GEORGIA DOT RESEARCH PROJECT 16-29

FINAL REPORT

ENHANCING GDOT'S COMPUTERIZED PAVEMENT CONDITION EVALUATION SYSTEM FOR PAVEMENT CONDITION SURVEY

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16. Abstract: The Computerized Pavement Condition Evaluation System (COPACES) is a software tool that has been used by the Georgia Department of Transportation (GDOT) for its statewide pavement condition survey since the late 1990s. The previous version was released in 2008, which ran on Windows XP laptops. To improve the productivity, this project developed a new version of COPACES (named COPACES for Tablet) that runs on tablet computers with Windows 8.1 or Windows 10 and fully utilizes the convenience of finger-touch-based operations. Because a tablet computer is not available for everyone at the current stage, the previous version of COPACES (named COPACES for Laptop) was upgraded to be compatible with the newer operating systems, i.e., Windows 7, 8.1, and 10. Two other programs, COPADQA and Upload, which are used for data quality checking and data uploading, were also upgraded to be compatible with the newer operating systems. To further improve the quality of field-collected data, several historical-data-based quality checking criteria were developed based on discussions with GDOT's pavement maintenance engineers and have been implemented in both COPACES for Tablet and COPACES for Laptop. The developed programs have been successfully implemented in GDOT to collect the COPACES data for the fiscal year 2017. Future development and further implementation considerations are discussed and recommended.				
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Final Report

ENHANCING GDOT'S COMPUTERIZED PAVEMENT CONDITION
EVALUATION SYSTEM FOR PAVEMENT CONDITION SURVEY

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AADT   Annual average daily traffic

COPACES   Computerized Pavement Condition Evaluation System

CSV   Comma-separated values

FY   Fiscal year

GAMS   Georgia Asset Management System

GDOT   Georgia Department of Transportation

MR&R   Maintenance, rehabilitation, and reconstruction

OIT   Office of Information Technology

OM   Office of Maintenance

OTD   Office of Transportation Data

PACES   Pavement Condition Evaluation System

RC   Road characteristics

EXECUTIVE SUMMARY

The Computerized Pavement Condition Evaluation System (COPACES) has been an indispensable tool for the Georgia Department of Transportation (GDOT) to annually collect pavement condition distress data. The COPACES data is used by GDOT to make informed decisions on statewide pavement maintenance, rehabilitation, and reconstruction (MR&R).

To improve the productivity of field data collection, this project developed a new program, COPACES for Tablet, that runs on tablet computers with Windows 8.1 or Windows 10 and fully utilizes their convenience of finger–touch-based operations. Also, the previous version of COPACES that was released in 2008 and ran on Windows XP was upgraded to be compatible with the newer operating systems, i.e., Windows 7, 8.1, and 10. Though it is out of the scope of this project, two other programs, COPADQA and Upload, were also upgraded to be compatible with the newer operating systems because GDOT needs them to check the district-level COPACES data quality and integrate it with the central COPACES database.

To be consistent with GDOT's GAMS (Georgia Asset Management System), the state route lookup table in COPACES has been comprehensively cleaned up and updated. Also, the road characteristics (RC) data in COPACES was updated using the most up-to-date RC data provided by the Office of Information Technology.

To improve the efficiency of software installation and update, an approach to automatically updating programs, including COPACES for Tablet, COPACES for Laptop, COPADQA, and Upload, has been applied. The software setup packages are stored in

GDOT's web repository. Whenever an update is available, the software on a user's computer can be automatically updated.

Data quality is of the most importance in a data-driven pavement management system. Thus, data quality checking has been rigorously implemented in the previous version of COPACES. However, the historical data was not utilized for that purpose. In this project, several historical-data-based quality checking criteria were developed based on the discussions with GDOT's pavement maintenance engineers. These criteria were implemented in both COPACES for Tablet and COPACES for Laptop to enhance the field-collected data quality. Thus, the accuracy of the decision-making on pavement MR&R could also be improved.

The developed programs have been successfully implemented in GDOT to collect the COPACES data for the fiscal year 2017. GDOT has used the data to select statewide pavement maintenance projects and allocate funding.

Finally, future development and further implementation considerations are discussed and recommended.

ACKNOWLEDGEMENTS

CHAPTER 1   INTRODUCTION

1. Research Background and Research Need

The Computerized Pavement Condition Evaluation System (COPACES) and other
relative software tools have been used by the Georgia Department of Transportation
(GDOT) to conduct pavement condition survey, and manage and maintain its statewide
asphalt pavements since the late 1990s (RP 05-19: Tsai, et al. 2009; Tsai & Lai, 2001;
Tsai & Lai, 2002; Tsai, et al. 2008). It consists of three major components, including
data acquisition, data management, and decision support. FIGURE 1.1 shows the
programs to implement these three components.

As shown in FIGURE 1.1, COPACES is a laptop-based computer program used by the
Office of Maintenance (OM) in GDOT to conduct the statewide asphalt pavement
condition survey in accordance with GDOT's Pavement Condition Evaluation System
(PACES) manual (GDOT, 2007), which is the impetus for the following data
management and decision support.

The previous version of COPACES (released in 2008) ran on a laptop with Windows XP.
To improve the productivity, OM has adopted tablet computers to gradually replace
laptops. More importantly, the previous version of COPACES was developed using
Microsoft Visual Basic 6.0, which has become obsolete and abandoned by Microsoft.
The supported operating system, Windows XP, was also obsolete. As a result, the
previous version of COPACES has some compatibility issues with the newer Windows
operating systems, e.g., Windows 7, Windows 8.1, and Windows 10. Thus, there was a

need to upgrade the previous COPACES by re-writing it with the most up-to-date programming language. Through the discussion with GDOT, Microsoft C# was adopted to develop the new version of COPACES. In addition, to fully utilize the convenience of tablet computers, e.g. Microsoft Surface, a new version of COPACES needed to be developed by using touch-based input instead of mouse and keyboard.
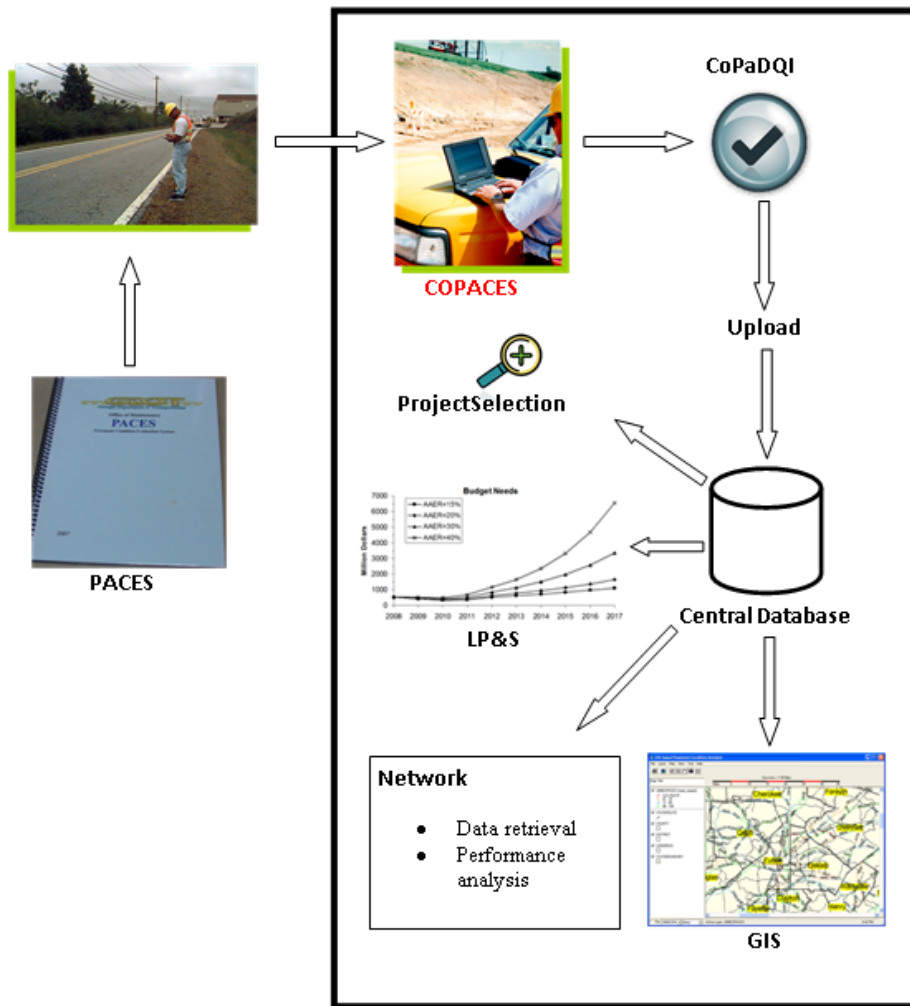
FIGURE 1.1: Major Programs for Pavement Management

Data quality is of the most concern in COPACES because it supports data-driven pavement maintenance decision-making (Tsai, et al. 2008). A systematic procedure for

checking COPACES data quality has been identified by GDOT pavement maintenance engineers to improve the quality of COAPCES data. Thus, there is a need to further enhance the data quality checking capability for field data collection using COPACES.

2. Research Objectives

The objective of this proposed project is to enhance GDOT's COPACES 1) to take full advantage of tablet computers for more productive data input and 2) to implement more rigorous in-field data quality checking.

The following are the originally proposed tasks:

1) Enhance COPACES by developing a tablet-based application;

2) Develop training materials and conducting training;

3) Enhance the field data quality checking for COPACES;

4) Summarize research findings and developing a final report.

Because OM started collecting COPACES data for the fiscal year (FY) 2017, the Georgia Tech research team closely worked with the OM Liaison Engineers (who oversee the statewide pavement condition survey and provide technical assistance to district and area engineers) and other district engineers to facilitate the data collection using the new version of COPACES. For this purpose, the following new tasks were added, though they are out of the scope of the original task orders:

1) A tablet-based application using finger-touch as the main input method is called a Windows Store App on Windows 8.1 or Windows 10. It is designed as a mobile application that directly communicates with online services. For safety concerns,

the Windows Store App has limited capability to access local files stored on hard drives. It cannot directly generate Microsoft Access database files as the previous version of COPACES could do. As shown in FIGURE 1.1, the output from COPACES will be used by COPADQA for district-level quality checking. Thus, a mechanism is needed to convert the output from the tablet-based COPACES to Microsoft Access database files. In addition, when OM started FY 2017 data collection, not everyone had a tablet computer running on Windows 8.1 or Windows 10. Instead, most of them were still using laptop computers running on Windows 7. Thus, they must use laptop-based COPACES. As mentioned above, the previous version of COPACES has some compatibility issues with Windows 7. It must be rewritten using the new programming language, Microsoft C#. Thus, two versions of COPACES (COPACES for Tablet and COPACES for Laptop) were developed in this project. COPACES for Tablet focuses on field data collection if a tablet computer is available. In the new version of COPACES for Laptop, some new functions were added to convert the output from COPACES for Tablet to Microsoft Access database files.

2) As shown in FIGURE 1.1, after COPACES data is collected, two other programs, COPADQA (COPACES Data Quality Assurance Program) and Upload, are needed before the data can be transferred and integrated into the central database to support the statewide project selection and funding allocation. COPADQA is responsible for performing district-level quality checking of the COPACES data collected by area offices in each working district. It will also combine all the data collected in each working district for uploading to the central database. The

Upload program is for uploading the collected COPACES data into the central database. Since the previous versions (released in 2008) of these two programs were also developed using Microsoft Visual Basic 6.0, they needed to be rewritten using the most up-to-date programming language, Microsoft C#. To facilitate OM's ability to complete the FY 2017 COPACES data collection, the Georgia Tech research team performed the system upgrade for COPADQA and Upload, even though doing so was not in the original task orders.

3) A COPACES survey is conducted on projects that are defined by RCLINK, along with starting and ending milepoints. During the project development, the Office of Information Technology (OIT) requested the routes in COPACES comply with the ones defined in GDOT's GAMS (Georgia Asset Management System); thus, the COPACES data can be conveniently migrated to the GAMS database. The Georgia Tech research team closely worked with OIT to acquire the most up-to-date projects from GAMS and converted them to the new version of COPACES, COPADQA and Upload.

4) In COPACES, a user needs to input road characteristics (RC) data for each project, such as AADT, truck percent, etc. However, most of the RC data is difficult to extract in field. To solve this issue, a lookup table that contains the RC data for each predefined route is embedded in the COPACES program. . The RC data is currently collected and maintained by the Office of Transportation Data (OTD) in GDOT. In this project, the Georgia Tech research team acquired the most up-to-date RC data from OIT and converted it to a COPACES lookup table.

5) When OM started to use the new version of COPACES (both laptop and tablet versions) to conduct FY 2017 data collection, it was found that the previous software distribution process in GDOT was inefficient when problems were encountered. In the previous software distribution process, when a user in an area office encountered a problem, he reported it to the district engineer. Then, the district engineer reported it to a Liaison Engineer, and then to the Georgia Tech research team. After the problem was solved, a new setup package would be developed and submitted to OM. OM would send the software to OIT and then to each working district. The IT personnel in each working district would perform the software update for each user in area offices. This process was very time-consuming. More importantly, some users might forget to update the software, which caused the problem of some of the versions of same software not being consistent among different users. To solve this issue and make it more efficient for OM to conduct the FY 2017 data collection, a new software distribution and update mechanism were developed in which software setup packages are centrally stored on OIT's server. When any update is available, the software on a user's computer will be automatically updated.

3. Report Organization

This report is organized into four chapters. Chapter 1 introduces the project background, need, objective, and tasks. Chapter 2 introduces the COPACES for Laptop program. Chapter 3 presents the COPACES for Tablet program. Chapter 4 summarizes the project

implementation and offers recommendations for future development and further implementation.

References

GDOT. "Pavement Condition Evaluation System." Georgia Department of Transportation, 2007.

Tsai, Y. and J. S Lai. "Utilization of Information Technology to Enhance Asphalt Pavement Condition Evaluation Program." The International Journal of Pavement Engineering, Vol. 2(1), pp.17-32, 2001.

Tsai, Y. and J. S. Lai. "A Framework and Strategy for Implementing An IT-based Pavement Management System." Transportation Research Record: Journal of Transportation Research Board, No. 1816, TRB, National Research Council, Washington, D.C., 2002, pp. 56-64, 2002.

Tsai, Y., Wang, Z., and Purcell, R. "Improving GDOT's Highway Pavement Preservation", Final Report, Georgia Department of Transportation, 2009.

Tsai, Y., Wu, Y., and Pitts, E. "Improving GDOT's Annual Preventive Maintenance Using a Collaborative Decision Support System." 7th International Conference on Managing Pavement Assets, 2008

CHAPTER 2   COPACES FOR LAPTOP

This chapter presents the development of COPACES for Laptop. The major functions of this program are the same as the previous version of COPACES that was released in 2008. However, the entire program was rewritten using the new programming language, Microsoft C#. Some new functions were added to convert the output from COPACES for Tablet to Microsoft Access database files that can be used by COPADQA. The development of COPACES for Tablet will be presented in Chapter 3. In addition, the embedded lookup tables for all state routes were updated to comply with GDOT's GAMS. RC data was also updated using the most up-to-date data provided by OIT.

1. System Architecture

In this project, four programs were developed: COPACES for Laptop, COPACES for Tablet, COPADQA, and Upload. To reduce the resource use for system development, this project did not change the entire system architecture, as shown in FIGURE 1.1. Instead, only the previous COPACES program was replaced by COPACES for Laptop and COPACES for Tablet to make it convenient for both Windows 7 users using laptops and Windows 8.1/Windows 10 users using tablet computers. COPADQA and Upload have the same functions as the previous versions that were released in 2008, but they were rewritten using C# to be compatible with Windows 7 or newer Windows operating systems. FIGURE 2.1 shows the relationship and information flow of these four programs.

As shown in FIGURE 2.1, Windows 7 users who use laptops can only use COPACES for

Laptop to collect data in the field. For Windows 8.1/10 users who use tablet computers,

both COPACES for Laptop and COPACES for Tablet are needed. In the field,

COPACES for Tablet is used for data collection. After that, the output from COPACES

for Tablet will be converted to Microsoft Access database files using functions in

COPACES for Laptop. The Access database files created by COPACES for Laptop will

be fed into COPADQA for district-level quality checking and combining. Finally, the

output from COPADQA will be uploaded to the central COPACES database using the

Upload program.
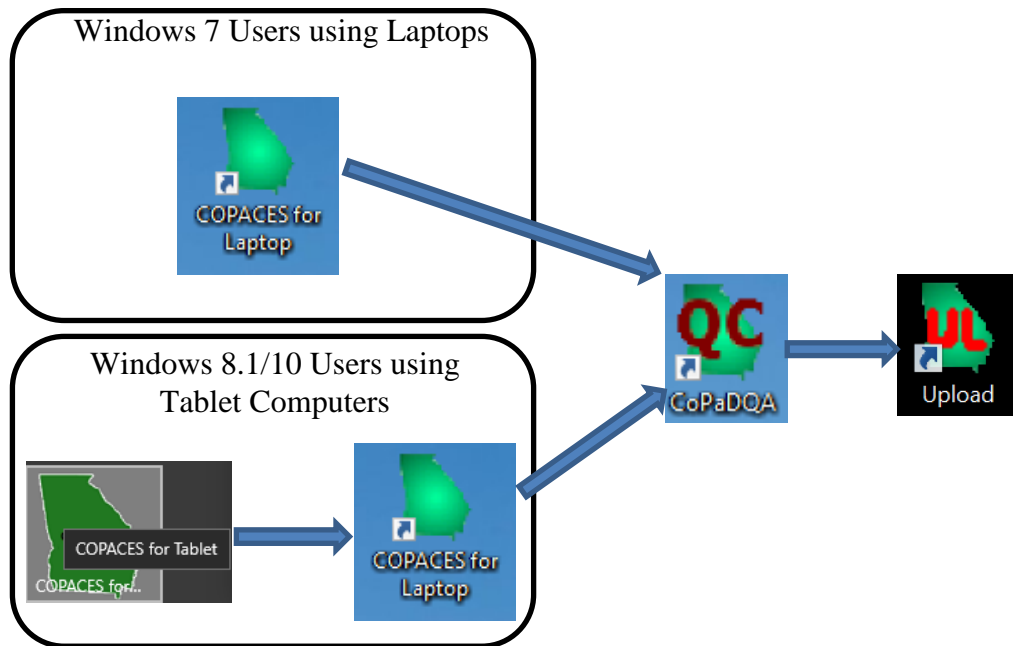
FIGURE 2.1: System Architecture of Four Programs

The following sections in this chapter introduce the new state route lookup table, the

major functions, and operation flow of COPACES for Laptop.

2. Update of Route and RC Lookup Tables

During the project development, OIT in GDOT requested that the state routes in COPACES should be consistent with the ones defined in GDOT's GAMS; thus, COPACES data can be conveniently migrated to GAMS. After several meetings with OIT, the Georgia Tech research team acquired the list of all the state routes defined by RCLINK and milepoints.

The lookup table of all the state routes is important to make sure the spatial definition of each COPACES project is consistent over time. In the central COPACES database, there exists data back to FY 1986. Thus, after discussion with OM engineers, it was decided to create a list of state routes that contains both the original routes and the updated routes from GAMS (the complete list of state routes can be found in Appendix I). For this purpose, a careful comparison between the existing and new state routes was performed. The following differences were identified:

1) In the existing list of state routes, each route is identified by a single RCLINK, along with starting and ending milepoints. When a route goes out of a county and back to the same county, the route is not split even if some portion of the route has different RCLINK data. In contrast, a route will be split into two or more routes if it goes out of and back to the same county in GAMS. As illustrated in FIGURE 2.2, a route in County 1 goes to County 2, as indicated in red, then back to County 1. Because RCLINK changes when the county changes, the red portion of this route has a different RCLINK. However, in the existing COPACES state route lookup table, this route is defined as the RCLINK in County 1 along with

MP-1 and MP-4 as the starting and ending milepoint, respectively. The rater will

add the red portion of this route to the same project with different RCLINK data,

along with MP-2 and MP-3. In GAMS, this route is split into two routes, as

shown in FIGURE 2.2. If a route goes out of and back to the same county several

times, it will be split into more than two pieces. TABLE 2.1 lists all routes that

are split in GAMS.
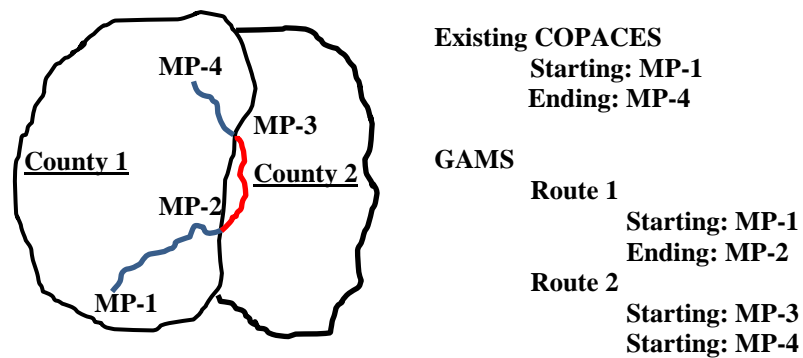
FIGURE 2.2: State Route Cross Several Counties

TABLE 2.1: List of Split Routes

CountyNo	RouteNo	RouteSuffix	Existing COPACES		GAMS LRS	
			MilepostFrom	MilepostTo	MilepostFrom	MilepostTo
047	0001	00	0	9.99	0	1.36
					8.23	9.65
243	0001	00	0	22.85	0	22.72
					23.22	23.34
259	0001	00	0	23.15	0	0.54
					0.62	23.12
295	0001	00	0	31.03	20.46	27.33
					0	19.1
					28.75	30.64
123	0002	00	0	26.24	0.89	26.25
					0.57	0.75
213	0002	00	0	32.73	32.63	32.73
					32.08	32.48

			Existing COPACES		GAMS LRS	
CountyNo	RouteNo	RouteSuffix	MilepostFrom	MilepostTo	MilepostFrom	MilepostTo
					0	31.88
249	0003	00	0	16.12	0.47	15.7
					0	0.47
121	0006	00	0	12.05	11.83	12.06
					0	11.51
121	0014	00	0	25.08	16.64	25.09
					0	16.26
119	0017	00	0	16.33	0	4.35
					7.47	16.29
147	0017	00	0	13.59	10.5	13.61
					0	6.17
145	0018	00	0	12.84	0	0.41
					0.41	12.69
001	0019	00	0	3.04	0	0.3
					2.04	3.05
161	0019	00	0	18.5	2.74	18.36
					0	1.73
107	0026	00	0	35.3	0	0.44
					1.78	35.38
167	0026	00	0	6.52	0	4.67
					5.11	6.45
037	0037	00	0	25.85	0	0.38
					0.68	25.75
061	0037	00	0	14.59	14.25	14.55
					0	13.87
037	0041	00	0	5.71	0	5.15
					5.69	5.81
243	0041	00	0	22.55	0.67	22.38
					0	0.55
089	0042	00	0	13.87	0	3.08
					9.12	13.92
175	0046	00	0	16.32	0	15.4
					16	16.35
309	0046	00	0	5.81	0	0.6
					0.95	5.76
019	0064	00	0	13.38	9.23	13.34
					0	3.1
173	0064	00	0	15.08	0	6.13
					10.24	15
121	0070	00	0	28.83	0	16.97

CountyNo	RouteNo	RouteSuffix	Existing COPACES		GAMS LRS	
			MilepostFrom	MilepostTo	MilepostFrom	MilepostTo
					22.63	33.47
189	0080	00	0	1.76	0	0.87
					0.92	1.69
301	0080	00	0	25.06	24.13	24.87
					0	23.27
023	0087	00	0	15.01	1.76	15.15
					0	0.87
091	0087	00	0	29.13	0	27.31
					28.18	29.07
067	0092	00	0	29.99	28.56	29.63
					6.57	14.01
					0	2.12
121	0092	00	0	74.69	69.88	74.87
					0	14.2
223	0092	00	0	18.56	13.89	18.35
					0	11.77
079	0096	00	0	3.92	3.45	4.19
					0	2.75
225	0096	00	0	14.98	1.44	15.07
					0	0.7
045	0113	00	0	17.37	0	13.44
					17.07	17.25
143	0113	00	0	5.39	3.81	5.37
					0	3.63
063	0138	00	0	12.56	0	10.56
					11.78	12.66
151	0138	00	0	10.79	0	1.19
					1.98	10.75
121	0141	00	0	21.04	0	2.32
					15.61	21
121	0154	00	0	33.68	17.13	36.28
					0	9.9
151	0155	00	0	23.85	0	19.16
					21.01	23.83
083	0157	00	0	20.04	20.27	20.34
					16.36	20.05
					0	1.52
295	0157	00	0	33.35	31.47	33.28
					12.62	27.5
					31.19	31.4

CountyNo	RouteNo	RouteSuffix	Existing COPACES		GAMS LRS	
			MilepostFrom	MilepostTo	MilepostFrom	MilepostTo
					0	11.1
091	0165	00	0	29.48	0	26.71
					27.99	29.42
107	0171	00	0	10.4	9.65	10.43
					0	9.53
167	0171	00	0	13.4	0	0.12
					0.9	13.33
299	0177	00	0	18.64	0	4.27
					6.88	18.57
083	0189	00	0	15.15	0	2.22
					2.75	15.03
295	0189	00	0	13.34	0	0.52
					12.81	13.43
199	0190	00	0	7.95	0	3.66
					7.78	8
159	0212	00	0	22.97	1.71	22.93
					0	0.5
					0.7	1.15
217	0212	00	0	16.71	15.46	15.66
					16.11	16.67
					0	14.96
197	0240	00	0	18.44	0.64	18.54
					0	0.17
263	0240	00	0	3.12	0	2.55
					2.73	3.2
137	0255	00	0	14.16	10.17	14.12
					0	4.48
311	0255	00	0	15.68	9.98	15.68
					0	5.54
061	0266	00	0	7.02	0	6.62
					6.92	7.58
243	0266	00	0	11.27	0	0.3
					0.97	11.63
107	0297	00	0	14.66	0	0.76
					6.43	14.69
197	0355	00	0	17.7	2.17	17.67
					0	1.37
063	0403	00	0	1.36	0	1.36
					1.79	2.03
121	0403	00	0	31.27	0	13.39

CountyNo	RouteNo	RouteSuffix	Existing COPACES		GAMS LRS	
			MilepostFrom	MilepostTo	MilepostFrom	MilepostTo
					14.75	15.17
					15.41	31.16
121	0407	00	0	62.66	60.62	62.66
					53.03	54.69
					0	13.22
					20.82	26.71
177	0520	00	0	7.35	1.38	6.7
					0	0.61
273	0520	00	0	23.83	0	22.43
					23.04	23.81

2) After careful comparison, it was found that 19 routes from GAMS don't exist in the existing COPACES lookup table. In the meantime, 39 routes in the existing COPACES lookup table were not found in GAMS. To maintain the data consistency, all these routes are now added to COPACES for Laptop as well as the other three programs that will be presented in the following chapters. These two categories of routes are listed in TABLE 2.2 and TABLE 2.3, respectively.

TABLE 2.2: List of Routes in GAMS Only

COUNTY	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
015	0003	CO	0	4.77
015	0113	CO	0	0.35
015	1000	00	0	3.3
077	0016	NO	0	0.63
097	0008	CO	0	0.39
097	0154	00	0	5.64
141	0016	WE	0	0.05
143	0100	SP	0	0.9
151	0920	CO	0	0.2
151	0920	WE	0	0.27
151	0921	CO	0	0.05
173	0038	WE	0	1.29
185	0007	SB	0	0.45
199	0100	SO	0	0.12

275	0035	CO	0	1.15
279	0015	EA	0	0.72
279	0029	EA	0	0.72
279	0030	WE	0	1.31
305	0038	WE	0	2.08

TABLE 2.3: List of Routes in GAMS Only

CountyNo	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
019	0076	CO	0	0.11
019	0158	00	0	5.43
027	0033	00	0	3.06
067	0005	SO	0	0.81
067	0120	LO	0	8.61
067	0176	00	0	14.95
077	0016	SO	0	0.63
113	0138	00	0	1.13
121	0014	SP	0	2.42
131	0038	SP	0	0.85
131	0262	00	0	7.53
137	0365	00	0	17.91
141	0016	SO	0	0.09
151	0020	DU	0	0.05
153	0329	00	0	0.99
157	0052	00	0	4.63
163	0004	BN	0	0.1
167	0086	00	0	1.67
173	0037	CO	0	0.04
175	0029	WE	0	0.11
179	0119	SO	1.73	2.93
185	0007	SO	0	0.45
185	0031	SO	0	0.48
185	0094	WE	0	0.73
187	0009	BU	0	1.21
187	0009	SO	0	0.06
187	0052	BU	0	1.21
187	0052	SO	0	0.06
187	0060	SB	0	0.06
211	0186	00	0	0.65
217	0036	SO	0	0.39
225	0011	00	0	0.1
225	0127	00	0	0.52

CountyNo	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
235	0011	EA	0	0.28
245	0056	SP	0	6.58
269	0090	CO	0	0.07
273	0041	00	0	2.4
275	0035	BU	0	5.51
301	0223	00	0	0.7
319	0018	SP	0	0.65

Other than the state route data, the lookup table for RC data was also updated because the traffic data, i.e., AADT and truck percent, was outdated in the existing COPACES program. Working with OIT in GDOT, the Georgia Tech research team acquired all the up-to-date RC data, which was converted to the lookup table in COPACES. TABLE 2.4 lists the definition of each field in the RC lookup table in COPACES.

TABLE 2.4: Data Dictionary of RC Lookup Table

Column Name	Description
ID	An automatic number starting from 1
District	A one-digit number indicating GDOT's construction district where the inventory data is located. 1 1st District 2 2nd District 3 3rd District 4 4th District 5 5th District 6 6th District 7 7th District
RouteType	It is a one-digit number. The following is the definition of each code. **Route Type** **CODE** State Route 1 County Road 2 City Street 3 Ramp 6 Private Road 7 Public Road Non Accepted Road 8 Collector-Distributor 9
RouteNo	Four-digit number for each road. Example: SR 3 is 0003; CR 361 is 0361.
RouteSuffix	A two-digit number. For State Route or County Road 00 (Numeric Zero Zero) None of the following NO NOrth SO SOuth

Column Name	Description
	EA EAst WE WEst AL ALternate BY BYpass BU BUsiness SP SPur CO COnnector LO LOop TO TOll EA EAst Spur DU DUal Mileage* AD Alternate Dual* BD BUsiness Dual* BC Bypass Connector* CD Connector Dual* SD Spur Dual* BN Business North
RouteSequence	Not used; blank
Shoulder1	For divided highway, it is the left shoulder width in feet in the direction of inventory For undivided highway, it is the left shoulder width in feet on the opposite direction of inventory
Surface1	For divided highway, it is the total width of travel lanes in feet in the direction of inventory For undivided highway, it is the total width of travel lanes in both directions of inventory
Shoulder2	For divided highway, it is the right shoulder width in feet in the direction of inventory For undivided highway, it is the right shoulder width in feet in the direction of inventory
Shoulder3	Only used for divided highway. It is the left shoulder width in feet on the opposite direction of inventory
Surface2	Only used for divided highway. It is the total width of travel lanes in feet on the opposite direction of inventory
Shoulder4	Only used for divided highway. It is the right shoulder width in feet on the opposite direction of inventory
SurfaceType1	For divided highway, it is the surface type in the direction of inventory. For undivided highway, it is the surface type in the both directions of inventory. It is a single character defined as follows: A Unpaved Primitive Road B Unpaved unimproved road C Unpaved Graded and drained road D Unpaved Soil - surfaced road E Unpaved Gravel and Stone F Paved Bituminous surfaced treated G Paved Mixed bituminous pavement I Paved High Flexible J Paved High rigid K Paved Brick L Paved Block N Not Divided
SurfaceType2	Only used for divided highway, it is the surface type on the opposite direction of inventory.

Column Name	Description
	It is a single character defined as follows: A Unpaved Primitive Road B Unpaved unimproved road C Unpaved Graded and drained road D Unpaved Soil - surfaced road E Unpaved Gravel and Stone F Paved Bituminous surfaced treated G Paved Mixed bituminous pavement I Paved High Flexible J Paved High rigid K Paved Brick L Paved Block N Not Divided
AADT	The current Average Annual Daily Traffic (AADT) for the route segment.
STAA	One character for designated truck route. The definitions are as follows: A- Designated Access Routes for oversize trucks allowing single and twin trailers. B- Designated Access Routes for oversize trucks allowing single trailers only. C- Designated Access Routes for oversize trucks routes allowing twin trailers only. D- All Interstate Routes. E- Designated Local truck route. T- Federally Designated National Network Truck Routes other than Interstate
Truck	Calculated percentage of truck volume on the highway system
CountyNo	County FIPS Code (three digits)
MilepostFrom	The starting milepoint of inventory road segment
MilepostTo	The ending milepoint of inventory road segment
TL_R	Number of Lanes in the direction of Inventory
TL_L	Number of Lanes on the opposite direction of inventory
Field23	Reserved; blank
Field24	Reserved; blank
Field25	Reserved; blank
Field26	Reserved; blank
Field27	Reserved; blank

3. Operation Flow

In this subsection, the system's operational flow and some major functions are presented. FIGURE 2.3 lists the major steps for operating COPACES for Laptop for Windows 7 users. The introduction of the data conversion from COPACES for Tablet will be presented in the next chapter.
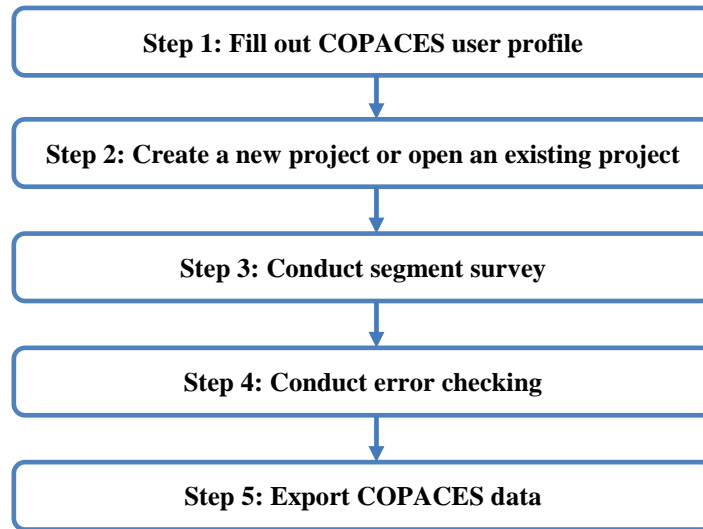
FIGURE 2.3: Operation Flow of Using COPACES for Laptop

3.1 COPACES User Profile

The COPACES User Profile form will pop up when COPACES for Laptop launches as shown in FIGURE 2.4. The Fiscal Year box is automatically filled based on the current date. Other boxes, Rater, District, and Office, need to be filled. After that, a Microsoft Access database file will be automatically generated. The naming convention of this database file is "FY{current fiscal year}_D{district number}_{office number}_{rater}.accdb." The texts in the curly parentheses need to be replaced with the actual content. For example, when user JS in District 1, Area Office 1 fills the form, a database file named FY2018_D1_A1_JS.accdb will be generated and stored in the folder of COPACES\Data\FY2018 in the "My Documents" folder. For a user, the user profile needs to be filled once in each fiscal year. The program will memorize the last input. After the user profile information is filled, the user clicks **OK** to proceed.

FIGURE 2.4: COPACES User Profile

3.2 Project Information

COPACES data is organized by projects. As defined in GDOT's PACES manual, "a project is a length of a roadway with a common pavement section, similar structural conditions, and logical beginning and ending points." When a rater starts a pavement condition survey, the information of the project needs to be filled.

As shown in FIGURE 2.5, two categories of project-related information need to be input: location information and RC data. For a project location, all RCLINK-related information, e.g., route type, route number, route suffix, and county name, along with the starting and ending milepoints (it is shown as "Milepost" on the Project Information form), is included. As shown in FIGURE 2.2, if a project goes out of the county, the additional county name and milepoints need to be input. In COPACES for Laptop, a project can cover up to three counties.

FIGURE 2.5: Project Information

RC data can be automatically extracted from the lookup table based on the input project

location information by clicking **RC Info**. However, if some items are missed, they need

to be manually input. After project information is filled, **Save** is clicked, and then

Segment Info is clicked to start the pavement condition survey on segments.

3.3 Pavement Condition Survey on Segments

For rating purposes, a project is divided into several segments, each of which is about one-mile long except the beginning and ending ones. FIGURE 2.6 shows the survey form for the first segment of the project defined in FIGURE 2.5.

FIGURE 2.6: Pavement Condition Survey on Segment

Based on GDOT's PACES manual, cracking distress (load, block/transverse, and reflection cracking) is only rated on a 100-foot sample location, which should represent the majority of the cracking distresses found in the rating segment. As suggested by the PACES manual, the 100-foot section is selected by a rater and can be located anywhere within the rating segment. Normally, a rater should drive slowly, make two or three stops within the first half of the rating segment, and look at the pavement from the car to

24

determine the type of cracking distress and the level of severity that are present. The 100-foot sample section can then be selected after the rater knows the overall pavement condition. In the **Sample Location** box, a number between 0 and 9 can be input. For example, 6 means the 100-foot sample location is selected between 0.6 ~ 0.7 miles of this segment.

Based on the definitions in the PACES manual, ten types of distresses need to be input. However, if a type of distress doesn't exist, it should be left blank. The program will perform real-time error checking when distress data is entered. For example, each **%** box needs a number between 0 ~ 100. If the input is out of the range, an error message will pop up. The real-time error checking significantly improves the data quality.

After the current segment survey is entered, **Save** is clicked and then **Add** to conduct the survey on the next segment.

3.4 Error Checking

When a rater completes the entire pavement condition survey and is ready to submit the data to a district engineer for district-level data quality checking using COPADQA, a comprehensive error check should be performed. Unlike the real-time error check introduced in Section 3.3, these error checking functions mainly focus on checking data completeness and data consistency. FIGURE 2.7 shows functions for error checking:
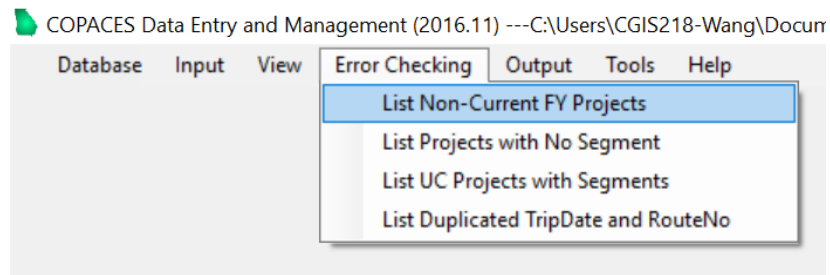
FIGURE 2.7: Error Checking

1) **List Non-Current FY Projects**

   This function checks if the current database file contains any projects that are not
   in the current fiscal year. This could happen if a rater starts a pavement condition
   survey using the data in the previous fiscal year. If the trip date is not updated by
   clicking **Now** in FIGURE 2.5, the corresponding project would have an old date.
   If any error is found using this function, it should be corrected before submission.

2) **List Projects with No Segment**

   This function checks if there is any normal project in the current database without
   a segment in it. The status of a project could be "Normal" or "Under
   Construction," which can be set using the **Status** box as shown in FIGURE 2.5.
   For a normal project, there should be at least one segment in it. Otherwise, it
   should be discarded or be added with a segment survey.

3) **List UC Projects with Segments**

   This function checks if an under-construction project has any segments in it or not.
   In GDOT, no pavement survey will be done on an under-construction project.

4) **List Duplicated TripDate and RouteNo**

26

In the database file, the trip date and route number of a project are used as a combined primary key to identify a unique project. If there are two or more projects that have the same trip date and route number, the uniqueness criteria will be violated.

When all errors, if any, are corrected, the database file is ready to be submitted to a district engineer. During the project development, it was found some raters forgot to conduct the above error check, which caused running COPADQA for district-level data quality checking and combining to fail. The database file had to be returned to the rater for correction.

3.5 Submission of Completed COPACES Database File

As a final step, a rater will submit the completed COPACES database file to the district engineer for district-level quality checking and combining with other raters' data files. The function can be accessed from the **Database** menu as shown in FIGURE 2.8.
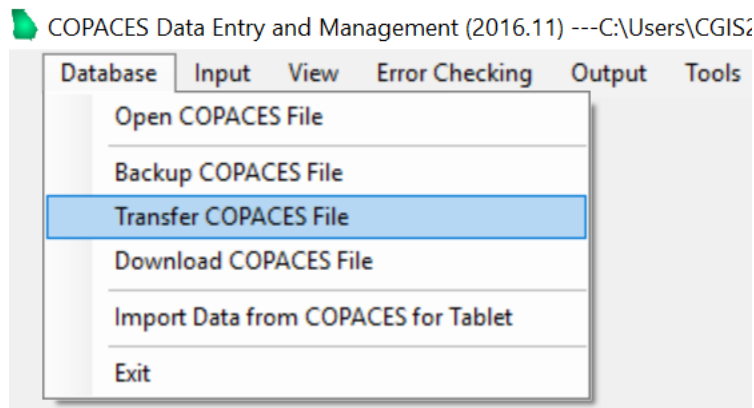
FIGURE 2.8: Data Transfer Function

After the **Transfer COPACES File** menu item is clicked, a message box will pop up to ask if the survey is completed and error checking is done. If the survey is incomplete or error checking is not conducted, the database file should not be submitted.
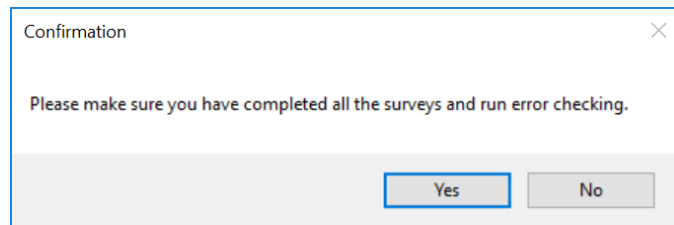
FIGURE 2.9: Confirmation on Data Completeness and Error Checking

If **Yes** is confirmed in the above message box, the database file can be saved on a user-designated drive and folder, which is ready to be submitted to the district engineer.

4. Automatic Software Update

Software delivery is an important process to make sure each user has the most up-to-date version. The Georgia Tech research team started this project shortly before OM started its FY 2017 COPACES data collection. Thus, the first version of COPACES for Laptop was quickly completed for raters to collect data, which caused inevitable program bugs. In addition, the change of state route and RC lookup tables also interrupted the use of the first version of COPACES for Laptop. Each time the program needed to be modified, the software delivery process had to be evaluated to ensure each user had the most up-to-date version.

FIGURE 2.10 shows the original software delivery and feedback process. After a new version of the software was ready, it would be submitted to OM. Then, it would be

passed to OIT. The designated IT personnel in OIT would disseminate the software to each working district. Finally, the raters in area offices needed to drive to the district office to have the software installed on their computers. This process was time-consuming, taking approximately two weeks. The feedback process was much faster. When an issue was identified, a rater normally reported it to the district engineer. Then, the Liaison Engineers in OM contacted the Georgia Tech research team. At the early stages of the software implementation, this process had to be often used. Due to the slow software delivery process, the data collection process was severely slowed down. More importantly, because a rater needed to go to the district office to install the software, some raters may have forgotten to update the software for various reasons. The inconsistency of software versions among raters eventually degraded the quality of the collected data.

```
┌─────────────────────┐
│    Georgia Tech     │
└─────────────────────┘
┌─────────────────────┐
│      GDOT OM        │
└─────────────────────┘
┌─────────────────────┐
│      GDOT OIT       │
└─────────────────────┘
┌──────────────┐   ┌──────────────┐
│ GDOT District│   │ GDOT District│
│  IT Support  │   │   Engineer   │
└──────────────┘   └──────────────┘
┌─────────────────────┐
│ GDOT Area Office    │
│      Raters         │
└─────────────────────┘
```
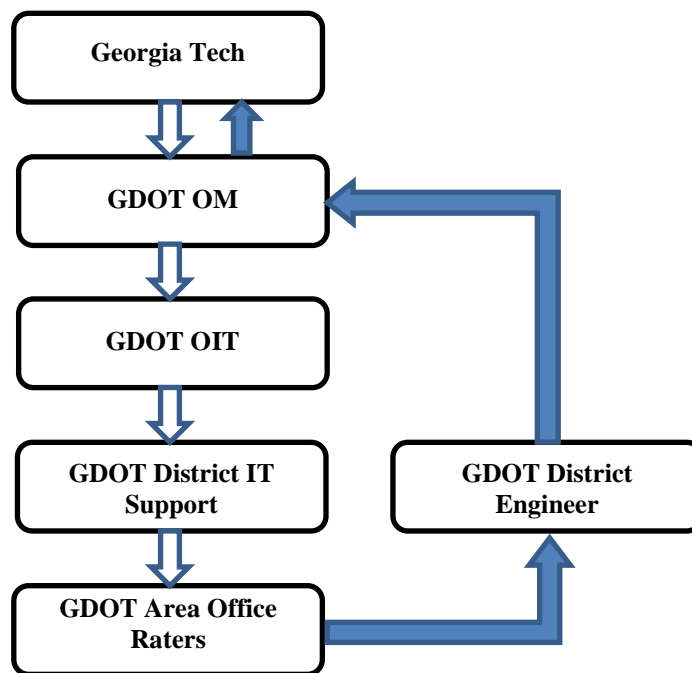
FIGURE 2.10: Previous Software Delivery Process

To solve the above issue, the Georgia Tech research team closely worked with OIT and devised a solution using automatic update functions. First, the setup package of COPACES for Laptop was developed using Microsoft ClickOnce; this Microsoft technology enables a user to install and run a Windows-based smart client application by downloading it from a web repository. Second, OIT helped to generate a web repository, http://software.dot.ga.gov/COPACESLaptop/, to store the ClickOnce setup files. During the first installation, the light-weight "setup.exe" file was sent to district offices for installation.   During the installation, the major program was downloaded from the web repository, which makes the size of the setup.exe file very small (only 575KB). In future software updates, there is no need to disseminate the setup file to district offices. After GDOT OIT receives a software update, a designated IT person will replace the files in the web repository using the new update. In the meantime, when a rater launches COPACES for Laptop and the computer has access to the internet, the program will automatically detect software updates and prompt the engineer to complete the software update process. The above process is illustrated in FIGURE 2.11. In comparison with the process in FIGURE 2.10, the four-step software delivery process was reduced to essentially one step because the raters don't need to ask for software updates because of the automatic update functions (indicated by the dotted arrow in FIGURE 2.11.
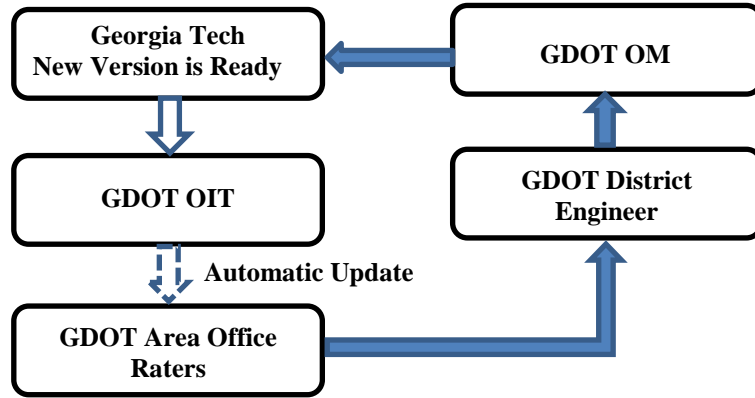
FIGURE 2.11: Software Delivery Process with Automatic Update

CHAPTER 3   COPACES FOR TABLET

Since the last release of COPACES in 2008, more easy-to-carry tablet computers have become available. Compared to the use of a tablet computer, it is inconvenient to use a laptop for collecting pavement condition data in the field. To improve the productivity of a field pavement condition survey, the engineers in OM have gradually adopted tablet computers. However, even though the original laptop-based COPACES program can run on a tablet computer if the operating system is compatible, the user experience has been poor because of the use of a keyboard and a touchpad on a smaller screen (the size of a tablet computer screen is normally less than 12 inches). A user may operate a laptop-based COPACES program using finger touch, but it is difficult because the controls and buttons are designed for mouse and keyboard. Thus, to fully utilize the convenience and productivity of a tablet computer, there is a need to develop a new COPACES program that can be operated using finger touch. The current Windows operating system (Windows 8.1 or Windows 10) provides two modes: the desktop mode and tablet mode. Under the desktop mode, only the classic programs (like COPACES for Laptop) can run; the program running the tablet mode uses different resources of the operating systems, but it provides full capability of finger-touch operations. Based on discussions with the engineers in OM, the new COPACES program (named COPACES for Tablet) is designed to run in the tablet mode; an end user can operate it using finger touch.

1. System Design

This section introduces the system design of COPACES for Tablet.

1.1 Main Functions

COPACES for Tablet includes four main functions:

1) **Creating New Project**: In creating a new project page, a user can create a new project and corresponding new segments in the corresponding district and area offices.

2) **Modifying Existing Project**: A user can review and modify any existing project. A user may also change a project's key information, such as "route number," but it will lead to creating a new project, which is not recommended.

3) **Loading Data from Previous Year**: A user can import the data from previous fiscal years as templates. These imported data are originally marked as "TODO" items until they are edited and saved. In FY 2017, due to the changes in the state route lookup table (see Chapter 2), no previous data should be used as templates. Thus, each project will be surveyed from scratch.

4) **Export Data**: Under the tablet mode, the survey data cannot be exported and saved as a Microsoft Access database file. As a remedy, COPACES for Tablet exports survey data in csv format. However, as mentioned in Chapter 2, a user needs to use COPACES for Laptop to convert it into an Access database file that can be submitted to a district engineer.

FIGURE 3.1 shows the program operation diagram.

1.2 Internal Data Storage

COPACES for Tablet is a Windows Store application, built on the Windows 8.1 Development Toolkit (it can also run in Windows 10). It uses an SQLite database as an

internal data storage format, stores data in local user app packages folder (FIGURE 3.2)

named "copaces." A user may open this database file using other software to check the

data directly (e.g. DB Browser). The file path is also shown on the start page of the

program.
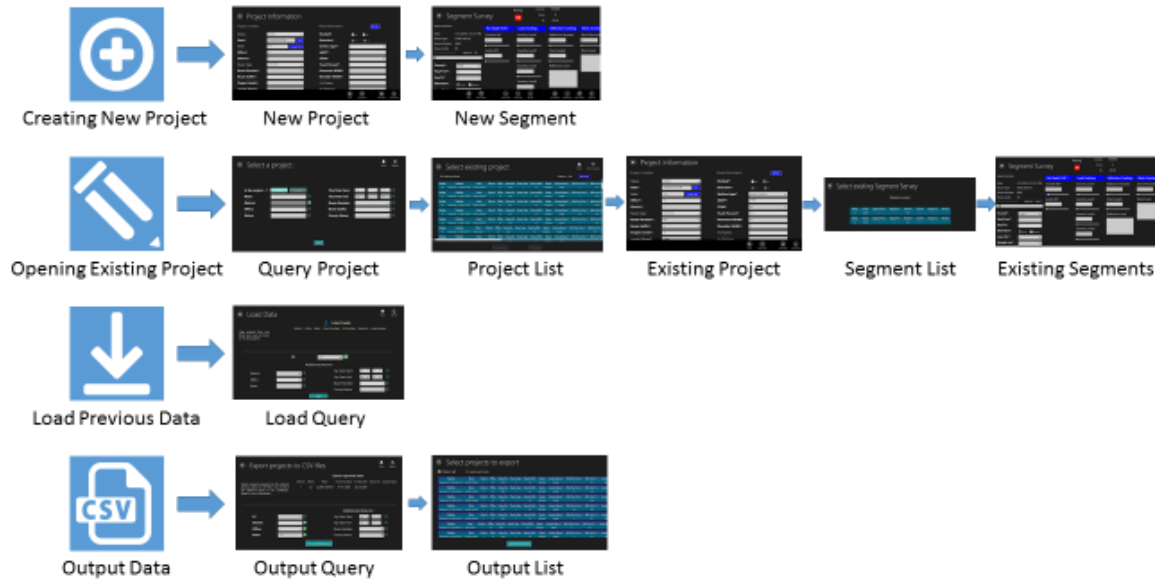
FIGURE 3.1: Program Operation Diagram

By default, this database contains 10 data tables inherited from the original COPACES

software that was released in 2008. These 10 data tables are "tblCounty," "tblRoute,"

"tblpaces," "tblRouteSuffix," "tblRouteType," "tblRCLink," "tblPrjLocat,"

"tblPrjSurvey," "tbSegInfo," and "tblSegSurvey."
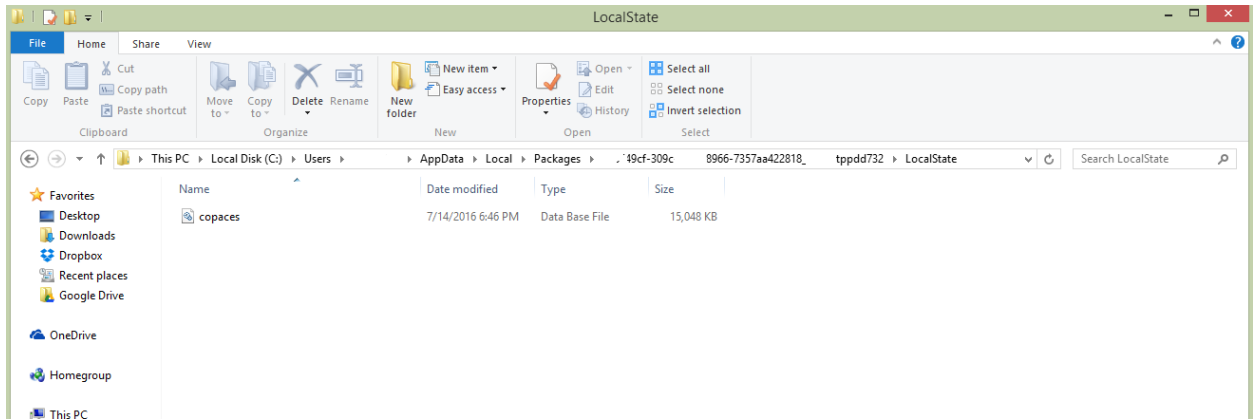
FIGURE 3.2: Internal Database File

2. Operations of COPACES for Tablet

This section presents all the major functions provided by COPACES for Tablet.

2.1 COPACES User Profile

Like COPACES for Laptop, a user profile is needed for COPACES for Tablet, which is found on the first page when the program is launched (see FIGURE 3.3). While the fiscal year number is automatically filled, users need to type in their name and select their current district and office. No user name or password is required.

At the bottom, two file paths are shown. The one in the larger font indicates the output file's location with a file name sample when it is exported. By default, this is in the "Downloads" folder. The other path is the location of the internal database file on a local tablet computer. The file is named "copaces.db." A user can read it using third-party software, such as "DB Browser," to check the data directly.

Clicking **OK** will navigate to the main page.
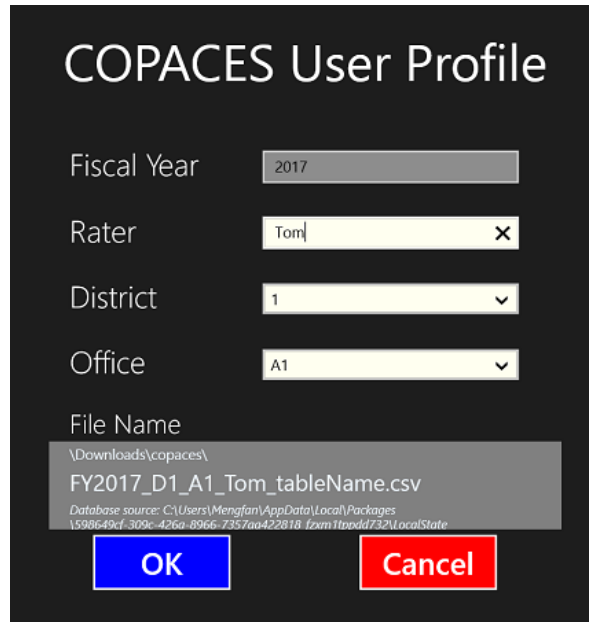
FIGURE 3.3: COPACES User Profile

2.2 Functions on Main Page

From the main page, a user can start any of the four main functions of the program by

tapping on the item using finger touch, as shown in FIGURE 3.4.
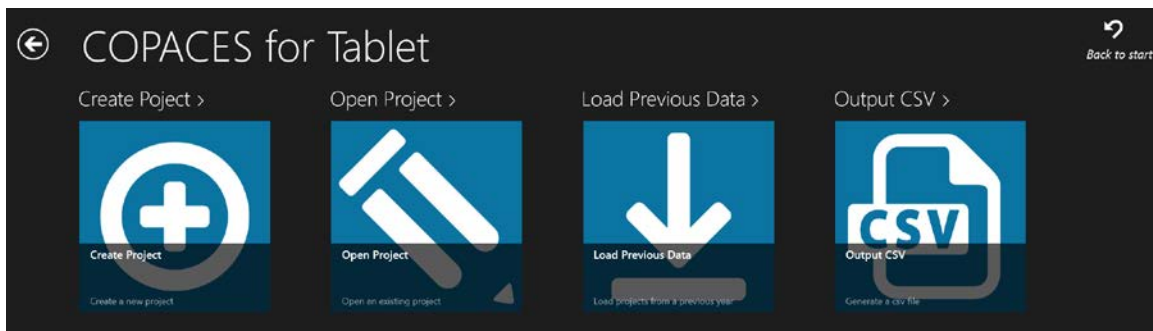
FIGURE 3.4: Layout of Functions on Main Page

2.3 Creating New Project

By clicking **Create Project** on the main page, a user is led to a new page, as shown in FIGURE 3.5. On this page, a user can create a new project with a unique date and time. This page is divided into two parts: "Project Location" and "Road Information." A user should fill in all necessary fields in the project location part before editing road information.

FIGURE 3.5: Creating New Project Page

FIGURE 3.6 shows all the items for the project information. Once a new project page is opened, several fields will be automatically filled. **Date** is always the current date . If one wants to update it, **NOW should be clicked on**, and an updated date and time will be filled. Rater, office and district are filled with the information the user has provided on the start page, which is not editable. The **Change Rater** button is only used when a user opens an existing project and the rater is not the user.

FIGURE 3.6: Project Location Information
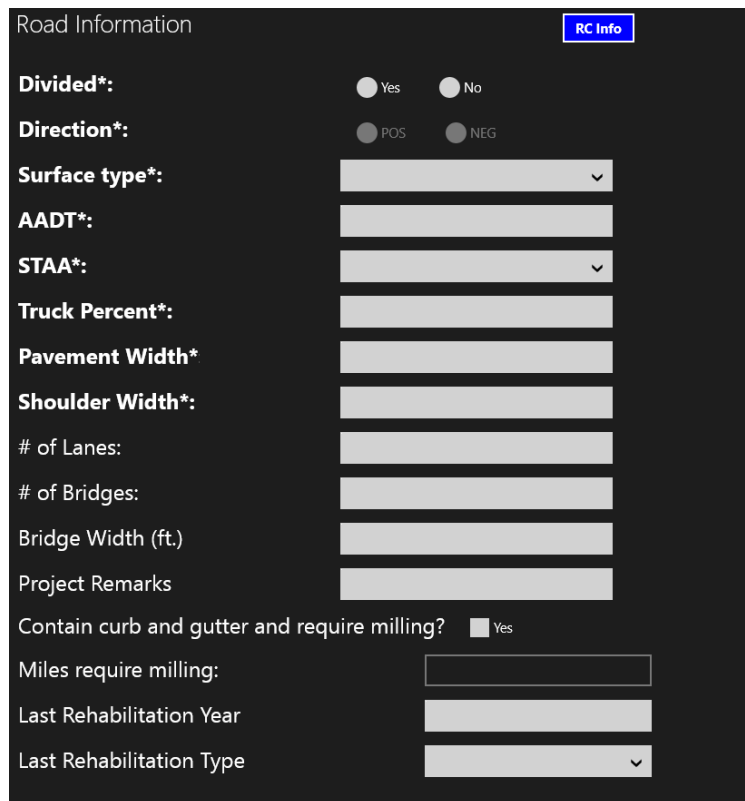
There is a list of selectable route numbers based on the user's district. After choosing a route number, the route suffix will be filled automatically if there is only one suitable suffix based on the lookup table. If there is more than one, manual selection is required.

If a route number and route suffix are provided, the user will see a list of selectable county names. If there is only one, it will be filled automatically with corresponding "Milepost from" and "Milepost to" and County2 and County3 files will be disabled, since only one county is available.

If more than one county can be selected, the user can add additional County2 and County3 information, or, the user should click the **Clear** button if additional county information is not needed.

The **From/To** information for all counties will always be filled automatically once the user selects the county name. By default, it will be 0 for "from" and a positive number for "to." If the user is conducting a survey from a negative direction, the user may click the reverse symbol to reverse the from/to information.

FIGURE 3.7 shows all the fields for road information. The **RC Info** button needs to be clicked before typing in any information. It will search the RC lookup table and try to fill the form with available information. Then, a user can edit it if any field is incorrect or missed. Direction is decided by milepost from/to information in the project location part that has been just filled in.

FIGURE 3.7: Road Information

Once project location and road information are filled in, the user can click **Save Project** to save the current project or "**Edit Seg Info**" to save and directly jump into the segment page on the bottom bar (FIGURE 3.5).

2.4 Creating New Segments

The segment survey page is divided into two parts, as shown in FIGURE 3.8. The left part is used for segment location information, while the right part is for distress survey information that contains an overview of all the distress values and the editor of each distress. The red rating box is updated once a distress or severity level is updated. On the right of the rating box, users can see the county and the starting and ending milepoints of the current project.

For multiple segments, users can use buttons at the bottom to navigate between different segments in a current project, add new segments, or delete segments.
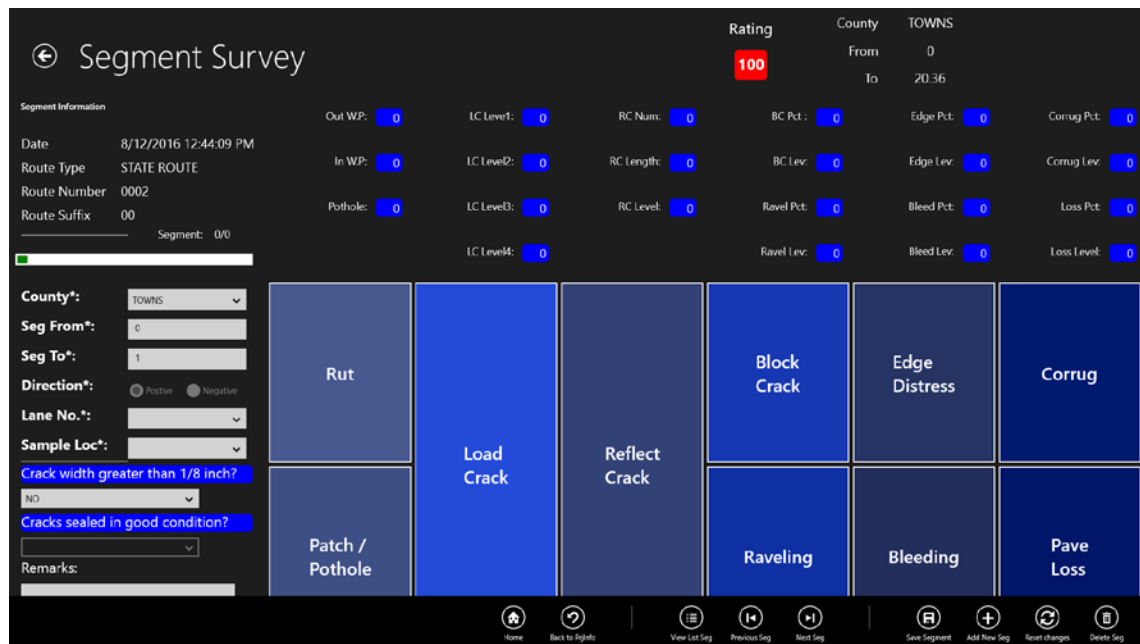
FIGURE 3.8: Segment Survey Page
41

FIGURE 3.9 shows all the fields for segment location information. When a user creates a new segment, the county and starting and ending milepoints of this segment will be automatically filled in ascending order. The value of "Seg To" will be the next integer of the "Seg From" value. If the project direction is negative, the starting milepoint will be greater than the ending one. The green bar shows the relative location of the current segment in this project.

FIGURE 3.9: Segment Location Information

FIGURE 3.10 and FIGURE 3.11 show two examples (load cracking and rut) of the pavement distress survey. The distress editor will display once a user taps on the corresponding distress button, as shown in FIGURE 3.8. There are 10 types of distress that should be filled in if the corresponding types of distresses occur and once the segment information for the current segment is complete.
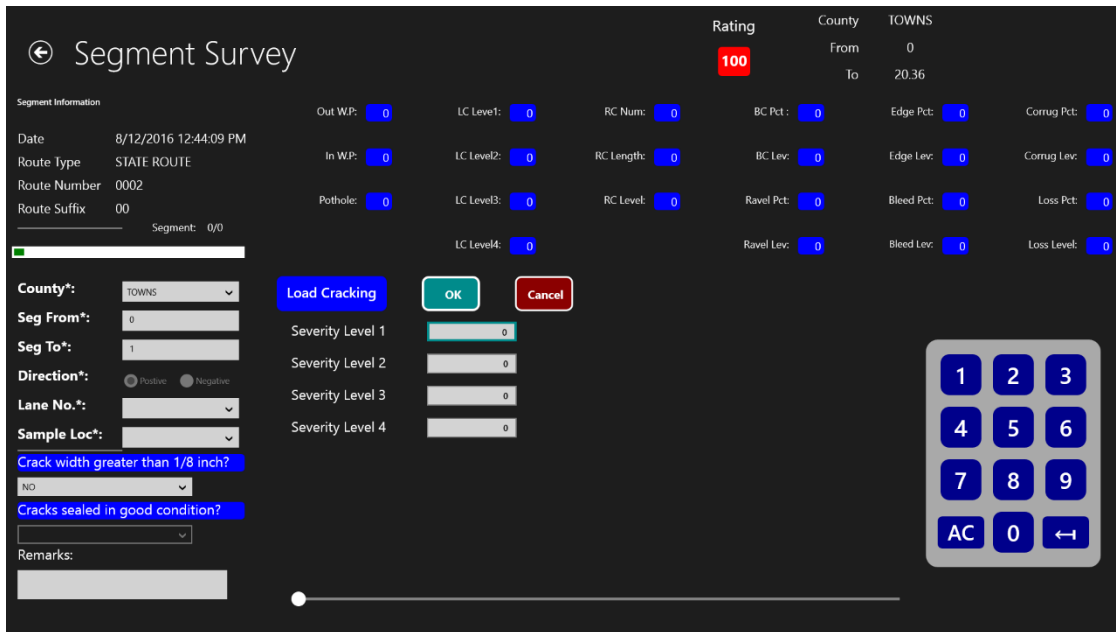
FIGURE 3.10: Distress Survey Example for Load Cracking

The upper half of the page shows an overview of all the distress values, while the lower half functions as a distress editor. A user can tap on the corresponding distress button, and the editor panel will display.

When editing, clicking on the input box, will display a green border, indicating this input is focused, and any value changes will reflect this distress. Two input methods are provided: number-board and slider. While slider can improve the speed of operation, number-board is more convenient for accurate data input.

When the user fills in the value and clicks **OK**, it will be updated to the distress value overview shown in the upper part of the page.   Clicking **Cancel** will discard the input value. Once users click **OK** and change any value in this part of the page, they will notice an automatic update on the overall rating at the top of the page.

FIGURE 3.11: Distress Survey Example for Rutting

Other than data input, there are several tools at the bottom of this page, as shown in FIGURE 3.12. The following is a brief list of their functions:

1) **Home**: Go directly to the Home Page; discard unsaved changes.

2) **Back to ProjInfo**: Back to the current project information page.

3) **View List Seg**: Jump to the new page showing all the segments of the current project.

4) **Previous Seg**: Navigate to previous segment information and survey based on the input order.

5) **Previous Seg**: Navigate to the next segment information and survey based on the input order.

6) **Save Segment**: Save or update the current project.

7) **Add New Seg**: Add a new segment after current segment; note that this new segment is not saved until save button is clicked.

8) **Reset Changes**: Discard unsaved changes of the current project and load the last saved information; if the information has never been saved, load default information.

9) **Delete Seg**: delete the current segment, and go back to the previous segment.
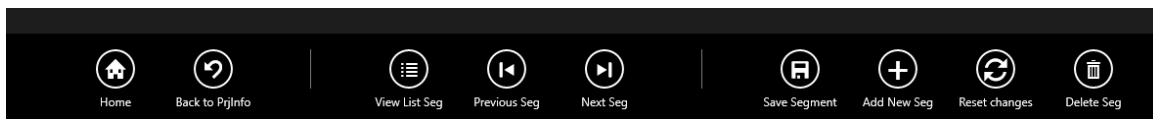
FIGURE 3.12: Segment Navigation Bar

2.5 Loading Data from Previous Year

When using the previous version of COPACES, a rater often started the survey for a new fiscal year based on the previous year's data. Thus, a rater does not need to re-enter the project location and road information. In this new COPACES for Tablet version, this function is also available by loading data from previous fiscal years and is provided on the Load Data page, as shown in FIGURE 3.13.

The **FY** box contains a list of fiscal years covering all data on the local machine. Then, the user can choose the district, office, and/or rater to filter the loaded data. Once a search condition is set, the user may notice the checkmark is brighter. The unset condition checkmark is relatively dark.

The ten most recent loaded records will be shown in the list of **Latest loads** to remind users what data has been loaded before.

Once data is loaded and before it is edited and saved, users can find it on the "open project" page as a "TO DO" item.
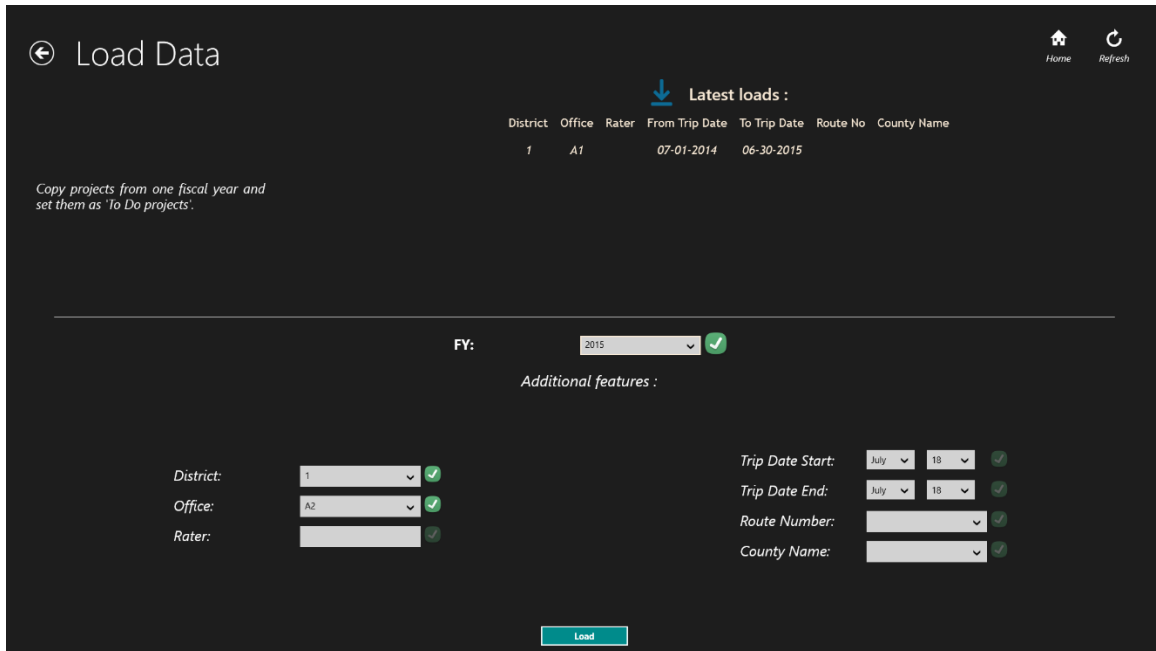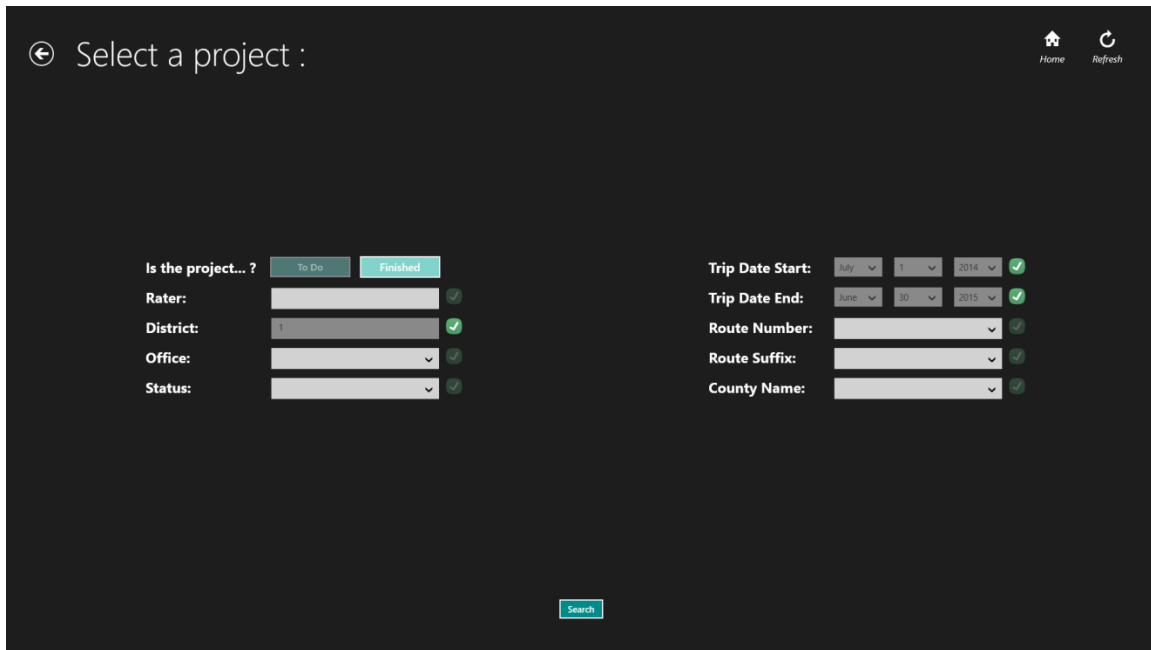
FIGURE 3.13: Load Data Page

2.6 Open Existing Project

The **Open Project** function on the main page (FIGURE 3.4) is used for opening or editing any existing project and its corresponding segments and surveys. The first step is to search projects based on the customized search conditions, as shown in FIGURE 3.14. If a user wants to open a "TO DO" project, which is loaded from a previous year but has not been edited or saved yet, the **TO DO** button needs to be clicked. If the target project is a completed one, the **Finished** button should be clicked. Selecting other conditions

will narrow down the target list. The checkmark for the set condition will appear brighter, while the unset condition checkmark is relatively dark. Clicking **Search** will reveal the result shown in FIGURE 3.15.

On the project list page, clicking on the target project enables a user to either go to the project information page to edit it or to delete it. Only 100 results are shown each time; users can use **Show previous** (if not on the first page) or **Show next** (if not on the last page) button to see all results.

FIGURE 3.14: Open Existing Project Page

FIGURE 3.15: List of Searched Projects

2.7 Export Data

As discussed in Chapter 2, COPACES for Tablet, as a Windows Store application, cannot directly store data in a Microsoft Access database file that will be used by COPADQA. Instead, COPACES for Tablet will export the internal data to csv files. Then, they will be converted to Access database files. The conversion function is implemented in COPACES for Laptop, which will be introduced in the next section.

On the main page (FIGURE 3.4), clicking **Output CSV** will open the page of **Export projects to CSV files,** as shown in FIGURE 3.16. Eight data-filtering conditions can be set to narrow down the target projects, which are fiscal year, district, office, rater, starting trip date, ending trip date, route number, and county name. The checkmark of the set condition will appear brighter, while an unset condition checkmark is relatively dark.

48

The latest 10 exported records will be shown in the list of **Latest exported data** to remind a user what data has been exported before.

The filtered projects are shown on the page of **Select projects to export** (FIGURE 3.17) A user can choose to export all the projects or some of them. The exported files will be stored in the **Downloads** folder of a local computer. FIGURE 3.18 shows some sample of exported data. A user will not directly use the exported data but will use the converted Microsoft Access database file.

FIGURE 3.16: Export Data Page

FIGURE 3.17: Export Data List View

FIGURE 3.18: Export Result Example

3. Converting Survey Data to Access Database

As mentioned above, the exported data from COPACES for Tablet needs to be converted

to Microsoft Access data files that can then be used by COPADQA for district-level

quality checking and data combination (FIGURE 2.1). The conversion function is

implemented in the COPACES for Laptop.

This function can be accessed from the menu item **Import Data from COPACES for Tablet,** as shown in FIGURE 3.19, when COPACES for Laptop is launched. Clicking this menu item will display the data import form, as shown in FIGURE 3.20.
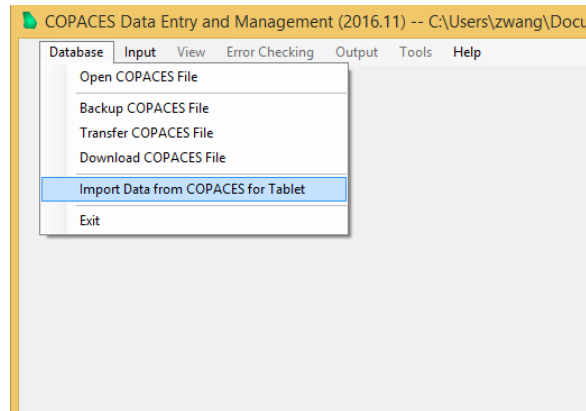
FIGURE 3.19: Menu Item for Importing Data from COPACES for Tablet

The exported data from COPACES for Tablet is stored in the folder "COPACES for Tablet" in the Downloads folder. However, for safety concerns, the Windows operating system uses a special folder (see FIGURE 3.20) to represent "COPACES for Tablet," which is automatically generated by the operating system. Thus, the first time data is imported, COPACES for Laptop does not know where the physical folder is and needs a user to manually specify the folder location. This is done by, clicking **Change Input Data Folder**. The **Browse For Folder** form appears, as shown in FIGURE 3.21. A user can navigate to and select the "COPACES for Tablet" subfolder under the Downloads folder. After that, COPACES for Laptop remembers this location, which will be automatically used next time.

The next step is to select the date of the exported data from COPACES for Tablet. For purposes of data safety, a user can periodically export data from COPACES for Tablet

and convert it to Microsoft Access data files. If several exporting events are found, the dates are listed in the list box shown in FIGURE 3.20. The top item is the newest one. Normally, a user will use the newest one for conversion because it contains all the new data and updates. After a date is selected, clicking **Import Data** will enable the user to proceed. The converted data will be stored and combined with the current Microsoft Access data file, which is similar to the data directly collected using COPACES for Laptop.
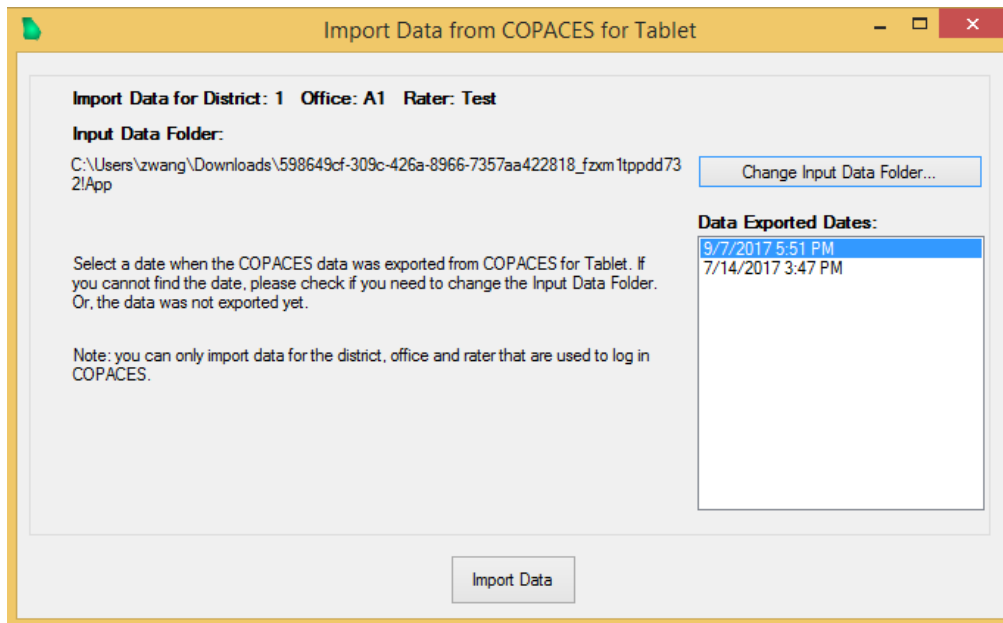
FIGURE 3.20: Data Import Form
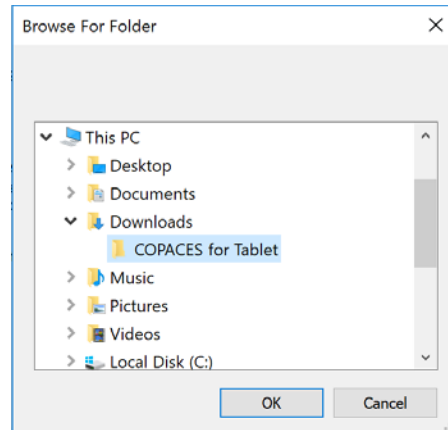
FIGURE 3.21: Selecting Source Data Folder

4. Enhanced Field Data Quality Checking

Data quality is the highest priority in a data-driven pavement management system. Due to its importance, data quality checking has been rigorously implemented in the previous version of COPACES. Since COPACES is used for field data collection, and its data quality directly affects the effectiveness of pavement preservation, maintenance, and rehabilitation decision-making, stricter data quality checking is desired. Comprehensive field data quality checking can help improve data accuracy and save the re-survey effort because quality issues can be identified and immediately solved in the field.

Based on the discussion with OM's Liaison Engineers, several data quality checking criteria were discussed and determined. Because COPACES for Tablet will be the major tool for field data collection, the enhanced data quality check procedures are implemented in this program. In the meantime, data conversion and management functions are implemented in COPACES for Laptop.

4.1 Quality Checking Criteria

Based on the systematic procedures suggested by GDOT Liaison Engineers, the following criteria for data quality checking are embedded in COPACES for Tablet.

- **Criterion #1: Pavement condition rating checking**

  Due to the deterioration of pavement surface conditions, the historical pavement ratings can be used to evaluate the reasonableness of the current pavement rating. Using this criterion, after the pavement condition data on a pavement project and /or segment is completed, the automatically-calculated PACES rating will be compared with the ones in previous years, such as the previous 3 years. If the current rating falls within a ±1% variance of the previous ones, the survey engineer should re-check the survey procedures and the selected sample section.

- **Criterion #2: Sample section location checking**

  Due to the limited resource, the PACES survey only rates the major pavement distresses, i.e., cracking distresses, on a selected 100-foot sample section for each pavement segment. Locations of the sample sections are subjectively determined by the rater in terms of their representativeness. Thus, the selected sample section locations vary year by year. Under this criterion, the sample section locations for each project will be compared with the ones in previous years. If more than 90% of the segments have the same sample section locations as the ones in previous years, the rater should re-check the survey procedures and make sure the selection of a sample location is not based on the previous survey results.

- **Criterion #3: Pavement distress data checking**

  Under this criterion, the surveyed distress data for each project will be checked against the ones in previous years. If 70% of the segments in one project have the same distress data (type and severity) as the ones in previous years, the rater should re-check the survey procedures and make sure the distresses are correctly rated.

- **Criterion #4: Pass/Fail test rules**

  Based on the above three levels of data quality checking, a rule will be set to determine if the survey on a project passes or fails. For example, if Criterion #1 and either Criteria #2 or #3 are triggered, the survey on this project will be considered failed and need to be done again.

4.2 Operations on Enhanced Data Quality Checking

Note that the enhanced data quality checking will use the previous years' COPACES survey data. However, in the FY 2017 COPACES survey, a new state route lookup table was used, as discussed in Chapter 2. Thus, all projects were surveyed from scratch without the use of any previous year's data. As a result, the enhanced data quality checking procedures were not used in FY 2017 data collection, though they have been implemented. The following discussion presents the functional operations.

The enhanced quality checking module is embedded in both COPACES for Tablet and COPACES for Laptop. Data is shared between these two programs through the data conversion procedure introduced in Section 3 of this chapter. The enhanced data quality checking module in COPACES for Tablet serves as instant feedback for raters, whereas

COPACES for Laptop summarizes all questionable data for district engineers and/or Liaison Engineers.

- **Quality Checking in COPACES for Tablet**

    When a user finishes collecting data for a segment and attempts to save the results, the quality checking module will be triggered once the user hits the **Home** or **Back to PrjInfo** button to end the process. The module will check the data quality according to the criteria listed above. If the collected data does not pass the quality check, a message will display, as shown in FIGURE 3.22, suggesting a user return and check or redo the survey.
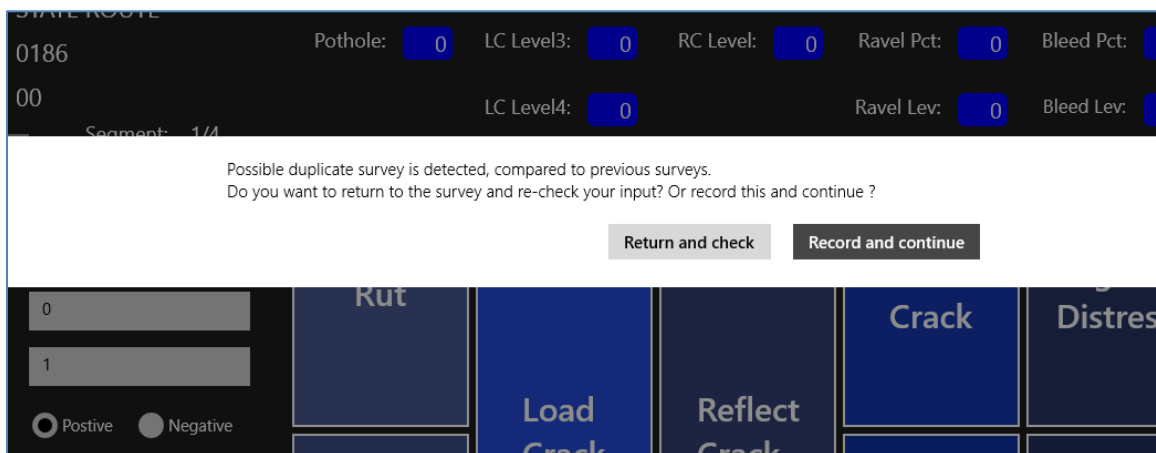
FIGURE 3.22: Collected Data Fails at Quality Checking in COPACES for Tablet

    However, the user can still choose to proceed and save the results, in which case the quality checking module will record this questionable survey in an additional table unless the issue has been resolved later. All questionable surveys, together with other useful information, can be exported to csv files.

- **Quality Checking in COPACES for Laptop**

After the exported data from COPACES for Tablet is converted to Microsoft Access database files (see Section 3 of this chapter), an additional function is added for error checking, as shown in FIGURE 3.23. The table of all questionable surveys is available in COPACES for Laptop, as shown in FIGURE 3.24.

For district engineers and/or Liaison Engineers, the list of questionable surveys can be used to further verify the quality of the submitted data from raters in area offices. If the data are unacceptable, a re-survey can be requested.
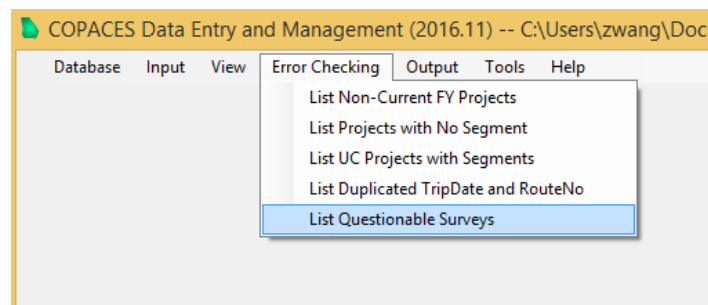
FIGURE 3.23: Quality Checking Function in COPACES for Laptop

FIGURE 3.24: Table of All Questionable Surveys

5. Automatic Software Update

As discussed in Chapter 2, to improve the efficiency of software delivery and software update, a mechanism for automatic software update has been implemented for COPACES for Laptop. Similarly, COPACES for Tablet can also be automatically updated.

After the setup files of COPACES for Tablet are submitted to GDOT's OIT, they are stored in a web repository, http://software.dot.ga.gov/COPACESTablet/. During the first installation, a method of "sideloading" is used to install COPACES for Tablet on a tablet computer. The operating system should be Windows 8.1 or Windows 10. Though the best way is to publish COPACES for Tablet is in a Microsoft Store, GDOT has not purchased the service for establishing a Microsoft Store for Business. The public Store is not suitable for publishing COPACES for Tablet. Finally, based on the discussion with GDOT's OIT, COPACES for Tablet is installed using "sideloading."

To implement an automatic update, a separate program, AutoUpdateCOPACESTablet, was developed. The corresponding executable file, AutoUpdateCOPACESTablet.exe, needs to be copied and stored on a local computer. When a new software update is available, a user will be asked to update the program when COPACES for Tablet is launched.

Due to the difference between Windows 8.1 and Windows 10, the sideloading methods are also different. Appendix II and Appendix III include the procedures for installing COPACES for Tablet on Windows 8.1 and Windows 10, respectively.

CHAPTER 4   CONCLUSIONS AND

RECOMMENDATIONS

Shortly after the Georgia Tech research team started this project, OM began to collect the FY 2017 COPACES data. As discussed in Chapter 1, the previous version of COPACES that was released in 2008 has compatibility issues with Windows 7, 8.1, and 10. Thus, COPACES for Laptop was upgraded from the previous COPACES using the newer programming language, Microsoft C#. In the meantime, the new COPACES for Tablet was also developed to improve data collection efficiency by using tablet computers. Note that COPACES for Laptop is not just a replica of the previous version but has new functions that were developed to work with COPACES for Tablet. Since time was very tight for this project, the Georgia Tech research team has closely worked with GDOT OM and OIT to deploy, test, and refine both COPACES for Laptop and COPACES for Tablet. A statewide training workshop was held in Macon on August 18, 2016.

OM's Liaison Engineers played an important role in implementing COPACES for FY 2017 data collection. Even though a statewide training workshop was held, not all raters fully understood the use of COPACES for Laptop or COPACES for Tablet. Constrained by resources, the Georgia Tech research team cannot directly communicate with all raters. Instead, intensive meetings were held between the Georgia Tech research team and OM's Liaison Engineers to test, refine, and improve the programs. In the meantime, the reported issues from individual end users were collected by Liaison Engineers and discussed/solved in the meetings.

When the COPACES data collection approached the end, district engineers started to collect the COPACES data from raters in area offices. After that, COPADQA was used to conduct district-level data quality checking and to combine all area office data in a district into a single database file. Then, the combined files were submitted to Liaison Engineers for transferring the data to the central COPACES database, which was done by the Upload program. As discussed in Chapter 1 and Chapter 2, the previous version of COPADQA and Upload have the compatibility issue with Windows 7, 8.1, and 10. Thus, they needed to be rewritten using C#. Though it was out of the scope of this project, the Georgia Tech research team rewrote these two programs to help OM complete the FY 2017 data collection. Since most of the functions are replicates of the previous versions, they are not presented in this final report. However, automatic updates were implemented for these two programs, like the one for COPACES for Laptop.

TABLE 4.1 summarizes the total numbers of projects and segments collected in 7 working districts.

<div align="center">

TABLE 4.1: Summary of FY 2017 COPACES Data

</div>

Working District	# of Projects	# of Segments
1	536	3,818
2	671	4,666
3	630	4,215
4	631	4,423
5	761	5,157
6	542	3,291
7	238	1,380

The enhanced data quality checking model fully utilizes previous COPACES data and provides more rigorous in-field data quality checking. The improved data quality will further improve the accuracy of pavement condition deterioration modeling and also

improve the effectiveness of pavement preservation, maintenance, and rehabilitation decision-making.

To prepare for the FY 2018 pavement condition data collection, a small-scale training session was conducted in GDOT OM on October 17, 2017. The Assistant State Maintenance Engineer, Liaison Engineers, and the Research Implementation Manager from the Office of Research attended the training. After that, a statewide training session was held in Macon on November 13, 2017, as shown in FIGURE 4.1. All field engineers in area offices and district offices attended this training.

FIGURE 4.1: COPACES Training in Macon

The following points recommend future improvements and further implementation:

- The most convenient way for deploying a Windows Store application, e.g., COPACES for Tablet, is to use the Microsoft Store. Since more and more applications are used on tablet computers, it is suggested a Microsoft Store for Business in GDOT be implemented. Thus, all GDOT-owned applications can be

conveniently published in this store, and users in GDOT can also quickly download and update the applications.

- The current operation flow for COPACES data transfer and data integration is not very convenient or efficient due to the use of local database files. Currently, cloud computing has been widely used for mobile data collection; in it, field-collected data can be quickly transferred to cloud databases through a WiFi connection. If GDOT-owned cloud services, e.g., cloud database and mobile services, are available, the COPACES data transfer and data integration process could be significantly simplified. In the meantime, the field-collected data could be transferred to OM's general office in real time.

APPENDIX I: LIST OF STATE ROUTES

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	011	BANKS	0015	00	0	19.2
1	011	BANKS	0051	00	0	18.56
1	011	BANKS	0052	00	0	5.12
1	011	BANKS	0059	00	0	6.85
1	011	BANKS	0063	00	0	10.61
1	011	BANKS	0098	00	0	6.22
1	011	BANKS	0105	00	0	10.02
1	011	BANKS	0164	00	0	6.87
1	011	BANKS	0184	00	0	2.39
1	011	BANKS	0198	00	0	7.26
1	011	BANKS	0323	00	0	4.81
1	011	BANKS	0326	00	0	5.95
1	011	BANKS	0403	00	0	6.47
1	013	BARROW	0008	00	0	18.35
1	013	BARROW	0011	00	0	12.88
1	013	BARROW	0053	00	0	12.98
1	013	BARROW	0081	00	0	6.37
1	013	BARROW	0082	00	0	10.63
1	013	BARROW	0124	00	0	3.48
1	013	BARROW	0211	00	0	24.47
1	013	BARROW	0316	00	0	15.79
1	013	BARROW	0324	00	0	0.76
1	013	BARROW	0330	00	0	1.52
1	013	BARROW	0403	00	0	2.4
1	059	CLARKE	0008	00	0	10.27
1	059	CLARKE	0010	00	0	17.32
1	059	CLARKE	0010	LO	0	15.08
1	059	CLARKE	0015	00	0	11.79
1	059	CLARKE	0015	AL	0	8.03
1	059	CLARKE	0024	00	0	0.67
1	059	CLARKE	0072	00	0	2.65
1	059	CLARKE	0422	00	0	15.08
1	085	DAWSON	0009	00	0	10.34
1	085	DAWSON	0009	WE	0	0.11
1	085	DAWSON	0052	00	0	10.12
1	085	DAWSON	0053	00	0	18.15
1	085	DAWSON	0053	WE	0	0.09
1	085	DAWSON	0136	00	0	26.81
1	085	DAWSON	0183	00	0	10.42

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	085	DAWSON	0400	00	0	7.34
1	105	ELBERT	0017	00	0	26.06
1	105	ELBERT	0072	00	0	24.67
1	105	ELBERT	0077	00	0	18.71
1	105	ELBERT	0077	CO	0	1.37
1	105	ELBERT	0079	00	0	7.99
1	105	ELBERT	0172	00	0	7.48
1	105	ELBERT	0368	00	0	10.68
1	117	FORSYTH	0009	00	0	21.69
1	117	FORSYTH	0009	SO	0	0.18
1	117	FORSYTH	0020	00	0	15.01
1	117	FORSYTH	0020	NO	0	0.37
1	117	FORSYTH	0053	00	0	4.93
1	117	FORSYTH	0141	00	0	7.01
1	117	FORSYTH	0306	00	0	12.75
1	117	FORSYTH	0369	00	0	19.79
1	117	FORSYTH	0371	00	0	6.02
1	117	FORSYTH	0400	00	0	20.13
1	119	FRANKLIN	0008	00	0	6.73
1	119	FRANKLIN	0017	00	0	4.35
1	119	FRANKLIN	0017	00	7.47	16.29
1	119	FRANKLIN	0017	BU	0	1.63
1	119	FRANKLIN	0051	00	0	23.14
1	119	FRANKLIN	0059	00	0	22.46
1	119	FRANKLIN	0063	00	0	4
1	119	FRANKLIN	0077	CO	0	1.31
1	119	FRANKLIN	0105	00	0	0.08
1	119	FRANKLIN	0106	00	0	19.73
1	119	FRANKLIN	0145	00	0	16.32
1	119	FRANKLIN	0174	00	0	4.81
1	119	FRANKLIN	0184	00	0	0.27
1	119	FRANKLIN	0198	00	0	7.07
1	119	FRANKLIN	0281	00	0	0.56
1	119	FRANKLIN	0320	00	0	9.79
1	119	FRANKLIN	0326	00	0	8.28
1	119	FRANKLIN	0327	00	0	9.77
1	119	FRANKLIN	0328	00	0	6.17
1	119	FRANKLIN	0403	00	0	21.48
1	135	GWINNETT	0008	00	0	22.21
1	135	GWINNETT	0008	WE	0	0.86
1	135	GWINNETT	0010	00	0	13.65
1	135	GWINNETT	0013	00	0	22.9

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	135	GWINNETT	0020	00	0	25.97
1	135	GWINNETT	0020	NO	0	0.73
1	135	GWINNETT	0084	00	0	3.56
1	135	GWINNETT	0120	00	0	12.61
1	135	GWINNETT	0120	WE	0	0.45
1	135	GWINNETT	0124	00	0	29.15
1	135	GWINNETT	0124	SO	0	0.27
1	135	GWINNETT	0140	00	0	5.24
1	135	GWINNETT	0141	00	0	6.05
1	135	GWINNETT	0141	CO	0	0.58
1	135	GWINNETT	0211	00	0	0.52
1	135	GWINNETT	0264	00	0	2.71
1	135	GWINNETT	0316	00	0	16.56
1	135	GWINNETT	0317	00	0	2.25
1	135	GWINNETT	0324	00	0	8.86
1	135	GWINNETT	0347	00	0	1.1
1	135	GWINNETT	0365	00	0	7.42
1	135	GWINNETT	0378	00	0	6.45
1	135	GWINNETT	0403	00	0	27.87
1	135	GWINNETT	0419	00	0	7.42
1	137	HABERSHAM	0015	00	0	22.13
1	137	HABERSHAM	0015	CO	0	0.72
1	137	HABERSHAM	0015	LO	0	1.2
1	137	HABERSHAM	0017	00	0	17.04
1	137	HABERSHAM	0017	AL	0	10.24
1	137	HABERSHAM	0105	00	0	12.98
1	137	HABERSHAM	0115	00	0	7.08
1	137	HABERSHAM	0197	00	0	20.85
1	137	HABERSHAM	0197	CO	0	0.09
1	137	HABERSHAM	0255	00	0	4.48
1	137	HABERSHAM	0255	00	10.17	14.12
1	137	HABERSHAM	0255	AL	0	3.29
1	137	HABERSHAM	0356	00	0	2.57
1	137	HABERSHAM	0365	00	0	17.91
1	137	HABERSHAM	0384	00	0	4.26
1	137	HABERSHAM	0385	00	0	11.62
1	137	HABERSHAM	0419	00	0	17.8
1	139	HALL	0011	00	0	27.04
1	139	HALL	0011	BU	0	3.17
1	139	HALL	0013	00	0	14.54
1	139	HALL	0051	00	0	1.49
1	139	HALL	0052	00	0	25.54

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	139	HALL	0053	00	0	21.4
1	139	HALL	0053	CO	0	3.73
1	139	HALL	0060	00	0	22.94
1	139	HALL	0060	CO	0	0.2
1	139	HALL	0082	00	0	3.99
1	139	HALL	0136	00	0	7.59
1	139	HALL	0211	00	0	8.05
1	139	HALL	0254	00	0	2.01
1	139	HALL	0283	00	0	15.69
1	139	HALL	0284	00	0	14.48
1	139	HALL	0323	00	0	9.28
1	139	HALL	0332	00	0	10.28
1	139	HALL	0347	00	0	11.27
1	139	HALL	0365	00	0	29.76
1	139	HALL	0369	00	0	11.1
1	139	HALL	0419	00	0	29.76
1	147	HART	0008	00	0	19.53
1	147	HART	0008	WE	0	0.55
1	147	HART	0017	00	0	6.17
1	147	HART	0017	00	10.5	13.61
1	147	HART	0017	BU	0	0.53
1	147	HART	0051	00	0	19.19
1	147	HART	0051	SO	0	0.15
1	147	HART	0059	00	0	0.68
1	147	HART	0077	00	0	20.69
1	147	HART	0077	CO	0	3.87
1	147	HART	0077	EA	0	0.45
1	147	HART	0077	SP	0	7.06
1	147	HART	0172	00	0	9.95
1	147	HART	0181	00	0	2.94
1	147	HART	0281	00	0	0.8
1	147	HART	0403	00	0	2.26
1	157	JACKSON	0011	00	0	17.4
1	157	JACKSON	0011	BU	0	5.36
1	157	JACKSON	0011	CO	0	3.15
1	157	JACKSON	0015	00	0	16.75
1	157	JACKSON	0015	AL	0	23.63
1	157	JACKSON	0052	00	0	4.63
1	157	JACKSON	0053	00	0	8.8
1	157	JACKSON	0059	00	0	0.2
1	157	JACKSON	0060	00	0	5.4
1	157	JACKSON	0082	00	0	21.54

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	157	JACKSON	0082	CO	0	4.71
1	157	JACKSON	0098	00	0	12.08
1	157	JACKSON	0098	WE	0	1.66
1	157	JACKSON	0124	00	0	11.87
1	157	JACKSON	0326	00	0	2.18
1	157	JACKSON	0330	00	0	4.56
1	157	JACKSON	0332	00	0	13.77
1	157	JACKSON	0334	00	0	12.36
1	157	JACKSON	0335	00	0	8.4
1	157	JACKSON	0403	00	0	21.68
1	187	LUMPKIN	0009	00	0	24.48
1	187	LUMPKIN	0009	BU	0	1.21
1	187	LUMPKIN	0009	SO	0	0.06
1	187	LUMPKIN	0011	00	0	9.64
1	187	LUMPKIN	0052	00	0	24.69
1	187	LUMPKIN	0052	BU	0	1.21
1	187	LUMPKIN	0052	SO	0	0.06
1	187	LUMPKIN	0060	00	0	21.09
1	187	LUMPKIN	0060	BU	0	4.74
1	187	LUMPKIN	0060	SB	0	0.06
1	187	LUMPKIN	0115	00	0	9.65
1	187	LUMPKIN	0400	00	0	3.75
1	195	MADISON	0008	00	0	18.34
1	195	MADISON	0008	SO	0	0.1
1	195	MADISON	0022	00	0	1.24
1	195	MADISON	0072	00	0	19.45
1	195	MADISON	0098	00	0	18.3
1	195	MADISON	0106	00	0	16.1
1	195	MADISON	0172	00	0	10.68
1	195	MADISON	0174	00	0	7.81
1	195	MADISON	0191	00	0	6.67
1	195	MADISON	0281	00	0	10.55
1	219	OCONEE	0008	00	0	10.34
1	219	OCONEE	0010	00	0	6.37
1	219	OCONEE	0010	LO	0	4
1	219	OCONEE	0015	00	0	15.38
1	219	OCONEE	0024	00	0	14.62
1	219	OCONEE	0024	BU	0	2.98
1	219	OCONEE	0053	00	0	13.44
1	219	OCONEE	0186	00	0	4.37
1	219	OCONEE	0316	00	0	7.67
1	219	OCONEE	0422	00	0	4

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	241	RABUN	0002	00	0	24.39
1	241	RABUN	0015	00	0	19.95
1	241	RABUN	0028	00	0	7.91
1	241	RABUN	0197	00	0	8.29
1	241	RABUN	0246	00	0	3.84
1	257	STEPHENS	0017	00	0	17.33
1	257	STEPHENS	0017	AL	0	9.19
1	257	STEPHENS	0063	00	0	8.41
1	257	STEPHENS	0105	00	0	0.03
1	257	STEPHENS	0106	00	0	9.25
1	257	STEPHENS	0145	00	0	8
1	257	STEPHENS	0184	00	0	16.66
1	257	STEPHENS	0320	00	0	0.07
1	257	STEPHENS	0328	00	0	3.62
1	257	STEPHENS	0365	00	0	14.52
1	257	STEPHENS	0419	00	0	14.52
1	281	TOWNS	0002	00	0	20.56
1	281	TOWNS	0017	00	0	17.39
1	281	TOWNS	0066	00	0	4.8
1	281	TOWNS	0075	00	0	15.59
1	281	TOWNS	0180	00	0	5.29
1	281	TOWNS	0180	SP	0	2.45
1	281	TOWNS	0288	00	0	5.76
1	281	TOWNS	0339	00	0	3.54
1	281	TOWNS	0515	00	0	6.42
1	291	UNION	0002	00	0	15.66
1	291	UNION	0011	00	0	24.22
1	291	UNION	0011	SO	0	0.05
1	291	UNION	0060	00	0	10.59
1	291	UNION	0180	00	0	20.81
1	291	UNION	0325	00	0	11.14
1	291	UNION	0348	00	0	7
1	291	UNION	0515	00	0	15.66
1	297	WALTON	0010	00	0	21.19
1	297	WALTON	0010	BU	0	4.07
1	297	WALTON	0011	00	0	19.29
1	297	WALTON	0012	00	0	2.2
1	297	WALTON	0020	00	0	7.16
1	297	WALTON	0081	00	0	19.88
1	297	WALTON	0083	00	0	8.95
1	297	WALTON	0138	00	0	10.44
1	297	WALTON	0138	WE	0	0.7

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
1	297	WALTON	0186	00	0	6.81
1	297	WALTON	0402	00	0	1.46
1	311	WHITE	0011	00	0	15.01
1	311	WHITE	0011	SO	0	0.04
1	311	WHITE	0017	00	0	15.25
1	311	WHITE	0075	00	0	17.82
1	311	WHITE	0075	AL	0	11.13
1	311	WHITE	0115	00	0	15.58
1	311	WHITE	0254	00	0	8.81
1	311	WHITE	0255	00	0	5.54
1	311	WHITE	0255	00	9.98	15.68
1	311	WHITE	0284	00	0	2.52
1	311	WHITE	0348	00	0	7.03
1	311	WHITE	0356	00	0	8.13
1	311	WHITE	0384	00	0	11.3
2	009	BALDWIN	0022	00	0	22.38
2	009	BALDWIN	0024	00	0	23.14
2	009	BALDWIN	0029	00	0	10.27
2	009	BALDWIN	0049	00	0	11.23
2	009	BALDWIN	0112	00	0	8.3
2	009	BALDWIN	0212	00	0	11.05
2	009	BALDWIN	0243	00	0	10.92
2	023	BLECKLEY	0026	00	0	18.63
2	023	BLECKLEY	0087	00	0	0.87
2	023	BLECKLEY	0087	00	1.76	15.15
2	023	BLECKLEY	0087	BU	0	4.16
2	023	BLECKLEY	0112	00	0	22.69
2	023	BLECKLEY	0126	00	0	7.47
2	023	BLECKLEY	0257	00	0	5.79
2	023	BLECKLEY	0278	00	0	7.93
2	023	BLECKLEY	0404	00	0	1.63
2	033	BURKE	0017	00	0	11.3
2	033	BURKE	0023	00	0	29.36
2	033	BURKE	0024	00	0	37.29
2	033	BURKE	0056	00	0	36.36
2	033	BURKE	0056	SP	0	6.68
2	033	BURKE	0078	00	0	0.74
2	033	BURKE	0080	00	0	29.76
2	033	BURKE	0088	00	0	4.27
2	033	BURKE	0121	00	0	22.56
2	033	BURKE	0121	BY	0	5.67
2	033	BURKE	0305	00	0	29.06

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
2	073	COLUMBIA	0010	00	0	6.89
2	073	COLUMBIA	0028	00	0	6.49
2	073	COLUMBIA	0047	00	0	24.54
2	073	COLUMBIA	0104	00	0	14.95
2	073	COLUMBIA	0150	00	0	14.37
2	073	COLUMBIA	0223	00	0	14.05
2	073	COLUMBIA	0232	00	0	13.79
2	073	COLUMBIA	0383	00	0	4.83
2	073	COLUMBIA	0388	00	0	4.54
2	073	COLUMBIA	0402	00	0	16.94
2	091	DODGE	0027	00	0	23.57
2	091	DODGE	0027	BU	0	3.92
2	091	DODGE	0030	00	0	13.1
2	091	DODGE	0031	00	0	2.05
2	091	DODGE	0046	00	0	10.93
2	091	DODGE	0046	CO	0	0.08
2	091	DODGE	0087	00	0	27.31
2	091	DODGE	0087	00	28.18	29.07
2	091	DODGE	0117	00	0	29.39
2	091	DODGE	0126	00	0	7.99
2	091	DODGE	0165	00	0	26.71
2	091	DODGE	0165	00	27.99	29.42
2	091	DODGE	0230	00	0	4.95
2	091	DODGE	0257	00	0	12.26
2	107	EMANUEL	0004	00	0	40.05
2	107	EMANUEL	0004	BU	0	7.87
2	107	EMANUEL	0015	00	0	1.66
2	107	EMANUEL	0023	00	0	12.59
2	107	EMANUEL	0023	SP	0	0.09
2	107	EMANUEL	0026	00	0	0.44
2	107	EMANUEL	0026	00	1.78	35.38
2	107	EMANUEL	0046	00	0	12.34
2	107	EMANUEL	0056	00	0	28.19
2	107	EMANUEL	0057	00	0	27.11
2	107	EMANUEL	0078	00	0	1.66
2	107	EMANUEL	0086	00	0	11
2	107	EMANUEL	0121	00	0	5.22
2	107	EMANUEL	0171	00	0	9.53
2	107	EMANUEL	0171	00	9.65	10.43
2	107	EMANUEL	0192	00	0	30.23
2	107	EMANUEL	0297	00	0	0.76
2	107	EMANUEL	0297	00	6.43	14.69

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
2	107	EMANUEL	0404	00	0	10.07
2	125	GLASCOCK	0080	00	0	7.78
2	125	GLASCOCK	0102	00	0	15.15
2	125	GLASCOCK	0123	00	0	4.14
2	125	GLASCOCK	0171	00	0	13.83
2	125	GLASCOCK	0296	00	0	0.13
2	133	GREENE	0012	00	0	22.82
2	133	GREENE	0015	00	0	27.75
2	133	GREENE	0044	00	0	27.28
2	133	GREENE	0077	00	0	20.15
2	133	GREENE	0402	00	0	16.35
2	141	HANCOCK	0015	00	0	22.95
2	141	HANCOCK	0015	SO	0	0.09
2	141	HANCOCK	0016	00	0	24.23
2	141	HANCOCK	0016	SO	0	0.09
2	141	HANCOCK	0016	WE	0	0.05
2	141	HANCOCK	0022	00	0	26.71
2	141	HANCOCK	0022	SO	0	0.05
2	141	HANCOCK	0077	00	0	9.79
2	159	JASPER	0011	00	0	25.78
2	159	JASPER	0011	SO	0	0.1
2	159	JASPER	0016	00	0	18.15
2	159	JASPER	0016	WE	0	0.1
2	159	JASPER	0083	00	0	26.73
2	159	JASPER	0083	SO	0	0.1
2	159	JASPER	0142	00	0	13.85
2	159	JASPER	0212	00	0	0.5
2	159	JASPER	0212	00	0.7	1.15
2	159	JASPER	0212	00	1.71	22.93
2	159	JASPER	0212	WE	0	0.1
2	159	JASPER	0380	00	0	5.81
2	163	JEFFERSON	0004	00	0	35.62
2	163	JEFFERSON	0004	BN	0	0.1
2	163	JEFFERSON	0004	BU	0	12.72
2	163	JEFFERSON	0017	00	0	31.03
2	163	JEFFERSON	0024	00	0	16.22
2	163	JEFFERSON	0047	00	0	6.61
2	163	JEFFERSON	0078	00	0	15.92
2	163	JEFFERSON	0080	00	0	14.4
2	163	JEFFERSON	0088	00	0	27.55
2	163	JEFFERSON	0102	00	0	10
2	163	JEFFERSON	0171	00	0	30.3

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
2	163	JEFFERSON	0242	00	0	2.39
2	163	JEFFERSON	0296	00	0	15.86
2	165	JENKINS	0017	00	0	21.11
2	165	JENKINS	0017	BY	0	1.52
2	165	JENKINS	0021	00	0	8.19
2	165	JENKINS	0023	00	0	25.09
2	165	JENKINS	0067	00	0	16.27
2	165	JENKINS	0121	00	0	22.84
2	167	JOHNSON	0015	00	0	21.19
2	167	JOHNSON	0026	00	0	4.67
2	167	JOHNSON	0026	00	5.11	6.45
2	167	JOHNSON	0031	00	0	7.02
2	167	JOHNSON	0057	00	0	25.89
2	167	JOHNSON	0078	00	0	31.07
2	167	JOHNSON	0086	00	0	1.67
2	167	JOHNSON	0171	00	0	0.12
2	167	JOHNSON	0171	00	0.9	13.33
2	175	LAURENS	0019	00	0	40.21
2	175	LAURENS	0026	00	0	32.33
2	175	LAURENS	0026	WE	0	0.13
2	175	LAURENS	0029	00	0	27.9
2	175	LAURENS	0029	SO	0	0.13
2	175	LAURENS	0029	WE	0	0.11
2	175	LAURENS	0031	00	0	36.59
2	175	LAURENS	0046	00	0	15.4
2	175	LAURENS	0046	00	16	16.35
2	175	LAURENS	0086	00	0	9.65
2	175	LAURENS	0117	00	0	25.25
2	175	LAURENS	0126	00	0	21.64
2	175	LAURENS	0165	00	0	1.27
2	175	LAURENS	0199	00	0	14.22
2	175	LAURENS	0257	00	0	16.59
2	175	LAURENS	0278	00	0	3
2	175	LAURENS	0338	00	0	22.29
2	175	LAURENS	0404	00	0	31.82
2	181	LINCOLN	0043	00	0	18.3
2	181	LINCOLN	0043	CO	0	1.91
2	181	LINCOLN	0044	00	0	1.33
2	181	LINCOLN	0047	00	0	16.73
2	181	LINCOLN	0079	00	0	18.71
2	181	LINCOLN	0220	00	0	18.73
2	189	MCDUFFIE	0010	00	0	25.39

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
2	189	MCDUFFIE	0012	00	0	5.93
2	189	MCDUFFIE	0017	00	0	23.09
2	189	MCDUFFIE	0017	BY	0	7.39
2	189	MCDUFFIE	0043	00	0	7.4
2	189	MCDUFFIE	0047	00	0	6.19
2	189	MCDUFFIE	0080	00	0	0.87
2	189	MCDUFFIE	0080	00	0.92	1.69
2	189	MCDUFFIE	0150	00	0	10.95
2	189	MCDUFFIE	0223	00	0	6.85
2	189	MCDUFFIE	0402	00	0	11.9
2	211	MORGAN	0012	00	0	19.93
2	211	MORGAN	0024	00	0	20.51
2	211	MORGAN	0024	BY	0	4.22
2	211	MORGAN	0024	SP	0	0.38
2	211	MORGAN	0083	00	0	26.21
2	211	MORGAN	0186	00	0	0.65
2	211	MORGAN	0402	00	0	24.36
2	217	NEWTON	0011	00	0	13.06
2	217	NEWTON	0012	00	0	16.31
2	217	NEWTON	0012	WE	0	0.73
2	217	NEWTON	0020	00	0	3.32
2	217	NEWTON	0036	00	0	16.19
2	217	NEWTON	0036	SO	0	0.39
2	217	NEWTON	0081	00	0	18.44
2	217	NEWTON	0138	00	0	1.79
2	217	NEWTON	0142	00	0	16.49
2	217	NEWTON	0162	00	0	16.25
2	217	NEWTON	0162	CO	0	1.46
2	217	NEWTON	0212	00	0	14.96
2	217	NEWTON	0212	00	15.46	15.66
2	217	NEWTON	0212	00	16.11	16.67
2	217	NEWTON	0402	00	0	15.09
2	221	OGLETHORPE	0010	00	0	18.55
2	221	OGLETHORPE	0022	00	0	27.89
2	221	OGLETHORPE	0077	00	0	33.27
2	237	PUTNAM	0016	00	0	23.64
2	237	PUTNAM	0024	00	0	23.8
2	237	PUTNAM	0024	BU	0	3.8
2	237	PUTNAM	0044	00	0	22.39
2	237	PUTNAM	0142	00	0	5.89
2	237	PUTNAM	0212	00	0	9.07
2	245	RICHMOND	0004	00	0	25.31

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
2	245	RICHMOND	0010	00	0	18.12
2	245	RICHMOND	0028	00	0	11.29
2	245	RICHMOND	0056	00	0	14.6
2	245	RICHMOND	0056	SP	0	6.58
2	245	RICHMOND	0088	00	0	10.85
2	245	RICHMOND	0088	CO	0	0.04
2	245	RICHMOND	0104	00	0	7.34
2	245	RICHMOND	0104	CO	0	0.66
2	245	RICHMOND	0104	EA	0	0.66
2	245	RICHMOND	0121	00	0	19.24
2	245	RICHMOND	0223	00	0	0.25
2	245	RICHMOND	0232	00	0	0.72
2	245	RICHMOND	0383	00	0	2.61
2	245	RICHMOND	0402	00	0	6.6
2	245	RICHMOND	0415	00	0	15.4
2	265	TALIAFERRO	0012	00	0	12.47
2	265	TALIAFERRO	0022	00	0	21.94
2	265	TALIAFERRO	0044	00	0	2.52
2	265	TALIAFERRO	0047	00	0	10.89
2	265	TALIAFERRO	0402	00	0	10.16
2	283	TREUTLEN	0015	00	0	13.21
2	283	TREUTLEN	0029	00	0	11.33
2	283	TREUTLEN	0046	00	0	20.72
2	283	TREUTLEN	0056	00	0	15.76
2	283	TREUTLEN	0078	00	0	10.19
2	283	TREUTLEN	0086	00	0	17.72
2	283	TREUTLEN	0171	00	0	2.57
2	283	TREUTLEN	0199	00	0	7.75
2	283	TREUTLEN	0199	SP	0	3.52
2	283	TREUTLEN	0227	00	0	2.17
2	283	TREUTLEN	0297	00	0	5.67
2	283	TREUTLEN	0298	00	0	4.36
2	283	TREUTLEN	0404	00	0	18.43
2	301	WARREN	0012	00	0	19.13
2	301	WARREN	0012	BY	0	1.61
2	301	WARREN	0016	00	0	10.97
2	301	WARREN	0017	00	0	4.67
2	301	WARREN	0017	CO	0	7.31
2	301	WARREN	0080	00	0	23.27
2	301	WARREN	0080	00	24.13	24.87
2	301	WARREN	0080	AL	0	1.99
2	301	WARREN	0123	00	0	3.43

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
2	301	WARREN	0171	00	0	7.17
2	301	WARREN	0223	00	0	0.7
2	301	WARREN	0296	00	0	0.33
2	301	WARREN	0402	00	0	13.05
2	303	WASHINGTON	0015	00	0	30.81
2	303	WASHINGTON	0024	00	0	32.87
2	303	WASHINGTON	0024	SP	0	2.7
2	303	WASHINGTON	0057	00	0	2.95
2	303	WASHINGTON	0068	00	0	18.69
2	303	WASHINGTON	0088	00	0	10.57
2	303	WASHINGTON	0102	00	0	6.8
2	303	WASHINGTON	0231	00	0	20.56
2	303	WASHINGTON	0242	00	0	22.69
2	303	WASHINGTON	0242	SP	0	2.45
2	303	WASHINGTON	0272	00	0	15.39
2	317	WILKES	0010	00	0	26.81
2	317	WILKES	0010	BU	0	4.58
2	317	WILKES	0017	00	0	28.42
2	317	WILKES	0017	BU	0	2.75
2	317	WILKES	0044	00	0	26.68
2	317	WILKES	0044	SP	0	2.03
2	317	WILKES	0047	00	0	19.9
2	317	WILKES	0047	CO	0	0.11
2	317	WILKES	0080	00	0	6.97
2	319	WILKINSON	0018	00	0	11.78
2	319	WILKINSON	0018	SP	0	0.65
2	319	WILKINSON	0019	00	0	1.03
2	319	WILKINSON	0029	00	0	25.94
2	319	WILKINSON	0057	00	0	28.22
2	319	WILKINSON	0096	00	0	9.37
2	319	WILKINSON	0112	00	0	37.6
2	319	WILKINSON	0243	00	0	10.2
2	319	WILKINSON	1085	00	0	6.5
3	021	BIBB	0011	00	0	16.76
3	021	BIBB	0019	00	0	19.43
3	021	BIBB	0019	EA	0	1.03
3	021	BIBB	0022	00	0	19.78
3	021	BIBB	0049	00	0	18.07
3	021	BIBB	0057	00	0	1.32
3	021	BIBB	0074	00	0	13.36
3	021	BIBB	0087	00	0	19.68
3	021	BIBB	0087	CO	0	0.18

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	021	BIBB	0247	00	0	15.68
3	021	BIBB	0401	00	0	21.24
3	021	BIBB	0404	00	0	9.02
3	021	BIBB	0408	00	0	11.99
3	035	BUTTS	0016	00	0	17.43
3	035	BUTTS	0036	00	0	18.29
3	035	BUTTS	0042	00	0	15.43
3	035	BUTTS	0087	00	0	5.94
3	035	BUTTS	0401	00	0	5.43
3	053	CHATTAHOOCHEE	0001	00	0	14.83
3	053	CHATTAHOOCHEE	0026	00	0	8.35
3	053	CHATTAHOOCHEE	0355	00	0	0.8
3	053	CHATTAHOOCHEE	0520	00	0	16.13
3	077	COWETA	0014	00	0	27.74
3	077	COWETA	0014	SO	0	0.63
3	077	COWETA	0016	00	0	32.2
3	077	COWETA	0016	NO	0	0.63
3	077	COWETA	0016	SO	0	0.63
3	077	COWETA	0034	00	0	23.09
3	077	COWETA	0034	BY	0	6.04
3	077	COWETA	0034	WE	0	0.06
3	077	COWETA	0041	00	0	3.97
3	077	COWETA	0054	00	0	15.83
3	077	COWETA	0070	00	0	8.46
3	077	COWETA	0074	00	0	7.65
3	077	COWETA	0085	00	0	7.65
3	077	COWETA	0100	00	0	0.47
3	077	COWETA	0154	00	0	13.15
3	077	COWETA	0403	00	0	23.3
3	079	CRAWFORD	0007	00	0	21.06
3	079	CRAWFORD	0022	00	0	20.8
3	079	CRAWFORD	0042	00	0	24.74
3	079	CRAWFORD	0096	00	0	2.75
3	079	CRAWFORD	0096	00	3.45	4.19
3	079	CRAWFORD	0128	00	0	6.21
3	079	CRAWFORD	0401	00	0	0.14
3	093	DOOLY	0007	00	0	19.79
3	093	DOOLY	0027	00	0	25.14
3	093	DOOLY	0090	00	0	19.83
3	093	DOOLY	0215	00	0	11.4
3	093	DOOLY	0230	00	0	28.86
3	093	DOOLY	0230	CO	0	0.33

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	093	DOOLY	0257	00	0	7.26
3	093	DOOLY	0329	00	0	6.47
3	093	DOOLY	0401	00	0	18.28
3	113	FAYETTE	0054	00	0	15.33
3	113	FAYETTE	0054	WE	0	0.98
3	113	FAYETTE	0074	00	0	17.32
3	113	FAYETTE	0085	00	0	15.32
3	113	FAYETTE	0092	00	0	19.64
3	113	FAYETTE	0138	00	0	1.13
3	113	FAYETTE	0279	00	0	3.75
3	113	FAYETTE	0314	00	0	5.99
3	145	HARRIS	0001	00	0	20.86
3	145	HARRIS	0018	00	0	0.41
3	145	HARRIS	0018	00	0.41	12.69
3	145	HARRIS	0036	00	0	0.05
3	145	HARRIS	0085	00	0	16.48
3	145	HARRIS	0085	AL	0	3.94
3	145	HARRIS	0103	00	0	13.58
3	145	HARRIS	0116	00	0	23.41
3	145	HARRIS	0190	00	0	8.71
3	145	HARRIS	0208	00	0	9.69
3	145	HARRIS	0219	00	0	20.08
3	145	HARRIS	0315	00	0	24.25
3	145	HARRIS	0354	00	0	6.93
3	145	HARRIS	0403	00	0	1.5
3	145	HARRIS	0411	00	0	20.7
3	149	HEARD	0001	00	0	18.59
3	149	HEARD	0034	00	0	20.56
3	149	HEARD	0100	00	0	26.29
3	149	HEARD	0219	00	0	6.52
3	151	HENRY	0003	00	0	5.49
3	151	HENRY	0020	00	0	19.87
3	151	HENRY	0020	DU	0	0.05
3	151	HENRY	0020	EA	0	0.54
3	151	HENRY	0042	00	0	23.49
3	151	HENRY	0042	SO	0	1.22
3	151	HENRY	0081	00	0	24.29
3	151	HENRY	0081	WE	0	0.79
3	151	HENRY	0138	00	0	1.19
3	151	HENRY	0138	00	1.98	10.75
3	151	HENRY	0155	00	0	19.16
3	151	HENRY	0155	00	21.01	23.83

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	151	HENRY	0155	SO	0	0.57
3	151	HENRY	0401	00	0	20.62
3	151	HENRY	0413	00	0	0.63
3	151	HENRY	0920	CO	0	0.2
3	151	HENRY	0920	WE	0	0.27
3	151	HENRY	0921	CO	0	0.05
3	153	HOUSTON	0007	00	0	18.21
3	153	HOUSTON	0007	SP	0	0.33
3	153	HOUSTON	0011	00	0	29.14
3	153	HOUSTON	0011	BU	0	4.62
3	153	HOUSTON	0011	CO	0	2.8
3	153	HOUSTON	0026	00	0	14.91
3	153	HOUSTON	0049	00	0	1.48
3	153	HOUSTON	0096	00	0	11.12
3	153	HOUSTON	0127	00	0	15.38
3	153	HOUSTON	0224	00	0	14.07
3	153	HOUSTON	0247	00	0	21.99
3	153	HOUSTON	0247	CO	0	7.01
3	153	HOUSTON	0247	SP	0	3.17
3	153	HOUSTON	0329	00	0	0.99
3	153	HOUSTON	0401	00	0	16.9
3	169	JONES	0011	00	0	24.09
3	169	JONES	0018	00	0	25.07
3	169	JONES	0022	00	0	18.51
3	169	JONES	0044	00	0	14.62
3	169	JONES	0049	00	0	14.11
3	169	JONES	0057	00	0	2.37
3	171	LAMAR	0007	00	0	19.06
3	171	LAMAR	0018	00	0	13.93
3	171	LAMAR	0036	00	0	19.28
3	171	LAMAR	0109	00	0	0.78
3	171	LAMAR	0401	00	0	2.68
3	193	MACON	0026	00	0	24.72
3	193	MACON	0049	00	0	28.91
3	193	MACON	0090	00	0	20.7
3	193	MACON	0127	00	0	21.05
3	193	MACON	0128	00	0	17.84
3	193	MACON	0128	BY	0	1.86
3	193	MACON	0224	00	0	16.1
3	193	MACON	0240	00	0	7.74
3	193	MACON	0329	00	0	2.96
3	197	MARION	0026	00	0	16.43

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	197	MARION	0030	00	0	6.1
3	197	MARION	0041	00	0	27.87
3	197	MARION	0041	CO	0	0.17
3	197	MARION	0127	00	0	8.76
3	197	MARION	0137	00	0	19.79
3	197	MARION	0137	SP	0	1.64
3	197	MARION	0153	00	0	0.86
3	197	MARION	0240	00	0	0.17
3	197	MARION	0240	00	0.64	18.54
3	197	MARION	0240	CO	0	1.94
3	197	MARION	0352	00	0	9.78
3	197	MARION	0355	00	0	1.37
3	197	MARION	0355	00	2.17	17.67
3	199	MERIWETHER	0018	00	0	27.66
3	199	MERIWETHER	0018	SO	0	0.15
3	199	MERIWETHER	0041	00	0	30.21
3	199	MERIWETHER	0041	SO	0	0.15
3	199	MERIWETHER	0054	00	0	8.9
3	199	MERIWETHER	0054	SP	0	0.16
3	199	MERIWETHER	0074	00	0	19.99
3	199	MERIWETHER	0085	00	0	28.18
3	199	MERIWETHER	0085	AL	0	14.1
3	199	MERIWETHER	0085	SP	0	0.81
3	199	MERIWETHER	0100	00	0	13.29
3	199	MERIWETHER	0100	SO	0	0.12
3	199	MERIWETHER	0109	00	0	21.5
3	199	MERIWETHER	0109	SP	0	9.05
3	199	MERIWETHER	0109	WE	0	0.08
3	199	MERIWETHER	0173	00	0	4.98
3	199	MERIWETHER	0190	00	0	3.66
3	199	MERIWETHER	0190	00	7.78	8
3	199	MERIWETHER	0194	00	0	5.4
3	199	MERIWETHER	0362	00	0	16.42
3	199	MERIWETHER	0403	00	0	4.44
3	207	MONROE	0007	00	0	6.26
3	207	MONROE	0018	00	0	19.9
3	207	MONROE	0019	00	0	13.11
3	207	MONROE	0042	00	0	27.03
3	207	MONROE	0074	00	0	17.82
3	207	MONROE	0083	00	0	24.62
3	207	MONROE	0087	00	0	18.67
3	207	MONROE	0401	00	0	24.89

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	207	MONROE	0408	00	0	3.94
3	215	MUSCOGEE	0001	00	0	19.7
3	215	MUSCOGEE	0022	00	0	21.79
3	215	MUSCOGEE	0022	CO	0	0.73
3	215	MUSCOGEE	0022	SP	0	10.31
3	215	MUSCOGEE	0085	00	0	14.71
3	215	MUSCOGEE	0219	00	0	8.65
3	215	MUSCOGEE	0411	00	0	14.94
3	215	MUSCOGEE	0520	00	0	7.74
3	225	PEACH	0007	00	0	11.34
3	225	PEACH	0007	CO	0	0.17
3	225	PEACH	0011	00	0	0.1
3	225	PEACH	0042	00	0	3.52
3	225	PEACH	0049	00	0	17.96
3	225	PEACH	0049	CO	0	4.73
3	225	PEACH	0096	00	0	0.7
3	225	PEACH	0096	00	1.44	15.07
3	225	PEACH	0127	00	0	0.52
3	225	PEACH	0247	CO	0	4.56
3	225	PEACH	0401	00	0	11.1
3	231	PIKE	0003	00	0	15.28
3	231	PIKE	0003	SO	0	0.87
3	231	PIKE	0007	00	0	3.32
3	231	PIKE	0018	00	0	22.02
3	231	PIKE	0074	00	0	2.09
3	231	PIKE	0109	00	0	18.9
3	231	PIKE	0362	00	0	9.44
3	235	PULASKI	0011	00	0	19.52
3	235	PULASKI	0011	BU	0	1.3
3	235	PULASKI	0011	EA	0	0.28
3	235	PULASKI	0026	00	0	13.19
3	235	PULASKI	0026	WE	0	0.77
3	235	PULASKI	0027	00	0	22.81
3	235	PULASKI	0027	WE	0	0.85
3	235	PULASKI	0112	00	0	17.43
3	235	PULASKI	0112	WE	0	0.85
3	235	PULASKI	0230	00	0	25.43
3	235	PULASKI	0230	WE	0	0.85
3	235	PULASKI	0247	00	0	5.78
3	235	PULASKI	0257	00	0	18.81
3	235	PULASKI	0257	WE	0	0.85
3	249	SCHLEY	0003	00	0	0.47

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	249	SCHLEY	0003	00	0.47	15.7
3	249	SCHLEY	0026	00	0	12.33
3	249	SCHLEY	0153	00	0	8.43
3	249	SCHLEY	0228	00	0	6.49
3	249	SCHLEY	0240	00	0	8.75
3	249	SCHLEY	0271	00	0	5.16
3	255	SPALDING	0003	00	0	11.68
3	255	SPALDING	0007	00	0	0.61
3	255	SPALDING	0016	00	0	23.41
3	255	SPALDING	0092	00	0	8.54
3	255	SPALDING	0155	00	0	12.99
3	255	SPALDING	0362	00	0	4.62
3	255	SPALDING	0401	00	0	1.88
3	259	STEWART	0001	00	0	0.54
3	259	STEWART	0001	00	0.62	23.12
3	259	STEWART	0001	CO	0	0.72
3	259	STEWART	0027	00	0	23.26
3	259	STEWART	0039	00	0	24.15
3	259	STEWART	0039	CO	0	15.71
3	259	STEWART	0039	SP	0	1.48
3	259	STEWART	0520	00	0	17.04
3	261	SUMTER	0003	00	0	18.48
3	261	SUMTER	0027	00	0	28.98
3	261	SUMTER	0027	WE	0	2.15
3	261	SUMTER	0030	00	0	36.18
3	261	SUMTER	0030	WE	0	2.15
3	261	SUMTER	0045	00	0	6.06
3	261	SUMTER	0049	00	0	26.59
3	261	SUMTER	0049	WE	0	1.53
3	261	SUMTER	0118	00	0	4.8
3	261	SUMTER	0153	00	0	2.18
3	261	SUMTER	0195	00	0	23.82
3	261	SUMTER	0228	00	0	3.74
3	261	SUMTER	0271	00	0	2.42
3	261	SUMTER	0308	00	0	11.39
3	261	SUMTER	0377	00	0	11.31
3	263	TALBOT	0022	00	0	29.04
3	263	TALBOT	0036	00	0	22.24
3	263	TALBOT	0041	00	0	25.25
3	263	TALBOT	0085	00	0	6.48
3	263	TALBOT	0085	AL	0	4.63
3	263	TALBOT	0090	00	0	11.04

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	263	TALBOT	0096	00	0	9.59
3	263	TALBOT	0116	00	0	7.27
3	263	TALBOT	0190	00	0	4.12
3	263	TALBOT	0208	00	0	21.42
3	263	TALBOT	0240	00	0	2.55
3	263	TALBOT	0240	00	2.73	3.2
3	263	TALBOT	0315	00	0	5.61
3	263	TALBOT	0355	00	0	2.14
3	269	TAYLOR	0003	00	0	26.78
3	269	TAYLOR	0003	SO	0	1.05
3	269	TAYLOR	0022	00	0	5.94
3	269	TAYLOR	0090	00	0	22.42
3	269	TAYLOR	0090	CO	0	0.07
3	269	TAYLOR	0096	00	0	24.96
3	269	TAYLOR	0127	00	0	20.51
3	269	TAYLOR	0128	00	0	11.13
3	269	TAYLOR	0137	00	0	27.46
3	269	TAYLOR	0137	WE	0	0.14
3	269	TAYLOR	0208	00	0	12.15
3	285	TROUP	0001	00	0	27.91
3	285	TROUP	0014	00	0	34.47
3	285	TROUP	0014	CO	0	1.12
3	285	TROUP	0014	SP	0	4.98
3	285	TROUP	0018	00	0	8.05
3	285	TROUP	0054	00	0	10.74
3	285	TROUP	0100	00	0	7.28
3	285	TROUP	0103	00	0	0.37
3	285	TROUP	0109	00	0	21.54
3	285	TROUP	0219	00	0	23.55
3	285	TROUP	0403	00	0	27.92
3	285	TROUP	0411	00	0	14.35
3	289	TWIGGS	0018	00	0	6.28
3	289	TWIGGS	0019	00	0	23.28
3	289	TWIGGS	0057	00	0	6.58
3	289	TWIGGS	0087	00	0	20.23
3	289	TWIGGS	0096	00	0	22.1
3	289	TWIGGS	0112	00	0	0.73
3	289	TWIGGS	0358	00	0	6.38
3	289	TWIGGS	0404	00	0	22.76
3	293	UPSON	0003	00	0	22.67
3	293	UPSON	0003	SO	0	1.83
3	293	UPSON	0022	00	0	4.54

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
3	293	UPSON	0036	00	0	19.1
3	293	UPSON	0036	WE	0	0.32
3	293	UPSON	0074	00	0	26.57
3	293	UPSON	0074	AL	0	1.49
3	293	UPSON	0074	WE	0	0.32
3	307	WEBSTER	0027	00	0	13.5
3	307	WEBSTER	0041	00	0	19.32
3	307	WEBSTER	0045	00	0	2.14
3	307	WEBSTER	0153	00	0	7.55
3	307	WEBSTER	0520	00	0	9.06
4	003	ATKINSON	0031	00	0	16.7
4	003	ATKINSON	0064	00	0	24.3
4	003	ATKINSON	0089	00	0	6.1
4	003	ATKINSON	0090	00	0	7
4	003	ATKINSON	0135	00	0	11.77
4	003	ATKINSON	0520	00	0	24.78
4	007	BAKER	0037	00	0	15.13
4	007	BAKER	0091	00	0	25.71
4	007	BAKER	0200	00	0	18.7
4	007	BAKER	0216	00	0	10.05
4	007	BAKER	0253	00	0	7.76
4	017	BEN HILL	0011	00	0	14.73
4	017	BEN HILL	0011	SO	0	1.53
4	017	BEN HILL	0090	00	0	24.31
4	017	BEN HILL	0090	SO	0	1.35
4	017	BEN HILL	0107	00	0	23.3
4	017	BEN HILL	0125	00	0	1.45
4	017	BEN HILL	0182	00	0	8.68
4	017	BEN HILL	0206	00	0	9.88
4	017	BEN HILL	0215	00	0	1.11
4	017	BEN HILL	0233	00	0	1.09
4	019	BERRIEN	0011	00	0	31.29
4	019	BERRIEN	0037	00	0	10.07
4	019	BERRIEN	0064	00	0	3.1
4	019	BERRIEN	0064	00	9.23	13.34
4	019	BERRIEN	0076	00	0	15.99
4	019	BERRIEN	0076	CO	0	0.11
4	019	BERRIEN	0125	00	0	26.85
4	019	BERRIEN	0135	00	0	11.08
4	019	BERRIEN	0158	00	0	5.43
4	019	BERRIEN	0168	00	0	13.22
4	019	BERRIEN	0520	00	0	16.68

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	027	BROOKS	0031	00	0	0.07
4	027	BROOKS	0033	00	0	3.06
4	027	BROOKS	0038	00	0	17.17
4	027	BROOKS	0076	00	0	30.46
4	027	BROOKS	0122	00	0	17.28
4	027	BROOKS	0133	00	0	20.1
4	027	BROOKS	0333	00	0	29.16
4	037	CALHOUN	0037	00	0	0.38
4	037	CALHOUN	0037	00	0.68	25.75
4	037	CALHOUN	0041	00	0	5.15
4	037	CALHOUN	0041	00	5.69	5.81
4	037	CALHOUN	0045	00	0	20.38
4	037	CALHOUN	0045	AL	0	0.38
4	037	CALHOUN	0055	00	0	10.08
4	037	CALHOUN	0062	00	0	18.52
4	037	CALHOUN	0216	00	0	14.44
4	037	CALHOUN	0234	00	0	5.7
4	061	CLAY	0001	00	0	8.53
4	061	CLAY	0037	00	0	13.87
4	061	CLAY	0037	00	14.25	14.55
4	061	CLAY	0039	00	0	22.98
4	061	CLAY	0266	00	0	6.62
4	061	CLAY	0266	00	6.92	7.58
4	069	COFFEE	0031	00	0	29
4	069	COFFEE	0031	SO	0	2.64
4	069	COFFEE	0032	00	0	28.96
4	069	COFFEE	0032	WE	0	1.11
4	069	COFFEE	0064	00	0	3.46
4	069	COFFEE	0090	00	0	3.85
4	069	COFFEE	0107	00	0	11.33
4	069	COFFEE	0135	00	0	24.37
4	069	COFFEE	0158	00	0	35.19
4	069	COFFEE	0206	00	0	15.83
4	069	COFFEE	0206	CO	0	4.46
4	069	COFFEE	0268	00	0	14.83
4	071	COLQUITT	0033	00	0	22.36
4	071	COLQUITT	0033	SO	0	1.68
4	071	COLQUITT	0035	00	0	26.84
4	071	COLQUITT	0037	00	0	29.93
4	071	COLQUITT	0037	WE	0	0.82
4	071	COLQUITT	0111	00	0	15.58
4	071	COLQUITT	0133	00	0	30.43

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	071	COLQUITT	0202	00	0	6.03
4	071	COLQUITT	0256	00	0	3.59
4	071	COLQUITT	0270	00	0	10.43
4	071	COLQUITT	0270	SP	0	0.35
4	075	COOK	0007	00	0	21.62
4	075	COOK	0037	00	0	13.86
4	075	COOK	0076	00	0	15.9
4	075	COOK	0401	00	0	21.31
4	081	CRISP	0007	00	0	17.02
4	081	CRISP	0030	00	0	19.62
4	081	CRISP	0033	00	0	7.78
4	081	CRISP	0033	CO	0	1.78
4	081	CRISP	0090	00	0	18.26
4	081	CRISP	0257	00	0	4.99
4	081	CRISP	0300	00	0	13.87
4	081	CRISP	0300	CO	0	3.31
4	081	CRISP	0401	00	0	15.93
4	087	DECATUR	0001	00	0	32.87
4	087	DECATUR	0001	BU	0	16.34
4	087	DECATUR	0038	00	0	25.4
4	087	DECATUR	0038	BU	0	2.82
4	087	DECATUR	0097	00	0	38.53
4	087	DECATUR	0097	CO	0	1.51
4	087	DECATUR	0097	SP	0	3.41
4	087	DECATUR	0241	00	0	5.56
4	087	DECATUR	0253	00	0	24.74
4	087	DECATUR	0253	SP	0	1.04
4	087	DECATUR	0262	00	0	31.71
4	087	DECATUR	0285	00	0	0.24
4	087	DECATUR	0302	00	0	4.56
4	087	DECATUR	0302	SP	0	1.11
4	087	DECATUR	0309	00	0	26.78
4	087	DECATUR	0310	00	0	14.36
4	087	DECATUR	0311	00	0	12.39
4	095	DOUGHERTY	0003	00	0	14.68
4	095	DOUGHERTY	0062	00	0	16.71
4	095	DOUGHERTY	0091	00	0	16.18
4	095	DOUGHERTY	0133	00	0	16.01
4	095	DOUGHERTY	0234	00	0	22.9
4	095	DOUGHERTY	0300	00	0	17.97
4	095	DOUGHERTY	0520	00	0	16.67
4	095	DOUGHERTY	0520	BU	0	11.9

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	099	EARLY	0001	00	0	21.32
4	099	EARLY	0001	BU	0	4.31
4	099	EARLY	0001	SB	0	0.12
4	099	EARLY	0038	00	0	6.86
4	099	EARLY	0039	00	0	28.79
4	099	EARLY	0045	00	0	12.95
4	099	EARLY	0062	00	0	26.95
4	099	EARLY	0062	BY	0	4.53
4	099	EARLY	0200	00	0	19.81
4	099	EARLY	0216	00	0	6.85
4	099	EARLY	0273	00	0	9.15
4	099	EARLY	0273	SP	0	0.75
4	099	EARLY	0370	00	0	12.61
4	101	ECHOLS	0007	00	0	1.61
4	101	ECHOLS	0011	00	0	17.04
4	101	ECHOLS	0089	00	0	5.98
4	101	ECHOLS	0094	00	0	35.48
4	101	ECHOLS	0135	00	0	17.29
4	101	ECHOLS	0187	00	0	9.9
4	101	ECHOLS	0376	00	0	4.49
4	131	GRADY	0035	00	0	7.63
4	131	GRADY	0038	00	0	19.02
4	131	GRADY	0038	CO	0	0.45
4	131	GRADY	0038	SP	0	0.85
4	131	GRADY	0093	00	0	26.9
4	131	GRADY	0111	00	0	31.84
4	131	GRADY	0112	00	0	12.84
4	131	GRADY	0188	00	0	9.9
4	131	GRADY	0262	00	0	7.53
4	155	IRWIN	0011	00	0	12.55
4	155	IRWIN	0032	00	0	27.7
4	155	IRWIN	0035	00	0	9.51
4	155	IRWIN	0090	00	0	16.32
4	155	IRWIN	0107	00	0	7.72
4	155	IRWIN	0125	00	0	14.06
4	155	IRWIN	0158	00	0	5.43
4	155	IRWIN	0206	00	0	2.07
4	173	LANIER	0011	00	0	21.89
4	173	LANIER	0011	BY	0	0.6
4	173	LANIER	0011	CO	0	0.06
4	173	LANIER	0031	00	0	17.74
4	173	LANIER	0031	CO	0	0.38

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	173	LANIER	0037	00	0	12.06
4	173	LANIER	0037	CO	0	0.04
4	173	LANIER	0038	00	0	4.35
4	173	LANIER	0038	WE	0	1.29
4	173	LANIER	0064	00	0	6.13
4	173	LANIER	0064	00	10.24	15
4	173	LANIER	0122	00	0	14.76
4	173	LANIER	0122	CO	0	0.65
4	173	LANIER	0125	00	0	2.53
4	173	LANIER	0135	00	0	14.31
4	173	LANIER	0135	BY	0	1.59
4	173	LANIER	0168	00	0	4.44
4	177	LEE	0003	00	0	21.65
4	177	LEE	0003	BY	0	1.83
4	177	LEE	0032	00	0	18.62
4	177	LEE	0091	00	0	8.86
4	177	LEE	0118	00	0	11.78
4	177	LEE	0133	00	0	2.62
4	177	LEE	0195	00	0	14.44
4	177	LEE	0377	00	0	8.64
4	177	LEE	0520	00	0	0.61
4	177	LEE	0520	00	1.38	6.7
4	185	LOWNDES	0007	00	0	38
4	185	LOWNDES	0007	AL	0	2.92
4	185	LOWNDES	0007	BU	0	6.99
4	185	LOWNDES	0007	SB	0	0.45
4	185	LOWNDES	0007	SO	0	0.45
4	185	LOWNDES	0031	00	0	26.23
4	185	LOWNDES	0031	SO	0	0.48
4	185	LOWNDES	0038	00	0	26.75
4	185	LOWNDES	0038	WE	0	0.91
4	185	LOWNDES	0094	00	0	6.54
4	185	LOWNDES	0094	WE	0	0.73
4	185	LOWNDES	0122	00	0	17.08
4	185	LOWNDES	0125	00	0	11.04
4	185	LOWNDES	0133	00	0	3.38
4	185	LOWNDES	0135	00	0	7.61
4	185	LOWNDES	0376	00	0	11.47
4	185	LOWNDES	0401	00	0	31.28
4	201	MILLER	0001	00	0	16.11
4	201	MILLER	0039	00	0	4.27
4	201	MILLER	0045	00	0	14.72

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	201	MILLER	0045	CO	0	0.1
4	201	MILLER	0045	SO	0	0.14
4	201	MILLER	0091	00	0	23.56
4	201	MILLER	0091	SO	0	0.14
4	201	MILLER	0091	SP	0	0.33
4	201	MILLER	0273	00	0	8.11
4	201	MILLER	0310	00	0	7.36
4	205	MITCHELL	0003	00	0	29.17
4	205	MITCHELL	0037	00	0	22.58
4	205	MITCHELL	0037	CO	0	0.28
4	205	MITCHELL	0065	00	0	17.28
4	205	MITCHELL	0093	00	0	33.94
4	205	MITCHELL	0097	00	0	18.73
4	205	MITCHELL	0111	00	0	3.81
4	205	MITCHELL	0112	00	0	28.39
4	205	MITCHELL	0262	00	0	12.74
4	205	MITCHELL	0270	00	0	2.27
4	205	MITCHELL	0300	00	0	29.17
4	205	MITCHELL	0311	00	0	11.44
4	239	QUITMAN	0027	00	0	10.05
4	239	QUITMAN	0039	00	0	16.66
4	239	QUITMAN	0050	00	0	15.49
4	243	RANDOLPH	0001	00	0	22.72
4	243	RANDOLPH	0001	00	23.22	23.34
4	243	RANDOLPH	0001	BU	0	3.33
4	243	RANDOLPH	0001	SB	0	0.09
4	243	RANDOLPH	0041	00	0	0.55
4	243	RANDOLPH	0041	00	0.67	22.38
4	243	RANDOLPH	0050	00	0	21.17
4	243	RANDOLPH	0050	WE	0	0.09
4	243	RANDOLPH	0216	00	0	9.01
4	243	RANDOLPH	0266	00	0	0.3
4	243	RANDOLPH	0266	00	0.97	11.63
4	253	SEMINOLE	0038	00	0	13.8
4	253	SEMINOLE	0039	00	0	20.96
4	253	SEMINOLE	0045	00	0	4.54
4	253	SEMINOLE	0091	00	0	11.36
4	253	SEMINOLE	0091	AL	0	1.85
4	253	SEMINOLE	0253	00	0	10.7
4	253	SEMINOLE	0285	00	0	13.74
4	253	SEMINOLE	0374	00	0	7.89
4	273	TERRELL	0032	00	0	9.69

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	273	TERRELL	0041	00	0	2.4
4	273	TERRELL	0045	00	0	27.24
4	273	TERRELL	0049	00	0	4.25
4	273	TERRELL	0050	00	0	9.34
4	273	TERRELL	0055	00	0	10.86
4	273	TERRELL	0118	00	0	10.4
4	273	TERRELL	0520	00	0	22.43
4	273	TERRELL	0520	00	23.04	23.81
4	275	THOMAS	0003	00	0	31.58
4	275	THOMAS	0003	AL	0	18.87
4	275	THOMAS	0033	00	0	18.12
4	275	THOMAS	0035	00	0	26.71
4	275	THOMAS	0035	BU	0	5.51
4	275	THOMAS	0035	CO	0	1.15
4	275	THOMAS	0038	00	0	26.15
4	275	THOMAS	0038	BU	0	4.88
4	275	THOMAS	0111	00	0	3.45
4	275	THOMAS	0122	00	0	14.95
4	275	THOMAS	0188	00	0	24.57
4	275	THOMAS	0202	00	0	9.53
4	275	THOMAS	0300	00	0	31.58
4	277	TIFT	0007	00	0	20.99
4	277	TIFT	0035	00	0	20.99
4	277	TIFT	0125	00	0	16.52
4	277	TIFT	0401	00	0	20.08
4	277	TIFT	0520	00	0	18.67
4	287	TURNER	0007	00	0	16.76
4	287	TURNER	0032	00	0	21.11
4	287	TURNER	0032	CO	0	0.03
4	287	TURNER	0090	00	0	9.53
4	287	TURNER	0107	00	0	10.86
4	287	TURNER	0112	00	0	23.41
4	287	TURNER	0159	00	0	12.35
4	287	TURNER	0401	00	0	16.82
4	315	WILCOX	0011	00	0	23.53
4	315	WILCOX	0030	00	0	20.55
4	315	WILCOX	0090	00	0	1.6
4	315	WILCOX	0112	00	0	20.39
4	315	WILCOX	0159	00	0	6.59
4	315	WILCOX	0215	00	0	26.04
4	315	WILCOX	0233	00	0	18.26
4	315	WILCOX	0257	00	0	3.43

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
4	321	WORTH	0032	00	0	14.33
4	321	WORTH	0033	00	0	33.1
4	321	WORTH	0112	00	0	23.45
4	321	WORTH	0133	00	0	10.32
4	321	WORTH	0256	00	0	17.35
4	321	WORTH	0300	00	0	15.02
4	321	WORTH	0313	00	0	22.23
4	321	WORTH	0520	00	0	20.2
5	001	APPLING	0004	00	0	21.14
5	001	APPLING	0015	00	0	32.86
5	001	APPLING	0019	00	0	0.3
5	001	APPLING	0019	00	2.04	3.05
5	001	APPLING	0027	00	0	24.78
5	001	APPLING	0121	00	0	26.26
5	001	APPLING	0144	00	0	15.56
5	001	APPLING	0169	00	0	2.69
5	001	APPLING	0203	00	0	10.79
5	005	BACON	0004	00	0	17.89
5	005	BACON	0004	AL	0	1.6
5	005	BACON	0019	00	0	6.67
5	005	BACON	0032	00	0	19.34
5	005	BACON	0203	00	0	12.8
5	025	BRANTLEY	0015	00	0	14.89
5	025	BRANTLEY	0023	00	0	20.11
5	025	BRANTLEY	0032	00	0	18.68
5	025	BRANTLEY	0110	00	0	16.17
5	025	BRANTLEY	0121	00	0	14.89
5	025	BRANTLEY	0520	00	0	27
5	029	BRYAN	0025	00	0	9.18
5	029	BRYAN	0026	00	0	5.85
5	029	BRYAN	0030	00	0	23.25
5	029	BRYAN	0067	00	0	7.48
5	029	BRYAN	0119	00	0	12.44
5	029	BRYAN	0144	00	0	24.24
5	029	BRYAN	0144	SP	0	3.98
5	029	BRYAN	0204	00	0	11.12
5	029	BRYAN	0404	00	0	9.06
5	029	BRYAN	0405	00	0	11.49
5	031	BULLOCH	0024	00	0	14.65
5	031	BULLOCH	0026	00	0	42.64
5	031	BULLOCH	0046	00	0	16.11
5	031	BULLOCH	0067	00	0	35.42

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
5	031	BULLOCH	0067	BY	0	7.24
5	031	BULLOCH	0073	00	0	24.12
5	031	BULLOCH	0073	BY	0	6.82
5	031	BULLOCH	0119	00	0	11.23
5	031	BULLOCH	0119	CO	0	5.99
5	031	BULLOCH	0119	SP	0	0.24
5	031	BULLOCH	0404	00	0	26.09
5	039	CAMDEN	0025	00	0	31.65
5	039	CAMDEN	0025	SP	0	2.7
5	039	CAMDEN	0040	00	0	23.86
5	039	CAMDEN	0040	SP	0	6.55
5	039	CAMDEN	0110	00	0	29.97
5	039	CAMDEN	0252	00	0	12.76
5	039	CAMDEN	0405	00	0	27.67
5	043	CANDLER	0023	00	0	18.43
5	043	CANDLER	0046	00	0	17.78
5	043	CANDLER	0057	00	0	8.69
5	043	CANDLER	0121	00	0	18.88
5	043	CANDLER	0129	00	0	9.03
5	043	CANDLER	0404	00	0	17.39
5	049	CHARLTON	0004	00	0	19.5
5	049	CHARLTON	0004	SO	0	1.46
5	049	CHARLTON	0015	00	0	19.42
5	049	CHARLTON	0023	00	0	52.3
5	049	CHARLTON	0023	WE	0	1.74
5	049	CHARLTON	0040	00	0	6.62
5	049	CHARLTON	0040	CO	0	1.33
5	049	CHARLTON	0094	00	0	12.92
5	049	CHARLTON	0121	00	0	51.25
5	049	CHARLTON	0177	00	0	2.6
5	049	CHARLTON	0185	00	0	12.96
5	049	CHARLTON	0252	00	0	10.63
5	051	CHATHAM	0017	00	0	4.73
5	051	CHATHAM	0021	00	0	17.74
5	051	CHATHAM	0021	SP	0	1.22
5	051	CHATHAM	0025	00	0	21.27
5	051	CHATHAM	0025	CO	0	3.12
5	051	CHATHAM	0025	EC	0	0.6
5	051	CHATHAM	0026	00	0	36.54
5	051	CHATHAM	0026	CO	0	0.2
5	051	CHATHAM	0026	WE	0	0.94
5	051	CHATHAM	0030	00	0	7.61

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
5	051	CHATHAM	0204	00	0	24.87
5	051	CHATHAM	0204	SP	0	7.17
5	051	CHATHAM	0307	00	0	8.49
5	051	CHATHAM	0404	00	0	16.53
5	051	CHATHAM	0404	SP	0	3.07
5	051	CHATHAM	0405	00	0	20.07
5	051	CHATHAM	0421	00	0	6.68
5	065	CLINCH	0031	00	0	3.82
5	065	CLINCH	0037	00	0	10.75
5	065	CLINCH	0038	00	0	22.92
5	065	CLINCH	0038	WE	0	1.39
5	065	CLINCH	0089	00	0	44.77
5	065	CLINCH	0094	00	0	10.4
5	065	CLINCH	0122	00	0	19.04
5	065	CLINCH	0168	00	0	10.7
5	065	CLINCH	0177	00	0	10.86
5	065	CLINCH	0187	00	0	17.1
5	103	EFFINGHAM	0017	00	0	29.3
5	103	EFFINGHAM	0021	00	0	27.89
5	103	EFFINGHAM	0021	BU	0	2.1
5	103	EFFINGHAM	0021	SP	0	0.51
5	103	EFFINGHAM	0026	00	0	6.38
5	103	EFFINGHAM	0030	00	0	17.02
5	103	EFFINGHAM	0119	00	0	21.98
5	103	EFFINGHAM	0275	00	0	5.55
5	103	EFFINGHAM	0404	00	0	2.91
5	103	EFFINGHAM	0405	00	0	0.63
5	109	EVANS	0030	00	0	12.84
5	109	EVANS	0073	00	0	14.86
5	109	EVANS	0129	00	0	17.14
5	109	EVANS	0169	00	0	14.37
5	109	EVANS	0169	SP	0	0.54
5	109	EVANS	0292	00	0	1.92
5	127	GLYNN	0025	00	0	25.56
5	127	GLYNN	0025	CO	0	1.12
5	127	GLYNN	0025	SE	0	4.11
5	127	GLYNN	0025	SP	0	7.45
5	127	GLYNN	0027	00	0	22.79
5	127	GLYNN	0032	00	0	11.57
5	127	GLYNN	0099	00	0	18.52
5	127	GLYNN	0303	00	0	9.13
5	127	GLYNN	0405	00	0	16.87

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
5	127	GLYNN	0520	00	0	25.07
5	161	JEFF DAVIS	0019	00	0	1.73
5	161	JEFF DAVIS	0019	00	2.74	18.36
5	161	JEFF DAVIS	0019	CO	0	0.17
5	161	JEFF DAVIS	0027	00	0	11.29
5	161	JEFF DAVIS	0107	00	0	8.8
5	161	JEFF DAVIS	0135	00	0	24.33
5	161	JEFF DAVIS	0135	CO	0	0.73
5	161	JEFF DAVIS	0135	SO	0	0.9
5	161	JEFF DAVIS	0268	00	0	8.09
5	179	LIBERTY	0025	00	0	18.25
5	179	LIBERTY	0038	00	0	21.48
5	179	LIBERTY	0038	CO	0	1.72
5	179	LIBERTY	0119	00	0	35.65
5	179	LIBERTY	0119	SO	1.73	2.93
5	179	LIBERTY	0144	00	0	19.83
5	179	LIBERTY	0196	00	0	26.98
5	179	LIBERTY	0405	00	0	13.12
5	183	LONG	0023	00	0	21.02
5	183	LONG	0038	00	0	13.57
5	183	LONG	0057	00	0	29.04
5	183	LONG	0144	00	0	8.19
5	183	LONG	0196	00	0	9.99
5	191	MCINTOSH	0025	00	0	22.85
5	191	MCINTOSH	0057	00	0	8.59
5	191	MCINTOSH	0099	00	0	20.5
5	191	MCINTOSH	0251	00	0	13.48
5	191	MCINTOSH	0405	00	0	21.92
5	209	MONTGOMERY	0015	00	0	11.57
5	209	MONTGOMERY	0029	00	0	11.57
5	209	MONTGOMERY	0030	00	0	12.28
5	209	MONTGOMERY	0056	00	0	23.83
5	209	MONTGOMERY	0056	SO	0	0.12
5	209	MONTGOMERY	0130	00	0	1.29
5	209	MONTGOMERY	0135	00	0	18.67
5	209	MONTGOMERY	0199	00	0	4.95
5	209	MONTGOMERY	0292	00	0	1.9
5	209	MONTGOMERY	0298	00	0	1.64
5	229	PIERCE	0015	00	0	21.98
5	229	PIERCE	0032	00	0	18.91
5	229	PIERCE	0038	00	0	21.91
5	229	PIERCE	0121	00	0	21.98

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
5	229	PIERCE	0203	00	0	12.1
5	251	SCREVEN	0017	00	0	24.05
5	251	SCREVEN	0021	00	0	30.56
5	251	SCREVEN	0021	BU	0	16.32
5	251	SCREVEN	0021	CO	0	0.03
5	251	SCREVEN	0021	SB	0	0.1
5	251	SCREVEN	0024	00	0	41.25
5	251	SCREVEN	0073	00	0	30.57
5	251	SCREVEN	0073	LO	0	3.02
5	251	SCREVEN	0073	SO	0	0.11
5	267	TATTNALL	0023	00	0	36.83
5	267	TATTNALL	0030	00	0	14.28
5	267	TATTNALL	0056	00	0	4.4
5	267	TATTNALL	0057	00	0	36.91
5	267	TATTNALL	0073	00	0	8.41
5	267	TATTNALL	0121	00	0	34.7
5	267	TATTNALL	0129	00	0	0.61
5	267	TATTNALL	0144	00	0	15.49
5	267	TATTNALL	0147	00	0	9.48
5	267	TATTNALL	0152	00	0	5.51
5	267	TATTNALL	0169	00	0	18.95
5	267	TATTNALL	0178	00	0	14.28
5	267	TATTNALL	0196	00	0	2.62
5	267	TATTNALL	0292	00	0	11.83
5	271	TELFAIR	0019	00	0	1.37
5	271	TELFAIR	0027	00	0	22.16
5	271	TELFAIR	0027	WE	0	1.01
5	271	TELFAIR	0030	00	0	12.31
5	271	TELFAIR	0031	00	0	21.43
5	271	TELFAIR	0117	00	0	34.58
5	271	TELFAIR	0132	00	0	18.6
5	271	TELFAIR	0149	00	0	18.51
5	271	TELFAIR	0149	CO	0	3.17
5	271	TELFAIR	0165	00	0	8.07
5	279	TOOMBS	0004	00	0	26.03
5	279	TOOMBS	0015	00	0	23.27
5	279	TOOMBS	0015	EA	0	0.72
5	279	TOOMBS	0029	00	0	11.28
5	279	TOOMBS	0029	EA	0	0.72
5	279	TOOMBS	0030	00	0	16.88
5	279	TOOMBS	0030	WE	0	1.31
5	279	TOOMBS	0056	00	0	17.27

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
5	279	TOOMBS	0086	00	0	13.16
5	279	TOOMBS	0130	00	0	10.95
5	279	TOOMBS	0147	00	0	9.71
5	279	TOOMBS	0152	00	0	8.26
5	279	TOOMBS	0178	00	0	15.14
5	279	TOOMBS	0292	00	0	15.33
5	279	TOOMBS	0297	00	0	9.04
5	279	TOOMBS	0298	00	0	0.58
5	299	WARE	0004	00	0	38.76
5	299	WARE	0004	BU	0	9.63
5	299	WARE	0038	00	0	21.87
5	299	WARE	0122	00	0	15.16
5	299	WARE	0158	00	0	9.87
5	299	WARE	0177	00	0	4.27
5	299	WARE	0177	00	6.88	18.57
5	299	WARE	0520	00	0	31.82
5	305	WAYNE	0023	00	0	23.38
5	305	WAYNE	0027	00	0	35.8
5	305	WAYNE	0038	00	0	20.72
5	305	WAYNE	0038	WE	0	2.08
5	305	WAYNE	0169	00	0	19.35
5	305	WAYNE	0203	00	0	11
5	309	WHEELER	0019	00	0	27.95
5	309	WHEELER	0030	00	0	17.56
5	309	WHEELER	0031	00	0	5.71
5	309	WHEELER	0046	00	0	0.6
5	309	WHEELER	0046	00	0.95	5.76
5	309	WHEELER	0126	00	0	17.84
5	309	WHEELER	0149	00	0	5.18
6	015	BARTOW	0003	00	0	27.96
6	015	BARTOW	0003	CO	0	4.77
6	015	BARTOW	0020	00	0	23.73
6	015	BARTOW	0020	SP	0	4.25
6	015	BARTOW	0061	00	0	26.82
6	015	BARTOW	0113	00	0	15.17
6	015	BARTOW	0113	CO	0	0.35
6	015	BARTOW	0140	00	0	22.6
6	015	BARTOW	0293	00	0	21.27
6	015	BARTOW	0293	CO	0	0.39
6	015	BARTOW	0401	00	0	29.94
6	015	BARTOW	1000	00	0	3.3
6	045	CARROLL	0001	00	0	21.52

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
6	045	CARROLL	0001	BU	0	0.79
6	045	CARROLL	0005	00	0	32.28
6	045	CARROLL	0008	00	0	8.39
6	045	CARROLL	0016	00	0	27.62
6	045	CARROLL	0061	00	0	13.11
6	045	CARROLL	0100	00	0	17.85
6	045	CARROLL	0101	00	0	6.32
6	045	CARROLL	0113	00	0	13.44
6	045	CARROLL	0113	00	17.07	17.25
6	045	CARROLL	0166	00	0	27.81
6	045	CARROLL	0166	CO	0	3.75
6	045	CARROLL	0274	00	0	1.17
6	045	CARROLL	0402	00	0	15.9
6	047	CATOOSA	0001	00	0	1.36
6	047	CATOOSA	0001	00	8.23	9.65
6	047	CATOOSA	0002	00	0	16.04
6	047	CATOOSA	0003	00	0	13.49
6	047	CATOOSA	0146	00	0	5.11
6	047	CATOOSA	0151	00	0	16.83
6	047	CATOOSA	0151	SP	0	0.23
6	047	CATOOSA	0401	00	0	13.41
6	055	CHATTOOGA	0001	00	0	18.67
6	055	CHATTOOGA	0048	00	0	12.61
6	055	CHATTOOGA	0100	00	0	14.84
6	055	CHATTOOGA	0114	00	0	12.74
6	055	CHATTOOGA	0157	00	0	6.71
6	055	CHATTOOGA	0337	00	0	12.78
6	057	CHEROKEE	0005	00	0	23.91
6	057	CHEROKEE	0005	BU	0	15.68
6	057	CHEROKEE	0005	CO	0	1.42
6	057	CHEROKEE	0020	00	0	25.89
6	057	CHEROKEE	0092	00	0	14.56
6	057	CHEROKEE	0108	00	0	15.7
6	057	CHEROKEE	0140	00	0	26.83
6	057	CHEROKEE	0369	00	0	4.76
6	057	CHEROKEE	0372	00	0	17.87
6	057	CHEROKEE	0401	00	0	2.12
6	057	CHEROKEE	0417	00	0	23.91
6	083	DADE	0058	00	0	22.75
6	083	DADE	0058	SO	0	0.07
6	083	DADE	0136	00	0	14.12
6	083	DADE	0157	00	0	1.52

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
6	083	DADE	0157	00	16.36	20.05
6	083	DADE	0157	00	20.27	20.34
6	083	DADE	0189	00	0	2.22
6	083	DADE	0189	00	2.75	15.03
6	083	DADE	0299	00	0	3.48
6	083	DADE	0301	00	0	10.31
6	083	DADE	0406	00	0	20.13
6	083	DADE	0406	CO	0	0.85
6	083	DADE	0409	00	0	4.1
6	111	FANNIN	0002	00	0	17.1
6	111	FANNIN	0005	00	0	14.38
6	111	FANNIN	0060	00	0	30.07
6	111	FANNIN	0060	SP	0	7.55
6	111	FANNIN	0515	00	0	17.1
6	115	FLOYD	0001	00	0	26.39
6	115	FLOYD	0001	LO	0	11.76
6	115	FLOYD	0020	00	0	27.36
6	115	FLOYD	0053	00	0	34.86
6	115	FLOYD	0100	00	0	18.33
6	115	FLOYD	0101	00	0	12.51
6	115	FLOYD	0140	00	0	10.3
6	115	FLOYD	0156	00	0	6.82
6	115	FLOYD	0293	00	0	8.46
6	123	GILMER	0002	00	0.57	0.75
6	123	GILMER	0002	00	0.89	26.25
6	123	GILMER	0005	00	0	22.29
6	123	GILMER	0052	00	0	28.02
6	123	GILMER	0136	00	0	5.18
6	123	GILMER	0282	00	0	13.06
6	123	GILMER	0382	00	0	11.64
6	123	GILMER	0515	00	0	22.29
6	129	GORDON	0003	00	0	15.73
6	129	GORDON	0053	00	0	27.48
6	129	GORDON	0053	SP	0	2.93
6	129	GORDON	0061	00	0	13.26
6	129	GORDON	0136	00	0	24
6	129	GORDON	0136	CO	0	9.78
6	129	GORDON	0156	00	0	27.54
6	129	GORDON	0225	00	0	8.35
6	129	GORDON	0401	00	0	15.65
6	143	HARALSON	0001	00	0	16
6	143	HARALSON	0001	BU	0	9

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
6	143	HARALSON	0008	00	0	19.16
6	143	HARALSON	0016	00	0	0.98
6	143	HARALSON	0100	00	0	18.1
6	143	HARALSON	0100	SP	0	0.9
6	143	HARALSON	0113	00	0	3.63
6	143	HARALSON	0113	00	3.81	5.37
6	143	HARALSON	0120	00	0	17.07
6	143	HARALSON	0402	00	0	9.6
6	213	MURRAY	0002	00	0	31.88
6	213	MURRAY	0002	00	32.08	32.48
6	213	MURRAY	0002	00	32.63	32.73
6	213	MURRAY	0052	00	0	19.69
6	213	MURRAY	0052	AL	0	5.36
6	213	MURRAY	0061	00	0	28.31
6	213	MURRAY	0136	00	0	2.79
6	213	MURRAY	0225	00	0	27.77
6	213	MURRAY	0282	00	0	6.85
6	213	MURRAY	0286	00	0	5.05
6	223	PAULDING	0006	00	0	16.7
6	223	PAULDING	0006	BU	0	6.03
6	223	PAULDING	0061	00	0	24.3
6	223	PAULDING	0092	00	0	11.77
6	223	PAULDING	0092	00	13.89	18.35
6	223	PAULDING	0101	00	0	11.47
6	223	PAULDING	0113	00	0	11.67
6	223	PAULDING	0120	00	0	22.06
6	223	PAULDING	0120	CO	0	7.39
6	223	PAULDING	0360	00	0	4.04
6	227	PICKENS	0005	00	0	15.22
6	227	PICKENS	0005	BU	0	0.47
6	227	PICKENS	0053	00	0	30.02
6	227	PICKENS	0053	BU	0	6.43
6	227	PICKENS	0108	00	0	6.53
6	227	PICKENS	0136	00	0	19.66
6	227	PICKENS	0136	CO	0	2.65
6	227	PICKENS	0372	00	0	0.47
6	227	PICKENS	0417	00	0	0.83
6	227	PICKENS	0515	00	0	14.39
6	233	POLK	0001	00	0	16.35
6	233	POLK	0001	BU	0	4.22
6	233	POLK	0006	00	0	29.32
6	233	POLK	0006	BU	0	3.22

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
6	233	POLK	0100	00	0	19.71
6	233	POLK	0101	00	0	13.25
6	233	POLK	0113	00	0	10.91
6	295	WALKER	0001	00	0	19.1
6	295	WALKER	0001	00	20.46	27.33
6	295	WALKER	0001	00	28.75	30.64
6	295	WALKER	0001	BU	0	3.34
6	295	WALKER	0002	00	0	4.33
6	295	WALKER	0095	00	0	7.78
6	295	WALKER	0136	00	0	36.25
6	295	WALKER	0151	00	0	14.74
6	295	WALKER	0157	00	0	11.1
6	295	WALKER	0157	00	12.62	27.5
6	295	WALKER	0157	00	31.19	31.4
6	295	WALKER	0157	00	31.47	33.28
6	295	WALKER	0189	00	0	0.52
6	295	WALKER	0189	00	12.81	13.43
6	295	WALKER	0193	00	0	27.14
6	295	WALKER	0201	00	0	3.24
6	295	WALKER	0337	00	0	9.94
6	295	WALKER	0341	00	0	15.49
6	313	WHITFIELD	0002	00	0	10.92
6	313	WHITFIELD	0003	00	0	27.27
6	313	WHITFIELD	0003	CO	0	0.67
6	313	WHITFIELD	0052	00	0	8.11
6	313	WHITFIELD	0071	00	0	13.56
6	313	WHITFIELD	0201	00	0	17.67
6	313	WHITFIELD	0286	00	0	5
6	313	WHITFIELD	0401	00	0	18.6
7	063	CLAYTON	0003	00	0	16.2
7	063	CLAYTON	0003	CO	0	1.15
7	063	CLAYTON	0006	00	0	0.32
7	063	CLAYTON	0014	00	0	0.4
7	063	CLAYTON	0042	00	0	6.95
7	063	CLAYTON	0054	00	0	13.38
7	063	CLAYTON	0054	CO	0	1.15
7	063	CLAYTON	0085	00	0	7.65
7	063	CLAYTON	0138	00	0	10.56
7	063	CLAYTON	0138	00	11.78	12.66
7	063	CLAYTON	0138	SP	0	0.53
7	063	CLAYTON	0139	00	0	6.28
7	063	CLAYTON	0314	00	0	4.76

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
7	063	CLAYTON	0331	00	0	3.28
7	063	CLAYTON	0401	00	0	10.8
7	063	CLAYTON	0403	00	0	1.36
7	063	CLAYTON	0403	00	1.79	2.03
7	063	CLAYTON	0407	00	0	5.95
7	063	CLAYTON	0413	00	0	7.58
7	067	COBB	0003	00	0	22.75
7	067	COBB	0003	CO	0	1.65
7	067	COBB	0005	00	0	25.09
7	067	COBB	0005	CO	0	2.07
7	067	COBB	0005	SO	0	0.81
7	067	COBB	0005	SP	0	2.33
7	067	COBB	0006	00	0	7.37
7	067	COBB	0006	SP	0	0.84
7	067	COBB	0008	00	0	8.55
7	067	COBB	0092	00	0	2.12
7	067	COBB	0092	00	6.57	14.01
7	067	COBB	0092	00	28.56	29.63
7	067	COBB	0120	00	0	22.21
7	067	COBB	0120	AL	0	4.06
7	067	COBB	0120	LO	0	8.61
7	067	COBB	0139	00	0	3.86
7	067	COBB	0176	00	0	14.95
7	067	COBB	0280	00	0	13.53
7	067	COBB	0360	00	0	11.45
7	067	COBB	0401	00	0	17.83
7	067	COBB	0402	00	0	3.61
7	067	COBB	0407	00	0	7.61
7	067	COBB	0417	00	0	6.29
7	089	DEKALB	0008	00	0	12.15
7	089	DEKALB	0010	00	0	15.11
7	089	DEKALB	0012	00	0	12.72
7	089	DEKALB	0013	00	0	8.23
7	089	DEKALB	0013	CO	0	1.05
7	089	DEKALB	0042	00	0	3.08
7	089	DEKALB	0042	00	9.12	13.92
7	089	DEKALB	0054	CO	0	1.05
7	089	DEKALB	0124	00	0	6.58
7	089	DEKALB	0141	00	0	7.25
7	089	DEKALB	0154	00	0	6.67
7	089	DEKALB	0154	SP	0	0.68
7	089	DEKALB	0155	00	0	20.24

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
7	089	DEKALB	0212	00	0	6.38
7	089	DEKALB	0236	00	0	14.28
7	089	DEKALB	0260	00	0	1.19
7	089	DEKALB	0402	00	0	17.56
7	089	DEKALB	0403	00	0	8.65
7	089	DEKALB	0407	00	0	26.34
7	089	DEKALB	0410	00	0	7.25
7	089	DEKALB	0413	00	0	2.9
7	097	DOUGLAS	0005	00	0	24.15
7	097	DOUGLAS	0006	00	0	6.58
7	097	DOUGLAS	0008	00	0	18.02
7	097	DOUGLAS	0008	CO	0	0.39
7	097	DOUGLAS	0061	00	0	1.2
7	097	DOUGLAS	0070	00	0	5.64
7	097	DOUGLAS	0092	00	0	13.92
7	097	DOUGLAS	0154	00	0	5.64
7	097	DOUGLAS	0166	00	0	20.72
7	097	DOUGLAS	0166	WE	0	0.23
7	097	DOUGLAS	0402	00	0	18.81
7	121	FULTON	0003	00	0	17.83
7	121	FULTON	0003	CO	0	0.17
7	121	FULTON	0006	00	0	11.51
7	121	FULTON	0006	00	11.83	12.06
7	121	FULTON	0008	00	0	10.03
7	121	FULTON	0008	WE	0	0.17
7	121	FULTON	0009	00	0	29.85
7	121	FULTON	0009	SO	0	0.74
7	121	FULTON	0010	00	0	2.6
7	121	FULTON	0013	00	0	3.79
7	121	FULTON	0014	00	0	16.26
7	121	FULTON	0014	00	16.64	25.09
7	121	FULTON	0014	AL	0	13.72
7	121	FULTON	0014	CO	0	2.01
7	121	FULTON	0014	CW	0	1.92
7	121	FULTON	0014	SO	0	0.76
7	121	FULTON	0014	SP	0	2.42
7	121	FULTON	0042	00	0	6.04
7	121	FULTON	0042	CO	0	0.62
7	121	FULTON	0042	SP	0	2.38
7	121	FULTON	0054	00	0	6.31
7	121	FULTON	0054	CO	0	0.73
7	121	FULTON	0070	00	0	16.97

District	CountyNo	CountyName	RouteNo	RouteSuffix	MilepostFrom	MilepostTo
7	121	FULTON	0070	00	22.63	33.47
7	121	FULTON	0074	00	0	3.07
7	121	FULTON	0092	00	0	14.2
7	121	FULTON	0092	00	69.88	74.87
7	121	FULTON	0120	00	0	17.25
7	121	FULTON	0138	00	0	8.42
7	121	FULTON	0139	00	0	17.5
7	121	FULTON	0139	SO	0	0.76
7	121	FULTON	0140	00	0	13.83
7	121	FULTON	0141	00	0	2.32
7	121	FULTON	0141	00	15.61	21
7	121	FULTON	0141	CO	0	0.86
7	121	FULTON	0154	00	0	9.9
7	121	FULTON	0154	00	17.13	36.28
7	121	FULTON	0154	CO	0	0.26
7	121	FULTON	0166	00	0	15.06
7	121	FULTON	0236	00	0	1.14
7	121	FULTON	0236	WE	0	0.15
7	121	FULTON	0237	00	0	3.26
7	121	FULTON	0279	00	0	5.76
7	121	FULTON	0280	00	0	4.76
7	121	FULTON	0372	00	0	8.83
7	121	FULTON	0400	00	0	22.51
7	121	FULTON	0401	00	0	17.81
7	121	FULTON	0402	00	0	11.59
7	121	FULTON	0403	00	0	13.39
7	121	FULTON	0403	00	14.75	15.17
7	121	FULTON	0403	00	15.41	31.16
7	121	FULTON	0407	00	0	13.22
7	121	FULTON	0407	00	20.82	26.71
7	121	FULTON	0407	00	53.03	54.69
7	121	FULTON	0407	00	60.62	62.66
7	247	ROCKDALE	0012	00	0	8.58
7	247	ROCKDALE	0020	00	0	17.65
7	247	ROCKDALE	0138	00	0	17.71
7	247	ROCKDALE	0155	00	0	1.85
7	247	ROCKDALE	0162	00	0	2.16
7	247	ROCKDALE	0212	00	0	8.22
7	247	ROCKDALE	0402	00	0	8.58

APPENDIX II: USER'S GUIDE FOR INSTALLING COPACES FOR TABLET ON WINDOWS 8.1

Preparation:
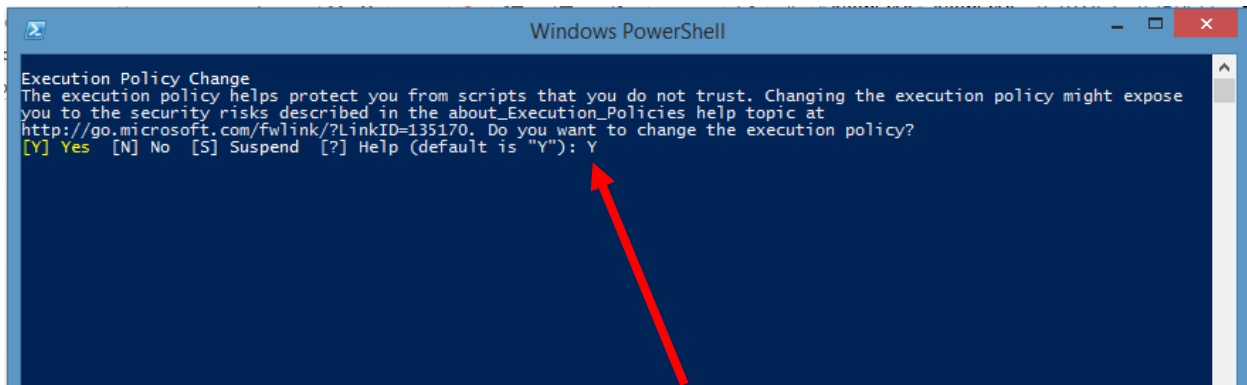
Please register for a free Hotmail email account if you don't have one. You need the administrator credential to install the software.

1. **Uninstall any previous COPACES for Tablet**
2. **Install COPACES for Tablet:**

*Step 1: Right-click **Add-AppDevPackage.ps1** (note: the file extension might not be shown on your tablet) and click **Run with PowerShell***
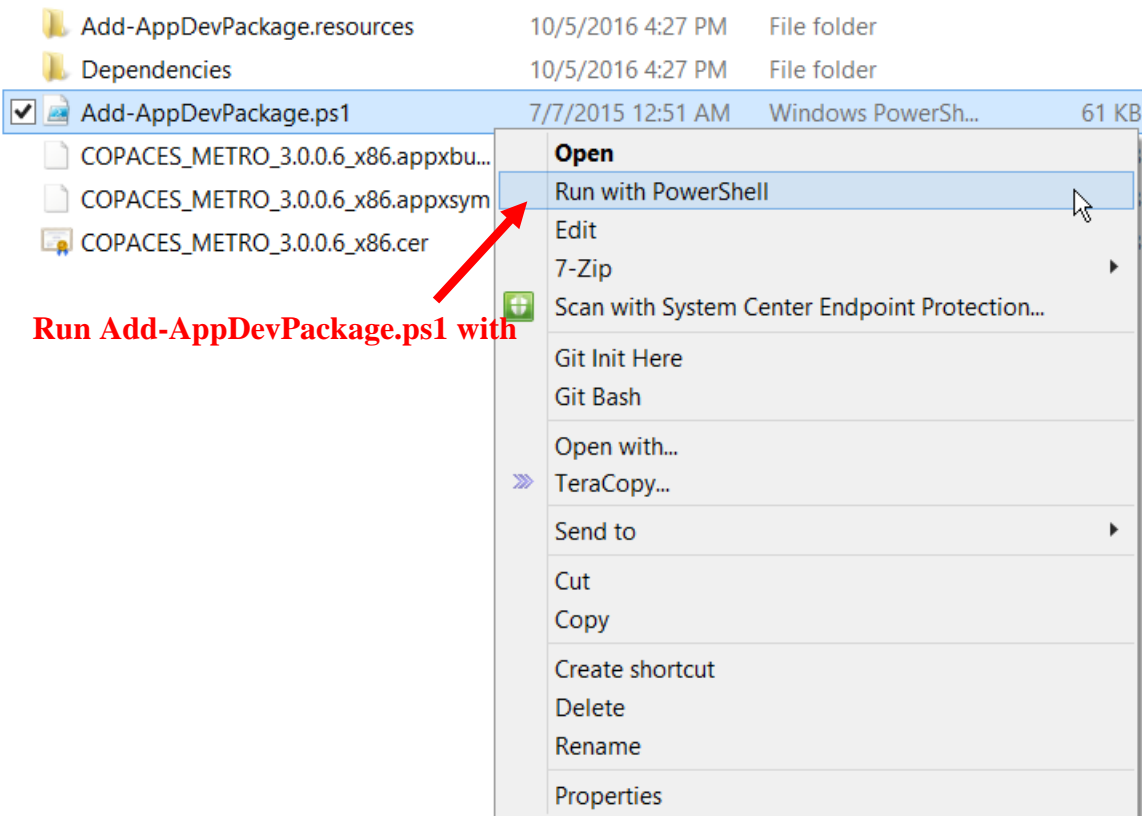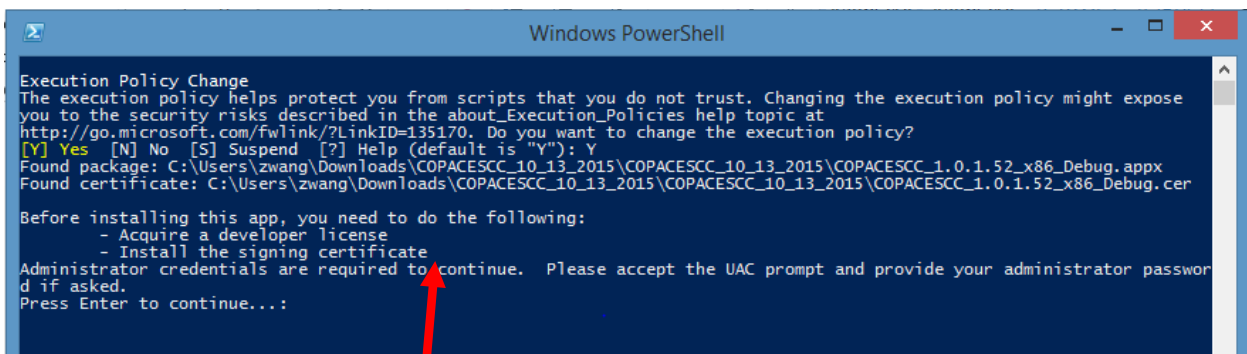
Step 2: Type Y to answer the first question

Type Y to answer the question.

Step 3: Press Enter to continue…

You will acquire a developer license and install the signing certificate. This step

is not always needed if you have done it before.

*Step 4: Click **I Agree** to continue…*
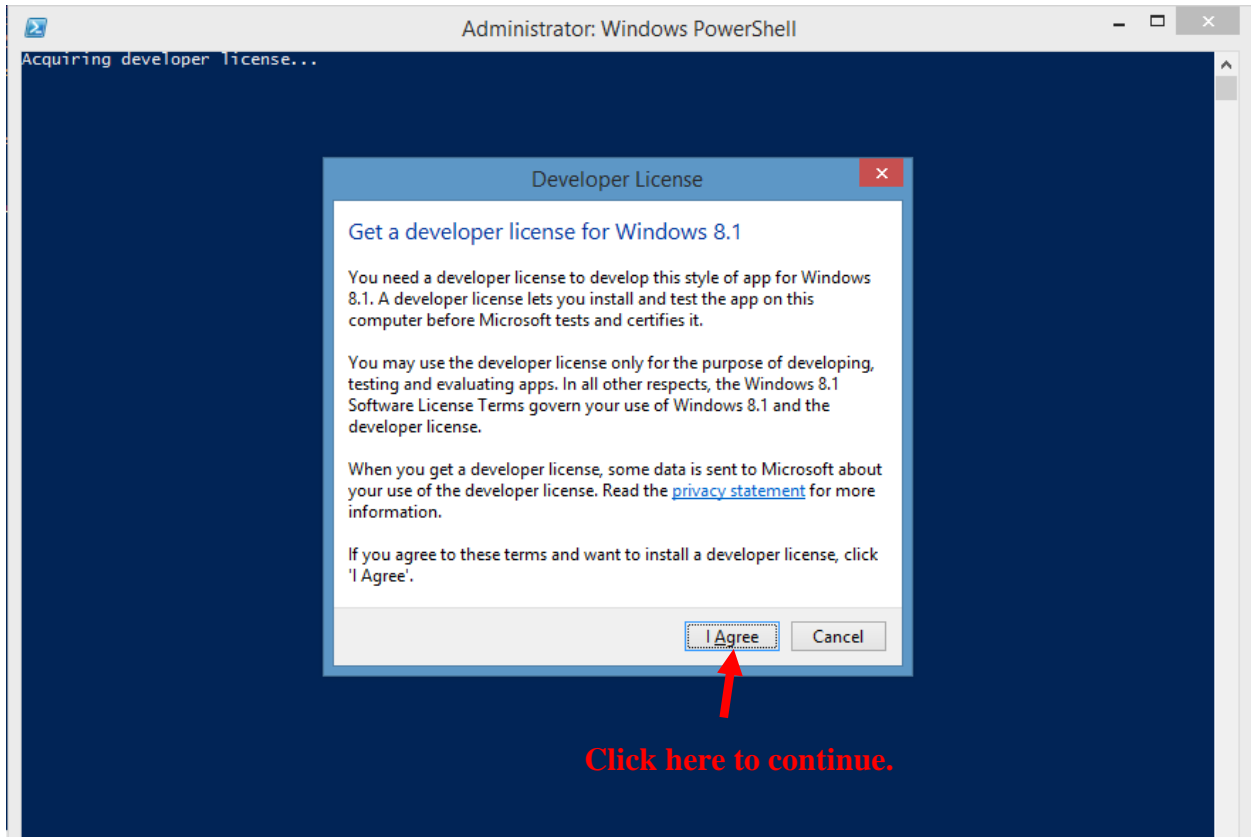
Step 5: Type your email and password and click **Sign in**
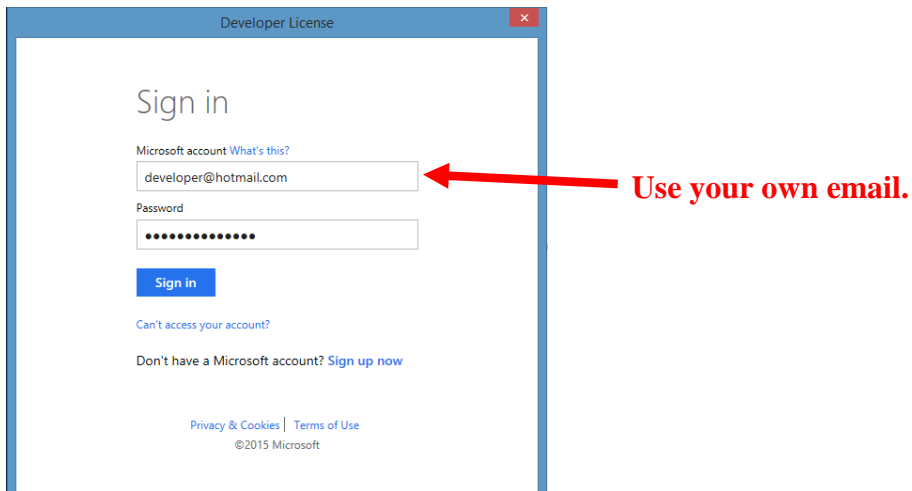
This is a confirmation. Click

Step 6: Type Y to install certificate
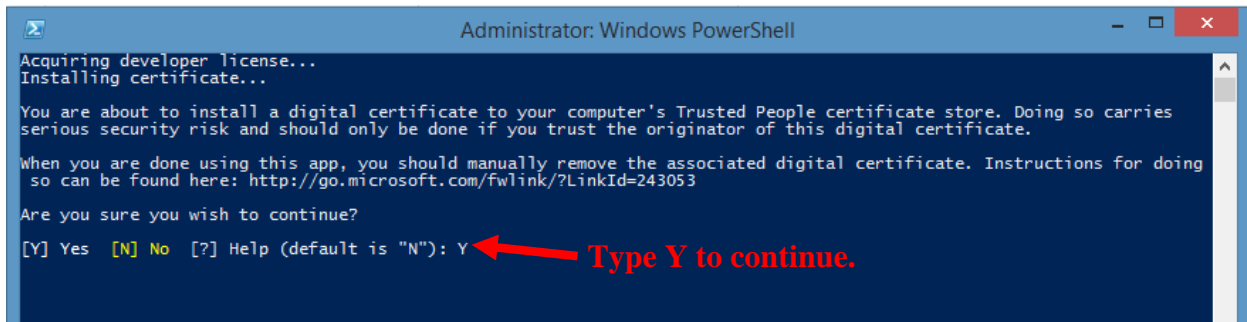
Type Y to continue.
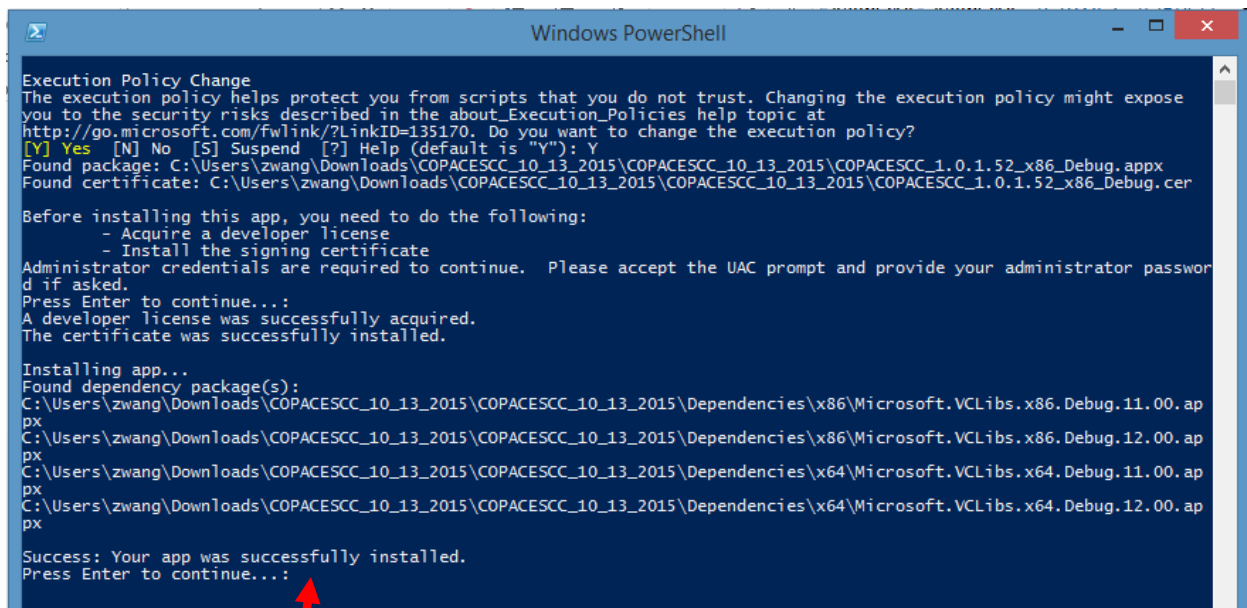
The installation is successful. Press Enter to finish

APPENDIX II: USER'S GUIDE FOR INSTALLING COPACES FOR TABLET ON WINDOWS 10

Prerequisite:

Turn on the developer mode in the system setting.

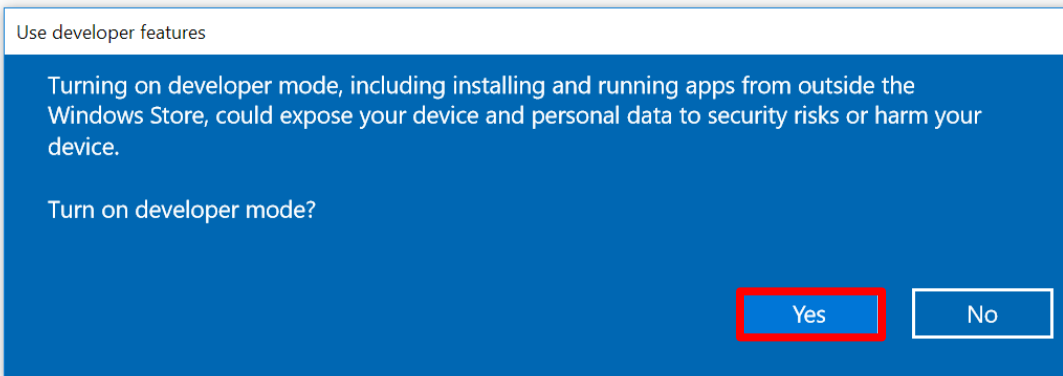1. Open Settings in start menu
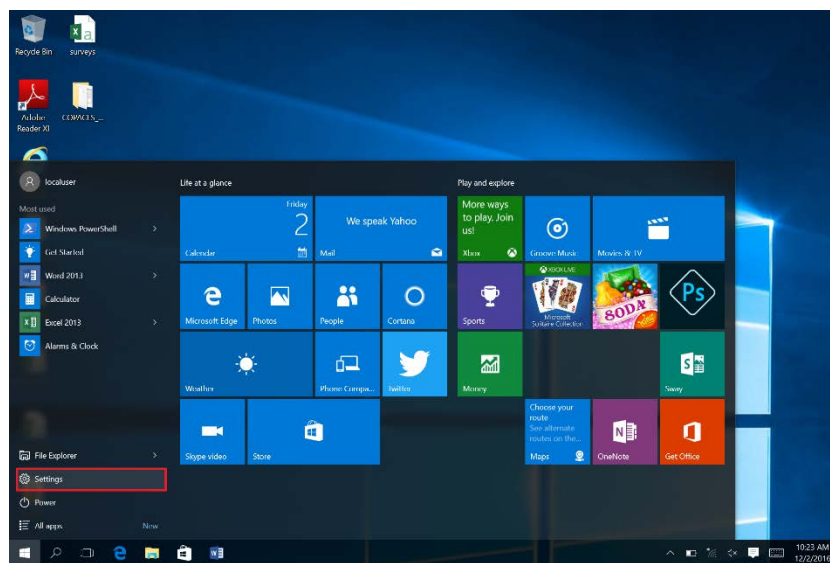
2. Open Update & Security in Settings
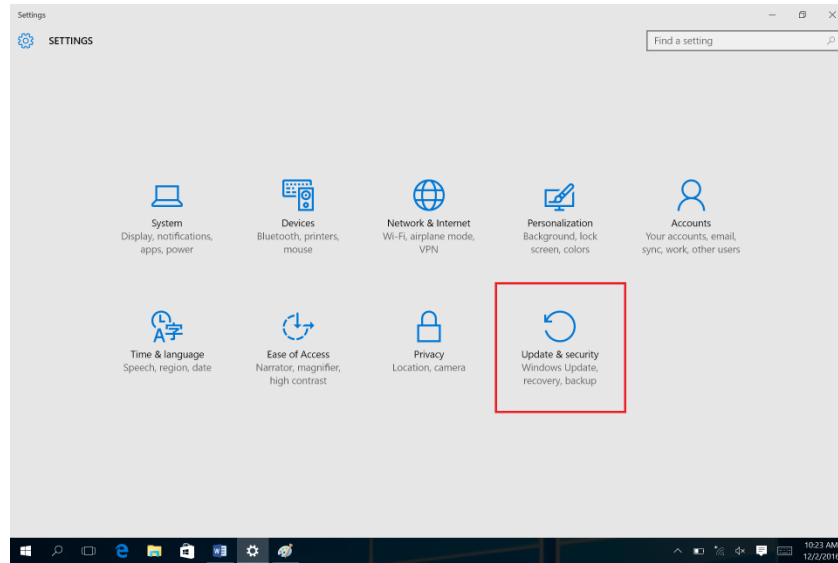
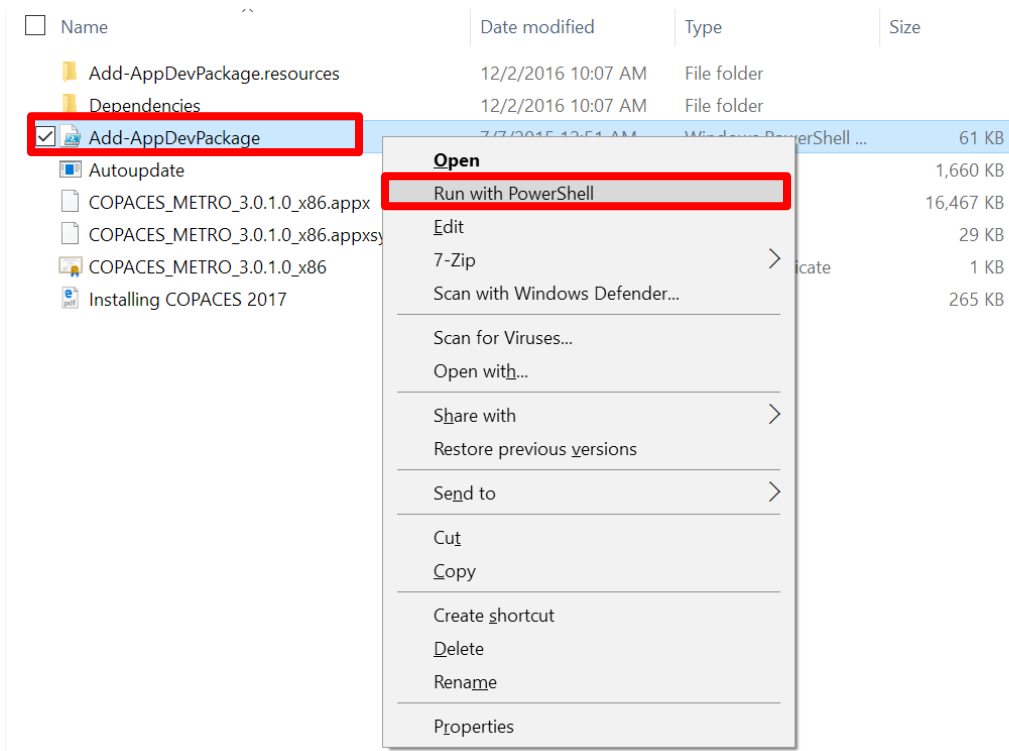3. In the "For Developers" section, select "Developer mode." You will need to click "Yes" in the pop-up dialog window.
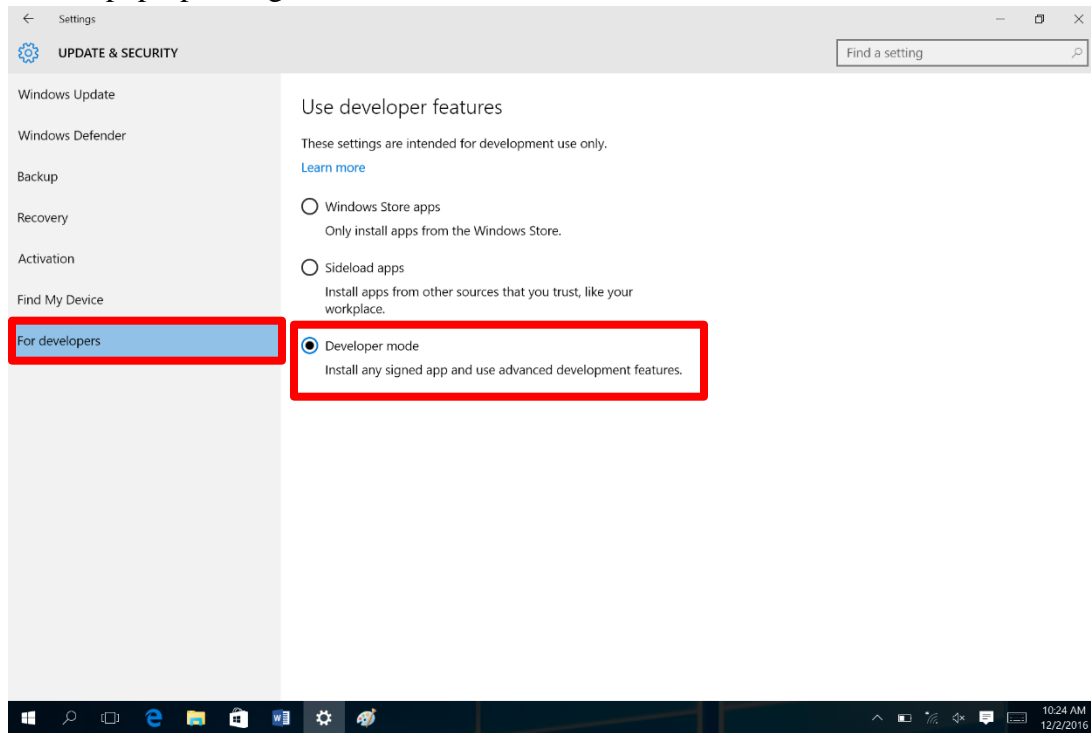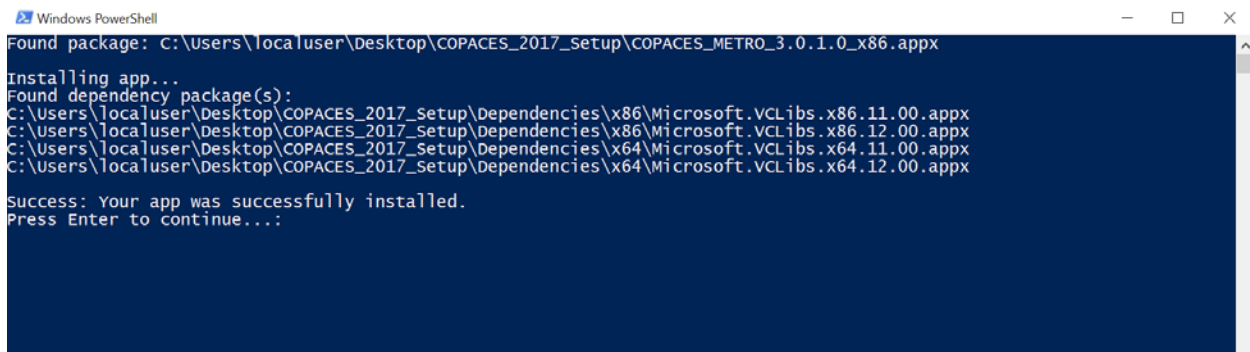
4. **Uninstall previous copies of COPACES for Tablet.**

Installation Procedure:

Step 1: Open the installation package and right-click **Add-AppDevPackage.ps1** (note: the file extension might not be shown on your tablet), and click **Run with PowerShell.**

Step 2: Press "Enter" button to close the PowerShell window after installation is complete.

Step 3 (not required): You may reset your developer feature in Figure 3 to "Windows Store apps" for security purposes.