

Production Process for Financial Data Tables in FHWA's *Highway Statistics Series*

Highway Statistics Series: Revenue, Debt, and
Expenditures

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List of Abbreviations

Abbreviation	Term
DOT	Department of Transportation
DOTs	State DOTs
FASH	Finance Analysis System on Highways
FHWA	Federal Highway Administration
FMIS	Financial Management Information System
GSA	General Services Administration
GUI	Graphical User Interface
HPPI	Office of Highway Policy Information
HS	Highway Statistics
MAP-21	Moving Ahead for Progress in the 21 st Century Act
NEAR	National Electronic Accounting and Reporting
NHCCI	National Highway Construction Cost Index
UPACS	User Profile and Access Control System
XML	Extensible Markup Language

Preface

This report documents the production process for highway-related financial data reported in the Federal Highway Administration's (FHWA) annual **Highway Statistics** Series. FHWA Office of Highway Policy Information obtains detailed information on highway-related receipts and disbursements from various Federal, State, and local sources, and processes these data to produce the tables and charts that appear in Chapters 9, 10, and 11 of **Highway Statistics**. Highway-related receipts consist of motor fuel taxes, driver's license and vehicle registration fees, toll revenues, borrowing proceeds, and miscellaneous other sources of revenue. These are disbursed for a wide variety of transportation-related purposes, including the construction and maintenance of the highway system. Data on revenues and spending are obtained primarily from reporting forms submitted by individual States. FHWA supplements those with other information reported by local government agencies and obtained from Federal sources. These are compiled into a series of tables and charts published annually in **Highway Statistics**, and are made available to Congress and the public [1].

I. Overview of *Highway Statistics* Financial Data

The objective of this report is to document the various steps that FHWA analysts use to collect, process, and format data reported in the financial tables and charts appearing in Chapters 9, 10, and 11 of the Office of Highway Policy Information's (HPPI) online *Highway Statistics* Series publications. The tables and charts herein detail the sources of highway-related revenue collected by the U.S. Federal government, State and local government agencies, and toll authorities, as well as the distribution of those revenues for various transportation-related purposes. These data are obtained mainly from reporting forms submitted by State Departments of Transportation (DOTs) and local government agencies, supplemented by information obtained from Federal data management systems. After conducting a series of steps to validate and process these data, FHWA uses the individual data elements reported on those forms and obtained from Federal sources in various combinations to produce approximately 70 tables and accompanying charts that appear annually in *Highway Statistics*.

I.1 FHWA's *Highway Statistics*

FHWA's *Highway Statistics* consists of a large number of detailed tables and charts presenting statistical tabulations related to highway and bridge infrastructure, travel, highway users and vehicles, fuel consumption, and highway revenues, spending, and financing. The *Highway Statistics* Series has been published annually by FHWA's Office of Highway Policy Information since 1945. Until 2006, it appeared in printed form; since then it is published on the website maintained by HPPI [1]. *Highway Statistics* provides vital information on the extent, condition, use, and financing of the U.S. highway system. FHWA uses it extensively; as do other government agencies, transportation firms and industries, groups representing highway system users, and researchers. The information it provides is used by the public and all levels of government use this to assess the current and historical performance of the nation's highway system, and to inform future highway investment choices. FHWA employs the information presented in *Highway Statistics* to develop and implement legislation, while State and Federal transportation officials also rely on it to plan, design, and administer the highway transportation system. *Highway Statistics* reports on information related to the 50 States, the District of Columbia, and Puerto Rico.

Highway-related financial data are the focus of three chapters of *Highway Statistics*. Chapter 9 includes tables and charts detailing revenues generated from taxes, tolls, and other charges levied on fuel, vehicles, and highway users, as well as transfers of revenue between different levels of government. Chapter 9 also documents receipts and outlays from the highway and transit accounts of the Federal Highway Trust Fund (HTF), together with their annual opening and closing balances. The tables appearing in Chapter 10 report debt obligations used to finance highway facilities, including total outstanding obligations at the beginning and end of each year, as well as changes resulting from new debt issues, retirement of outstanding obligations, and refunding of existing debt. Chapter 11 consists of tables that report the basis for funds distributed by the Federal government to the States, the amounts

distributed, expenditures by States, local governments, and toll authorities for transportation-related purposes, and uses of highway-related revenues for non-transportation purposes.

I.2 Chapter 9: Revenues

Chapter 9 of *Highway Statistics* includes a series of detailed tables that report the sources and uses of highway-related and other revenue by the Federal government, individual States, local government agencies, and operators of toll facilities (such as roads, bridges, and tunnels). Highway-related revenues consist primarily of Federal and State fuel taxes, but also include State taxes and fees levied on motor vehicles and motor carriers, toll receipts, transfers from general government revenues, property taxes levied by local governments, and miscellaneous other revenue sources. Most tables in Chapter 9 report the disposition of revenues among a few major categories: highway-related purposes, mass transit support, expenses for collecting revenues, and remaining revenues available for general purposes.

Highway funding in the U.S. operates through a system of intergovernmental transfers, and transfers of funds from the level of government at which they are originally collected; they appear as disbursements to the government agencies making these transfers and as revenues to the agencies receiving them. Most notably, Federal fuel tax revenues are transferred to the States to fund construction and maintenance of highways, and these transfers appear as both disbursements by the Federal government and as revenues received by individual States in various tables in Chapter 9. Other tables in Chapter 9 also report transfers between States and local government agencies, which again appear as disbursements to the level of government making those transfers and as revenues to their recipients.

Finally, the U.S. system of highway finance also relies on borrowing and repayment of debt by government agencies and toll authorities to allow them to construct, expand, or rebuild highway facilities before they receive revenues that would normally fund those activities. Proceeds from new issues of bonds or other forms of borrowing by these agencies are reported as revenues in some Chapter 9 tables; similarly, annual payments to retire previously-issued bonds or other debt instruments appear as disbursements in those tables.

I.3 Chapter 10: Debt Obligations for Highways

Chapter 10 focuses on the outstanding value of previously-issued debt used to fund construction of highway facilities. It also reports changes in that value during the current year resulting from new borrowing and repayment of outstanding debt. Because use of debt to finance highway-related spending is limited to States, local government, and toll facility operators, Chapter 10 includes tables for only those agencies. Chapter 10 provides extensive detail on States' individual new bond issues during each year, as well as on their sources of funding for annual debt repayment. Other tables in Chapter 10 report the values of outstanding debt at the beginning and end of each year, proceeds from new debt issues, and debt repayment for States, local government agencies within each State, and toll authorities.

I.4 Chapter 11: Apportionments, Obligations, and Expenditures

Chapter 11 of *Highway Statistics* Outlays refers to the different classifications of highway expenditures.

Depending on the outlay category, an associated table series is used to generate details of expenditures and debt.

- a) **Direct Federal spending:** Refers to categories under capital outlay costs such as expenses for highway improvements and maintenance; traffic and administration services; and law enforcement and safety programs.
- b) **Inter-government transfers:** Refers to the Federal Government sending money to States (and States sending money to county and local governments). The highway system is built and maintained by States through money distributed from the Federal Government.
- c) **Debt service on outstanding bonds:** Refers to costs associated from borrowing funds for highway, road, and street projects. Debt service includes expenses incidental to the sale of highway bonds, bond administration expenses, interest, and redemption payments.

I.5 Data Presentation Formats in *Highway Statistics*

After FHWA receives State-submitted reporting forms, the data are validated and ‘cleaned’ for accuracy to generate (both automatically and manually) a series of tables and charts providing details in three data presentation formats, as follows:

- a. **Annual tables.**
Annual tables provide a cash flow statement for highways and mass transit identifying major revenue sources. These tables are a balanced statement of all funds associated with highway-related functions. (Example: *Highway Statistics* 9.4.7. Annual Table SF-1, Revenues Used by States for Highways – 2012)
- b. **Cumulative tables (usually from year of last cumulative table to date).**
This format represents tables with data from multiple years; they are published with multiyear charts. (Example: *Highway Statistics* 11.2.2. Cumulative Table DISB-C, Total Disbursements for Highways by Function 1945 – 2011)
- c. **Charts.**
Charts are graphical representations of the data. Most charts are marked with a –C suffix on the code. (Example: *Highway Statistics* 9.4.12. Chart SF-21C, Summary State funding for highways - Chart)

Tables report subject matter aggregated either nationally (typically reported earlier in a chapter), the State level, or the level of State and local toll authorities related to the National Highway System.

2. Overview of Data Production Process

The data production process is a system of programs and steps in which FHWA collects data from State-delivered forms, validates versions of the data, and generates financial tables and charts that are published and made public on the **Highway Statistics** Series website. Figure 1 depicts a high-level process summary.

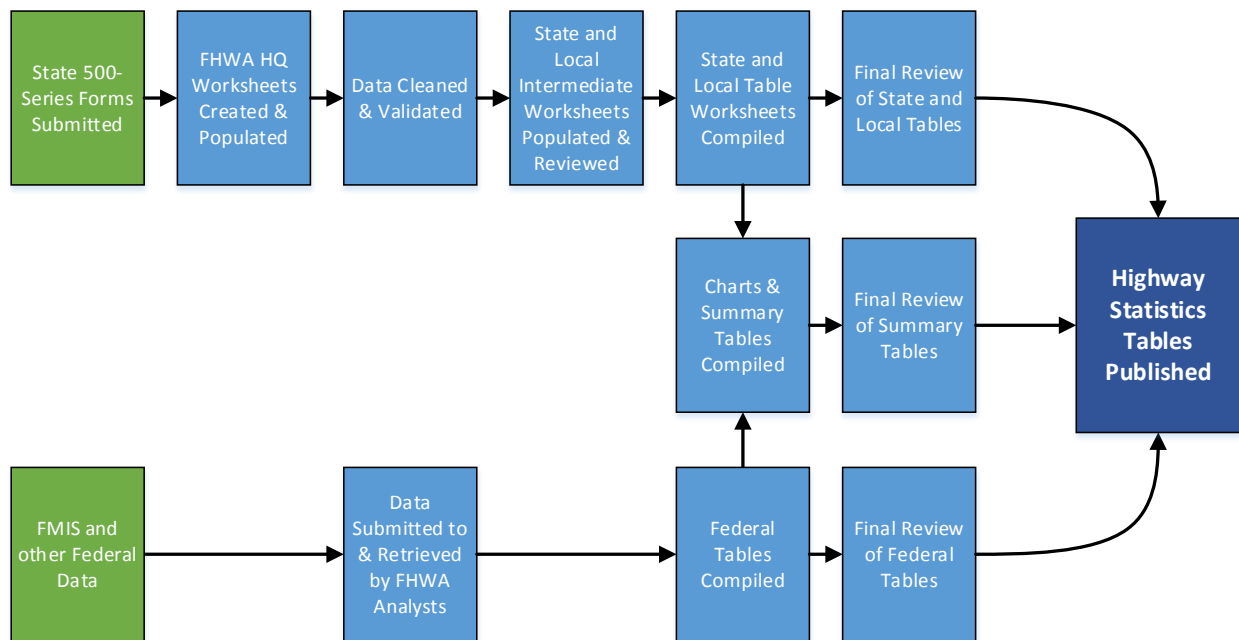


Figure 1. High-level data production process summary

Data specific to revenue and income States reported is submitted to FHWA on the ‘500’ series forms. Some tables rely on Federal data, sourced internally within FHWA. The overall data production process includes:

- 1) States report data to FHWA
- 2) FHWA produces internal versions of submitted forms and checks and validates data
- 3) FHWA produces intermediate worksheets compiling submitted data
- 4) Data are arranged in the form of **Highway Statistics** tables and given a final review
- 5) Data are published on the **Highway Statistics** Series website.

Figure 2 is a more comprehensive diagram of data production, including specific tables and their related forms.

2.1 Reporting of Original Data

The financial data series in *Highway Statistics* draw on data that State DOTs submit to FHWA plus internal FHWA sources.

State DOTs are responsible for submitting the '500' series forms to FHWA. FHWA forms 531, 532, 534, 536, 539, 541, and 542 pertain to the financial tables in Chapters 9, 10 and 11 of *Highway Statistics*. State DOTs compile the necessary state and local data to complete the 500-series forms and submit through the FHWA-developed web application referred to as Fuels and FASH (See section 3.4 for more details). FHWA analysts then use Fuels and FASH to download State data for processing. FHWA analysts issue regular reminders to submit their forms, and provide training, manuals, and phone assistance to State DOT personnel.

FHWA analysts draw on the Financial Management Information System (FMIS) data system as well as other internal sources to provide information on Federal highway expenditures. See Chapter 6 for more discussion.

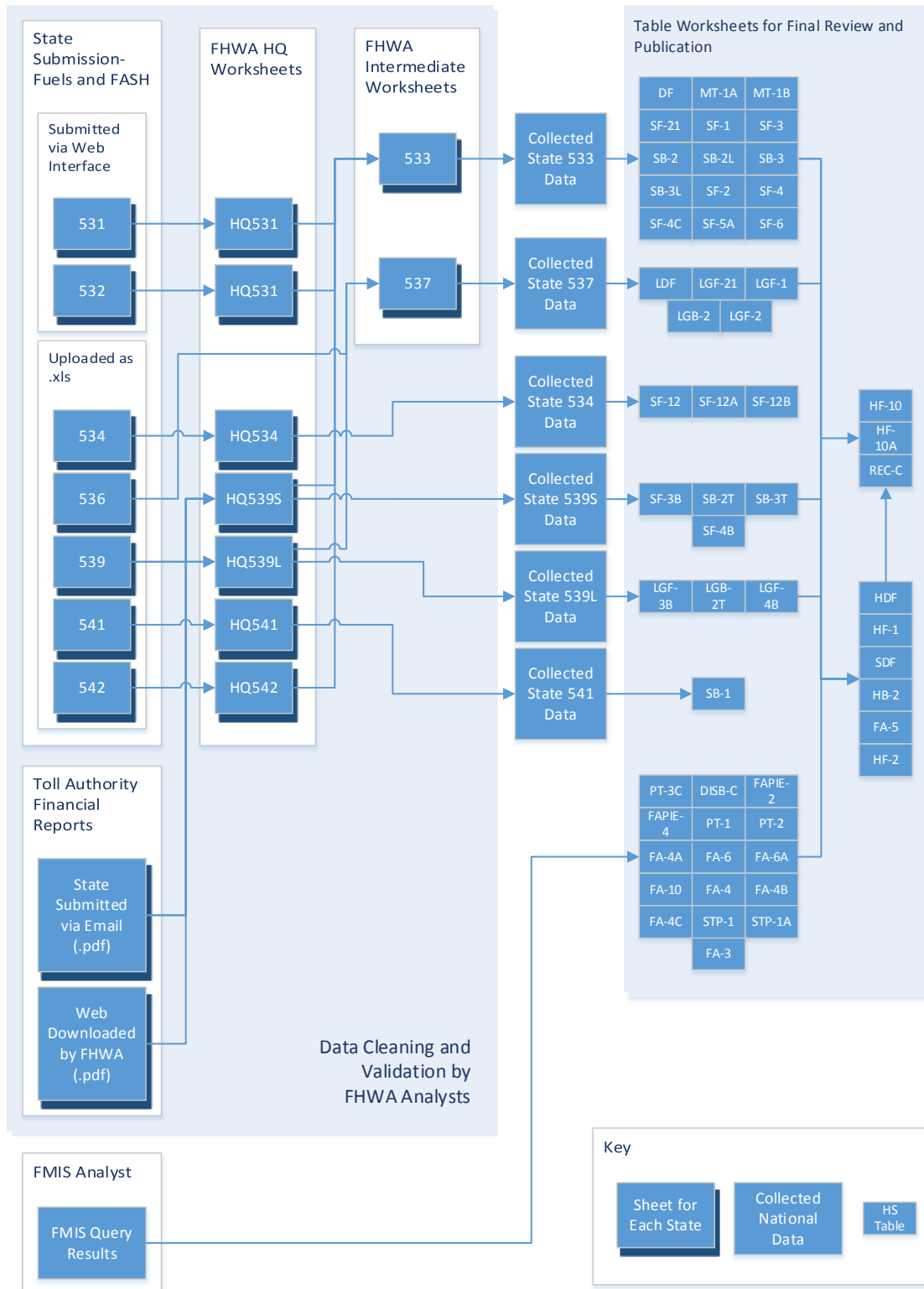


Figure 2. Data production process flow diagram. Once table worksheets are produced, FHWA performs a final edit and review and submits the tables for publication in *Highway Statistics*.

2.2 Processing of State-Submitted Data

Upon receipt of State data, FHWA analysts go through several steps to clean, validate, and prepare those for compilation into *Highway Statistics* tables. Analysts use Excel macros referred to as the “Table Generator” (see Chapter 4 for a detailed description) to move data from the forms it arrives submitted on to tables prepared for final publication. See Chapter 3 for a step-by-step ordering of this process.

2.2.1 Preparation of HQ Copies

FHWA creates internal versions of State-submitted forms. At this point, the forms are checked for data-entry accuracy. These internal forms include checks confirming that forms agree with one another.

2.2.2 Validation of Data

FHWA’s internal forms 533, 537, 539S, and 539L are used to pull together State-level line item entries for *Highway Statistics* tables from their internal versions of State-submitted forms. These Microsoft Excel files include multiple tests that validate final data. Macros then extract the State-level data to publication-ready Federal tables.

- Form 533: Extracts from forms 531, 532, 539S, and 542 to produce 15 tables.
- Form 537: Extracts from forms 536 and 539L to produce 5 tables.
- Form 539S: Produces 4 tables.
- Form 539L: Produces 3 tables.

A number of other tables are generated manually from FHWA’s internal forms. For instance:

- Form 534: Extracts Capital outlay tables (SF-12 series).
- Forms 537 and 533 combined: Generate 9 tables and toll and Federal data.
- 19 tables in Chapters 9, 10, and 11 are produced from FMIS or other internal Federal data sources.

2.3 Preparation of Excel Table Worksheets

After the completion and validation of the FHWA internal forms, FHWA analysts use the table generator Excel document to produce worksheets for each *Highway Statistics* table. These worksheets pull from each States’ internal forms to collect relevant data in a publishable composition for final cleaning and validation. These worksheets are then used to generate the publishable tables, complete with any necessary annotations, for publication.

2.4 Publication on *Highway Statistics* Site

Final tables and charts are published in the annual *Highway Statistics* publication, posted on the Office of *Highway Statistics* Series Publications website. Tables are posted as soon as available. Publications include the most recent years’ data as well as historical archived information. The snippets in Figure 3

show the data in a final table taken from *Highway Statistics Series*, Chapter 11, Disbursements by States for Highways:

STATE	CAPITAL OUTLAY			MAINTENANCE AND SERVICES		
	STATE ADMINISTERED HIGHWAYS 2/	LOCAL ROADS AND STREETS	TOTAL	STATE ADMINISTERED HIGHWAYS 2/	LOCAL ROADS AND STREETS	TOTAL
Alabama	977,342	103,184	1,080,526	178,867	-	178,867
Alaska	592,321	-	592,321	226,048	-	226,048
Arizona	84					
Arkansas	1,21					
California	3,15					
Colorado	88	196,655	233,353	78,554	14,540	-
Connecticut	79	80,587	47,529	9,918	22,120	-
Delaware	40	216,192	195,495	214,907	155,400	541
Dist. of Col.	-	138,018	95,532	11,640	66,210	-
Florida	4,63	882,589				
Georgia	1,17	141,016				
Hawaii	20	339,728				
Idaho	36	76,820				
Illinois	3,37	34,478	205,844	1,988,339	561,123	-
Indiana	1,53	274,358	12,111	990,634	(6,999)	(6,999)
Iowa	73	290,520	693,074	3,124,612	1,462,202	1,462,202
Kansas	59	79,177	-	1,783,151	457,743	-
Kentucky	1,26	302,416	651,003	2,580,236	768,381	768,381
		96,708	32,515	1,981,892	1,155,298	1,155,298
		117,764	-	1,368,025	1,740,265	64,014
		68,634	-	431,709	46,218	-
		35,723	386,201	9,546,956	2,874,681	4,473
		87,363	3,157	2,678,677	1,991,095	-
			51,278	462,864	232,607	-
			134,994	791,390	170,826	-
			496,319	5,711,188	2,799,404	-
			173,615	2,824,733	33,594	-
			667,837	1,837,045	295,151	1,975
			144,486	1,419,490	626,755	15,328
			1,556	2,537,054	59,802	-

Figure 3. State disbursements for highways — 2013 — table SF-2.

3. State Data Reporting Process

States are responsible for submitting up to fourteen ‘500’-series forms to provide data for **Highway Statistics**. The forms relevant to the financial data series in Chapters 9, 10, and 11 include: 531, 532, 534, 536, 539, 541, 542, and 543 (listed and described in Table 1). Forms 531 and 532 are submitted online via the Fuels & FASH web application; the remaining forms are uploaded to an online mailbox within Fuels & FASH.

Form 536 is only required biennially. Form 539 may be substituted with financial reports from toll authorities (see section 3.4.2 for more details).

Table 1 lists the eight main reporting forms used to submit data to the FHWA that generate associated tables and charts. States are directed to comply with FHWA’s submission deadlines and are responsible for filling out their own copies of these forms [3].

Table 1. State data reporting forms produce highway financial statistical tables and charts.

FHWA Form	Description	Submission Deadline
531	State highway income	January 1 (for fiscal year), April 1 (for calendar year).
532	State highway expenditures	January 1 (for fiscal year), April 1 (for calendar year).
534	State highway capital outlay and maintenance expenditures	February 15 (for fiscal year), May 15 (for calendar year).
536	Local highway financial	Required biennially for odd-number data years and due October 1 the following even-numbered year. Reporting for even-numbered years is optional.
539	Toll facility receipts and disbursements	January 1 (for fiscal year), April 1 (for calendar year). States may submit a form 539 for each toll authority or may submit annual financial statements from the toll authorities themselves.
541	State transportation obligations issued during year and allotment of proceeds	January 1 (for fiscal year), April 1 (for calendar year).
542	Status of State transportation debt	January 1 (for fiscal year), April 1 (for calendar year).
543	State transportation sinking fund and debt service transactions	January 1 (for fiscal year), April 1 (for calendar year). Optional form.

3.1 Designation of Reporting Personnel

State DOTs and highway departments are structured differently in different States. Most DOTs appoint one designated reporter, but other States may break up the forms by areas of expertise. Often, reporters are not accountants and may not work in the financial offices, which can increase reporting errors and delay reporting.

Designated reporting personnel receive UPACS logins through their division offices. UPACS is the system that connects to Fuels and FASH. Division offices grant users access to the Fuels and FASH application.

3.2 FHWA Resources for State Reporters

Guidelines for reporting statistics are available on FHWA's website and on the Fuels and FASH web application. Additionally, FHWA analysts conduct an annual presentation on data reporting for interested State reporters at the Highway Information Seminar, located at the National Highway Institute. This Seminar is focused on all the reporting FHWA requires of States for **Highway Statistics** and is free for attendees who travel to Arlington, VA. FHWA analysts share their contact information freely, and devote large amounts of their time to assisting State reporters with specific questions.

A Guide to Reporting Highway Statistics. *A Guide to Reporting Highway Statistics*, located on the [Highway Statistics Series website](#), supports States with detailed information and guidance on filling out reporting forms. It presents detailed procedures to prepare and submit forms pertaining to revenue and income found in Chapters 8 through 12.

Fuels & FASH. The Fuels & FASH Quick Start Guide is designed to help users understand the Finance Analysis System on Highways (FASH) web application. Providing step-by-step instruction, the Quick Start Guide is a good starting point for users to understand how the FASH web application serves as a tool to submit various FHWA forms. This web application allows States the option to submit their finance reporting data to FHWA electronically [4].

States communicate with division offices to receive assistance in preparing forms for submission. FHWA offers calls, webinars, and in-person seminars on properly filling out forms in addition to the written guidance available. FHWA staff field questions and sends reminders for submission, but after States submit their forms, limits questions to clarifications to States.

3.3 Sources for Data

Data are sourced primarily from internal State DOT records. Given the differing departmental structures and financial conventions across States, information sources can significantly vary. Additional information may be necessary from other State agencies that submit to State DOTs, i.e., motor vehicle registries, State revenue departments, State and local toll authorities, and other sources.

For local financial data (as reported on form 536), states typically request information from local governments themselves, depending on their internal reporting systems.

3.4 State Data Submission

States primarily submit data via Fuels and FASH, a web application that allows submission of forms 531 and 532 via web interface and the submission of the remaining forms via uploaded Excel file. Remaining toll information, if submitted, can be submitted as .pdf files via email.

3.4.1 Fuels & FASH

FHWA has developed a web application for data submittal, known as Fuels & FASH, so States can easily submit financial data while improving data accuracy. This system uses a web interface to collect State-reported motor fuels, driver licensing, and vehicle registration data. 'Fuels' refers to inputting State fuel tax, motor vehicle (fuel, 556 and 566), while FASH (finance analysis system-highways) handles the financial data relevant to this report (forms 531 and 532). Fuels and FASH also include a mailbox module to accept Excel files for the remaining forms which have not been programmed into the web interface.

All other State-delivered forms are uploaded in Excel spreadsheets to the Mailbox, which is periodically checked by FHWA staff for new submissions.

STATE HIGHWAY INCOME		State
		Year Ending (mm/yy):
INFORMATION FROM THE RECORDS OF:		PREPARED BY:
B.1. State motor-fuel taxes		B.6. Funds from FHWA (Identify by purpose)
a. Total Distributed (from FHWA-556, Item 8k)		a. Highway purpose
b. Adjustments Due To Timing differences		b. Transit purpose
c. Less Collection Costs Not Shown on FHWA-556		c. Total, FHWA-531, B.6
d. Other (Specify)		B.7. Funds from other Federal agencies (Identify by agency)
e. Other (Specify)		a. Federal Transit Admin.-Highway purpose
f. Net Income, FHWA-531, B.1		b. Federal Transit Admin.-Transit purpose
B.2. State motor vehicle, motor carrier and driver license taxes, fees, etc.		c. National Highway Traffic Safety Admin.
a. Total Distributed (from FHWA-566, Item 8k)		d. Forest Service (Reserve funds)
b. Adjustments Due To Timing differences		e. Bureau of Indian Affairs
c. Less Collection Costs Not Shown on FHWA-566		f. Bureau of Land Management
d. Other (Specify)		g. Bureau of Reclamation
e. Other (Specify)		h. Mineral Management Service
f. Net Income, FHWA-531, B.2		i. Army Corps of Engineers
B.3. Appropriations from State general funds (Indicate purpose e.g., State Highways, State Police, Grants To Counties, etc.)		j. Department of Energy
a.		k. Federal Emergency Management Agency
b.		l. (Specify)
c.		m. (Specify)
d.		n. (Specify)
e.		o. (Specify)
f.		p. Total, FHWA-531, B.7
g. Total, FHWA-531, B.3		Report Totals for Items B.8 and B.9 on page 2
B.4. Other State taxes or fees (Identify by type of tax)		B.10. Miscellaneous State highway income (Identify major items)
a. Sales And Use Taxes		a. Interest On Investments, Sinking Funds
b. Severance Taxes		b. Interest On Investments, Other Accounts
c. (Specify)		c. Private Contributions
d. (Specify)		d. (Specify)
e. (Specify)		e. (Specify)
f. Total, FHWA-531, B.4		f. (Specify)
Report Totals for Item B.5 on page 2		g. (Specify)
NOTES AND COMMENTS:		h. (Specify)
		i. Total, FHWA-531, B.10

Figure 4. State highway income reporting form 531.

3.4.1.1 Automated Form Submission

Fuels & FASH allows States to enter two forms on-screen:

- Form 531, State Highway Income
- Form 532, State Highway Expenditures

(See Figure 4, State Highway Income reporting form 531.) In addition, Fuels & FASH allows uploading structured data, such as XML, which minimizes manual data entry.

For the purposes of Fuels & FASH, forms 531 and 532 are combined. As forms 531 and 532 are complementary, automatic submission allows built-in checks to improve data accuracy. Before submission, Fuels & FASH automatically validates the form and prevents submission until errors (if any) are resolved. When these forms are submitted, FHWA analysts receive notifications including which State forms were submitted.

3.4.1.2 Mailbox Submission

All financial forms (other than forms 531 and 532) are uploaded to a 'mailbox' located as part of Fuels and FASH. The mailbox is a folder that States can upload Excel and other file types to for FHWA analysts to download. Unlike automated submissions, analysts receive no notification if a document is submitted. Thus, they check the mailbox weekly to check for new submissions and update the status of what has been submitted.

3.4.2 Reminders for State Reporters

FHWA analysts maintain a status log with entries for each State and each form. As forms are submitted, FHWA staff updates the log to note 'Received.' This log is emailed out twice a year to FHWA's list of State contacts.

FHWA will call delinquent States beginning in late spring (a few months after their deadline) to encourage submission.

3.4.3 Toll Financial Data

Toll data are specially treated. States have the option to submit a 539 form via the Fuels and FASH mailbox, or they may substitute the annual financial report for a given toll authority (if such a report is available). As a State DOT may not have financial information on a toll authority in the State (particularly for a local toll authority), this option is commonly exercised. In the past, States would email in a copy of this report. Increasingly, States do not email this information, and FHWA analysts go online to toll authority web sites to download this information manually.

As many States have multiple toll authorities, it is not uncommon to submit a 539 form for one toll authority and to submit a PDF-formatted financial report for another toll authority. FHWA analysts are responsible for standardizing this information for processing.

4. FHWA Procedures for Processing State-Reported Data

Data used in the financial data series require processing before publication. While Federal data can be simply formatted for publication, State-submitted data require reformatting and auditing to ensure completeness and accuracy. FHWA analysts use the “Table Generator” (hereinafter HFGenerator) to move data from State forms to tables for final publication.

4.1 The Table Generator

FHWA analysts use Excel macros referred to as the “Table Generator” to move data from State-submitted forms to where data can be cleaned and validated, and finally towards final publication. All but a handful of summary tables and capital-expenditure worksheets are produced using “HFGenerator.” The HFGenerator is a single Excel file that uses a graphical user interface (GUI) for analysts to move through the various steps of producing *Highway Statistics* tables.

The HFGenerator works around a file structure on a Shared Drive accessible within the FHWA financial statistics team. Analysts download State-submitted forms to State sub-folders in a folder for the current publication year; then they label them per the agreed-upon file convention. When a State’s files are in place, FHWA analysts use the HFGenerator to create FHWA versions (referred to as Headquarters or HQ Worksheets) of the same Excel sheets. The HFGenerator generates these HQ worksheets and saves them to the shared drive, automatically populated with the State-submitted data. FHWA analysts then work to validate and clean these HQ worksheets. Once complete, FHWA analysts use the HFGenerator to compile intermediate worksheets populated with data from HQ worksheets, used for final validation of State data. When all analyst validation is complete for each State, analysts use the HFGenerator to produce Excel worksheets of each *Highway Statistics* financial table, populated with the correct State data. The HFGenerator includes instructions regarding the sequence in which tables must be completed.

FHWA IT staff updates the macros annually. IT updates the Shared Drive that hosts the files used in *Highway Statistics* financial table production and links that structure to the HFGenerator, and updates the year and other dates for the generator.

4.2 Steps for Preparing Internal FHWA Worksheets

FHWA prepares internal versions of submitted forms for the purpose of data verification and cleaning, and to assure all State data are uniformly formatted in preparation for publication. Fuels & FASH provides forms 531 and 532 directly to FHWA, which come already validated through the automatic checks that Fuels & FASH provide. Forms 534, 536, 541, and 542 must undergo additional processing. Toll information needs significant additional processing to be ready for table preparation. Form 543 is used only to provide background information on States with sinking funds.

FHWA versions of State forms include automatic tests to show incomplete or incorrect information. These primarily check for correct arithmetic, for instance, ensuring that expenditures and revenues

balance, and that signs point the correct way (a State doesn't owe more on existing debt at years' end than at years' beginning).

Internal formulas check across forms to verify that the information is correct. For example, the internal copy of a given State's 531 will automatically compare entries for toll revenue against the same information reported in a State's 539S form and will flag a discrepancy. Form 542, which lists the current State 531 and 532, are cross-checked during submission through Fuels & FASH.

The outputs of processing are worksheets that include formatted data for each State for a significant number of the *Highway Statistics* financial forms. These worksheets are listed, with source forms, below in Table 2.

Table 2. Outputs of Processing State-Reported Data

Worksheet	Data Sources
533	HQ531, HQ532, 539S, HQ542
HQ534	ST534
537	533, HQ539L, 536
539S	539, toll authority financial reports
539L	539, toll authority financial reports
HQ541	541

What follows is a step-by-step guide to producing the internal headquarters (HQ) copies of the State-submitted forms and internal worksheets. HQ copies are made for every State, and so while a particular State needs to proceed roughly in the order listed below, FHWA analysts can move data for a particular State forward through this process independent of other States' data.

4.2.1 HQ Versions of Forms 531 and 532 (Revenue and Expenditure)

For each State, forms 531 and 532 are downloaded from Fuels and FASH as entered and saved as State copies of forms on FHWA's shared drive. HFGenerator is used to generate headquarters copies of the forms (HQ531 and HQ532), which are automatically populated with information from the State forms. Analysts go through the forms, checking for the plausibility of figures (including checking past years' submissions) and for agreement between the two forms.

4.2.2 Processing of Toll Financial Reports and HQ Versions of Form 539

States must submit financial information for each toll authority in the State. They are allowed to do this through either a 539 form for each toll authority or through toll authority annual financial statements. Submitted 539 forms are downloaded from the Fuels & FASH mailbox and saved to FHWA's shared drive, while toll financial reports are typically downloaded from state websites or are submitted via

email in .pdf form. This means that substantial processing is required to get these data into a form FHWA can use.

FHWA analysts use the HFGenerator to create two internal forms for each State, if applicable:¹

- 539S form, collecting Statewide toll authorities
- 539L form, collecting local toll authorities

These internal forms include individual sheets for each toll authority, a sheet aggregating all the data collected in the form, and a sheet with State line items for final **Highway Statistics** tables. For each toll authority, analysts either copy the submitted 539 form, or (laboriously) copy individual lines from submitted reports, indicating on the HQ copy where in the report specific information was sourced.

4.2.3 HQ Versions of Forms 541 and 542 (Bond and Debt Data)

For each State, forms 541 and 542 are downloaded from the Fuels and FASH mailbox as entered by States and saved as State copies of forms on FHWA's shared drive. HFGenerator is used to generate headquarters copies of the forms (HQ541 and HQ542), which are automatically populated with information from the State forms (HQ541 does need to be prepared before HQ542). Analysts go through the forms, checking for the plausibility of figures (including checking past years' submissions), for agreement between the two forms, and for consistency with HQ531 and HQ532.

4.2.4 Interim Worksheet 533

Worksheet 533 is an internally used form that consolidates information from HQ531, HQ532, HQ542, and 539S for use in final **Highway Statistics** tables. FHWA Analysts use HFGenerator to create HQ533, which is populated with data from HQ531, HQ532, HQ539S, and HQ542. 533 includes a number of internal verifications to ensure both consistency of data between submitted forms, and plausibility (for example, checking that numbers are not negative or two data points that must equal zero do).

4.2.5 Local Financial Data (Form 536 & 537)

Local financial data (submitted on form 536) is submitted biennially. In years without submission, FHWA estimates figures using an inflator based on past submissions, national trends and figures reported on the HQ531 and HQ532. FHWA performs this calculation using form 537, which is generated from HFGenerator.

Following generation by FHWA analysts, the 537 worksheet is manually populated (an analyst copies and pastes between spreadsheets) with information from current and past 536 forms (retrieved from the shared drive or from the Fuels and FASH mailbox as necessary).² Information is also added from the

¹ If a State has no State toll authorities, then the State requires no 539S. If a State has no local toll authorities, then the State requires no 539L.

² In interviews, analysts noted that this process could be automated, and currently is very time-consuming.

State's completed form 533. Analysts ensure that figures match those reported on HQ531 and HQ532 (and by extension, the 533) regarding local highway transfers.

4.2.6 Capital Expenditures (Form 534)

FHWA analysts download State copies of Form 534 from the Fuels and FASH mailbox to save to FHWA's shared drive as ST534. Form 534 includes a page for each area and functional system within a State, and a total sheet for the whole State. Analysts use a generator called StatetoHQ534 to transfer the information from the State-submitted 534 to a headquarters copy of form 534, which varies in structure significantly. The HQ534 also pulls information from the completed HQ532 and HQ533 worksheets.

Because 534 is typically filled out by State planners who are building up from project reports and 532 is filled out using State accounting data, sometimes inconsistencies appear between reported capital outlay on form 532 and data reported on 534. Analysts compare the reported figures and correct such discrepancies. Where variations occur, analysts adjust figures reported on the 534 to within 20% of those reported on 532.

4.3 Procedures for Dealing with State Incomplete or Non-Reporting

In instances where the data are incomplete or States have neglected to report, FHWA analysts work to provide the missing information as best they can internally. FHWA never sends forms back to States, but in the instance of a major concern or error, they will call and email for more information. Strategies for including information in the absence of submission include estimating values from other reported entries, extrapolating previous years' entries, and substituting previous years' entries. When a State does not, or is not able to, submit forms for a given year in time for publication, the previous years' data are substituted. For example, Massachusetts' entries in the 2012 table series are 2011 data (and are so footnoted).

5. Preparing Tables that Report State and Local Highway Financial Data

The end product of all State and local data processing are six worksheets for each State: 533, HQ534, 537, 539S, 539L, and HQ541. When verification and processing are complete on a final worksheet for all States, the generator can pull information from each State’s worksheet to populate one of the tables to be published in *Highway Statistics*.

For each financial table in *Highway Statistics*, Analysts use the generator to create an Excel worksheet that automatically populates with the information from the 50 States plus DC and Puerto Rico. Analysts perform final verifications for formatting and accuracy on this worksheet before it is formatted for publication. Following completion of these tables, a variety of summary tables are developed, sometimes incorporating Federal data sources.

The following sections detail the process for producing the tables that rely on these worksheets, as well as the tables that require additional steps to process. Each section also includes the original State forms from which data in these tables originates.

5.1 Tables produced using Internal Forms

5.1.1 Tables Generated from 533 Data

Following FHWA analysts’ completion and verification of every State’s 533, analysts use the HF Generator to create worksheets for the 15 *Highway Statistics* tables listed in Table 3. These tables provide information on broad State revenues and spending plus spending on debt service and overall State indebtedness.

Table 3. 533-dependent HS tables and data sources.

Table	Chapter	Name	Source Form(s)
SF-1	9.4.7	Revenues used by States for highways	531, 532, 539S
SF-3	9.4.8	Revenues used by States for State-administered highways	531, 532, 539S, 542
DF	9.4.10	Disposition of receipts from State imposts on highway users	531, 532, 539S
SF-21	9.4.11	Summary State funding for highways	531, 532, 539S
MT-1A	9.5.5	Funding for direct State mass transit activities	531, 532, 539S
MT-1B	9.5.6	Funding for State grants-in-aid for mass transit	531, 532, 539S
SB-2	10.4.2	Change in indebtedness, State highways	539S, 542
SB-2L	10.4.3	Change in indebtedness, local highways	542
SB-3	10.4.5	Funding for debt service, State highways	531, 532, 539S

SB-3L	10.4.6	Funding for debt service, local highways	542
SF-2	11.4.3.3	Disbursements by States for highways	532, 539S, 542
SF-4	11.4.3.4	Disbursements by States for State-administered highways	532, 539S, 542
SF-4C	11.4.3.5	Disbursements by States for State-administered, classified by function	532, 539S
SF-5A	11.5.2	Funding for State grants-in-aid for local roads and streets	531, 532, 539S
SF-6	11.5.3	State expenditures and grants-in-aid for local roads and streets	532, 542

5.1.2 Tables Generated from HQ534 Data

Following FHWA analysts' completion and verification of every State's HQ534, analysts use the HF Generator to create worksheets for the three *Highway Statistics* tables shown in Table 4. These tables describe State highway capital outlay.

Table 4. HQ534-dependent HS tables.

Table	Chapter	Name	Source Form
SF-12	11.4.3.6	State capital outlay and maintenance, classified by functional system and area	534
SF-12A	11.4.3.7	State capital outlay and maintenance, classified by improvement type	534
SF-12B	11.4.3.8	State capital outlay and maintenance, classified by Federal-aid system	534

5.1.3 Tables Generated from 537 Data

Following FHWA analysts' completion and verification of every State's 537, analysts use the HF Generator to create worksheets for the five *Highway Statistics* tables listed in Table 5. These tables describe local highway spending.

Table 5. Form 537-dependent HS tables and data sources.

Table	Chapter	Name	Source Form(s)
LDF	9.5.2	Disposition of local government receipts from State and local highway-user imposts, including tolls	536, 539L
LGF-21	9.5.3	Summary local government funding for highways	531, 536, 539L
LGF-1	9.5.4	Revenues used by local governments for highways	536, 539L
LGB-2	10.5.1	Change in indebtedness, local highways	536, 539L
LGF-2	11.5.1	Disbursements by local governments for highways	536, 539L

5.1.4 Tables Generated from 539S Data

Following FHWA analysts' completion and verification of every State's 539S, analysts use the HF Generator to create worksheets for the four *Highway Statistics* tables listed in Table 6. These tables describe State-level toll authority finance.

Table 6. Form 539S-dependent HS tables.

Table	Chapter	Name	Source Form(s)
SF-3B	9.4.9	Receipts of State-administered toll road and crossing facilities	State 539/Toll Financial Reports
SB-2T	10.4.4	Change in indebtedness, toll roads, and crossings	State 539/Toll Financial Reports
SB-3T	10.4.7	Funding for debt service, toll roads, and crossings	State 539/Toll Financial Reports
SF-4B	11.4.3.9	Disbursements of State toll road and crossing facilities	State 539/Toll Financial Reports

5.1.5 Tables Generated from 539L Data

Following completion and verification of every State's 539L, FHWA analysts use the HF Generator to create worksheets for the three *Highway Statistics* tables listed in Table 7. These tables describe local-level toll authority finance.

Table 7. Form 539L-dependent HS tables.

Table	Chapter	Name	Source Form(s)
LGF-3B	9.5.1	Receipts of local toll facilities	Local 539/Toll Financial Reports
LGB-2T	10.5.2	Change in indebtedness, local toll facilities	Local 539/Toll Financial Reports
LGF-4B	11.4.3.10	Disbursements of local toll facilities	Local 539/Toll Financial Reports

5.1.6 SB-1 Generated from HQ541 Data

Data from HQ541 are used to produce only one HS table, SB-1, which is not populated automatically. FHWA Analysts use HFGenerator to create a blank SB-1 worksheet. They then copy and paste relevant data for each State from that State’s HQ541.

Table 8. HQ541-dependent HS tables.

Table	Chapter	Name	Source Form(s)
SB-1	10.4.1	State Obligations for Highway (total), issued or assumed during the year	541

5.2 Summary Table Preparation by FHWA Staff (Data Sources and Output Tables)

Following the production of the State and Federal tables (as listed in Table 11), FHWA produces a handful of summary tables that rely either on information from both Federal and State sources, or require special manual preparation. Many of these tables require others to be completed before they can be compiled.

As with the State and local tables, these are produced using table worksheets generated by HFGenerator and populated using data from previously-entered HQ worksheets or HS worksheets. Analysts verify information, formatting, and any necessary footnoting before sending them for publication.

Table 9. Manual summary table preparation by FHWA — data sources and output tables.

Table	Chapter	Name	Prerequisite Form/Table(s)	Source Form(s)
HDF	9.4.1	Disposition of receipts from highway user taxes and tolls	DF, SDF, LDF	531, 532, 536, 539L, 539S, MF-3, MV-3
HF-1	9.4.2	Revenues used for highways, all units of government	SF-1, LGF-1, FA-5	531, 532, 536, 539L, 539S, FMIS
SDF	9.4.6	Disposition of receipts from State and highway-user imposts, including tolls	533, MF-3, MV-3	531, 532, 539S, MF-3, MV-3
HB-2	10.3.1	Long-term highway obligations for all units of government	LGB-2, SB-2	536, 539L, 539S, 542
FA-5	11.3.2	Receipts and expenditures for highways by Federal agencies-Summary	LGF-1, 537, SF-5A, 531	FMIS, 537, 531, 539L
HF-2	11.4.3.1	Total disbursements for highways, all units of government	LGF, FA-5, SF-2	532, 536, 539S, 542, FMIS

5.2.1 HF-10 Tables

Tables HF-10 and HF-10A require special production. HF-10A is an adjusted version of the prior year’s HF-10 table; it contains updated local and Federal data. HF-10 is produced using the HF-HIST document, which is updated using information from the SF-1 and FA-5 tables, as well as information from the 537 local worksheet. In recent years, analysts have relied on estimates of local funding for the FHWA Conditions and Performance report (a report produced by FHWA for decision makers on the State of the highway system).³ Estimates for the previous year are updated using the same sources as HF-10A.

Analysts assemble relevant data and fill in a table worksheet to be submitted for publication.

Table 10. HF-10 tables and sources.

Table	Chapter	Name	Source Table(s)/Form(s)
HF-10	9.3.1	Funding for highways and disposition of highway-user revenues	HF-HIST (SF-1, FA-5, 537/local worksheets)
HF-10A	9.3.2	Funding for highways and disposition of highway-user revenues	HF-HIST (SF-1, FA-5, 537/local worksheets)
REC-C	9.3.3	Total receipts for highways, by governmental unit—Chart	HF-10/HF-HIST

³ Interview with FHWA staff, June 22, 2015.

6. Preparation of Tables Using Federal Data

The tables in chapters 9, 10, and 11 include tables that provide national-level financial data from a number of Federal sources. Included is information on authorizing legislation, and financial information from the General Services Administration (GSA), FMIS, and National Highway Construction Cost Index (NHCCI).

6.1 Data Sources

FHWA analysts use data from multiple internal sources to populate *Highway Statistics* tables related to Federal expenditures on highways and national-level data.

6.1.1 FMIS

FMIS is a warehouse of financial information for the Federal Government, providing detail on receipts and expenditures. FMIS is an Oracle database that manages, stores, and queries information produced by the National Electronic Accounting and Reporting (NEAR) System. FMIS provides daily, monthly, and yearly information for financial analysis and, in FHWA's case, reporting. FHWA analysts request necessary information annually request with of FMIS staff. FMIS staff accesses the system through the FMIS Query Tool user interface, and transmits the necessary information to Analysts via email [5].

6.1.2 NHCCI

The NHCCI is a price index that tracks price changes in highway construction costs and converts current-dollar expenditures into real value terms. It uses collected bid tabs for State highway construction to develop an index of construction costs [6]. This is used in tables PT-1, PT-2, and PT-3C.

6.1.3 Legislation

A handful of tables in the FA-series in chapter 11 include apportionment formulas sourced from enabling highway legislation, currently MAP-21, as well as other FHWA-sourced data. These include FA-4, FA-4A, and FA-4B.

6.2 Production of Federally-Sourced *Highway Statistics* Tables and their Sources

As with State and local tables, Analysts use HFGenerator to produce a table worksheet for each HS table. Analysts copy information from the Federal source into the worksheet, format and update footnotes where necessary, and submit the table for publication when complete. Table 11 lists Federally-sourced

tables and their source information.

Table 11. Federally-Sourced *Highway Statistics* Tables and Data Sources

Table	Chapter	Name	Source Form(s)
PT-3C	11.2.1	Highway expenditures, all units of government, current and constant dollars—chart	NHCCI
DISB-C	11.2.2	Total disbursements for highways, by governmental units—chart	FMIS/Federal data, multiyear
FAPIE-2	11.2.3	Obligation of Federal Funds for Roadway Projects—chart	FMIS
FAPIE-4	11.2.4	Obligation of Federal Funds for Roadway Projects by Improvement Type—chart	FMIS
PT-1	11.2.5	Price trends for Federal-aid highway construction—chart	NHCCI
PT-2	11.2.6	Average distribution of costs on contracts completed—chart	NHCCI
FA-4A	11.3.1	Highway apportionment formulas	Enabling legislation/FHWA Website
FA-6	11.3.3	Obligation of National Highway System and Surface Transportation Program funds by system and improvement type	FMIS
FA-6A	11.3.4	Obligation on National Highway System and total funds for all systems by functional and improvement type	FMIS
FA-10	11.3.5	Obligation of Federal-aid highway funds by functional system and improvement type	FMIS
FA-4	11.4.1.1	Federal-aid highway fund apportionments	Enabling legislation/FHWA Website
<i>FA-4E</i>	<i>11.4.1.2</i>	<i>Selected data used in apportionments for fiscal year 2014</i>	<i>Discontinued</i>
<i>FA-4D</i>	<i>11.4.1.3</i>	<i>Federal-aid highway fund allocations</i>	<i>Discontinued</i>
FA-4B	11.4.2.1	Obligation of Federal-aid highway funds	Enabling legislation/FHWA Website
FA-4C	11.4.2.2	Obligation of Federal-aid highway funds by functional system	FMIS
STP-1	11.4.2.3	Uses of Surface Transportation Program funds for projects not on the National Highway System (by improvement category)	FMIS

Table	Chapter	Name	Source Form(s)
STP-1A ⁴	11.4.2.4	Uses of Surface Transportation Program funds for projects not on the National Highway System (by functional system)	FMIS, STP-1
FA-3	11.4.3.2	Expenditure of Federal funds administered by the Federal Highway Administration	FMIS

⁴ Requires the completion of STP-1 to produce.

7. References

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8. Appendix

This Appendix includes the sources for *Highway Statistics* tables by chapter.

Table 12. Table source forms for chapter 9.

Table	Chapter	Name	Source Table(s)/Form(s)
HF-10	9.3.1	Funding for highways and disposition of highway-user revenues	HF-HIST (SF-1, FA-5, 537/local worksheets)
HF-10A	9.3.2	Funding for highways and disposition of highway-user revenues	HF-HIST (SF-1, FA-5, 537/local worksheets)
REC-C	9.3.3	Total receipts for highways, by governmental unit—Chart	HF-10/HF-HIST
HDF	9.4.1	Disposition of receipts from highway user taxes and tolls	531, 532, 536, 539L, 539S, MF-3, MV-3
HF-1	9.4.2	Revenues used for highways, all units of government	531, 532, 536, 539L, 539S, FMIS
SDF	9.4.6	Disposition of receipts from State and highway-user imposts, including tolls	531, 532, 539S, MF-3, MV-3
SF-1	9.4.7	Revenues used by States for highways	531, 532, 539S
SF-3	9.4.8	Revenues used by States for State-administered highways	531, 532, 539S, 542
SF-3B	9.4.9	Receipts of State-administered toll road and crossing facilities	State 539/Toll Financial Reports
DF	9.4.10	Disposition of receipts from State imposts on highway users	531, 532, 539S
SF-21	9.4.11	Summary State funding for highways	531, 532, 539S
SF-21C	9.4.12	Summary State funding for highways—Chart	531, 532, 539S
LGF-3B	9.5.1	Receipts of local toll facilities	Local 539/Toll Financial Reports
LDF	9.5.2	Disposition of local government receipts from State and local highway-user imposts, including tolls	536, 539L
LGF-21	9.5.3	Summary local government funding for highways	531, 536, 539L
LGF-1	9.5.4	Revenues used by local governments for highways	536, 539L
MT-1A	9.5.5	Funding for direct State mass transit activities	531, 532, 539S
MT-1B	9.5.6	Funding for State grants-in-aid for mass transit	531, 532, 539S

Table 13. Table source forms for chapter 10.

Table	Chapter	Name	Source Table(s)/Form(s)
HB-2	10.3.1	Long-term highway obligations for all units of government	536, 539L, 539S, 542
SB-1	10.4.1	State Obligations for Highway (total), issued or assumed during the year	541
SB-2	10.4.2	Change in indebtedness, State highways	539S, 542
SB-2L	10.4.3	Change in indebtedness, local highways	542
SB-2T	10.4.4	Change in indebtedness, toll roads, and crossings	State 539/Toll Financial Reports
SB-3	10.4.5	Funding for debt service, State highways	531, 532, 539S
SB-3L	10.4.6	Funding for debt service, local highways	542
SB-3T	10.4.7	Funding for debt service, toll roads, and crossings	State 539/Toll Financial Reports
LGB-2	10.5.1	Change in indebtedness, local highways	536, 539L
HB-2	10.3.1	Long-term highway obligations for all units of government	LGB-2, SB-2

Table 14. Table source forms for chapter 11.

Table	Chapter	Name	Source Table(s)/Form(s)
PT-3C	11.2.1	Highway expenditures, all units of government, current and constant dollars—chart	NHCCI
DISB-C	11.2.2	Total disbursements for highways, by governmental units—chart	FMIS/Federal data, multiyear
FAPIE-2	11.2.3	Obligation of Federal Funds for Roadway Projects—chart	FMIS
FAPIE-4	11.2.4	Obligation of Federal Funds for Roadway Projects by Improvement Type—chart	FMIS
PT-1	11.2.5	Price trends for Federal-aid highway construction—chart	NHCCI
PT-2	11.2.6	Average distribution of costs on contracts completed—chart	NHCCI
FA-4A	11.3.1	Highway apportionment formulas	Enabling legislation/FHWA Website
FA-6	11.3.3	Obligation of National Highway System and Surface Transportation Program funds by system and improvement type	FMIS

Table	Chapter	Name	Source Table(s)/Form(s)
FA-6A	11.3.4	Obligation on National Highway System and total funds for all systems by functional and improvement type	FMIS
FA-10	11.3.5	Obligation of Federal-aid highway funds by functional system and improvement type	FMIS
FA-4A	11.3.1	Highway apportionment formulas	Enabling legislation/FHWA Website
FA-4	11.4.1.1	Federal-aid highway fund apportionments	Enabling legislation/FHWA Website
<i>FA-4E</i>	<i>11.4.1.2</i>	<i>Selected data used in apportionments for fiscal year 2014</i>	<i>Discontinued</i>
<i>FA-4D</i>	<i>11.4.1.3</i>	<i>Federal-aid highway fund allocations</i>	<i>Discontinued</i>
FA-4B	11.4.2.1	Obligation of Federal-aid highway funds	Enabling legislation/FHWA Website
FA-4C	11.4.2.2	Obligation of Federal-aid highway funds by functional system	FMIS
STP-1	11.4.2.3	Uses of Surface Transportation Program funds for projects not on the National Highway System (by improvement category)	FMIS
STP-1A	11.4.2.4	Uses of Surface Transportation Program funds for projects not on the National Highway System (by functional system)	FMIS, STP-1
HF-2	11.4.3.1	Total disbursements for highways, all units of government	532, 536, 539S, 542, FMIS
FA-3	11.4.3.2	Expenditure of Federal funds administered by the Federal Highway Administration	FMIS
SF-2	11.4.3.3	Disbursements by States for highways	532, 539S, 542
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SF-12A	11.4.3.7	State capital outlay and maintenance, classified by improvement type	534
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Table	Chapter	Name	Source Table(s)/Form(s)
SF-4B	11.4.3.9	Disbursements of State toll road and crossing facilities	State 539/Toll Financial Reports
LGF-4B	11.4.3.10	Disbursements of local toll facilities	Local 539/Toll Financial Reports
LGF-2	11.5.1	Disbursements by local governments for highways	536, 539L
SF-5A	11.5.2	Funding for State grants-in-aid for local roads and streets	531, 532, 539S
SF-6	11.5.3	State expenditures and grants-in-aid for local roads and streets	532, 542

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