



Who Pays?

Part Two of Two

An Overview of the Sales Tax in Colorado

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Local governments in Colorado have relatively broad authority to levy new sales taxes, conditional on voter approval. Most counties and municipalities levy a sales tax while a number of special districts do as well. Table 1 shows the number of taxing entities levying at least one sales tax. At the end of 2022, 312 local government entities imposed 323 general sales tax rates.¹ The difference arises because some taxing entities impose different rates in different geographies and for different purposes. Pitkin County, for example, levies a 2.1% rate inside the town of Basalt but 3.1% everywhere else. Pitkin County, like Eagle County and Summit County, imposes special countywide rates for mass transit. These sales tax rates are distinct from the sales tax imposed by the Roaring Fork Transportation Authority, a separate taxing entity.

Table 1: Locally-Imposed General Sales Tax Rate Counts

	Entities imposing at least one sales tax	Total entities	% of entities	Average Rate
Counties ¹	52	62	84%	1.792%
Municipalities ²	228	271	84%	3.118%
Special Districts				
Scientific and Cultural Facilities Districts	1	1	100%	0.100%
Health Service Districts	6	40	15%	0.700%
Multi-Jurisdictional Housing Authorities	1	9	11%	0.725%
Local Improvement Districts	6	49	12%	0.738%
Metropolitan Districts	12	2,235	0.5%	2.604%
RTAs/RTDs	6	8	75%	0.670%
Total	312	2,675	12%	

Source: Authors' analysis of Department of Revenue Form DR 1002 and the Department of Local Affairs' Local Government Information Services database.

Notes: The state levies a statewide sales tax of 2.9 percent. RTA means regional transportation authority. RTD means regional transportation district. Some entities tax different goods at different rates. These are excluded here. The table intends to only capture the general rate applicable to most goods in an entity's geographic boundary.

¹Broomfield and Denver are cataloged as municipalities for the purpose of the table.

²The unpopulated town of Carbonate is excluded.

In many ways, Basalt illustrates well the confusion shoppers and businesses may face in Colorado's sales tax system. The town spans two counties (Eagle and Pitkin) with shoppers in either portion of the city being responsible for sales taxes for county general purposes (1% in Eagle and 2.1% in Pitkin), county-specific taxes for mass transit (0.5% in both counties), and town-wide taxes for the Roaring Fork Transportation Authority (0.80%) and general purposes (3%). In other words, anywhere in the town limits shoppers will face four local sales tax rates for different entities, and at the county border, crossing the street can save or cost shoppers 1.1 percentage points more. It is unsurprising, then, that most town retail is in the Eagle County portion of the town where the combined sales tax rate is at present 8.20%.²

¹ Local governments may set different rates for different activities. If one tracks each of these economic activities, there are over 500 sales tax rates in Colorado.

² Facing four local sales tax rates is not uncommon. Retailers and shoppers in a few parts of south east Jefferson County (west of Marston Lake) will face five local rates plus the state rate due to local improvement districts and the Southwest Plaza metropolitan district. Five overlapping rates is the greatest rate density in the state that we are aware of, but readers should not assume more rates means a greater combined rate. Shoppers will face a 7.93% combined sales tax rate (five local plus the state) in the Bellevue Shores shopping center, but crossing West Crestline Ave to the south, the combined rate increases to 8.81% while the number of rates decreases to four (three local plus the state).

In addition to local determination in setting tax rates, some local governments have flexibility in determining the sales tax base and tax administration. With respect to the former, state law enumerates two types of sales tax exemptions: mandatory and local option.³ Local governments cannot opt out of mandatory exemptions whereas they can opt out of non-mandatory exemptions. Food purchased with SNAP or WIC funds, for example, is exempted by state mandate whereas all other groceries (food for at-home consumption) is taxable at local option. One implication of exemption discretion is that the sales tax base is not uniform across the state; a good that is taxable in one jurisdiction may not be taxable in another.⁴ Further complicating matters is that sales tax collections are not always remitted to the same place. The state administers sales taxes for counties and non-home rule municipalities, while home rule municipalities have the option to self-administer or contract administration with the state at no cost. At the end of 2022, 68 home rule municipalities self-administered.⁵ In order to be fully compliant with state and local sales tax laws, then, retailers must know which goods are taxable, which rates to apply to which goods, and potentially which jurisdiction to remit which portion of collections.⁶

Because exemptions obscure the amount of economic activity that would be taxed if they did not apply, it is impossible to evaluate how much exemptions cost local governments without making unverifiable, and potentially unrealistic, assumptions about how sensitive consumers and businesses are to small changes in the sales tax.⁷

An alternative window into sales tax base policy choices is to consider particular types of exemptions, and we think the tax status of groceries is worth consideration given the frequency of consuming ready-to-eat food. Figure 1 shows the percentage of local government entities taxing groceries as of December 2022 for the four types of local governments that do so; the other local government types listed in Table 1, as well as the state, do not tax groceries. In terms of percentages, though relatively few local improvement districts (LIDs) levy a general sales tax, nearly all of those that do levy it on groceries. Most municipalities tax groceries. This holds similarly for counties. Few health service districts (HSDs) tax food, but there are few such districts in general.

³ Additional information on these exemptions is provided by the Department of Revenue in the supplemental instructions to sales tax return form DR 0100.

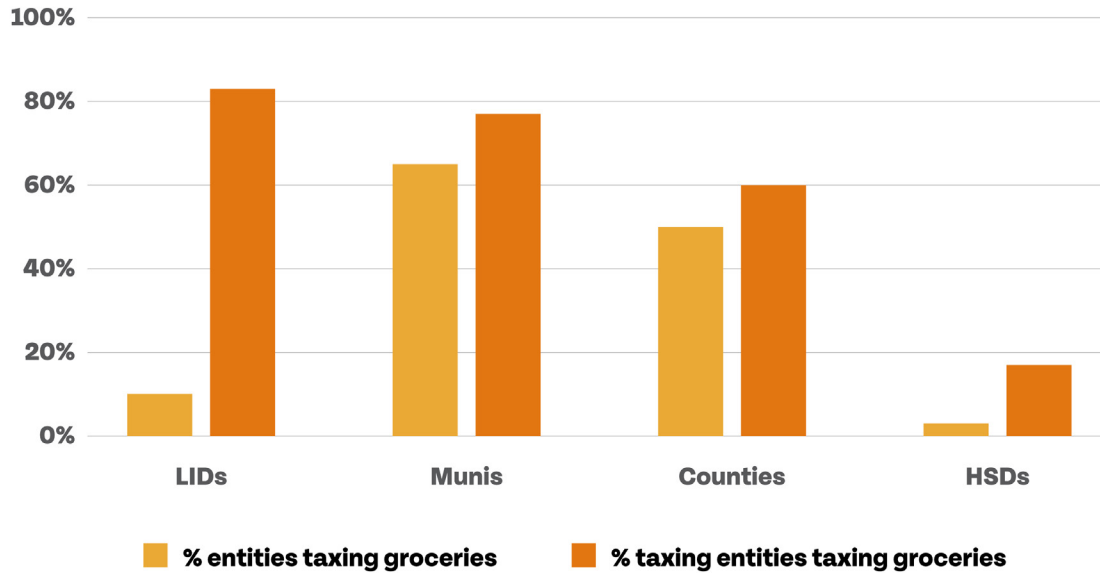
⁴ Home rule municipalities can exempt any taxable activity from its sales tax.

⁵ By comparison, all 71 home rule municipalities self-administered at the end of 2018.

⁶ Sales tax remittance has become easier and cheaper with advances and innovation in tax administration technology. The Department of Revenue's Taxation Division launched the Sales and Use Tax System (SUTS) in May 2020. SUTS is a one-stop-shop to help businesses identify tax rates and remittees. Some home rule municipalities that self-administer participate in SUTS by allowing businesses to use the state's system to remit collections. A list of SUTS participating jurisdictions is available at <https://tax.colorado.gov/SUTS-jurisdictions>. Participation in SUTS is not free. Though the state does not charge self-administering jurisdictions an SUTS access fee, it does charge a \$1.00 per day fee for batch bank processing.

⁷ Scoring is the process of estimating the tax cost of exemptions, abatements, credits, exclusions, and other policy instruments that divert dollars away from public services through the tax code. The fastest and most common scoring technique is called static scoring whereby the analyst assumes the imposition of a tax has no effect on the tax base. This is typically a poor assumption, since people change their behavior in response to changes in prices for most goods. The smaller the behavioral responses, the more accurate static scoring becomes. The alternative is dynamic scoring whereby the analyst attempts to incorporate behavioral responses into the tax expenditure estimation. Dynamic scoring requires high quality data and information on demand and supply elasticities. Absent these, dynamic scoring would need more assumptions than static scoring, and therefore generate tax cost estimates of unclear credibility.

Figure 1: Share of entities and sales taxing entities taxing groceries



Effective Sales Tax Rates

Given differences in sales tax policy choices and commodity prices within and across overlapping taxing entities, it is misleading to draw conclusions about sales tax burdens using only information on tax rates and bases. Two communities may have identical rates but apply them to different sized bases, leading one to impose a greater sales tax burden on consumers than the other. Or one community may generate more sales tax revenue by applying it to a broader set of economic activity than a community that imposes a greater sales tax rate but on a narrower set of activity.

A more insightful way to compare sales tax burdens across Colorado is effective sales tax rates (ETRs). The ETR is a ratio of the sales tax paid divided a denominator common to all taxpayers multiplied by the total price of goods consumed multiplied by 100. We use prices as the denominator, and perhaps the most difficult part of calculating sales tax ETRs is obtaining prices for all goods consumed. For our analysis, we rely on prices collected by Corona Insights, a private company that calculates school district-level inflation price indices for the General Assembly as part of the state’s education funding process. The company collects pre-tax price information for a range of commodities and services at various retailers throughout the state, last doing so in 2021. To align the prices with the tax rate and base data we have collected, we inflation adjusted the prices to November 2022 figures using the Denver metro area CPI for the specific commodity category.

We focus on the price of four commodities: a box of Cheerios, a gallon of 2% milk, a pack of AA batteries, and a 14-inch cheese pizza for take-out. We treat these goods as a basket and ask how the sales tax ETR for this basket varies across the state. Said differently, suppose someone purchased all of these goods anywhere in the state, what would the variation in sales tax burden look like? This basket, therefore, is not intended

⁸ Knowing which goods are taxable and at what rate is also problematic but less so when focusing on a single state where rich sales tax policy information—such as in Colorado—is available.

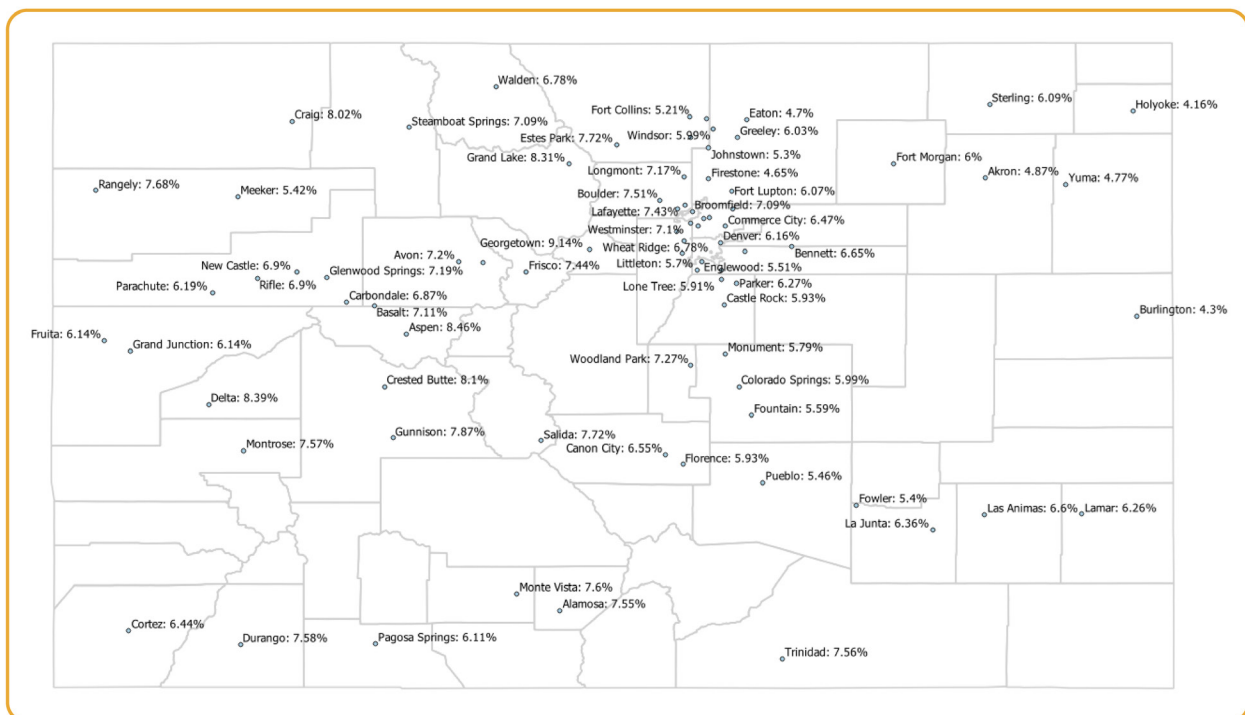
⁹ We used the “Dairy and other products” CPI growth to inflation-adjust the price of milk, for instance.

to be a representative basket purchased by any particular Coloradan, nor should the sales taxes due on the basket be interpreted as a representative sales tax burden. Instead, we use the basket simply to paint a picture about how a hypothetical person’s sales tax burden varies across the state were they to purchase a hypothetical but identical set of goods.

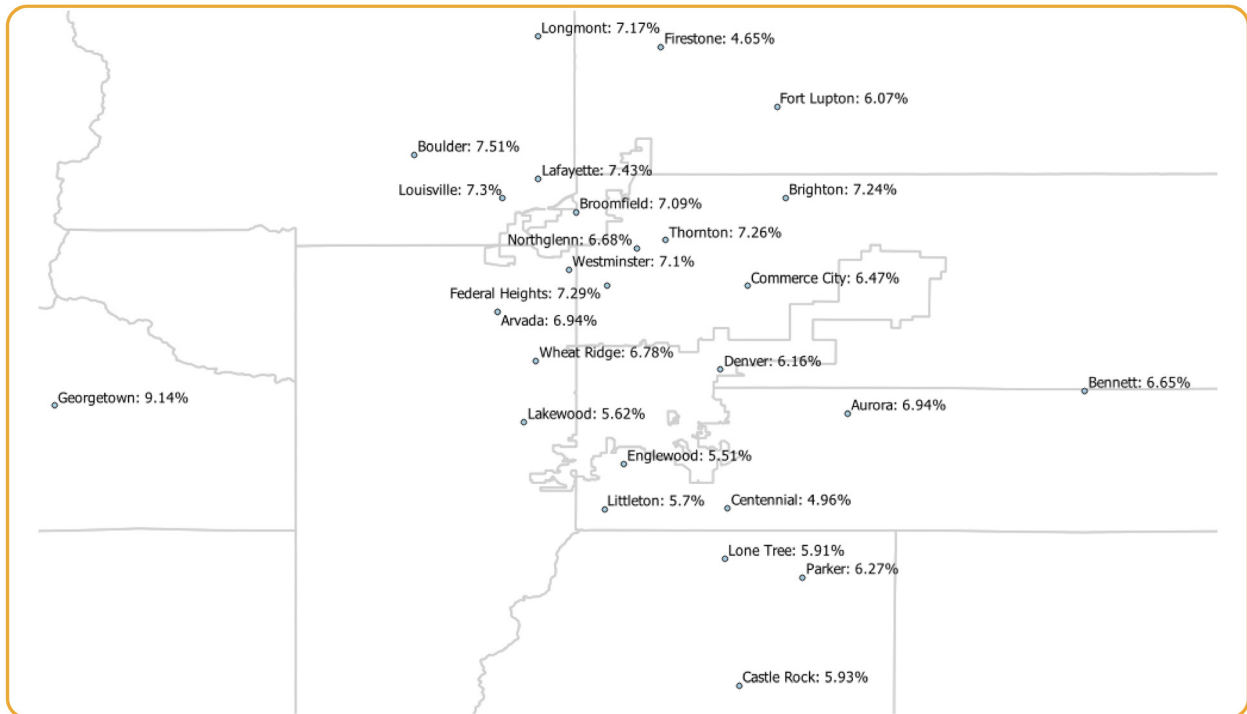
To illustrate our process, consider that Denver does not tax groceries (milk and Cheerios), taxes prepared food at 4% (take-out pizza), and everything else that is taxable at 4.81%. The state charges a 2.9% tax, the Regional Transportation District levies a 1% tax, and the Scientific and Cultural Facilities District levies another 0.1% tax, and these three entities also exempt groceries. Applying the individual commodity prices to the respective statutory tax rate and then summing yields a total sales tax bill of \$1.75 on a basket that costs \$27.98, or a 6.2% price-based ETR. This is more than two percentage points less than the total statutory rate in Denver of 8.81%, further highlighting that comparing statutory rates alone is a misleading way to evaluate sales tax burdens.

Repeating this process for all retailers surveyed and then averaging prices within 80 communities for which price data on the basket are available, the statewide average ETR is 6.55%. Figure 2 maps the effective sales tax rates across municipalities for which pricing data for the basket of goods were available. One pattern that emerges from the data is that ETRs are generally greater in the Western Slope than elsewhere in the state. Indeed, after controlling for prices, the overall sales tax rate, and whether groceries are taxable, ETRs in the Western Slope communities are 0.32 percentage points greater than those in the Front Range. In contrast, there is no statistical difference between ETRs in Western Slope communities and those in the Eastern Plains.¹⁰

Figure 2: Effective sales tax rates by municipality for our hypothetical basket of goods



¹⁰ We fit a robust regression model with the data using ETRs as the dependent variable and prices, the overall sales tax rate, and a categorical fixed effect taking on one of three values corresponding to the Eastern Plains, the Front Range, and the Western Slope.



Given this pattern, it is worth considering how much sales tax burdens are determined by prices versus local tax policy decisions. This has policy value. Unlike commodity prices, elected officials and voters have more control over sales tax rates and bases. Based on the statistical analysis detailed in footnote 10, we find that statutory tax rates are 80 times stronger predictors of ETRs than prices, while taxing groceries is 34 times stronger. This implies that differences in prices of goods across the state poorly explain differences in ETRs; that sales tax policy decisions are far more important for this four-item basket. Moreover, of the two sales tax policy levers—how much to tax and what to tax—the former is the stronger predictor, and increases are directly controlled by voters.

We have thus far considered price-based ETRs, but we also consider sales tax burdens with respect to income. Income-based ETRs are common for such analyses, but we lack data on how often the items in the basket are purchased, making it impossible to align sales taxes owed and income earned over the same period of time. As an alternative, we can estimate how long someone would have to work in order to pay the sales taxes owed on the basket of goods. For income, we used zip code-level data from the Internal Revenue Service (IRS) for 2020, the most recent year available but which we then adjusted to 2022 dollars using the Consumer Price Index.¹¹ We identified all non-PO Box zip codes within 5 miles for each retailer in our sample, which we then linked to the IRS zip code data. For each zip code, the IRS further disaggregates income into adjusted gross income categories. We define a lower-income household as those making less than \$50,000 but more than \$0; an upper-income household as those making \$100,000 or more; and a middle-income household as making between \$50,000 and \$99,999.¹²

¹¹ The IRS provides income data for zip code tabulation areas (ZCTAs), not for zip codes. The latter are zones used by the US Postal Service, and ZCTAs approximate zip code boundaries for non-PO box zip codes.

¹² These income group definitions are constrained by how granular or not the IRS chooses to make income data publicly available. Our income class definitions here are different than those we have used in the past, most notably with the upper limit of the middle-income group which is greater than \$100,000. We chose to omit from the analysis returns with negative income.

For each income group, we then calculated the wage per minute for the average wage earner assuming they worked 40 hours a week for 52 weeks.¹³ When we merged these data with the 80 sampled retailers, we have an estimate of local wages per minute within 5 miles of each retailer for the average person in each income group. For the average lower-, middle-, and upper-income worker in our sample, the mean wage per minute is \$0.21, \$0.50, and \$1.54, respectively.¹⁴ Finally, dividing the sales tax owed by the income earned per minute yields the number of minutes the average person would have to work to pay the sales tax bill on the selected bundle of goods.

Table 2: Minutes of Work Needed to Pay Sales Tax Bill for Hypothetical Basket

Community	Sales Tax Owed	Average Taxpayer Income Group			Lower-to-Upper Work Time Ratio
		Lower Income (<\$50,000)	Middle Income	Upper Income (≥\$100,000)	
Sample Mean	\$1.79	9	3.8	1.5	7.1
Sample Median	\$1.75	9	3.8	1.5	5.9
Denver	\$1.73	8.1	3.3	1.1	7.4
Colorado Springs	\$1.62	7.3	3.3	1.4	5.2
Aurora	\$1.80	8.8	3.6	1.5	5.9
Fort Collins	\$1.39	7.2	2.9	1.1	6.5
Lakewood	\$1.49	7.1	2.9	1.2	5.9
Thornton	\$1.92	9.5	4	2	4.8
Arvada	\$1.73	8.3	3.4	1.5	5.5
Westminster	\$1.91	9.3	3.9	1.8	5.2
Pueblo	\$1.44	7.6	3.3	1.5	5.1
Greeley	\$1.62	8.1	3.7	1.6	5.1
Centennial	\$1.27	6.4	2.5	0.9	7.1
Boulder	\$2.28	11.9	3.6	1.1	10.8
Longmont	\$1.86	9.6	3.9	1.6	6
Loveland	\$1.52	7.8	3.3	1.4	5.6
Broomfield	\$1.88	9.3	3.8	1.8	5.2
Castle Rock	\$1.53	8.4	3.1	1.1	7.6
Grand Junction	\$1.60	8.6	3.8	1.7	5.1
Commerce City	\$2.02	9.8	4	1.7	5.8
Parker	\$1.50	8.1	3	1.1	7.4
Littleton	\$1.54	7.8	3	1.1	7.1

Note: The sample mean and median figures are for the 80 communities sampled, not the 20 most populous listed in the table.

¹³ For the average wage earner calculation, we counted single- and head-of-household returns as one wage earner and joint returns as two wage earners. Our methodology and interpretation make assumptions about where people earn wages and where they shop for the hypothetical basket of goods, assumptions which we cannot validate with publicly available data. Appropriate qualifications are necessary when reporting the figures.

¹⁴ The median wages per minute are \$0.19, \$0.46, and \$1.14, respectively.

Table 2 displays the results for the 20 most populous cities along with the mean and median values for the 80 sampled communities. Interpreting the data is as follows. If the average lower-income Denverite purchased the hypothetical basket of goods in Denver, she would have to work 8.1 minutes to pay the sales tax on the basket. If she is a middle-income earner, she would have to work 3.3 minutes, and 1.1 minutes if an upper-income earner. This pattern persists across all communities sampled: lower-income earners have to work longer to pay the same sales tax bill as higher income earners. This finding is, of course, unsurprising, but now the variation across income groups and across the state has been quantified, thereby encouraging a discussion of whether this variation is desirable or not. The final column in the table shows the work time ratio. Based on our sample, lower income earners in Denver need to work 7.4 times longer to pay the sales tax bill than upper income earners.

By focusing on a single revenue stream, one risks drawing incomplete inferences about how public finance systems as a whole affect taxpayers. For example, it is worth asking if lower sales tax burdens are offset by higher burdens in some other part of local governments' revenue budget. To illustrate, consider property taxes. Local governments that impose a low sales tax rate on a relatively narrow base may attempt to compensate for the revenue loss with higher property tax mill levies. A similar logic holds for user charges, vehicle taxes, and other revenue sources in local governments' portfolios. In other words, local revenue sources are substitutes, and given a level of public expenditures, reducing reliance on one stream increases reliance on others. How this translates into ETRs depends in no small part on the number of overlapping taxing jurisdictions and their respective rate and base decisions, recognizing that, at least in our sample, basket prices weakly predict sales tax ETRs.

To illustrate these potential relationships, we calculated average effective property tax rates in each of the 80 communities.¹⁵ We then categorized each community according to whether they have sales tax ETRs greater or less than the sample mean and similarly for property tax ETRs. There is a statistically significant negative correlation between the property tax ETR and the sales ETR such that each 0.1 percentage point increase in the former is associated with a 0.3 percentage point decrease in the latter.

Table 3 shows where the 80 sampled communities fall in the sales tax ETR for the hypothetical basket and property tax ETR spectrum. Though the table does not show how far above or below the respective ETR means a community is, it nonetheless provides information on how and which communities are bunched together. The sales tax and property tax burdens appear to be substitutes in a little more than half of the communities: 24 have relatively low sales tax ETRs but relatively higher property tax ETRs while 21 have the reverse. In the other half of communities, burdens for both taxes are relatively low (15) or relatively high (21). It could be that in these communities, there is less (greater) demand for public services, and therefore lower (higher) tax burdens in general, or perhaps some other revenue stream serves as a sales tax substitute.

¹⁵ More specifically, we obtained the estimated median home value in Census block groups within 5 miles of each retailer surveyed by Corona Insights. We use the median of these values. Contemporaneously, we used GIS software to determine the median combined mill levy from all overlapping property tax entities at the Census block level, and we then further found the median combined mill levy when aggregated to the block group level. We calculated ETRs using the 2022 residential assessment rate of 6.95%.

Table 3: Effective Sales and Property Tax Rates by City

		Effective Property Tax Rate			
		Less than the Mean		Greater than the Mean	
Effective Sales Tax Rate	Less than the Mean	Centennial Colorado Springs Commerce City Cortez Denver Englewood Fountain Grand Junction	La Junta Lamar Littleton Meeker Monument Pagosa Springs Parachute	Akron Burlington Castle Rock Eaton Firestone Florence Fort Collins Fort Lupton Fort Morgan Fowler Fruita Garden City	Greeley Holyoke Johnstown Lakewood Lone Tree Loveland Parker Pueblo Sterling Timnath Windsor Yuma
	Greater than the Mean	Aspen Avon Crested Butte Delta Durango Federal Heights Frisco Grand Lake Gunnison Las Animas Montrose	New Castle Northglenn Rangely Salida Steamboat Springs Thornton Trinidad Vail Walden Westminster	Alamosa Arvada Aurora Basalt Bennett Boulder Brighton Broomfield Canon City Carbondale Craig	Estes Park Georgetown Glenwood Springs Lafayette Longmont Louisville Monte Vista Rifle Wheat Ridge Woodland Park

Notes: The mean is the average of the 80 sampled communities for which the basket of goods had available prices. The average effective sales tax rate is 6.55%. The average effective property tax rate is 0.51%.

The exact reasons for these patterns cannot be discerned from the present data, but the results nevertheless highlight potential tax policy tradeoffs. If a community needs to raise \$1, how it raises the money is, in part, a public finance question.¹⁶ If the choice is between the sales tax or the property tax, there are advantages and disadvantages to raising the dollar from each. Increasing sales taxes is usually more politically feasible than increasing the property tax.¹⁷ Sales tax bills, though more frequent than property tax bills, are nonetheless much smaller in magnitude, making them easier to accept.¹⁸ In addition, a nontrivial percentage of the community-wide sales tax bill may be paid by nonresidents, reducing residents' average cost of financed public goods. The portion of the sales tax paid locally, though, may disproportionately fall on lower income residents, and this tax inequity can be aggravated or ameliorated by local policy decisions, as we have highlighted throughout in this analysis.¹⁹

¹⁶ There is a political aspect to deciding how to raise an additional dollar, but public finance principles enter the process as well. In contrast, whether it should raise the money in the first place is strictly a political question.

¹⁷ The property tax is, historically speaking, less popular than most other taxes. From 1972 through 1994, the defunct US Advisory Commission on Intergovernmental Relations (ACIR) surveyed Americans on their opinions of various taxes 20 times. In 9 of these surveys, the local property tax was rated the least fair compared to other local, state, and federal taxes, and in the other 11 surveys, it was second to the federal income tax. The Tax Foundation conducted tax sentiment surveys from 2005 through 2009 (except in 2008) and found similar results.

¹⁸ If an individual's annual sales tax bill is the same amount as their annual property tax bill, the former being spread out over more installments compared to the latter should be irrelevant to one's opinion of either tax, assuming individuals are attentive to their relative tax burdens.

In contrast, the property tax is a tax on wealth. While this progressive element of the tax is often desired, holding public goods constant, increasing the property tax decreases property prices and, hence, wealth accumulation.²⁰ Current homeowners in particular not only have a financial interest in keeping property taxes low, all other things equal, but they also tend to be active voters, which makes it more difficult to pass a mill levy increase than a sales tax rate increase. The property tax is also a more stable revenue stream than the sales tax. Whereas the sales tax ebbs and flows with economic conditions, the property tax has a countercyclical element, allowing taxing entities more reliant on property taxes to make smaller cuts to public services during economic downturns.²¹

There are many other advantages and disadvantages to each tax, including how they are administered, how they affect local economies, and how they affect schools. Our discussion intends only to provide a cursory review of perhaps the most salient characteristics of each tax and to highlight some of the policy tradeoffs voters and lawmakers face when deciding how to raise an additional local tax dollar.

¹⁹ The sales tax is generally perceived as regressive, since lower-income households spend a larger portion of their budget on the tax than higher-income households. This perception, however, rests on tacit assumptions about the breadth of the tax base and the share of the tax shifted to consumers. The tax in practice is not broadly applied and the extent of forward-shifting depends on the relative elasticity of supply and demand, which varies within and across industries and communities.

The magnitude of regressivity can also depend on how one measures income: annually, over a lifetime, or some other way, or as a comprehensive measure versus wage income. These analytic choices when evaluating the sales tax suggests the extent of its regressivity is not a foregone conclusion.

²⁰ By the same logic, reducing property tax burdens increases buyers' reservation price of housing, all other things equal. In this way, property tax relief programs only benefit existing property owners but push prices upward for future residents, thereby increasing cost barriers to future home ownership. See Moulton, Jeremy G., Bennie D. Waller, and Scott A. Wentland. (2018). "Who benefits from targeted property tax relief? Evidence from Virginia elections." *Journal of Policy Analysis and Management*, 37(2), 240-264.

²¹ The property tax is not immune to economic downturns, but there is a lag in time between when an economic downturn is experienced by residents and when the downturn shows up in property tax bills. In Colorado, the lag is approximately two years, conditional on appeals outcomes. In the rest of the country, the lag ranges from six months to six years, depending on state property assessment law. During the earlier part of economic downturns, then, property owners will be paying taxes on assessed values from before the downturn. During the earlier part of the subsequent economic recovery when prices are increasing, property owners will be paying taxes on depressed assessed value from during the downturn.