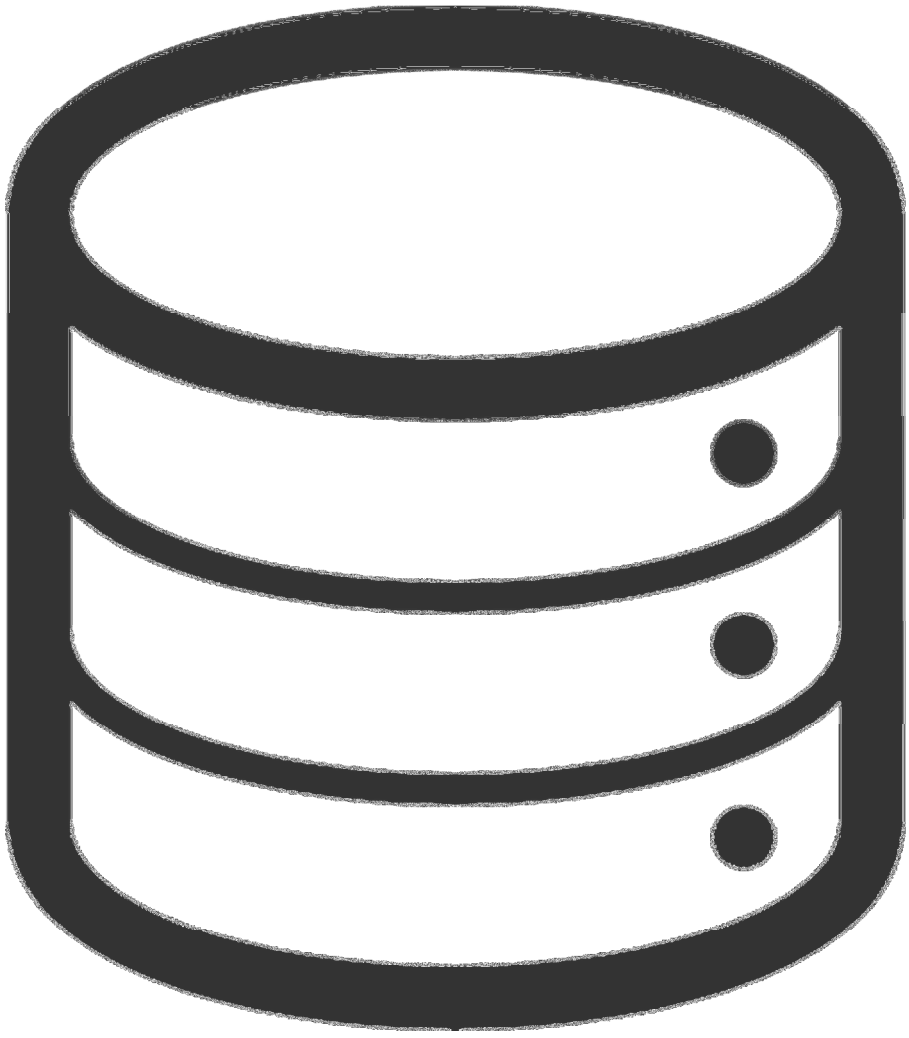
TransBASE

Technical Design Manual



Beta: 2.0

San Francisco Department of Public Health
Environmental Health Division
Draft for Review: September 22, 2014

1.0 Introduction

This document is intended to formally define the functional capabilities and the system architecture that defines the software and data components of TransBASE.

1.1 Project Overview

The objective of this project is to design a spatial database to support pedestrian safety analyses, including data on transportation-related injuries and collisions, transportation facilities, land use, and population characteristics. Currently, these datasets are typically collected and maintained by multiple agencies and aggregated using differing geographical units of analysis, making data acquisition extremely time consuming and limiting the ability to perform more complex analyses of system factors.

TransBASE's goal is to serve as the central data repository for all public health related transportation data; to be a free and open data resource for the general public to use; and to support interagency collaboration, data standards, and data sharing within San Francisco. The primary users of this database will be city staff involved in transportation safety research and individuals/groups in the general public who would use the data to conduct research or advocacy work.

1.2 Document Terms and Conventions

This Functional Requirements document defines the following acronyms and technical terms as:

Apache Tomcat: An open source software implementation of a Java Servlet used to extend the capabilities of a server.

Apache HTTP Server: Commonly referred to as Apache, is a free and open source web server application.

AWS: Amazon Web Services. A collection of remote computing services (also called web services) that together make up a cloud computing platform, offered over the Internet by Amazon.com.

CNN: Centerline network number. A unique number assigned by the Department of Public Works to identify intersections and street segments in the City's street centerline network data.

EC2: Amazon Elastic Compute Cloud. A commercial Web service from AWS that lets users "rent" computing resource in the cloud.

ERD: Entity relationship diagram. A data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database.

Ext JS: A pure open source JavaScript application framework for building interactive web applications using techniques such as Ajax, DHTML and DOM scripting.

GeoExt: An open source JavaScript library that integrates OpenLayers with the user interface of Ext JS to help build desktop style GIS applications on the web.

GeoServer: An open source software server written in Java that allows users to share and edit geospatial data. It can publish data from any major spatial data source using open standards.

GIS: Geographic information systems. A computer system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

Heron MC: Heron Mapping Client. An open source JavaScript library that facilitates the creation of browser-based web mapping applications with the GeoExt library.

MapFish Print: An open source Java library to print maps in a variety of formats.

ODBC: Open database connectivity. A standard programming language middleware application interface for accessing database management systems.

OpenLayers: An open source pure JavaScript library for displaying map data in most modern web browsers, with no server-side dependencies.

Open source: A software development model promotes a universal access via free license to a product's design or blueprint, and universal redistribution of that design or blueprint, including subsequent improvements to it by anyone.

PostGIS: An extension to the PostgreSQL object-relational database system which allows GIS objects to be stored in the database.

PostgreSQL: Often simply "Postgres", is an object-relational database management system with an emphasis on extensibility and standards-compliance. As a database server, its primary function is to store data, securely and supporting best practices, and retrieve it later, as requested by other software applications, be it those on the same computer or those running on another computer across a network.

RDBMS: Relational database management system. A software system where data is represented as a collection of tables, which might be related by common fields (database table columns).

SFDPH: San Francisco Department of Public Health.

SWITRS: Statewide Integrated Transportation Records System.

TransBASE: This term refers to all the components that make up the Department of Public Health's transportation safety database and includes: a single authoritative and spatially enabled database, a web-based viewing and query application, and the suite of potential future web services that will expand the capabilities and interface of the system.

2.0 System Description.

SFDPH seeks to create a relational database system where pedestrian and bicycle collision and injury data is integrated with existing environmental (including but not limited to transportation factors) and socio-demographic data. While initially developed to support pedestrian safety initiatives, TransBASE is designed to also serve other transportation and health initiatives. Its focus is much more narrow and specialized than DataSF, as it seeks to be a central repository for transportation systems safety and health-related data and is set up to aid in geospatial analysis.

2.1 System Overview

The TransBASE system will consist of the following primary entities:

- A single, authoritative spatially enabled PostgresSQL/PostGIS RDBMS.
- A web-based application portal that allow users to view TransBASE feature layers through a web mapping service (WMS) tile provider; query feature layers by attribute, location, or overlap with other features in TransBASE through a web feature service (WFS) provider; and create PDFs through a web map printing service provider.
- The ability to use an ODBC connection to allow other software systems access to the underlying database. Both geographic based feature layers and database tables are made available and can be accessed through either a GIS based systems (i.e. Esri, QGIS) or table/spreadsheet based systems (i.e. Access, R Studio).

2.2 System Functions

TransBASE consists of the following primary functions:

- Provide an authoritative portal for all transportation related safety data in the City.
- Provide accurate and timely metadata for all features contained within TransBASE.
- Allow City staff and members from the public to easily access and use data for a variety of purposes.

2.3 System Users

TransBASE will support several classes of users, including:

- SFDPH departmental staff. These users may wish to view and download transportation safety relate data in order to perform analysis or provide maps in reports. Departmental staff may use the web-based portal application to query, display, and print data on a map.
- Geographic Information Systems (GIS) staff at SFDPH or other City departments. This user group may integrate TransBASE data with other geospatial datasets using desktop GIS applications. GIS staff will have read-only access to data stored in TransBASE.
- General public. This user groups consists of individuals or groups in the general public who have an interest in doing research on or advocating for transportation safety issues in the City. This group may use the web-based portal application to query, display, and print on maps. In addition, groups with GIS technical skills will be able to access the underlying database through an ODBC connection.

2.4 Design and Implementation Constraints

The TransBASE system is developed within the following technical and deployment constraints:

- Open Source Software Use: SFDPH has defined the use of open source geospatial software as a requirement for the system.

- Cloud Computing Platform: TransBASE will be deployed "on the cloud" -- a virtual computing hardware and software available provided as a utility by a vendor.

- The data stored within the database should be made available in a variety of ways.

3.0 System Design Architecture

The overall system design for TransBASE may be communicated using an "architectural view" of the system. Architectural views describe the requirements and constraints of the system from a particular perspective.

The diagram below is an implementation view. This design view summarizes the significant components and sub-systems of the application and organizes these features into application tiers and identifies the application development environment and the main software modules, and the application tiers for the system.

3.1 Hardware and Operating System (as of Summer 2014)

EC2 instance specification:

Instance Family	Instance Type	Processor Arch	vCPU	Memory (GiB)	Instance Storage (GB)	EBS-optimized Available	Network Performance
General purpose	m1.large	64-bit	2	7.5	2 x 420	Yes	Moderate

Operating system: Windows Server Datacenter® 2008 R2 (Service Pack 2)

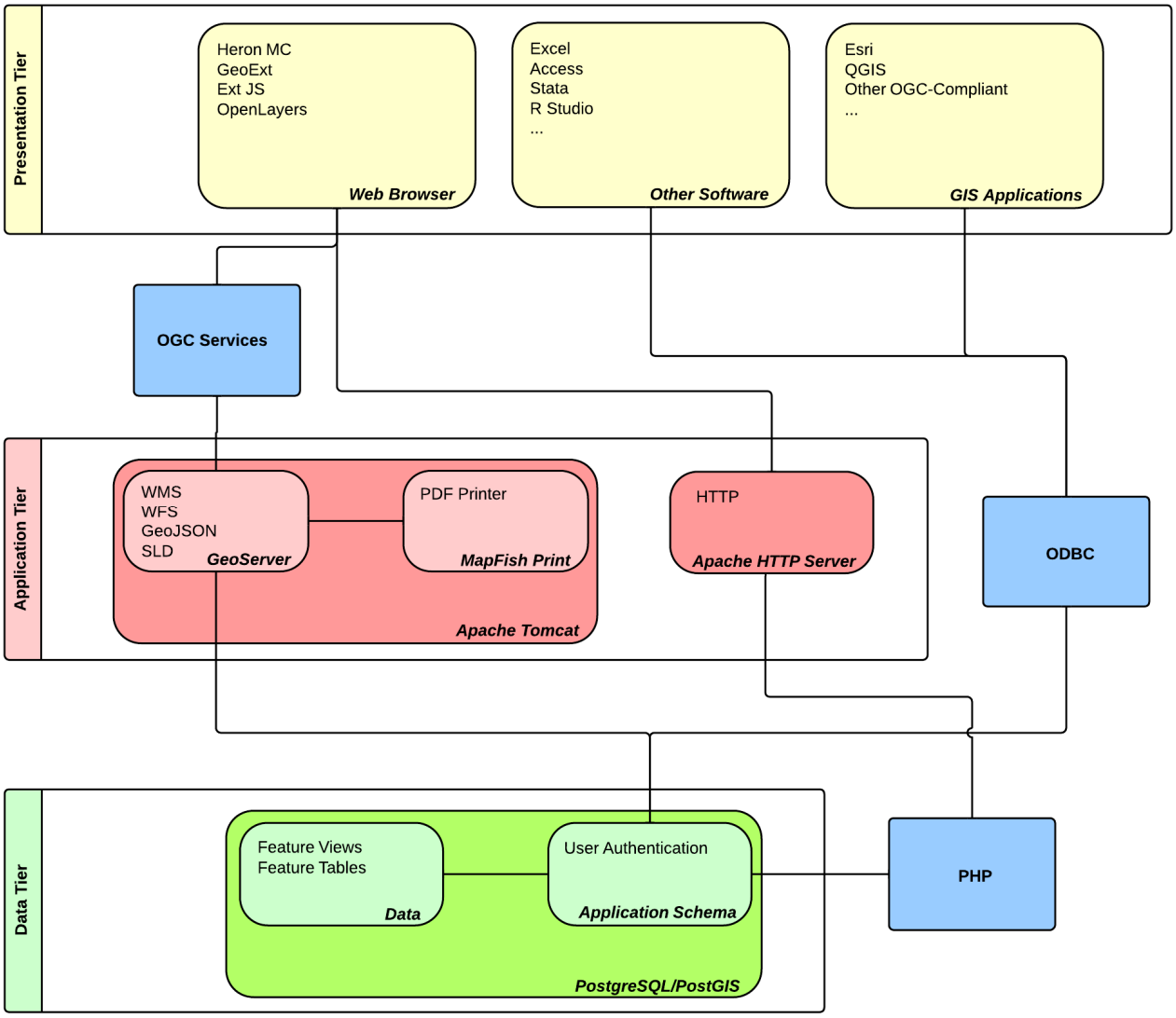
Processor: Intel® Xeon® CP E5-2650 0 @ 2.00GHz 1.81 Ghz

Memory (RAM): 7.50 GB

System type: 64-bit Operating System

3.2 Architecture Diagram

Implementation design view for TransBASE:



3.3 Data Tier Description

PostgreSQL 9.1 with PostGIS 2.0.3 is the open source backend database for TransBASE. Version 9.1/2.0.3 was chosen because it is compatible with ArcGIS 10.1 and above. Data is stored as tables in the database and can be served out as features with geographical information via views. The three methods currently used to access the data within PostgreSQL/PostGIS are with PHP (metadata table, one off project tables), ODBC, and as an OGC service with GeoServer. There currently exist two roles in the database: a super-user with permissions to create and edit tables/views/triggers/procedures, and a publically accessible role with read-only access to specific database tables/views.

3.4 Application Tier Description

Apache Tomcat is an open source implementation of the Java Servlet and JavaServer Pages (JSP) technology. In TransBASE it is used to deploy GeoServer and MapFish Print services. Apache Tomcat allows dynamic slippy map content as served by GeoServer to be easily configured and requested through a web browser.

Apache HTTP Server is a widely used open source HTTP server. In TransBASE it is used to serve static webpage content on the site. Apache HTTP Server also processes PHP scripts allowing for some dynamic content to be served (Metadata Panel).

GeoServer is an open source server written in Java for sharing geospatial data. Its role in TransBASE is to access the underlying PostgreSQL/PostGIS database and serve geospatial information in a variety of OGC compliant standards. GeoWebCache, a component of GeoServer, allows for the caching and retrieving of map tiles for quicker rendering in browsers. GeoServer also allows provides a REST interface for quickly manipulating data within the server.

MapFish Print is an open source web mapping application that is compliant with OGC standards. TransBASE currently uses only the print module to generate static PDF maps that a user can download.

3.5 Presentation Tier Description

OpenLayers is an open source JavaScript library used by the TransBASE web portal to build a rich web-based geographical application.

GeoExt is an open source JavaScript library that provides a user interface for interacting with layers presented by OpenLayers.

Ext JS is an open source JavaScript library similar to jQuery or Dojo which allows for the quick creation of rich web applications. GeoExt is dependent on the Ext JS library.

Heron MC is an open source JavaScript library that leverages GeoExt to create widgets and high-level components to quickly build a web based GIS application. TransBASE uses Heron MC's framework to and tools to create the web portal feature of the database.

4.0 Data Schema Information

4.1 Database Rules

All data must be projected in ESPG:3857 (WGS 1984 Web Mercator Auxiliary Sphere).

Unless a feature is a polygonal boundary, all tables joined to a geometry (either street segment or intersection) represented as a view to create a geospatially enabled feature class.

Every table must have a unique, nonrepeating identification for all records within that table.

Every table related to intersections or a street segment must have cnn_fkey (foreign key) the relates it back to either the geo_st_sgmt or geo_intrsctn feature class.

Every table field must be documented in the metadata table.

Field and table names must be all in lower case and underscores must be used for spaces.

Date ranges should be appended to end of table name.

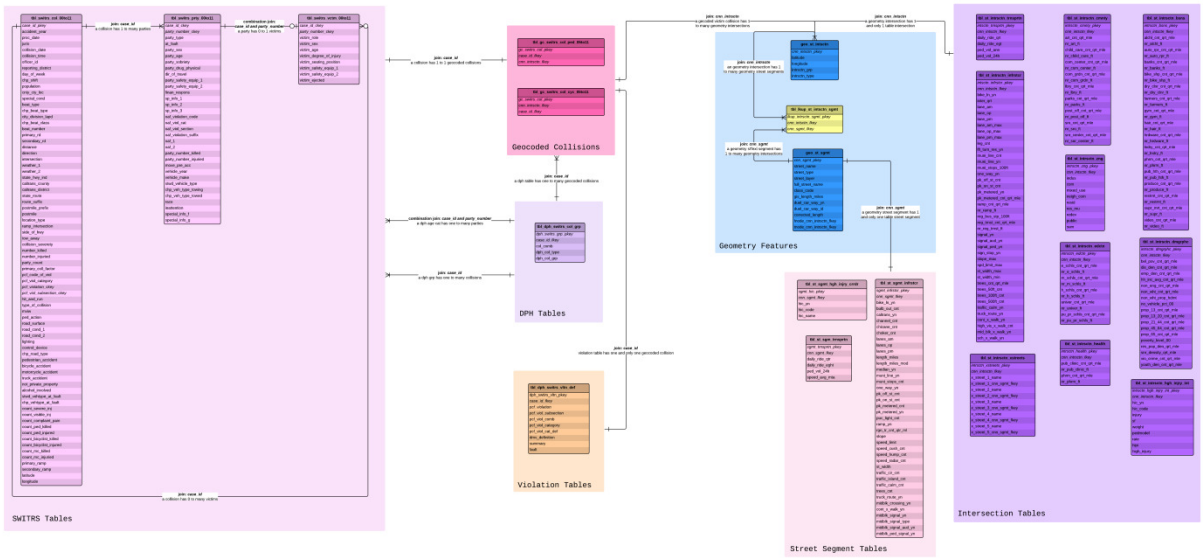
4.2 Naming Conventions

Prefixes

geo – Feature class with geometry
tbl – Table without geometry
vw – View representation of a feature class joined to table information
st_intrsctn – Data that are at or have been aggregated to an intersection level
st_sgmt – Data that are at or have been aggregated to a street segment level
bndry – Polygon feature class representing a political or geographical boundary
lkup – Lookup table
switrs – Data are from the Statewide Integrated Transportation Records System
sp – Special one-off projects or tables

4.3 Entity Relationship Design

See TransBASE_ERD_{date}.pdf for larger copy.



4.4 Table Description

Table: geo_st_intrsctn

Abstract: Dataset represents intersection nodes within the street centerline network of San Francisco.

Purpose: This is a geospatially enabled feature class containing all the intersections within the City of San Francisco. All other data tables with intersection level data should be joined to this geo_st_intrsctn in order to spatially enable said data tables. This dataset originated from the Department of Public Works street centerline file and can be found on DataSF here: https://data.sfgov.org/Geography/Street-Intersections-Zipped-Shapefile-Format-/snrq-gvyd.

Keys: cnn_intrsctn_pkey (primary key).

Relations: *cnn_intrsctn_pkey = cnn_intrsctn_fkey*. This relationship is found with the following tables: tbl_st_intrsctn_bsns (one to one); tbl_st_intrsctn_cmnty (one to one); tbl_st_intrsctn_dmgrphc (one to one); tbl_st_intrsctn_edctn (one to one); tbl_st_intrsctn_health (one to one); tbl_st_intrsctn_zng (one to one); tbl_gc_switrs_col_cyc_05to11 (many to one); tbl_gc_switrs_col_ped_05to11 (many to one); and tbl_lkup_st_intrsctn_sgmt (many to one). *cnn_intrsctn_pkey = f_node_cnn_intrsctn_fkey.* This relationship can be found with the following table: geo_st_sgmt (one to many). *cnn_intrsctn_pkey = t_node_cnn_intrsctn_fkey.* This relationship can be found with the following table: geo_st_sgmt (one to many).

Table: geo_st_sgmt

Abstract: Data set represents the street centerline network of San Francisco.

Purpose: This is a geospatially enabled feature class containing all the street segments that allow for vehicle traffic within the City of San Francisco. All other data tables with street segment level data should be joined to this geo_st_sgmt in order to spatially enable said data tables. This dataset originated from the Department of Public Works street centerline file and can be found on DataSF here: https://data.sfgov.org/Geography/Streets-of-San-Francisco-Zipped-Shapefile-Format-/wbm8-ratb.

Keys: cnn_sgmt_pkey (primary key); f_node_cnn_intrsctn_fkey (foreign key); t_node_cnn_intrsctn_fkey (foreign key).

Relations: *cnn_sgmt _pkey = cnn_sgmt_fkey*. This relationship can be found with the following tables: tbl_st_sgmt_cyc_hgh_injry_crrdr (one to one); tbl_st_sgmt_cyc_lanes (one to one); tbl_st_sgmt_infrstcr (one to one); tbl_st_sgmt_ped_hgh_injry_crrdr (one to one); tbl_st_sgmt_trnsprtn (one to one) tbl_lkup_st_intrsctn_sgmt (many to one). *f_node_cnn_intrsctn_fkey = cnn_intrsctn_pkey.* This relationship can be found with the following table: geo_st_intrsctn (many to one). *t_node_cnn_sgmt_fkey = cnn_intrsctn_pkey.* This relationship can be found with the following table: geo_st_intrsctn (many to one).

Table: tbl_dph_switrs_col_grp

Abstract: Table represents unique collision groups created by SFDPH.

Purpose: Collision types and groups, classified by the San Francisco Department of Public Health in 2012, are used within the department for defining unique injury collisions combinations based on who was involved in the collision using CHP SWITRS data. The 33 unique combinations ('ColComb') are split into 14 summarized collision types ('DPH_ColType') and 10 summarized collision groups ('DPH_ColGrp').

Keys: dph_switrs_grp_pkey (primary key); case_id_fkey (foreign key).

Relations: *case_id_fkey = case_id_pkey*. This relationship can be found with the following tables: tbl_switrs_col_05to11 (one to one); tbl_gc_switrs_col_cyc_05to11 (one to one); tbl_gc_switrs_col_ped_05to11 (one to one). *case_id_fkey = case_id_ckey*. This relationship can be found with the following tables: tbl_switrs_prty_05to11 (one to many); tbl_switrs_vctm_05to11 (one to many).

Table: tbl_dph_switrs_vltn_def

Abstract: Table represents the Department of Motor Vehicle (DMV) definitions for California Vehicle Code (CVC) for primary collision factor violation (PCF).

Purpose: The purpose of this table is to provide an exact definition from the DMV CVC violation found in the SWITRS collision table. In addition, this table contains a summary created by SFDPH of the violation and, based off the text of the violation, a determination as to who is at fault. Only the CVC violations for vehicle-pedestrian and vehicle-cyclist collision are currently in this table.

Keys: dph_swtirs_vltn_pkey (primary key); case_id_fkey (foreign key).

Relations: *case_id_fkey = case_id_pkey*. This relationship can be found with the following tables: tbl_switrs_col_05to11 (one to one); tbl_switrs_prty_05to11 (one to many); tbl_switrs_vctm_05to11 (one to many); tbl_gc_switrs_col_cyc_05to11 (one to many); tbl_gc_switrs_col_ped_05to11 (one to many).

Table: tbl_gc_switrs_col_cyc_05to11

Abstract: Table is a lookup between SWITRS collisions and street intersections in San Francisco where a cyclist was an injured victim in a collision.

Purpose: This table assigns collisions where a cyclist was a victim from tbl_switrs_col_05to11 to an intersection in geo_st_intrsctn. The data was geocoded at an intersection level using a combination of the ArcGIS Online Geocoding Service, San Francisco's street centerline network, and Google Maps. All SWITRS injury collision data is geocoded at an intersection level and does not take any offset distance into account.

Keys: gc_switrs_col_pkey (primary key); case_id_fkey (foreign key); cnn_intrsctn_fkey (foreign key).

Relations: *case_id_fkey = case_id_pkey*. This relationship is found with the following table: tbl_switrs_col_05to11 (one to one); case_id_fkey = *case_id_ckey*. This relationship is found with the following tables: tbl_switrs_prty_05to11 (one to many); tbl_switrs_vctm_05to11 (one to many).

Table: tbl_gc_switrs_col_ped_05to11

Abstract: Table is a lookup between SWITRS collisions and street intersections in San Francisco where a pedestrian was an injured victim in a collision.

Purpose: This table assigns collisions where a pedestrian was a victim from tbl_switrs_col_05to11 to an intersection in geo_st_intrsctn. The data was geocoded at an intersection level using a combination of the ArcGIS Online Geocoding Service, San Francisco's street centerline network, and Google Maps. All SWITRS injury collision data is geocoded at an intersection level and does not take any offset distance into account.

Keys: gc_switrs_col_pkey (primary key); case_id_fkey (foreign key); cnn_intrsctn_fkey (foreign key).

Relations: *case_id_fkey = case_id_pkey.* This relationship is found with the following table: tbl_switrs_col_05to11 (one to one); case_id_fkey = *case_id_ckey.* This relationship is found with the following tables: tbl_switrs_prty_05to11 (one to many); tbl_switrs_vctm_05to11 (one to many).

Table: tbl_lkup_st_intrsctn_sgmt

Abstract: Table acts as a lookup between an intersection and all the street segments that intersect at that street segment.

Purpose: This table provides a way to lookup up all the intersections that a street segment intersects or all the street segments that meet at a given intersection.

Keys: lkup_intrsctn_sgmt_pkey (primary key); cnn_intrsctn_fkey (foreign key); cnn_sgmt_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey.* This relationship is found with the following tables: geo_st_intrsctn (one to one). *cnn_sgmt_fkey = cnn_sgmt_pkey.* This relationship is found with the following tables: geo_st_sgmt (one to one).

Table: tbl_metadata

Abstract: Table contains all the metadata information for fields found within each feature class or table in TransBASE.

Purpose: This table is intended to keep track of all the metadata in TransBASE and provide a standard template for metadata that should be collected for each table or feature class. Each record in the metadata table contains information for a specific field (column) in a feature class or table. This table will be updated whenever a table or feature class is added to TransBASE.

Keys: meta_id (primary key).

Relations: This table has no relationships with other tables.

Table: tbl_st_intrsctn_bsns

Abstract: Table contains information on an intersection's proximity to commercial services.

Purpose: This table aggregates business and commercial service data to an intersection level. Both the distance to the nearest business in feet and count of businesses within a quarter mile radius of each intersection are calculated. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intsctn_bsns_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_cmnty

Abstract: Table contains information on an intersection's proximity to community and civic institutions.

Purpose: This table aggregates community and civic institution data to an intersection level. Both the distance to the nearest community/civic institution in feet and count of community/civic institutions within a quarter mile radius of each intersection are calculated. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_cmnty_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_dmgrphc

Abstract: Table contains information on an intersection's relation to demographic and socio-economic data.

Purpose: This table aggregated demographic and socio-economic data at an intersection level. Data is presented as either a raw count of units within a given radius of the intersection or as a proportion of the total population that meets a given condition. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_dmgrphc (primary key); pkey cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_edctn

Abstract: Table contains information on an intersection's proximity to educational institutions.

Purpose: This table aggregates educational institution data to an intersection level. Both the distance to the nearest educational institution in feet and count of educational institutions within a quarter mile radius of each intersection are calculated. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_edctn_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_health

Abstract: Table contains information on an intersection's proximity to healthcare institutions.

Purpose: This table aggregates healthcare institution data to an intersection level. Both the distance to the nearest healthcare institution in feet and count of healthcare institutions within a quarter mile radius of each intersection are calculated. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_health_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_hgh_injry_int

Abstract: Table contains intersections that are High Injury / Pedestrian Volume Intersections (HIPIs) and High Injury Intersections (HIIs).

Purpose: This table shows intersections that are High Injury / Pedestrian Volume Intersections (HIPIs) and High Injury Intersections (HIIs). Locations with a relatively high rate of (pedestrian injuries/pedestrian volumes), using pedestrian volumes estimated from a pedestrian volume model developed for San Francisco. HIIs are intersections with a relatively higher number of pedestrian injuries that were not located on HICs. For more information on efforts by SFDPH and the Pedestrian Safety Task Force to address pedestrian safety in San Francisco, visit Program on Health, Equity and Sustainability: Pedestrian Safety For a detailed methodology of how high-injury intersections were identified: Identifying High Injury Density Corridors and Areas for Targeted Safety Improvements to Reduce Severe and Fatal Pedestrian Injuries: A Methodology.

Keys: intrsctn_hgh_injry_int_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_infrstcr

Abstract: Table contains information on an intersection's proximity to transportation infrastructure.

Purpose: This table aggregates infrastructure improvements to an intersection level. Some fields note the presence of specific infrastructure at an intersection level while others give the distance to the nearest infrastructure improvement in feet or a count of improvements within a specified radius of each intersection. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_infrstcr_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_trnsprtn

Abstract: Table contains information on an intersection's relation to transportation data.

Purpose: This table aggregates transportation related count data to an intersection level. This data is often either manual counts or created from a traffic model. Some fields represent a proximity or radius calculation while others are counts at a specific intersection. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_trnsprtn_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_xstreets

Abstract: Table contains an intersection's cross streets.

Purpose: This table contains all the names and cnn_sgmt_fkeys for all the street segments that intersect at that given intersection in a horizontal table format. Fields that do not apply to an intersection are assigned a NULL for their record value.

Keys: intrsctn_xstreets_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_intrsctn_zng

Abstract: Table contains information on an intersection's relation to land use zoning data.

Purpose: This table aggregates zoning and land use related data to an intersection level. This data is often either manual counts or created from a traffic model. Some fields represent a proximity or radius calculation while others are counts at a specific intersection. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: intrsctn_zng_pkey (primary key); cnn_intrsctn_fkey (foreign key).

Relations: *cnn_intrsctn_fkey = cnn_intrsctn_pkey*. This relationship is found with the following tables: geo_st_intrsctn (one to one).

Table: tbl_st_sgmt_cyc_hgh_injry_crrdr

Abstract: Pedestrian high-injury corridors represent 4.2% of San Francisco's street miles, and include 60% of all severe and fatal cyclist injuries and 50% of total cyclist injuries reported to the State Highway Patrol between 2005 and 2011.

Purpose: Cyclist high injury corridors are derived from 2007-2011 injury records. Severe and fatal injuries were weighted by multiplying those counts times 3 while complaints of pain and visible injury were assigned a count of 1. Weighted injuries were then aggregated at an intersection level (based on primary and secondary streets in SWITRS) and then assigned their adjoining street segments. The high injury corridors capture 66% of vehicle-pedestrian-cyclist injuries, 57% of cyclist-pedestrian injuries, 45% of cyclist-parked car injuries, and 54% of cyclist only injuries. A complete methodology will be posted online in late August of 2014.

Keys: sgmt_cyc_hgh_injry_crrdr_pkey (primary key); cnn_sgmt_fkey (foreign key).

Relations: *cnn_sgmt_fkey = cnn_sgmt_pkey.* This relationship is found with the following tables: geo_st_sgmt (one to one).

Table: tbl_st_sgmt_cyc_lanes

Abstract: Table represents all cyclist infrastructure currently tracked by the SFMTA as of 2013.

Purpose: This table contains information about cyclist infrastructure improvements that have occurred on a street segment level. Information includes the facility type, direction of travel, installation data (if available), and other notes or features. Only street segments that contain cyclist infrastructure are included as records in this table.

Keys: sgmt_cyclst_infrstcr_pkey (primary); cnn_sgmt_fkey (foreign key).

Relations: *cnn_sgmt_fkey = cnn_sgmt_pkey.* This relationship is found with the following tables: geo_st_sgmt (one to one).

Table: tbl_st_sgmt_infrstcr

Abstract: Table contains information on a street segment's proximity to transportation infrastructure.

Purpose: This table aggregates infrastructure improvements to a street segment level. Some fields note the presence of specific infrastructure at a street segment while others give the distance to the nearest infrastructure improvement in feet or a count of improvements within a specified radius of each street segment. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: sgmt_infrstcr_pkey (primary key); cnn_sgmt_fkey (foreign key).

Relations: *cnn_sgmt_fkey = cnn_sgmt_pkey.* This relationship is found with the following tables: geo_st_sgmt (one to one).

Table: tbl_st_sgmt_ped_hgh_injry_crrdr

Abstract: Pedestrian high-injury corridors represent 6.2% of San Francisco's street miles, and include 60% of all severe and fatal injuries and 55% of total pedestrian injuries reported to the State Highway Patrol between 2005 and 2011.

Purpose: This analysis was conducted on behalf of the Data Subcommittee of the Citywide Pedestrian Safety Task Force, convened in 2010 by a mayoral executive directive to address the citywide goal of reducing serious and fatal pedestrian injuries by 50% by 2021. The high-injury corridors were identified based on severity-weighted pedestrian injury counts for injuries reported between 2005 and 2011. For more information on efforts by SFDPH and the Pedestrian Safety Task Force to address pedestrian safety in San Francisco, visit Program on Health, Equity and Sustainability: Pedestrian Safety For a detailed methodology of how high-injury corridors were identified: Identifying High Injury Density Corridors and Areas for Targeted Safety Improvements to Reduce Severe and Fatal Pedestrian Injuries: A Methodology.

Keys: st_sgmt_ped_hgh_injry_crrdr_pkey (primary key); cnn_sgmt_fkey (foreign key).

Relations: *cnn_sgmt_fkey = cnn_sgmt_pkey.* This relationship is found with the following tables: geo_st_sgmt (one to one).

Table: tbl_st_sgmt_trnsprtn

Abstract: Table contains information on a street segment's relation to transportation data.

Purpose: This table aggregates transportation related count data to a street segment level. This data is often either manual counts or data created from a traffic model. Some fields represent a proximity or radius calculation while others are counts at a specific street segment. All spatial calculations were performed in the NAD 1983 State Plane California III FIPS 0403 Feet projected coordinate system.

Keys: sgmt_trnsprtn_pkey (primary key); cnn_sgmt_fkey (foreign key).

Relations: *cnn_sgmt_fkey = cnn_sgmt_pkey.* This relationship is found with the following tables: geo_st_sgmt (one to one).

Table: tbl_switrs_col_05to11

Abstract: Collision table contains information on each collision. Data is from the Statewide Integrated Transportation Records System (SWITRS) from 2005 to 2011.

Purpose: The Statewide Integrated Traffic Records System (SWITRS) is a database administered by the California Highway Patrol (CHP) that serves as a means to collect and process data gathered from a collision scene. The collision table in TransBASE contains all collision in the City of San Francisco from 2005 to 2011. More information on SWITRS can be found here: http://iswitrs.chp.ca.gov/Reports/jsp/RawData.jsp. For a more detailed description of the data in this table please consult the SIWTRS Codebook available here: http://tims.berkeley.edu/help/files/SWITRS_codebook.doc.

Keys: switrs_col_pkey (primary key); case_id_pkey (primary key).

Relations: *case_id_pkey = case_id_ckey.* This relationship is found with the following tables: tbl_switrs_prty_05to11 (one to many); tbl_switrs_vctm_05to11 (one to many). *case_id_pkey =case_id_fkey.* This relationship is found with the following tables: tbl_gc_switrs_col_ped_05to11 (one to many); tbl_gc_switrs_col_cyc_05to11 (one to many); tbl_dph_switrs_col_grp (one to many); tbl_dph_switrs_vltn_def (one to one).

Table: tbl_switrs_prty_05to11

Abstract: The party table contains information on each party involved in a collision. Data is from the Statewide Integrated Transportation Records System (SWITRS) from 2005 to 2011.

Purpose: The Statewide Integrated Traffic Records System (SWITRS) is a database administered by the California Highway Patrol (CHP) that serves as a means to collect and process data gathered from a collision scene. The party table in TransBASE contains all party members, regardless of injury or mode of transportation, involved in a collision in the City of San Francisco from 2005 to 2011. More information on SWITRS can be found here: http://iswitrs.chp.ca.gov/Reports/jsp/RawData.jsp. For a more detailed description of the data in this table please consult the SIWTRS Codebook available here: http://tims.berkeley.edu/help/files/SWITRS_codebook.doc.

Keys: switrs_prty_pkey (primary key); case_id_ckey (combination key); party_number_ckey (combination key). Note that together case_id_ckey and party_number_ckey make a unique key for each party record.

Relations: *case_id_ckey = case_id_pkey.* This relationship is found with the following tables: tbl_switrs_col_05to11 (many to one). *case_id_ckey/party_number_ckey.* This relationship is found with the following tables: tbl_switrs_vctm_05to11 (one to one).

Table: tbl_switrs_vctm_05to11

Abstract: The victim table contains information on each party member who has been injured and is involved in a collision. Data is from the Statewide Integrated Transportation Records System (SWITRS) from 2005 to 2011.

Purpose: The Statewide Integrated Traffic Records System (SWITRS) is a database administered by the California Highway Patrol (CHP) that serves as a means to collect and process data gathered from a collision scene. The victim table in TransBASE contains all victim parties (parties that have suffered an injury) regardless of injury or mode of transportation, involved in a collision in the City of San Francisco from 2005 to 2011. More information on SWITRS can be found here: http://iswitrs.chp.ca.gov/Reports/jsp/RawData.jsp. For a more detailed description of the data in this table please consult the SIWTRS Codebook available here: http://tims.berkeley.edu/help/files/SWITRS_codebook.doc.

Keys: switrs_vctm_pkey (primary key); case_id_ckey (combination key); party_number_ckey (combination key). Note that together case_id_ckey and party_number_ckey make a unique key for each victim record.

Relations: This relationship is found with the following tables: *case_id_ckey = case_id_pkey.* This relationship is found with the following tables: tbl_switrs_col_05to11 (many to one). *case_id_ckey/party_number_ckey.* This relationship is found with the following tables: tbl_switrs_prty_05to11 (one to one).
