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/*****/
/*most current code by Brian 2015 after 84009 added June 1 2016*/
/*updated by Shelly July 2017*/
/*Kim Neerings went through the code 9/27/17 and Shelly made all corrections*/
/*Kim Neerings assigned the following for a facilities small area SAS code in 2026*/
/*84132-24.1, 84134-17, 84143-18, 84148-19.1, 84190-25*/
zip_code=.;
ctycode=.;
zip_code=zipcode1;
zipcode=zipcode1;
/*****/

ctycode = ctycode2;
* old definition of district;
* used for testing purposes;
    if ctycode in (3,5,33) then OrgDistrict = 1;
    if ctycode in (23,27,31,39,41,55) then OrgDistrict = 2;
    if ctycode = 11 then OrgDistrict = 3;
    if ctycode = 35 then OrgDistrict = 4;
    if ctycode in (37) then OrgDistrict = 13; *san juan;
    if ctycode in (7,15,19) then OrgDistrict = 5.1; *southeast;
    if ctycode in (1,17,21,25,53) then OrgDistrict = 6;
    if ctycode = 43 then OrgDistrict = 7;
    if ctycode = 45 then OrgDistrict = 8;
    if ctycode in (9,13,47) then OrgDistrict = 9;
    if ctycode = 49 then OrgDistrict = 10;
    if ctycode = 51 then OrgDistrict = 11;
    if ctycode in (29,57) then OrgDistrict = 12;

    if 1<=ctycode<=57 then AssignedCounty=(ctycode+1)/2; *convert FIPS to county codes 1...26;
    else if 1>ctycode or ctycode>57 then AssignedCounty=.;

/*****/
/*Small Area      */
/*****/

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/*First: assign the small areas by county if no valid ZIP. This can only happen for Counties that
are small areas or are a subset of a small area(Beaver,Carbon, Daggett, Duchesne,
Emery, Garfield, Grand, Juab, Kane, Millard, Morgan Paiute, Rich, San Juan, Sanpete, Sevier,
Summit, Tooele, Uintah, Wasatch, Wayne)*/
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district=.;
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sarea_r2 = . ;
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*if year<2018 then zip_code=zip;
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if zip_code<84000 or zip_code>85000 then zip_code=.; *set out of state and in valid zip
codes to missing;
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if zip_code<84000 or zip_code>85000 then zipcode=.;
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if zipcode=. then do;
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IF ( AssignedCounty IN (1, 9, 13)) THEN sarea_r2= 61;/* Beaver/Garfield/Kane*/
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ELSE IF (AssignedCounty IN (4)) THEN sarea_r2 = 56.1;/*Carbon*/
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ELSE IF (AssignedCounty IN (8)) THEN sarea_r2 = 56.2;/*Emery*/
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ELSE IF (AssignedCounty IN (5, 24)) THEN sarea_r2 = 53.1;/*Duchesne*/
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ELSE IF (AssignedCounty IN (7)) THEN sarea_r2 = 53.2;/*Daggett/Uintah*/
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ELSE IF (AssignedCounty IN (10)) THEN sarea_r2 = 57.1;/*Grand*/
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*ELSE IF (AssignedCounty IN (19)) THEN sarea_r2 = 57.2;/*San Juan*/
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ELSE IF (AssignedCounty IN (16,28)) THEN sarea_r2 = 54.4;/*Piute/Wayne*/
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ELSE IF (AssignedCounty= 26) THEN sarea_r2 = 52;/*Wasatch*/
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ELSE IF (AssignedCounty=17) THEN sarea_r2= 4.1 ;/*Rich*/
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ELSE IF (AssignedCounty=15) THEN sarea_r2= 6.2 ;/*Morgan*/
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if AssignedCounty in (2,3,6,11,12,14,18,19,20,21,22,23,25,27,29) then sarea_r2=96; *if zip_code is missing or
invalid and they live in one of these counties we aren't able to assign small area based on county;
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**Assign district to those with only a valid county no valid zipcode;
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if AssignedCounty in (2,3,17) then district = 1;
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if AssignedCounty in (12,14,16,20,21,28) then district = 2;
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if AssignedCounty = 6 then district = 3;
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if AssignedCounty = 18 then district = 4;
if AssignedCounty in (4,8,10) then district = 5.1;
if AssignedCounty in (1,9,11,13,27) then district = 6;
if AssignedCounty = 22 then district = 7;
if AssignedCounty = 23 then district = 8;
if AssignedCounty in (5,7,24) then district = 9;
if AssignedCounty = 25 then district = 10;
if AssignedCounty = 26 then district = 11;
if AssignedCounty in (15,29) then district = 12;
    if AssignedCounty in (19) then district=13;

**Assign missing zipcodes to 99999;
    zipcode=99999;
END; *end if zipcode=. loop;

IF (zipcode=99999 and AssignedCounty=.) THEN sarea_r2 = 98 ;
    *if neither zip code or county provided;
        if (zipcode=99999 and AssignedCounty=.) THEN district=98;
            *if neither zip code or county provided;
                if (zipcode=99999 and AssignedCounty=.) THEN AssignedCounty=98;
                    *if neither zip code or county provided;

/*Second assign the small areas by zip and county as long as they don't cross county lines*/

/****lhd=1 Bear River*****/
    /*1 Brigham City*/
    IF (AssignedCounty in (2) and zip_code= 84302 ) THEN sarea_r2 =1 ;
        /*2.1 Box Elder County (Other) V2*/
    ELSE IF AssignedCounty in (2) and zip_code in
(84301,84307,84309,84311,84313,84314,84316,84324,84329,84330,84331,84334,84336,84340) THEN sarea_r2 =2.1;
        /*2.2 Tremonton*/
    ELSE IF AssignedCounty in (2) and zip_code in (84337) THEN sarea_r2= 2.2 ;
        /*3.1 Logan V2*/
    ELSE IF AssignedCounty in (3) and zip_code IN (84321, 84322, 84323, 84326, 84332) THEN sarea_r2= 3.1 ;
        /*3.2 North Logan*/

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    ELSE IF AssignedCounty in (3) and zip_code IN (84341) THEN sarea_r2= 3.2 ;
    /*4.1 Cache County (Other)/Rich County (All) V2*/
ELSE IF AssignedCounty in (3,17) and zip_code IN (84028, 84038, 84064, 84086, 84304, 84305, 84308, 84318,
84320, 84325, 84327, 84328, 84333, 84338, 84339) THEN sarea_r2= 4.1 ;/*4.1 Oth Cache/Rich Co*/
    /*4.2 Hyrum*/
    ELSE IF (AssignedCounty in (3) and zip_code IN (84319)) THEN sarea_r2= 4.2 ;
    /*4.3 Smithfield*/
    ELSE IF (AssignedCounty in (3) and zip_code IN (84335)) THEN sarea_r2= 4.3 ;

/*****lhd=12 Weber-Morgan*****/
    /*5 Ben Lomond*/
    *All of small area 5 zip codes cross borders;
    /*6.1 Weber County (East)*/
    ELSE IF (AssignedCounty in (29) and zip_code IN (84310,84317,84414)) THEN sarea_r2= 6.1;
    /*6.2 Morgan County*/
    ELSE IF ( AssignedCounty in (15) and zip_code in (84018)) THEN sarea_r2 = 6.2 ;
    /*7 Ogden (Downtown)*/
ELSE IF ( AssignedCounty in (29) and zip_code in (84401, 84402)) THEN sarea_r2 = 7 ;
    /*8 South Ogden*/
ELSE IF (AssignedCounty in (29) and zip_code in (84403, 84408, 84415)) THEN sarea_r2=8 ;
    /*9 Roy/Hooper*/
ELSE IF (AssignedCounty in (29) and zip_code in (84067)) THEN sarea_r2 = 9 ;
    /*10 Riverdale*/
    *All of small area 10 zip codes cross borders;

/*****lhd=3 Davis*****/
    /*11 Clearfield Area/Hooper*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84015, 84016, 84089)) THEN sarea_r2 = 11 ;
    /*12 Layton/South Weber*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84040, 84041)) THEN sarea_r2 = 12 ;
    /*13.1 Kaysville/Fruit Heights*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84037)) THEN sarea_r2 = 13.1 ;
    /*13.2 Syracuse*/
    ELSE IF (AssignedCounty in (6) and zip_code IN (84075)) THEN sarea_r2 = 13.2 ;
    /*14.1 Centerville*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84014)) THEN sarea_r2 = 14.1 ;

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/*14.2 Farmington*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84025)) THEN sarea_r2 = 14.2 ;
/*15.1 North Salt Lake*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84054)) THEN sarea_r2 = 15.1 ;
/*15.2 Woods Cross/West Bountiful*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84087)) THEN sarea_r2 = 15.2 ;
/*16 Bountiful*/
ELSE IF (AssignedCounty in (6) and zip_code IN (84010, 84011)) THEN sarea_r2 = 16 ;

/*****lhd=4 Salt Lake add 84132, 84134, 84143, 84148*****/
/*17 Salt Lake City (Rose Park)*/
ELSE IF (AssignedCounty in (18) and zip_code in (84116, 84122, 84134)) THEN sarea_r2 = 17 ;
/*18 Salt Lake City (Avenues)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84103, 84143, 84150)) THEN sarea_r2 = 18 ;
/*19.1 Salt Lake City (Emigration Canyon)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84108, 84148, 84158)) THEN sarea_r2 = 19.1;
/*20 Magna*/
ELSE IF (AssignedCounty in (18) and zip_code = 84044) THEN sarea_r2 = 20 ;
/*21 Salt Lake City (Glendale)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84104,84110,84145,84151,84180)) THEN sarea_r2 = 21.1;
/*22.1 West Valley (Center)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84120, 84170)) THEN sarea_r2 = 22.1 ;
/*22.2 West Valley (West) V2*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84128)) THEN sarea_r2 = 22.2 ;
/*23.1 West Valley (East) V2*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84119, 84125, 84126, 84127, 84130, 84131)) THEN sarea_r2 =
23.1;
/*24.1 Salt Lake City (Downtown) V2 - add 84132*/
ELSE IF (AssignedCounty in (18) and zip_code IN
(84101,84102,84111,84112,84113,84114,84132,84133,84132,84147)) THEN sarea_r2 = 24.1 ;
/*24.2 Salt Lake City (Southeast Liberty)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84105)) THEN sarea_r2 = 24.2 ;
/*25 South Salt Lake*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84115, 84165, 84190)) THEN sarea_r2 = 25 ;
/*26.1 Salt Lake City (Sugar House)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84106,84152)) THEN sarea_r2 = 26.1 ;

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/*26.2 Millcreek (South)*/
  ELSE IF (AssignedCounty in (18) and zip_code IN (84124)) THEN sarea_r2 = 26.2 ;
/*26.3 Millcreek (East)*/
  ELSE IF (AssignedCounty in (18) and zip_code IN (84109)) THEN sarea_r2 = 26.3 ;
/*27.1 Holladay V2*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84117)) THEN sarea_r2 = 27.1 ;
/*28 Cottonwood*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84121, 84171)) THEN sarea_r2 = 28 ;
/*29.1 Kearns V2*/
ELSE IF (AssignedCounty in (18) and (zip_code=84118)) THEN sarea_r2 = 29.1;
/*30 Taylorsville (East)/Murray (West)*/
ELSE IF (AssignedCounty in (18) and zip_code=84123) THEN sarea_r2 = 30 ;
/*30.1 Taylorsville (West)*/
ELSE IF AssignedCounty in (18) and zip_code IN (84129) THEN sarea_r2 = 30.1; /*not data from ACS*/
/*31 Murray*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84107, 84157)) THEN sarea_r2 = 31 ;
/*32 Midvale*/
ELSE IF (AssignedCounty in (18) and zip_code =84047) THEN sarea_r2 = 32 ;
/*33.2 West Jordan (Northeast) V2*/
ELSE IF (AssignedCounty in (18) and (zip_code =84084)) THEN sarea_r2 = 33.2;
/*34.1 West Jordan (Southeast)*/
ELSE IF (AssignedCounty in (18) and (zip_code=84088)) THEN sarea_r2 = 34.1;
/*34.2 West Jordan (West)/Copperton*/
ELSE IF (AssignedCounty in (18) and zip_code in (84006, 84081)) THEN sarea_r2 = 34.2 ;
/*35.1 South Jordan V2*/
ELSE IF (AssignedCounty in (18) and zip_code in (84095)) THEN sarea_r2 = 35.1 ;
/*35.2 Day Break*/
ELSE IF (AssignedCounty in (18) and zip_code in (84009)) THEN sarea_r2 = 35.2 ;
/*36.1 Sandy (West)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84070, 84091)) THEN sarea_r2 = 36.1 ;
/*36.2 Sandy (Center) V2*/
  ELSE IF (AssignedCounty in (18) and zip_code IN (84094)) THEN sarea_r2 = 36.2 ;
/*37 Sandy (Northeast)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84090, 84093)) THEN sarea_r2 = 37 ;
/*38 Sandy (Southeast)*/
ELSE IF (AssignedCounty in (18) and zip_code IN (84092, 84138)) THEN sarea_r2 = 38 ;

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/*39.1 Draper*/
  *all of small area 39.1 zip codes cross borders;
/*39.2 Riverton/Bluffdale*/
  *small area 39.2 zip code crosses borders;
/*39.3 Herriman*/
  ELSE IF (AssignedCounty in (18) and zip_code IN (84096)) THEN sarea_r2 = 39.3 ;

/*****lhd=8 Tooele*****/
  /*40.1 Tooele County (Other)*/
  ELSE IF (AssignedCounty in (23) and zip_code in (84022, 84069, 84071, 84080)) THEN sarea_r2 = 40.1;
  /*40.2 Tooele Valley*/
  ELSE IF (AssignedCounty in (23) and zip_code in (84074)) THEN sarea_r2 = 40.2;

/*****lhd=10 Utah County*****/
  /*41.1 Eagle Mountain/Cedar Valley*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84005, 84013)) THEN sarea_r2 = 41.1 ;
  /*41.2 Lehi*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84043)) THEN sarea_r2 = 41.2 ;
  /*41.3 Saratoga Springs*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84045)) THEN sarea_r2 = 41.3 ;
  /*42.1 American Fork*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84003)) THEN sarea_r2 = 42.1 ;
  /*42.2 Alpine*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84004)) THEN sarea_r2 = 42.2 ;
  /*43 Pleasant Grove/Lindon*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84042, 84062)) THEN sarea_r2 = 43 ;
  /*44 Orem (North)*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84057)) THEN sarea_r2 = 44 ;
  /*45 Orem (West)*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84058,84059)) THEN sarea_r2 = 45 ;
  *84059 changed in 2019 from small area 44 to small area 45 fixed 2/5/20;
  /*46 Orem (East)*/
  ELSE IF (AssignedCounty in (25) and zip_code =84097) THEN sarea_r2 = 46 ;
  /*47 Provo/BYU*/
  ELSE IF (AssignedCounty in (25) and zip_code IN (84602)) THEN sarea_r2 = 47 ;
  /*48.1 Provo (West City Center)*/

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ELSE IF (AssignedCounty in (25) and zip_code IN (84601, 84603)) THEN sarea_r2 = 48.1 ;
/*48.2 Provo (East City Center)*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84605, 84606)) THEN sarea_r2 = 48.2 ;
/*49.1 Salem City*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84653)) THEN sarea_r2 = 49.1 ;
/*49.2 Spanish Fork*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84660)) THEN sarea_r2 = 49.2 ;
/*49.3 Springville*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84663)) THEN sarea_r2 = 49.3;
/*49.4 Mapleton*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84664)) THEN sarea_r2 = 49.4 ;
/*50.1 Utah County (South) V2*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84626,84633,84655)) THEN sarea_r2 = 50.1 ;
/*50.2 Payson*/
ELSE IF (AssignedCounty in (25) and zip_code IN (84651)) THEN sarea_r2 = 50.2 ;

/*****lhd=7 Summit*****/
/*51.1 Park City*/
ELSE IF (AssignedCounty in (22) and zip_code IN (84098)) THEN sarea_r2 = 51.1;
/*51.2 Summit County (East)*/
ELSE IF (AssignedCounty in (22) and zip_code IN (84024,84055,84061)) THEN sarea_r2 = 51.2;

/*****lhd=11 Wasatch*****/
/*52 Wasatch County*/
ELSE IF (AssignedCounty in (26) and zip_code in (84032, 84049, 84082)) THEN sarea_r2 = 52;

/*****lhd=9 TriCounty*****/
/*53.1 Daggett and Uintah County*/
ELSE IF (AssignedCounty IN (5,24) and zip_code in
(84008,84026,84035,84039,84046,84063,84076,84078,84079,84085)) THEN sarea_r2 = 53.1;
/*53.2 Duchesne County*/
ELSE IF (AssignedCounty IN (7) and zip_code in (84001,84002,84007,84021, 84027,
84031,84051,84053,84072,84073)) THEN sarea_r2 = 53.2;

/*****lhd=2 Central*****/

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/*54.1 Nephi/Mona*/
ELSE IF (AssignedCounty IN (12) and zip_code in (84645,84648)) THEN sarea_r2 = 54.1;
/*54.2 Delta/Fillmore*/
ELSE IF (AssignedCounty IN (14) and zip_code in (84624,84631,84635, 84640)) THEN sarea_r2 = 54.2;
/*54.3 Sanpete Valley*/
ELSE IF (AssignedCounty IN (20) and zip_code in (84627,84634,84642,84647)) THEN sarea_r2 = 54.3;
/*54.4 Central (Other)*/
ELSE IF (AssignedCounty IN (12, 14,16, 20,21,28) and zip_code in
(84620,84621,84622,84623,84628,84630,84632,84636,84637,84638,84639,84643,
84644,84646,84649,84652,84656,84657,84662,84665,84667,84711,84715,84723,84724,84728,84730,84732,84734,84739,84740,
84744,84747,
84749,84750,84766,84773,84775)) THEN sarea_r2 = 54.4;
/*55.1 Richfield/Monroe/Salina*/
ELSE IF (AssignedCounty IN (21) and zip_code in (84654,84701,84754)) THEN sarea_r2 = 55.1;

/*****lhd=5.1 Southeast*****/
/*56.1 Carbon County*/
ELSE IF (AssignedCounty IN (4) and zip_code in (84520,84526,84529,84539,84542)) THEN sarea_r2 = 56.1;
/*56.2 Emery County*/
ELSE IF (AssignedCounty IN (8) and zip_code in (84513,84516,84518,84521,84522,84523,84528,84537)) THEN
sarea_r2 = 56.2;
/*57.1 Grand County*/
ELSE IF (AssignedCounty IN (10) and zip_code in (84515, 84540)) THEN sarea_r2 = 57.1;

/*****lhd=13 San Juan*****/
/*57.3 Blanding/Monticello*/
ELSE IF (AssignedCounty IN (19) and zip_code in (84511,84535)) THEN sarea_r2 = 57.3;
/*57.4 San Juan County (Other)*/
ELSE IF (AssignedCounty IN (19) and zip_code in (84510,84512,84530,84531,84534,84536)) THEN sarea_r2 =
57.4;

/*****lhd=6 Southwest*****/
/*58 St. George*/
ELSE IF (AssignedCounty IN (27) and zip_code IN (84770, 84771, 84790, 84791)) THEN sarea_r2 =58 ;
/*59.1 Washington County (Other) V2*/

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ELSE IF (AssignedCounty IN (27) and zip_code in (84733,84746,84763,84767,84774,84779,84782,84783,84784)) THEN
sarea_r2 =59.1;
/*59.2 Washington City*/
ELSE IF (AssignedCounty IN (27) and zip_code in (84780)) THEN sarea_r2 =59.2;
/*59.3 Hurricane/La Verkin*/
ELSE IF (AssignedCounty IN (27) and zip_code in (84745)) THEN sarea_r2 =59.3;
/*59.4 Ivins/Santa Clara*/
ELSE IF (AssignedCounty IN (27) and zip_code in (84738,84765)) THEN sarea_r2 =59.4;
/*60 Cedar City*/
ELSE IF ((AssignedCounty in (11) and zip_code IN (84721))) THEN sarea_r2 = 60 ;
/*61 Southwest LHD (Other)*/
ELSE IF AssignedCounty IN (1, 9, 11, 13) and zip_code in
(84710,84713,84714,84716,84718,84719,84729,84731,84735,84736,84741,84742,84751,84752,84753,84755,84758,84760,84761
,84762,
84764,84772,84776) THEN sarea_r2= 61;

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\*\*\*\*\*Some zip codes cross county lines for these cases we need to assign small area based on both the zip code and county\*\*\*;  
\*\*\*\*\*However if the county is missing or inconsistent and the zipcode crosses county lines we will assign to the small area with the greatest HUD Res Rate;

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%macro bordercross(zip, cnty1, sa1, cnty2, sa2, biggestsa, biggestc);
if zipcode=&zip and AssignedCounty=&cnty1 then sarea_r2=&sa1;
else if zipcode=&zip and AssignedCounty=&cnty2 then sarea_r2=&sa2;
else if zipcode=&zip then do;
sarea_r2=&biggestsa;
AssignedCounty=&biggestc;
end;
%mend;

%bordercross (84017, 22, 51.2, 15, 6.2, 51.2, 22);
%bordercross (84020, 18, 39.1, 25, 41.2, 39.1, 18);
%bordercross (84023, 5, 53.1, 24, 53.1, 53.1, 5);
%bordercross (84029, 23, 40.1, 2, 2.1, 40.1, 23);
%bordercross (84033, 22, 51.2, 15, 6.2, 51.2, 22);
%bordercross (84034, 23, 40.1, 12, 54.4, 40.1, 23);

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```
%bordercross (84036, 22, 51.2, 26, 52, 51.2, 22);
%bordercross (84050, 15, 6.2, 18, 19.1, 6.2, 15);
%bordercross (84052, 7, 53.2, 24, 53.1, 53.2, 7);
%bordercross (84056, 6, 11, 29, 10, 11, 6);
%bordercross (84060, 22, 51.1, 26, 52, 51.1, 22);
%bordercross (84066, 7, 53.2, 24, 53.1, 53.2, 7);
%bordercross (84068, 22, 51.1, 26, 52, 51.1, 22);
%bordercross (84083, 12, 54.4, 23, 40.1, 40.1, 23);
%bordercross (84312, 2, 2.2, 3, 4.1, 2.2, 2);
%bordercross (84315, 29, 9, 6, 11, 9, 29);
%bordercross (84404, 29, 5, 2, 2.1, 5, 29);
%bordercross (84405, 6, 12, 29, 10, 10, 29);
%bordercross (84409, 29, 10, 6, 12, 10, 29);
%bordercross (84412, 29, 5, 2, 2.1, 5, 29);
%bordercross (84501, 4, 56.1, 8, 56.2, 56.1, 4);
%bordercross (84525, 8, 56.2, 10, 57.1, 56.2, 8);
%bordercross (84532, 10, 57.1, 19, 57.4, 57.1, 10);
%bordercross (84533, 19, 57.4, 13, 61, 57.4, 19);
%bordercross (84604, 25, 47, 26, 52, 47, 25);
%bordercross (84629, 20, 54.3, 25, 49.2, 54.3, 20);
%bordercross (84712, 9, 61, 16, 54.4, 54.4, 16);
%bordercross (84720, 11, 60, 27, 59.1, 60, 11);
%bordercross (84722, 27, 59.1, 11, 61, 59.1, 27);
%bordercross (84725, 27, 59.1, 11, 61, 59.1, 27);
%bordercross (84726, 9, 61, 13, 61, 61, 9);
%bordercross (84737, 27, 59.3, 11, 61, 59.3, 27);
%bordercross (84743, 16, 54.4, 1, 61, 54.4, 16);
%bordercross (84756, 11, 61, 27, 59.1, 61, 11);
%bordercross (84757, 27, 59.1, 11, 60, 59.1, 27);
%bordercross (84759, 9, 61, 11, 61, 61, 9);
%bordercross (84781, 27, 59.1, 11, 60, 59.1, 27);
%bordercross (84065, 18, 39.2, 25, 41.2, 39.2, 18);
%bordercross (84306, 2, 2.1, 3, 4.1, 2.1, 2);
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if sarea_r2 NE . then do;
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**assign district based on county if small area has been assigned ;
  if AssignedCounty in (2,3,17) then district = 1;
  if AssignedCounty in (12,14,16,20,21,28) then district = 2;
  if AssignedCounty = 6 then district = 3;
  if AssignedCounty = 18 then district = 4;
  if AssignedCounty in (4,8,10) then district = 5.1;
  if AssignedCounty in (1,9,11,13,27) then district = 6;
  if AssignedCounty = 22 then district = 7;
  if AssignedCounty = 23 then district = 8;
  if AssignedCounty in (5,7,24) then district = 9;
  if AssignedCounty = 25 then district = 10;
  if AssignedCounty = 26 then district = 11;
  if AssignedCounty in (15,29) then district = 12;
    if AssignedCounty in (19) then district=13;
end;
*****END*****;
if sarea_r2=. then AssignedCounty=.;
****We determined to give zipcode the benefit of the doubt so we need to set county to missing and then reassign
based on zip code;

/*Third assign the small areas by zip if zip does not match county and we have not yet assigned a small area*/
if sarea_r2=. then do;
/****lhd=1 Bear River*****/
  IF zip_code= 84302 THEN sarea_r2 =1 ; /*1 Brigham City*/

  ELSE IF zip_code in (84301,84307,84309,84311,84313,84314,84316,84324,84329,84330,84331,84334,84336,84340)
THEN sarea_r2 =2.1;
  ELSE IF zip_code in (84337) THEN sarea_r2= 2.2 ;
  ELSE IF zip_code IN (84321, 84322, 84323, 84326, 84332) THEN sarea_r2= 3.1 ;
  ELSE IF zip_code IN (84341) THEN sarea_r2= 3.2 ;
  ELSE IF zip_code IN (84028, 84038, 84064, 84086, 84304, 84305, 84308, 84318,84320, 84325, 84327, 84328,
84333, 84338, 84339) THEN sarea_r2= 4.1 ;

  ELSE IF zip_code IN (84319) THEN sarea_r2= 4.2 ;
  ELSE IF zip_code IN (84335) THEN sarea_r2= 4.3 ;

```

```
/******lhd=12 Weber-Morgan*****
```

```
*All of small area 5 zip codes cross borders;
```

```
ELSE IF zip_code IN (84310,84317,84414) THEN sarea_r2= 6.1;  
    ELSE IF zip_code in (84018) THEN sarea_r2 = 6.2 ;
```

```
ELSE IF zip_code in (84401, 84402) THEN sarea_r2 = 7 ;
```

```
ELSE IF zip_code in (84403, 84408, 84415) THEN sarea_r2=8 ;
```

```
ELSE IF zip_code in (84067) THEN sarea_r2 = 9 ;
```

```
*All of small area 10 zip codes cross borders;
```

```
/******lhd=3 Davis*****
```

```
ELSE IF zip_code IN (84015, 84016, 84089) THEN sarea_r2 = 11 ;
```

```
ELSE IF zip_code IN (84040, 84041) THEN sarea_r2 = 12 ;
```

```
ELSE IF zip_code IN (84037) THEN sarea_r2 = 13.1 ;  
    ELSE IF zip_code IN (84075) THEN sarea_r2 = 13.2 ;
```

```
ELSE IF zip_code IN (84014) THEN sarea_r2 = 14.1 ;  
    ELSE IF zip_code IN (84025) THEN sarea_r2 = 14.2 ;
```

```
ELSE IF zip_code IN (84054) THEN sarea_r2 = 15.1 ;  
    ELSE IF zip_code IN (84087) THEN sarea_r2 = 15.2 ;
```

```
ELSE IF zip_code IN (84010, 84011) THEN sarea_r2 = 16 ;
```

```
/******lhd=4 Salt Lake add 84134, 84143, 84148*****
```

```
ELSE IF zip_code in (84116, 84122, 84134) THEN sarea_r2 = 17 ;
```

```
ELSE IF zip_code IN (84103, 84143, 84150) THEN sarea_r2 = 18 ;
ELSE IF zip_code IN (84108, 84148, 84158) THEN sarea_r2 = 19.1;
ELSE IF zip_code = 84044 THEN sarea_r2 = 20 ;
ELSE IF zip_code IN (84104,84110,84145,84151,84180) THEN sarea_r2 = 21.1 ;
ELSE IF zip_code IN (84120, 84170) THEN sarea_r2 = 22.1 ;
    ELSE IF zip_code IN (84128) THEN sarea_r2 = 22.2 ;
ELSE IF zip_code IN (84119, 84125, 84126, 84127, 84130, 84131) THEN sarea_r2 = 23.1;
ELSE IF zip_code IN (84101,84102,84111,84112,84113,84114,84132,84133,84147) THEN sarea_r2 = 24.1 ;
*add 84132;
    ELSE IF zip_code IN (84105) THEN sarea_r2 = 24.2 ;
ELSE IF zip_code IN (84115, 84165, 84190) THEN sarea_r2 = 25 ;
ELSE IF zip_code IN (84106,84152) THEN sarea_r2 = 26.1 ;
    ELSE IF zip_code IN (84124) THEN sarea_r2 = 26.2 ;
    ELSE IF zip_code IN (84109) THEN sarea_r2 = 26.3 ;
ELSE IF zip_code IN (84117) THEN sarea_r2 = 27.1 ;
ELSE IF zip_code IN (84121, 84171) THEN sarea_r2 = 28 ;
ELSE IF zip_code=84118 THEN sarea_r2 = 29.1;
ELSE IF zip_code=84123 THEN sarea_r2 = 30 ;
ELSE IF zip_code IN (84129) THEN sarea_r2 = 30.1; /*not data from ACS*/
ELSE IF zip_code IN (84107, 84157) THEN sarea_r2 = 31 ;
ELSE IF zip_code =84047 THEN sarea_r2 = 32 ;
ELSE IF zip_code =84084 THEN sarea_r2 = 33.2;
```

```
ELSE IF zip_code=84088 THEN sarea_r2 = 34.1;
ELSE IF zip_code in (84006, 84081) THEN sarea_r2 = 34.2 ;
```

```
ELSE IF zip_code in (84095) THEN sarea_r2 = 35.1 ;
  ELSE IF zip_code in (84009) THEN sarea_r2 = 35.2 ;
ELSE IF zip_code IN (84070, 84091) THEN sarea_r2 = 36.1 ;
  ELSE IF zip_code IN (84094) THEN sarea_r2 = 36.2 ;
```

```
ELSE IF zip_code IN (84090, 84093) THEN sarea_r2 = 37 ;
```

```
ELSE IF zip_code IN (84092, 84138) THEN sarea_r2 = 38 ;
```

```
  *All of small area 39.1 zip codes cross borders;
  *small area 39.2 zip code crosses borders;
```

```
  ELSE IF zip_code IN (84096) THEN sarea_r2 = 39.3 ;
```

```
/******lhd=8 Tooele******/
```

```
ELSE IF zip_code in (84022,84069,84071,84080) THEN sarea_r2 = 40.1;
  ELSE IF zip_code in (84074) THEN sarea_r2 = 40.2;
```

```
/******lhd=10 Utah County******/
```

```
ELSE IF zip_code IN (84005,84013) THEN sarea_r2 = 41.1 ;
  ELSE IF zip_code IN (84043) THEN sarea_r2 = 41.2 ;
  ELSE IF zip_code IN (84045) THEN sarea_r2 = 41.3 ;
```

```
ELSE IF zip_code IN (84003) THEN sarea_r2 = 42.1 ;
  ELSE IF zip_code IN (84004) THEN sarea_r2 = 42.2 ;
```

```
ELSE IF zip_code IN (84042,84062) THEN sarea_r2 = 43 ;
```

```
ELSE IF zip_code IN (84057) THEN sarea_r2 = 44 ;
```

ELSE IF zip\_code IN (84058, 84059) THEN sarea\_r2 = 45 ;  
\*84059 changed in 2019 from small area 44 to small area 45 fixed 2/5/20;

ELSE IF zip\_code =84097 THEN sarea\_r2 = 46 ;

ELSE IF zip\_code IN (84602) THEN sarea\_r2 = 47 ;

ELSE IF zip\_code IN (84601,84603) THEN sarea\_r2 = 48.1 ;  
ELSE IF zip\_code IN (84605,84606) THEN sarea\_r2 = 48.2 ;

ELSE IF zip\_code IN (84653) THEN sarea\_r2 = 49.1 ;  
ELSE IF zip\_code IN (84660) THEN sarea\_r2 = 49.2 ;  
ELSE IF zip\_code IN (84663) THEN sarea\_r2 = 49.3 ;  
ELSE IF zip\_code IN (84664) THEN sarea\_r2 = 49.4 ;

ELSE IF zip\_code IN (84626,84633,84655) THEN sarea\_r2 = 50.1 ;  
ELSE IF zip\_code IN (84651) THEN sarea\_r2 = 50.2 ;

/\*\*\*\*\*lhd=7 Summit\*\*\*\*\*/

ELSE IF zip\_code IN (84098) THEN sarea\_r2 = 51.1 ;  
ELSE IF zip\_code IN (84024,84055,84061) THEN sarea\_r2 = 51.2 ;

/\*\*\*\*\*lhd=11 Wasatch\*\*\*\*\*/

ELSE IF zip\_code in (84032,84049,84082) THEN sarea\_r2 = 52 ;

/\*\*\*\*\*lhd=9 Tri County\*\*\*\*\*/

ELSE IF zip\_code in (84008,84026,84035,84039,84046,84063,84076,84078,84079,84085) THEN sarea\_r2 = 53.1 ;  
ELSE IF zip\_code in (84001,84002,84007,84021,84027,84031,84051,84053,84072,84073) THEN sarea\_r2 = 53.2 ;

/\*\*\*\*\*lhd=2 Central\*\*\*\*\*/

ELSE IF zip\_code in (84645,84648) THEN sarea\_r2 = 54.1 ;  
ELSE IF zip\_code in (84624,84631,84635, 84640) THEN sarea\_r2 = 54.2 ;

```

ELSE IF zip_code in (84627,84634,84642,84647) THEN sarea_r2 = 54.3;
ELSE IF zip_code in (84620,84621,84622,84623,84628,84630,84632,84636,84637,84638,84639,84643,
84644,84646,84649,84652,84656,84657,84662,84665,84667,84711,84715,84723,84724,84728,84730,84732,84734,84739,84740,
84744,84747,
84749,84750,84766,84773,84775) THEN sarea_r2 = 54.4;

ELSE IF zip_code in (84654,84701,84754) THEN sarea_r2 = 55.1;
/*****lhd=5.1 Southeast*****/
ELSE IF zip_code in (84520,84526,84529,84539,84542) THEN sarea_r2 = 56.1;

ELSE IF zip_code in (84513,84516,84518,84521,84522,84523,84528,84537) THEN sarea_r2 = 56.2;

ELSE IF zip_code in (84515, 84540) THEN sarea_r2 = 57.1;
/*****lhd=13 San Juan*****/
ELSE IF zip_code in (84511,84535) THEN sarea_r2 = 57.3;
ELSE IF zip_code in (84510,84512,84530,84531,84534,84536) THEN sarea_r2 = 57.4;
/*****lhd=6 Southwest*****/
ELSE IF zip_code IN (84770, 84771, 84790, 84791) THEN sarea_r2 =58 ;

ELSE IF zip_code in (84733,84746,84763,84767,84774,84779,84782,84783,84784) THEN sarea_r2 =59.1;
ELSE IF zip_code in (84780) THEN sarea_r2 =59.2;
ELSE IF zip_code in (84745) THEN sarea_r2 =59.3;
ELSE IF zip_code in (84738,84765) THEN sarea_r2 =59.4;

ELSE IF zip_code IN (84721) THEN sarea_r2 = 60 ;

ELSE IF zip_code in
(84710,84713,84714,84716,84718,84719,84729,84731,84735,84736,84741,84742,84751,84752,84753,84755,84758,84760,84761
,84762,
84764,84772,84776) THEN sarea_r2= 61;

```



```

ELSE IF sarea_r2 in (40.1, 40.2) then AssignedCounty=23;

ELSE IF sarea_r2 in (41.1, 41.2, 41.3, 42.1, 42.2, 43, 44, 45, 46, 47, 48.1, 48.2, 49.1, 49.2, 49.3, 49.4,
50.1, 50.2) then AssignedCounty=25;

    ELSE IF sarea_r2 in (51.1, 51.2) then AssignedCounty=22;

ELSE IF sarea_r2 = 52 then AssignedCounty=26;
/*****small area 53.1*****/
    ELSE if zipcode in (84046) then AssignedCounty=5;
    ELSE if zipcode in (84008, 84026, 84035, 84039, 84063, 84076, 84078, 84079, 84085) then
AssignedCounty=24;

ELSE IF sarea_r2 = 53.2 then AssignedCounty=7;

    ELSE IF sarea_r2 in (54.1) then AssignedCounty=12;
    ELSE IF sarea_r2 = 54.2 then AssignedCounty=14;
    ELSE IF sarea_r2 in (54.3) then AssignedCounty=20;
/*****small area 54.4*****/
ELSE IF zipcode in (84628, 84639) then AssignedCounty=12;

    ELSE IF zipcode in (84636, 84637, 84638, 84644, 84649, 84656, 84728) then AssignedCounty=14;
    ELSE IF zipcode in (84723, 84732, 84740, 84750) then AssignedCounty=16;
    ELSE IF zipcode in (84621, 84622, 84623, 84630, 84632, 84643, 84646, 84662, 84665, 84667) then
AssignedCounty=20;
    ELSE IF zipcode in (84620, 84652, 84657, 84711, 84724, 84730, 84739, 84744, 84766) then
AssignedCounty=21;
    ELSE IF zipcode in (84715, 84734, 84747, 84749, 84773, 84775) then AssignedCounty=28;

ELSE IF sarea_r2 =55.1 then AssignedCounty=21;

ELSE IF sarea_r2 =56.1 then AssignedCounty=4;
    ELSE IF sarea_r2 =56.2 then AssignedCounty=8;

ELSE IF sarea_r2 = 57.1 then AssignedCounty=10;

```



```

if sarea_r2=99 then AssignedCounty=99;           *Unassigned need assignment;
if sarea_r2=99 then district=99;                *Unassigned need assignment;
if sarea_r2=97 then AssignedCounty=97;         *crosses boarder can't determine county;
if sarea_r2=97 then district=97;               *crosses boarder can't determine county;

*****;
*****There are zip codes that are between 84000-84999 that are not valid **;
*or at least not assigned a small area. We need to use original county code **;
*to determine district and reassign county back to the original county**;
*and then assign small area based on the county**;
*****;
if sarea_r2 in (99) then do;

*****If original county code is not FIPS you will need to change this to sequential numbers;
  if 1<=ctycode<=57 then CountyR=(ctycode+1)/2;      *convert FIPS to county codes 1...29;
    else if 1>ctycode or ctycode>57 then CountyR=.;

    if CountyR in (2,3,17) then district = 1;
    if CountyR in (12,14,16,20,21,28) then district = 2;
    if CountyR = 6 then district = 3;
    if CountyR = 18 then district = 4;
    if CountyR in (4,8,10) then district = 5.1;
    if CountyR in (1,9,11,13,27) then district = 6;
    if CountyR = 22 then district = 7;
    if CountyR = 23 then district = 8;
    if CountyR in (5,7,24) then district = 9;
    if CountyR = 25 then district = 10;
    if CountyR = 26 then district = 11;
    if CountyR in (15,29) then district = 12;
      if CountyR in (19) then district=13;

  IF (CountyR IN (1, 9, 13)) THEN sarea_r2= 61;/* Beaver/Garfield/Kane*/
  ELSE IF (CountyR IN (4)) THEN sarea_r2 = 56.1;/*Carbon*/
  ELSE IF (CountyR IN (8)) THEN sarea_r2 = 56.2;/*Emery*/
  ELSE IF (CountyR IN (5, 24)) THEN sarea_r2 = 53.1;/*Duchesne*/
  ELSE IF (CountyR IN (7)) THEN sarea_r2 = 53.2;/*Daggett/Uintah*/

```

```
    ELSE IF (CountyR IN (10)) THEN sarea_r2 = 57.1; /*Grand*/
    *ELSE IF (CountyR IN (19)) THEN sarea_r2 = 57.2; /*San Juan*/
    ELSE IF (CountyR IN (16,28)) THEN sarea_r2 = 54.4; /*Piute/Wayne*/
ELSE IF (CountyR= 26) THEN sarea_r2 = 52; /*Wasatch*/
ELSE IF (CountyR=17) THEN sarea_r2= 4.1 ; /*Rich*/
ELSE IF (CountyR=15) THEN sarea_r2= 6.2 ; /*Morgan*/
```

```
if AssignedCounty=99 then AssignedCounty=CountyR;
end;
```