



# Kansas LTAP Fact Sheet

A Service of The University of Kansas Transportation Center for Road & Bridge Agencies

## Excel PivotTables, Easy as 1-2-3

By Chad Banka, P.E.

*A powerful, easy-to-use feature you can't live without*

In public works professions we develop data spreadsheets containing many types of information. We track crashes, monitor traffic data, keep maintenance records and quantify product consumption during winter storms, to name a few. The information collected is invaluable, but we need to efficiently organize the data into something useful.

PivotTables are a versatile feature of Excel, offering a powerful way to organize and quickly manipulate a lot of information without cumbersome, headache-inducing formulas. They are easy to update and they allow data to be summed, counted, or averaged quickly by dragging and dropping with a few clicks of the mouse.

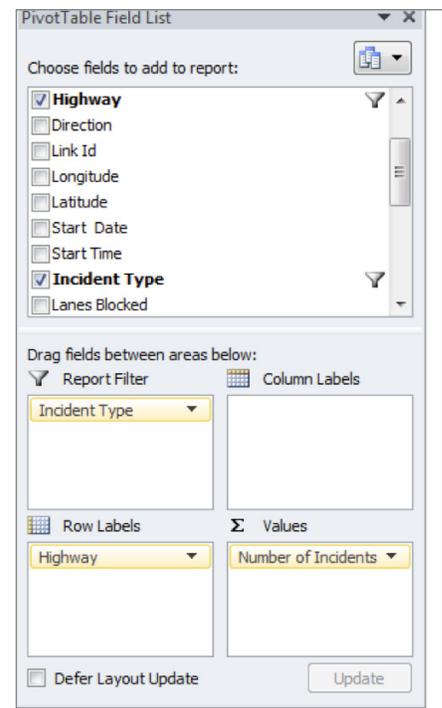
At WICHway, KDOT's Intelligent Transportation System in Wichita, PivotTables help make sense of the massive amount of collected data. The information generated from PivotTables is used to create traffic incident and congestion index reports for Wichita's

*PivotTables help you communicate meaningful information generated from your spreadsheets —information people can understand and use.*

major highways. Once created, these graphs and reports may be easily updated each month.

When information is requested by a council member, commission member, or the public, it is helpful to create a table in minutes showing how many signs were struck in a particular month or the average amount of product used in a winter storm. When comparing monthly data, yearly trends or analyzing traffic count data, PivotTables help us communicate by streamlining the data

▼ When creating the PivotTable, you simply drag the fields you want in your report into the Report Filter area.



▼ A PivotTable starts with an Excel spreadsheet with cleaned-up, well-organized data.

	A	B	C	D	E	F	G	H	I	J
1	Inc Id	Link Name	Highway	Direction	Link Id	Longitude	Latitude	Start Date	Start Time	Incident Type
180	14224	US-54 WB at Armour	US-54	W	54022140	-97.247492	37.680117	1/3/2014	7:55:00	ACCIDENT-INJ/FAT
181	27584	US54 at Woodlawn-WB	US-54	W	54219640	-97.2639	37.6797	12/30/2014	9:21:00	ACCIDENT-PDO
182	27469	I-135 at Pawnee-SB	I-135	S	13500402	-97.312004	37.650135	12/23/2014	17:07:00	ACCIDENT-PDO



into meaningful information that is easy to visualize and understand.

Making these reports is as easy. Let's walk through some simple steps to get you started in just minutes.

**Step One.** Organize your spreadsheet data. The data in your Excel spreadsheet must be organized in columns and include appropriately-named headings. Eliminate empty rows and columns and clean up any bad data. For this example, we have several thousand rows of crash/incident data over the course of one year.

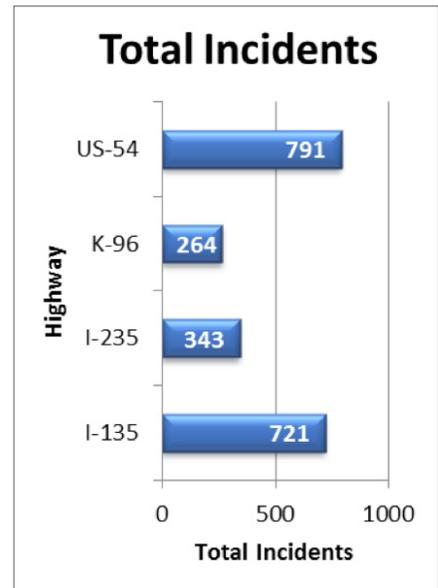
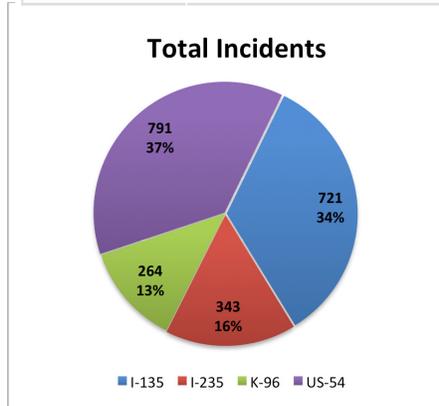
**Step Two.** Create the PivotTable. In the insert ribbon at the top of the screen, choose Tables, then PivotTable. Excel will automatically select all of the data in your spreadsheet, outlined by the "marching ants" border; or you may custom-select the data you want from the activated dialog box. Next, select where you want to place the PivotTable (typically into a new worksheet) and hit "OK." Once selected, a new worksheet and PivotTable box appears.

**Step Three.** Build the PivotTable report. To build your table, simply drag and drop the fields (the column headings of your spreadsheet) you want to summarize into the row, column and values area of the PivotTable Field List.

In our example, we want to count the total incidents on four major highways

▼ You have choices for how you want your reports to display the data—below, a list, a pie chart and a bar graph.

Highway	Number of Incidents
I-135	721
I-235	343
K-96	264
US-54	791
<b>Grand Total</b>	<b>2119</b>



in Wichita and filter out unwanted information. To accomplish this, we drag the highway field to "Row Labels," and incident type to the "Values" area. The "Values" area identifies and controls the type of calculation summarizing your data. By default, the counting value

is used, but other functions, including averages, sums, and basic statistics, are available by double-clicking the field button (or right click the field button) and selecting "Value Field Settings." Lastly, the incident type field is placed into the "Report Filter," filtering out unwanted data.

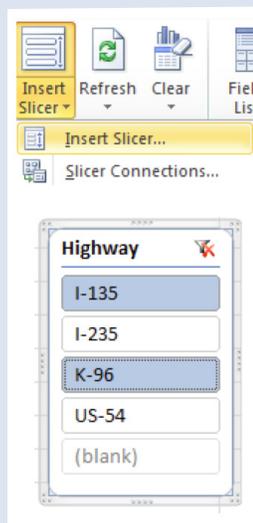
At this point, the PivotTable begins to automatically generate. From here, we may want to add additional fields to our PivotTable, make comparisons, or separate our data by month. It's exciting to try different fields and functions and then watch the PivotTable dynamically update. PivotTables can be as complicated or simple as you need them to be.

**A step further...** The three steps above are just the beginning. Many of the basic Excel functions you're already familiar with can be used to sort, arrange and format the data to your satisfaction. PivotCharts are a great way to illustrate the data from the PivotTables. PivotCharts include bar and pie charts as shown here, but line charts, scatter plots, and numerous other charts are also available.

## Using Slicers

Slicers, new in Microsoft Excel 2010, are similar to traditional filters, but are easier to understand and visualize. Slicers are available for both PivotTables and PivotCharts and interactively filter the data using buttons that allow the user to quickly control the displayed data. To insert a Slicer, select the intended PivotTable, click "Options" from the PivotTable Tools ribbon, and select "Insert Slicer."

In our example, instead of looking at the data for the entire city, we may want to look at a specific highway or compare a couple of options instead of using all the spreadsheet data. Using Slicers and a click of the mouse on the intended highways, the table updates instantly. Multiple Slicers may be used on a single table or chart, allowing the user to look at or analyze specific information with a click of the mouse, such as filtering to look at injury or animal crashes on just one highway.





Want to add more raw data to the spreadsheet? No problem! Individual or multiple PivotTables and charts in the workbook are easy to update after adding new data to the spreadsheet by using the standard refresh or refresh-all button.

If you're looking for more information on PivotTables or have questions, videos and interactive tutorials can be found through a simple search on the internet. To see some examples of how TranSystems uses PivotTables, check out the "Reports" section at <http://www.WICHway.org/wichway/Reports>.

*Chad Banka is a transportation engineer in TranSystems' Wichita office and is the operations support engineer for WICHway, Wichita's Intelligent Transportation System. WICHway is owned and operated by the Kansas Department of Transportation and is located in downtown Wichita. Banka may be reached at (316) 303-3000 or at [ccbanka@transystems.com](mailto:ccbanka@transystems.com)* ■

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