Metro Orlando Licensing Packet | June 2021

xGeographic

CONTENTS

01 | Wave GIS Suite

The Wave suite is currently available for Orange, Osceola and Seminole County, Florida. The Wave suite consists of a series of GIS files that can be used by Wave users. These files have been created using a methodology consisting of a series of geoprocessing and coding steps that update the database with updates to baseline input data.

Wave Roadway Segment Polyline GIS File

The Wave Polyline GIS shapefile consists of approximately 180,000 roadway segments and includes the fields detailed in section 03. Fields include roadway features, proximity features, and algorithmic outputs that use Wave software.

Wave Point of Interest Point GIS File

The Point of Interest Point GIS file contains 57 point of interest types, with a total of approximately 21,500 points of interest. This database can be queried for custom analysis.

Wave Park Polygon GIS File

The Park Polygon GIS file contains approximately 1,600 public parks and homeowner's association parks. These park types are differentiated within the TYPE field.

Wave Smart Parcel Polygon GIS Files (3)

The Smart Parcel Polygon GIS files contain critical parcel information as well as data cross-references with the Wave polyline file.

Wave Trails and Paths Polyline GIS File

The Trails and Paths Polyline GIS file contains trails and off-network paths within the metro area. The type field differentiates trails from paths.

Wave Barrier Polygon GIS Files (4)

Four barrier files are included so that Wave users can run Euclidean distance functions using the points of interest in ArcGIS. These barriers include 1) automobile travel area, 2) bike-ped travel area, 3) custom park barrier, and 4) as-the-crow-flies (water-excluded) barrier.

Wave MXD File Containing Symbolized Data

An ArcGIS MXD has been prepared with all layers included in the Wave database, as well as customized symbology for easy map-making.

ArcGIS Pro Project File Containing Symbolized Data

An ArcGIS Pro map document containing pre-formatted maps of all layers included in MXD.

Simulation Tools

Five tools are usable in ArcGIS Desktop and ArcGIS Pro.

02 | xGeographic Wave Pricing and Data Usage

PRICING

xGeographic Wave (shortened to "Wave" in this document) is provided to end users on an annual, licensed basis. There are four pricing categories for the software, and they are included below. All of the licenses described below include the Wave Suite files located in section 01. These pricing levels are for licenses finalized effective January 2021 to December 2021.

All organizations and companies that license the software/database are also provided 20 hours of technical assistance by xGeographic to integrate Wave and discuss/work on any existing projects. These 20 hours can be used for general consulting, Wave integration into existing workflows, and project-specific insights that can be identified using Wave on day one.

Organization Type	Annual Licensing Cost	Expansion Cost
For-Profit Companies, Academia	$6,250	N/A
Federal and State Government Agencies	$6,250	N/A
Regional Agencies	$6,250	N/A
Counties	$6,050`	N/A
Municipalities, Population > 100,000	$5,750	N/A
Municipalities, Population < 100,000	$4,750	N/A
Wave Expansion to Other Geographies**	N/A	$0.10 per resident of expansion area Min. 500k population

**Perpetual Data License for Purchasing Organization

DATA USAGE AND SHARING AGREEMENT

Please contact PJ Smith of xGeographic at pjsmith@xgeographic.com or 407-496-5463 for the complete licensing agreement.

DATA DELIVERY

The Wave data will be provided to users on an external hard drive beginning on May 1, 2021. The data can then be loaded into the organization's intranet for use. xGeographic has a Florida state-certified seller's permit, effective October 2020.

03 | **Wave Roadway Polyline Field Descriptions** *(all attributes also linked to all Parcels)*

Roadway Features and Demographic Cross Reference Fields

COUNTY

Description: The County that the roadway centroid is located within.
Values: Orange, Seminole, or Osceola.
Sources & Methods: Selected roadway centroids by location.

ROAD_TYPE

Description: The road typology as defined by the Wave database.
Values: The following road types are included, with rules for typologies below:

- FDOT: Non-highway roads that are included in the FDOT RCI database. This includes all non-limited access, FDOT roadways.
- FDOT – Limited Access: Highways that are included in the FDOT RCI database that are limited access, requiring access via on on-ramp, and the on-and-off ramps themselves.
- Disney: Limited access roadways located on Disney World property. These do not have pedestrian facilities and typically require toll or on-ramp access.
- Airport: Limited access roadways located on Orlando International Airport property.
- Main Local: Roadways not included in the FDOT RCI database that have more than two lanes or roadways that serve as primary connectors between FDOT roadways.
- Minor Local with Deviation: Roadways that do not meet any of the criteria above but that have a median or a turn lane at the entrance to a neighborhood.
- Minor Local: Roadways that do not meet any of the above criteria. These roadways are typically located in neighborhoods and have the following attributes: two travel lanes, no medians, no bicycle lanes. Blanket attributes are provided for roadway width (< 30 feet).

Sources & Methods: Satellite data and roadway attribute data are used to classify roadways using the rules above.

FL_ROADWAY

Description: The FDOT RCI roadway ID.
Values: Eight-digit number, in format ########, if applicable.
Sources & Methods: FDOT RCI database cross-reference.

OS_ROADWAY

Description: The Osceola County public works roadway ID
Values: A one to four-digit number, in format #, ##, ### or ####, if applicable.

Sources & Methods: Manually hard coded using the TMap ID field in the Osceola County public works database, effective 2018.

ROAD_NAME

Description: The name of the roadway.
Values: Capitalized source data from Counties and FDOT.
Sources & Methods: County roadway centerline files and FDOT roadway centerline (RCI). Local roadway names take precedent over FDOT (state) road names.

CONSTRUCT

Description: Describes if the roadway is under construction or planned for construction, per satellite imagery.
Values: Yes or No
Sources & Methods: Satellite imagery.

LENGTH_MI

Description: The length of the roadway segment, in miles.
Values: Numerical, with decimals.
Sources & Methods: Geometry calculation in ArcGIS.

SPEED

Description: The speed limit of the roadway.
Values: The speed limit, in format ##, or a template value based on the road type. Speeds without classification are provided a value of "30 or Less". These records are under quality assurance. A value of '1' indicates a roadway that has been constructed but where the speed limit has not yet been determined.
Sources & Methods: FDOT RCI database, Google Maps street view.

SPEED2

Description: The speed limit of the roadway.
Values: Numerical. Local roadways with no documented speed limit are provided a value of 25. A value of '1' indicates a roadway that has been constructed but where the speed limit has not yet been determined.
Sources & Methods: FDOT RCI database, Google Maps street view.

THRU_LANE

Description: The number of through-lanes present on a roadway segment.
Values: Numerical.

Sources & Methods: Satellite imagery.

TURN_LANE

Description: The number of turn lanes present on a roadway segment. At T-intersections, lanes that terminate are counted as through lanes.
Values: Numerical.
Sources & Methods: Satellite imagery.

RAMP_LANE

Description: The number of onramp or offramp lanes present on a roadway segment. Onramps or offramps must run parallel to the roadway segment to be included, and must be at level grade with the local roadway.
Values: Numerical.
Sources & Methods: Satellite imagery.

BUS_LANE

Description: The number of bus-only lanes present.
Values: Numerical.
Sources & Methods: Satellite imagery.

TOTL_LANE

Description: The total number of lanes present.
Values: Numerical.
Sources & Methods: Satellite imagery.

SURFC_WID

Description: The surface width of the roadway segment, not including bicycle lanes. Neighborhood and minor local roads are provided a value of "< 30" and are under quality assurance.
Values: Numerical.
Sources & Methods: Satellite imagery, distance measuring tool.

SURFC_WID2

Description: The surface width of the roadway segment, not including bicycle slots. Neighborhood and minor local roads are provided a value of 25.
Values: Numerical.
Sources & Methods: Satellite imagery, distance measuring tool.

MEDIAN_WID

Description: The width of the median, including inside shoulders.
Values: Numerical.
Sources & Methods: Satellite imagery.

MEDIAN_TYP

Description: The type of median present, with the number of medians in parenthesis.
Values: Type (Count if greater than 1)
Sources & Methods: Satellite imagery, FDOT RCI file (quality assured).
MEDIAN_TP2 field summarizes this field: G (Grass), M (Multiple), P (Paved), O (Other), N (None)

TOTAL_WID

Description: The total width of the roadway, including medians and bike slots but not including outside shoulders.
Values: Field calculation using multiple attributes.
Sources & Methods: Field calculation.

TOTAL_WID2

Description: The total width of the roadway, including medians and bike slots but not including outside shoulders.
Values: Field calculation using multiple attributes. Roadways with no width values are provided a value of 0, and local/ neighborhood roads are provided a default value of 25.
Sources & Methods: Field calculation.

PAVED_SHLD

Description: The number of paved shoulders greater than 4 feet in width present.
Values: 0, 1 or 2.
Sources & Methods: Satellite imagery.

BIKE_SLOT

Description: The number of bicycle slots present.
Values: 0, 1 or 2.
Sources & Methods: Satellite imagery.

BIKE_LANE

Description: The types and numbers of bicycle lanes present.
Values: Type, Type (Number); done east to west, north to south.
Sources & Methods: Satellite imagery, city and County bicycle lane GIS files.

AADT
Description: The annual average daily traffic along a roadway segment.
Values: Numerical, roadway segments without AADT data are provided a value of 0.
Sources & Methods: FDOT RCI; County data quality assurance underway for 2021 release.

TRUCK_AADT
Description: The annual average daily truck traffic along a roadway segment.
Values: Numerical, roadway segments without AADT data are provided a value of 0.
Sources & Methods: FDOT RCI.

AADT_LANE
Description: Annual average daily traffic per lane.
Values: Field calculated based on AADT field and TOTL_LANE field. Roadways without AADT data are provided a value of 0.
Sources & Methods: FDOT RCI.

PCT_TRUCKS
Description: The percent of AADT on a roadway segment attributable to trucks.
Values: Field calculated based on the TRUCK_AADT and AADT fields. Roadways without AADT data are provided a value of 0.
Sources & Methods: FDOT RCI.

SIDEWALKS
Description: The number of sidewalks present on a roadway segment.
Values: 0, 1, or 2.
Sources & Methods: Satellite imagery.

FLUSH_SDWK
Description: The number of sidewalks with no roadway separation present.
Values: 0, 1 or 2.
Sources & Methods: Satellite imagery.

RETROFIT
Description: "Lateral Roadway Width Available for Retrofit" – The amount of space that can be reduced from the width of the roadway segment per FDOT context classification and lane width guidelines. An assessment of the roadway is required for further analysis.
Values: Numerical. See section 07.004 for calculation procedures.
Sources & Methods: FDOT Context Classification Guidelines, FDOT Design Handbook.

SIGNALIZED

Description: For FDOT and main roads only, describes if there is a traffic signal within one-eighth of a mile.
Values: Yes or No
Sources & Methods: Satellite imagery to quality assure baseline FDOT data. Used preliminary ECFRPC-FHWA 2019 data to identify new signals through the PX_TRAFSIG field. Then completed a quality assurance of satellite imagery to identify new signals.

LIGHTING

Description: The level of lighting on a roadway. Not included as of 2021.
Values: To be determined.
Sources & Methods: To be determined.

BP_CRASH

Description: The number of bicycle and pedestrian crashes that occurred along a roadway segment from 2015-2019. A spatial join function was performed in order to join the Wave database to the Signal Four Analytics database. A search radius of 70 feet was used and the "JOIN_COUNT" of the output table was populated into the bike-ped crash field. Since a spatial join was used, certain bicycle and pedestrian crashes may be counted more than once.
Values: Numerical.
Sources & Methods: Signal Four Analytics.

EVACUATION

Description: Determines if a roadway is a designated hurricane evacuation route by the Florida Division of Emergency Management.
Values: Yes or No.
Sources & Methods: FDEM, Counties.

FUNCLASS

Description: The FDOT functional classification of the roadway segment.
Values: Verbatim classification name as provided by FDOT.
Sources & Methods: FDOT RCI.

CONTXCLASS

Description: The FDOT context classification of the roadway segment.
Values: Verbatim classification name as provided by FDOT.
Sources & Methods: FDOT Context Classification shapefile.

SURFACE

Description: The surface type of the roadway segment.
Values: Verbatim, as provided by the source data.
Sources & Methods: FDOT RCI, Osceola County Public Works.

PAVMT_COND

Description: Pavement conditions, as provided by FDOT.
Values: Verbatim, as provided by FDOT.
Sources & Methods: FDOT RCI.

MAINTAINER

Description: The maintaining agency of the roadway, as provided by source data.
Values: The official name of the organization that maintains the roadway.
Sources & Methods: FDOT RCI, Osceola County Public Works data.

FLOOD_ZONE

Description: Describes whether or not a roadway segment is located within the 100-year FEMA flood zone.
Values: Yes (100 Year) or None.
Sources & Methods: FEMA 100-Year Floodplain shapefiles, location cross-reference.

SURGE_ZONE

Description: Describes whether or not a roadway segment is located within a storm surge zone. Not included in the Orange, Osceola and Seminole County database.
Values: Category #, or None.
Sources & Methods: TBRPC Storm Surge tool, location cross-reference.

SLR_ZONE

Description: The 2017 NOAA High Curve sea level rise horizon year where the roadway segment is located. Not included in the Orange, Osceola and Seminole County database.
Values: None, 2040, 2060, 2080 or 2100.
Sources & Methods: NOAA High Curve shapefiles, location cross-reference.

CENSUS_CBG

Description: The ID of the census block group that the roadway centroid is located within.
Values: Census Tract Number (6 digits), dash, Census Block Group Number (one digit), in format ######-#.
Sources & Methods: U.S. Census data location cross-reference.

CENSUS_CT

Description: The ID of the census tract that the roadway centroid is located within.
Values: Six digits, in format 1400000US12#########.
Sources & Methods: U.S. Census data location cross-reference.

INCOME

Description: The median household income of the Census Block Group that the roadway segment is located within.
Values: Monetary value, #####
Sources & Methods: U.S. Census 2017 ACS. Used field B19013e1 and cross-referenced with the Census Block Group ID number.

ZERO_VEHCL

Description: The percent of households with zero vehicles within the Census Block Group that the roadway segment is located within.
Values: Percentage in decimal form. A value of 0.5 translates to 50%.
Sources & Methods: U.S. Census 2017 ACS, Census Data. Cross-reference fields used include B25033e1 (occupied households), B25044e3 (owner households with zero vehicles), and B25044e10 (renter households with zero vehicles). Divided total zero vehicle households by occupied households to obtain the percentage.

JURIS

Description: The jurisdiction(s) that the roadway segment is located within. If each side of the roadway includes a different jurisdiction, both jurisdictions are listed.
Values: Jurisdiction name.
Sources & Methods: Property Appraiser TAX ID code overlay and municipal zoning file cross-reference. See field creation notes in section 01.003.

TAZ

Description: The identification number of the Transportation Analysis Zone (TAZ) that the roadway segment is located within.
Values: Numerical.
Sources & Methods: 2020 TAZ CFRPM, obtained from FDOT District 5

TAZ_JOBS
Description: The number of jobs per acre in 2020, not counting water bodies, for the TAZ that the roadway segment is located within.
Values: Numerical.
Sources & Methods: 2020 TAZ CFRPM, obtained from FDOT District 5

TAZ_POP
Description: The population per acre in 2020, not counting water bodies, for the TAZ that the roadway segment is located within. This includes all occupants of hotels.
Values: Numerical.
Sources & Methods: 2020 TAZ CFRPM, obtained from FDOT District 5

TAZ_POP45
Description: The population per acre in 2045, not counting water bodies, for the TAZ that the roadway segment is located within, as estimated by the CFRPM. This includes all occupants of hotels.
Values: Numerical.
Sources & Methods: 2020 TAZ CFRPM, obtained from FDOT District 5

TAZ_POPGRO
Description: The population growth per acre between 2020 and 2045, not counting water bodies, for the TAZ that the roadway segment is located within, as estimated by the CFRPM. This includes all occupants of hotels.
Values: Numerical.
Sources & Methods: 2020 TAZ CFRPM, obtained from FDOT District 5

TREE_CVG – Currently not available.
Description: Describes the level of tree coverage present on a roadway.
Values: TBD
Sources & Methods: TBD

GEOID
Description: The Census GEOID of the roadway segment.
Values: Twelve-digit number, formatted ############, verbatim from the Census Bureau.
Sources & Methods: Data downloaded from the U.S. Census Bureau and joined spatially.

Proximity Fields

Proximity fields use a Euclidean with barrier distance function to determine the distance, *in feet*, that the centroid of a roadway segment is from the nearest point of interest, or a specified point of interest. The matrix below identifies the attribute name and point of interest type corresponding to the attribute. 'X' is used for fields that measure bicycle and pedestrian distances to points of interest, 'Y' is used to measure automobile distances to points of interest, 'Z' compares 'X' and 'Y'. while 'W' fields measure the "as the crow flies" distance to points of interest and compares it to bike-ped distances within the 'U' fields. See the barrier file creation portion of this report for more information on the underlying barriers utilized to calculate these distances.

Values of 0 within the Y and W proximity fields are null values. Values of 99999 within the X proximity fields are also null values. These have been provided for all limited access roadways. Road segments located more than two miles from the point of interest being assessed also have null values. A maximum value of 10560 is present within these fields, indicating the centerline of the road polyline is 10560 feet away from the point of interest being measured. A search radius of 50 feet is used to match centerlines to the underlying raster-to-point output, however all centerlines find the "closest" nearby raster-to-point output.

Proximity Fields Overview

- X FIELDS – Measures distance to points of interest for bicyclists and pedestrians.
- Y FIELDS – Measures distance to points of interest for automobiles.
- W FIELDS – Measures distance to points of interest as-the-crow-flies, excluding lakes.
- Z FIELDS – Equals the automotive distance minus the bike/ped distance.
- U FIELDS – Equals the bike/ped distance divided by the as-the-crow-flies distance.
- N FIELDS – Equals the number of a certain point of interest type within ½ mile.

"X" Proximity Fields | Bike-Ped Distance (ft)

** This field uses the bike-ped barrier as the barrier file, allowing for movement through automobile corridors, parking lots, driveways, as well as trails and off-network paths.*

** 99999 is a null value within these fields, provided for highways and road segments more than 2 miles away*

Field Name	Point of Interest Type(s)	Access Metric
X_AUTO	Auto Parts & Car Wash	Bike/Ped Distance
X_BANK	Bank	Bike/Ped Distance
X_BARS	Bars & Night Clubs	Bike/Ped Distance
X_CITYHALL	City Hall & County Administration	Bike/Ped Distance
X_COFFEE	Café's – Coffee & Tea Shops	Bike/Ped Distance
X_COLLEGES	Colleges & Universities	Bike/Ped Distance
X_COMMCTR	Community Center	Bike/Ped Distance
X_CONVST	Convenience Store	Bike/Ped Distance
X_CONVNTN	Convention Center	Bike/Ped Distance
X_COSMETIC	Cosmetic Stores & Services	Bike/Ped Distance
X_CREDITU	Credit Union	Bike/Ped Distance
See Dept. bundle below	Department Store – Athletic	Bike/Ped Distance
See Dept. bundle below	Department Store – Clothing	Bike/Ped Distance
See Dept. bundle below	Department Store – Electronics	Bike/Ped Distance
See Dept. bundle below	Department Store – Home	Bike/Ped Distance
See Dept. bundle below	Department Store – Office	Bike/Ped Distance
X_ELEMSCHL	Elementary School	Bike/Ped Distance
X_ENTVENUE	Entertainment Venue	Bike/Ped Distance
X_FASTFOOD	Fast Food	Bike/Ped Distance
X_FIRE	Fire Station	Bike/Ped Distance
X_GOLF	Golf Course Clubhouse	Bike/Ped Distance
X_GROCERY	Grocery Store	Bike/Ped Distance
X_GYM	Gyms & Training Centers	Bike/Ped Distance
X_HIGHSCHL	High School	Bike/Ped Distance
X_HOAPARK	HOA & Private Parks	Bike/Ped Distance
X_HOSPITAL	Hospital	Bike/Ped Distance
See Lodging bundle below	Hotel	Bike/Ped Distance
X_ICECREAM	Ice Cream Shop	Bike/Ped Distance
X_K8SCHL	K-8 School	Bike/Ped Distance
X_LIBRARY	Library	Bike/Ped Distance
X_LIQRWINE	Liquor & Wine Stores	Bike/Ped Distance
X_BUSSTOP	LYNX Bus Stop	Bike/Ped Distance
X_MALL	Malls & Super Outlets	Bike/Ped Distance

X_MARKET	Market, Market with Pharmacy	Bike/Ped Distance
X_MIDSCHL	Middle School	Bike/Ped Distance
See Market bundle below	Mini Markets & Bodegas	Bike/Ped Distance
See Lodging bundle below	Motel	Bike/Ped Distance
X_MOVIE	Movie Theater	Bike/Ped Distance
X_MUSEUM	Museum	Bike/Ped Distance
X_PARK	Park	Bike/Ped Distance
X_PETVET	Pet Stores & Veterinarians	Bike/Ped Distance
X_POLICE	Police Station	Bike/Ped Distance
X_POSTOFFC	Post Office	Bike/Ped Distance
See Lodging bundle below	Resort	Bike/Ped Distance
X_RESTRNT	Restaurant & Take-Out	Bike/Ped Distance
X_BARFOOD	Sports Bars & Bars Serving Food	Bike/Ped Distance
X_STADIUM	Sports Stadium	Bike/Ped Distance
X_STORE	Retail Store	Bike/Ped Distance
X_SUNRAIL	SunRail Station	Bike/Ped Distance
X_SUPERCTR	Super Center	Bike/Ped Distance
X_THEMPARK	Theme Park	Bike/Ped Distance
X_TOBVAPE	Tobacco & Vape Stores	Bike/Ped Distance
X_TRAILS	Trails	Bike/Ped Distance
X_YMCA	YMCA	Bike/Ped Distance

Multiple Point of Interest Types within X Fields:

X_BARS: Includes 1) Bars & Night Clubs, and 2) Sports Bars & Bars Serving Food
X_CONVST: Includes 1) Convenience Stores, and 2) Mini-Markets & Bodegas
X_RESTRNT: Includes 1) Restaurant & Take Out, and 2) Sports Bars & Bars Serving Food
X_GYM: Includes 1) Gyms, and 2) YMCA's
X_MIDSCHL and X_ELEMSCHL include K8 schools
X_MARKET: Includes 1) Market, and 2) Market & Pharmacy

Point of Interest "Bundles" Overview (for all X, Y, W, Z, U, N fields)

Proximity fields for point of interest "bundles" include groups of related points of interest. Examples include entertainment, dining and supermarkets. The W, Y, Z, U and N proximity fields are calculated for bundles only. See section 02.005 for bundle descriptions.

X_DEPTSTR	Department Stores (Bundle)	Bike/Ped Distance
X_DINING	Dining (Bundle)	Bike/Ped Distance
X_ALLENTV	Entertainment (Bundle)	Bike/Ped Distance

X_LODGING	Lodging (Bundle)	Bike/Ped Distance
X_ALLMKT	Markets (Bundle)	Bike/Ped Distance
X_ALLPARK	Parks (Bundle)	Bike/Ped Distance
X_PHARMACY	Pharmacies (Bundle)	Bike/Ped Distance
X_SCHOOL	Schools (Bundle)	Bike/Ped Distance
X_SUPERMKT	Supermarkets (Bundle)	Bike/Ped Distance
X_TRANSIT	Transit (Bundle)	Bike/Ped Distance

"Y" Proximity Fields | Automobile Distance (ft) for Point of Interest Bundles

** This field uses the automobile barrier as the barrier file, which includes roadways, driveways and parking lots. Highways are excluded from this barrier (as well as the bike/ped barrier) in order to simulate local traffic trips.*

** 0 is a null value within these fields, provided for highways and road segments more than 2 miles away*

Y_DEPTSTR	Department Stores (Bundle)	Automobile Distance
Y _DINING	Dining (Bundle)	Automobile Distance
Y_ALLENTV	Entertainment (Bundle)	Automobile Distance
Y _LODGING	Lodging (Bundle)	Automobile Distance
Y _ALLMKT	Markets (Bundle)	Automobile Distance
Y_PHARMACY	Pharmacies (Bundle)	Automobile Distance
Y _SCHOOL	Schools (Bundle)	Automobile Distance
Y _SUPERMKT	Supermarkets (Bundle)	Automobile Distance
Y _TRANSIT	Transit (Bundle)	Automobile Distance
Y_FIRE	Fire Stations	Automobile Distance
Y_POLICE	Police Stations	Automobile Distance
Y_HOSPITAL	Hospitals	Automobile Distance

"W" Proximity Fields | As the Crow Flies "Air" Distance (ft) for Point of Interest Bundles

** This distance parameter allows 360-degree move, unobstructed by all barriers except for NHD water bodies*

** 0 is a null value within these fields, provided for highways and road segments more than 2 miles away*

W_DINING	Dining (Bundle)	Air Distance
W_ALLENTV	Entertainment (Bundle)	Air Distance
W _LODGING	Lodging (Bundle)	Air Distance
W _ALLMKT	Markets (Bundle)	Air Distance
W _ALLPARK	Parks (Bundle)	Air Distance
W _SCHOOL	Schools (Bundle)	Air Distance
W _SUPERMKT	Supermarkets (Bundle)	Air Distance
W _TRANSIT	Transit (Bundle)	Air Distance

"Z" Proximity Fields

Difference Between Driving and Walking Distance (ft) for Point of Interest Bundles

** Higher values within this field indicate that the bike/ped network saves time relative to walking along roadways*

** The output of this field depicts roadways that have benefitted the most from bike/ped trails and paths*

** 0 is a null value within these fields, provided for highways and road segments more than 2 miles away*

Z _DINING	Dining (Bundle)	Z Distance
Z_ALLENTV	Entertainment (Bundle)	Z Distance
Z _LODGING	Lodging (Bundle)	Z Distance
Z _ALLMKT	Markets (Bundle)	Z Distance
Z _SCHOOL	Schools (Bundle)	Z Distance
Z_SUPERMKT	Supermarkets (Bundle)	Z Distance
Z_TRANSIT	Transit (Bundle)	Z Distance

"U" Proximity Fields

Proportion of Bike/Walk Distance to As the Crow Flies Distance for Point of Interest Bundles

** Higher values within this field indicate that the bike/ped network is not spatially fluid, or connected*

** Roadways within 1/8-mile and outside 2 miles of the nearest point of interest (X distance) excluded from analysis*

U _DINING	Dining (Bundle)	U Distance
U _ALLENTV	Entertainment (Bundle)	U Distance
U _LODGING	Lodging (Bundle)	U Distance
U _ALLMKT	Markets (Bundle)	U Distance
U _ALLPARK	Parks (Bundle)	U Distance
U _SCHOOL	Schools (Bundle)	U Distance
U _SUPERMKT	Supermarkets (Bundle)	U Distance
U _TRANSIT	Transit (Bundle)	U Distance

"N" Proximity Fields | Number of Points of Interest within ½ Mile for Point of Interest Bundles

N _DINING	Dining (Bundle)	Number within ½ Mile
N _ALLENTV	Entertainment (Bundle)	Number within ½ Mile
N _LODGING	Lodging (Bundle)	Number within ½ Mile
N _ALLMKT	Markets (Bundle)	Number within ½ Mile
N _ALLPARK	Parks (Bundle)	Number within ½ Mile
N _SCHOOL	Schools (Bundle)	Number within ½ Mile
N _SUPERMKT	Supermarkets (Bundle)	Number within ½ Mile
N _TRANSIT	Transit Stops (Bundle)	Number within ½ Mile

Access Indices Fields

The scores below, as explained in section 04, aggregate the walking and biking scores for multiple points of interest within the categories below, using a weighting for each point of interest type. For example, the Food Access Index evenly weights supermarkets, dining locations and community markets. A score of 0 indicates no access, while a score of 100 would indicate a location that is within one-quarter-mile (walking) or one-half-mile (bicycling) of the points of interest being measured for a particular scoring category.

Methodology Sections: 004.01 through 004.11

P_FOOD	Food Access Index for Pedestrians	Access Index, 0-100
B_FOOD	Food Access Index for Bicyclists	Access Index, 0-100
P_ENTMT	Entertainment Access Index for Pedestrians	Access Index, 0-100
B_ENTMT	Entertainment Access Index for Bicyclists	Access Index, 0-100
P_NIGHT	Night-Life Access Index for Pedestrians	Access Index, 0-100
B_NIGHT	Night-Life Access Index for Bicyclists	Access Index, 0-100
P_GOODSVC	Goods & Services Access Index for Pedestrians	Access Index, 0-100
B_GOODSVC	Goods & Services Access Index for Bicyclists	Access Index, 0-100
P_PUBREC	Public Recreation Access Index for Pedestrians	Access Index, 0-100
B_PUBREC	Public Recreation Access Index for Bicyclists	Access Index, 0-100
P_PARKREC	Recreation Access Index for Pedestrians	Access Index, 0-100
B_PARKREC	Recreation Access Index for Bicyclists	Access Index, 0-100
P_TRANSIT	Transit Access Index for Pedestrians	Access Index, 0-100
B_TRANSIT	Transit Access Index for Bicyclists	Access Index, 0-100
P_MUNICIPL	Municipal Services Index for Pedestrians	Access Index, 0-100
B_MUNICIPL	Municipal Services Index for Bicyclists	Access Index, 0-100
P_JOBDENS	Job Density Index for Pedestrians	Access Index, 0-100
B_JOBDENS	Job Density Index for Bicyclists	Access Index, 0-100
P_POPDENS	Population Density Index for Pedestrians	Access Index, 0-100
B_POPDENS	Population Density Index for Bicyclists	Access Index, 0-100
P_FOODNF	Food Access Index #2 for Pedestrians	Access Index, 0-100
B_FOODNF	Food Access Index #2 for Bicyclists	Access Index, 0-100

*P_FOODNF and B_FOODNF fields (see section 04.011) do not include fast food.

Other Output Fields

GAP_FOOD

Description: "Food Investment Area Score" – Locations that have been identified as an area with low food access that also have high combined levels of population density, job density, general goods and service access, and transit access.
Values: Scored 0-100; higher values represent areas that could benefit from a food business.
Methodology Section: 05.001

GAP_PARKS

Description: "Recreation Investment Area Score" – Locations that have been identified as an area with low park access that also have high combined levels of population density, food access, entertainment access, and general goods and services access.
Values: Scored 0-100; higher values represent areas that could benefit from a park.
Methodology Section: 05.002

GAP_TRANST

Description: "Recreation Investment Area Score" – Locations that have been identified as an area with low transit access that also have high combined levels of population density, job density, food access, and general goods and services access.
Values: Scored 0-100; higher values represent areas that could benefit from a transit stop.
Methodology Section: 07.001

SAF_ROAD

Description: "The Bike-Ped Risk Index" – Uses number of lanes, AADT, turn lane presence and median types to develop a 0 to 100 score that evenly weights the bicycle and pedestrian crash rates between the four road characteristics (and sub-variables within each of the four).
Values: Scored 0-100, higher values equate to higher bike/ped risk roadway design features. A value of 100 equates to 7 or more lanes, an AADT greater than 50,000, 1 or more turn lanes present, and a median type other than grass (the latter combined with 4 or more lanes).
Methodology Section: 06.001

SAF_ROADLU

Description: "The Bike-Ped Risk Index Normalized for Location" – Finds areas that have high levels of goods and services, food and nightlife access that also score poorly within the bike-ped risk index. The three land use categories chosen have the highest bike/ped crash rates.
Values: Scored 0-100, higher values equate to higher bike/ped risk.
Methodology Section: 06.002

RETRO_BIKE

Description: Calculates whether or not 1 or 2 existing bike lanes can potentially be protected (or buffered with a paint strip) though a re-pave and re-stripe project.
Values: 0 (none), 1 (1 bike lane protectable), or 2 (2 bike lanes protectable)
Methodology Section: 07.004

RETRO_SPD

Description: Determines areas with bike lanes that have a speed limit exceeding 35 mph.
Values: Yes, Speed > 35; or Not Applicable
Methodology Section: 07.004

RETRO_LAN

Description: "Lane Elimination Candidates" – Determines roadway segments with four or more through lanes that have an AADT less than 20,000. The FDOT 2020 Design Manual identifies roadways with these metrics as lane elimination candidates.
Values: "Yes" (meets criteria) or "No" (does not meet criteria)
Methodology Section: 07.004

SAF_TRANST

Description: Determines areas with sidewalk gaps on roadways with speeds 35 miles per hour or greater that are within ¼ mile (bike/walk) of a transit stop.
Values: Not applicable, 1 (1 sidewalk gap), or 2 (2 sidewalk gaps)
Methodology Section: 07.002

SAF_SCHOOL

Description: Determines areas with sidewalk gaps on roadways with speeds 35 miles per hour or greater that are within ¼ mile (bike/walk) of a public school.
Values: Not applicable, 1 (1 sidewalk gap), or 2 (2 sidewalk gaps)
Methodology Section: 07.003

FOOD_INCOM

Description: "Low Income Food Deserts" – Determines areas that are 40% below Florida's median family income that are also not within a 10-minute walk of supermarkets and markets. Outputs are color coded by 1) income level, or 2) distance to food. This does not equate to the USDA definition of a "food desert" but can be calculated using those parameters.
Values: "Yes" (meets criteria) or "No" (does not meet criteria)
Methodology Section: 08.001

PARK_INCOM

Description: "Low Income Park Deserts" – Determines areas that are 40% below Florida's median family income that are also not within a 10-minute walk (one-half-mile) of a public park. Outputs are color coded by 1) income level, or 2) distance to parks.
Values: "Yes" (meets criteria) or "No" (does not meet criteria)
Methodology Section: 08.002

TRAN_INCOM

Description: "Low Income Transit Deserts" – Determines areas that are 40% below Florida's median family income that are also not within a 10-minute walk (one-half-mile) of a transit stop. Outputs are color coded by 1) income level, or 2) distance to transit.
Values: "Yes" (meets criteria) or "No" (does not meet criteria)
Methodology Section: 08.003

TRAN_ZEROV

Description: "Zero Vehicle Household Transit Gaps" – Determines areas that have *double the national zero-vehicle ownership rate* (17.4%) that are also not within a 10-minute walk (one-half-mile) of a transit stop. Outputs are color coded by 1) zero vehicle %, or 2) distance to transit.
Values: "Yes" (meets criteria) or "No" (does not meet criteria)
Methodology Section: 08.004

GAP_HOSPTL

Description: "Hospital Access Analyzer" – Determines areas that are more than two miles away from the nearest hospital. Field shows population density in persons per acre.
Values: Numerical, depicting the TAZ population density in persons per acre.
Methodology Section: 09.001

GAP_FIRE

Description: "Fire Station Coverage Analyzer" – Determines areas that are more than two miles away from the nearest fire station. Field shows population density in persons per acre.
Values: Numerical, depicting the TAZ population density in persons per acre.
Methodology Section: 09.002

LTS_MTA

Description: "MetroPlan Orlando Level of Traffic Stress (Mixed Traffic Assessment)" – Uses the 2020 MetroPlan Orlando algorithm to calculate the level of traffic stress.
Values: 1 through 4. 1 is lower traffic stress, 4 is higher traffic stress.

MetroPlan Priority Project List (PPL) Fields

PPL projects that are located along roadway routes are imbedded into the wave fields below.

PPL_INTSTA

Description: "Interstate Roadway Projects" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment.

PPL_STATE

Description: "State Roadway Projects" and "State Projects, SunTrail Program" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment. Unranked projects are listed in order on the public MetroPlan excel matrix as NR1, NR2, etc.

PPL_MMRWCS

Description: "Multimodal System Projects – Roadway & Complete Streets" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment.

PPL_MMTSNP

Description: "Multimodal System Projects – Transportation Systems Management & Operations, New Phases for Funding" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment.

PPL_MMRTSM

Description: "Multimodal System Projects – Regional Trail & School Mobility Projects" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment. New trails (second matrix listing under this category) can be found within the other PPL GIS files.

PPL_TRANPREM

Description: "Transit Projects – Premium Transit" as listed by MetroPlan Orlando. Field populated with the ranking of the project.

PPL_TRANFEAS

Description: "Transit Projects – Feasibility Studies" as listed by MetroPlan Orlando. Field populated with the ranking of the project.

PPL_TRIP

Description: "Multimodal System – TRIP Candidates" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment. All projects are "unranked", and are listed in the order as presented on the public MetroPlan excel matrix as NR1, NR2, etc.

PPL_STROS

Description: "State Roadway Projects – Roadways of Significance" as listed by MetroPlan Orlando. Field populated with the ranking of the project. Multiple projects can be located along the same segment. All projects are "unranked", and are listed in the order as presented on the public MetroPlan excel matrix as NR1, NR2, etc.

PPL Projects Not Located Along Roadway Routes

Additional PPL projects, such as intersection or off-network trail/transit projects, are included in the files listed below. The project number and type are located within the PPL_RNKTYP field within these files.

PPL_GeneralArea: Includes projects that are to be implemented in a general area. Not enough information or documentation is provided at this point to map these projects.

PPL_NewRoad: Includes new roadway projects that are currently built.

PPL_Point: Includes projects located at a specific point, such as intersection improvements and parking lot expansions, among other projects.

PPL_Trail: Includes trail priority projects, copied and pasted from the xPathsTrails file.

PPL_Transit: Includes new transit lines located off of the roadway network, such as SunRail Phase 3.

PPL Categories that are Mapped Exclusively within Above Separated Files

- Multimodal System – Regional Trail Gaps
- Transit Projects – Transit Assets

PPL Projects That Do Not Qualify for Map Format

- Multimodal Projects, TSM&O, Regional (all projects)
- Transit Asset Projects #4-21, 23, 28
- Premium Transit Project #7
- Transit Enhancements and New Service (all projects)

04 | **Point of Interest Typologies & Bundles**

The following points of interest are included in the Wave database as of the January 2021 release. Bundles, or grouped typologies, are also shown below.

Point of Interest Type	Bundle Inclusion
Auto Parts & Car Wash	None
Bank	None
Bars & Night Clubs	Entertainment
City Hall & County Administration	None
Café's – Coffee & Tea Shops	Dining
Colleges & Universities	None
Community Center	None
Convenience Store	Market
Convenience Store with Gas	Market
Convention Center	None
Cosmetic Stores & Services	None
Credit Union	None
Department Store – Athletic	Department Stores
Department Store – Clothing	Department Stores
Department Store – Electronics	Department Stores
Department Store – Home	Department Stores
Department Store – Office	Department Stores
Elementary School	Schools
Emergency Shelters	None
Entertainment Venue	Entertainment
Fast Food	Dining (Not included in FOODNF fields)
Fire Station	None
Gentlemen's Club	None
Golf Course Clubhouse	None
Grocery Store	Supermarkets
Gyms & Training Centers	None
High School	Schools
HOA & Private Parks	All Parks
Hospital	None
Hotel	Lodging
Ice Cream Shop	None
K-8 School	Schools

Library	None
Liquor & Wine Stores	None
LYNX Bus Stop	Transit Stops
Malls & Super Outlets	Entertainment
Market	Market
Market & Pharmacy (included in X_MARKET field)	Market; Pharmacy
Middle School	Schools
Mini Markets & Bodegas	Market
Motel	Lodging
Movie Theater	Entertainment
Museum	Entertainment
Park	All Parks
Pet Stores & Veterinarians	None
Pharmacy (not within Market; located in X_PHARMACY)	Pharmacy
Police Station	None
Post Office	None
Resort	Lodging
Restaurant & Take-Out	Dining
Sports Bars & Bars Serving Food	Dining; Entertainment
Sports Stadium	Entertainment
Store (General Retail – Other)	None
SunRail Station	Transit Stops
Super Center	Supermarkets; Department Stores
Theme Park	Entertainment
Tobacco & Vape Stores	None
YMCA	None

*****Points of interest located within Hotels include "– Within Hotel" to the TYPE field.
*****Points of interest that are currently closed include "– Closed" in the TYPE field

05 | Point of Interest Point File and Park Polygon File Field Descriptions

NAME

Description: The name of the point of interest. The name field is currently only populated for entertainment venues, major pharmacies, police stations, fire stations, hospitals, schools (all levels), YMCA's, theme parks, super centers, SunRail stations, sports stadiums, post offices, parks, museums, movie theaters, malls, libraries, grocery stores, golf courses and community centers.
Values: The name of the point of interest.

TYPE

Description: The type of point of interest. See points of interest types in section 4.
Values: See values in section 04.

BUNDLES

Description: The land use bundle that the point of interest falls into, if applicable.
Values: See values in section 04.

06 | Smart Parcel File

Parcel files were downloaded for Orange, Osceola and Seminole County from the University of Florida GeoPlan Center.

Following the completion of the Wave polyline database, a spatial join was performed using a join distance of 200 feet between the three county parcel files (target features) and the Wave polyline file (join features). This spatial join joined each parcel with the nearest Wave polyline segment (following the ROADQA validation process outlined on the following page) and imbedded all attributes into the parcel file. A final Q/A was completed in map form using the AADT field to ensure parcels along major roadways and within neighborhoods near major roadways were properly tagged. The field descriptions for the smart parcel file match the fields within the Wave polyline file. Existing fields within the parcel files are described below:

The field descriptions for the smart parcel file match the fields within the Wave polyline file. Existing fields within the parcel files are described below:

Original Field Name	Wave Field Name	Description
PARCELID	PARCEL_ID	Parcel ID (Source: Counties)
CNTYNAME	COUNTY	The County the Parcel is Within
ONAME	OWNER	Parcel Owner Name
PHYADDR1	ADDRESS	Physical Address of Parcel
PHYCITY	CITY	Mailing City of Parcel
PHYZIP	ZIPCODE	Zip Code of Parcel
EFFYRBLT	YRBUILT	Year Last Built (0 = Vacant)
NOBULDNG	BUILDINGS	Number of Buildings on Site
LNDVAL	LAND_VAL	Land Value of Parcel
AV_SD	ASSESSED_V	Assessed Value of Parcel
TX_SD	TAXABLE_V	Taxable Value of Parcel
ACRES	ACRE	Parcel Size in Acres
GOOGLEMAP	GOOGLE	Parcel Google Web Link URL
DESCRIPT	LAND_USE	Dept. of Revenue Land Use

*JURIS field from Wave polyline is populated with the tax municipality from parcel file

** Plus, all Wave Roadway Polyline fields, except for PPL and TIP fields

All (blue) parcel fields above have a data effective date of June 17, 2020.
Parcel ID field allows for linking with countywide databases, which are updated weekly.

Zoning (ZON) and Future Land Use (FLU) Fields

Zoning and Future Land Use were added to the parcel database. April 2021 land use information was collected from municipalities and added to the database.

Wave Field Name	Description
ZONING	The Current Zoning of the Parcel
FLU	The Future Land Use of the Parcel

Economic Development Fields

The following fields were added to the Wave database using April 2021 Opportunity Zone data from USHUD, and Community Redevelopment Area data from counties and municipalities.

Wave Field Name	Description
OPP_ZONE	Describes if parcel is in a Federal Opportunity Zone
CRA	Describes if the parcel is in a Community Redevelopment Area
BROWNFIELD	Describes if parcel is in a USEPA brownfield site

ROADQA Field

The ROADQA field is an internal field for xGeographic use. This field is used to classify parcels by the type of service road that serves the parcel entrance. Following a spatial join of address points to the closest roadway centerline, a satellite imagery-based quality assurance process was completed to ensure proper tagging of parcels to roadways. This methodology was used to link the parcels to the roadway characteristic fields, environmental fields, and access distances and algorithms. Field value definitions are below:

" " Roadways were correctly joined to the minor service road at its entrance
"1" Roadways were correctly joined to the major service road at its entrance
"2" Parcel join was corrected to be joined to the nearest minor service road
"3" Parcel join was corrected to be joined to the nearest major service road

National Wetlands Inventory

Wave Field Name	Description
NWI_WETLND	Describes if parcel is in the NWI Wetland Zone

07 | Wave Toolboxes

The Wave Toolboxes are usable in ArcGIS Desktop and ArcGIS Pro. These toolboxes allow Wave users to simulate new features and update the database with new fields or outputs. Each of these tools comes with step-by-step directions, which are included in this portion of the methodology. The tools are listed below:

- Access Area Exporter
  The Access Area Exporter adds a new proximity field to the Wave database (populated with the distance to any point of interest type, or selected types) and exports a raster file of the access zone. Custom selection allows users to select multiple point of interest types, including subjective categories such as "essential services" that are defined by the end-user organization.

- New Point of Interest Access Simulation
  The New Point of Interest Access Simulation exports a new access zone (for any point of interest type, or types) with the addition of one or more new points of interest. These maps can be compared to earlier Wave access maps in order to show improvements in access.

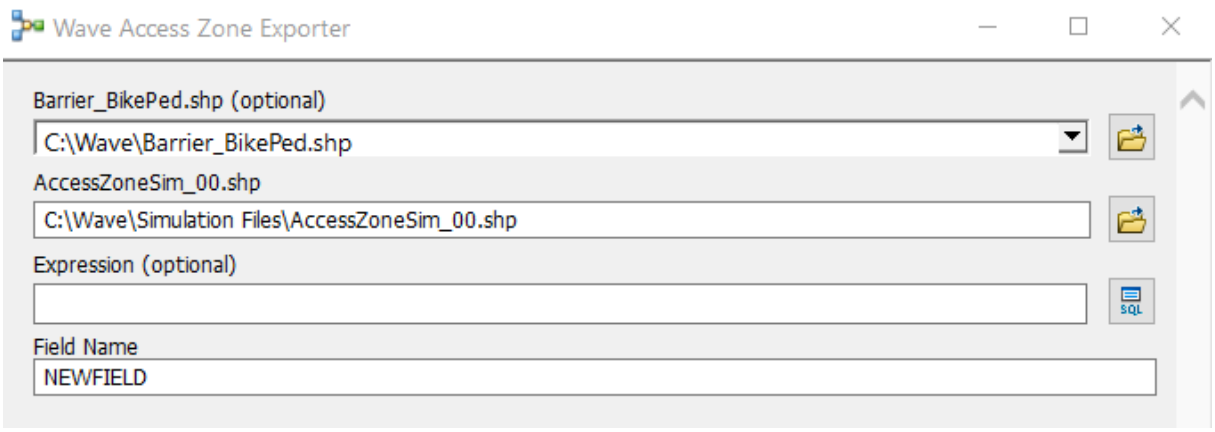
- New Trail Access Simulation
  The New Trail Access Simulation exports an expanded bicycle and pedestrian access zone that utilizes a new trail or path segment. The new trail or path is drawn in by the Wave user, saved, and new access outputs are provided. Done by xGeographic, completed within 48 hours of the request up to two times per year per purchasing organization. Additional simulations cost $500 per simulation.

- New Park Access Simulation
  The New Park Access Simulation exports an expanded bicycle and pedestrian access zone that utilizes a new park. The new park is drawn in by the Wave user, saved, and new access outputs are provided.

- Parcel Finder Export
  The Parcel Finder allows Wave users the ability to select parcels by multiple criteria, including demographic, transportation, land use, building, and proximity information. Parcels that meet the criteria are exported as a new shapefile for further analysis.

Access Area Exporter

Set the parameters as described below to execute this tool:



1) Barrier: Select from one of four barrier files. Barrier_BikePed runs the bicycle and pedestrian distance, Barrier_Auto runs the automotive distance, and Barrier_Linear runs the as-the-crow-flies distance.

2) Name your output. It is recommended that users replace the '00' with '01', and exports that follow should follow a number appreciation (increase) format.

3) Under expression, query the xPOI (point of interest) file. You can select by point of interest type or bundles. This selection allows for the custom access zone to be exported using your input selections.

4) Name the new field that will be added to your new Wave file. This field will populate with the distance (in feet) to the points of interest that you have selected.

   Following the model run, clear the data from C:/Wave/Temporary Data

New Point of Interest Access Simulation

Follow the directions below to execute this tool:

1) Create a new blank shapefile (file type must be point). Add a "TYPE" field to this shapefile in text format. Add one or more points, making sure each point is a maximum or 10 feet away from the nearest roadway centerline. Make sure that you fill out the type field in order to include your new points of interest in the steps that follow.

2) Merge this shapefile with the xPOI shapefile, export to C:/Wave/Simulations and save as with your own naming convention.

3) Open the "New Point of Interest Access Simulation" tool by right clicking the tool and selecting edit. Drag in your new layer to the top left.

4) Using the connector arrow (blue and green squares connected by a line) in ModelBuilder, connect your new shapefile to "Select Layer By Attribute".

5) "SAVE AS" THE UPDATED model with a custom name. You can remove this model if you choose to after running the simulation.

6) X-Out of the model. Then, double click the model in order to fill in the model parameters. Enter parameters as follows:
    a. Barrier: Select from one of four barrier files. Barrier_BikePed runs the bicycle and pedestrian distance, Barrier_Auto runs the automotive distance, and Barrier_Linear runs the as-the-crow-flies distance.
    b. Name your output. It is recommended that users replace the '00' with '01', and exports that follow should follow a number appreciation (increase) format.
    c. Under expression, query the xPOI (point of interest) file. You can select by point of interest type or bundles. This selection allows for the custom access zone to be exported using your input selections. If your new point of interest has a new type within the TYPE field, make sure you include it in the query.
    d. Name the new field that will be added to your new Wave file. This field will populate with the distance (in feet) to the points of interest that you have selected.

Following the model run, clear the data from C:/Wave/Temporary Data

TIP: Compare this output with the original Wave output in map form in order to see the change in the access area.

New Trail Access Simulation

This tool is executed by the xGeographic team and provided to the requesting organization within two days of the request. Each licensing organization can request model runs by xGeographic *four times annually*. The model runs costs $500 per additional request beyond the fourth model run.

Follow the simple directions below:

1) Create a shapefile in polyline format. Draw the location of the new trail or trails that you would like to simulate an access zone for.
2) Indicate the access type that you would like to run. The access type determines the point of interest types that the access simulation will run against the new trail. For example, if parks are selected, the trail access simulation will calculate the access zone to all parks BEFORE and AFTER the addition of the trail. The following access types can be selected:
    a. Parks
    b. Dining
    c. Supermarkets
    d. Transit Stops
    e. Schools
    f. Entertainment
    g. Market
    h. Pharmacy
3) Send the shapefile to xGeographic by emailing pjsmith@xgeographic.com.
4) The outputs will be delivered within 48 hours of receipt of the request.

New Park Access Simulation

Follow the directions below to execute this tool:

1) Create a new blank shapefile (file type must be polygon). Add a "TYPE" field to this shapefile in text format. Add one or more polygons, making sure each point is a maximum or 10 feet away from the nearest roadway centerline. Make sure that you fill out the type field in order to include your new park in the steps that follow.

2) Merge this shapefile with the xParks_Merge shapefile, which is located in C:/Wave/Wave.gdb. Export to C:/Wave/Simulations and save as with your own naming convention.

3) Open the "New Park Access Simulation" tool by right clicking the tool and selecting edit. Drag in your new layer to the top left.

4) Using the connector arrow (blue and green squares connected by a line) in ModelBuilder, connect your new shapefile to "Select Layer by Attribute".

5) "SAVE AS" THE UPDATED model with a custom name. You can remove this model if you choose to after running the simulation.

6) X-Out of the model. Then, double click the model in order to fill in the model parameters. Enter parameters as follows:
    a. Barrier: Select the Barrier_Parks barrier file.
    b. Name your output. It is recommended that users replace the '00' with '01', and exports that follow should follow a number appreciation (increase) format.
    c. Under expression, query the xParks_Merge file. Select private parks, pubic parks, both public and private parks, or a new category of park if your shapefile includes a different value in the "TYPE" field. You can select by point of interest type or bundles. This selection allows for the custom access zone to be exported using your input selections.
    d. Name the new field that will be added to your new Wave file. This field will populate with the distance (in feet) to the points of interest that you have selected.

Following the model run, clear the data from C:/Wave/Temporary Data

TIP: Compare this output with the original Wave output in map form in order to see the change in the access area.

Parcel Finder Export

Set the parameters as described below to execute this tool:

1) This tool must be run one county at a time due to the size of the underlying data. First select the tool corresponding to the county you would like to work with within the Wave Tools toolbox.

2) Double click the model that you would like to run. Under parameters, follow these instructions:

    a. Under "Expression", query your parcel criteria. You can use any fields present within the Wave database.

    b. Under "Field Name (2)" and "Field Name", name the new field that you would like to add to the Smart Parcel File. The field name must match within both of these dialogue boxes. Please be aware that using a field name that is already located in the Smart Parcel file will cause the model to crash. The new field name must be unique.

    c. Run the model. To view the output of the data, query your new field. A value of '1' within your new field indicates that the parcel meets your criteria.

08 | Category Scoring

There are numerous scoring metrics in the Wave database. This section of the report outlines how these scores are calculated in their default format.

Metric Types

Wave software includes four types of scoring metrics that serve as a first step toward measuring the bike-ped environment analytically. These include:

- Access Indices: Access indices measure bicycle and pedestrian accessibility to point of interest types, such as food, entertainment or parks, using distance as the scoring metric.
- Access Countermeasures: Access countermeasures identify areas that are large distances away from points of interest, but would benefit greatly from the presence of specific point of interest types in the future due to demographic or other related factors.
- Mobility Indices: Mobility indices measure bicycle and pedestrian mobility from the perspective of roadway design (physical features of the roadway) and roadway layout (connectivity of the roadway network).
- Mobility Countermeasures: Mobility countermeasures identify potential roadway re-design options, on-and-off-network connectivity countermeasures, and mobility options that improve the utility of transit services.

Standard Weighting Methodology Sources

This section of the report outlines the research done to provide "standard weight" values for all scoring indices included in the Wave software program. On an annual basis, the standard weighting is subject to change based on new research and through a peer review process with all Wave users. Please contact xGeographic for custom weighting options.

Food Access Indices

As part of the food access analysis, three primary categories have been identified from the point of interest types included in the Wave database, including supermarkets, dining and markets. The supermarket category includes grocery stores and super centers. The dining category includes restaurants, fast food, bars serving food, cafes and coffee shops. The market category includes convenience stores, community markets, bodegas, and markets located inside of larger retailers such as Big Lots, CVS and Walgreens. Research is underway to determine the percentage of trips that are allocated to different food destination types, although recent research from the American Enterprise institute shows that U.S. consumer spending on food is primarily split between supermarkets and dining out (50.466 billion to 50.475 billion in January 2015, respectively), suggesting an equal weighting in their importance to consumers. Due to the even nature of consumer spending between supermarkets and dining out, and taking into account the hybrid nature of many markets (many of which offer groceries and fast-food options), an even weighting approach is being implemented for the food indices. This will weight the three destination types at 33.33%.

Goods & Services Access Indices

A wide range of goods and services are included in the goods and services indices, and they are provided even weights due to their overall diversity. The category includes pharmacies (medical goods), supermarkets (which contain retail goods), department stores (see the types in the attribute description section of this report), cosmetic service stores, general retail stores, banks, pet stores and veterinarians, and convenience stores (which typically provide retail offerings).

Recreation (and Public Recreation) Access Indices

The public recreation access indices include public parks and trails. Trails were test-weighted at 5% intervals and map outputs were qualitatively assessed in order to develop a weighting. The Wave development team decided on a weighting of 5% for trails in order to 1) provide a premium to areas with both a trail network and public parks, and 2) to limit the effective radius of trails while minimizing the downside to areas with good park coverage but no access to

trails. The 5% figure provided as a weighting for trails within the indices can be altered by Wave users by requesting xGeographic to run a new model.

Population Density Indices

The population density index uses the population density per acre for all roadway segments and converts this figure into a 0 to 100 score, with 100 signifying the highest density value. A thorough review of the region in map-form and through the statistics viewer in the ArcGIS attribute table, the development team found that the average population density across all roadway records was 4.74, with a standard deviation of 4.68.

On the higher end of the distribution, a qualitative approach was used to identify highly-populated areas such as downtown Orlando to set as a benchmark (maximum score) population density. The benchmark population density was determined to be 15 persons per acre following a review of the map output and symbology.

The map on this page shows the output of the qualitative review, with red areas depicting maximum, or "benchmark" population density areas that score 100. The population density index is calculated as the population density present, divided by 15, and then multiplied by 100, with a maximum potential score of 100. The population density indices are equal for bicycling and walking, and they include the number of residents in an area plus the number of tourists using 2015 CFRPM TAZ data. 2020 data will be used once it is made publicly available.

Job Density Indices

The job density index underwent the same process that the population density indices underwent in order to convert jobs per acre data into 0 to 100 scores. A mean of 2.26 jobs per acre across all roadway records confirmed that jobs per acre is generally lower than population density per acre at a regional scale. As part of the job density map output and quantitative analysis, a maximum or "benchmark" job density figure of 10 was utilized. The job density index is calculated as the job density present, divided by 10, and then multiplied by 100, with a maximum potential score of 100. The job density indices are equal for bicycling and walking and are generated using 2015 CFRPM TAZ data. 2020 data will be used once it is made publicly available.

Overview | **Access Indices**

The access indices provide a 0 (low access) to 100 (high access) score for all roadway segments and parcels using baseline distance data from the "X" fields in the Wave database. The goal of the access indices is to provide a snapshot of access to multiple point of interest types within specific categories. The access indices included in the Wave database include:

- Food Access Indices (for Walking and Biking)
- Entertainment Access Indices (for Walking and Biking)
- Nightlife Access Indices (for Walking and Biking)
- Goods and Services Access Indices (for Walking and Biking)
- Public Recreation Access Indices (for Walking and Biking)
- Recreation Access Indices (for Walking and Biking)
- Transit Access Indices (for Walking and Biking)
- Municipal Services Access Indices (for Walking and Biking)
- Job Density Indices
- Population Density Indices
- Food (Minus Fast Food & Coffee Shops) Access Indices (for Walking and Biking)

For all points of interest, the following scoring metric is utilized, assigning a 0 to 100 score to all distances (for the point of interest being analyzed), for walking and biking.

Distance	Biking Score (y)	Biking Time	Walking Score (y)	Walking Time
0 Miles	100	0 Mins.	100	0 Mins.
0.25 Miles	90	2 Mins.	80	5 Mins.
0.50 Miles	80	5 Mins.	60	10 Mins.
0.75 Miles	70	7 Mins.	40	15 Mins.
1.00 Miles	60	10 Mins.	20	20 Mins.
1.50 Miles	40	15 Mins.	0	30 Mins.
2.00 Miles	20	20 Mins.	0	40 Mins.
Beyond	0	N/A	0	N/A

***** Biking time measured using a metric of 6 miles per hour average cycling speed, including stops

Scores currently adhere to the following linear equations, where x is the distance in feet:

- Pedestrian: $y = .0151515(5280-x) + 20$
- Bicycling: $y = .00757575(10560-x) + 20$

What do these scores mean? Common urban planning principles were utilized to create these scores (including the 5-minute walk zone, 10-minute walk zone, and 2-mile bike shed), and the table below summarizes how these scores convert into qualitative information

Score	Biking Time	Walk Time	Star Rating	Qualitative Assessment
81 – 100	0-5 Min.	0-5 Min.	5	Excellent Access
61 – 80	5-10 Min.	5-10 Min.	4	Good Access
41 – 60	10-15 Min.	10-15 Min.	3	Moderate Access
21 – 40	15-20 Min.	15-20 Min.	2	Lower to Moderate Access
0 – 20	> 20 Min.	> 20 Min.	1	Poor or No Access

When applying these metrics to multiple points of interest, the one-quarter mile metric was utilized to generate maximum scores for walking and the half-mile metric was used for maximum bicycling scores.

Within the access indices on the following pages, a threshold number of points of interest are set as a baseline in order to score the category. For food, three point of interest bundles are used. Within the food score, if a location is within one-quarter-mile of *all three* of these point of interest types, then the score is equal to 100. To account for the quarter mile equaling 80 points (for walking and biking), the weighting of these three categories exceeds 100%. The maximum is 125, and any score exceeding 100 is converted to 100.

This was done in order to assign a premium to areas that have *superior optionality* within the category being analyzed for access. All weighting utilizes this methodology with the exception of the transit, population and job indices. More information is provided on the following pages concerning how each category is scored.

Food Access Indices

The Food Access Indices measure access to food destinations.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

If all three of these point of interest types are within one-quarter-mile of a location, the pedestrian score translates to 100. If all three of these point of interest types are within one-half-mile of a location, the bicycling score translates to 100. Scores exceeding 100 are converted to 100.

Pedestrian Index Score Field: P_FOOD
Bicyclist Index Score Field: B_FOOD

Point of Interest Type	Score Weight
A: Supermarket (POI Bundle)	41.667%
B: Dining (POI Bundle)	41.667%
C: Markets (POI Bundle)	41.667%

Entertainment Access Indices

The Entertainment Access Indices measure access to sources of entertainment.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

If a total of four of these point of interest types are within one-quarter-mile of a location, the pedestrian score in that location translates to 100. If a total of four of these point of interest types are within one-half-mile of a location, the bicycling score translates to 100. Scores exceeding 100 are converted to 100.

Pedestrian Index Score Field: P_ENTMT
Bicyclist Index Score Field: B_ENTMT

Point of Interest Type	Score Weight
A: Mall	31.25%
B: Entertainment Venue	31.25%
C: Sports Stadium	31.25%
D: Movie Theater	31.25%
E: Theme Park	31.25%
F: Sports Bars & Bars Serving Food	31.25%
G: Bars & Night Clubs	31.25%
H: Museum	31.25%

Night-Life Access Indices

The Night-Life Access Indices measure access to businesses likely to be active at night.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

If all four of these point of interest types are within one-quarter-mile of a location, the pedestrian score in that location translates to 100. If all four of these point of interest types are within one-half-mile of a location, the bicycling score translates to 100. Scores exceeding 100 are converted to 100.

Pedestrian Index Score Field: P_NIGHT
Bicyclist Index Score Field: B_NIGHT

Point of Interest Type	Score Weight
A: Entertainment Venue	31.25%
B: Bars & Night Clubs	31.25%
C: Sports Bars & Bars Serving Food	31.25%
D: Restaurant & Take-Out	31.25%

Goods & Services Access Indices

The Goods & Services Access Indices measure access to a wide array of retail destinations and service businesses.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

If a total of six of these point of interest types are within one-quarter-mile of a location, the pedestrian score in that location translates to 100. If a total of six of these point of interest types are within one-half-mile of a location, the bicycling score translates to 100. Scores exceeding 100 are converted to 100.

Pedestrian Index Score Field: P_GOODSVC
Bicyclist Index Score Field: B_GOODSVC

Point of Interest Type	Score Weight
A: Pharmacy (POI Bundle)	20.833%
B: Supermarket (POI Bundle)	20.833%
C: Department Store (POI Bundle)	20.833%
D: Cosmetic Services	20.833%
E: Retail Store	20.833%
F: Bank	20.833%
G: Veterinarian / Pet Store	20.833%
H: Market (POI Bundle)	20.833%

Public Recreation Access Indices

The Public Recreation Access Indices measure access to public parks and trails.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

No scoring or weighting conversions are completed for the public recreation access index.

Pedestrian Index Score Field: P_PUBREC
Bicyclist Index Score Field: B_PUBREC

Point of Interest Type	Score Weight
A: Public Park	95%
B: Trail	5%

Recreation Access Indices

The Recreation Access Indices measure access to public and HOA parks and trails.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

No scoring or weighting conversions are completed for the recreation access index.

Pedestrian Index Score Field: P_PARKREC
Bicyclist Index Score Field: B_PARKREC

Point of Interest Type	Score Weight
A: All Parks (Bundle)	95%
B: Trail	5%

Transit Access Indices

The Transit Access Indices measure access to LYNX bus stops and SunRail stations.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

No scoring or weighting conversions are completed for the transit access index due to a lack of multiple point of interest types within the index. Locations within ¼ mile of a transit stop are provided a score of 80.

Pedestrian Index Score Field: P_TRANSIT
Bicyclist Index Score Field: B_TRANSIT

Point of Interest Type	Score Weight
A: Transit Station (Bundle)	100%

Municipal Service Indices

The Municipal Service Indices measure access to municipal services and forums.

All roadway segments in the Wave database are scored based on their proximity, in feet, to the point of interest types included below using the bicycle and pedestrian barrier file and a Euclidean distance function, along other geoprocessing steps. Fields beginning with the letter "X" are the inputs to this access index using the scoring methodology located at the beginning of this section of the methodology.

If all four of these point of interest types are within one-quarter-mile of a location, the pedestrian score in that location translates to 100. If all four of these point of interest types are within one-half-mile of a location, the bicycling score translates to 100. Scores exceeding 100 are converted to 100.

Pedestrian Index Score Field: P_MUNICIPL
Bicyclist Index Score Field: B_MUNICIPL

Point of Interest Type	Score Weight
A: City Hall	31.25%
B: Post Office	31.25%
C: Library	31.25%
D: Community Center	31.25%

Job Density Indices

The Job Density Indices measure job density per acre. Section 003.03 contains more information pertaining to the usage of "10" as a multiplier of job density. All scores exceeding 100 are converted to 100. The pedestrian and bicyclist scores are equal for this access index.

Pedestrian Index Score Field: P_JOBDENS
Bicyclist Index Score Field: B_JOBDENS

Population Density Indices

The Population Density Indices measure population density per acre. Section 003.03 contains more information pertaining to the usage of "6.6666" as a multiplier of job density. All scores exceeding 100 are converted to 100. The pedestrian and bicyclist scores are equal for this access index.

Pedestrian Index Score Field: P_POPDENS
Bicyclist Index Score Field: B_POPDENS

Food Access Indices (Not Including Fast Food and Coffee Shops)

This measure of food access is similar to the Food Access Indices, however fast-food restaurants and coffee shops are not included in the dining category. Additionally, dining typologies are separated as individual categories, together making up 41.667% of the weighting.

Pedestrian Index Score Field: P_FOODNF
Bicyclist Index Score Field: B_FOODNF

Point of Interest Type	Score Weight
A: Supermarket (POI Bundle)	41.667%
B: Restaurants	13.889%
C: Sports Bars & Bars Serving Food	13.889%
D: Café (Coffee & Food)	13.889%
E: Markets (POI Bundle)	41.667%

Food Investment Areas

The food investment areas countermeasure identifies areas with high population densities, high job densities, as well as good access to transit and goods and services that *also* currently have low access to food. The walking access indices are used for each respective data input. Higher values within this field represent a larger relative gap in food coverage. Refer to the demographic section of this report to view additional uses of this data output in the context of low-income areas. The food investment area countermeasure field (GAP_FOOD) is populated using the following equation:

P = Population Density Index (P_POPDENS)
J = Job Density Index (P_JOBDENS)
T = Transit Access Index (P_TRANSIT)
G = Goods & Services Access Index (P_GOODSVC)
F = Food Access Index (P_FOOD)
X = Food Investment Area Index (GAP_FOOD)

$$X = [\ (P + J + T + G) / 4\ ] - F$$

Recreation Investment Areas

The recreation investment areas countermeasure identifies areas with high population densities and good access to food, entertainment and goods and services that *also* currently have low access to parks. The walking access indices are used for each respective data input. Higher values in this field represent a larger relative gap in park coverage. Refer to the demographic section of this report to view additional uses of this data output in the context of low-income areas. The recreation investment area countermeasure field (GAP_PARKS) is populated using the following equation:

P = Population Density Index (P_POPDENS)
F = Food Access Index (P_FOOD)
E = Entertainment Access Index (P_ENTMT)
G = Goods & Services Access Index (P_GOODSVC)
R = Recreation Access Index (P_PARKREC)
X = Park Investment Area Index (GAP_PARKS)

$$X = [\ (P + F + E + G) / 4\ ] - R$$

Bike-Ped Risk Index

The bike-ped risk index (SAF_ROAD) uses crash rate data to assign a risk profile to roadway segments based on their characteristics. As part of the development of FHWA data in 2019 by the ECFRPC, bicycling and pedestrian crash rates corresponding to total number of lanes, number of turn lanes, median presence, and annual average daily traffic were developed. The following crash statistics, which are publicly available, are shown below in four categories.

Category	Design Characteristic	Annual Bicycle and Pedestrian Crashes Per Mile
A	1-2 Lanes (Local)	0.022
A	1-2 Lanes (Non-Local)	0.108
A	3-4 Lanes	0.288
A	5-6 Lanes	0.891
A	7 or More Lanes	1.907
B	No Turn Lanes (Local)	0.022
B	No Turn Lanes (Non-Local)	0.151
B	Turn Lane Present	0.957
C	1-3 Lanes	0.043
C	Grass Median and 4+ Lanes	0.455
C	No Median (or Under Construction) and 4+ Lanes	1.272
C	Non-Grass Median or Multiple Medians and 4+ Lanes	1.549
D	AADT < 10,000 (Local)	0.024
D	AADT < 10,000 (Non-Local)	0.142
D	AADT 10,001 – 20,000	0.400
D	AADT 20,001 – 30,000	0.707
D	AADT 30,001 – 40,000	1.185
D	AADT 40,001 – 50,000	1.312
D	AADT More than 50,000	1.971

Using these categories, each roadway segment is provided with a Bike-Ped Risk Index score by identifying the crash rate under each category that fits the roadway segment's design profile. The Bike-Ped Risk Index (R) is equal to the average of the 4 categories above, *multiplied by 62.6566 in order to convert the maximum possible risk score to 100*. This index score, simplified below, is located in the SAF_ROAD field within the Wave database.

$$R = [\ (A_x + B_x + C_x + D_x) / 4\ ] \times 62.6566$$

Bike-Ped Risk Index Normalized for Location

The bike-ped risk index normalized for location adds a land use context to the bike ped risk index score. To do this, the bike-ped risk index is compared against three of the access indices reviewed previously in this report, including the Goods & Services Access Index, the Food Access Index, and the Night-Life Access Index (for pedestrians). These three access indices are used due to the high rate of bicycle and pedestrian crashes that occur in close proximity to these establishment types. The bike-ped risk index normalized for location, located in the Wave database under the SAF_ROADLU field, is simplified below. *Higher values within this field equate to a higher risk profile* for the roadway segment in question.

G = Goods and Services Access Index (P_GOODSVC)
F = Food Access Index (P_FOOD)
N = Night-Life Access Index (P_NIGHT)
R = Bike-Ped Risk Index (SAF_ROAD)
X = Bike-Ped Risk Index Normalized for Location (SAF_ROADLU)

$$X = [\ (G + F + N) / 3\ ] - (100 - R)$$

Navigable Fluidity Indices

The navigable fluidity indices calculate the proportional differences in travel distance between different forms of travel, including 1) traveling by walking or biking on sidewalks, trails and off-network paths, 2) traveling via car on the roadway network and through parking lots, and 3) traveling in the air, "as the crow flies", with no lateral obstacles blocking north, east, south and west travel. These metrics allow users of Wave to see how fluid a particular roadway or bicycle and pedestrian network is. Within the wave database, these distances are input (in feet) within fields that begin with a letter and an underscore. The following distances are calculated as part of the navigable fluidity indices:

W_ Distance: "As the crow flies" distance with no lateral barriers
X_ Distance: Walking/ biking distance using sidewalks, trails, and off-network paths
Y_ Distance: Driving distance using the roadway network and parking lots
U_ Proportion: Proportion of bike/walk distance to as-the-crow-flies distance (X/W)
Z_ Difference: The difference, in feet, between the bike/walk distance and the driving distance (Y - X). Positive values equate to the number of feet saved by walking/biking.

Transit Investment Opportunities

The transit investment opportunities countermeasure identifies areas with high population densities, high job densities, and good access to food and goods and services that *also* currently have low access to transit. The walking access indices are used for each respective data input. Higher values in this field represent a larger relative gap in transit coverage. Refer to the demographic section of this report to view additional uses of this data output in the context of low-income areas. The transit investment opportunity countermeasure field (GAP_TRANSIT) is populated using the following equation:

P = Population Density Index (P_POPDENS)
J = Job Density Index (P_JOBDENS)
F = Food Access Index (P_FOOD)
G = Goods & Services Access Index (P_GOODSVC)
T = Transit Access Index (P_TRANSIT)
X = Transit Investment Opportunity Index (GAP_TRANSIT)

$$X = [\ (P + J + F + G) / 4\ ] - T$$

Roadway Safety Countermeasures for Access to Transit

This countermeasure, populated within the SAF_TRANST field, *identifies roadway segments with sidewalk gaps* that also have a speed limit greater than 30 *and* are located within ¼ mile of a LYNX or SunRail stop. The output of this field indicates whether one or two sidewalk gaps exist on the roadway, allowing planners and engineers to see areas for potential safety and mobility enhancements near transit stops.

SAF_TRANST = '1 Sidewalk Gap'
WHERE [SPEED2] > 30 AND [X_TRANSIT] < 661 AND [SIDEWALK] = 1

SAF_TRANST = '2 Sidewalk Gaps'
WHERE [SPEED2] > 30 AND [X_TRANSIT] < 661 AND [SIDEWALK] = 0

Roadway Safety Countermeasures for Access to Public Schools

This countermeasure, populated within the SAF_SCHOOL field, *identifies roadway segments with sidewalk gaps* that also have a speed limit greater than 30 *and* are located within ¼ mile of a public elementary, middle or high school. The output of this field indicates whether one or two sidewalk gaps exist on the roadway, allowing planners and engineers to see areas for potential safety and mobility enhancements near schools.

SAF_SCHOOL = '1 Sidewalk Gap'
WHERE [SPEED2] > 30 AND [X_SCHOOL] < 661 AND [SIDEWALK] = 1

SAF_SCHOOL = '2 Sidewalk Gaps'
WHERE [SPEED2] > 30 AND [X_SCHOOL] < 661 AND [SIDEWALK] = 0

Roadway Redesign Opportunities

The retrofit and redesign fields identify modifications that can potentially be made to roadway segments based on Florida Department of Transportation design criteria. Metrics include retrofittable lateral space (RETROFIT field), protectable bike lane opportunities (RETRO_BIKE), speed limit alteration candidates (RETRO_SPD) and lane reduction candidates (RETRO_LAN).

RETROFIT

The retrofittable lateral space field identifies the amount of lateral space that can be repurposed along a roadway segment. To compute this field, the following metrics are used: 1) Roadway width, 2) Total number of lanes, and 3) The context classification of the roadway. The amount of retrofittable space (R) is calculated using the roadway width (W) and total number of lanes (L), multiplied by the variable X, subject to the context classification (C), which is defined below:

$$R = W - LX_C$$

Where X_C is 11 when the context classification is C3, C4, C5 or C6; X_C is 11 when the context classification is C2T, and X_C is 12 when the context classification is C1 or C2. X_C is 10 when the roadway is a local roadway with a measured width greater than 25 feet.

These lane width standards are included in the 2020 Context Classification update by the Florida Department of Transportation.

RETRO_BIKE

The retrofittable bike lane field identifies existing bicycle lanes that could potentially be protected with a 2-foot-plus buffer (painted strip, raised buffer, etc.). If there is one bicycle lane present and the retrofittable space is 4 feet or greater, then the RETRO_BIKE field is populated with "1", signifying that one bicycle lane is potentially protectable. If there are two bicycle lanes present and the retrofittable space is 5 feet or greater, then the RETRO_BIKE field is populated with "2", signifying that two bicycle lanes are potentially protectable.

RETRO_SPD

The retrofittable speed field identifies roadways that have at least one bike lane present that currently have a speed limit greater than 35 miles per hour. This analysis is completed in order to identify high risk bikeways adjacent to roadways with high vehicular speeds.

RETRO_LAN

The lane reduction candidate field identifies roadways with four or more through lanes and daily traffic volumes lower than 20,000. These values are identified in the 2020 FDOT Design Manual, Section 126, as lane elimination candidate roadways.

Low-Income Food Desert Finder

The FOOD_INCOM field in the Wave database identifies food deserts that are located in low-income areas. Specifically, this field identifies areas that are more than a 10-minute walk (one-half mile) from a grocery store and more than a 10-minute walk from a market (not including small markets) and that *also* have a median family income of $35,020 or lower. Convenience stores, mini-markets and bodegas are not included in the market category. The $35,020 figure is 40% below the median Florida family income of 58,368 (U.S. Census Bureau, 2019), which is considered "low income" by the U.S. Department of Housing and Urban Development.

Low-Income Recreation Desert Finder

The PARK_INCOM field in the Wave database identifies park deserts that are located in low-income areas. Specifically, this field identifies areas that are more than a 10-minute walk (one-half mile) from a public park that *also* have a median family income of $35,020 or lower. The $35,020 figure is 40% below the median Florida family income of 58,368 (U.S. Census Bureau, 2019), which is considered "low income" by the U.S. Department of Housing and Urban Development.

Low-Income Transit Shortage Finder

The TRAN_INCOM field in the Wave database identifies transit deserts that are located in low-income areas. Specifically, this field identifies areas that are more than a 10-minute walk (one-half mile) from a transit stop that *also* have a median family income of $35,020 or lower. The $35,020 figure is 40% below the median Florida family income of 58,368 (U.S. Census Bureau, 2019), which is considered "low income" by the U.S. Department of Housing and Urban Development.

Zero-Vehicle Household Transit Shortage Finder

The TRAN_ZEROV field in the Wave database identifies areas that are more than one-half of a mile (10-minute walk) from transit stations that also have a greater than 17.4% zero-vehicle household rate. The 17.4% rate is equal to 200% of the national average for household vehicle ownership in 2019, which was 8.7% according to the 2018 U.S. Census ACS.

Hospital Access Analyzer

The hospital access analyzer populates the GAP_HOSPTL field with the population density (persons per acre) of roadway segments located more than two miles away from a hospital. The Y_HOSPITAL field (automotive distance to the nearest hospital) is used to identify areas outside of the 2-mile access zone to hospitals, and the GAP_HOSPTL field is populated with the value from the TAZ_POP field.

This quick analysis tool uses the automotive barrier file and depicts higher-density areas that could potentially benefit from the placement of a new hospital.

Fire Station Coverage Analyzer

The fire station coverage analyzer populates the GAP_FIRE field with the population density (persons per acre) of roadway segments located more than two miles away from a fire station. The Y_FIRE field (automotive distance to the nearest fire station) is used to identify areas outside of the 2-mile access zone to fire stations, and the GAP_FIRE field is populated with the value from the TAZ_POP field.

This quick analysis tool uses the automotive barrier file and depicts higher-density areas that could potentially benefit from the placement of a new fire station.

09 | Contact Information

Direct Contact

PJ Smith, AICP
407-496-5463
pjsmith@xgeographic.com

Online

www.xgeographic.com/wave