Mining TCAD and WCAD Public Record Data – ETL Guide to TCAD and WCAD

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ABSTRACT

A multitude of Public Record Data (PRD) is readily available for SAS programmers interested in data mining government data. This paper presents a step-by-step tutorial on how to request Public Tax Record data, import the data into SAS[®], and then perform ETL and data mining with BASE SAS[®].

INTRODUCTION

The Texas Public Information Act (Texas General Code in Title 5, Subchapter A and Subtitle 552) requires that Texas government organizations respond to data inquiries from the general public. This means that you can submit a Public Information Request (PIR) to gain access to reports or data held by taxing organizations such as the Travis Central Appraisal District (aka TCAD <u>www.traviscad.org</u>) or Williamson Central Appraisal District (aka WCAD <u>www.wcad.org</u>). This data can be combined with your organization's existing customer data to help build contact lists, improve demographic profiles, or just provide a better understanding of physical properties of customer buildings. Here, ETL (Extract, Transform, and Load) is critical to accurately merging the public data set with your internal data set.

METHODOLOGY - HOW TO GET TCAD DATA:

Public Data is generally available via a PIR (Public Information Request). Requests should be sent to the Records Coordinator.

1.) Email the Records Manager (<u>RecMgr@tcadcentral.org</u>). Since this file is generally large, it's probably best to have them post to an SFTP server or a cloud drive (Google Drive, Drop Box, etc.)

Hello TCAD Records Coordinator,

<Your Company> would like to order the most recent copy of the TCAD property files as well as the most recent Shapefiles (STANDARD APPRAISAL EXPORT and GIS SHAPEFILES). Can you please send a PayPal invoice to <Contact Here> (I believe the fee is \$80). <Contact Here> Email is <Contact Email Here>. Please use this link to upload the files to the SFTP file server (You will create a linked folder from your account to share SFTP LINK).

- thanks, <Your Name Here>

2.) Here is a typical cost breakdown

Here is a breakdown of the costs:

Standard Appraisal Export will contain appraisal roll information for each parcel. The information is in ASCII comma delimited format and may be imported into the database program of your choice. A template and instructions for importing the data into Access is included on the CD. A file layout of all data fields and an improvement type list is also included. The cost of the Standard Appraisal Export is \$55.

Qty x Price	Total	
5 x \$0.25	\$1.25	
35 x \$1.50	\$52.50	
15 x \$.0366	\$0.55	
CD	\$1.00	
	\$55.00	
	Qty x Price 5 x \$0.25 35 x \$1.50 15 x \$.0366 CD	Qty x Price Total 5 x \$0.25 \$1.25 35 x \$1.50 \$52.50 15 x \$.0366 \$0.55 CD \$1.00 \$55.00

GIS Shape files are the outline of parcels. They contain only the PID # and the house number on some of the files. They do not contain the street name or owner name. You must have GIS or ESRI to use them. You also need to purchase the Export in order to have the data to match them to. The GIS data will match the appraisal roll on a one to one basis. However, the GIS data is typically not as up-to-date as information extracted from our appraisal roll. We use the Prop ID field to make all joins. This is the key link between property ownership and GIS information. The export CD should include instructions for importing the text files into an access database. Once the files have been imported you can join the owner name and address data. The cost of the Shape file CD is \$25.

Itemized List of Charges:		
Description	Qty x Price	Total
Labor minutes (\$15/hour)	5 x \$0.25	\$1.25
Midsize minutes	15 x \$1.50	\$22.50
Client server minutes (\$2.20/hour)	5 x \$.0366	\$0.18

- 3.) The tables will be in an Access database format. Unpacking instructions are included.
 - a. The tables used in the database are: IMP_DET, IMP_INFO, LAND_DET, PROP, STATE_CD
 - b. Also download the most recent 'GIS Data'. Download to a network share or your local drive or order the CD

HOW TO GET WCAD DATA

4.) Ownership information can only be obtained via a PIR. There is no cost at this time. Send the following Email as a PIR to WCAD (<u>PIR@wcad.org</u>)

Hello WCAD,

My name is <Your Name Here>. I work for the <YOUR COMPAY NAME HERE>. I'm requesting a copy of the all unrestricted fields from the "Owner" table within the 2018 Access Database file. I would please like this in one of the following standard electronic formats: dbf, mdb, csv, txt, xlsx. A csv file is fine if this is easiest. I'm requesting this information so that I can update our databases with new property ownership information. Please let me know if you have any questions regarding this request

- Thanks, <Your Name Here>

- 5.) The remaining WCAD tables can be downloaded directly from the WCAD website:
 - a. Go to http://www.wcad.org/ and scroll down to the 'Data Downloads' section. Click 'Learn More' and 'accept disclaimer'
 - You can choose 'Certified Data' and download the '<Year> Access Export' (or possibly '<Year> Property Data Export')
 - c. If you select 'Non-Certified' data, you can get an Access version of next year's data
 - d. Download and UNZIP the file.
 - e. The tables used in the database are: Property, Owner, Sales, ImpSeg Real Property, Improvement Real Property, Final Values
 - f. Also download the most recent 'GIS Data':
 - i. Select GIS Data 'Parcels'
 - ii. Unzip the Parcel file. This is the Shapefile database.
 - g. Download to a network share or your local drive.

- 6.) TCAD
 - a. Once the fee has been paid, the TCAD coordinator will transfer the .zip files. Follow the "TCAD_Roll_Extract_Documentation" to rebuild the Access database.
 - b. Follow the unpacking instructions for the TCAD files.
 - c. The shapes files contain a map called "Parcel_Poly.shp". This map is in the Texas Planar (NAD 1983 State Plane Texas Central FIPS 4203 Feet) coordinate system (ESRI:102739). Details below:

7.) WCAD

- a. Download the WCAD Access database: "<Year> Appraisal Roll Report"
- b. Perform a compact and repair.
- c. Import the "OWNER" Table into the WCAD database
- d. The shapes files contain a map called "Parcel_Poly.shp". This map is in the Texas Planar (NAD 1983 State Plane Texas Central FIPS 4203 Feet) coordinate system (ESRI:102739). Details below:

It's important to be aware of the planar coordinate system of your shapefiles so that you can accurately overly other SAS[®] coordinate data with these. The example below shows how to intersect GPS data with your shapefile data using the sashelp.proj4def data set:

```
PROC MAPIMPORT OUT=WCAD DATAFILE="YOUR FILE PATH HERE\Parcel poly.shp";
run;
/*DEFINE LATTITUDE, LONGITUDE, AND POINT ID*/
data have (KEEP = lat long PointID);
      set <YOURPOINT DATA SET HERE>;
      run;
/*PROJECT YOUR DATA ONTO THE TEXAS PLANAR COORDINATE SYSTEM*/
proc gproject latlon
project=proj4 to="ESRI:102739"
data=have out=want;
id PointID;
run;
/*perform a geospacial overlay - this step can take some time \otimes*/
proc ginside data=WANT map=WCAD out=FOUND INSIDEONLY;
  id OBJECTID PROP ID;
run:
```

In the TCAD database you've just unpacked, the "prop_id" field serves as the "primary key". This key makes it possible to relate each table to the other tables. While there are many tables available in the TCAD public record database, I've found the tables listed below to be the most useful:

PROP	IMP_INFO	PROP ENT	STATE CD
prop_id	prop id		state of
prop type cd	prop val vr	prop_o	state_cu
prop val vr	impry id		state_cu_description
sup num	Impry type cd	sup_num	
sup action	Impry type desc	owner_ki	
sup.cd	Impry state cd	entry_d	
sup_cos	Impry homesite	entity_cu	
neo id	Impry val	enuty_name	
av owner id	and a loss	enuty_xrer_u	
py owner name		meri	
natial owner		assessed_val	
udi group		taxable_val	
filer1		ab_amt	
nv addr line1		en_amt	
py_addr_inici	IMP_DET	Ir_am	
py_dour_linez	prop_id	nt_amt	
py_addr_ines	prop_val_yr	pro_amt	
py_addr_dty	imprv_id	pc_amt	
py_addr_state	imprv_det_id	so_amt	
py_addr_country	Imprv_det_type_cd	ex366_amt	
py_addr_zip	Imprv_det_type_desc	hs_amt	
py_addr_zip_cass	Imprv_det_class_cd	ov65_amt	
py_addr_zp_rt	yr_built	dp_amt	
py_conndendal_nag	depreciation_yr	dv_amt	
py_address_suppress_riag	imprv_det_area	ex_amt	
nijerz	imprv_det_val	ch_amt	
py_addr_mi_deliverable	sketch_cmds	market_value	
hiler3		appraised_value	
stus_street_preix		hs_cap	
stus_sueer		ag_late_loss	
situs_street_sumx		freeport_late_loss	
situs_city		hs_state_amt	
srus_zip		hs_local_amt	
legal_desc	LAND_DEI	land_hstd_val	
legal acreace	-prop_id	land_non_hstd_val	
legal_acreage	prop_val_yr	imprv_hstd_val	
head ad	land_seg_id	imprv_non_hstd_val	
Nock	land_type_co	ag_use_val	
book	land_type_desc	ag_market_val	
tract_or_iot	state_cd	tim_use_val	
land_non_hetd_val	land_seg_nomeste	bm_market_val	
looper held val	size_acres	partial_entity	
imprv_ristu_val	size_square_reet	freeze_yr	
an use val	effective_front	freeze_ceiling	
ag_use_val	enecuve_deput	freeze_transfer_flag	
timber use	mkt_is_method	freeze_transfer_date	
timber market	Inst_IS_Cass	freeze_previous_tax	
annraised val	lanu_sey_mk_val	rreeze_previous_tax_unirrozen	
ten nement can	ag_appiy	freeze_transfer_percentage	
assessed val	ag_is_method	ive_amt	
filerd	ag_is_class	eco_amt	
arb protest flag	ag_value	ag_use_val_ne	
filer5		ag_use_val_ex	
deed book id		ag_market_ne	
deed book page		ag_market_ex	
daat dt		umber_use_ne	
mortgage co id		timber_use_ex	
mortage on name		umber_market_ne	
norwige_co_nerre		umber_market_ex	

Similarly, in the WCAD database you've just unpacked, the "PropertyID" field serves as the "primary key". While there are many tables available in the WCAD public record database, I've found the tables listed below to be the most useful:

Property	Improvement_Real_Property		ImpSeg-RealProperty
ID	ID	7	ID
PropertyID	 -PropertyID		- PropertyID
Tax Year	AdHocTaxYear		InstanceID
QuickRefID	NodeID		AdHocTaxYear
PropertyNumber	TreeNodeID		NodeID
PropertyNumberSearch	vTSGImp SequenceNumber		TreeNodeID
PropertvAddress	ParentNodeID		LBound
AbstractBlock	LPParentNodeID		ParentNodeID
Acres	fAdiPct		L PParentNodeID
PropertyTypeKey	fApprMethod		FirstPage
PropertyStatusCode	fComment		fActYear
PropertyStatusDesc			fAddlEixtures
PropertyStatusKey	Sale		fApprMethod
PropertyTypeDesc	ID		fΔrea
PropertyTypeCode	AdHocTaxYear		fAreaEactor
DateCreated	-PropertyID		fBedrooms
Date act Changed	OwnershipTransferID		fCapPorcont
InactiveDate	Book		fCanStatus
InactiveDate	Cmmnt		fCapVaar
Property Commont	DeedDate		fCapition
Propertycomment	DisplayOrder		fConstStyle
CabaalTavinglusita	InsertedBelow		f consultation
School LaxingUnits	InstrumentNumber		
TaxingUnitGroupCode	InstrumentTypeCode		TEΠYear (FetFinish
	OtherDeference		
	Dage		fFireplace
TaxingUnitList	Page Recorded Date		fFlatValue
NeighborhoodID	SalaData		ImpSeq-Commercial Property
NeighborhoodCode	SaleDale Calad lister Daview Nacidad		
NeighborhoodDesc	SalesHistoryReviewiveeded		-PropertyID
LeaseID	ImpSeq-Mobile Home Only		InstanceID
LeaseNumber			AdHocTaxYear
MapNumber			NodeID
PropertyFlags			TreeNodeID
TotalAgUseValue			Bound
TotalAssessedValue			ParentNodeID
TotalImpMktValue			
TotalLandMktValue			FirstPage
TotalPropMktValue			fActVear
TotalSqFtLivingArea			fApprMathad
LegalDescription	ParentNodeLD		fArea
MHModel			fAreaFactor
MHSpace	FirstPage		fCapParcont
MHTitle	fAdjPct		fCapStatus
SubBlock	Ownor		fCapVaar
SubLotRange			fCoiling
SubLot			fCondition
SubSection			Condition
C. J. L. J. J.	 PropertyID		Consistyle
Subunit			
PropertyLegalType	AdHocTaxYear		TDOCK
PropertyLegalType Township	AdHocTaxYear PartyID		rDock fEconomic
PropertyLegalType Township TownshipRange	AdHocTaxYear PartyID PrimaryOwner		TDOCK fEconomic fEffYear
SubUnit PropertyLegalType Township TownshipRange TownshipSection	AdHocTaxYear PartyID PrimaryOwner PropertyOwnerID		TDOCK fEconomic fEffYear fExtFinish

Interpreting and translating database fields can sometimes be more art than data science. Be sure to have a solid understanding of what the field values represent.

DATA FLOW DIAGRAM

Once you've imported the TCAD or WCAD data into SAS, you can then think about a data flow diagram outlining how you want to compose the data so that it will make sense within your organization. An ETL Data flow shown below:

			variable	туре	Len	Format
			Date	Num	8 1	MMDDYY8.
TCAD DATA	WCAD DATA		Time	Num	8 7	TIM E8.
	PropertyAddress		STATE_CD	Char	3	\$3.00
geo_id	QuickRefID		STATECODE	Char	50	\$50.00
prop_id	TavingUnitList		MINSOFT	Num	8	10
prop_type_cd			MAXFLOOR	Num	8	10
py owner name	TOTALIMPMETVALUE	MERGE AND ROLLUP	MINFLOOR	Num	8	10
Entities	TotalLandMktValue		MAXYRBLT	Num	8	10
impry hetd val	TotalSqFtLivingArea	SUMMARY DATA	MINYRBLT	Num	8	10
impro_nscu_vai	StreetNumber		BLDGCOUNT	Num	8	10
imprv_non_nstd_vai	UnitTypeKey		PROPERTYID	Char	12	\$12.00
land_hstd_val	UnitNumber		PROPTYPE	Char	18	\$18.00
land_non_hstd_val	Office the state of the state o		GEOCODE	Char	75	\$75.00
deed dt	StreetDirectional		OWNERNAME	Char	75	\$75.00
situs num	StreetName		TAXCODES	Char	75	\$75.00
situs street prefy	StreetSuffix		STREETNMBR	Char	10	\$10.00
situs_street_pieix	City		STREETPREFX	Char	6	\$6.00
situs_street	Zip		STREETUNIT	Char	6	\$6.00
situs_unit	Propert vTvpeCode		STREET	Char	75	\$75.00
situs_street_suffix	FullNamo		STREETSUEEX	Char	6	\$6.00
situs_city	DeedDate		STREETCITY	Char	75	\$75.00
situs_zip	DeedDate		STREETZIP	Char	6	\$6.00
hs_exempt	EverntionList		APPRAISEDLAND	Num	8 1	DOLLAR 12.2
land state cd	ExemptionList		APPRAISEDIM PROVEM ENT	Num	8 [OLLAR 12.2
appr owner name	QuickRefID		DEEDDATE	Num	8 1	MMDDYY8.
appr_addr_line1	Address1		FULLADDRESS	Char	150	\$150.00
appr_addr_lines	Address2		LOCATION	Char	25	\$25.00
appi_addi_inez	Address3		COUNTY	Char	20	\$20.00
appr_addr_ime3	FullName		POOLSPA	Char	15 10	\$15.00 \$10.00
appr_addr_city	MATLCTTY		POOLSPA_YR	Num	8	4
appr_addr_state	Chata		MAILTONAME	Char	50	\$50.00
appr addr country	State		MAILTOSTREET	Char	50 25	\$50.00 \$25.00
appr addr zip	MAILZIP		BATH_TOTAL	Num	8	5.2
abb.Taga.Trib			BED_TOTAL	Num	8	5.2
			COMMENT	Char	150	\$150.00

USING SAS CODE TO TRANSFORM YOUR DATA

Now that you have the data in a Microsoft ACCESS[®] format, you can create a BASE SAS[®] library to extract the fields you need for your project:

```
/*INPUT DATA LIBRARIES – USING SAS/ACCESS Interface to PC Files*/

libname TCADIN 'C:\LOCATION OF DATABASE\TCAD.accdb';/*TCAD IN*/

ibname WCADIN 'C:\LOCATION OF DATABSE\WCAD.accdb'; /*WCAD IN*/

/**OUTPUT DATA LIBRARIES**/

/*TCAD*/libname TCADOUT "C:\OUTPUT DIRECTORY\TCAD";

/*WCAD*/libname WCADOUT "C:\OUTPUT DIRECORY\WCAD";
```

You can now begin combining the fields you need for your project. Use the "PropertyID" or "PROP_ID" to combine fields from different tables. Here is an example SQL macro which will do this...

```
/*
                                                     */
                       JOINTBL Macro
/* MERGE TWO SOURCE TABLES AND OUTPUT A SAS SOURCE TABLE */
/***
                                                 *****/
%macro JOINTBL(INDIR, INTABLE1, INTABLE2, OUTDIR, OUTTABLE, FIELD1, FIELD2);
proc sql dquote=ansi;
     create table &OUTDIR..&OUTTABLE as
     select distinct a.*,b.*
     from &INDIR...&INTABLE1 as a left join &INDIR...&INTABLE2 as b on a.&Field1=b.&Field2
     quit;
%mend JOINTBL;
Call EXECUTE ('%JOINTBL(WCADIN, "Improvement Real Property", "ImpSeq-
RealProperty",WCAD,JOINCODES,PropertyID,PropertyID)');
```

It's helpful to create descriptive formats using "PROC FORMAT" in SAS to keep you on track while summarizing and defining your final data output. This can make the ETL steps less confusing...

proc format; /*MAPPING THE INPUT AND OUTF	PUT FIELDS*/	proc format;/*H	IOW TO CO	OUNT FLOORS*/
value \$FieldLabel		value	\$FloorCou	nt
/*TCAD*/ geo_id	= GEOCODE	'1st Fl	oor'	= 'COUNT' /*TCAD FIELD*/
py_owner_name	= OWNERNAME	'2nd F	loor'	= 'COUNT' /*TCAD FIELD*/
entities	= TAXCODES	'3rd Fl	loor'	= 'COUNT' /*TCAD FIELD*/
appraised_val	= APPRAISED	'4th Fl	loor'	= 'COUNT' /*TCAD FIELD*/
deed_dt	= DEEDDATE	'5th Fl	loor'	= 'COUNT' /*TCAD FIELD*/
situs_num	= STREETNMBR	'6th Fl	loor'	= 'COUNT' /*TCAD FIELD*/
situs_street_prefx	= STREETPREFX	'Lobby	y'	= 'COUNT' /*TCAD FIELD*/
situs_street	= STREET	'Addit	ional Floor	' = 'COUNT' /*TCAD FIELD*/
situs_unit	= STREETUNIT	'MA'		= 'COUNT' /*WCAD FIELD*/
situs_street_suffix	= STREETSUFFX	'MA2'		= 'COUNT' /*WCAD FIELD*/
situs_city	= STREETCITY	'MA3'		= 'COUNT' /*WCAD FIELD*/; run;
situs_zip	= STREETZIP			
/*WCAD*/ TaxingUnitList	= TAXCODES	proc format;/*⊦	IOW TO FI	ND POOLS*/
TotalAssessedValue	= APPRAISED	value	\$WaterCo	de
TotalSqFtLivingArea	= TOTALSQFT	/*POOLS*/'601'	=	"POOL COMM'L"
StreetNumber	= STREETNMBR	'609'	=	'POOL FV'
StreetDirectional	= STREETPREFX	'604'	=	'POOL RES CONC'
StreetName	= STREET	'603'	=	'POOL RES FIBERGL'
UnitNumber	= STREETUNIT	/*SPAS*/ '349'	=	'SPA FV'
StreetSuffix	= STREETSUFFX	'448'	=	'SPA FIBERGLASS'
City	= STREETCITY	'447'	=	'SPA CONCRETE'
Zip	= STREETZIP; run ;	'449'	=	'SPA'
		'1'	=	'SCP'; run ;

proc fo	mat;/*Sta	teCode*/	'G3'	=	'Mineral'
	value \$S	tateCode	'J1'	=	'UTILITY (WATER)'
/*TCAD	FIELDS*/		'J2'	=	'UTILITY (GAS)'
'A1'	=	'SINGLE FAMILY RESIDENCE'	'J3'	=	'UTILITY (ELECTRIC)'
'A2'	=	'SINGLE FAMILY RESIDENCE MH'	'J4'	=	'UTILITY (TELEPHONE)'
'A3'	=	'SINGLE FAMILY RESIDENCE DETAILS'	'J5'	=	'UTILITY (RAILROADS)'
'A4'	=	'CONDOS'	'J6'	=	'UTILITY (PIPELINES)'
'A5'	=	'CONDOS DETAILS'	'J7'	=	'UTILITY (CABLE)'
'A9'	=	'HS COMMERCIAL HIGHEST & BEST USE'	'J8'	=	'UTILITY (OTHER)'
'B1'	=	'MULTIFAMILY'	'J9'	=	'UTILITY (NOT CODED)'
'B2'	=	'DUPLEX'	'L1'	=	'COMMERCIAL PP'
'B3'	=	'TRI-PLEX'	'L2'	=	'INDUSTRIAL MAJOR MANUFACTURING PP'
'B4'	=	'FOUR-PLEX'	'L3'	=	'Mineral'
'C1'	=	'VACANT LOT'	'M1'	=	'TANGIBLE PERSONAL PROP MH'
'C2'	=	'VACANT LAND/MISC DETAILS'	'M2'	=	'NON-INCOME PRODUCING TANGIBLE PP'
'D1'	=	'ACREAGE (AG) 1-D-1'	'N'	=	'Mineral'
'D2'	=	'ACREAGE (NON-AG)'	'N1'	=	'INTANGIBLE PP'
'D3'	=	'AG 1-D'	'N2'	=	'RR ROLLING STOCK'
'E1'	=	'FARM AND RANCH IMPR'	'01'	=	'RESIDENTIAL INVENTORY'
'E2'	=	'FARM AND RANCH IMPR MH'	'S1'	=	'SPECIAL INVENTORY'
'E3'	=	'FARM AND RANCH IMPR MISC'	'X'	=	'TOTALLY EXEMPT PROPERTY'
'F1'	=	'COMMERCIAL IMPROVED'	'Y'	=	'Mineral'; run ;
'F2'	=	'INDUSTRIAL MAJOR MANUFACTURING IMPROVED'			
'F3'	=	'COMMERCIAL DETAILS'			
'F4'	=	'COMMERCIAL CONDO'			
'F5'	=	'COMMERCIAL RES CONVERSION'			
'G1'	=	'MINERAL'			
'G2'	=	'Mineral'			

The example below shows how you can use public data to better understand your customers. The BASE SAS[®] code below will overlay properties with hot tubs on the Austin Energy Service Territory. Going further, you could use the "PROC GINSIDE" procedure to get a good count of all customers with hot tubs.



CONCLUSION

The instructions presented in this paper should get you started with TCAD and WCAD public record data. This type of data is very useful when establishing legal property ownership, taxable property attributes, and owner mailing information. You can add this data into existing databases, and relate it to your existing data at your organization using geocoding or GIS tools such as ESRI ARCGIS[®]. Happy Coding [©]

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REFERENCES

Texas Public Information Act https://en.wikipedia.org/wiki/Texas_Public_Information_Act

Paper BT005 Maps Made Easy Using SAS[®] Mike Zdeb, University of Albany School of Public Health <u>https://www.lexjansen.com/nesug/nesug03/bt/bt005.pdf</u>

Maps Made Easy Using SAS[®] Mike Zdeb, Art Carpenter, July 2002 https://www.sas.com/store/books/categories/getting-started/maps-made-easy-using-sas-/prodBK_57495_en.html

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