

ADVANCING ADT ROAD MAP FOR SOUTH CAROLINA

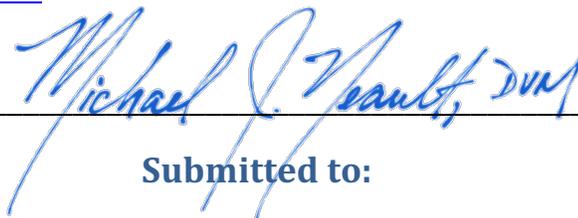
A Three-Year Plan

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I. EXECUTIVE SUMMARY

The primary mission of the South Carolina Animal Disease Traceability (ADT) Program is to protect the health and marketability of South Carolina livestock. Many of the identifiers, tags, and other aspects of the ADT program may add value to other aspects of livestock production. Secondary uses that directly relate to animal disease control and prevention require diligent protection of producer confidentiality. We encourage these other legitimate uses with the explicit approval of the producers. We believe that a successful ADT program operating at the “speed of commerce” will add significant value to our state’s livestock. Large investments in time and money require proven future “value added” for acceptance. We believe the value of animal disease traceability will be proportional to the extent of willing participation by all industry stakeholders: producers, markets, dealers, etc. This document represents the best strategy for South Carolina to improve traceability capabilities. This is a living document that will have revisions as new requirements, technologies, and implementation methods develop.

II. CURRENT TRACEABILITY SITUATION

The Clemson University Livestock Poultry Health (LPH) mission includes protection of animal health in South Carolina through control of endemic, foreign, and emerging diseases in livestock and poultry. LPH serves South Carolina and fulfills its mission as the state’s animal health authority, meat and poultry inspection department, and veterinary diagnostic laboratory. Traceability and its four overarching strategic goals are fundamental components for protecting animal health in the state. Knowing where individually identified, diseased and at-risk animals are, where they’ve been, and where they’re going at a given point in time are critical to the success of South Carolina’s animal disease control activities.

Historically, the State Veterinarian’s role of protecting animal health was largely through management of specific disease eradication and control programs. The South Carolina General Assembly created the position of State Veterinarian with Clemson University over a century ago to specifically deal with Cattle Fever Tick in the state. Bringing Tuberculosis (TB) and Brucellosis under control took a significant part of the twentieth century. During that time, livestock mostly had permanent identification and traceability was accomplished through participation in individual disease eradication programs such as Brucellosis calfhood vaccination, TB herd certification, etc. Most farms with significant livestock production were enrolled in one or more disease eradication and certification programs. With the success of these eradication efforts, much of this activity stopped. Only rarely does the State Veterinarian’s staff have to trace an animal suspected of, or exposed to, any of the program diseases. But some of these same diseases, as well as other diseases, lurk, ready to strike the state’s livestock. When these existing or emerging diseases strike in South Carolina or are traced to South Carolina, our livestock populations and markets are at risk. To successfully control an actual, or even perceived disease situation, the State Veterinarian must quickly locate the source of the suspect animal and any potentially exposed susceptible animals. An efficient animal disease traceability system is pivotal to rapid disease control and prompt restoration of markets.

Primary responsibility for the South Carolina Animal Disease Traceability program rests with the State Veterinarian and his staff. However, program success is dependent upon collaboration and effort by all members of the animal agriculture community. The South Carolina Animal Disease Traceability Steering Committee formalizes this relationship and provides input to the State Veterinarian on the direction of the Animal Disease Traceability program and key program-related decisions. The group is instrumental in ensuring that the program remains focused on its key guiding principles.

Livestock in South Carolina

Agribusiness (including forestry) is the largest sector in South Carolina's economy with an estimated \$41.7 billion total economic impact¹. Food animal livestock make up almost 60% of the non-forestry segment². Poultry (broilers, turkeys, and egg production) is the highest income commodity group, followed by cow-calf, dairy, and swine³. South Carolina has no large-scale feedlots. Most of our calf production moves to other states for feeding and finishing. Small ruminant production, particularly goats, has shown rapid growth. The equine industry is also a major contributor to South Carolina's economy but is not included in the cited animal agriculture production statistics.

In 2016, South Carolina's poultry industry represented 47.1% of direct sales from the state's agriculture, with a direct economic impact of \$4 billion for the state³. Poultry companies employ about 13,000 people, while many more work in related fields such as feed production, refrigerated trucking, paper box and egg carton manufacturing, rendering, and construction⁵. Poultry is the state's number one animal agriculture export.

In the cattle industry, South Carolina is mainly a cow/calf production state. Calves are born and reared here for several months before being sold for final fattening and slaughter. In 2017, the state had a total of 326,114,000 head of cattle and calves². A small but growing segment of cattle farmers are developing forage-fed operations, some even finishing and custom marketing their products direct to consumers. Dairy cattle statistics stabilized in recent years with approximately 15,310 cows located on 215 dairy operations². In 2017, South Carolina dairy sales were almost \$57 million². Of these farms, since 2012 the number of operations with more than 100 cows has decreased from 52 to 41 commercial dairy farms.

The swine industry in South Carolina is comprised of primarily finishing operations; 85-90% of swine producers are contract growers for large companies³. Some smaller producers are producing specialized pork for direct sales to supermarkets and high-end restaurants. Pork producers are strong supporters of prevention of disease spread and animal disease traceability and have long recognized that opportunities for industry growth are international. Swine sales in 2017 amounted to \$68.6 million².

The demand for goat meat is increasing with many breeders now working in associations to meet large commercial sales contracts. South Carolina had 4,580 milk goats in 2017, and 35,279 meat and other goats with production totaling about \$1.9 million. Sheep and lamb production also contribute to the state economy. South Carolina had 738 farms with 12,627 sheep and lambs in 2017 with production totaling about \$769,0002.

There are more than 100,000 horses that reside in South Carolina³. The horse population is very diverse, with approximately 60% considered pleasure horses that may be placed in trail riding categories³. The remaining 40% are divided into multiple disciplines: racing, breeding, eventing, fox hunting, training, rodeo, showing, driving, and polo³. Horses in competitive disciplines are particularly mobile, especially showing and polo groups which frequently move not only interstate, but internationally. The economic impact of S.C. horses from sales, feed, boarding, and other services is about \$400 million per year³. In addition to its resident equine population, South Carolina hosts a large number of winter-training horses and polo horses from international competition.

2.1 Who are we?

South Carolina's Animal Disease Traceability (ADT) Steering Committee has representatives from LPH, USDA APHIS VS District 1, priority species producers and industry groups, Clemson University Cooperative Extension Service (CUCES), South Carolina State University, Extension Service, and other interested state and federal governmental agencies. The South Carolina Traceability Steering Committee meets in person as necessary and receives email updates as needed.

Success of the national animal disease eradication programs has brought a significant decrease in the need and frequency of routine animal disease traces. Changes in routine tagging, tagging sites and other program activities make each trace somewhat more difficult with much higher potential consequences. State and federal animal health officials work to identify the origin of every identified suspect or contact animal. We are usually successful in preserving animal health status in the state, but this is often at greater expense than if the traces themselves had been successful at truly identifying and tracing the animal from its birth farm to the point that it was identified as a concern.

The most common "official" cattle identification obtained at the point of animal identification for needed tracing is the federal backtag during slaughter surveillance. For cattle moving directly from a livestock market to a slaughter facility, backtags provide valuable information for search of market records for seller's information. Market records are generally a good source of information, since markets are regulated, and the required market records are subject to state/federal inspection on a regular basis. However, in some cases application of a backtag occurs at the slaughter facility, so

even the best records may only identify the animal to a load of delivered cattle. In some of these cases, additional unofficial identification is available to help further narrow down the possible source of the animal from the load. Hauler/dealer records for the animal load may provide information on the dealer/seller or place of origin of the animal(s). Dealers must maintain records of all animals bought and sold; however, the quality of dealer records is often lower than permanent livestock market records. Often the dealer or hauler can only provide information on the farm name(s) where animals were loaded on a given day. The trace investigation must then expand to those locations. Using available trace movement information and available animal identification, contact is made with the potential sellers to rule-in or rule-out the seller as the source of the animal being traced. Seller records may be able to confirm the original birth farm of the animal or may direct investigators to the place of animal origin. Traces thus may or may not end with a conclusive source.

In cases of slower moving contagious diseases, such as TB or Brucellosis, herd tests of all possible source premises may satisfy the disease control requirements to retain good official health status for the state. Incompleteness of a trace may result in much higher testing costs, but not necessarily permanent damage to animal health or marketability. In cases of chronic diseases, such as scrapie or Bovine Spongiform Encephalopathy (BSE), an incomplete trace leaves critical unknowns that may affect marketability for years. In the worst case of a highly contagious emerging or foreign disease, incomplete tracing may lead to delays in quarantine and testing that may have truly catastrophic consequences.

2.2 Current Status of Traceability in South Carolina

Current statistics on elements in use to achieve traceability in South Carolina are as follows:

Premises

There were 6,763 registered premises in the state database as of December 31, 2021. The following charts provide a breakdown of South Carolina premises types and number of premises associated with livestock species:

Premises Type	#
Production Unit	9,060
Non-Producer Participant	124
Market/Collection Point	119
Clinic	110
Exhibition	61
Slaughter Plant	41
Meat Processing	7
Rendering	5
Laboratory	3
Port of Entry	1

Premises Species	#
Bovine	3,299
Ovine	858
Porcine	607
Camelid	61
Poultry	2,886
Equine	1,689
Caprine	3,666

Interstate Certificates of Veterinary Inspection (ICVI)

Clemson University Animal Health Programs receives and stores Interstate Certificates of Veterinary Inspection (ICVIs) and other certified electronic movement documents in an electronically accessible state database. Statistics for the twelve-month period ending on December 31, 2020, are in the chart below:

South Carolina Database ICVIs (entered 1/1/21 thru 12/31/21)

Species	CVIs Out	Animals Out	Destination States	CVIs In	Animals In	Origin States
Cattle	1,160	65,992	31	551	5,860	34
Sheep	41	223	9	33	207	18
Goats	102	533	13	50	263	22
Horses	5,317	10,032	48	5,244	8,627	49
Swine	412	371,679	15	945	491,385	14
Poultry	610	7,890,318	45	13,326	24,572,409	32
Camelids	16	54	5	10	33	6

South Carolina Database eCVIs (entered 1/1/21 thru 12/31/21)

Species	eCVIs Out	Animals Out on eCVIs	Destination States	eCVIs In	Animals In on eCVIs	Origin States
Cattle	182	1,939	23	256	3,459	26
Sheep	19	122	6	10	99	8
Goats	51	285	10	36	204	16
Horses	3,017	5,171	48	4,054	6,246	49
Swine	410	371,660	13	934	491,326	10
Poultry	403	7,872,398	40	576	23,264,587	25
Camelids	7	11	2	2	8	1

Tags

Official individual Animal Identification Numbers (AINs) include “840” Electronic Identification (EID) cattle tags, “840” EID equine microchips, scrapie tags for sheep and goats, and “silver brite” National Uniform Eartagging System (NUES) tags. AINs are initially recorded in the USDA Animal Identification Management System (AIMS) then updated in USAHERDS when the tags are issued and introduced into production. Poultry identification bands are used for non-commercial poultry when tested for specific disease programs. These bands are also recorded in USAHERDS when issued. Statistics for tags issued, to producers and markets or non-commercial entities for specific disease programs, for the twelve-month period ending with December 31, 2021, are:

Tag Type	Tags Issued
NUES	8,009
Other	2
Poultry Band	10,661
RFID	15,128
Scrapie	62,337

South Carolina initiated a tag inventory in 2014 with biannual inventories occurring in every subsequent year. Through the inventories, unreconciled tags were identified. These are tags which were recorded as allocated but were unaccounted for in following inventories and lacked an application date. To minimize the number of unreconciled tags, the livestock inspectors emphasized the importance of tag accountability at livestock markets. By successfully communicating the need to maintain accurate tagging records, the total number of unreconciled tags in South Carolina reduced by 98.99% for NUES and 99.53% for Scrapie tags in the subsequent five years. More recently some after-hours markets have been back sliding. Additional work is needed with these markets.

Total Unreconciled Tags in South Carolina Markets by Tag Type:

Year	NUES	Scrapie
2014	3,975	9,540
2015	2,077	6,944
2016	534	2,395
2017	124	2,065
2018	40	45
2019	49	84
2020	0	102
2021	10	224

Permits

State and federal laws and regulations require permits for public livestock markets and equine sales facilities. Public livestock markets include: Livestock Auction Markets, Daily Buying Stations, Dealers, Expositions, and Miscellaneous Markets. Permit holders must maintain records of buyers, sellers, individual animal identification, and exhibitors for at least five (5) years for cattle, horses, sheep and goats and two (2) years for poultry and swine. Sale market records must be made available to State Animal Official representatives upon request.

South Carolina Active Market Permits as of 12/31/21:

Permit Type	Permits
Livestock Dealer	59
Miscellaneous Vendor	46
Exposition or Fair	21
Equine Sale Facility	10
Livestock Auction Market	6
Miscellaneous Sale	6
Livestock Auction Market, After Hours	5
Daily Buying Station	2

All metrics included in current and previous ADT cooperative agreement reports are included in a comprehensive “report card” dashboard. Virtually all traceability data are now available to all staff 24/7 as either fully digital records or, at worst, scanned and indexed documents.

Livestock producers are the most important members of the animal agriculture industry. Numerous industry groups, government organizations and academia support the producers. The South Carolina Department of Agriculture, South Carolina Farm Bureau, South Carolina Cattlemen’s Association, South Carolina Horsemen’s Council, South Carolina Pork Producers, South Carolina Poultry Federation, and many other organizations seek to defend the interests of our producers and to preserve

and extend markets for South Carolina agricultural products. Clemson University and South Carolina State University Extension Services provide education and support for producers to apply the latest scientific advancements in production. Often scientific advancements come from the Clemson University Experiment Station through projects targeting problems communicated to researchers by the Extension agents in the field. Staff of LPH (Office of the State Veterinarian) work to protect the health of our animal population and to ensure confidence in the health status of South Carolina animals to maintain access to markets in other states and around the world. AHP staff further educate producers on the importance of animal disease traceability whenever invited to present animal disease updates within the state. Conscientious Accredited Veterinarian partners are also critical for the success of the program. All of us must work together to ensure the health of South Carolina's livestock and livestock industries.

LPH staff literally invented the eCVI XML data standard by proposing that AAFLD/USAHA create the subcommittee on data standards to function as a standards development organization (SDO). This standard is now widely accepted not because it is perfect but because it was developed by the industry for the industry with guidance from regulators to ensure it contained all essential information.

2.3 Strengths and Weaknesses

Strengths:

The State Veterinarian's office at LPH includes three departments: Animal Health Programs (AHP), the South Carolina Meat Poultry Inspection Department (SCMPID), and the Clemson Veterinary Diagnostic Center (CVDC). These departments share a facility in Columbia, South Carolina.

LPH has most of the essential human and technical resources needed. Staff include experts in traceability, data standards, poultry, and swine identification, etc.

Weaknesses:

Each of the resources above is the bare minimum, one-deep, and usually multi-tasked between many responsibilities. This true of both human and virtual resources. The LPH server hosts four virtual servers providing five different full application environments. There are no fail-over capabilities beyond off-site backups of data.

Infrastructure for livestock markets and challenges from the work force are concerns. Lack of internet resources still affect areas of the state.

2.4 Opportunities and Threats

Opportunities

South Carolina has several special opportunities identified as we look forward on traceability. Industry groups have shown interest in assisting with traceability in South Carolina by exploring possibilities for making producer information they hold available in an animal disease event. The South Carolina Cattlemen's Association is a member of the Southeast Livestock Network (SELN). SELN has had discussions in the past on how data from their age and source verification marketing programs might be made available in an animal disease event. This opportunity still holds promise and would be consistent with South Carolina's guiding principle of avoiding duplication. The SELN also raised the idea of initiating consistent intrastate identification regulations and laws in their member states and hope to work with state veterinarians to produce draft documents for this purpose. SELN has not been active recently but may become more active going forward. South Carolina is open to this opportunity should South Carolina stakeholders show interest in this concept.

South Carolina will continue to invest in infrastructure to maintain a traceability program, as evidenced by the creation of a new inspector position focused on traceability, consistent with USDA's four overarching goals resulting from the State and Federal Animal Disease Traceability Working Group 14 key points. To better protect animal health, South Carolina can advance data sharing using electronic ID to enhance the ability to track animals from birth to slaughter. There is also an opportunity to elevate the discussion with accredited veterinarians and livestock owners on increasing the usage of eCVIs where animal health certificates are electronically transmitted from private veterinarians to state animal health officials.

South Carolina has an opportunity to explore innovations in identification, data capture, and transmission and storage of data due to the lower volume of livestock routinely handled in our markets compared to those in the Midwest, which can accommodate a trial. South Carolina has strength in our current ability to trace swine and poultry, including a higher-than-average percentage of backyard poultry, thanks to the collaborative commitment of these industries to work with us on traceability. South Carolina continues to focus on cattle, especially beef cattle of breeding age, under this strategic plan.

Obstacles

Confidentiality remains a primary concern of South Carolina stakeholders. Along with USDA APHIS VS, South Carolina has always maintained and assured confidentiality of stakeholder information. Working with our

constituents, LPH proposed and successfully achieved legislation in 2012 to clearly establish confidentiality of this information in South Carolina (SC Code of Laws 47-4-170).

We believe it is a fundamental part of the plan to develop consequences for those who do not abide by the regulations implemented to ensure our poultry and livestock continue to thrive. South Carolina will collaborate with USDA APHIS VS on monitoring and enforcement of proper use of official animal identification, proper use of and accurate documentation on ICVIs, and appropriate collection of animal ID at slaughter.

Compatibility between tag technology is an essential component of the new strategy. Providing industries with the choice of which tag type works best for their operations could limit the interoperability of tagging systems and negatively impact the speed of commerce if consistency between tag types is not established.

Our premises registration, tag tracking, and animal health program database (USAHERDS) is based on 20-year-old technology. USAHERDS's support vendor (Acclaim Systems) is working on a totally new platform, however that change will come at a cost roughly equivalent to changing software to a new vendor. It is not clear that USAHERDS will remain the best available technology. We may find ourselves needing to change systems. Such a change will involve significant cost, both financial and in terms of effort and lost productivity during the transition.

Adequate funding for animal disease traceability remains an issue for South Carolina. Transitioning from NUES tags to electronic identification may require financial assistance to the producer or livestock markets through either cost-sharing for electronic tags and/or infrastructure to read EIDs at markets and elsewhere. The proposed elimination of USDA providing free tags for cattle (NUES) and the resulting new cost to producers is not likely to be well received. The provision of a limited number of no-cost RFID tags has been a significant help in this area but is not promised to continue indefinitely. Additional discussions at the state and national level are necessary to determine the best approach for minimizing the economic impact of the new system on the industry.

South Carolina producers and allied industry concerns about the impact of ADT requirements on their profit/loss bottom line persist. In addition, there are those who have a basic distrust of government at any level, especially the federal level. We must recognize that these individuals remain potential obstacles to a fully successful system.

2.5 Inventory of existing infrastructure and suitability assessment

The State Veterinarian is ultimately responsible for all traceability activities. An LPH Veterinary Epidemiologist/Informaticist actively involved in traceability activities reports directly to the State Veterinarian. The AHP Director of Field Services is a veterinarian who also reports directly to the State Veterinarian. In addition to the Field Services Director, AHP currently (January 2022) has a staff of three (3) veterinarians and one (1) administrative staff person at headquarters and three (3) livestock law enforcement officers, one (1) livestock inspector in the field, one (1) poultry inspector in the field, and one (1) livestock inspector for traceability. A significant portion of the AHP administrative staff person's duties relate directly to animal disease traceability, to include managing ICVIs (by scanning ICVIs and data entry to in-house database), movement permits, and market permits and reports. As a larger portion of ICVIs become electronic and more swine movement permits shift to swine herd plan electronic records, the workflow is shifting from data-entry to data quality monitoring of those electronic records. One livestock inspector specializing in traceability was added in 2018 to focus on increasing usage of eCVIs and EIDs. This inspector also works with the State Veterinarian's Administrative Coordinator to complete traceability-related tasks to include processing premises registrations and exceptions as well as processing AIN (Tag) distributions. All AHP veterinarians work to monitor animal health, enforce the laws and regulations of South Carolina, and educate stakeholders and the public. Each veterinarian has a specialty or area of interest (beef, dairy, swine, poultry, equine, small ruminants, and emergency preparedness) and is heavily invested in traceability activities.

The six (6) AHP field staff (law enforcement officers and inspectors) actively monitor livestock movement activities, including all activities at livestock markets. Each fulfills duties as educator, animal health technician, and law enforcement officer. They facilitate compliance by performing animal health technical duties, such as disease testing, market inspection, and animal identification. The Director of Animal Health Programs Field Services supervises and leads their field activities.

AHP maintains inventory of RFID tags distributed in South Carolina. For creating records correlating backtags to RFID tags, we have one (1) Allflex LDC-V100 Livestock Logger, six (6) Agrident AWR300 wand readers—three on loan to markets—two (2) Allflex RS420-60 RFID wand readers, one (1) PD7100 barcode reader, one (1) Destron DTR3e Wand RFID reader, and two Aleis-Multi A system panel readers—both on loan to markets. The RS420 wand readers can be used alone or with an app on a smart phone or Samsung tablets. We also have one (1) AVID handheld scanner and one (1) universal IMAX handheld scanner. At the present

time, we have a small, adequate inventory of “silver brite” tags and EIDs for disease program work. The USDA APHIS VS Cooperative Agreement funding continues to support a significant portion of the current traceability activities. Additionally, USDA APHS VS supplies 840 RFID tags in a limited breeding cattle identification program initiated in 2020.

Using ADT supplemental funding we have purchased additional wand readers to provide to livestock markets. If funding continues, we will continue to purchase what is allowed under the supplemental provisions to increase South Carolina’s ADT infrastructure while addressing speed of commerce needs.

III. VISION CONTEXT FOR ADVANCING TRACEABILITY

3.1 Vision Statement

ADT and its four overarching strategic goals are fundamental foundations for protecting animal health in South Carolina. Knowing where individually identified, diseased and at-risk animals are, where they’ve been, and where they’re going at a given point in time are critical to the success of South Carolina’s animal disease control activities. South Carolina will continue to promote education, build and adapt infrastructure at the veterinarian, producer, market, slaughter facilities, and state regulatory agency to meet the speed of commerce.

IV. TRACEABILITY REQUIREMENTS

4.1 Strategic goal(s)

South Carolina seeks to advance ADT to ensure that state animal health officials can promptly determine the origin of any reportable disease affected or exposed animal in South Carolina, or to promptly trace animals moved into South Carolina from another state. Should a determination be made that the animal did not originate in South Carolina, state animal health officials should be able to determine the state of animal origin - the animal’s state of birth or the state of initial tagging of the animal, if the two are not the same. South Carolina traceability should also be able to determine the identity and location of other South Carolina animals potentially exposed to an affected animal. Traceability activities are time-sensitive and should be accomplished as quickly as practical and appropriate for the disease of concern.

Guiding Principles

Key issues identified by South Carolina animal health officials, producers, and allied industries as essential to development and implementation of animal disease traceability plans for South Carolina include:

- Confidentiality and appropriate use of information,
- Options for voluntary use of program elements in marketing and management to avoid duplication and extra expense,
- Minimization of any negative impacts on speed of commerce,

- Value consistency between states, especially Southeast states, and
- Prioritization of activities to those with actual traceability impact.

Confidentiality is a cornerstone concept in traceability. Participants in the Animal Disease Traceability program, at both the state and federal level, have been assured that their proprietary information held in federal traceability databases, especially information held in state-specific applications hosted in the federal systems, is confidential and will only be used for animal disease traceability purposes. To ensure continuation of the trusted relationship with livestock and poultry producers, we must be able to ensure that use of the information we receive is only for animal disease traceability and other appropriate purposes, such as disasters, emergencies, tracing lost/displaced animals and measuring ADT system performance, and otherwise will be kept confidential. 2012 South Carolina legislation provides for protection of ADT-related information (South Carolina Code of Laws 47-4-170). Protection of information at the federal level is less clear.

Many producers use traceability as a marketing tool. Progressive markets may offer incentives for animal age and source verification information. Configuration of elements of animal disease traceability should allow producers the option to choose to use some or all elements (e.g., AINs, PINs) for marketing and management purposes without having to duplicate the elements for each purpose. When data essential for traceability is already present in existing industry programs, those data should be permissible for traceability when technology and permissions allow.

Traceability efforts must be efficient and simple. Many South Carolina livestock markets have marked technologic challenges that limit options for technical solutions (e.g., no to limited internet in areas, working staff education levels, etc.). When developing and implementing effective methods of animal disease traceability, we must consider and minimize any negative effects on the speed of commerce. In some cases, improvements in animal ID will enhance and improve the speed of commerce and efficiencies at stockyards and sales.

Industry stakeholders repeatedly ask for greater uniformity between states to enhance their ability to meet the regulatory requirements. When possible, South Carolina continues to collaborate to develop consistent regulations within and between states, especially Southeastern states, and to ensure that our methods are consistent, well thought out, and more likely to promote acceptance from industry, in part by not putting producers in any one state at a regulatory disadvantage. In a regulatory environment, it is important to keep an open mind to new ideas and accepted practices to achieve improved traceability. The ability to successfully trace cattle and other livestock is the ultimate goal in South Carolina.

The overarching strategic goals of ADT are:

1. Enhance electronic sharing of data among Federal and State animal health officials, veterinarians, and industry, including sharing basic ADT data with the Federal Animal Health Events Repository (AHER). The federal Animal Health Events Repository (AHER) provides an opportunity to advance the electronic sharing of data among federal and state animal health officials, veterinarians, and industry. As a USAHERDS using state, the conversion to the USDA supported USAHERDS service was fully functional by January 2022. We look forward to seeing how this system works in real-time over the next several years.
2. Increase use of electronic ID tags for animals requiring individual identification in order to make the transmission of data more efficient.
3. Enhance the ability to track animals from birth to slaughter through a system that allows tracking data points to be connected; and
4. Elevate the discussion with States and industry to work toward a system where animal health certificates are electronically transmitted from private veterinarians to State animal health officials.

eCVIs have the potential to minimize errors and maximize efficiency in understanding how animals are moving into and out of the state. A livestock inspector specializing in traceability has been hired to elevate the discussion of eCVIs with private veterinarians. This vital increase in personnel provides an opportunity to further education within the state on the benefits of eCVIs. To enhance our communication and outreach efforts, an emphasis can be placed on veterinary practices with the highest error to CVI ratios. The traceability specialist can also communicate standards for ICVI data and tag performance to industry stakeholders in South Carolina. To be able to provide a no-cost eCVI solution to all South Carolina accredited veterinarians, Livestock Poultry Health is collaborating with several other USAHERDS states to develop the Vet-CVI App. Once this app is released, it can become the default CVI and can replace with supplied paper forms.

Again, livestock producers are the most important members of the animal agriculture industry. Numerous industry groups, government organizations and academia support the producers. The South Carolina Department of Agriculture, South Carolina Farm Bureau, South Carolina Cattlemen's Association, South Carolina Horsemen's Council, South Carolina Pork Producers, South Carolina Poultry Federation, and many other organizations seek to defend the interests of our producers and to preserve

and extend markets for South Carolina agricultural products. Clemson University and South Carolina State University Extension Services provide education and support for producers to apply the latest scientific advancements in production. Often scientific advancements come from the Clemson University Experiment Station through projects targeting problems communicated to researchers by the Extension agents in the field. Staff of LPH (Office of the State Veterinarian) work to protect the health of our animal population and to ensure confidence in the health status of South Carolina animals to maintain access to markets in other states and around the world. AHP staff further educate producers on the importance of animal disease traceability whenever invited to present animal disease updates within the state. Conscientious Accredited Veterinarian partners are also critical for the success of the program. All of us must work together to ensure the health of South Carolina's livestock and livestock industries.

4.2 Programmatic goals

Programmatic goals for South Carolina include:

- Target, develop, and implement outreach messaging regarding data quality and processing for animal health information forms
- Monitor ICVI data quality
- Input data into appropriate systems
- Improve retrieval of available traceability information
- Establish compatible standards for sharing data with States/Tribes/Territories and USDA when needed
- Integrate surveillance and traceability data
- Establish advisory committee
- Establish authority
- Develop policy
- Enhance IT infrastructure
- Establish and/or update tag distribution record system
- Continue outreach and education programs external stakeholders (e.g., producers, veterinarians, markets, haulers, processors, etc.).

4.3 ADT Trace Performance Measures (TPMs)

Basic tools essential for successful animal disease traces include animal identification, premises identification, animal movement and dealer records, as well as permits for livestock markets, events, and sales. South Carolina plans to continue to support and monitor these essential processes as important indicators of the overall success of traceability in South Carolina.

Traceability performance elements are easy to identify but difficult to measure consistently and accurately. The ability to assess the effectiveness of the traceability plan critically and fairly should be the same across the country. We believe that state participation in federally designed and led

test exercises are an effective means of evaluating traceability performance in the state. USDA has changed to a system of all National Priority Trace (NPT) exercises initiated by VS ADT staff. Successful tracing depends on several conditions. To date, trace exercises focus on movements of cattle with permanent official identification. South Carolina actively participates in these exercises. While these exercises provide valuable training in retrieval of animal identification and movement records from existing systems, they fail to measure the impact of less than complete compliance with official animal identification requirements.

**South Carolina’s Trace Performance Measure (TPM) Rating
Time for the 2020 and 2021 Cooperative Agreement Period:**

TPM	2020 Avg. Elapsed Time (Hrs.)	2021 Avg. Elapsed Time (Hrs.)	USDA Rating
TPM 1	0.68	0.19	Completed successfully
TPM 2	0.25	0.20	Completed successfully
TPM 3	0.22	0.27	Completed successfully
TPM 4	0.30	0.18	Completed successfully

4.4

Data requirements

Data requirements for traceability involve identification of places (premises), animals by official animal identification numbers, and, to a much less extent, people as contacts for obtaining information about premises and animals. Data collection on animals is critical at each significant animal-life event: tagging, movement, and harvest. This data collection depends upon the cooperation of producers, markets, dealers, laboratories, slaughter facilities, etc.

Essential attributes of these data include the three key elements of information security: confidentiality, integrity, and availability. Producers must have faith that the use of data collected about them, and their livestock is only for appropriate animal disease control activities. Data maintenance must be current and always be correct. Data integrity and effectiveness of animal disease traceability are lost with transcription errors, lost records, or out-of-date information. Data must also be available to all appropriate users in a timely manner to support animal disease traceability within a time frame that supports effective disease control.

LPH has used USAHERDS since 2012. Staff enter Animal ID tag distribution information into the federal AIMS database and enter tag information into USAHERDS when an animal ID is distributed to a veterinarian or producer, or physically placed on livestock. Staff use the AIMS Excel download file to import AIMS tag information into USAHERDS for more convenient access.

LPH, in conjunction with several other southeastern states that use USAHERDS, are working toward having swine health plan movements documented in a USAHERDS proprietary Excel spreadsheet format. Prior to that we were, and are, converting from various swine company formats that we accept if all the required movement elements are included.

Data are only shared for legitimate animal health purposes as required by 2012 South Carolina legislation that provides for protection of ADT-related information (South Carolina Code of Laws 47-4-170).

4.5 Information technology plan

The information technology plan for LPH continues to consist of four (4) main components: premises registration, individual animal identification tracking, field electronic data collection, and electronic management of Interstate Certificates of Veterinary Inspection (ICVI). Premises registration data is the foundation of traceability. Effective tracking of individual animal identification devices, from manufacture, to distribution, to application on individual animals, and finally through animal movements, is an essential element for traceability. Capabilities for field data collection remain an important element for timely transfer of critical animal movement identification and movement information. The use of electronic applications for interstate communications of livestock movement information, electronic Certificates of Veterinary Inspection (eCVI), is an asset for rapid and accurate transfer of critical information.

The LPH technology plan continues to involve both federal and state information processing resources and data sharing, as appropriate. LPH remains dependent on the federal system for animal identification number management.

South Carolina uses USAHERDS, a compliant premises registration system. This system has improved staff efficiency and reduced exposure of producer data to unreliable federal confidentiality policies. LPH provides basic premises number registration information to the federal system through the premises identification number allocator. This allows us to maintain sensitive producer data at the state level. The USAHERDS application is approaching twenty years old. Its underlying technology is rapidly becoming obsolete. The support vendor for USAHERDS is planning and beginning implementation of a completely new platform version. Such a change will present challenges both financial and functional. This may drive a need to re-evaluate our database platform, while continuing to achieve the required functionality.

LPH scans and indexes ICVI electronically in the USAHERDS platform. Paper and electronic versions of the VS Form 9-3 (National Poultry Improvement Plan's movement document for poultry) are also entered into

USAHERDS. We continue to pursue effective alternatives to ICVIs and, in cooperation with other state animal health officials, to promote the use of swine bulk movement and extended equine CVIs. These advancements greatly increase efficiency and effectiveness of animal traceability. We are active participants in the AAVLD/USAHA Subcommittee on Animal Health Surveillance and Information Systems and support standardization of ICVI information for data exchange. LPH funding supported the development of a USAHERDS add-on that facilitates creation of this indexing information in the form of minimally complete USAHERDS CVI records with the scanned images automatically attached for rapid retrieval.

The VS Mobile Information Management System (MIMS) and its replacement Animal Health System (AHS) continues to be a significant part of the overall technology plan. MIMS/AHS provides the ability to collect animal sighting and test information in the field and then efficiently transfer those data to state and federal databases, as appropriate. A most critical element in the technology plan is the tracking of individual animal identification devices through the AIMS. We developed and use a simple computer script to facilitate loading of the AIMS records into our local USAHERDS, thus maintaining AIMS as the master “source of truth” record while making a local, rapidly-accessible copy. Many steps in this process remain out of the control of state animal health authorities and tracing must be done by, or under the control of, USDA Veterinary Services or other federal agencies, such as the Food Safety and Inspection Service (FSIS). The USAHERDS platform modification handles the function of an AIN management system after the initial allocation. We manage all further distribution and in-state animal sightings exclusively in state databases.

4.6 Resource requirements

Continued federal infrastructure development support is required for success of the program. This may include continued financial aid for EID reading equipment, EID tags, to developing or modifying Veterinary Services Processes Streamlining to allow capture and reporting of EIDs at markets or by accredited veterinarians, like how the system allows creation of free eCVIs to accredited veterinarians.

4.7 Organizational needs

4.7.1 Executive support

The South Carolina state veterinarian’s office supports the ADT program. The baseline measures captured for ADT measurement reviews are listed in the current status of traceability portion of this Road Map and include monitoring the number of ICVIs vs. eCVIs issued for imports and exports each quarter, and EIDs issued by the state through the USDA breeding replacement RFID program.

4.7.2 Coordination and oversight procedures

As mentioned earlier, South Carolina's ADT Steering Committee has representatives from LPH, USDA APHIS VS District 1, priority species producers and industry groups, Clemson University Cooperative Extension Service (CUCES), South Carolina State University, Extension Service, and other interested state and federal governmental agencies. The South Carolina Traceability Steering Committee meets in person as necessary and receives email or verbal updates as needed and added Cattlemen's, Farm Bureau's, veterinary, and other state and local livestock association and extension meetings. Ultimately, the State Veterinarian, through activities conducted through LPH as discussed in inventory of existing infrastructure and suitability assessment are responsible for South Carolina's traceability activities.

For emergency preparedness, LPH participates on several committees addressing questions surrounding ADT during emergency disease events (e.g., identification, premises identification, movement from zones, etc.). Participation is on the National Assembly's African swine fever working group, Southern Agriculture and Animal Disaster Response Alliance (SAADRA) and the USAHA permit requirements subcommittee.

4.7.3 Policy

State general statute and codes of regulations align with ADT general standards. Additional federal changes are needed to implement true ADT using official EID tags within 9 CFR 86 and are encouraged to standardize to all species including replacing or incorporating the scrapie tag program into the ADT program.

4.7.4 Staffing

Staff and duties were discussed under "Inventory of existing infrastructure and suitability assessment."

4.7.5 Budget requirements

Funding for South Carolina's ADT programs comes from various sources including:

- State allocated funds for hiring full-time inspectors, veterinarians, and office staff. Variable adjustments are made annually to cost of living allowance granted
- Funding from USDA's ADT Cooperative Agreement. Cooperative agreement funding assists staff working on ADT projects while they also perform their state funded FTE duties, and
- Funding from USDA's Supplementary ADT Cooperative Agreement that varies the allowances of use each year rather

than allow multiple options that states could select to meet their need(s).

Continued federal financial support is important to continue to promote a national program. Knowing a timeline for when federal changes to the 9 CFR will occur addressing a more standardized official tag (e.g., electronic identification only with retirement of NUES tags) will help to establish better timelines for projects with external stakeholders and development by veterinary and livestock market vendors to track and report data to state and federal agencies.

4.7.6 Outreach

4.7.6.1. Accredited veterinarians

Continue outreach to accredited veterinarians advancing use of eCVIs, promoting EID usage, traceability program education, proper ICVI completion refresher trainings and official tag inventory and reporting procedures. Outreach is made through (and not limited to) direct contact, emails or paper mail, social media, website, and through state veterinary medical and livestock association meetings.

LPH will continue to work with accredited veterinarians and producers to distribute the free tags issued to the state associated with USDA breeding replacement RFID tag program.

4.7.6.2. Slaughter plants

LPH is home to the South Carolina Meat Poultry Inspection Department and has good relationships with state inspected and crossover plants. USDA VS South Carolina office has relationships with the federally inspected plants. Communication channels exist to request and access records from plants.

During the Road Map's operational period, LPH will communicate with slaughter plants to listen and address (as able) their concerns.

4.7.6.3. Industry as a whole

USDA APHIS VS has been conducting a dialogue with state animal health officials, producers and other industry representatives about what the next steps should be

nationally for ADT, especially in cattle. South Carolina participates in these discussions and keeps our South Carolina stakeholders informed. In South Carolina, we have seen significant progress in our ability to trace cattle more effectively and efficiently as described earlier in this plan. The traceability program is essential to safeguarding the health and economic well-being of the livestock industry.

4.8. Monitoring and reporting interstate movement activity

All electronic CVIs are imported directly to the LPH database using the AAVLD/USAHA data standard. Paper ICVIs are converted to the standard data format with the scanned PDF attached and key traceability data transcribed using the Civet software developed at LPH and available to all states free of charge.

Paper ICVIs are checked for errors during data transcription with errors recorded in the database via Civet. Electronic CVIs are checked periodically by LPH staff using a USAHERDS feature developed for LPH that allows recording review data searching for unreviewed CVIs.

The following data are tracked and available upon request. (See current statistics reported above.)

- Number of ICVIs and other interstate movement documents created within the State/Tribe/Territory on a year-to-date basis for move-out animals
- Number of ICVIs and other interstate movement documents received for move-in animals
- Number of animals by species and class for move-in events associated with ICVIs and other interstate movement documents, indicating the number of animals officially identified and the number not officially identified
- Number of animals by species and class for move-out events associated with ICVIs and other interstate movement documents, indicating the number of animals officially identified and the number not officially identified
- Volume of distribution for each official numbering system/device issued by the State/Tribe/Territory and/or AVIC office, including backtags by market or slaughter facility.

V. ADVANCING TRACEABILITY

5.1 Ranking of priorities for advancement

Moving forward, development and implementation of a cost-sharing or other infrastructure development financial aid support program that minimizes the financial impact of the cost of infrastructure to read EIDs and the cost of switching to only EIDs as official identification for cattle and other livestock species is important. We have concerns about the impact that expansion of individual ID requirement to feeder cattle may have on speed of commerce in our markets and elsewhere, one of our core principles. This strategic plan will be revisited and adjusted as appropriate should USDA APHIS VS reach a final decision or publish a new rule because of the current dialogues.

5.2 Implementation of objectives

#	Objective	Federal Funding Required?
1	Maintain current traceability infrastructure: premises registrations (including managing exceptions), traceability web page, coordinating steering committee, data entry from paper ICVIs to make information electronically accessible, education and outreach activities.	Yes (Including personnel – at least 1.0 FTE)
2	Continue outreach to Accredited Veterinarians: advancing use of ECVIs, promoting EID usage, traceability program education, proper CVI completion refresher trainings and official tag inventory and reporting procedures.	Yes (Including personnel – at least 1.0 FTE)
3	LPH compliance with current South Carolina laws and regulations regarding the use of Animal Disease Traceability Data.	
4	Continue to encourage use of alternative methods to document actual interstate livestock movements and increase the use of electronic ICVIs.	Yes (Including personnel – at least 0.5 FTE)
5	Continue to educate producers on advancing use of animal identification for management and marketability.	Yes
6	Continue recording individual AIN for cattle from paper ICVIs.	Yes (Personnel – at least 0.5 FTE)
7	Adapt tag inventory system for visual official ID and EIDs, and plan to provide financial assistance for infrastructure required to read EIDs in commerce and for purchase of EIDs as those resources become available.	Yes
8	Continued participation in USDA-directed national and state trace performance measure (TPM) exercise(s) throughout region. Supports USDA developing new exercises to test traceability standards.	Yes (Including personnel – at least 0.5 FTE)
9	Continue to educate producers and stakeholders on consequences to the state for failure to comply with animal disease traceability regulations.	
10	Seek harmonization of interstate movement regulations for movement of cattle with other states (especially Southern States).	
11	Participate in a multi-state workshop for next steps to advance animal disease traceability.	Yes (Including travel)

VI. ENDNOTES

1. James B. London, The Impact of the Agribusiness Sector on the South Carolina Economy, January 2015, London & Associates, <https://www.clemson.edu/public/reports/files/ag-impact2015.pdf>
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4. 2016 South Carolina Dairy Facts, American Dairy Association of South Carolina, <http://southeastdairy.org/wp-content/uploads/2015/09/2016-South-Carolina-Facts-Sheet.pdf>

5. South Carolina Poultry Federation, Economic Impact, <https://scpoultry.org/economicimpact/>