*Technical Manual:*

***The District of Columbia Family Resource Simulator***

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## Contents

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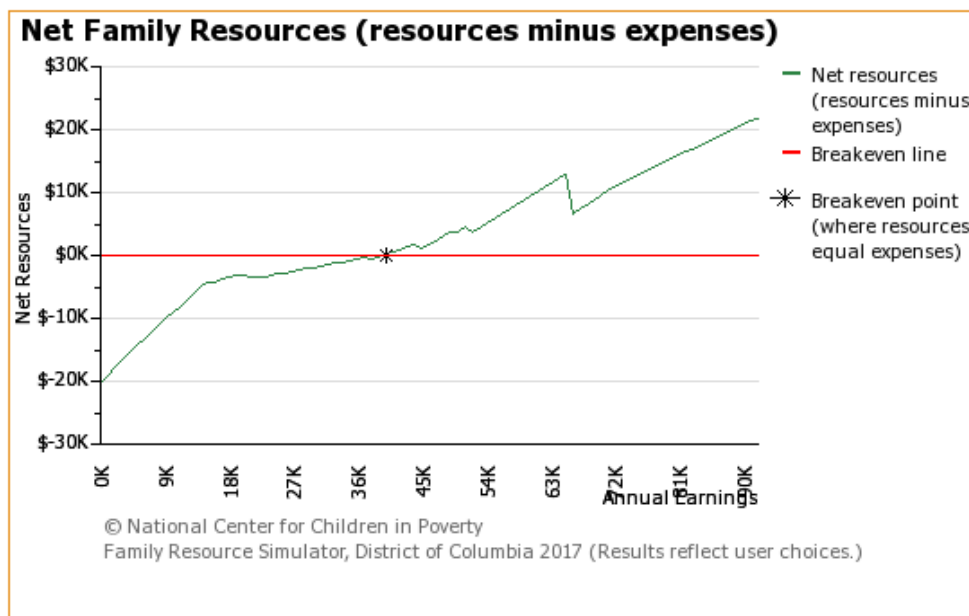### INTRODUCTION TO THE FAMILY RESOURCE SIMULATOR

The National Center for Children in Poverty's Family Resource Simulator ("FRS," or, "simulator") is an interactive web-based tool designed to help policymakers, advocates, and researchers understand how federal, state, and local safety net programs interact with one another to affect a family's net resources. The FRS models net resources for a range of family types by subtracting a family's estimated expenses from its estimated resources, including earnings and benefits from cash assistance and near-cash assistance like SNAP (food stamps). Some work supports, like Temporary Assistance to Needy Families (TANF) benefits, are considered cash or near cash and are included in family resources, while others are incorporated as reductions to family expenses, like Low Income Home Energy Assistance Program (LIHEAP) . The main formula driving the tool is as follows:

Net resources = Family Resources – Basic Expenses

*Family resources* include the following: post-tax earnings, child support received, state and federal tax credits, and any cash or near-cash value of work supports received.

*Basic expenses* include the following: rent payments, transportation expenses, debt payments, child care expenses, food expenses, health expenses, and expenses for other necessities.

The online interface of the FRS allows users to see how net resources shift as a family's earnings rise. The graphs and tables that users can generate using this tool can help identify *benefit cliffs* that occur when a marginal change in earnings makes a family ineligible for an important work support (e.g., child care subsidies), thereby sharply reducing the family's net resources. These same graphs and tables can be used to identify when a family "breaks even" – when the calculations of family resources and basic expenses are equal. Net resources estimated by the model for different family types in D.C. are displayed in a line graph like this one:



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Family Resource Simulator, District of Columbia 2017 (Results reflect user choices.)

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Another graph shows a breakdown of the resources and expenses of the family across a range of earnings:
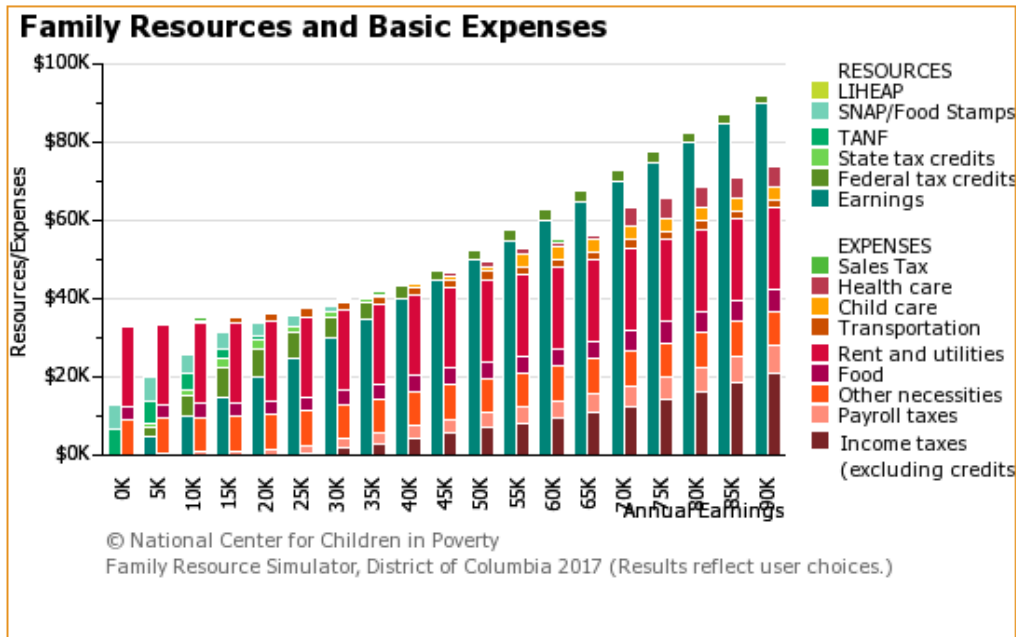


The FRS models net resources based on users' answers to a series of questions across seven steps on the tool's interface. Each step has default settings to model net resources for a representative family. However, these settings are customizable. These steps are as follows:

1. *City & State:* The user selects the city/county and state from their respective drop down menus. The year that appears next to the state is the year in which the FRS was updated.

2. *Family:* In this step, the user selects characteristics about the family they would like to model: whether the family is headed by a one or two-parent family, the ages of the parent(s), and the number and ages of children. Additionally we include a question about breastfeeding, which influences the amount the family would receive under the WIC program; whether either parent/guardian has a disability; whether the family receives child support; whether the family works non-traditional hours. If the user answers yes to receiving child support, more questions about the characteristics of the non-custodial parent who pays support are asked in Step 3. If the parent works outside of the typical 9 am - 5 pm, Monday through Friday schedule, then the user should select yes to the question that asks "Do parent(s) in the family work nontraditional hours?" The user will be able to provide more details on the parents' work schedules in Step 3.

3. *Income & Assets:* In this step, the user can enter a starting wage rate, which would be the rate applied to both parents for a two-parent family, since the FRS models net resources over a range of annual incomes. (For more explanation about methods, go to section titled "Earnings.") The user can also enter amounts for family savings, value of the family's vehicles and amount owed on them, and debt payments. Some of the questions asked in this step only appear if the user answers questions in earlier steps a certain way:

    ● If the user indicates the family is a two-parent family in Step 2, then the user can select whether the other parent works full-time, part-time, or not at all.

    ● If the user answers yes to receiving child support in Step 2, then in Step 3 the user will be asked about the non-custodial parent's income, the number of children outside the modeled family's home the non-custodial parent must support, and which children in the modeled family receives child support.

- If the user answers yes to working nontraditional hours in Step 2, then in Step 3, the user must answer questions about length of work shifts, the amount of time between shifts, weekend work hours, and the time that the work day begins.

4. *Work Supports:* The user selects the box next to each work support, or public benefit, the modeled family would receive when modeled at eligible income levels and fulfilling any required family characteristics captured in Step 2 (e.g., disability status needs to be present in order to be eligible for Supplemental Security Income).

5. *Child Care:* In this step, the user can select a child care setting to estimate costs for each child needing care, or the user can opt to enter their own cost estimates. If the user selects Child Care and Development Fund (CCDF) Subsidies in Step 4, then the user can choose different settings for unsubsidized and subsidized care. Since the child care setting influences the cost of care, the user can select the highest cost setting for subsidized care and the lowest cost setting unsubsidized care to help optimize the modeled family's budget.

6. *Health Insurance:* The user can select whether the family receives employer provided health insurance or an individual/nongroup plan (Marketplace insurance), or enter their own cost estimates. If the user selects Public Health Insurance (Medicaid, CHIP) in Step 4, the FRS gives cost estimates for both parents and families under the employer and individual/nongroup plans. This is because public health insurance eligibility is more generous for children, so there may be income levels at which the family is modeled where children are receiving public health insurance, but parents are not.

7. *Other Expenses:* Here, the user can enter their own cost estimates for rent and utilities, food, and transportation, or utilize the FRS estimates. Home type and energy source are asked because they influence the amount of LIHEAP benefits, if the user chooses to model this in Step 4. If the user chooses that at least one parent in the family has a disability in Step 2, then two additional user-entered fields will appear in this step: (1) personal expenses needed by the disabled adult(s) and (2) expenses needed for items or services that disabled parent(s) need(s) in order to work.

8. *Results:* Depending on user selections, 3-4 graphs will appear on the last output page. The first graph is one that displays the modeled family's annual net resources over a range of annual earnings (see example above). The second bar graph displays a breakdown of the family's resources and expenses side by side over the range of annual earnings (example above). The third displays only the family's resources, including any work supports selected by the user in Step 4. The fourth graph only appears if the user chooses any work supports in Step 4 and displays the annual earnings levels at which the family receives selected work supports. The results page also provides a link to a downloadable comma-separated value (.csv) file that includes the data used to generate the graphs on this page. The data from the .csv files can be saved for users to help generate their own graphs that compare the outputs resulting from entering different inputs.

The "Family Resources" and "Family Expenses" sections below include a detailed breakdown of how each component that makes up resources and expenses is calculated and what work supports are included. NCCP uses the latest available federal and district policy rules and most and up-to-date data on family expenses to calculate eligibility and net resources.

### General assumptions and methodology

The FRS models net resources over a range of annual earnings, based on the answers users give in Steps 1-7 summarized above. The FRS takes user-entered values for a parent's working schedule

(traditional versus nontraditional) to estimate hours of work, numbers of shifts, and starting wage rate to calculate the number of hours each parent spends per week in paid employment and transit to and from shifts, the overlap between work schedules and children's school schedules, and parents' earnings. These variables are important in determining earnings, child care needs, and transportation expenses. When the user selects the starting wage rate in the FRS in Step 3, this rate is assumed to apply to both the first and second parent, if the user selects to model a two-parent family. The default wage is set at $12.50 minimum wage for D.C.[1]

NCCP collects information about program rules and eligibility from a variety of sources, including state or local partners. Wherever available, NCCP collects program rules directly from district statutes and laws, citing all sources. The 2017 federal poverty guidelines are used to determine eligibility for certain benefits.[2] When clarification is needed, we contact representatives of state or local agencies. For the 2017 D.C. FRS, the District of Columbia Department of Human Services (DHS) provided such clarifications. Additionally, while uses are able to override many of the default settings in the simulator, NCCP provides users with default values, often based on market rates or industry standards, and relies on methodology that assumes certain behaviors of the families being modeled. We outline these methods and assumptions throughout and include sources for estimates of expenses and methodologies when applicable.

## Family Characteristics

This section provides information about the families we include in the FRS, as well as outlining the assumptions we make and why. Some basic assumptions in the model about family characteristics include the following:

- We include one- and two-parent families. If modeling is a two-parent family, we assume parents are married, which is relevant when calculating tax liability and credits. (The word "parent" is used in this manual and in the simulator as shorthand for "parent or guardian.")
- We assume that no individual has ever served in the military, is elderly, or retired.
- We do not include non-parent adult dependents, such as grandparents or adult children.
- We do not include families headed by parents younger than 18. We assume that any young parents (e.g. parents ages 18-24) are not attending college or other institutions of higher education, and that they are not accessing government programs specifically aimed at supporting younger parents.
- While the D.C. 2017 FRS includes the additional capability for users to model disability among parents, we assume no children are disabled. (There are special rules, benefits programs, and income disregards for public benefit programs that apply when children are disabled and we have not included these this year, although we hope to include these options in later versions of the simulator.)
- We assume that at least one parent is able to work and earn income, regardless of disability. Additionally, we assume that no parent in the family is blind, as the presence of people who are blind in a household allows access to a range of benefit programs and allowances that the FRS is not yet equipped to model.

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[1] Department of Employment Services. District of Columbia minimum wage poster. Retrieved from https://does.dc.gov/sites/default/files/dc/sites/does/page_content/attachments/Minimum%20Wage%20Amendment%20Revision%20Act%20Poster%20-%20Eng.pdf.

[2] U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. U.S. federal poverty guidelines used to determine financial eligibility for certain federal program. Retrieved from https://aspe.hhs.gov/poverty-guidelines.

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- If a user indicates that one parent in the family both has a disability and does not make any income, we assume that the parent is incapacitated, allowing for special allowances in certain benefit programs.  (This is only an option in two-parent families, because at least one parent in the family must be able to earn income in order for the FRS model to work correctly. For the current model, we assume that if a user identifies a parent as incapacitated in this way, that parent can still care for young children at home while the other parent in the household is working.)
- We only include parents' whose ages fall between 18 and 61. This is because there are specific programs that we do not include that apply to adults aged 62 and above. Additionally, it is necessary to input age to better estimate health care premiums and food costs.
- We assume that no parent in the household is pregnant, as programs such as WIC and TANF have different eligibility and benefit rules for pregnant household members.

<div align="center">

**FAMILY RESOURCES**

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The FRS models a family receiving work supports only if the user includes those work supports in Step 4 and if the family meets eligibility guidelines. If the user chooses to model all of the available work supports in Step 4 of the user interface, the calculation of family resources is as follows:

*Family Resources = earnings + interest + SSI + child support received + TANF + SNAP + federal tax credits + district tax credits*

The following sections explain how each component of Family Resources is calculated.

### *Earnings*

As can be seen in the graphs at beginning of this manual, the final output page of the FRS compares net resources on the y-axis to earnings on the x-axis. We assume earnings are not from self-employment, but from wage-paying jobs. (This is because there are special rules and benefits with regard to taxes, child support, health coverage, etc. that apply to self-employed individuals that we do not include.) We assume that each parent's income is consistent across all months in a year.

One of the aspects of the Family Resource Simulator that sets it apart from other simulators is that it models family expenses and benefits received *over a range of incomes*, not just at a single income level. Rather than just being able to estimate how much assistance a family can receive and what that family's expenses can be projected to be based on a specific annual income, the simulator generates outputs for a user-defined earnings range, so that a user can see what family budgets will look like if that family experiences income changes. The simulator is run at every earnings level modeled, which means that eligibility for work supports are reassessed at every earnings level, and expenses and resources are recalculated for every earnings level.
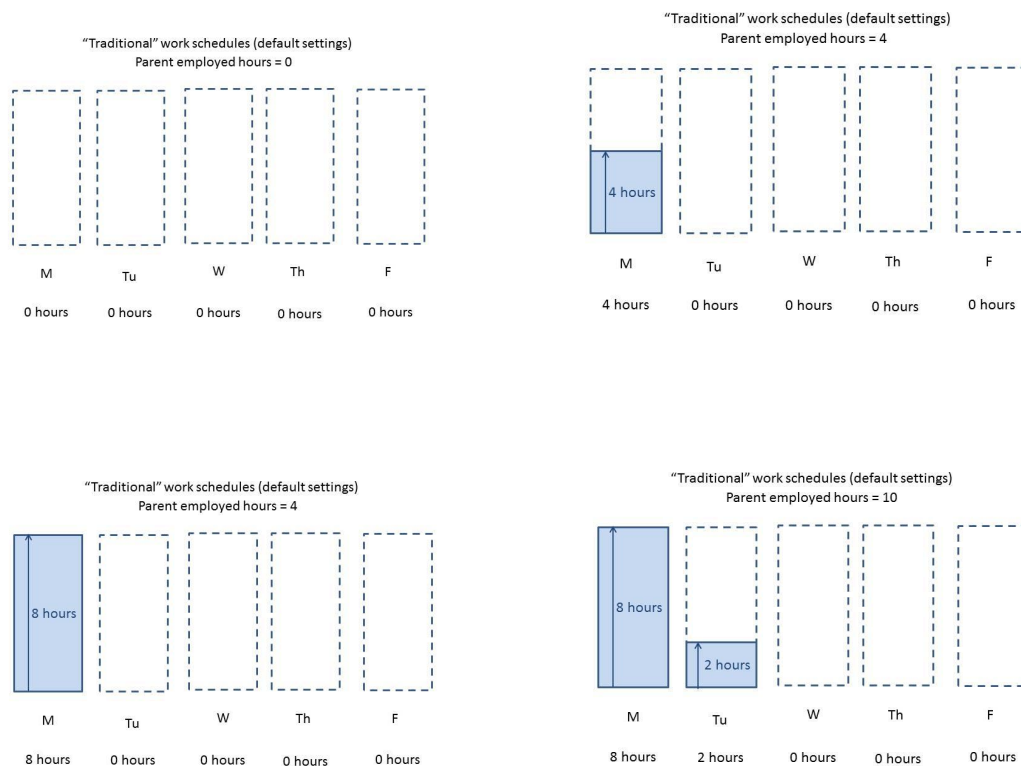
In order to model how increases in earnings can affect family expenses and receipt of various benefit programs, the simulator also requires information about parent work schedules and hourly wages. This is primarily because a parent making lower hourly wages must work more hours per week than another parent with higher wages in order to achieve the same weekly income. Because that first parent is working more hours, their children may require more child care, leading to potentially higher child care costs.

One of the user inputs is the wage rate, whose default is the 25th percentile wage in any state and D.C.  We assume that if parent earnings equal $0, they are not working. Once parent earnings exceed $0, we assume parents are working hourly at the user-entered wage. So for example, if the user enters the starting wage rate as $10/hour for a single-parent family that works up to 40 hours per week, when modeled at $10,000, the simulator will calculate that a single parent is working 19.23 hours a

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week ($10,000/($10*52 weeks)).  We continue assuming parents are working hourly at the user-entered wage until their hours worked equal the user-defined maximum number of hours worked in a week; which for this scenario would be at the $20,800 earnings level. Once all parents in the household work their maximum work week, we assume that any additional increases in earnings are a result of higher hourly wages, rather than assuming that parents work more hours. We do not model overtime wages in the 2017 FRS.

A new addition to the FRS in 2017 is the inclusion of more variables to model nontraditional schedules, defined as working outside of 9 a.m. - 5 p.m. on Mondays through Fridays. Users answering affirmatively to the question in Step 2 about nontraditional schedules can adjust a number of factors about parent work schedules in Step 3, to tell the simulator how to model the distribution of hours in a work week as parents earn more. This includes the time parents begin working in a day, the maximum number of hours parents work in a week, the maximum number of days they work per week, and how long their daily shifts at their job(s) last. The answers to these questions primarily affect the model's calculation of child care and transportation costs in this model.

The default settings that the simulator is programmed to run include starting work at 9 a.m., working in 8-hour shifts for one shift a weekday, working 5 days per week, and, as mentioned above, working 40 hours per week. For these defaults, the simulator incrementally increases work hours to build up earnings as follows:



"Traditional" work schedules (default settings)
Parent employed hours = 0

| M | Tu | W | Th | F |
|---|----|----|----|---|
| 0 hours | 0 hours | 0 hours | 0 hours | 0 hours |



"Traditional" work schedules (default settings)
Parent employed hours = 4

| M | Tu | W | Th | F |
|---|----|----|----|---|
| 4 hours | 0 hours | 0 hours | 0 hours | 0 hours |



"Traditional" work schedules (default settings)
Parent employed hours = 4

| M | Tu | W | Th | F |
|---|----|----|----|---|
| 8 hours | 0 hours | 0 hours | 0 hours | 0 hours |



"Traditional" work schedules (default settings)
Parent employed hours = 10

| M | Tu | W | Th | F |
|---|----|----|----|---|
| 8 hours | 2 hours | 0 hours | 0 hours | 0 hours |

"Traditional" work schedules (default settings)
Parent employed hours = 40



Again, since expenses and resources are re-calculated at every earnings level, these are not static across the income range. If we change the maximum shift length to 4 hours instead of eight, though, work is first distributed across the workweek in 4-hour increments, before hours are increased in the first day of the week:

Default settings but with maximum shift length = 4 hours
Parent employed hours = 40
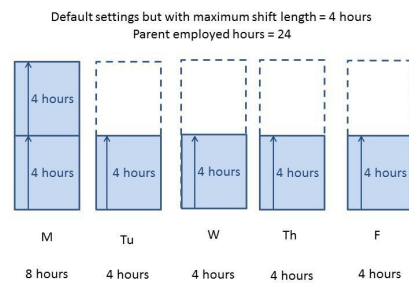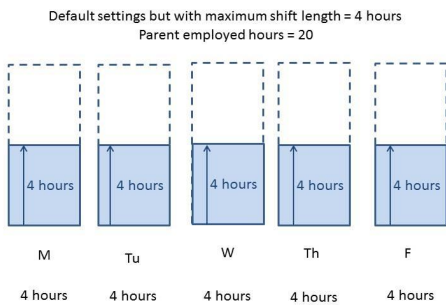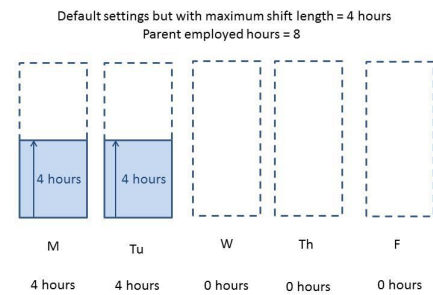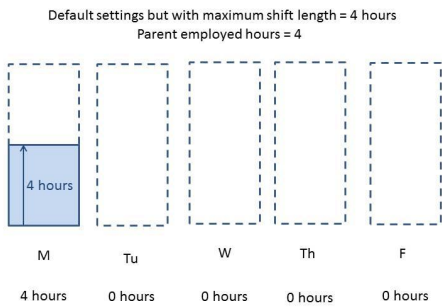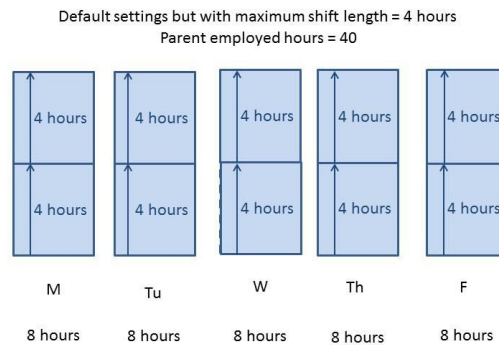
The model is run for each earnings level, meaning that in each of these scenarios, once the modeled earnings level results in a work week over 40 hours or the user-entered amount per parent, the model will then assume that additional earnings reflect increased wages, rather than more hours added to the parents' work schedules. Until the work week reflects the user-entered amount for maximum hours worked per parent, however, the hourly wage will continue to reflect the user-entered starting wage rate from Step 3 or the default 25th percentile wage rate. Additionally, if a parent works more than one shift in a single day, the model assumes that those shifts are worked continuously, or that the parent drives from one place of work to another, and does not time to return home to care for a child (Thereby lowering potential child care costs) before leaving again for work.

### Interest

Interest is derived from the amount entered for family's savings in the user-interface on Step 3. The FRS utilizes the U.S. Department of Housing and Urban Development's (HUD) method for calculating interest: when a family has net assets over $5,000, we apply the national average interest rate, also known as the passbook savings rate. Savings equal to or less than $5,000 are assumed not to accrue interest. The passbook savings rate was 0.06 percent in 2017, unchanged from 2016.[3] Moreover, the FRS assumes rate is compounded annually, as compounding monthly or quarterly adds only a tiny fraction to the results. Lastly, we assume the family does not have any other investments beyond those captured in the FRS.

### Supplemental Security Income (SSI)

Using information about parent disability entered in Steps 2 and 7, as well as whether the family opts to receive SSI when eligible, the simulator calculates the amount of SSI received annually by parents in the family. If there are no disabled adults in the family being modeled, then this amount is $0. The amount of SSI received by any disabled adult in the FRS family is calculated following the Social Security administration's program rules.[4] Aside from disability, other relevant user-entered inputs that

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[3] U.S. Department of Housing and Urban Development. Assistant Secretary for housing-federal housing commission. *Subject: Passbook Savings Rate Effective February 1, 2016.* By Edward Golding. Washington: January 19, 2016. (Notice: 2016-01). Retrieved from https://portal.hud.gov/hudportal/documents/huddoc?id=16-01hsgn.pdf.

[4] U.S. Social Security Administration. *Understanding Supplemental Security Income SSI Income -- 2017 Edition.* Retrieved from https://www.ssa.gov/ssi/text-income-ussi.htm

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are used to assess eligibility for SSI are savings and the value of the lowest value vehicle. User-entered inputs used to assess the amount of SSI payments are interest, earnings, number of children, and the amount entered in Step 7 for additional expenses need for items/services that any disabled parent(s) might need in order to work, or disability-related work expenses. Disability-related work expenses are any expenses that allow a family member to be employed (e.g., assistive technology).

We assume that families who have people with disabilities transfer all interest-generating accounts to a non-disabled individual in the family, in order to maximize their SSI receipt. Therefore, all interest will be considered unearned income for any non-disabled parents.

### *Child Support*

Another addition to the 2017 FRS is improving the way we calculate child support income. Our previous model only allowed users to enter a fixed amount of child support paid by the non-custodial parent per month. In 2017, however, this amount changes over the modeled income range because we use D.C. rules for estimating the likely court-ordered child support paid by the non-custodial parent to support child(ren) in the family being modeled.[5] If the user does not indicate that the family receives child support in Step 2, then this amount will be $0.

D.C.'s family court system uses a hybrid model[6] for determining the base child support amount, first determining the percentage of each parent's income over their combined gross income, then reducing the amount ordered based on the custodial parent's resources and the non-custodial parent's resources.  Each parent's income and contributions toward child care and medical expenses for the child(ren) receiving child support are relevant in estimating child support payments. Each parent's child care and medical expenses for the child(ren) receiving child support, and whether the custodial family receives TANF are relevant in estimating child support payments. New fields allow users to enter information about the non-custodial parent's income, the number of children the non-custodial parent has a legal duty to support outside of the child support order, and which children the non-custodial parent is obligated to provide support in the custodial parent's home.  We use unsubsidized child care costs as estimates for the custodial parent's child care expenses and the Affordable Care Act's premium ratio costs plus out-of-pocket medical expenses per child receiving support (user-entered in Step 6) as estimates for medical expenses. If the custodial parent is married (the family is a 2-parent family), the second parent's income does not affect child support obligations (as per D.C. regulations).  If the family receives TANF payments, the family receives the lesser of child support payments or $150 (the pass-through maximum), monthly.[7]

To minimize the number of user-entered fields and because much of the guidance on child support is dependent upon the assigned judicial officer's discretion, we have made the following assumptions:

- We assume that the non-custodial parent does not incur medical or child care costs for children under the child support orders.

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[5]§16–916.01  Child Support Guideline. Retrieved from https://beta.code.dccouncil.us/dc/council/code/sections/16-916.01.html & APPENDICES I. Schedule of Basic Child Support Obligations, II. Worksheet A: Sole Physical Custody, and III. Worksheet B: Shared Physical Custody to follow. §16–916.01a. — Appendices to §16-916.01. Retrieved from https://beta.code.dccouncil.us/dc/council/code/sections/16-916.01a.html.

[6]See how D.C. 's child support calculations compare with other state models at National Conference of State Legislatures. Child support guideline models by state. Retrieved from http://www.ncsl.org/research/human-services/guideline-models-by-state.aspx.

[7]$150 Pass-Through. D.C. Child Support Division. Retrieved from https://cssd.dc.gov/page/150-pass-through.

- We assume that the non-custodial parent does not have shared physical custody of the child(ren).
- We assume that the non-custodial parents' income is constant, and there are no lapses in payments by the non-custodial parent.
- If multiple children in a family receive child support, we assume they have the same non-custodial parent. We also assume that the custodial parent is not a payer in other child support orders and that the number of children in the household (besides the ones for which the non-custodial parent is paying child support) are the only ones for which the custodial parent supports.
- We assume that in two-parent families, only one parent receives child support payments from a non-custodial parent.

*Temporary Assistance to Needy Families (TANF)*

This simulator calculates the annual amount of TANF payments received by the family from user-entered selections and is dependent on receipt of SSI, child care expenses, and family size and other characteristics. The term 'unit' is used instead of family because not all members of the family are always counted when determining family size for TANF, which is explained in more detail below. The user is presented with a number of options under TANF in Step 4 ("Work Supports") to model different family characteristics that affect eligibility or the amount of TANF cash assistance.

1. Calculate TANF eligibility and benefit receipt based on requirements for program entry, rather than program exit?
    a. While the FRS typically uses current recipients' eligibility rules (rather than applicant eligibility rules) to model the earnings level at which families receive TANF, selecting this will allow the user to model entrance eligibility and benefit receipt. If this is not selected, we assume that we are only looking at recipient families here and not applicant families, and therefore use exit eligibility to determine whether the modeled family's income falls within the eligibility guidelines.
2. Is the family facing TANF sanctions due to noncompliance with TANF rules?
    a. Selecting this will model a 6% reduction to a family's TANF grant, when eligible for TANF.
    b. A family can be sanctioned and still fulfill work requirements.
3. Do parents in the family satisfy TANF work requirements?
    a. Selecting this means that the family may incur more child care costs (if they are not receiving child care subsidies) and transportation expenses, because the simulator assumes that if the working hours of parents do not satisfy work requirements, parents are enrolled in unpaid training or educational activities for the number of hours needed to satisfy such requirements. Leaving it unselected therefore allows some families to avoid paying extra child care and transportation costs while still on TANF. If a user leaves this option unselected, the simulator will also assume that if the family contains a non-disabled unmarried teen parents who does not have an infant at home, that parent is similarly not following TANF school attendance requirements.
4. While on TANF, is the family eligible for transit stipends when eligible?
    a. This results in an increase in the TANF benefit.
    b. We assume that transit stipends are only awarded to families that are not making any income from work.
5. While on TANF and working, is the family eligible for work bonuses?
    a. If the user selects this and checks the box next to the question "Do parents in the family satisfy TANF work requirements?", the family will be modeled as receiving an additional

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$200 monthly bonus to TANF benefits, an estimate of the average monthly benefit for work bonuses.
   b. TANF units that include individuals that the user indicates are facing sanctions will not be eligible to receive work bonuses.

If a family's savings are greater than the TANF asset limit, then the family is ineligible for TANF benefits. Moreover, we do not model DC's POWER program in TANF because, in the case of a two-parent assistance unit, both parents must be incapacitated in order for the unit to qualify for POWER, but in the FRS, at least one parent in our family must be able to work (as the FRS measures changes in income due to work). However, we do include additional TANF benefits when one parent in a two-parent family is incapacitated; in this case the model, like the TANF program, treats assistance unit as a TANF single-parent assistance unit. (As mentioned above, we assume a parent is incapacitated if they have a disability and the user indicates they never work.) We also reduce the unit size for any parent receiving SSI, and exclude their income from the countable income of the household to determine TANF eligibility and the amount of cash assistance received.

The FRS calculates TANF countable income, earned income deductions, disregards, and cash assistance received based on TANF guidelines, user inputs, and FRS estimates of other benefits and expenses a family faces. While most of these calculations are straightforward, one deduction of note is the dependent care deduction, which is the amount the family spends on child care and the care of a disabled parent, if applicable. The FRS calculates this deduction as the amount spent on dependent care per child or disabled adult, up to $175 per month for disabled parents or children older than 2 years old, and up to $200 per month for care for children less than 2 years old. The amount of dependent care deduction can change depending on the family's receipt of child care subsidies. Per D.C.'s CCDF policy,[8] TANF recipients receiving both child care subsidies and participating in TANF work requirements do not pay any copay while receiving child care subsidies, and neither do parents with disabilities. Additionally, afterschool copays are also exempted for TANF recipients, so for ongoing eligibility, we assume afterschool child care is $0.

### Supplemental Nutrition Assistance Program (SNAP)

If the user selects "SNAP/Food Stamps" on Step 4, the FRS calculates the annual monetary amount of SNAP benefits (also known as Food Stamps) that the family receives when eligible. If the family's income falls above the eligibility limits or the user does not select SNAP from the list of work supports to model in Step 4, then this amount is $0. In accordance with D.C. rules, assets are not counted against the recipient when assessing SNAP eligibility. The main formulas we use to calculate the eligibility as well as amount of SNAP benefits are below. As with TANF and other benefits, the FRS calculates SNAP based on program rules,[9] user inputs, and FRS estimates for TANF payments, child support income, and child care expenses.

Of note, our calculation of SNAP receipt confers categorical eligibility for LIHEAP in D.C., accounting for the District's "Heat-and-Eat" program[10] in the calculation of benefits. This nominal energy payment is given to SNAP recipients so they can claim the standard utility allowance (a deduction

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[8] District of Columbia Child Care Development Fund Plan with Conditional Approval Letter for FY 2016-2018. D.C. Office of Child Care.

[9] U.S. Department of Agriculture. Supplemental Nutrition Assistance Program: Am I Eligible?.Retrieved from https://www.fns.usda.gov/snap/eligibility.

[10] ESA Policy Manual. Economic Security Administration, D.C. Department of Human Services. Washington, D.C. page 304.

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from countable income for SNAP), which increases the amount of SNAP benefits for the family, regardless of whether the user also opts to model LIHEAP benefits (summarized below).

Also of note, we do not incorporate SNAP work requirements, as participation in SNAP work requirements in D.C. is voluntary.[11]

### Federal refundable tax credits

Along with calculating federal income taxes as family expenses (see below), the FRS also calculates the cash value a family receives from four federal tax credits, the nonrefundable child and dependent care tax credit (CADC), the nonrefundable child tax credit (CTC), the refundable additional child tax credit (ACTC), and the refundable Earned Income Tax Credit (EITC). Nonrefundable credits reduce tax burden, lowering expenses, while refundable tax credits offer the potential of a tax refund, increasing resources. Interest and earnings are counted to estimate EITC eligibility, the number of children and income. At the federal level, these non-refundable tax credits are the Child Tax Credit (CTC) and the Child and Dependent Care Credit (CADC). The CADC incorporates both child care expenses as well as expenses for the care of a disabled second parent if applicable. If we model a two-parent family and the second parent is disabled and not working, then the disabled adult will be assumed to be incapable of self-care and the amount entered for disability personal expenses will be assumed to be the expenses for the care of the disabled second parent (entered on Step 7 under disability-related expenses). [12]

### D.C. refundable tax credits

We include only one District tax credit as a resource: the District's Earned Income Tax Credit (EITC)/Low-Income Credit (LITC). EITC is only calculated if both the federal and state options are selected in Step 4. D.C. filers cannot take both the LITC and the EITC, but can take whichever one is greater. Following the tax form instructions, the FRS calculates both and the family ends up receiving whichever is higher. This is a refundable credit.[13]

While the district offers a Child and Dependent Care Credit, it is nonrerfundable. It is therefore modeled in the FRS as a reduction in tax liability, as a reduction in family expenses rather than a separate benefit.

### FAMILY EXPENSES

Similar to how Family Resources are calculated separately but combined together following their separate calculations in an aggregate figure, called "Family Expenses," based on the following equation:

*Family Expenses = Tax before credits + payroll tax + rent paid + child care expenses + food expenses + transportation expenses + other expenses + sales tax + health expenses + disability-related expenses + afterschool expenses + debt payments*

The following sections describe how the FRS calculates each of these expenses.

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[11] States have discretion as to what work requirements they impose. D.C. Department of Human Services transitioned their SNAP Employment and Training program to an "All Voluntary Program" in FY 2014.

[12] Internal Revenue Service. Topic Number: 602 - Child and Dependent Care Credit. Retrieved from https://www.irs.gov/taxtopics/tc602 .

[13] D.C. Office of Tax and Revenue. D.C. Individual income tax forms and instructions. (2016) Forms D-40EZ and D-40. Retrieved from https://otr.cfo.dc.gov/sites/default/files/dc/sites/otr/publication/attachments/2016%20D-40_40EZ%20Booklet_Final.pdf .

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### *Tax before refundable credits*

The FRS calculates federal and District tax liability based on income tax policy.[14,15] As mentioned previously, we assume the family does not have any investment income, and do not include Social Security disability or retirement benefits.  We also assume that families take the standard deduction and do not itemize deductions. "Expenses" due to federal and District income tax are thus calculated as follows:

*Tax (not including refundable credits) = (federal tax liability – non-refundable federal tax credits)*
*+ (state tax liability – non-refundable state tax credits)*

As mentioned before, while the district offers a Child and Dependent Care Credit, it is modeled in the FRS as a reduction in state tax liability.

The FRS includes three filing statuses, which influence tax calculations. When modeling one-parent families, households are considered "single" if the earnings and interest are less than the monetary amount they receive through child support and work supports. The filing status is "head of household" when earnings are over this amount for a one-parent family. We assume that a two-parent families are "married filing jointly".  We only include cash and near-cash benefits in our calculation of work supports for determining filing status. This is in keeping with common practice among tax preparers.

### *Payroll taxes*

Payroll taxes are the sum of the parents' tax contributions from their earnings. We include the following federal taxes:  Social Security, Medicare, and the additional Medicare tax. In 2016, Social Security taxes were 6.2% of earnings (up to $127,200) and Medicare were 1.45% of earnings. We include the additional Medicare tax, but this tax is only levied on earnings greater than $200,000.[16]

### *Rent*

We assume that no family in the FRS owns their homes, so this is the amount the family pays for rent, which is dependent on family size and housing subsidy receipt.

Unsubsidized housing costs: The cost of unsubsidized housing is based on the Fair Market Rent (FMR) as determined by the U.S. Department of Housing & Urban Development.[17] This value is based on the state, county, city, and number of children. As per D.C. regulations for Occupancy Standards,[18] the Simulator assumes a 2-bedroom unit for families with 1-2 children, a 3-bedroom unit for families with 3-4 children, and a 4-bedroom unit for families with five children. In this program, 'unit' refers to a place of residence. FMRs include the cost of all tenant paid utilities except telephones, cable or satellite television service, and internet service.[19]

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[14]Internal Revenue Service. 1040 Instructions 2016.  Retrieved from https://www.irs.gov/pub/irs-pdf/i1040gi.pdf.

[15] D.C. Office of Tax and Revenue. D.C. Individual income tax forms and instructions. (2016) Forms D-40EZ and D-40.  Retrieved from https://otr.cfo.dc.gov/sites/default/files/dc/sites/otr/publication/attachments/2016%20D-40_40EZ%20Booklet_Final.pdf.

[16] Internal Revenue Service. Publication 15. (2017).  Retrieved from https://www.irs.gov/pub/irs-pdf/p15.pdf

[17]U.S. Department of Housing & Urban Development. Retrieved from https://www.huduser.gov/portal/datasets/fmr/fmrs/FY2017_code/select_Geography.odn

[18] See DC regulations for Occupancy Standards 14-6110.

[19]Retrieved from https://www.hudexchange.info/faqs/2365/does-the-fair-market-rent-fmr-include-utilities/.

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*Section 8 Housing Choice Voucher Program subsidies*

D.C.'s payment standard (maximum subsidy) via the federal Housing Choice Voucher Program (Section 8) is 175 percent of FMR for all size units.[20] If a user manually enters an amount for rent in Step 7 that is higher than 175 percent of the FMR for their unit size, they will not be eligible for Section 8. If the users do not enter a value for rent in Step 7 ("Other Expenses") for rent, we assume families choose housing units that have rents at the FMR for the family and that they do not move despite increases in earnings.

Determining eligibility for subsidies:  HUD uses two income limits for determining whether a family is eligible for housing subsidies, one for first time applicants (very low income limit), and another for current recipients (low-income limit).[21] The FRS models both income limits, which is possible because eligibility is re-determined at every earnings level the family is modeled. The FRS first checks whether the family's annual gross income is greater than the low-income limit. If it is, they are not eligible for Section 8 subsidies. If the family's gross income is greater than the entrance eligibility limit and the family did not receive housing subsidies at the last income level they were modeled, they are not eligible for section 8 subsidies. In other words, if receipt of section 8 has not been continuous and the family's gross income is above the entrance eligibility limit, then the family's rent is the FMR or the user-entered amount. If the family's gross income is below the entrance eligibility limit or if the family received Section 8 before and the gross income is below the exit eligibility limit, the family is eligible for subsidized housing.

Estimating net income for calculating rent costs:  The FRS calculates the family's annual net income to determine the amount of housing subsidy to the family and how much they should pay for rent. This is done as per HUD guidelines,[22] subtracting several deductions and allowances from gross income.

*Net income = family gross income – (dependent allowances + disabled household allowance + child care expenses + disability assistance expenses + medical expenses)*

The disabled household allowance, disability assistance expenses deduction, and the medical expenses deduction are only available if one or both parents are disabled. Dependent allowances equal $480 per child, and the disabled household allowance is capped at $400 per household, regardless of whether just one or both parents are disabled.  Child care expenses are derived from the FRS's estimate, described above. For the disability assistance expenses deduction, which is for expenses that allow a family member to be employed, we use the user-entered value in Step 7: "Additional expenses needed for items or services that disabled parent(s) needs in order to work". The allowance is capped at the amount of income made by the disabled individual. If there are any remaining disability work expenses, we apply them to the second parent if they also have a disability.   We use the health expenses previously calculated as described above as the medical expenses deduction.  This deduction is only available to elderly or disabled households (meaning, for the purposes of FRS modeling, only families that include a parent with a disability), and the health expenses of all family members are counted.

Calculating rent paid by housing choice voucher recipients: After calculating deductions and net income, the FRS calculates the Total Tenant Payment (TTP), which is the greater of 30 percent of family

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[20] Source: 14 DCMR 8300.
[21] Income Limits. 14 DCMR 6108
[22] U.S. Department of Housing and Urban Development.  Housing Choice Voucher Program Guidebook. Retrieved from https://www.hud.gov/program_offices/public_indian_housing/programs/hcv/forms/guidebook.

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net income or 10 percent of gross income. The family pays a total rent cost equaling the lesser of the total tenant payment and the family payment for rent (up to the payment standard for D.C.):

*Total Tenant Payment (TTP) = greater of:  (.3 \* net income) and (.10 \* gross income)*

*Family payment for rent = lesser of: TTP and (12\*value of monthly rent of the apartment/house, described below)*

*Housing subsidy received = [(12\* 1.75 \* Fair Market Rent) OR (12\*user-entered value if less than 1.75 of FMR)] – Family payment for rent*

Note on determining  value of monthly rent: As indicated above, if the user does not select Section 8 in Step 4, then the cost of rent would be either the Fair Market Rent or the user entered value as selected/entered in Step 7 ("Other Expenses"). If the user selects Section 8 in Step 4, however, the cost for rent is not as straightforward. In step 7 ("Other Expenses"), the values selected or entered for rent will be assumed to be the unsubsidized value of the rental unit, NOT necessarily what the family's housing costs will be. If the user selects Fair Market Rent (FMR) and chooses to model Section 8 housing subsidies, then the family's rent at FMR is subsidized by Section 8 until they are no longer income-eligible. Once they do not qualify for Section 8 subsidies, the monthly housing expenses equal the FMR.

If the user selects Section 8 in Step 4 and enters a value for rent other than FMR, then that value is assumed to be the rent value of the apartment or house, NOT necessarily what the family is actually paying for rent.  If the user-entered value is less than or equal to 1.75 times the FMR, which is D.C.'s payment standard for Section 8, the family will be modeled as receiving section 8 housing costs when income eligible, and as paying the subsidized rate according to the formula. Once they are no longer eligible for Section 8 subsidies, housing expenses will equal the user-entered value. If the user-entered value for rent exceeds 1.75 times the FMR for their family size, then we assume that the family chose a unit that cannot qualify for Section 8 housing subsidies, and they will not have Section 8 subsidies at any income level. Their housing expenses will equal the user-entered value at all income levels.

### *Low-Income Home Energy Assistance Program (LIHEAP)*

If the user chooses to model LIHEAP benefits in Step 4 ("Work Supports") and the family is eligible, then LIHEAP benefits are modeled as a reduction in rent payments. This is because FMRs include utility costs and LIHEAP payments are made directly to utility companies. The amount of benefit depends on household size, income, type of unit (apartment or house), and fuel source (gas, electric, or oil).[23],[24] The latter two variables are selected by the user in Step 7 ("Other Expenses"), although the respective default values are Apartment and Gas.

For families receiving subsidized housing, we assume that utilities are included in rent and that they provide proof they are responsible for their own utility payments to the Department of Energy and Environment, the agency in D.C. that administers LIHEAP.   When utilities are included in rent, the

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[23]District of Columbia, Low income home energy assistance program (LIHEAP) Detailed Model Plan Fiscal Year 2017. Public Law 97-35, as amended. Retrieved from
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/04%20FY18%20LIHEAP%20State%20Plan%20Draft.pdf
[24] Appendix to FY 2017 LIHEAP detailed model plan. Benefit matrix levels for FY 2017  Retrieved from
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/LIHEAP_REGULAR_Benefits_Table_FY2017_0.pdf

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LIHEAP benefit is $250, also known as the heat-in-rent benefit. Even though we use FMRs to estimate non-subsidized rent costs, which include utilities, we assume that the household receives the sliding scale LIHEAP benefit, not the heat-in-rent benefit.

If a D.C. resident qualifies for LIHEAP, they also qualify for D.C.'s Utility Discount Program (UDP), which can come in the form of a residential aid discount (RAD) or residential essential services (RES).[25] RAD provides assistance with electric bills that goes directly to Pepco, the main electricity provider in D.C. RES provides assistance with gas bills and is paid to Washington Gas Light Company. We assume that all households receive the full RAD, which results in an average reduction of 30 percent of electric bill, and the average reduction to a bill when receiving RES, 25 percent.[26] To estimate the average bill, we use HUD Utility Allowances for D.C. according to selected utility source to estimate household utility costs. We assume the family is not responsible for water or sewage bills.

### Health expenses

The FRS models health expenses as the combination of health insurance premiums and out-of-pocket medical costs, reducing this amount by any premium tax credits the family receives. Health expenses are calculated differently depending on whether the user opts to model public health insurance in Step 4 ("Work Supports") and the type of private insurance selected in Step 6 ("Health insurance"), which would be modeled once ineligible for or if opting not to model public health insurance. If the user chooses to model public health insurance in Step 4, the selections made in Step 6 are for the type of insurance the family will receive once they are no longer eligible for public health insurance. If the user chooses not to model public health insurance, then the family is modeled as receiving the type of health insurance selected in Step 6 across all income levels. Users can also enter their own cost estimate for family coverage on Step 6. Individuals receiving public health insurance (Medicaid, CHIP) coverage do not pay any premiums for health insurance in D.C. When no longer eligible for public health insurance, the Simulator provides for estimates for health insurance premiums based on whether the user indicates that private insurance is obtained through employer-provided health insurance (employer-based plan) or insurance purchased off the D.C. health insurance marketplace (Individual/Nongroup plan).

Employer-based plan: Employer-based plan estimates for parent(s) and family are based on the average employee contribution for employer-based coverage in D.C.'s private sector, according to the Medical Expenditure Panel Survey (MEPS) conducted by the federal Agency for Healthcare Research and Quality in 2013 (for more information, see www.meps.ahrq.gov/mepsweb/data_stats/quick_tables.jsp). These estimates vary by state and the number of parents and children covered, reflecting yearly state averages for "single coverage" for a single parent and "family coverage" for a family plan that includes children.

Marketplace (individual/nongroup) plan: Marketplace (individual/nongroup) plan estimates are based on market-rate data collected by the federal government from the D.C. marketplace, using the second-lowest cost silver plan as the standard for health insurance costs. (This standard is also used to determine the amount of premium tax credit received.) Individual marketplace premiums vary by age, and the FRS incorporates these variances based on the age curve that D.C. imposes on its marketplace plans (in accordance with documentation provided to the federal government). Like several states, D.C.

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[25] A document saved in the Resources folder indicates that a vast majority of UDP applicants are enrolled in LIHEAP. Further communication with DC's LIHEAP agency confirmed that it made sense to treat UDP as part of the LIHEAP module than having it as a separate flag.

[26] Public Service Commission of the District of Columbia. Utility Discount programs for low-income households. Dated 10/19/16. Retrieved from https://www.dcpsc.org/PSCDC/media/PDFFiles/UDP_flyer.pdf.

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has applied and been approved for different age curves for 2017 and 2018 than the federal default age curves, and all federal and state age curves are publicly available.

Out of pocket medical costs: The user can also enter a monthly estimate for any additional out-of-pocket medical expenses in Step 6 ("Health insurance"). While the default value for this is $0, users can use it to model the amount of co-pays, coinsurance, or payments toward deductibles over the course of a year. Because Medicaid covers these costs and most other costs that D.C. residents might need to pay out of pocket while on private plans, the simulator reduces out of pocket medical costs to $0 when all family members are eligible for Medicaid.

Disability medical expenses: This is an annual user-entered value in Step 6 ("Health insurance"). This field only appears if the user indicates that one or more parent is disabled in Step 2 ("Family"). The FRS considers these expenses to be part of a family's out-of-pocket medical costs, but it is important to ask because these expenses also inform eligibility and receipt of a number of public benefits.

### *Medicaid*

If the user chooses to model public health insurance benefits, the family will be modeled as receiving Medicaid at eligible income levels only. Since public health insurance eligibility is usually different for children than for parents, if the user selects public health insurance in Step 4, then in Step 6 the user will see separate cost estimates under employer-based and individual/non-group plans for parents and families, instead of just family cost estimates if Public Health Insurance is not selected.

Once the family makes an income above Medicaid or CHIP eligibility levels, only then will they be modeled as receiving the type of private health insurance selected by the user in Step 6, meaning that these Step 6 selections are relevant only at earnings levels above the CHIP and Medicaid eligibility limits. The FRS models Medicaid eligibility by using Modified Adjusted Gross Income methodology (MAGI) for calculating income, household composition, and family size. MAGI methods are used for pregnant women, parents, and children under the age of 21, all of which include the family types modeled in the FRS. While we recognize that certain populations are eligible for Medicaid using pre-ACA (non-MAGI) eligibility requirements, the FRS currently only models MAGI-supported eligibility as well as eligibility for SSI recipients.

### *Premium tax credit*

We model health care subsidies for low-income families as per ACA rules. For Simulators beginning in 2015, premium tax credits are considered reductions in healthcare costs, rather than as net gains to family resources. Premium tax credits are also known as the ACA subsidies, which are applied to individual/nongroup plans if these plans are selected in Step 6 ("Health Insurance").

### *Child care expenses*

Child care costs are determined by family characteristics (one or two-parent families), number of children, their ages, whether children are in afterschool programs or Pre-K, parent work schedules, and whether the family receives Child Care and Development Fund (CCDF) subsidies. TANF receipt also informs child care expenses when TANF program work requirements lead to increased work hours and more time when children under 13 years old would otherwise be unattended.

Determining child care need: If the user chooses to model a two-parent family with one parent not working, the child care costs will be zero across all modeled earnings levels since it will be assumed that the parent not working will be caring for the child, even if the parent has a disability. In addition, we assume that children ages 13 and over do not require child care. For children who are not school-age or for 3 and 4 year olds not enrolled in Pre-K, the hours of child care needed are a sum of the parents' overlapping work schedules and time spent in transit to work or in between shifts.

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For school-age children, user-entered selections about traditional versus nontraditional working hours greatly influence the FRS calculations about the number of child care hours needed. The FRS estimates the amount of time parent work schedules overlap with children's school schedules to estimate child care needs outside of school hours. Time in transit to and from work as well as between shifts is incorporated in these child care need calculations. We allocate one hour of round-trip travel time to and from work, which we assume includes pickup from child care or school, although when a parent works more than one shift in the same day, the user can indicate the travel time between shifts. These selections influence how much more time is spent in travel and, therefore, how much more time is needed for child care.

User-entered inputs are used to define the type of care (full-time vs. part-time, traditional vs. nontraditional) needed among those available in D.C., which affect how expensive child care can be (and how much D.C. reimburses child care providers). These types and definitions are identical to those used in the 2016 D.C. Child Care Utilization report:

- If 6-11 hours of care are needed between 7 a.m. and 6 p.m., Monday through Friday, the child care rate will be for **full-time traditional care**.
- If less than six hours are needed between 7 a.m. and 6 p.m., Monday through Friday, the child care rate will be for **part-time traditional care**.
- If 6-11 hours of care are needed between 6 p.m. and 7 a.m., Monday through Friday, and 6-11 hours needed on Saturday or Sunday, regardless of time of day, the child care rate will be for **non-traditional full-time care**.
- If less than six hours of care are needed between 6 p.m. and 7 a.m., Monday through Friday or less than six hours are needed on Saturday or Sunday, regardless of time of day, the child care rate will be for **non-traditional part-time care**.

Since child care needs for school-aged children will vary because of additional care needed during the summer, the FRS checks whether the majority of the hours needed for child care fit within the traditional or nontraditional definitions. Because there can only be 24 hours in a day, 11 of which are "traditional" hours, there will be, at most, 13 hours of non-traditional time. We therefore consider the remainder of this excessive amount of child care time to be during traditional hours. Child care expenses usually are less if the child is in an afterschool program. After school copays are calculated separately from child care expenses.

Additionally, costs for multiple stints of child care in a single day are calculated when a child is in need of child care at multiple times in a day. When users indicate that the second parent works in a 2 parent family, the simulator assumes child care is needed at after the first parent reaches the maximum work hours and the second parent is modeled as working.

We also account for 9 weeks of summer. During these summer months, we assume that school-age children (under age 13) need care whenever parent(s) are working or traveling to work.[27]

*Unsubsidized child care costs*
The simulator normally provides cost estimates for multiple child care settings based on data from the state's most recent child care market rate survey. However, rather than reporting on findings from a child care market survey, the most recent child care utilization report from D.C.'s CCDF lead agency reflected a decision on their part to focus on strategies helping child care providers achieve

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[27] D.C. Public Schools https://dcps.dc.gov/ece; D.C. Public School schedule. Retrieved from https://dcps.dc.gov/sites/default/files/dc/sites/dcps/publication/attachments/DCPS%20SY17-18%20Traditional%20Calendar%203-6-17.pdf.

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sustainability based on earnings from D.C.'s provider reimbursement rate. The D.C. FRS follows suit in this decision, and models costs for unsubsidized care based on D.C.'s provider reimbursement rates. These costs differ based on the type of care received by each child, based on one of the four designations listed in the previous section (traditional full-time care, nontraditional full-time care, etc.).

### *Subsidized child care costs through the Child Care and Development Fund (CCDF)*

When the family is modeled as receiving CCDF subsidies, the child care expenses are the family's co-pays for each child needing care. Cost estimates for subsidized child care costs are based on copayment tables published annually by each state (including D.C.), and are capped at the reimbursement rates that D.C. provides child care providers.

## *Food expenses*

To estimate family food costs, we utilize the U.S. Department of Agriculture's (USDA) Low-Cost food plan issued March 2017.[28] The USDA lists food costs for children under 11 and separates food costs according to gender and age of children over 11 and adults. For parents' food costs, the FRS uses the average of the listed costs for female and male adults aged 19-50 years, and then for older parents, ages 51-70. For children's food costs and 18-year-old parents, we take the average of the listed male and female costs according to the child's age. Since the costs for food provided in the low cost food plan are based on a family of four, the food costs for the family is adjusted according to their size. Finally, we reduce food expenses based on savings from participation in school or summer meals programs, or participation in the WIC program:

*Food expenses = family food costs – (savings from school or summer meals programs + WIC benefits)*

### *School and summer meals for children*

This number is the monetary value of the following meal programs that the children in the modeled family receive: the National School Breakfast Program (NSBP), Free and Reduced Priced Lunch (FRPL), Afterschool Snack/Supper, and the Free Summer Meals Program (FRMP). If any of the programs are selected in Step 4 ("Work Supports") and the family is eligible, then all children in the family are modeled as receiving meals through the selected programs.

- NSBP: All D.C. Public School students and Pre-K students receive free breakfast regardless of income levels. All school-aged children and children ages three or 4 who are in Pre-K (if the user selects Pre-K on Step 4) are modeled as receiving free breakfast during the school year (181 days out of the year).
- FRPL: If a school-age child's household receives TANF, SNAP, or the child's gross household income is less than 185 percent of the Federal Poverty Guidelines, they are eligible to receive free meals in D.C. Unlike other localities, D.C. does not have a reduced price lunch program.  If the child fits eligibility criteria, then all of the school-aged children and children ages 3 or 4 who are in Pre-K (if the user selects Pre-K among the "Work Supports" menu on Step 4) are modeled as receiving free lunch during the school year. [29]

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[28] Retrieved from https://www.cnpp.usda.gov/sites/default/files/CostofFoodMar2017.pdf

[29] DC uses the Federal Income Eligibility Guidelines (https://www.fns.usda.gov/sites/default/files/cn/EligibilityManualFinal.pdf) to determine household gross income, which is identical to SSI income determinations, but SSI assistance is included. Reportable Income (https://www.ssa.gov/OP_Home/cfr20/416/416-app-k.htm) includes earnings, SSI, cash assistance, child support, and any other money available to pay for children's meals. SNAP value is not counted.

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- Afterschool snack/supper:  All D.C. Public School children enrolled in afterschool programs are eligible to receive a snack and an evening meal. If the user selects afterschool and the child is in school, the child is modeled as receiving free supper regardless of income levels.
- FSMP: If the user chooses to model FSMP, then it is assumed that all children in the family above the age of one will receive one free meal a day during the summer program's duration. All participating D.C. FSMP sites are open sites, except camps, which mean all children, regardless of income, can receive free meals at these sites. We estimate the summer program's duration as 49 days during the summer months, assuming that children will receive a free meal only Mondays through Fridays, removing one day for July 4 holiday, when most programs (e.g., libraries and summer camps) are closed.

The FRS estimates the monetary value of these meal programs by first calculating the number of meals received by each child in each program and multiplying this number by per meal costs as derived from the USDA's estimates for food expenses. Users cannot model the impact of some children in the family receiving free meals while their siblings do not. We assume all school-aged children attend public school.

*Monetary value of school, afterschool, and summer meals = per meal costs * number of meals received through school and summer meals programs*

### Women, Infants, and Children Program (WIC)

There are three types of WIC benefits in D.C.: food instruments, cash value checks, and farmer's market. The FRS only includes the first two in modeling WIC, not the farmer's market benefits. We estimate the monetary value of the food packages/instruments and the cash value checks received by families eligible for WIC using the D.C. Department of Human Services (DHS) sample values for the benefits of participating in the program (available at https://doh.dc.gov/service/wic-food-packages). The value of a WIC package an eligible family receives depends on the number of children in the family, the ages of the children, and whether or not the mother is breastfeeding (all user selections in Step 2). In estimating the value of the vegetables and fruit cash-value check, we assume that families do not include twins/triplets/other multiple children to minimize user-entered fields (These mothers get a slightly higher check, which amounts to only a slight difference).

Families with infant children (age 0 in the FRS) or children under the age of five are eligible to receive WIC benefits if they also meet income or categorical eligibility criteria, and mothers of young children receive different benefits depending on whether they are breastfeeding or not. The family is eligible if the sum of household earnings (including interest), SSI benefits, TANF benefits, and child support income is less than or equal to 185 percent of the FPG. Families who receive SNAP, TANF, Free or Reduced Price Lunch, or public health insurance are categorically eligible to receive WIC.[30]

### Transportation expenses

Transportation expenses are the expenses the family pays for travel to work and child care. It is dependent on whether public or private transit is used, the user-entered selections for traditional versus nontraditional work, work hours, disability status, and number of shifts. For estimating these costs, we assume that D.C. parents primarily use public transit, following methods used in the Self Sufficiency Standard developed by Diana Pearce for the Self-Sufficiency Standard at the Center for Women's

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[30] WIC Policy & Procedure Number 8.007, page 18 makes it clear that we administrators assume nutritional or medical conditions are met for all WIC applicants with children of eligible ages. Retrieved from https://www.fns.usda.gov/sites/default/files/2013-3-IncomeEligibilityGuidance.pdf.

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Welfare (for more information, see http://www.selfsufficiencystandard.org/about.html). We use public transit cost estimates for any locality where 7 percent or more of the population uses public transit. For localities where public transit use is lower, we use private transit costs. In D.C., we estimate public transit costs using the average round trip price at peak hours fares as the FRS default setting. If a parent is disabled, the FRS estimates reduced transit costs for them; Washington Metropolitan Area Transit Authority (WMATA) offers half-price metro rides for people with disabilities. We assume children and parents are residents who do not commute into and out of D.C. We assume that people use the Metrorail only and not the bus or Circulator.

We also incorporate costs for travel in between shifts, when applicable, and add these to total travel costs. If the user enters their own values for parent transit costs in step 6, the FRS takes those values to project the annual transit expenses according to that parent's work hours and transit needs, which will vary by modeled earnings level. Also of note is that if the family receives TANF and requires increased hours in training to satisfy TANF work requirements, the working hours are adjusted to fulfill the program's work requirements. As such, the transportation expenses are also adjusted according to the hours required by TANF participation.

## Other necessities

The FRS also models "other necessities" to estimate a family's expenses on necessities not captured in the previous categories, such as clothing, personal care items, and household repairs. We model our method for calculating other necessities based on the Economic Policy Institute's (EPI) 2015 method for calculating other necessities in their family budget calculator.[31] EPI estimates the amount of other necessities as a percentage of food and rent expenditures. EPI uses data from the Bureau of Labor Statistics (BLS) Consumer Expenditure Survey on expenditures within the lowest income quintile for the cost of items, and cover "apparel, entertainment, personal care expenses, household supplies (including furnishings and equipment, household operations, housekeeping supplies, and telephone services), reading materials, school supplies, and other miscellaneous items of necessity". These items total to 48.3 percent of the cost of food and housing. Upon closer analysis of their approach, NCCP staff decided to adjust this calculation by removing educational expenses (which includes private tuition and other costs that we already account for, elsewhere, such as afterschool co-pays) as well as entertainment costs, as these can be considered function of disposable income rather than costs depicting a basic, livable income. Based on 2015 Consumer Expenditure Survey data, the removal of these expenses brings the proportion of these costs compared to rent, utilities, and food down to 34 percent of the cost of food and housing. This percentage is applied to all earnings levels.

We use the unsubsidized rent cost (either the FMR or a user-entered value) as the standard for rent costs in the "Other Necessities" formula, so that receipt of Section 8 does not affect costs of other necessities. Beginning in 2017, we also include disability-related expenses, both work and personal expenses, derived from new user-entered inputs in Step 7 ("Other Expenses") into the calculation of other necessities. Since telephone costs are included in other expenses, we also subtract the Lifeline subsidy from this amount, based on eligibility requirements detailed below.

## Lifeline subsidy

Lifeline is the federal telephone subsidy. If the user chooses to model the program in Step 4 ("Work Supports") and the family is eligible, they receive the lifeline subsidy, which is $9.25 per month or $120.25 annually. A family is eligible for the Lifeline subsidies if their earnings are less than or equal

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[31] Economic Policy Institute. Retrieved from http://www.epi.org/publication/family-budget-calculator-technical-documentation/

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to 135 percent of the Federal Poverty Guidelines, if any household members receives public health insurance, SSI, housing subsidies, or SNAP.[32]

### *Sales tax*

The calculation for other necessities includes an estimate of sales taxes paid by the hypothetical family. In D.C., the only applicable sales tax rate for the purposes of the FRS is the 5.75% tax rate on tangible personal property,[33] and these expenditures are captured completely in the other expenses calculation. Tangible personal property does not include food prepared at home and also excludes expenses related to an individual's disability (e.g. wheelchairs), so we exclude food costs and disability expenses from this calculation.

Once we calculate the estimate of sales tax a family will pay, we then reduce the calculation of "other necessities" by this amount, to avoid double-counting.

### *Disability expenses*

This is sum of the user-entered amount for disability work expenses and disability personal expenses entered on Step 7 ("Other Expenses"). If neither parent is disabled or if the user does not enter an amount for either field, this amount is $0.

### *Afterschool expenses*

All school-aged children and three- and four-year-olds in Pre-Kindergarten are eligible for the Out of School Time (OSTP) Afterschool Program offered at D.C. Public Schools.  Afterschool co-pays constitute the entirety of afterschool expenses for children attending OSTP afterschool. If a child receives public health insurance or if the child's family receives TANF, there is no co-pay for that child.[34] Since afterschool is offered at the same location as a child's regular school, there are no additional transportation costs for parent pick-up.

### *Debt payments*

Finally, debt payments are calculated as the user-entered monthly value for debt (entered in Step 3, with a default value of $0), multiplied by 12 to generate an annual amount.

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[32] The 2016 revisions to Lifeline rules, effective December 1, 2016. Retrieved from https://www.fcc.gov/general/lifeline-program-low-income-consumers. These changes include excluding eligibility for TANF, LIHEAP and NSLP from categorical eligibility for Lifeline. The FCC pages at https://www.fcc.gov/consumers/guides/lifeline-support-affordable-communications are also helpful, but includes antiquated rules without the adjustments made in 2016.

[33] DC Code § 47-20,Retrieved from  https://beta.code.dccouncil.us/dc/council/code/titles/47/chapters/20/

[34] Afterschool Parent Handbook 2015_0 for these descriptions. Retrieved from

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