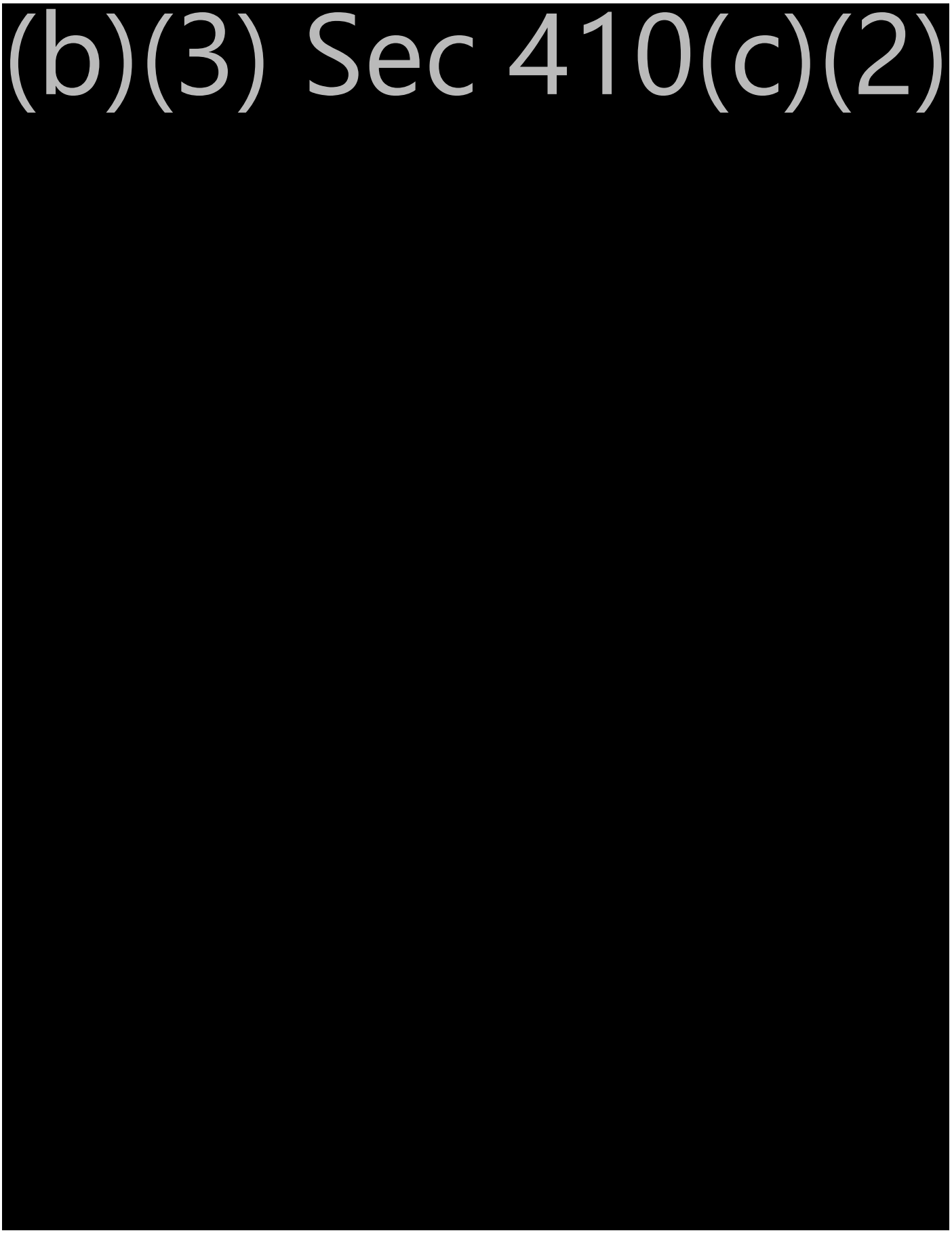
(b)(3) Sec 410(c)(2)

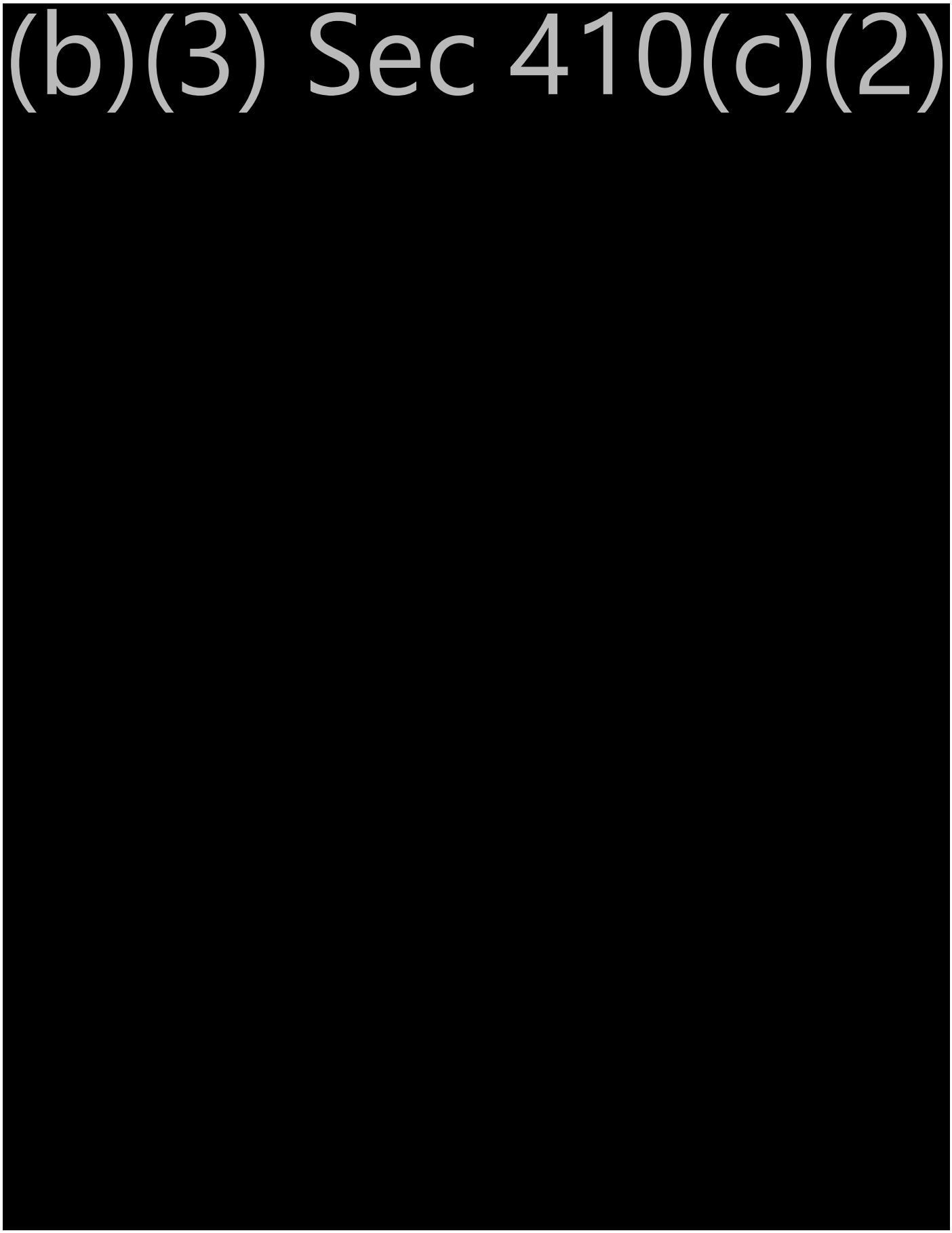
RRECS Standard Values and Characteristics

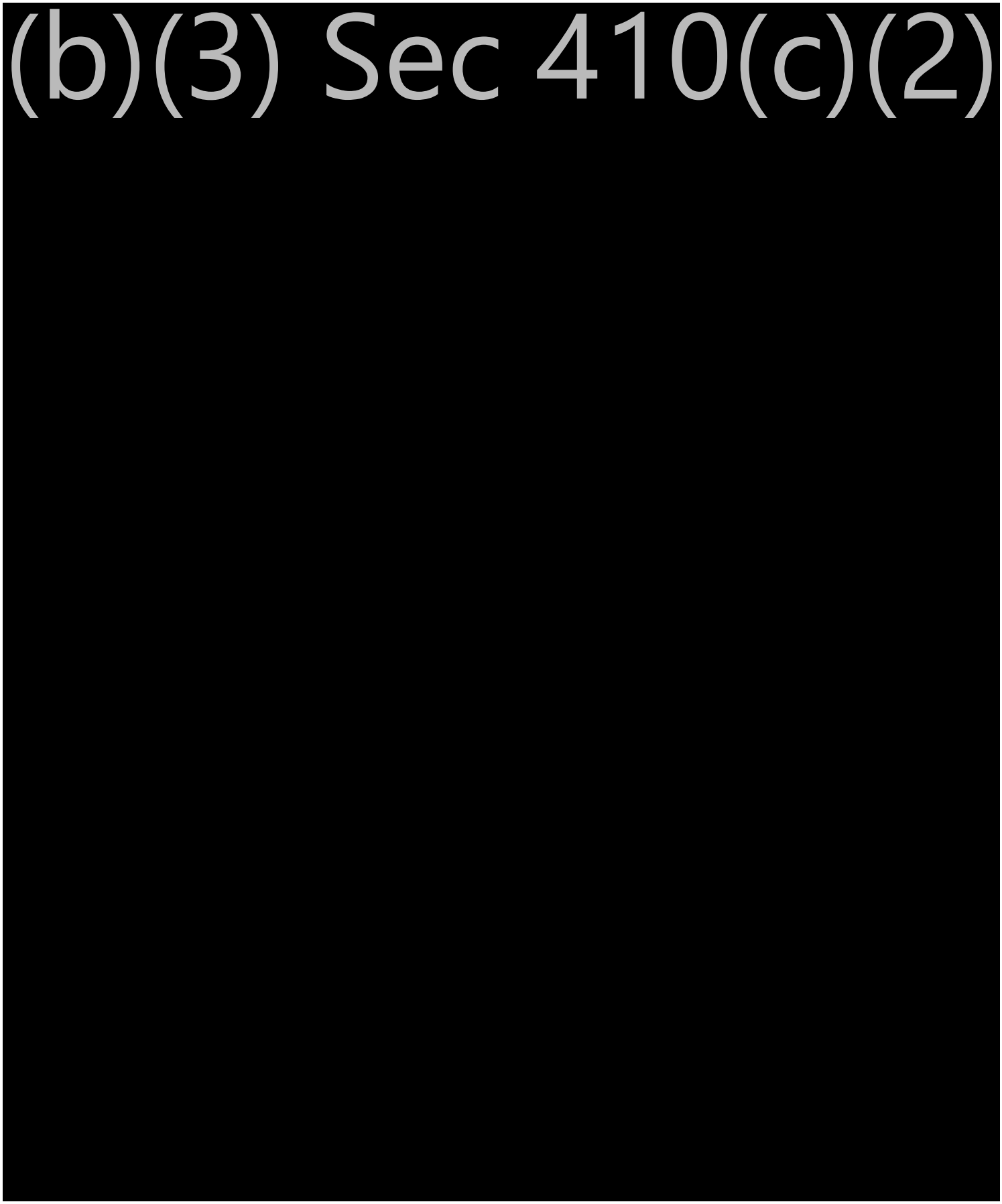
(b)(3) Sec 410(c)(2)

Table 3. RRECS Standards, May 31, 2018

Standard Number	Standard Description	Standard Minutes	Units (min per)	Location	Type of Standard
[redacted]					


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)

RRECS Constant Values and Characteristics

RRECS constants are fixed values used in calculating standard time for some sequences. (b)(3) Sec 410(c)(2)

[redacted]

The values of constants in Table 4 reflect all changes in standards resulting from the Panel's responses to the comments of the parties. The values in Tables 4 are the Chairperson's final determination on RRECS constants.

(b)(3) Sec 410(c)(2)

Table 4. RRECS Constants, October 31, 2017

Constant Number	Constant Description	Value	Units	Source	Documentation
[redacted]					

Route Coverage

The concept of “route coverage” is used to estimate the addresses actually serviced each day on each delivery route in order to give the carrier credit for the actual work performed. (b)(3) Sec 410(c)(2)

[redacted]

Coverage of Single Address Stops

(b)(3) Sec 410(c)(2)

[redacted]

3. (b)(3) Sec 410(c)(2)

This methodology was tested on a random set of 20 routes and the results are shown in (b)(3) Sec 410(c)(2)

Adjustments to the Methodology

Based on discussions with the parties after the October 31 Panel Report, three adjustments were made to the methodology based on mail volume.

1. (b)(3) Sec 410(c)(2)

parties will need to negotiate a reasonable rule for identifying these situations (e.g. single-box curb stops > 100; or single-box curb stops > 100 or 20% of total boxes, whichever is less).

Coverage of Multiple Address Stops

(b)(3) Sec 410(c)(2)

[redacted]

Using Coverage in Calculating Daily Evaluations

(b)(3) Sec 410(c)(2)

[redacted]

Impact of Coverage on Daily Evaluations

(b)(3) Sec 410(c)(2)

[redacted]

BUSINESS LOGIC

Introduction

Determining Pay

The current Evaluated Compensation System (ECS) combines standards, counts and business logic to calculate total standard hours and minutes per week (***standard hours)*** allowed to deliver mail on regular rural routes. A regular rural carrier's pay is based on ***evaluated hours****,* which are whole-hour equivalents that correspond to ranges of standard hours. Table 5 shows how this process works for "K" routes.

Table 5. Table of Evaluated Hours for Regular Rural Routes

K Routes (Relief Day Each Week)	
Total Hours and Minutes per Week (Standard Hours)	Evaluated Hours
47:24 to 48:35	40 Hours
48:36 to 49:47	41 Hours
49:48 to 50:59	42 Hours
51:00 to 52:11	43 Hours
52:12 to 53:23	44 Hours
53:24 to 54:35	45 Hours
54:36 to 55:47	46 Hours
55:48 to 56:59	47 Hours
57:00 to 57:36	48 Hours

This conversion table comes from Article 9.2.6.a of the Collective Bargaining Agreement (CBA). In addition to the K route table, the CBA also has tables for H routes (no relief days) and J routes (relief days every other week).

This approach to determining evaluated hours and pay remains intact in RRECS. RRECS differs from the ECS in how standard hours and minutes are calculated. In the narrative below, we will follow the convention used in the CBA and refer to the standard hours and minutes used to determine evaluated hours as ***base hours.***

RRECS Outputs

(b)(3) Sec 410(c)(2)

2. (b)(3) Sec 410(c)(2)

[redacted]

Business Logic

(b)(3) Sec 410(c)(2)

[redacted]

Daily Standard Time: Development, Validation and Documentation

(b)(3) Sec 410(c)(2)

[redacted]

DST Development

Background. (b)(3) Sec 410(c)(2)

[redacted]

(b)(3) Sec 410(c)(2)

[redacted]

[redacted]

DST Business Logic. (b)(3) Sec 410(c)(2)

[redacted]

[redacted]

The entries in the table reflect all changes since October 31, 2017 made by the Panel in response to the parties' comments as well as changes to correct errors and make improvements. The business logic formulas in the table are intended to represent all required calculations accurately and completely; however, the formulas are complex and the translation of excel formulas into code is

complicated. For these reasons it is especially important to validate the final code very carefully.

The entries in Table 6 are the Panel Chairperson's final determination on RRECS business logic. The final determination also requires careful and full validation of the business logic's final code.

The data in Table 6 is copied from the embedded excel file below.

Table 6. RRECS Daily Standard Time Business Logic, May 31, 2018

Seq No	Sequence Description	Business Logic Formula	Standards Applied	Data Elements	Location/ Time	Classification
[redacted]						

(b)(3) Sec 410(c)(2)

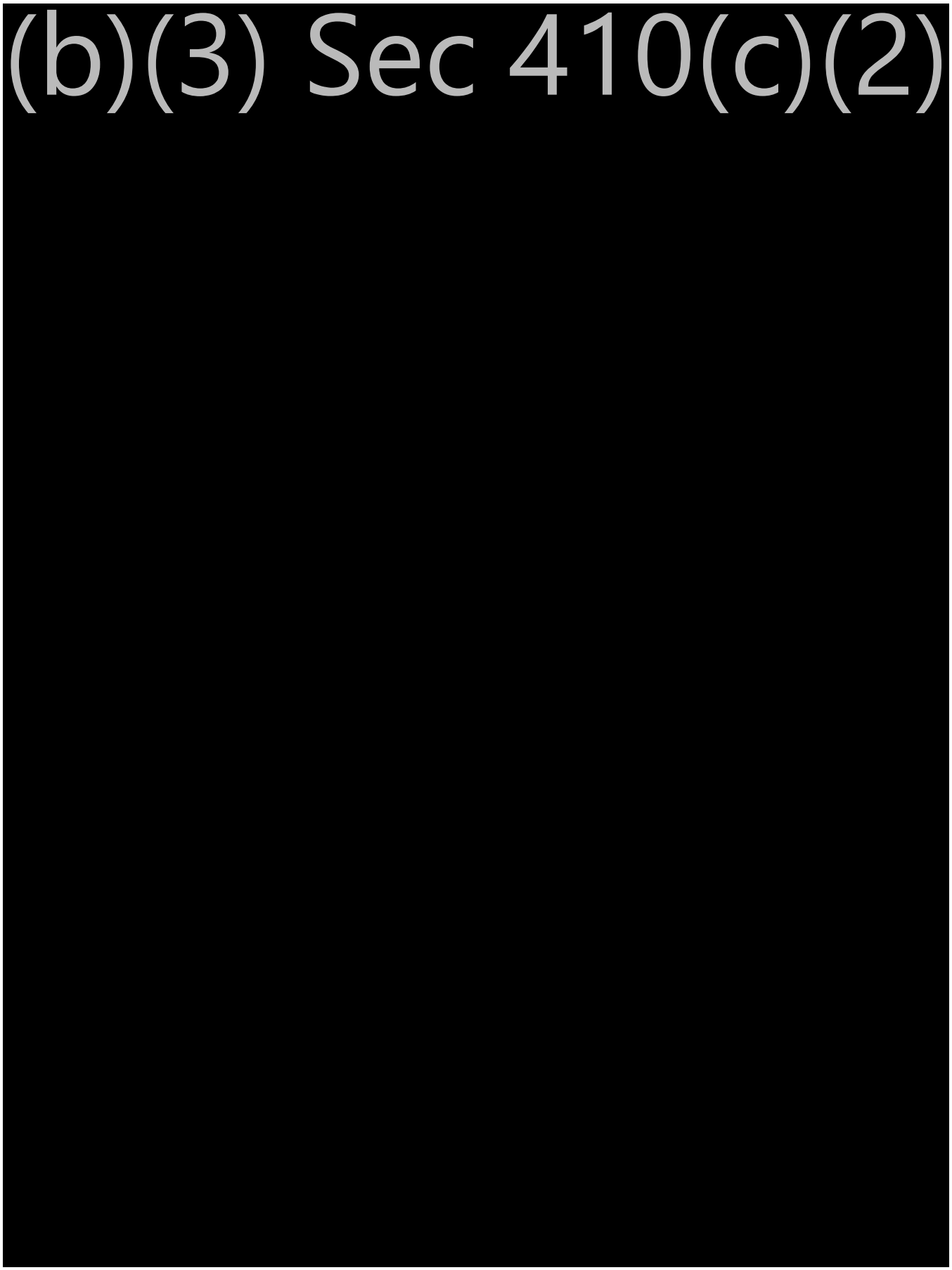
(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)


(b)(3) Sec 410(c)(2)

DST Validation. (b)(3) Sec 410(c)(2)

[redacted]

DST Documentation. (b)(3) Sec 410(c)(2)

[redacted]

Solver Inputs to DST

Background on Solver Inputs. (b)(3) Sec 410(c)(2)

[redacted]

(b)(3) Sec 410(c)(2)

[redacted]

[redacted]

Business Logic Solver Inputs. (b)(3) Sec 410(c)(2)

[redacted]

[redacted]

[redacted]

(b)(3) Sec 410(c)(2)

[redacted]

Validation of Solver Inputs. (b)(3) Sec 410(c)(2)

[redacted]

Documentation of Solver Inputs. (b)(3) Sec 410(c)(2)

[redacted]

Current Weekly Evaluations

Background on CWE. (b)(3) Sec 410(c)(2)

[redacted]

Business Logic for CWE. (b)(3) Sec 410(c)(2)

[redacted]

(b)(3) Sec 410(c)(2)

[redacted]

Validation of CWE. (b)(3) Sec 410(c)(2)

[redacted]

Documentation of CWE. (b)(3) Sec 410(c)(2)

[redacted]

(b)(3) Sec 410(c)(2)

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Base Hours and Evaluated Hours

Background on BH and EH. (b)(3) Sec 410(c)(2)

Hence BH drives carriers' pay and is the ultimate output of RRECS.

(b)(3) Sec 410(c)(2)

Business Logic for BH. (b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2)

[redacted]

Validation of BH. (b)(3) Sec 410(c)(2)

[redacted]

The parties will negotiate the frequency of base hour resets or adjustments to route evaluations and the events that may trigger the need for these changes/updates (Panel Response, JOINT 05). See "Panel Recommendations on RRECS Issues, May 31, 2018" for a discussion of Panel views on these issues.

Calculating Base Hours on New Auxiliary Routes after Route Adjustment

Background Adjusted Routes. (b)(3) Sec 410(c)(2)

[redacted]

Business Logic Adjusted Routes. (b)(3) Sec 410(c)(2)

[redacted]

(b)(3) Sec 410(c)(2)

[redacted]

(b)(3) Sec 410(c)(2)

[redacted]

Validation Adjusted Routes. (b)(3) Sec 410(c)(2)

[redacted]

Documentation Adjusted Routes. (b)(3) Sec 410(c)(2)

[redacted]

REMAINING RRECS REQUIREMENTS

Introduction

The tasks described in this section of the report represent technical requirements of RRECS that must be completed for the system to function properly. **They are an integral part of the Panel Chairperson's final determination.** At this point, the requirements have all been set, some of the work is complete, and this document lays out the requirements for the work that remains. The discussion that follows divides the remaining requirements into the three broad functional areas of RRECS: data capture, standards and business logic. Each will be discussed in turn.

Data Capture

(b)(3) Sec 410(c)(2)

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T1 - Withdrawing mail and T2 - DPS letters cased

(b)(3) Sec 410(c)(2)

The new requirement is to change the Daily Worksheet screen as necessary to continue capturing these two elements.

T6 - Random letters and T7 - Random flats

The original requirement was to capture the counts of these data elements in a DUVRS-

(b)(3) Sec 410(c)(2)

T22 - Carrier pickup events and T23 - Carrier pickup items

(b)(3) Sec 410(c)(2)

The new requirement is to establish a two-step data capture procedure on the MDD with step one indicating a pickup event and step two indicating the number of items retrieved.

(b)(3) Sec 4 - Change for Address and (b)(3) Sec 4 - PARS label

(b)(3) Sec 410(c)(2)

The new requirement is to manually count PARS labels once per year and enter the count(s) in a redesigned Daily Worksheet in RWHT. The new COA requirement is to retire the data element and include COA processing as part of EOS.

T43 - End-of-shift time

(b)(3) Sec 410(c)(2)

The new requirement is to create a new PM casing scan, used only by carriers who are required to case mail at the end of the day to indicate the start of the PM casing period. Carriers must be trained to complete EOS activities before starting casing.

(b)(3) Sec 410(c)(2) **Parcels delivered to: door, mailbox and parcel locker**

(b)(3) Sec 410(c)(2)

The new requirement is to establish a two-step data capture on the MDD with step one indicating a parcel without a readable barcode, and step two requiring the carrier to indicate the delivery location (mailbox, parcel locker or door) on a drop-down menu.

(b)(3) Sec 4 **– Straight-line, round-trip distance from the point of departure to the pump and return**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2)

(b)(3) Sec 4 **– LHD government vehicle**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 4 **– Miscellaneous activities**

(b)(3) Sec 410(c)(2)
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(b)(3) Sec 4 **– One-way distance - case to safety service**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 4 **– Safety service talk**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 4 **– Round trip walk distance - case/DPSL storage**

(b)(3) Sec 410(c)(2)

Action on Scans is High Priority

(b)(3) Sec 410(c)(2)

Business Logic

(b)(3) Sec 410(c)(2)
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(b)(3) Sec 410(c)(2 **– Gather DPS letters for transport to case and SEQ8 – Locate and access DPS letter trays**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Case DPS letters**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Gather DPS flats for transport to case and SEQ15 – Locate and access DPS flat trays**

(b)(3) Sec 410(c)(2).

(b)(3) Sec 410(c)(2) **– Case DPS flats**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2))

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Carrier pickup item and manifest scans**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Miscellaneous activities**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Safety service talks**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Office Walking – DPSL**

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2) **– Verify addresses**

(b)(3) Sec 410(c)(2)

Calculating Route Coverage

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2)

(b)(3) Sec 410(c)(2)

Standards Time Calculations Associated with Route Coverage

(b)(3) Sec 410(c)(2)

Requirement: Develop code to calculate service time for each type of address by multiplying the number of addresses of each type by the coverage factor and then multiplying the resulting product by the associated service standard.

Base Hour Calculations (Tracker)

(b)(3) Sec 410(c)(2)

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Calculating Base Hours on New Auxiliary Routes after Route Adjustment

(b)(3) Sec 410(c)(2)

CONCLUSIONS

This report constitutes the Panel Chairperson's "*final determination with regard to the revised Evaluated Compensation System".*

The Rural Route Evaluated Compensation System (RRECS) replaces the current evaluated compensation system with a mostly automated data capture system capable of generating daily counts of work activities, new engineered and statistical standards, and an automated system of business logic that calculates and updates evaluations of rural routes.

The standards and underlying methodology for the RRECS system are based on sound, generally accepted industrial engineering principles and modern computer technology.

When properly implemented the RRECS system will provide USPS and NRLCA with a fair system to measure rural carrier workload and use as a basis for rural carrier pay. In addition, the RRECS system:

- Will provide significantly more accurate measures of workload and performance than the current evaluated system (ECS)
- Will eliminate most of the significant cost and issues associated with current manual mail counts
- Will allow evaluations to adapt to the continuously changing USPS mail flows, particularly parcel volumes
- Will facilitate change management
- Will provide the digital foundation for a modern tool set for managing the USPS delivery system and analyzing the impact of changes in investment and strategies

The major challenges in scaling up RRECS are associated with digitizing the customer and route data that currently exists only in the heads of the carriers. While this scaling effort will require significant time and investment, it is difficult to imagine how USPS can compete long-term without this digitization, particularly since competitors such as UPS started their digitization process at least 10 years ago. The RSD system is efficient for digitizing the customer information. The significant scaling effort required is due to the very large number of customers that must be digitized. The RSD system is not very efficient for editing carrier routes, but the Panel believes that the simplified mapping approach described in this report and *Panel Recommendations on RRECS Issues* will avoid most editing and allow for the editing capability to be improved over time.

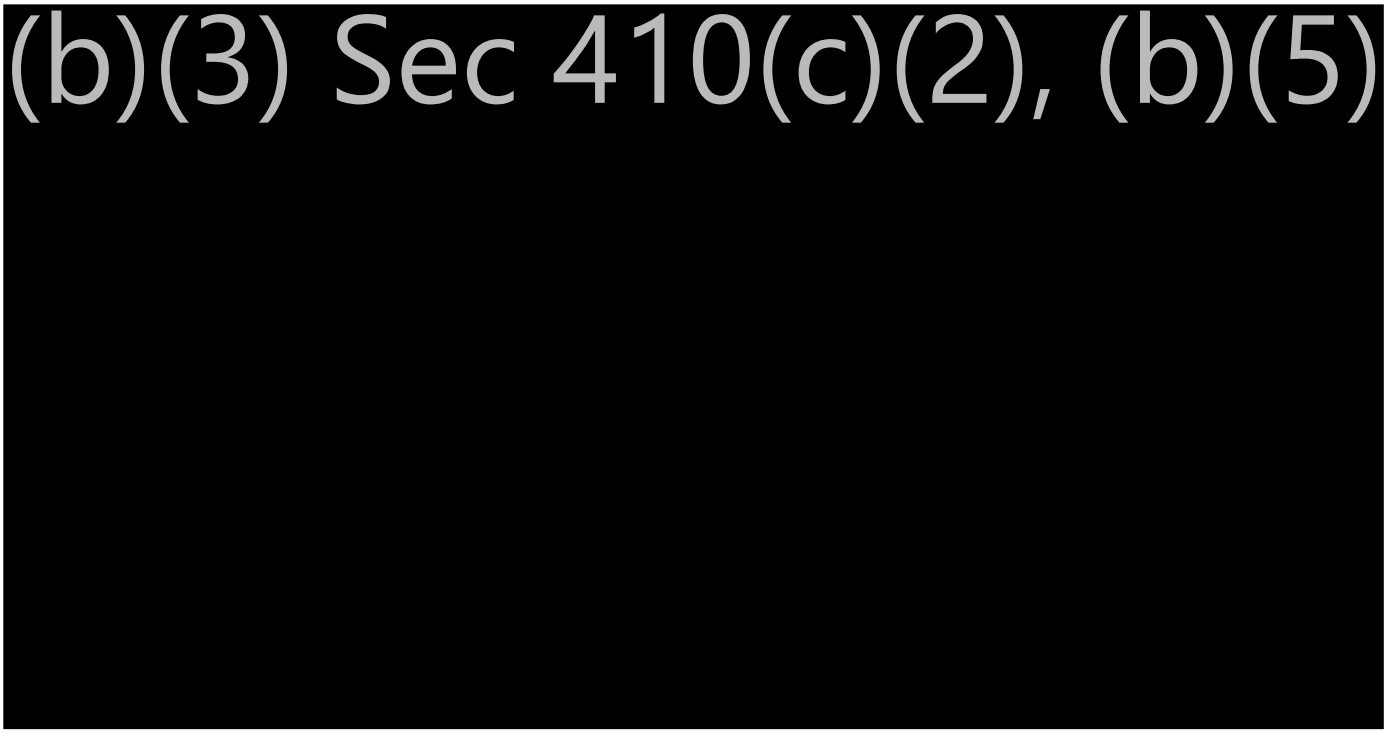
Most of the remaining data quality challenges are believed to be the result of carriers not following the standard procedures associated with using the scanners. This can be overcome with continued emphasis on training and follow-up.

Almost all of the technology required by RSD, Solver, Tracker and the functionality for the MDDs has been developed and validated. The few items that remain are well understood and can be completed and validated by the parties.

The RRECS Validation Plan of October 7, 2015 (Appendix Support Document 40) consisted of five components: validation of (1) Counts (2) Engineered Standards (3) Drive Speed Standards (4) Business Logic, and (5) Route Evaluations. **Except for specific requirements mentioned in this document, validation of the first four components has been completed.**

The main role of the Panel in this project has been to establish the technical requirements for RRECS and to advise, monitor progress and assess outcomes. The teams have been responsible for the actual design and development of the various components. While the Panel developed the validation plan, its role in completing it has

depended for considerable time on the completion of the system by the teams. The system is not yet complete, and it is simply impossible to validate RRECS completely until it is.



RRECS has required a lot of innovation and effort by all of the teams involved in its development. In its current form, RRECS provides the foundation for an excellent system. While USPS and NRLCA should take pride in what has been accomplished, it should be clearly understood that significant effort is required to complete, maintain, improve and extend the capabilities of the system in order to maximize the returned value.

GLOSSARY

1. AMS – Address Management System is a USPS data base that includes all mailing addresses in delivery sequence
2. Ave route – a route generated by an averaging process performed on breadcrumb trails between mail stops
3. BH (Base hours) – the weekly hours used as a basis for rural carrier pay
4. Breadcrumbs – the GPS coordinates generated from hand held devices
5. CBA – Collective Bargaining Agreement
6. CBU – Cluster box unit
7. CENT – Centralized unit
8. CRUB – Curb unit
9. COD – Collect on Delivery
10. Coverage – the percentage of addresses serviced by a carrier on a given day
11. CR Flats – carrier routed flats have addresses that are sequenced in delivery order
12. CWE – Current Weekly Evaluation
13. Data Warehouse – used primarily to store data history related to daily standards
14. DDD – Direct door delivery
15. DET – Detached delivery type. Village Post Offices fit in this category
16. Dismounts – when carriers leave the vehicle to deliver mail or parcels or to perform pickups
17. DPS – Delivery point sequence
18. DSM – Drive Speed Matrix
19. DST – Daily Standard Time
20. DUVRS – Delivery Unit Volume Recording System
21. ECS – Evaluated Compensation System
22. EH – Evaluated Hours
23. Engineered Standard -
24. ESRI – Corporate supplier of geographic information systems.
25. EOR – end of run counts of DPS mail
26. Frequent stops – stops identified by breadcrumb trails which occur at a location at least a specified present of the route days
27. GPS – Global Positioning System
28. IISE – Institute of Industrial and Systems Engineers
29. Informed visibility (IV) is a newly organized USPS real-time, single source for all mail and mail aggregate information, leveraging data to provide business intelligence for USPS functional groups and the mailing industry
30. IV – Informed Visibility
31. K Routes – mail delivery routes 40 – 48 hours with a relief day each week

32. ORION – On-Road Integrated Optimization and Navigation, a system used by UPS to design and manage parcel delivery routes
33. Line of travel – the roads and turns driven in a delivery route
34. Maps – digital maps used to capture and display locations of USPS customer related points and lines of travel
35. Mailcounts – the number of pieces per day of various mail streams
36. Mail points – the locations of each customer's door, mailbox, mailstop and DDD stop
37. Micro Motion – a worker motion of very short duration
38. Mini mailcount – mailcount that covers a small number of mail streams
39. MDD – Mobile delivery device used by carriers to scan barcodes and enable GPS tracking
40. MOU – Memorandum of understanding agreed to by USPS and NLRCA
41. MTM – Methods-Time Measurement is a predetermined motion time system
42. NPU – non-personnel unit
43. Office walk – the distances that carriers walk, primarily inside the delivery unit, while performing required activities that occur before leaving for the street
44. Office Walk Database – the database where office walk segments and their distances for each carrier are stored
45. OOR – Out of Route
46. OTHER – mail delivery type that requires a dismount and is not one of the designated types (CBU, CENT, SDWK, etc.)
47. Panel – the three person group (Dr. Martin-Vega, Dr. Mericle, and Dr. Ratliff) responsible for determining the requirements for RRECS and monitoring the RRECS validation
48. PFD – Personal, Fatigue and Delay
49. Poka-Yoke – engineering design process to eliminate the possibility of making errors
50. Project Management – the team contracted from Deloitte with responsibility for coordinating interactions between the development teams and the Panel
51. PTR – Product Tracking and Reporting is a database used by USPS to store data outputs from the MDDs
52. Retired – a standard or data element that was numbered in RRECS development, but is no longer used
53. RSD – Rural street database
54. RRECS – Rural Route Evaluated Compensation System
55. RWHT – Rural Work Hour Tracker is a USPS web application used to enter and track work hours
56. Scan – a term used to describe both the scanning of bar codes and the capture of other data by manual input into the MDDs

57. SDWK – Sidewalk delivery type that is similar to a curb type but require that the carrier dismount the vehicle and service the boxes while walking
58. Solver – a USPS software system developed primarily by Accenture that develops approximations for carrier routes and stops to use in populating RSD and processes data from multiple USPS databases to provide input to the Tracker system
59. Standard times – "standard time" for a delivery route is the time required by an experienced and motivated worker of normal skill and ability, working at a normal day-work pace, to perform a specific task under specific conditions with allowance time to meet personal needs, overcome the fatiguing aspects of work and compensate for unavoidable delays
60. TCP – Traffic Control Points
61. Tracker – a USPS software system that processes data from multiple systems to determine the standard time for each route
62. Traffic control points – stop signs, yield signs, traffic lights, etc.
63. WebEOR – Web End-of-Run is a USPS system that collects and reports counts for DPS mail
64. XGPS – Bluetooth GPS receiver by Dual Electronics

Appendix: Support Documents (Digital Files)

1 Appendix B to the Opinion and Award Dated July 2, 2012
2 RRECS Scans descriptions and instructions 050415
3 Revision of RRECS Scans 072317
4 CRF Inflator 022317
5 OW Measurement Instructions 051916
6 Count Validation Phase 2 Report 030317
7 Count Validation Phase 3 Report 051717r
8 Allowance Policy 121416
9 Performance against RRECS and Current Standards
10 Mailstop Statistical Validation 092717
11 DDD Stop Statistical Validation 092717
12 Priority Standards 102717
13 DSM 072017
14 Unavoidable Delay Study 102917
15 Stop Sign 022517

16 Traffic Light 022517
17 Yield 022517
18 School Crossing 022517
19 Railroad 022517
20 Access Gate 022517
21 End of Shift 060817
22 Creep Calculations 122015
23 Creep Time Development 071816
24 Manual Entry Revisions 122215
25 Miles per Refuel
26 Coverage Analysis 102817
27 RRECS Data Needs
28 Test Tracker Logic 081717
29 comments on RSD_GPS_IFC
30 suggestions for managing rsd data
31 how to identify stops
32 notes on drive times
33 notes on stop times
34 Bundle Schema
35 Test Solver Mailstop Logic 072717
36 Interim Adjustments 092017 km2
37 Volume-Related Sequences 100517
38 Start-up Plan 092117
39 Workbook Adjusted Route 101917 rev

Appendix: Panel Responses to Parties Comments

Appendix: Standards Documentation