



Mailer's Technical Advisory Committee

Address Quality Methodologies

Address Quality Methodologies

Preface

Undeliverable-as-Addressed (UAA) mail volume exceeds 6 billion pieces of mail annually and costs the United States Postal Service® approximately \$1.2 billion each year. UAA mail costs the mailing industry in lost revenue due to missing or delayed customer communications, and increased costs due to handling of undeliverable mail returned or customer dissatisfaction and complaints.

Even though mail volume is decreasing, and UAA volume has declined since 2010, UAA volume continues to be a significant problem. A conservative estimate is that each year, 2.2 billion pieces of mail are delivered without a complete address. This addressing discrepancy requires a delivery employee's personal knowledge at a cost of \$160 million to the USPS. An additional 1.2 billion mail pieces lack a complete address and must be returned or discarded at \$185 million cost to the USPS.

The Mailers Technical Advisory Committee created Workgroup 97 to focus on address methodologies and to present a list of best practices that would aid in the reduction of UAA mail. Workgroup 177 was formed in 2015 to review the document that WG 97 created and to update it while incorporating the new technology, processes, and solutions available.

The following best practices represent short, medium, and long-term approaches to improving address quality. Where applicable, efforts have been made to provide a quantitative approach to identifying the tangible benefit of applying these best practices.

It is the suggestion of this workgroup that these best practices be shared with the industry at large via several suggested methods including educational venues as well as marketing efforts. It is further suggested that, where noted, some of these best practices should evolve into larger recommendations for adoption by the industry and/or the USPS®.

The co-chairs for this workgroup would like to thank the members for their outstanding contributions in creating this document. We suggest that MTAC members review the contents of this document and implement the short-term suggested practices immediately as well as continue research and implementation into some of the long-term solutions.

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Special thanks to the original MTAC Workgroup 97 leadership and members for creating the foundation of this document which without would have made this task much more challenging.

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Address Quality Methodologies

The following items have been identified as best practices for address quality. Each best practice has been assigned a category, a definition, identification of current practices within the industry, and suggested best practices for improved address quality.

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1. Rendition

Category: Standards

Definition: The process through which the address data is formatted for presentation for a specific medium (which may be a mail piece). This includes abbreviation, order and placement of address elements. An industry standard of 30 to 40 characters per line exists with 99.9% of current addresses fitting into this space. Although there is a limitation of 64 characters, 100% of all addresses fall within a total of 48 characters, and 30 character abbreviations are available for those addresses with 31 characters or more to help with printing limitations.

Current Practice: Mailers are concerned about their ability to provide fully standardized addresses. Addresses in existing legacy systems may have a ZIP + 4[®] code but not necessarily meet the USPS definition of "complete and correct address" that can be verified with a Delivery Point Validated (DPV) 11-Digit ZIP Code. Many mailers have difficulty in modifying individual address elements or adding missing elements to addresses in an existing file. Many mailers do not allow the output from the CASS™ validation to be presented into the physical address components presented onto the mail.

Best Practice: Use the output from the CASS™ validation tool to present the corrected address and standardized address onto the physical mail piece. Use the postal standardized address whenever possible. CASS certified software should follow the guidelines established in PUB 28 (<http://www.usps.com/publications/pubs/welcome.htm>) for abbreviation of address components in order to accommodate the address space specified by the user. If a significant number of addresses require abbreviations it is indicative that the space allocated for the address component is inadequate. This is most common when databases have been designed to meet the constraints of an address label or window envelope.

The USPS standardizes on a maximum of 64 characters and abbreviates to 30 characters. The industry should continue their progress toward standardizing on a 30 to 40 character output for all address related products. Five lines of customer name & address data are recommended to ensure all data components can be presented. CASS software vendors should develop abbreviation logic to be certified by the USPS for addresses that have been shortened to fit in fields less than 30 characters per line.

2. Data Storage

Category: Storage

Definition: Data storage refers to how name and address elements and related information such as documentation of address hygiene performance, are stored in a persistent manner, so as to be available for various task related to mailing and mail production.

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Current Practice: Presently, string with defined line content is the best and most supported format. In using any format adequate space should be reserved for the field or line to contain at least the fully standardized field or line. Confusion currently exists around secondary data elements storage and presentation when an address length does not allow the complete address line. Secondary address components are many times stored on a line below the primary address line due to limitations or business practices. When multiple addresses are stored, for example a street address and a P.O. Box™, there may be confusion as to which address should be used as the mailing address. Information that is not part of the actual delivery address may also be stored such as Mail Stop coding that is used by the mail room to distribute mail internally at a business location.

Best Practice: When multiple addresses are stored, best practice is to include an indicator to identify which is the USPS mailing address and the purpose for the other address (physical location, Mail Stop or department coding, etc). Address data should be parsed when stored so that each address element is maintained in its own field.

Best practices for data storage is to include the ability to store the data at levels of granularity sufficient to meet practical needs such as rendition, comparison, matching and detection of missing items. The ability to store data at multiple levels of granularity is also desirable provided that business rules concerning which data values depend upon other data values have been defined. For example, changing address elements may require changing the ZIP Code, and that in turn may require changing the documentation of when and how the address was updated, or specifically how the ZIP Code was obtained. The data about the names and addresses, not actually name and address data itself can be referred to as metadata.

Also, data storage systems should permit file updates to be permanently retained. If there is a need to retain original input data, then this should also be available as a feature of the systems. In addition to storing elements, there may be a benefit from storing composites, even whole renditions provided that they have a “freshness” date attached.

Recommendation: For new database or system development, use the ADIS specification (Address Data Interchange Specification as outlined by the IDEAlliance at <http://www.idealliance.org/specifications/adis>) for recommendations on the finest depth of data storage needs.

Additional resources are available for International addressing. The Addressing S42 standard consists of postal address components used in worldwide addresses and languages for expressing address templates. The S53 standard facilitates the exchange of name and address data between postal authorities, businesses, mailers, and other organizations. Both can be found at: <http://www.upu.int/en/activities/addressing/>

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3. *Data Interchange*

Category: Exchange

Definition: Data interchange pertains to the exchange of name and address data among parties in the mailing industry or between mailers and the Postal Service using an agreed upon format.

Current Practice: Address lists have traditionally been exchanged without reliable information concerning the quality of address lists, even on the basis of characteristics of the list as a whole. Correct and complete positioning of data elements becomes a challenge due to the various formatting requirements between mailers, vendors & USPS.

Best Practice: Best practices in this area include the ability to exchange name and address elements as well as full renditions, the ability to exchange metadata concerning names and addresses, including data identifying the address quality performances and the resulting quality status, and the tagging or other means of identifying element by element information using standardized naming conventions.

Best practices also include the ability to exchange data quickly and efficiently without the need for the receiver to convert the data to another format and with some degree of protection against transmission errors.

A better practice is to have available documentation of quality characteristics of the list as a whole, including the information available from Form 3553. A best practice is to have this data stored on an address by address basis as well as on a list by list basis, so that each address carries its own quality portfolio documenting the status of the address as complete and correct or otherwise, dates of move updating, and dates and sources of postal codes such as the DPBC and carrier route code. This would allow renting lists on a “ready to go” basis so that they could be directly incorporated into mail production, at least prior to some specified expiration date, without the need for further address hygiene activities.

4. *Data Collection*

Category: Data Collection and Acquisition

Definition: Data collection refers to the initial acquisition of name and address data, whether through the Internet, telephone, fax, hard copy, mail, or other means. The data may be acquired directly from the potential recipient of mail, or indirectly through third parties.

Current Practice: Failure to capture a complete and accurate address is a problem for the USPS and Mailing Companies. Mailers often only use batch versions of address

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cleansing tools after the data has been acquired, and thus are losing the opportunity to query the data provider for corrections or missing information.

Best Practice: Best practices in data collection depend upon introducing at the earliest possible stage, and preferably in real time (first-time), a means to validate and confirm the name and address elements as they are being captured or entered into the database. This includes the ability to make any necessary changes or additions, based on information from the primary source, and before the name and address elements are placed in persistent storage. This should include a DPV-based Address Validation interface for all address capture systems, which is currently considered best practice. During capture, the address information should not be abbreviated and each element should be included in its own field.

DPV[®] and other transactional address cleansing tools should also be leveraged at the point of data acquisition, where feasible. Records that do not receive a DPV – “Y” confirmed address or that receives a “D” or “S” return code should be flagged for further additional action. Refer to Appendix C for a list of return codes available in USPS Address Management products.

5. *Mail Address Validation*

Category: Verification

Definition: Mail address validation involves using an approved industry process or address hygiene tool to validate the correctness of the address prior to submitting it to the USPS for verification.

Current Practice: The current practice for validating mail addresses involves using only CASS Certified™ software. This is often done days, weeks, or even months before submitting the addresses for USPS verification. The lapse in time and limited application of data cleansing often results in addresses that are non-deliverable.

Best Practice: Best practices for mail validation would include implementing a just-in-time approach to validating mail addresses versus many days or weeks prior to mailing. This would involve using CASS certified software, which includes DPV, LACS^{Link®}, and Suite^{Link®} capabilities.

6. *Mail Acceptance and Address Verification*

Category: Verification

Definition: Mail acceptance and address verification refers to the activities of a postal service or other agency in receiving items with names and addresses, making sure that the physical and informational properties of the items meet requirements, and if relevant, determining rate eligibility.

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Current Practice: No current USPS practice can validate an address to ensure that name and address components are complete and correct, that the Delivery Point Bar Code corresponds to the address components, and that timely move updating has been performed. Furthermore, an address that has not been validated to the 11-Digit DPV will not be able to receive Move Update information through NCOA^{Link®}.

The USPS provides mailers with a Mailer Scorecard that includes valuable feedback for mailers to convey information on address hygiene and Move Update quality. The scorecard provides mailers with viable information to assist with reducing UAA mail and better understand anomalies that impact their Move Update and delivery performance.

Best Practice: Best practices include the ability to examine the name and address data for each mailpiece, to detect errors both in content and in procedures followed, to minimize any unneeded efforts in delivery and to ensure that any preferential rates have been earned.

Since it may be difficult or impossible to physically examine all of the submissions, sampling may be used to gather data. Within the category of sampling, in-line sampling may be more efficient than off-line sampling, and automatic sampling may be more consistent than manual sampling. No matter what sampling method is used, mailers want to be assured that if their entire mailing meets standards, they are not at risk of penalties due to accidental characteristics of the sample.

7. *Non-typical Addresses and Names*

Category: Management

Definition: These are address types that include multicultural, dual, military, multiple secondary, firms, dual use, colleges and universities, prestige, and geographic addresses that have attributes such as leading zeros. These non-typical addresses can complicate issues including collection, matching, storage, and rendition.

Current Practice: Although it appears that both USPS and private software company data files have been enhanced to improve coding results for addresses in Puerto Rico, mailer files are still coding significantly less than the code rate for continental addresses.

Inclusion of Extraneous or Inaccurate Information: Problem: Business addresses tend to have more address elements as well as extraneous (non-official postal delivery) data in the address database fields. The presence or absence of these additional data as well as the absence of additional space to house this extraneous data inhibits proper coding. Businesses are reluctant to change current practice and remove elements that are considered important for internal mail delivery practices.

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Best Practice: Best practices in this area should include storing name and address elements using a methodology that retains positional information, such as pre-directional and post-directional. Additional fields may need to be defined, such as multiple surnames and surname prefixes. It may then be necessary to concatenate fields in order to match to databases that may combine multiple elements into a single field, but this is easier than parsing a single field to match to multiple elements.

With parsed address elements it is possible to validate an address and render it in the customer-preferred manner or the postal preferred manner. However, today most addresses are not presented in a parsed manner so the best practice is to use the address as returned by address matching software. As for names, the best practice reserves sufficient space to store longer names and store them in the order of their cultural preference (not all cultures put the given name first).

All additional data elements, not used to match for the address records, should be maintained by the CASS vendor products in an auxiliary file. This data should be allowed to be presented onto the physical mail if the mailer deems this necessary for internal mailing delivery. Puerto Rico: Education, awareness and additional space in the address database for the extra elements, such as Urbanization codes critical to PR addresses.

8. *Timeliness of the Data / Just In Time Processes*

Category: Management

Definition: This topic includes meeting and exceeding the requirements for updating name and address files with respect to coding, address accuracy, and move updating.

Current Practice: When most CASS certified systems were installed, the intent of this requirement was to place the ZIP + 4 and Delivery Point Barcode onto a physical mail piece. With the improved understanding of addressing – it has been determined that the frequency and process for performing CASS updates has increased. In addition, other tools to enable improved addressing capabilities have been developed and provided to the mailing community.

Best Practice: Best practices include performing address hygiene activities as close as possible to the time of mailing.

Addressing updates need to be validated and communicated timely. USPS AMS/CASS Database updates are provided via electronic download, which allows for faster dissemination of the updates into mailer systems. New or removed addresses added to the AMS database are validated first. As ZIP Codes or other address data elements are added or deleted, the USPS updates the Zone Matrix and Labeling Lists to include those changes. Information on the major and minor release schedules for the current year are located on RIBBS at:

https://ribbs.usps.gov/intelligentmail_scheduleYYYY/LabelingListandMDFSchedule.cfm

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Replace YYYY with the current year, example:

https://ribbs.usps.gov/intelligentmail_schedule2016/LabelingListandMDFSchedule.cfm

Ensuring the quality and all required components of address data, as it is passed through various systems to the downstream production, is critical.

It is important that if address data components are changed at the back-end process, just prior to mailing, that the corrected elements are provided back to the source database for correct updating of the customer address data.

9. *Transition to Best Practices*

Category: Management

Definition: This topic reflects the difficulties of making changes all at once to existing procedures in name and address quality in an environment with many interacting suppliers and frequent mailing events.

Current Practice: Implementing a data quality solution, in this case an address cleansing solution is often done with only an upfront cost in mind. The budget for the address cleansing solution is often placed solely upon the IT department or the mail center rather than considering the impact data quality will have on the entire organization. As such, implementations are often rushed with crucial steps overlooked or forgotten. This ultimately results in more costs and further delays.

Best Practice: Best practices in this area may include developing timelines to meet expected increases in postal requirements, establishing new methodologies outside of legacy systems, and gradually moving applications to the new approach. In some cases, a cutover from an old to a new system may be accomplished, but in this situation, the ability to roll back should be provided for.

The return on investment (ROI) needs to be considered for transitioning to best practices. Both the industry and the USPS need to be mindful of where the key areas of costs and returns are related to transitioning to a best practice,

10. *Accuracy of the Data*

Category: Management

Definition: Address accuracy is best defined as the application of address cleansing tools, including move update, to yield a complete, correct, and current address. Address accuracy includes ensuring all address components critical for mail delivery is presented on the physical mail piece.

Current Practice: The postal database must satisfy criteria including internal consistency, unique definition of each delivery point, and timely addition of new delivery

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points using multiple sources, including local municipalities and data generated from delivery resources. Further, there may be non-postal delivery addresses that are not necessarily defined in any database outside of proprietary applications.

Accuracy of move updates can be verified by reference to postal databases, but this is subject to earlier availability of information through direct customer communications or commercial databases. Postal databases are maintained by checking for moves both at the old and new address so that chaining of move records can be performed whenever possible.

Best Practice: Best practices in this area include using delivery point validation tools such as CASS/MASS and AEC I and II to verify address accuracy and both pre-mailing tools such as NCOA^{Link} and post-mailing tools such as ACSTM to verify move updates.

Recommendation: At the initiation of a new address, capturing of the address data between the municipalities and the USPS needs to be strengthened so new address data points are consistently validated and updated in all areas.

11. Information Dissemination

Category: Management

Definition: This topic relates to how and when information is disseminated throughout the industry and the USPS. It includes such sub-topics as disaster response, new addresses, never delivered addresses, vendor communication, and other issues.

Current Practice: Currently the mailing industry is provided with information on non-delivery points or temporary moves during times of disasters or massive address changes through Service Alerts at:
<http://about.usps.com/news/service-alerts>

Best Practice: The best practice is where the mailers and the USPS work together to minimize the impediments to mail delivery. This would include the sharing of crucial information in a timely manner for expedited updates to the industry. Consistency in the message is vital here to prevent further disruptions.

11.1 Disaster Response (ex. Hurricanes Katrina and Rita)

Category: Management (Information dissemination)

Definition: The dissemination of information during a disaster is crucial to the mailing industry as well as the Postal ServiceTM. The application of best practices here will not only ensure timely mail deliverability, but also help prevent additional costs incurred with routing of mail to avoid the disaster areas.

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Current Practice: Presently, information related to disasters is provided through various methods and from numerous sources. These include the USPS Service Alerts available to business and residential customers on usps.com which is provided in near real-time. Mailing industry newsletters, vendor notifications, and industry association web sites and list servers often share this information to their contacts and associates as well.

Best Practice: Mailers should regularly monitor the USPS Service Alerts and disaster related information provided through other mailing industry resources. Mailers may be able to associate the feedback provided via NCOA^{Link} with those service alerts to clearly identify those locations where mail can no longer be delivered.

11.2 Measurement / Metrics

Category: Management (Information Dissemination)

Definition: Measurement and metrics are a part of the software process (for CASS and PAVE™ certified products) and the Postal validation procedures. This may also be expanded to include either mailers software procedures or address lists.

Current Practice: As discussed above with regard to data interchange, address lists have traditionally been acquired without reliable information concerning overall list address quality. A basic metric is to document quality characteristics of the list as a whole, including the output information available from Form 3553. This can be compared with various system-wide or segment-wide averages to gain an index of relative quality.

Information on CASS and PAVE certified product changes is provided to the mailing industry a minimum of 90 days prior to the change implementation. Mailer management teams may better prepare for the vendor-required changes imposed by the USPS for future cycle releases.

Best Practice: USPS and the industry through the Mailer Technical Advisory Committee (MTAC) have developed an improved communication strategy regarding CASS & PAVE certification changes – to ensure that mailers can accurately test and validate measurement changes within products to ensure data integrity and accuracy of match assignments. Disaster related metrics are shared with the industry as a means to provide context to the information provided.

12. Supply Chain Relationships

Category: Management

Definition: The Supply chain relationship encompasses the entire value chain of entities involved in order to produce a complete and correct address. This includes

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entities such as list providers, service bureaus, mailers, the USPS, and software vendors.

Current Practice: There are often many different entities that touch, store, or move address information throughout the supply chain. Often, there is a false assumption that the address is correct as it travels from one entity to another.

Best Practice: A best practice approach to supply chain relationships is to understand which entities handle the address and what processes are involved at each step.

Other best practices include software evaluation when selecting a new address quality solution and software testing when applying an update to address quality software. Vendors should provide feedback to the list owner on the results of the process that indicates those addresses that were standardized and validated using the USPS address quality tools.

12.1 Software Evaluation

Category: Management

Definition: Software evaluation best practices may be developed both for assisting customers in purchase decisions among products with similar capabilities, and in using other developed best practices to identify products with more relevant capabilities than others.

Current Practice: The current practice for software evaluation is often done through word-of-mouth recommendations via forums such as list serves, postal customer councils, or industry associations. Software selection can also be done by contacting companies listed on the RIBBS[®] web site (<http://ribbs.usps.gov>).

Unfortunately, while there are many certified software products available, there can be significant differences in their features, functionality, price, and support. Often, price is the only factor considered with little or no thought toward growth opportunities for future expansion.

Best Practice: A software company and the solution they provide needs to be thoroughly evaluated prior to licensing and implementing their solution. Appendix A provides a list of questions that should be considered when evaluating software.

12.2 Software Testing

Category: Management

Definition: Software testing in this document refers to understanding the impact a software update may have on your current addresses.

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Current Practice: The current practice is to simply install software updates without fully understanding the impact it may have on the overall address quality.

Best Practice: A best practice would be to carefully review the software update release notes and follow a process of evaluating the update prior to implementing. Appendix B provides a thorough list of points to consider for software testing.

13. Address Maintenance Process

Category: Management

Definition: The process by which previously collected information is kept current.

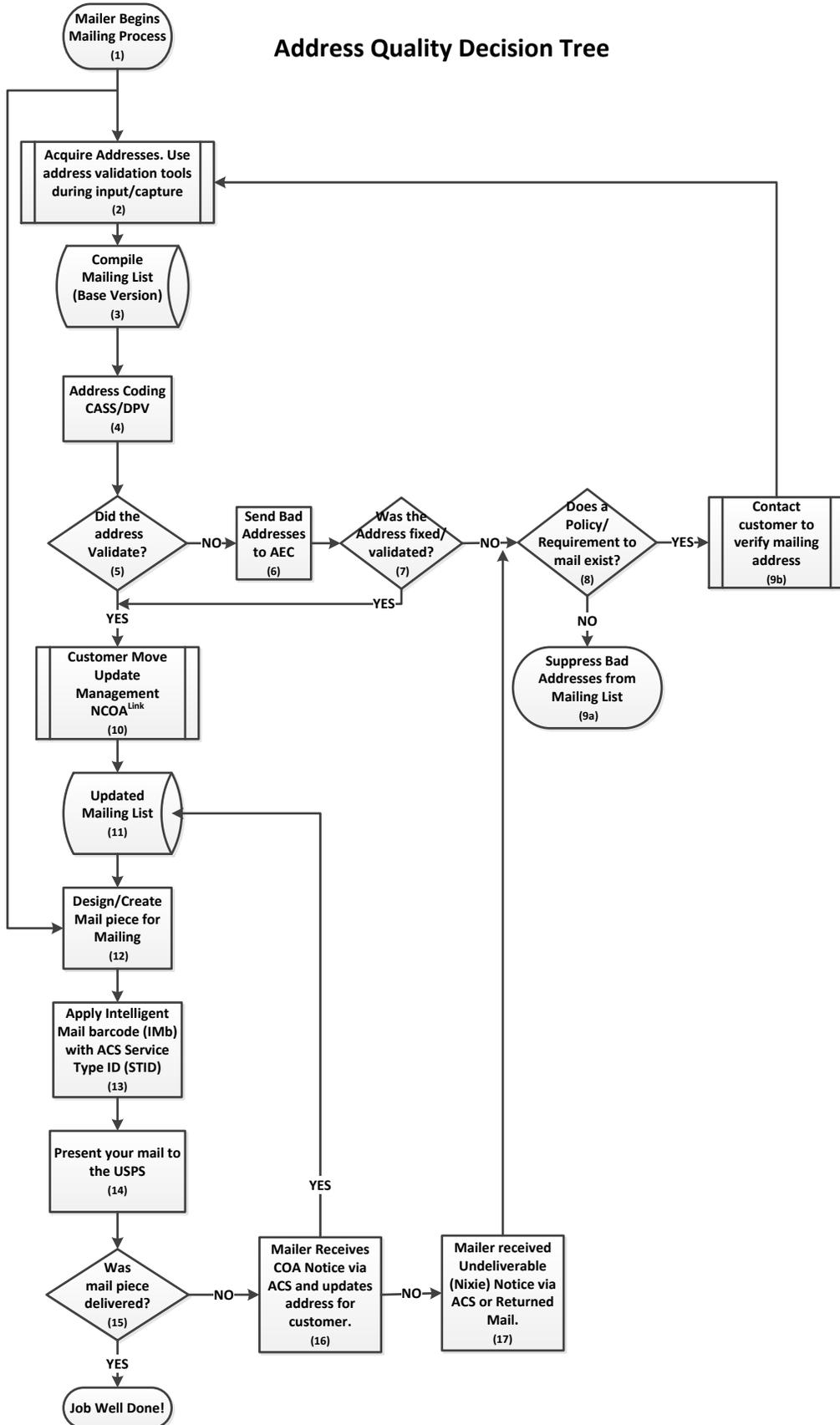
Current Practice: The current practice for address maintenance varies considerably throughout the mailing industry. For mailers who rent lists, often the only maintenance applied is running the addresses through a CASS Certified product and applying Address Correction Services during the mailings. In these instances, the updates are often not sent back to the list owner.

Best Practice: Data should be run through CASS/DPV/NCOA^{Link} immediately prior to any mailing. Keep the original address if it is still needed, but as a matter of best practices, you need to keep the new information. Consider the application of the following flow chart.

Recommendation: It is important that if address data components are changed at the back-end process, just prior to mailing, that the corrected elements are provided back to the source database for correct updating of the customer address data

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Address Quality Decision Tree



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13.1 Management of Un-Assignable Addresses

Category: Management (Address Maintenance)

Definition: Un-assignable addresses are defined as those addresses that have gone through a CASS certified and DPV validation process without finding a match, no ZIP + 4 assigned, no delivery point validation, or not considered a valid address. CASS will look at the address, but can't take any action.

Current Practice: There is no widespread Industry best practice in place at a transactional or batch level for assignable addresses. It's unknown what mailers do to evaluate un-assignable addresses. The reaction may be specific to the industry type (Financial, Marketing, Insurance, Healthcare, etc). It's assumed that they mail at full rate or determine not to mail. Some mailers have not identified the level of evaluation their company should do to identify root cause for un-assignable addresses. As a last resort, the Mailer initiates customer contact to get a resolution.

In some instances the USPS must accept a COA request that has a new address that may not DPV confirm. It may be new construction, or the address provided does not have enough correct information for the USPS to standardize the address. The USPS runs these addresses through the address validating processes weekly and periodically through an internal AEC-like process. If the correct address is not found, this may result in address corrections that provide new addresses that cannot be validated and may result in UAA mail. These COA's are not available in the NCOA^{Link} product, but they may be provided through ACS and manual address correction notices.

Best Practice: Address accuracy should start at the first inception of the address – and when it doesn't CASS & DPV code it should be highly questioned before allowing posting to a mailer database.

The primary objective is never to have an un-assignable. All mail is run through a CASS certified/ DPV validation process. Addresses that fail to validate should be submitted for processing through the Address Element Correction (AEC) products. AECI and AECII[®] will attempt to match them to historical records of bad addresses, and if that process fails, the address will be sent for review and response to the delivery unit that serves that area.

Recommendation: The USPS should continue to drive customers to complete change-of-address requests via the on-line method. ICOA validates addresses as they are entered and prompts the customer for better information if the address being entered cannot be matched to a valid address. It also allows them to indicate when new construction is the cause for not validating. An increase in ICOA usage will result in being able to add new construction addresses into AMS faster, and more accurate COA information provided through NCOA^{Link}, ACS and manual address correction notices.

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Appendix C of this document provides suggestions for mailers, the USPS, and vendors to consider for management of un-assignable addresses.

13.1 Selection of Quality Addresses

Category: Verification

Definition: The process of selecting and assessing the accuracy, currency and value of addresses from a given source.

Current Practice: The current process of selecting quality addresses is often left to those addresses that can be assigned a ZIP + 4 Code through CASS Certified software. This provides a false assumption that the address is truly deliverable and current.

Best Practice: The best practice in quality address selection includes:

- Evaluating the content and structure of the data
- Assign names and data types for all address fields
- Process through CASS software to determine which addresses are truly deliverable (pass DPV) by the USPS.

13.1.2 Tracking Address Matching Dates and Return Codes

Category: Management (management of address qualification information)

Definition: Tracking address matching dates and return codes is the practice of establishing a method of maintaining address information, return codes and dates from the CASS address matching process so that it is possible to distinguish addresses that have met the postage discount requirements from those which do not meet these requirements.

This topic applies particularly for unassignable addresses where the combination of data elements is not complete and correct. It also applies to addresses that may not meet the processing date restrictions for postage discounts.

Current Practice: Today address data may be passed through CASS address matching software and both good and bad addresses may be written to a single output file containing all of the addresses (both good and bad). This output file is then carried through to another software package for mail sortation and some of this address data may be incorrect but there is no process by which the bad addresses can be detected. In CASS software there are available both dates and return codes that indicate when addresses were CASS processed and what happened during this process. These dates and return codes would identify corrected/confirmed or rejected address information.

However, this information is not retained on the database or on address files. Therefore, the mail sorting software is unable to determine whether a given address is good and actually qualifies for a class of mail or a postage discount.

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Best Practice: Dates and return codes are a way of marking records so that each time it goes through a certification process it carries indicators of when it was processed and of the quality of the address data. This would have implications for the NCOA^{Link} output, as well. PAVE software could be modified to require the date of processing and return codes from CASS software to properly sort for postal discounts. Therefore, the dates and return codes would have to be passed on each address record from CASS on into PAVE. The actual counts of good and bad return codes and dates within the qualification period could even be a support for discounts claimed.

Knowing the number of addresses that cannot be mailed at a discounted rate would facilitate determining an ROI for the cost of improving the address quality. The return code information could also be leveraged for other uses such as creating a do not mail file. These identifiable addresses could be included in first class mailings at a single piece rate to solicit correct address information from the addressee or by using ACS to further address clean-up efforts. The return codes information could also be used to facilitate resolving unmatched addresses by identifying the missing or incorrect address elements.

13.1.3 Carry Through of Additional Supporting Address Data

Category: Data Management

Definition: Carrying through information can also include additional address information that is not necessarily needed to match or assign the delivery point barcode. This would include such items as additional or supporting secondary information. An example would be having both a building number and a suite number or both a floor and a suite.

Current Practice: CASS address matching software can retain extraneous input secondary information when it does not match to a valid secondary address range or drop it. If the information is retained, it should be either appended to the end of the address line or moved to the second address line.

Example:

Input: Mark Twain

225 Humphreys Blvd Bldg A Ste 501 (invalid secondary)
Memphis TN 38119

Output: Mark Twain

225 Humphreys Blvd Ste 501 Bldg A (appended invalid input secondary to end of address line)
Memphis TN 38119-5704

Output: Mark Twain

Bldg A (moved invalid input secondary to second address line)
225 Humphreys Blvd Ste 501
Memphis TN 38119-5704

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Best Practice: CASS software should be able to detect when the additional information meets the criteria for secondary information, or if it is not critical to validating the address.

Recommendation: Maintain a separate field for unidentified additional information that is not critical to validating the address. If the mailer chooses to display it in the address lines, it can be placed after all of the address elements that are critical to validating the address.

13.2 Management of Undeliverable Addresses

Category: Management

Definition: Undeliverable addresses may be identified through the return of the mail piece to the mail owner or undeliverable information provided via address correction services. The reasons may be due to: address quality; customer moved; address entry error by company, the customer, or the Postal Service. Management of the process includes actively reviewing, investigating, and resolving addresses to move from an undeliverable to deliverable state.

Current Practice: There is no known industry-wide practice to manage UAA by identifying root causes and/or determining actionable items to reduce UAA.

Best Practice: Best practices for managing undeliverable addresses should include pre-mailing and post-mailing move update processing. It should not be limited to software processes, but also should discuss possible human intervention, which could mean additional processes such as phone calls, and/or criteria for human interpretation of unclear outcomes.

Best Practice UAA Management Processes include:

Mailers:

- CASS/DPV software is incorporated in front-end processes that identifies an address as undeliverable, prior to mailing, and captures only valid, USPS compliant deliverable addresses. AEC and AECII services are used to investigate those addresses that cannot be validated using the CASS/DPV method.
- Move Update processing used with both pre and post mailing processes to ensure customer moves are updated appropriately.
- Mailers actively participate with the USPS and mailing industry to understand UAA root causes and develop strategies for resolution.
- Mailers report reason codes and % of UAA so common approaches to UAA management and tracking is supported industry-wide.

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- Automated returned mail processes allow for easily tracked and reported UAA to customer care systems, as appropriate.
- Electronic use of various address products and other sourcing data enables high resolution of customer address information.
- Investigation and customer contact for resolution of UAA may be required.
- Address resolutions are updated to source data points.

USPS:

- The USPS has transitioned to the use of the Intelligent Mail[®] barcode technology which is used to sort and track letters and flats and allows mailers to encode requests for address corrections and IMb Tracing[®].
- USPS has implemented the Postal Automated Redirection System (PARS) which allows for the interception of letter mail that is undeliverable due to a COA on file. PARS has contributed to efficient forwarding of mail and timely address correction notifications provided to the mailing industry.
- USPS has established policies and procedures for Delivery Offices on how to appropriately handle undeliverable-as-addressed mail.
- USPS performs quality reviews of Carrier Throwback Cases to ensure consistent and accurate mail delivery. Management incentives include quality of delivery indicators to drive improved measurement and delivery quality.
- USPS provides UAA reason codes that are meaningful and accurately reflect the reason for the return.
- USPS provides Mailers with feedback information on problems related to unique mailing or addressing issues.
- USPS actively works with mailing industry to understand UAA root causes and develop further strategies for resolutions. USPS performs studies and assists Mailers with investigation of UAA root causes.

Vendors:

- Create more robust solutions that will reduce the number of software applications required to address un-assignables.
- Develop products that can be utilized in a transactional-based format, over just batch formats.

Recommendations:

- Whenever feasible, Industry Mailers need to incorporate software into their front-end processes that identifies undeliverable addresses, prior to mailing, and moves to capture valid addresses.
- Industry Mailers should review the [AMEE White Paper](#) on ACS and the ACS Technical Guides for suggestions on how to handle UAA mail and feedback.
- USPS needs to develop procedures, with Industry Mailers, aimed at reducing UAA.
- Include USPS Delivery Office personnel on creating policies so carriers and other postal employees know what policies to follow.

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- Throwback case quality review should occur to ensure USPS carriers are accurately delivering mail that is deliverable.
- The USPS should develop greater visibility both for internal (USPS Employees) and external (Mailers) to the returned mail provided by the carrier units, to determine appropriate root cause and handling.
- USPS and the Industry Mailers need to further define the reasons for returns codes.
- USPS needs to provide defined processes with marking return reason codes and ensure appropriate discipline to ensure accuracy of reason codes are used.
- USPS and Mailers need to develop and utilize the feedback loop to improve methodologies and procedures around return mail.
- The sub-team encourages the USPS and Industry Mailers to work towards mutual goals to enable improvement in the return process. Use of commonly defined return mail categories can assist mailers in quantifying UAA return reasons. Additional support by the USPS is required to investigate unknown causes of UAA.
- Mailers and USPS to study and evaluate UAA based on common characteristics and provide details on root causes. Use of the attached tool should be evaluated:

13.3 Management of UAA Mail due to Change-Of-Address

Category: Management (Address Maintenance)

Definition: This can be characterized as a workflow for managing addresses through a process that provides change-of-address information to meet the Move Update standard including both pre-mailing solutions like NCOA^{Link} and post-mailing solutions like ACS. The Move Update Standard is a means of reducing the volume of mail that requires forwarding or return by periodically matching the address records with change-of-address records received and maintained by the USPS. Mailers who claim presort or automation prices for First-Class Mail[®] or Standard Mail[®] must demonstrate that they have updated their mailing list within 95 days before the mailing date. More information can be found at:

<https://ribbs.usps.gov/moveupdate>

Current Practice: There is no widespread common industry practice in place. Some mailers may choose to mail at full rate, others initiate a direct customer contact to obtain current information.

Best Practice:

- In the best of scenarios, the mailer will send all addresses through a CASS Certified software with DPV integrated and use the return codes to further investigate and analyze non-coded records.
- Utilize AEC software, where legally applicable.
- USPS needs to consider all possible methods of communicating the need of Change-of-Address (COA) filing for citizens and business. Suggested channels

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- include: existing advertising, special arrangements with developers and politicians, Internet and other media.
- Example of a good practice was the disaster planning between industry and USPS to remind customers to complete a COA
 - Consider allowing citizens to file a move more than 30 days in advance
 - Other consideration is to ensure that the COA forms are available in various languages for those customers that don't speak English. Offer education in numerous languages.
 - The workgroup noted that there is the absence of a COA that creates a return but also an additional layer, where the original person who lived at a delivery point moves and files a COA, but the person that moves in with the same last name fails to file a COA. (High-density ethnic areas.) The USPS needs to address with customers the importance of filing COA in both instances.

13.4 Use All Available Data Resources to Find Lost Customers

Category: Management (Address Maintenance)

Definition: The process of identifying addresses that are not code-able or not deliverable and correcting them using all postal and industry resources available.

Current Practice: In addition to the USPS Address Element Correction Service (AEC), a limited number of service bureaus provide address correction using proprietary lists that do not utilize the USPS change-of-address resources. The price for this service varies as does the source of the data used to cleanse the list. It is presumed that few mailers leverage this service either due to price, time to process, or lack of knowledge.

Best Practice: A suggested best practice in this area would be greater industry awareness of the anticipated results in address cleansing by leveraging these services.

14. Software Defaults

Category: Policy

Definition: This refers to the use of software option settings or license options to ensure that the selection most suited to promote overall system-wide address quality is used unless there is a specific reason to do otherwise. As an example, DPV processing is considered to be a best practice; the USPS provides all software users the DPV information in the product. Licensed vendors may allow users to opt out of it. Vendors may also modify the return codes that are provided through the CASS or NCOA^{Link} process or they may not provide that feedback at all.

Current Practice: The current practice is to set the software defaulted to the options used when the product was CASS Certified. Unfortunately, many of these settings are not understood. For example, enabling Early Warning System (EWS) is one option that

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is rarely enabled and yet can assist in preventing an incorrect assignment for new addresses.

Best Practice: Best practices in this area include defaults to user options that promote overall system-wide address quality while preserving user choice. For example, best practices on parameter settings would include enabling Early Warning System (EWS), DPV, LACS^{Link} processing, and producing return codes for those addresses unassigned.

Some barriers to achieving best practices in software defaults include balancing business needs for improved address assignment with the implications to the overall information technology processing required. There is also the problem of simplifying the understanding of parameter sets while maintaining a competitive advantage across software products.

The USPS requires Commercial First-Class Mail and Standard Mail to meet the Move Update standard. Appendix C provides information on the return codes provided by CASS and NCOA^{Link}. Mailers should familiarize themselves with this feedback and develop internal solutions to investigate and update whenever possible.

15. Source of the Data

Category: Management

Definition: Source of the data can reflect not only an external list source but also the method of data collection for an internal source.

Current Practice: In some cases, the source of the data used to create or update a name and address record can assist either in verification or even in determining what sort of processing to undertake. For example, knowing that a move update came from the recipient, ACS, or from NCOA^{Link} might be relevant. In addition, knowing that address data is originated from users directly rather than having gone through validation software may affect the kind of processing needed to match it to name and address databases.

Best Practice: A suggested best practice for data source would be the implementation of a data tag that identifies the source. The tag could include information such as the source provider, contact information, mailpiece information if the source was from returned mail or ACS, and date.

16. List Certification

Category: Management

Definition: A process by which an individual mailing list and also a list maintenance process can be certified and maintain certification.

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Current Practice: This proposal was evaluated by the USPS and was denied. USPS currently does not certify mailing lists, nor does it certify a list maintenance process.

Best Practice: List Certification refers to identifying mailing lists which meet the highest standards of address hygiene based on current technology and procedures.

As a best practice, the mailing industry may adopt this proposal to identify when a mailing list is made up entirely of certified addresses with the appropriate performance and status indicators carried within the record as part of the portfolio for the address. To ensure that the highest quality is achieved, certified addresses should be those with no detected deficiencies. Non-certified addresses with deficiencies identified during the certification process could be included in a separate list that would not be certified. The separation into distinct files of certified and uncertified addresses provides maximum differentiation based on quality while not restraining commerce.

The certified list would be accompanied by a date of certification, a database date, and a freshness date that would state the last date on which the list could still be mailed without updating the address hygiene.

In one sense, a certified list, which is by definition made up entirely of complete and correct addresses that have been recently checked against available databases as specified by postal regulations, stands on its own merits. An address record verified as correct against some set of processes such as CASS, DPV, NCOA^{Link}, and others which can occur concurrently with those listed meets the quality standards. What about the addresses, which end up in the uncertified category? They can be mailed anyway, but may be subject to higher return rates or delivery delays, and may be candidates for UAA status. They could be suppressed from mailing. Or they could be sent to further processing steps, not concurrent but off-line processes, which may correct the defects and qualify the resulting, corrected addresses as certified addresses.

As a best practice, a list maintenance system should incorporate such a remedial capability including but not restricted to using AEC and AEC II and taking a period of months to complete its cycle. This is a best practice in list maintenance because it can produce the largest number of addresses reaching a certifiable status. The certified list maintenance process may include steps to independently confirm name and address information, and review updates before applying them to the main list.

Mailer Self-Certification: This is the minimum level of USPS involvement. The mailer or agent carries out the address quality procedures as defined above, including those that can be done through direct computer processing, and those that require offline activity such as sending files to an offline process and integrating return data, using vendor software licensed by the USPS and/or USPS products and services. The mailer or agent then affirms to the mailing list user, in hard copy or electronically, that the procedures have been carried out.

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Appendix A: Best Practice in Software Evaluation

The purpose of this section is to describe the types of information one needs to gather to assess a software vendor and the appropriateness of their product for your company.

The following suggested software vendor considerations are broken down by the following categories:

- ♦ Things You Need to Know About Your Own Environment
- ♦ Things You Need to Know About the Vendor
- ♦ Product Support
- ♦ Application
- ♦ Industry Knowledge
- ♦ Fulfillment
- ♦ Testing and Implementation
- ♦ Performance
- ♦ Price
- ♦ Other Company Information

Things You Need To Know About Your Own Environment:

It is important for mailers to evaluate their current business needs and practices to determine whether all of the following questions are appropriate to evaluate their address software product needs.

Providing a system diagram and testing requirements documentation may be helpful in the discussions with the vendor. Some of the things a software vendor will need to know about your company:

1. The Platform/s (work station, mainframe) on which you expect to operate the software.
2. The operating system/s on which you expect this software to run
3. The number of sites at which you expect to run this software
4. The number of CPUs on which you will run this software
5. If you are considering NCOA^{Link} you will have to secure an authorization code from the USPS before approaching a vendor.

Things You Will Want to Know About the Vendor:

1. What platform/s does this software run under and how much experience does your company have with our company's platforms.
2. Have you done prior work with our company? Do you have an existing Master Purchase Agreement/Non-Disclosure Agreement?
3. How many other customers do you provide similar services for? What is their approximate size? How is your software used by the other companies? How many use the software?

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4. List four references by contact name, company, and telephone number (or other contact method). Please specify any companies of a similar size that are processing in a similar environment.
5. Would any of the work required be subcontracted and/or produced through partnerships with other companies? What is your current level of dependency on this mode of operation?
6. What USPS processes are required in order to meet address product certification?
7. If your product is certified, please provide the results / scores from your most recent test/s.
8. What is your company's annual expenditure in R&D (Research and Development)? Please express as a total dollar value, as well as a percentage of annual expenses.
9. Many companies require software vendors to have a third party maintain a copy of their source code in 'escrow'. What company does your company use to store escrow code/programs? Has the code escrow ever been exercised?

Product Support:

1. What are your guaranteed support metrics? Please detail your support options (on call, one day availability, etc.) and the associated cost. Do you provide help on a time and material basis as an alternative to full maintenance?
2. What is the turnaround time for sending out data updates? What is the method of distribution?
3. What is included in your maintenance (e.g., helpdesk, software upgrades and enhancements, fixes, etc.)?
4. If you are evaluating a DPV product (or any other product with a programmed "halt"), in case of a possible (erroneous) address or condition that triggers the product to halt (per the USPS security requirements), what are the procedures and turnaround times established for contact, restarting the product, notification to the USPS - etc?
5. Provide detail on any business continuity plans you have for resumption of normal business after a disaster. Specifically, provide information related to how our company can continue to receive data updates in the case of a disaster at your primary development site.
6. What types of related services does your company offer, such as consulting, training, installation, etc.? Which of those are included in your standard price? Please include the price for any which are non-standard in the pricing section.

Application:

1. Provide detail (method and results) on any security audits done in the past 12 months on your code base.

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2. Describe your application's typical response time for the various platforms your products support. Is there anything that our company can do with the product to further improve response time from your product?
3. Is your software available for a free trial? And how long is it available? Can the product be installed on our system or must we send the data to you?
4. What is necessary to run this product? Can the product work in our environment/s without additional software (GUIs, Scripts, etc...)?
5. What kind of Utility programs come with the product? Address-file batching? Monitoring and performance diagnostics? Error log file analysis? What utilities, if any, are available to validate databases?
6. What security provisions (administration, access, recovery, etc.) does your software/solution offer? If it does not offer any, how does it interface with the host and system environment for those functions?
7. How are your documentation and support services organized this way? Are your licenses organized this way?
8. Is there a recommended restart frequency, such as a daily restart, weekly restart, or monthly restart? If so, what is the recommended frequency?

Industry Knowledge:

1. Does your company actively participate in any mailing industry trade association, if so, please identify.
2. Does your company actively participate on any USPS committees? If so, please identify which ones and your company involvement on these committees.
3. Who is your expert on USPS requirements for your company?
4. How are changing USPS requirements shared with your application teams who build your software solutions? How long does it take for these requirements to become coded and generally available to your customers?

Fulfillment:

1. How many releases do you build and distribute in an average year? How often are software updates typically issued?
2. Is maintenance of the software (software updates) separate from maintenance of the underlying data, or are the software and data updates accomplished in a packaged "all-inclusive install"? If the software and data updates are packaged together, can they be separated?
3. How easy is it to have more than one version on a single machine? Testing before commitment to production is critical, with the ability to roll back if needed. Do you currently have other clients who use this setup?
4. About how long does it take to update the product with a new database?

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5. Do you package a utility test-suite for us to confirm that an installation works as intended?
6. What, if any, are the local indexes customers must create and maintain?
7. Do you issue software patches to solve your customer support problems, or do you simply fold them into complete releases?
8. If you patch, about how many patches do you issue in a year? What is the range of the time that a problem is reported and a patch is issued?
9. Are your releases distributed with change-logs and "What's new" documentation appendices?
10. If you support your products on multiple platforms:
 - a. Are your products released for all platforms at the same time?
 - b. Are they simultaneously usable in a heterogeneous environment (different platforms working in concert)?
 - c. Do customers get software for all available platforms with releases, at no additional cost?

Testing and Implementation:

1. What languages do you support?
2. What is the developer documentation like? (Manuals, javadoc, PDF, etc.). Are there usage examples and sample programs?
3. Does your firm offer training, or is this product self-evident enough that training isn't warranted? If training is required, how much is included with the initial software purchase at no additional cost? What is the cost for additional training?
4. Is there a basic test file supplied with the software that customers can augment with addresses that are of interest to customer applications? Regression testing (test that can or will be compared to previous or future results of the same or different products) with each product update and each month when the new product database is installed is critical. Test data should represent addresses from every state and certain specific address types:
 - Grid style addresses common in Utah and Wisconsin.
 - Fractional and alpha extensions of the house numbers
 - Pre-direction and post-direction addresses
 - Puerto Rican addresses that require urbanity

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- High-rise style addresses
- Alpha house numbers
- Single alpha street names (A ST, M AVE, and N BLVD)

Performance:

1. If Client/Server, how many concurrent connections does the server support?
2. At what rate can address validations be serviced over any given single connection or embedded instance?
3. How is the product typically scaled for load? Can the product be throttled by control parameters and then allowed to consume more or less resources by changing them? Or do you recommend adding more instances? Or more licenses? Or more processors? Or more machines?
4. If parametric, can the configuration and scale of the product be adjusted "on-the-fly" or is it necessary to Shutdown and Restart?

Price:

1. What are the standard list price and your proposed pricing for my company? Please include a detailed price list with a total.
2. What is the cost of your on-going maintenance?
3. What is the cost of training?
4. What is your warranty policy? Include a description of how it applies relative to the fixed and non-fixed (i.e., customization) parts of your quote.
5. What allowances have you made in your price quote for customization of the base software for integration into our companies existing infrastructure?
6. How is your software licensed?
7. Do you provide an Enterprise licensing option?

Other Company Information:

1. Is your company publically held? If so, how is the company identified by Dunn and Bradstreet? If you are privately held, please include the 2 most current years' balance sheets and income statements.
2. Attach a copy of your Certificate of Insurance.
3. What is your company's commitment to ISO 9000?
4. Is your company SAS-70 Compliant?
5. Is your company a Minority/Women/Disabled Veterans Business enterprise?

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Appendix B: Best Practices in Software Testing

What is 'Software Testing'?

Testing involves operation of a system or application under controlled conditions and evaluating the results (e.g., 'if the user is in interface A of the application while using hardware B, and does C, then D should happen'). The controlled conditions should include both normal and abnormal conditions. Testing should intentionally attempt to make things go wrong to determine if things happen when they shouldn't or things don't happen when they should.

Why is it important to test Address Software Products?

This document provides testing criteria and processes to be considered when testing software specific to Addressing products. Software quality is critical to ensure software products do not incorrectly update or change customer address information. Adequately testing software quality includes detailed analysis and diagnosis of the original customer address data to the new update. Address Software Products should be fully evaluated each time a new database or software product is deployed. These changes include monthly or quarterly database updates, patches/fixes provided by the vendor, and the annual USPS Certification changes which require new software to be deployed.

Companies and organization vary in how they assign responsibility for software testing. The risk to the business from the software process should be considered when evaluating how robust the testing conditions should be and who to involve in reviewing the results. It has been said before that as long as the software doesn't bend – it works. This is not true! Companies could have a catastrophic problem if address software is not adequately tested prior to deployment. Even when software vendors indicate a software update as customer transparent – robust testing is still required!

Testing Conditions/Criteria to consider:

The following is important to consider whether you are managing an address software product database update, fix/software patch, or new software version.

The overall process of testing should include – but is not an exhaustive list to consider:

- Stay knowledgeable regarding the product expectations and changes the USPS is making or considering for future releases.
- Ensure receipt of the software or database update is within the specified timeframe required for USPS compliance.
- Define what was changed to the software or database provided.
 - Evaluate what changes the USPS may have required of the software vendor to make.

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- Evaluate what changes the software vendor has identified they are making that fall outside of the USPS required changes. These may include fixes and enhancements.
- Document the list of all changes and define test cases and expected results for all expected changes. Develop this in a checklist to ensure all components are tracked. Highlight on the checklist any specific changes that must be monitored more carefully.
- Ensure a robust test database is available for testing that has multiple example of various address complexities (this list is not inclusive of all variations to consider):
 - Grid style addresses common in Utah and Wisconsin.
 - Fractional and alpha extensions of the house numbers
 - Pre-direction and post-direction addresses
 - Puerto Rican addresses that require urbanity
 - High-rise style addresses
 - Alpha house numbers
 - Single Alpha Street names (A ST, M AVE, and N BLVD)
 - Add test data to cover the changes to the software and exercise any parameter changes that affect your company's use of the product.
- Add the list of additional test cases identified from the changing requirements to the master address database/test file for the overall quality evaluation. Continue to add to the test database based on any live/production experience.
- Include in your test addresses items you would not expect to be changed – so you can ensure the product didn't do something unexpected.
- Have others within your team review your test cases and expected results – with the proposed changes by the vendor – to ensure all test cases are adequately covered.
- Ensure not only individual components are tested, but that integration testing with other functions are included to ensure no other applications are impacted as a result of the update/change.
- Evaluate the need for stress/volume testing to ensure all aspects of the software performance and expected results are managed.
- Ensure the test environment that is developed mimics the production environment in which the software will run – to ensure performance of the software once implemented is as expected.
- Evaluate the base (original output) to the test (new output) from the original and changed software.
 - Review all statistical data and information provided from software reports
 - Compare the base and test results to ensure all changes are as expected

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- Determine specific test cases that are uniquely validated for all components to ensure the software update performs as expected.
- Ensure all parameters of how to utilize the software are implemented correctly. Running address software products in non-compliant parameters could make a product void from USPS compliance.
 - Check changes to parameter settings/definitions whether USPS regulatory or the vendor's enhancements.
 - Check parameter changes against any special work-arounds or routines that may have been done to adapt the software to your environment.
- Ensure if your company uses the same product in multiple platforms – that all platforms are adequately tested. Don't assume since it is tested in one environment that it will function and operate the same in another environment or platform.
- Document the results from the testing and maintain these results for future evaluation of production issues should they arise.
- Evaluate the quality of the software provided by the vendor and keep track of the number of fixes/patches or software updates a vendor provides within a year. Ensure you keep track of when these updates were implemented into your production environment – so in case issues arise in the future you can quickly isolate any potential cause from a software update.
- Ensure all documented test cases and expected results are obtained. If testing anomalies are discovered – ensure this information is presented to the vendor immediately for investigation of the results to determine if the integrity or quality of the software update is at risk.
- Do not deploy software that jeopardizes address quality due to database or software bugs. Escalate any found issues with the appropriate vendor or USPS management for resolution, when needed.

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Appendix C: Best Practices for Managing Un-assignable Addresses

Mailers:

- Send all addresses through a CASS Certified software with DPV integrated while at address initiation.
- Review detailed reporting and return codes to determine root cause on UAA from the CASS results.
- Have vendor come in to do an audit of the address data structure/format, the process of capturing and maintaining the data, and how it is architected/integrated in the system and look for ways to take advantage of the software.
- Use of multiple CASS tools to ensure assignable addresses. Ideal situation is to hold vendors accountable to provide quality products that wouldn't require multiple uses of CASS tools. Mailers should evaluate CASS vendors to determine which provides the services that best meets their address data needs.
- Review parameters of how software is set-up to get maximum benefit of software applications
- Provide their technical teams more training on how to use the CASS software process
- Look at the context of how the address was presented to the CASS certified product
- Un-assignable addresses should be further interrogated to evaluate the reason or cause for un-assignable addresses.
- Invoke Early Warning System (EWS) to determine if any potential addresses may be on a future database release.
- Use AEC and AECII to investigate and correct unassignable addresses.
- Utilize automated methods/channels to resolve the question and initiate customer contact as a last resort.

USPS:

- Update source data to ensure that un-assignable addresses are not caused by delays in getting address data posted into the USPS address database.
- Non-codeable addresses should be further interrogated to evaluate the reason or cause for non-codeable addresses.
- Define/ Establish a process that enables an address to be DPV prior to mail delivery being initiated by the carrier.
 - "Y" is the valid code.
 - "N" is not confirmed by DPV, no such primary address number on that street, street doesn't exit, non-existent delivery point.
 - "S" and "D" codes are incomplete/ inaccurate addresses. Valid primary number, secondary number inaccurate or incomplete, delivery point not identified yet.
 - For these responses, additional interrogation of the address is needed by the mailer and possibly USPS.

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- Additional codes available from address management products are provided in the table below.
- Continue to prove the value of AEC with Industry Mailer’s assistance. This means that the address management technology must be able to flag an address as being in process for AEC and AECII processing. Mailers can request a specific time-frame for the USPS to investigate the addresses submitted to AECII: 30 days, 60 days, or 90 days for resolution. Once proven by mailers:
 - Utilize AEC software, where legally applicable for all non-DPV/non-codeable addresses, prior to mailing.
 - Utilize AEC II to further evaluate delivery ability to the mailing address.
- The following table includes a list of codes included with the AMS API. CASS developers create their own return codes in the software they provide.

ZIP+4 Return Codes

10	<p>Invalid Dual Address Information presented could not be processed in current format. Corrective action is needed. Be sure that the address line components are correct. For example, the input address line may contain more than one delivery address</p>
11	<p>Invalid City/St/ZIP The ZIP Code in the submitted address could not be found because neither a valid city and state nor a valid 5-digit ZIP Code was present. Corrective action is needed. It is also recommended that the requester check the submitted address for accuracy.</p>
12	<p>Invalid State The state in the submitted address is invalid. Corrective action is needed. It is also recommended that the requester check the submitted address for accuracy.</p>
13	<p>Invalid City The city in the submitted address is invalid. Corrective action is needed. It is also recommended that the requester check the submitted address for accuracy.</p>
21	<p>Not Found The address, exactly as submitted, could not be found in the ZIP+4 file. It is also recommended that the requester check the submitted address for accuracy. For example, the street address line may be abbreviated excessively and may not be fully recognizable.</p>
22	<p>Multiple Response More than one ZIP+4 code was found to satisfy the address as submitted. The submitted address did not contain sufficient complete or correct data to determine a single ZIP+4 code. It is recommended that the requester check the address for accuracy and completeness. Address elements may be missing.</p>
31	<p>Exact Match Single response based on input information. No corrective action is needed since an exact match was found in the ZIP+4 file.</p>
32	<p>Default Match A match was made to a default record in the ZIP+4 file. A more specific match may be available if a secondary number (i.e., apartment, suite, etc.) exists.</p>

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- The following codes and descriptions represent an analysis of the individual address elements and what was done to enable a match to the ZIP + 4 product.

DPV Flag

Y	Address was DPV confirmed for both primary and secondary (if present) numbers.
D	Address was DPV confirmed for the primary number only. Secondary information was missing.
S	Address was DPV confirmed for the primary number only. Secondary information was present but unconfirmed.
N	Both primary and secondary (if present) number information failed to DPV confirm.
Blank	Address was not presented to the hash table

DPV Footnote Codes

AA	Input address Matched to the ZIP+4® file
A1	Input address Not Matched to the ZIP+4® file
BB	Input address Matched to DPV (all components)
CC	Input address Primary Number Matched to DPV but Secondary Number Not Matched (present but invalid)
F1	Input address matched to a Military address
G1	Input address matched to a General Delivery address
N1	Input address Primary Number Matched to DPV but address Missing Secondary Number
M1	Input address Primary Number Missing
M3	Input address Primary Number Invalid
P1	Input address RR, or HC Box Number Missing
P3	Input address PO, RR, or HC Box Number Invalid
RR	Input address matched to CMRA and PMB designator present (PMB 123 or #123)
R1	Input address matched to CMRA but PMB designator not present (PMB 123 or #123)
U1	Input address matched to a Unique ZIP Code™

DPV Vacant Flag

Y	Address DPV confirmed for both primary and secondary numbers (if present). Address identified as currently vacant; in most cases unoccupied over 90 days.
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Vendors:

- Provide quality CASS Certified products that don't require the use of multiple software applications to give us assignable addresses.
- Offer solutions in transactional based scenarios versus batch formats only.
- Provide solutions that evaluate and validate address information during data entry, either by the mail list owner or the addressee.

CASS Certified software and other related tools provide return codes (error codes) that can provide important clues as to the next best action for correcting an un-assignable address. The following chart is an example of this approach.

Vendor Code (example)	Error Description	Action
xx1	Last line is bad or missing	3
xx2	No city and bad ZIP	2
xx3	Bad city and no ZIP	2
xx4	Bad city and bad ZIP	2
xx5	Bad ZIP, can't determine which city match to select	2
xx6	No primary address line parsed	1
xx7	Street name not found in directory	1
xx8	Possible street name matches too close to choose	1
xx9	Primary range is missing	1
x10	Primary range is invalid for street/route/building	1
x11	Predirectional needed, input is wrong or missing	1
x12	Suffix needed, input is wrong or missing	1
x13	Suffix & directional needed, input wrong or missing	1
x14	Postdirectional needed, input is wrong or missing	1
x15	Bad ZIP, can't select an address match	2
x16	Bad city, can't select an address match	2
x17	Possible addr. line matches too close to choose one	1
x18	Urbanization needed, input is wrong or missing	2
x19	Exact match in EWS directory	1
x20	Other Error	4
x21	Foreign	4
x22	Input record entirely blank	4
x23	ZIP not in area covered by partial ZIP + 4 Directory	4
x24	Overlapping ranges in ZIP + 4 directory	4
x25	Marked by USPS as unsuitable for delivery of mail	4

Action Codes:

- 1 – Should be reviewed by user for minor adjustments to yield an assignment
- 2 – Candidate for external service bureau processing

Address Quality Methodologies

3 – Candidate for AECII processing by the USPS

4 – Should be removed from the domestic mailing list based on company policy or requirements.