RELU

Greater Los Angeles Region

Data Documentation

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Contents

1. RELU Categories:

Table 1: Counties in RELU-LA

RELU County Names	FIPS Code
Imperial	025
Los Angeles	037
Orange	059
Riverside	065
San Bernardino	071
Ventura	111

Table 2: Worker types

RELU Worker Type	Earnings Category (f)
1	Less than $30,000
2	$30,000 to $49,999
3	$50,000 to $ 74,999
4	$ 75,000 and above

Year 2000 dollar

Table 3: Mode types

RELU Mode Type (m)	Description
1	Drove alone and 2-or-more-person carpool
2	Public transportation-excludes taxicab
3	All other means including taxicab

Table 4: Building types

RELU Building Type (k)	Description
1	Single Family Residential
2	Multi-Family Residential
3	Commercial
4	Industrial
5	Public

Table 5: RELU-LA Industries

RELU Industry Code	IMPLAN Sectors	Census 2000 Industry Categories
1. Agriculture, forestry, fishing, mining	1-47, 57	Agriculture, forestry, fishing and hunting, and mining (2)
2. Construction	48-56	Construction (3)
3. Electric, gas, sanitary services	443-446, 511, 514	Transportation and warehousing, and utilities (7) [Part]
4. Finance, insurance, real estate	456-460, 462	Finance, insurance, real estate and rental and leasing (9)
5. Manufacturing	58-432	Manufacturing (4)
6. Others	461, 516-518, 521, 524, 526-528	
7. Retail trade	448-455	Retail trade (6)
8. Services	463-509, 525	Information (8) Professional, scientific, management, administrative, and waste management services (10) Educational, health and social services (11) Arts, entertainment, recreation, accommodation and food services (12) Other services (except public administration) (13)
9. Transportation, communications, warehousing	433-442, 510, 513	Transportation and warehousing, and utilities (7) [Part]
10. Wholesale trade	447	Wholesale trade (5)
11. Public administration	512, 515, 519, 520, 522, 523	Public administration (14)

Table 6

Industries using Commercial Buildings	Industries using Industrial Buildings
Finance, insurance, real estate	Agriculture, forestry, fishing, mining
Retail trade	Construction
Services	Electric, gas, sanitary services
	Manufacturing
	Transportation, communications, warehousing
	Wholesale trade

2. Floor to Area Ratio:

Excel sheet: FAR

File description: Floor to area ratio by building type

Table 7

Variable	Description
model_zone_id	Model Zone number
far_k1	FAR; Single Family Residence
far_k2	FAR; Multi - Family Residence
far_k3	FAR; Commercial
far_k4	FAR; Industrial
far_k5	FAR; Public

Notes:

- SCAG parcel data.

3. Stock:

Excel sheet: stock

File description: Stock of vacant land area and floor area by building type

Table 8

Variable	Description
Model_zone	RELU-LA model zone
land_k0	Land area; vacant land
floor_k1	Floor area; single family homes
floor_k2	Floor area; Multi-family homes
floor_k3	Floor area; Commercial family homes
floor_k4	Floor area; Industrial family homes
floor_k5	Floor area; Public family homes

Notes:

- Unit: Square feet.
- Source: SCAG parcel database

4. Value:

Excel sheet: value

File description: value of floor area by building types

Table 9

Variable	Description
value_k_0	value; vacant land
value _k_1	value; single family homes
value _k_2	value; Multi-family homes
value _k_3	value; Commercial family homes
value _k_4	value; Industrial family homes
value _k_5	value; Public family homes

Notes:

- Unit: Dollar per square feet
- Source: SCAG parcel data
- Year: 2000

5. Rent:

Excel sheet: rent

File description: rent of floor area by building types

Table 10

Variable	Description
model_zone_id	RELU-LA model zone number
rent _k_1	rent; single family homes
rent _k_2	rent; Multi-family homes
rent _k_3	rent; Commercial family homes
rent _k_4	rent; Industrial family homes
rent _k_5	rent; Public family homes

Notes:

- Unit: Dollar per square feet

- Source: SCAG parcel data
- Year: 2000

6. Construction Cost:

Excel sheet: constructioncost

File description: construction cost of floor area by building types

Table 11

Variable	Description
model_zone	RELU-LA model zone number
conscost_k1	Construction cost; single family homes
conscost_k2	Construction cost; Multi-family homes
conscost_k3	Construction cost; Commercial family homes
conscost_k4	Construction cost; Industrial family homes
conscost_k5	Construction cost; Public family homes

Notes:

- Unit: Dollar per square feet
- Source: RSMeans construction cost handbook
- Year: 2006

7. Bridge between Census Tracts to Model Zones:

Excel sheet: tract_zone_link

File description: links census tracts to model zones.

Table 12

Variable	Description
CensusID	12 digit unique census tract id
Model_Zone_1	Model zone number for census tract
County	FIPS county code
mzs	Share of census tract belonging to model zone

Notes:

- Outside region has model zone number 98 and census tract id ‘000000000000’.

8. Employed and Unemployed Workers:

Excel sheet: employed_unemployed

File description: workers by type and non-workers

Table 13

Variable	Description
model_zone	Residence model zone
wok_1	Number of employed workers of type 1
wok_2	Number of employed workers of type 2
wok_3	Number of employed workers of type 3
wok_4	Number of employed workers of type 4
non_wok	All non-working adults

Notes:

- Source: CTPP 2000 part 1 table 54

9. Probability of Work Location:

Excel sheet: probjobloc

File description: Probability of work location choice, by worker type.

Table 14

Variable	Description
wok_mz	RELU-LA work model zone
prob_wok1	Probability of work location choice; type 1 worker
prob_wok2	Probability of work location choice; type 2 worker
prob_wok3	Probability of work location choice; type 3 worker
prob_wok4	Probability of work location choice; type 4 worker

Note:

- Source: Modified CTPP 2000 part 3 table 7.

- See appendix for how CTPP 2000 part 3 was modified.

10. Probability of Residence Location:

Excel Sheet: probresloc

File description: Probability of residence location choice, conditional on work location; by worker type.

Table 15

Variable	Description
wok_mz	Work model zone
res_mz	Residence model zone
prob_wok1	Probability of residence location choice; type 1 worker
prob_wok2	Probability of residence location choice; type 2 worker
prob_wok3	Probability of residence location choice; type 3 worker
prob_wok4	Probability of residence location choice; type 4 worker

Note:

- Source: Modified CTPP 2000 part 3 table 7.
- See appendix for how CTPP 2000 part 3 was modified.

11. Probability of Mode Choice:

Excel sheet: probmode

File description: Probability of mode choice, conditional on work and residence location; by worker type.

Table 16

Variable	Description
wok_mz	Work model zone
res_mz	Residence model zone
mode	Mode of commuting
prob_wok1	Probability of mode choice; type 1 worker
prob_wok2	Probability of mode choice; type 2 worker
prob_wok3	Probability of mode choice; type 3 worker
prob_wok4	Probability of mode choice; type 4 worker

Note:

- Source: Modified CTPP 2000 part 3 table 7.
- See appendix for how CTPP 2000 part 3 was modified.
- Value: mode
    - mode = 1 is drove or carpooled
    - mode = 2 is public transportation
    - mode = 3 are all other modes

12. Commute Trips:

Excel sheet: commutetrip

File description: Population estimate of number of daily RELU-LA commute trips, by worker type and mode.

Table 17

Variable	Description
res_mz	RELU-LA residence model zone
wok_mz	RELU-LA work model zone
wok1_mode1	earning less than $30,000; drove/carpooled
wok1_mode2	earning less than $30,000; public transportation
wok1_mode3	earning less than $30,000; other modes
wok2_mode1	earning between $30,000 and $49,999; drove/carpooled
wok2_mode2	earning between $30,000 and $49,999; public transportation
wok2_mode3	earning between $30,000 and $49,999; other modes
wok3_mode1	earning between $50,000 and $74,999; drove/carpooled
wok3_mode2	earning between $50,000 and $74,999; public transportation
wok3_mode3	earning between $50,000 and $74,999; other modes
wok4_mode1	earning $75,000 and above; drove/carpooled
wok4_mode2	earning $75,000 and above; public transportation
wok4_mode3	earning $75,000 and above; other modes

Notes

- Source: Modified CTPP 2000 part 3 table 7.
- See appendix for how CTPP 2000 part 3 was modified.

13. Commute Times:

Excel sheet: commutetime

File description: Population estimate of mean one way commuting time, by mode.

Table 18

Variable	Description
res_mz	RELU-LA residence model zone
wok_mz	RELU-LA work model zone
mtt_mode1	mean one way commute time to work; drove alone/carpooled
mtt_mode2	mean one way commute time to work; public transportation
mtt_mode3	mean one way commute time to work; other modes

Notes

- Unit: Minutes
- Source: Modified CTPP 2000 part 3 table 7.
- See appendix for how CTPP 2000 part 3 was modified.

14. Non-Work Trips:

Excel sheet: nonworktrip

File description: Population estimate of number of RELU-LA non-work trips; by worker type and mode type.

Table 19

Variable	Description
RELU Mode	1 = Drove alone or carpooled 2 = Public Transportation 3 = All other means
hh_mz	Household residence model zone
Model_zone	Destination model zone
wok_1	Worker type 1
wok_2	Worker type 2
wok_3	Worker type 3
wok_4	Worker type 4

Notes:

- Source: SCAG travel survey year 2000.

15. Non Work Aggregate Trip Times:

Excel sheet: nonworktriptime

File description: Population estimate of aggregate daily RELU-LA non-work trip times (minutes); by worker type and mode type.

Table 20

Variable	Description
RELU Mode	1 = Drove alone or carpooled 2 = Public Transportation 3 = All other means
hh_mz	Household residence model zone
Model_zone	Destination model zone
wok_1	Worker type 1
wok_2	Worker type 2
wok_3	Worker type 3
wok_4	Worker type 4

Notes:

- Source: 2000 SCAG travel survey.

16. Employment by Industry and Earnings:

Excel sheet: emp_ind_ear

File description: Population estimates of number of workers; by industry, at place of work.

Variable	Description
MODEL_ZONE	Model Zone
ARFC	Armed Forces; Number of Workers
AGRI	Agriculture; Number of Workers
CONS	Construction; Number of Workers
FIRE	Finance, Real Estate, Rental and Leasing; Number of Workers
MANU	Manufacturing; Number of Workers
PUAD	Public Administration; Number of Workers
RETA	Retail; Number of Workers
SERV	Services; Number of Workers
TRAW	Transportation and Warehousing; Number of Workers
UTIL	Utility; Number of Workers
WHOL	Wholesale; Number of Workers
county	County;
ARFC_COUNTY	Armed Forces; Aggregate Number of Workers in the County
AGRI_COUNTY	Agriculture; Aggregate Number of Workers in the County
CONS_COUNTY	Construction; Aggregate Number of Workers in the County
FIRE_COUNTY	Finance, Real Estate, Rental and Leasing; Aggregate Number

	of Workers in the County
MANU_COUNTY	Manufacturing; Aggregate Number of Workers in the County
PUAD_COUNTY	Public Administration; Aggregate Number of Workers in the County
RETA_COUNTY	Retail; Aggregate Number of Workers in the County
SERV_COUNTY	Services; Aggregate Number of Workers in the County
TRAW_COUNTY	Transportation and Warehousing; Aggregate Number of Workers in the County
UTIL_COUNTY	Utility; Aggregate Number of Workers in the County
WHOL_COUNTY	Wholesale; Aggregate Number of Workers in the County

Notes:

- Source: CTPP 2000 part 2 table 11.

17. Residential Building type:

Excel sheet: buildingtype

File Description: Population estimates of number of households by income category and residential building type.

Table 21

Variable	Label
Hh_mz	Household model zone
Relu_inccat	RELU household income category
Relu_k	RELU residential building type, SFR = Single family, MFR = Multi-family

Notes:

- Source: 2000 SCAG travel survey data.

18. Earnings:

Excel Sheet: wage

File Description: Population estimates of annual earnings; by worker type, at place of work.

Table 22

Variable	Description
wok_mz	Work model zone
wok1_wage	Annual wage earnings; workers type 1
wok2_wage	Annual wage earnings; workers type 2
wok3_wage	Annual wage earnings; workers type 3
wok4_wage	Annual wage earnings; workers type 4

Notes:

- Units: Dollars
- Year: 2000
- Source: CTPP 2000 part 2 table 39

19. Employee Compensation:

Excel sheet: employeecomp

File description: Distribution of employee compensation between households and governments by County.

Table 23

Variable	Description
empcomp_shares	Percentage of employee compensation in a county going to households or governments

Notes:

- Year: 2000.
- Source: IMPLAN.

20. Household Commodity Expenditure Shares:

Excel sheet: hhcommexp

File description: Share of household expenditure on commodities; by County.

Table 24

Variable	Description
County	Resident county
InstitutionPayments_1	Institution making payment (household)
ReceiptsDescription	Institution receiving payment (industry)
Commodity_share	Share of expenditure commodities
Countycode	RELU county code

Notes:

- Year: 2000.
- Source: IMPLAN.

21. Industry Cost Shares:

Excel sheet: industrycostshares

File description: Industry cost shares.

Table 25

Variable	Description
payeeindustry	Industry that receives payment
payerindustry	Industry that makes payment
payeecounty	Host county of payee industry
payercounty	Host county of payer county
payer_mz	Location of payer industry
costshare	Industry cost share
COSTSHARE_CONS	Cost share going to construction industry
COSTSHARE_ADJ	Industry cost share net of payment to construction sector

Notes:

- Year: 2000.

- Source: IMPLAN.
- Values:
    - AGRI = Agriculture
    - CONS = Construction
    - FIRE = Finance, real estate, and insurance
    - MANU = Manufacturing
    - PUAD = Public administration
    - RETA = Retail trade
    - SERV = Service
    - TRAW = Transportation and warehousing
    - UTIL = Utility
    - WHOL = Wholesale
    - EMCO = Employee compensation
    - FOTR = Foreign trade
    - INBT = Indirect business taxes
    - OTPI = Other property income
    - PRIN = Proprietary income

22. Non-Wage Income:

Excel sheet: nonwageincome

File description: Gives different components of income

Table 26

Variable	Description
model_zone	Residence model zone
Tot_hh	Total Households
earnings_hh	Households with earnings
Noearnings_hh	Households with no earnings
wage_hh	Households with wage
Nowage_hh	Households with no wage
selfempinc_hh	Households with self-employment income
Noselfempinc_hh	Households with no self -employment income
intdivreinc_hh	Households with interest, dividend and rental income
Nointdivreninc_hh	Households with no interest, dividend and rental income
SocSinc_hh	Households with social security income
NoSocSinc_hh	Households with no social security income
SupSinc_hh	Households with supplemental security income
NoSuSinc_hh	Households with no supplemental security income
painc_hh	Households with public assistance income
Nopainc_hh	Households with no public assistance income
retinc_hh	Households with retiree income
Noretinc_hh	Households with no retiree income

otherinc_hh	Households with other income
Nootherinc_hh	Households with no other income
Aggearnings_dol	Aggregate dollar earnings
Aggwage_dol	Aggregate dollar wage income
Aggselfempinc_dol	Aggregate dollar self-employment income
Aggintdivreninc_dol	Aggregate dollar interest dividend rental income
AggSocSinc_dol	Aggregate dollar social security income
AggSupSincome_dol	Aggregate dollar supplemental security income
Aggpainc_dol	Aggregate dollar public assistance income
Aggretinc_dol	Aggregate dollar retiree income
Aggotherinc_dol	Aggregate dollar other income
w_inc1	Workers employed; household income category 1
wno_ear_inc1	Workers unemployed; household income category 1
nw_inc1	Not workers; household income category 1
w_inc2	Workers employed; household income category 2
wno_ear_inc2	Workers unemployed; household income category 2
nw_inc2	Not workers employed; household income category 2
w_inc3	Workers employed; household income category 3
wno_ear_inc3	Workers unemployed; household income category 3
nw_inc3	Not Workers employed; household income category 3
w_inc4	Workers employed; household income category 4
wno_ear_inc4	Workers unemployed; household income category 4
nw_inc4	Not workers employed; household income category 4

Notes:

- Year: 2000
- Source: Census SF3 file, CTPP 2000 part 1 table 75

23. Gross Products:

Excel sheet: grossproducts

File description: Industry gross products; by County.

Table 27

Variable	Description
county	Host county
Description	Industry description
IndustryCommodityProduction	Dollar value of total industry production
industry_code	RELU industry code (not necessary)
countycode	RELU county code (not necessary)

Notes:

- Year: 2000.
- Source: IMPLAN.

24. Residential Vacancy:

Excel sheet: resvacancy

File description: Population estimates of number of occupied and vacant single and multi-family houses.

Table 28

Variable	Description
model_zone	Residence model zone
occ_sfr	Occupied single family houses
occ_mfr	Occupied multi-family houses
vac_sfr	Vacant single family houses
vac_mfr	Vacant multi-family houses

Notes:

- Year: 2000.
- Source: U.S. Census 2000, SF3.

25. Housing Cost:

Excel sheet: housingcost

File description: Housing cost.

Table 29

Variable	Description
model_zone	Residence model zone
rent	

Notes:

- rent = 0.1*V*S+R*(1-S)
  V = Value for owner occupied housing
  R = Rents for renter occupied housing

S = Share of all occupied houses that are owned

- Year: 2000.
- Source: U.S. Census 2000, SF3.

26. Construction flow:

Excel sheet: consflow_imputed

File description: Imputed construction flow.

Table 30

Variable	Description
ModelZone	RELU-LA model zone
consflowimp_k1	Imputed construction flow for building type 1
consflowimp_k2	Imputed construction flow for building type 2
consflowimp_k3	Imputed construction flow for building type 3
consflowimp_k4	Imputed construction flow for building type 4
consflowimp_k5	Imputed construction flow for building type 5

Notes:

- See appendix for imputation procedure.

27. Non-Work Trips (Imputed):

Excel sheet: nonworktrip_imp

File description: Imputed RELU-LA non-work trips.

Table 31

Variable	Description
dest_mz	Destination RELU-LA model zone
hh_mz	Household RELU-LA model zone
worker_type	Type of RELU-LA worker
mode_type	Type of RELU-LA mode
nw_w_ratio	Non-work to work trip ratio from SCAG travel survey
miss_flag	Flag to indicate if nw_w_ratio is missing
imp_nw_trips	Imputed non-work trips

Notes:

- See appendix for imputation procedure.

28. Net Exports:

Excel sheet: NetExports

File description: Net-export; by industry.

Table 32

Variable	Description
Industry	RELU-LA industry
NetExports	Net-export by industry out of the region

Notes:

- Unit: Dollars.
- Year: 2000.
- Source: IMPLAN.

29. Appendix

1. Modifying CTPP Part 3:

- CTPP 2000 part 3 contains residence by workplace flow data.
    - CTPP 2000 part 3 table 307: Household Income in 1999 by Means of Transportation.
- Problems:
    - As part of the Census Bureau's disclosure avoidance process tables 303 to 307 in Part 3 has been subjected to a threshold or minimum size criterion for each worker flow. For these tables, if the un-weighted count of workers making up the flow is less than three, then all the cell values for these tables have been set to zero. Part 3 contains a variable called ‘Flow_flag’ which indicates whether that particular flow meets the disclosure avoidance threshold. *We need to impute the missing flows*.

  - Table 307 is flow of worker by household income type. *We need flow of workers by worker earnings type*.
- CTPP part 1 contains tabulations by workers place of residence.
  - CTPP part 1 table 39: Household income in 1999 (11) by Worker earnings in 1999 (12).
- CTPP part 2 contains tabulations by workers place of residence.
  - CTPP part 2 table 39: Household income in 1999 (11) by Worker earnings in 1999 (12).
- Find the probability (at place of residence) $P_{f|hi}$ that a worker who resides in a household of type h, is a type f worker

$$P_{f|hi} = \frac{N_{ifh}}{\sum_f N_{ifh}}$$

N_{ifh} = Number of workers of type f residing in census tract i, belonging to household of type h
- Find the probability (at place ofwork) $P_{f|hj}$ that a worker who resides in a household of type h, is a type f worker

$$P_{f|hj} = \frac{N_{jfh}}{\sum_f N_{jfh}}$$

N_{jfh} = Number of workers working of type f residing in census tract j, belonging to household of type h
- CTPP part 3 table 308: Mean travel time by Means of Transportation (8) and Time Leaving Home (4) (Not subject to Census Bureau's disclosure avoidance process).
- CTPP part 3 table 314: Aggregate travel time by Means of Transportation (8) and Time Leaving Home (4) (Census Bureau's disclosure avoidance process).
- If flow between two census tracts are censored.

$$\widehat{N}_{jim} = \frac{ATT_{jim}}{MTT_{jim}}$$

$\widehat{N}_{jim}$ = Total number of workers (imputed), flowing between work census tract j, residence census tract i, and mode of commuting m.
ATT_{jim} = Aggregate one way commuting time for all workers, flowing between work census tract j, residence census tract i, and mode of commuting m.
MTT_{jim} = Mean one way commuting time for all workers, flowing between work census tract j, residence census tract i, and mode of commuting m.
- If flow between two census tracts are *not censored* then

$$N_{jim|f} = \frac{P_{f|hj}P_{f|hi}}{\sum_f P_{f|hj}P_{f|hi}} N_{jim|h}$$

$N_{jim|h}$ = Flow of workers, belonging to household of type h, between work census tract j, residence census tract i, using mode of commuting m.
- If flow between two census tracts are *censored* then

$$P_{f|j} = \frac{\sum_h N_{fh|j}}{\sum_f \sum_h N_{fh|j}}$$

$$P_{f|i} = \frac{\sum_h N_{fh|i}}{\sum_f \sum_h N_{fh|i}}$$

$$N_{jim|f} = \frac{P_{f|j}P_{f|i}}{\sum_f P_{f|j}P_{f|i}} \widehat{N}_{jim|h}$$

2. Impute Trade Flows for Intermediate Inputs:

- The industry cost shares data used in RELU-LA is derived from IMPLAN.
- IMPLAN is a computer software program from MIG Inc that uses an internal database to generate Social Account Matrix (SAM) for a region for a given year.
- For the project we had access to SAMs for the six Counties which make up the greater Los Angeles region for year 2000.
- Problem:
    - The SAM for a County gives the dollar value that each industry located in the County spends on goods produced by other industries located in the same county, goods produced outside the County but within the U.S., and goods produced outside the U.S.
    - For the dollars spent on goods produced outside the County, the SAM does not provide the division between different industries.
    - Our task was to impute the dollar value spent by each industry located in a particular County on goods produced by other industries located in the other five counties.
- We describe the procedure for a particular industry located in a particular County. Letters in bold are data.
- Determine the total dollar value of trade flows between the Counties.

E_{co} = domestic export by industry located in county c to the rest of the U.S. This data is obtained from individual County SAMs.
E_{ro} = domestic exports by industry located in the region to the rest of the U.S. This data is obtained from the SAM which treats the six Counties as one region.

$$tradeflow = \sum_{c=1}^{6} E_{co} - E_{ro}$$

$E_{cc'}$ = export from County c to County c' (unknown)

$$tradeflow = \sum_{c}\sum_{c'} E_{cc'}, \qquad E_{cc'} = 0, if\ c = c'$$

- We assume the following,

$$\sum_{c'} E_{cc'} = tradeflow\left(\frac{E_{co}}{\sum_c E_{co}}\right)$$

- We then assume the following,
  y = Gross County Product
  D = Distance

$$E_{cc'} = \frac{y_{c'}^{\alpha} D_{cc'}^{\beta}}{\sum_{c'} y_{c'}^{\alpha} D_{cc'}^{\beta}}\left(\sum_{c'} E_{cc'}\right)$$

- We then assume the following,
  $I_{c'c}$ = import into county c' from county c

$$\sum_{c} I_{c'c} = tradeflow\left(\frac{I_{c'}}{\sum_{c'} I_{c'}}\right)$$

- We then solve the following optimization problem to get α. We set $\beta = -1$.

$$min_{\beta} \sum_{c\prime} \left(\frac{\sum_c E_{cc\prime} - \sum_c I_{c\prime c}}{\sum_c I_{c\prime c}} \right)^2$$

- Once we know α we know $E_{cc\prime}$.

Table 33: Parameter Estimates from Minimization Procedure

Industry	*Parameter (β , $\gamma = -1$)
Agriculture, forestry, fishing, mining	-
Construction	0.67
Manufacturing	1.65
TCW	1.06
Electric, gas, sanitary services	0.81
Wholesale trade	4.57
Retail trade	0.86
FIRE	1.02
Others	0.88
Services	1.07
Public administration	1.02

3. Impute Earnings:

Problem: Impute average annual earnings for each worker type at place of work.

- We perform a hermite spline interpolation on data from CTPP 2000 part 2 table 11 (Industry by Worker earnings in 1999) to estimate the cumulative distribution function for annual earnings at each place of work.
- We compute the median earnings for each worker type from the estimated cumulative distribution function.

4. Impute Non-Work Trips:

Problem: Impute RELU-LA non-work trips based on 2000 SCAG travel survey data and CTPP 2000 part 3.

- A trip in SCAG travel survey is travel that begins at one place and ends at another. A trip in RELU-LA begins at home and ends at home, and is made for a single purpose. Our task is to convert a series of SCAG trips that starts and ends at home into a single RELU-LA trip, and assign each RELU-LA trip one single purpose.

- The main components of the SCAG travel survey are the following files:

    - ct_main.csv: For each address referenced during the course of the study, a unique location number is assigned and placed in this file. We choose only locations that are matched or out of the region.
    - cthh_main.csv: This file contains data about households present in the travel survey.
    - PERMAIN.csv: This file contains data about persons present in the travel survey.
    - PLACMAIN.csv: This file contains data regarding trips made to each place during the travel survey.

- We do the following data editing.

    - Delete persons who did not respond to the survey questions.
    - Delete persons who did not use travel diary.
    - Delete persons who made no trips on their travel day.
    - Only include SCAG trips that starts and ends at home.
    - Only include persons from the base sample in the SCAG travel survey data.

- We wrote a code in R which assigns for each person the same number to the series of SCAG trips that starts and ends at home. This is the RELU-LA trip number for the person.

- We then assign for each person the same purpose to the series of SCAG trips that starts and ends at home. This is the RELU-LA trip purpose for the person.

    - This is the purpose with the greatest activity duration among the series of SCAG trips that starts and ends at home. This purpose can be,
        - Work
        - School
        - Shopping plus
        - Personal
        - Don't know

- The destination of the RELU-LA trip is the place with the highest activity duration.

- We then tabulate population RELU-LA non-work trips (all trips made for shopping plus and personal purposes) by household income, mode and O-D zone.

  $Trips_{jim|hi}^{nw}$ = Number of non-work trips between destination zone j, residence zone i and mode m by worker of household income type h.

    - Use final expansion weight to project sample estimates to population estimates.

- Convert RELU-LA model trips by household income, mode and O-D zone to worker earnings, mode and O-D zone using the following formula.

$$Trips^{nw}_{jim|f} = p_{f|hi} Trips^{nw}_{jim|hi}$$

$$P_{f|hi} = \frac{N_{ifh}}{\sum_f N_{ifh}}$$

$Trips^{nw}_{jim|f}$ = Number of non-work trips between destination zone j, residence zone i and mode m by worker of earnings type f.
$p_{f|hi}$ = Probability that a worker who resides in zone i and belongs to household income type h is of earnings type f.
N_{ifh} = Number of workers who reside in zone i, belong to household income type h, and are of earnings type f. (Source: CTPP 2000 part 1 table 39).

- Compute $Trips^{w}_{jim|f}$ (w = work) using the same method as $Trips^{nw}_{jim|f}$.

- Use the following method to calculate the number of RELU-LA non-work trips to be used in calibration.

$$Trips^{nw}_{jim|f,ctpp3} = \frac{Trips^{nw}_{jim|f}}{Trips^{w}_{jim|f}} Trips^{w}_{jim|f,ctpp3}$$

$Trips^{w}_{jim|f,ctpp3}$ = Number of RELU-LA work trips between work zone j, residence zone i, and mode of commuting m by workers of earnings type f. (Source: CTPP3 part 3 modified).

  - If $\frac{Trips^{nw}_{jim|f}}{Trips^{w}_{jim|f}}$ is missing then we substitute it by the sample mean.

5. Impute Construction Flow:

Problem: Construction flow data obtained from SCAG parcel data contained a lot of zeros. Therefore, it was decided to impute construction flow for the year 2000 for different building types based on the developer model in RELU-LA. The imputation was done using SCAG parcel data.

V_k = Value per square feet of floor space for building type k.
C_k = Construction cost per square feet of floor space.
f_k = Floor space to lot size ratio for building type k.
ρ = Discount rate.
Δ_k= Amount of land developed for building type k.
π_{0k} = Profit from developing a unit of vacant land into building type k.
Q_{0k} = Probability of developing a unit of vacant land into building type k.

α_k, β are parameters that are estimated from data.

$k = 0$ (Vacant)
$k = 1$ (Single Family Residential)
$k = 2$ (Multi-Family Residential)
$k = 3$ (Commercial)
$k = 4$ (Industrial)
$k = 5$ (Vacant)

$$\pi_{0k} = \alpha_k + \beta \frac{(V_k - C_k) f_k}{1 + \rho}, k = 1,2,3,4,5$$

$$\beta = exp(\gamma * \log(V_{0z}))$$

$V_{0z} =$ Value of vacant land in zone z.

$$Q_{0k} = \frac{e^{\pi_{0k}}}{\sum_{k'}^{5} e^{\pi_{0k'}}}, k = 1,2,3,4,5$$

$Q_{0k} =$ Probability of vacant land being developed into building type k.

- Estimate α_k and β using maximum likelihood technique.

$$max_{\alpha_k, \beta}\ ll = \sum_{z=1}^{97} \sum_{k=0}^{5} \Delta_{kz} log(Q_{0kz})$$

- Impute floor space.

$$\hat{F}_{kz} = f_{kz} \hat{Q}_{0kz} \left(\sum_{k=0}^{5} \hat{\Delta}_{kz} \right)$$

$\hat{F}_k =$ Imputed floor space for building type k.
$\hat{\Delta}_{kz} =$ Imputed developed land.

$$\hat{\Delta}_{kz} = \frac{\sum_{k=1}^{5} S_{kz,2006} - \sum_{k=1}^{5} S_{kz,1992}}{14}$$

$\sum_{k=1}^{5} S_{kz,1992}$ and $\sum_{k=1}^{5} S_{kz,2006}$ are the stock of developed land computed from the National Land Cover Dataset (NLCD) courtesy the USGS.

- Procedure to compute $\sum_{k=1}^{5} S_{kz,1992}$ and $\sum_{k=1}^{5} S_{kz,2006}$ (Done by Sayan De Sarkar).

- NLCD 1992-2001 retrofit landcover change, 2001 landcover, 2006 landcover. These are all in raster format.
- Modelzone_final_names which is a shapefile. It consists of information related to 97 zones.
- Add projection coordinate for the shapefile: GCS: NAD_1983; PCS: NAD_1983_UTM_Zone_11N.
- Clip all the raster data by the shapefile specification.
- Build raster attribute table.
- Select the VALUE = 21, 22, 23 and 24
- Use zonal statistics to get a table which gives us the developed land (in pixel count) for each of the 97 zones.
- Convert the count into square feet.

$$Elasticity_{k,V_k} = \frac{\sum_{z=1}^{97}\left[\frac{\beta V_{kz} f_{kz}}{1+\rho}(1-Q_{kz})\Delta_{kz}\right]}{\sum_{z=1}^{97}\Delta_{kz}}$$

Table 34: Estimation Results

Building Type	Variable	Estimate	t values	$\text{Elasticity}_{k,V_k}$
	γ	-1.41	-7048.94	
SFR	α_1	0.00		1.34
MFR	α_2	0.62	930.23	0.34
COM	α_3	1.84	2830.54	0.07
IND	α_4	2.33	3752.11	0.12
PUB	α_5	1.57	2306.91	0.25
Goodness of fit	0.91			

α_k is building k specific dummy.

6. Industry Cost Share on Buildings:

- Get from IMPLAN the Social Account Matrix (SAM) for each county.
- In each county, for each industry, find the share of 'Other Property Income' in total industry expenditure.
  7001 Other Property Income, 1001 Industry Total 15053, Factor Receipts*
- In each county find the share of 'Rents with Capital Consumption Adjustment' in 'Other Property Income' paid to households.
  10001 Households, 7001 Other Property Income, 15005 Rent with Capital ConsumptionAdj*
- Multiply the two shares to get the share of rent in industry expenditure.

*Institution Receipts, Institution Payments, Type of Transfer

30. Definitions

Capital consumption adjustment (CCAdj), (private). The difference between private capital consumption allowances (CCA) and private consumption of fixed capital (CFC). (Source: BEA)

Capital consumption allowance (CCA), (private). Consists of tax-return-based depreciation charges for corporations and nonfarm proprietorships and of historical-cost depreciation (calculated by BEA) for farm proprietorships, rental income of persons, and nonprofit institutions. Related terms: consumption of fixed capital (CFC), capital consumption adjustment (CCAdj). (Source: BEA)

Consumption of fixed capital (CFC). The charge for the using up of private and government fixed capital located in the United States. It is the decline in the value of the stock of fixed assets due to wear and tear, obsolescence, accidental damage, and aging. For general government and for nonprofit institutions that primarily serve individuals, CFC serves as a measure of the value of the current services of the fixed assets owned and used by these entities. Related terms: capital consumption adjustment (CCAdj), capital consumption allowance (CCA). (Source: BEA)

Other property type income consists of payments for rents, royalties, and dividends. Payments to individuals in the form of rents received on property, royalties from contracts, and dividends paid by corporations are included here as well as corporate profits earned by corporations. Other property type income numbers are derived from U.S. Bureau of Economic Analysis Gross State Product data. (Source: implan_pro_manual_v2_3rd_edition, Page 150)

30. Tables and Figures

Figure 13-1. SAM Framework

	Industry	Commodity	Factors	Institutitons	Enterprises	Capital	Trade	Total
Industry		*Make*					*Exports*	Total Industry Income
Commodity	*Use*			*Consumption*		*Consumption*		Total Commodity Income
Factors	*Value Added*						*Exports*	Total Factor Income
Institutions		*Sales*	*Transfers*	*Transfers*	*Transfers*		*Exports*	Total Institution Income
Enterprises								Total Enterprise Income
Capital						*Transfers*	*Exports*	Total Capital Income
Trade	*Imports*		*Factor Trade*	*Imports*		*Transfer*	*Exports*	Total Trade Income
Total	Total Industry Outlay	Total Commodity Outlay	Total Factor Outlay	Total Institution Outlay	Total Enterprise Outlay	Total Capital Outlay	Total Trade Outlay	

SAM Element Description

Institution Receipts	Descriptic	Institution Payments	Descriptior	Type of Transfer	Description
1001	Industry Total	2001	Commodity Total	15052	Commodity Make
1001	Industry Total	25001	Foreign Trade	15051	Commodity Trade
1001	Industry Total	28001	Domestic Trade	15051	Commodity Trade
2001	Commodity Total	1001	Industry Total	15050	Commodity Use
2001	Commodity Total	10001	Households	15051	Commodity Trade
2001	Commodity Total	11001	Federal Government NonDefense	15051	Commodity Trade
2001	Commodity Total	11002	Federal Government Defense	15051	Commodity Trade
2001	Commodity Total	11003	Federal Government Investment	15051	Commodity Trade
2001	Commodity Total	12001	State/Local Govt NonEducation	15051	Commodity Trade
2001	Commodity Total	12002	State/Local Govt Education	15051	Commodity Trade
2001	Commodity Total	12003	State/Local Govt Investment	15051	Commodity Trade
2001	Commodity Total	14001	Capital	15051	Commodity Trade
2001	Commodity Total	14002	Inventory Additions/Deletions	15051	Commodity Trade
5001	Employee Compensation	1001	Industry Total	15053	Factor Receipts
6001	Proprietary Income	1001	Industry Total	15053	Factor Receipts
7001	Other Property Income	1001	Industry Total	15053	Factor Receipts
8001	Indirect Business Taxes	1001	Industry Total	15053	Factor Receipts
10001	Households	2001	Commodity Total	15052	Commodity Make
10001	Households	5001	Employee Compensation	15002	Emp Comp (Wages/Salary w/o Soc Sec)
10001	Households	5001	Employee Compensation	15003	Employee Comp (Other Labor Income)
10001	Households	5001	Employee Compensation	15010	Transfers
10001	Households	6001	Proprietary Income	15004	Proprietors Inc (w/o Soc Sec & CCA)
10001	Households	7001	Other Property Income	15005	Rent with Capital Consumption Adj
10001	Households	7001	Other Property Income	15006	Business Transfers
10001	Households	7001	Other Property Income	15008	Interest (Net-from Industries)
10001	Households	7001	Other Property Income	15036	Interest (Net-from RoW)
10001	Households	10001	Households	15009	Interest (Gross)
10001	Households	11001	Federal Government NonDefense	15009	Interest (Gross)
10001	Households	11001	Federal Government NonDefense	15010	Transfers
10001	Households	12001	State/Local Govt NonEducation	15009	Interest (Gross)
10001	Households	12001	State/Local Govt NonEducation	15010	Transfers
10001	Households	13001	Enterprises (Corporations)	15007	Dividends
10001	Households	14001	Capital	15011	Surplus or Deficit
10001	Households	25001	Foreign Trade	15051	Commodity Trade
10001	Households	28001	Domestic Trade	15037	Factor Trade
10001	Households	28001	Domestic Trade	15051	Commodity Trade
11001	Federal Government NonDefense	2001	Commodity Total	15052	Commodity Make
11001	Federal Government NonDefense	5001	Employee Compensation	15013	Wage Accruals Less Surplus
11001	Federal Government NonDefense	5001	Employee Compensation	15014	Soc Sec Tax, Employee Contribution
11001	Federal Government NonDefense	5001	Employee Compensation	15015	Soc Sec Tax, Employer Contribution
11001	Federal Government NonDefense	6001	Proprietary Income	15014	Soc Sec Tax, Employee Contribution
11001	Federal Government	7001	Other Property Income	15008	Interest (Net-from Industries)

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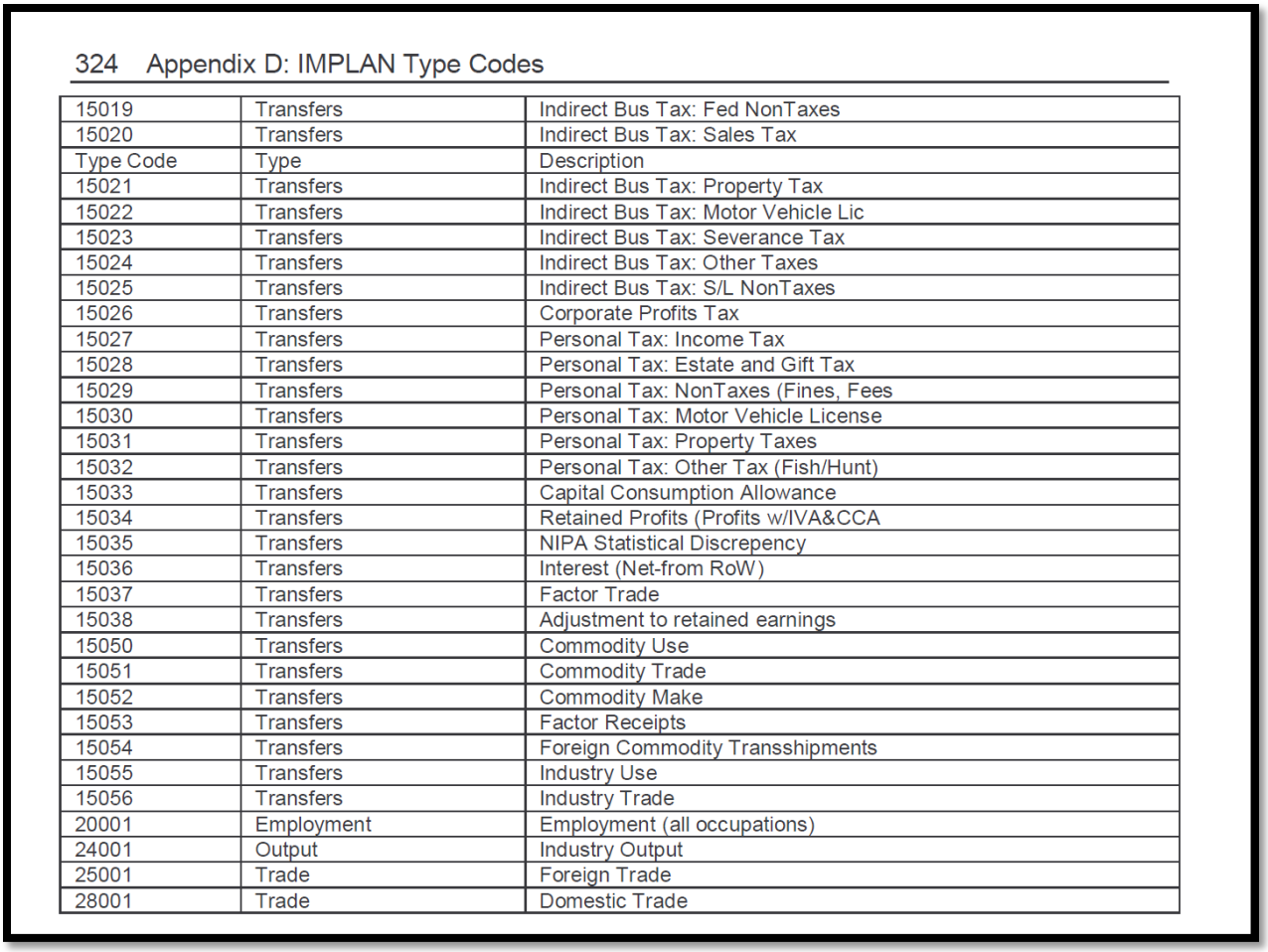
	NonDefense				
11001	Federal Government NonDefense	7001	Other Property Income	15016	Surplus-Subsidy, Govt Enterprises
11001	Federal Government NonDefense	7001	Other Property Income	15036	Interest (Net-from RoW)
11001	Federal Government NonDefense	8001	Indirect Business Taxes	15017	Indirect Bus Tax: Excise Taxes
11001	Federal Government NonDefense	8001	Indirect Business Taxes	15018	Indirect Bus Tax: Custom Duty
11001	Federal Government NonDefense	8001	Indirect Business Taxes	15019	Indirect Bus Tax: Fed NonTaxes
11001	Federal Government NonDefense	10009	Households	15009	Interest (Gross)
11001	Federal Government NonDefense	10009	Households	15027	Personal Tax: Income Tax
11001	Federal Government NonDefense	10009	Households	15028	Personal Tax: Estate and Gift Tax
11001	Federal Government NonDefense	10009	Households	15029	Personal Tax: NonTaxes (Fines, Fees
11001	Federal Government NonDefense	13001	Enterprises (Corporations)	15026	Corporate Profits Tax
11001	Federal Government NonDefense	25001	Foreign Trade	15051	Commodity Trade
11001	Federal Government NonDefense	28001	Domestic Trade	15051	Commodity Trade
11002	Federal Government Defense	11001	Federal Government NonDefense	15010	Transfers
11002	Federal Government Defense	14001	Capital	15011	Surplus or Deficit
11003	Federal Government Investment	11001	Federal Government NonDefense	15010	Transfers
12001	State/Local Govt NonEducation	2001	Commodity Total	15052	Commodity Make
12001	State/Local Govt NonEducation	5001	Employee Compensation	15013	Wage Accruals Less Surplus
12001	State/Local Govt NonEducation	5001	Employee Compensation	15014	Soc Sec Tax, Employee Contribution
12001	State/Local Govt NonEducation	5001	Employee Compensation	15015	Soc Sec Tax, Employer Contribution
12001	State/Local Govt NonEducation	6001	Proprietary Income	15014	Soc Sec Tax, Employee Contribution
12001	State/Local Govt NonEducation	7001	Other Property Income	15008	Interest (Net-from Industries)
12001	State/Local Govt NonEducation	7001	Other Property Income	15016	Surplus-Subsidy, Govt Enterprises
12001	State/Local Govt NonEducation	8001	Indirect Business Taxes	15020	Indirect Bus Tax: Sales Tax
12001	State/Local Govt NonEducation	8001	Indirect Business Taxes	15021	Indirect Bus Tax: Property Tax
12001	State/Local Govt NonEducation	8001	Indirect Business Taxes	15022	Indirect Bus Tax: Motor Vehicle Lic
12001	State/Local Govt NonEducation	8001	Indirect Business Taxes	15023	Indirect Bus Tax: Severance Tax
12001	State/Local Govt NonEducation	8001	Indirect Business Taxes	15024	Indirect Bus Tax: Other Taxes
12001	State/Local Govt NonEducation	8001	Indirect Business Taxes	15025	Indirect Bus Tax: S/L NonTaxes
12001	State/Local Govt NonEducation	10001	Households	15009	Interest (Gross)
12001	State/Local Govt NonEducation	10001	Households	15027	Personal Tax: Income Tax
12001	State/Local Govt NonEducation	10001	Households	15028	Personal Tax: Estate and Gift Tax
12001	State/Local Govt NonEducation	10001	Households	15029	Personal Tax: NonTaxes (Fines, Fees
12001	State/Local Govt NonEducation	10001	Households	15030	Personal Tax: Motor Vehicle License
12001	State/Local Govt NonEducation	10001	Households	15031	Personal Tax: Property Taxes
12001	State/Local Govt NonEducation	10001	Households	15032	Personal Tax: Other Tax (Fish/Hunt)
12001	State/Local Govt NonEducation	11001	Federal Government NonDefense	15010	Transfers

12001	State/Local Govt NonEducation	13001	Enterprises (Corporations)	15007	Dividends
12001	State/Local Govt NonEducation	13001	Enterprises (Corporations)	15026	Corporate Profits Tax
12001	State/Local Govt NonEducation	25001	Foreign Trade	15051	Commodity Trade
12001	State/Local Govt NonEducation	28001	Domestic Trade	15051	Commodity Trade
12002	State/Local Govt Education	12001	State/Local Govt NonEducation	15010	Transfers
12002	State/Local Govt Education	14001	Capital	15011	Surplus or Deficit
12003	State/Local Govt Investment	12001	State/Local Govt NonEducation	15010	Transfers
12003	State/Local Govt Investment	14001	Capital	15011	Surplus or Deficit
13001	Enterprises (Corporations)	7001	Other Property Income	15001	Corporate Profits with IVA
14001	Capital	2001	Commodity Total	15052	Commodity Make
14001	Capital	7001	Other Property Income	15033	Capital Consumption Allowance
14001	Capital	7001	Other Property Income	15035	NIPA Statistical Discrepency
14001	Capital	10009	Households	15011	Surplus or Deficit
14001	Capital	11001	Federal Government NonDefense	15011	Surplus or Deficit
14001	Capital	11003	Federal Government Investment	15011	Surplus or Deficit
14001	Capital	12001	State/Local Govt NonEducation	15011	Surplus or Deficit
14001	Capital	13001	Enterprises (Corporations)	15011	Surplus or Deficit
14001	Capital	14002	Inventory Additions/Deletions	15011	Surplus or Deficit
14001	Capital	25001	Foreign Trade	15051	Commodity Trade
14001	Capital	28001	Domestic Trade	15011	Surplus or Deficit
14001	Capital	28001	Domestic Trade	15051	Commodity Trade
14002	Inventory Additions/Deletions	2001	Commodity Total	15052	Commodity Make
14002	Inventory Additions/Deletions	25001	Foreign Trade	15051	Commodity Trade
14002	Inventory Additions/Deletions	28001	Domestic Trade	15051	Commodity Trade
25001	Foreign Trade	1001	Industry Total	15051	Commodity Trade
25001	Foreign Trade	7001	Other Property Income	15010	Transfers
25001	Foreign Trade	10009	Households	15010	Transfers
25001	Foreign Trade	10009	Households	15051	Commodity Trade
25001	Foreign Trade	11001	Federal Government NonDefense	15010	Transfers
25001	Foreign Trade	11001	Federal Government NonDefense	15051	Commodity Trade
25001	Foreign Trade	11002	Federal Government Defense	15051	Commodity Trade
25001	Foreign Trade	11003	Federal Government Investment	15051	Commodity Trade
25001	Foreign Trade	12001	State/Local Govt NonEducation	15051	Commodity Trade
25001	Foreign Trade	12002	State/Local Govt Education	15051	Commodity Trade
25001	Foreign Trade	12003	State/Local Govt Investment	15051	Commodity Trade
25001	Foreign Trade	14001	Capital	15011	Surplus or Deficit
25001	Foreign Trade	14001	Capital	15051	Commodity Trade
25001	Foreign Trade	14002	Inventory Additions/Deletions	15051	Commodity Trade
25001	Foreign Trade	25001	Foreign Trade	15051	Commodity Trade
28001	Domestic Trade	1001	Industry Total	15051	Commodity Trade
28001	Domestic Trade	7001	Other Property Income	15037	Factor Trade
28001	Domestic Trade	10009	Households	15051	Commodity Trade
28001	Domestic Trade	11001	Federal Government NonDefense	15051	Commodity Trade
28001	Domestic Trade	11002	Federal Government Defense	15051	Commodity Trade
28001	Domestic Trade	11003	Federal Government Investment	15051	Commodity Trade
28001	Domestic Trade	12001	State/Local Govt NonEducation	15051	Commodity Trade
28001	Domestic Trade	12002	State/Local Govt Education	15051	Commodity Trade
28001	Domestic Trade	12003	State/Local Govt Investment	15051	Commodity Trade
28001	Domestic Trade	14001	Capital	15051	Commodity Trade
28001	Domestic Trade	14002	Inventory Additions/Deletions	15051	Commodity Trade

IMPLAN Data Types Codes

T pe Code	Type	Description
1-509	Industry/Commodity	Industry Detail
1001	Industry	Industry Total
2001	Commodity	Commodity Total
3001-3509	SAM Commodity Codes	Commodity Detail
5001	Factors	Employee Compensation
6001	Factors	Proprietary Income
7001	Factors	Other Property Income
8001	Factors	Indirect Business Taxes
10001	Households LT10k	Households LT10k
10002	Households 10-15k	Households 10-15k
10003	Households 15-25k	Households 15-25k
10004	Households 25-35k	Households 25-35k
10005	Households 35-50k	Households 35-50k
10006	Households 50-75k	Households 50-75k
10007	Households 75-100k	Households 75-100k
10008	Households 100-150k	Households 100-150k
10009	Households 150k+	Households 150k+
11001	Institutions	Federal Government NonDefense
11002	Institutions	Federal Government Defense
11003	Institutions	Federal Government Investment
12001	Institutions	State/Local Govt NonEducation
12002	Institutions	State/Local Govt Education
12003	Institutions	State/Local Govt Investment
13001	Institutions	Enterprises (Corporations)
14001	Institutions	Capital
14002	Institutions	Inventory Additions/Deletions
15001	Transfers	Corporate Profits with IVA
15002	Transfers	Emp Comp (Wages/Salary w/o Soc Sec)
15003	Transfers	Employee Comp (Other Labor Income)
15004	Transfers	Proprietors Inc (w/o Soc Sec & CCA)
15005	Transfers	Rent with Capital Consumption Adj
15006	Transfers	Business Transfers
15007	Transfers	Dividends
15008	Transfers	Interest (Net-from Industries)
15009	Transfers	Interest (Gross)
15010	Transfers	Transfers
15011	Transfers	Surplus or Deficit
15012	Transfers	Savings (Surplus) not use
15013	Transfers	Wage Accruals Less Surplus
15014	Transfers	Soc Sec Tax, Employee Contribution
15015	Transfers	Soc Sec Tax, Employer Contribution
15016	Transfers	Surplus-Subsidy, Govt Enterprises
15017	Transfers	Indirect Bus Tax: Excise Taxes
15018	Transfers	Indirect Bus Tax: Custom Duty



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15019	Transfers	Indirect Bus Tax: Fed NonTaxes
15020	Transfers	Indirect Bus Tax: Sales Tax
Type Code	Type	Description
15021	Transfers	Indirect Bus Tax: Property Tax
15022	Transfers	Indirect Bus Tax: Motor Vehicle Lic
15023	Transfers	Indirect Bus Tax: Severance Tax
15024	Transfers	Indirect Bus Tax: Other Taxes
15025	Transfers	Indirect Bus Tax: S/L NonTaxes
15026	Transfers	Corporate Profits Tax
15027	Transfers	Personal Tax: Income Tax
15028	Transfers	Personal Tax: Estate and Gift Tax
15029	Transfers	Personal Tax: NonTaxes (Fines, Fees
15030	Transfers	Personal Tax: Motor Vehicle License
15031	Transfers	Personal Tax: Property Taxes
15032	Transfers	Personal Tax: Other Tax (Fish/Hunt)
15033	Transfers	Capital Consumption Allowance
15034	Transfers	Retained Profits (Profits w/IVA&CCA
15035	Transfers	NIPA Statistical Discrepency
15036	Transfers	Interest (Net-from RoW)
15037	Transfers	Factor Trade
15038	Transfers	Adjustment to retained earnings
15050	Transfers	Commodity Use
15051	Transfers	Commodity Trade
15052	Transfers	Commodity Make
15053	Transfers	Factor Receipts
15054	Transfers	Foreign Commodity Transshipments
15055	Transfers	Industry Use
15056	Transfers	Industry Trade
20001	Employment	Employment (all occupations)
24001	Output	Industry Output
25001	Trade	Foreign Trade
28001	Trade	Domestic Trade

Table 35: SHARE OF RENT IN OTHER PROPERTY INCOME BY COUNTY

COUNTY	SHARE
Imperial	4.03
Los Angeles	5.39
Orange	4.99
Riverside	6.83
San Bernardino	4.31
Ventura	5.33

Source: IMPLAN

Table 36: SHARE OF OTHER PROPERTY INCOME IN TOTAL EXPENDITURE BY COUNTY

Source: IMPLAN

COUNTY	PaymentDescription	SHARE
Imperial	Agriculture, forestry, fishing, mining	9.45
Imperial	Construction	3.76
Imperial	Electric, gas, sanitary services	34.04
Imperial	Finance, insurance, real estate	41.09
Imperial	Manufacturing	6.58
Imperial	Others	62.76
Imperial	Public administration	12.53
Imperial	Retail trade	13.95
Imperial	Services	7.43
Imperial	Transportation, communications, warehousing	11.43
Imperial	Wholesale trade	12.89
LosAngeles	Agriculture, forestry, fishing, mining	24.94
LosAngeles	Construction	4.13
LosAngeles	Electric, gas, sanitary services	25.25
LosAngeles	Finance, insurance, real estate	31.71
LosAngeles	Manufacturing	8.76
LosAngeles	Others	62.74
LosAngeles	Public administration	15.01
LosAngeles	Retail trade	13.65
LosAngeles	Services	7.06
LosAngeles	Transportation, communications, warehousing	12.53
LosAngeles	Wholesale trade	12.97
Orange	Agriculture, forestry, fishing, mining	23.99
Orange	Construction	4.14
Orange	Electric, gas, sanitary services	26.9
Orange	Finance, insurance, real estate	35.54
Orange	Manufacturing	9.82
Orange	Others	62.74
Orange	Public administration	12.32
Orange	Retail trade	13.72
Orange	Services	7.46
Orange	Transportation, communications, warehousing	17.83
Orange	Wholesale trade	13.02
Riverside	Agriculture, forestry, fishing, mining	13.8
Riverside	Construction	3.83

Riverside	Electric, gas, sanitary services	23.95
Riverside	Finance, insurance, real estate	39.82
Riverside	Manufacturing	9.88
Riverside	Others	62.76
Riverside	Public administration	12.43
Riverside	Retail trade	13.74
Riverside	Services	8.09
Riverside	Transportation, communications, warehousing	11.18
Riverside	Wholesale trade	12.94
SanBernardino	Agriculture, forestry, fishing, mining	7.82
SanBernardino	Construction	3.93
SanBernardino	Electric, gas, sanitary services	24.58
SanBernardino	Finance, insurance, real estate	40.7
SanBernardino	Manufacturing	9.15
SanBernardino	Others	62.75
SanBernardino	Public administration	18.02
SanBernardino	Retail trade	13.82
SanBernardino	Services	7.28
SanBernardino	Transportation, communications, warehousing	11.24
SanBernardino	Wholesale trade	12.95
Ventura	Agriculture, forestry, fishing, mining	18.64
Ventura	Construction	3.89
Ventura	Electric, gas, sanitary services	27.91
Ventura	Finance, insurance, real estate	30.15
Ventura	Manufacturing	18.84
Ventura	Others	62.75
Ventura	Public administration	18.61
Ventura	Retail trade	13.85
Ventura	Services	7.51
Ventura	Transportation, communications, warehousing	18.12
Ventura	Wholesale trade	12.98