Under a New Halo:
Site Suitability Study for the Hypothetical Relocation of Angel Stadium

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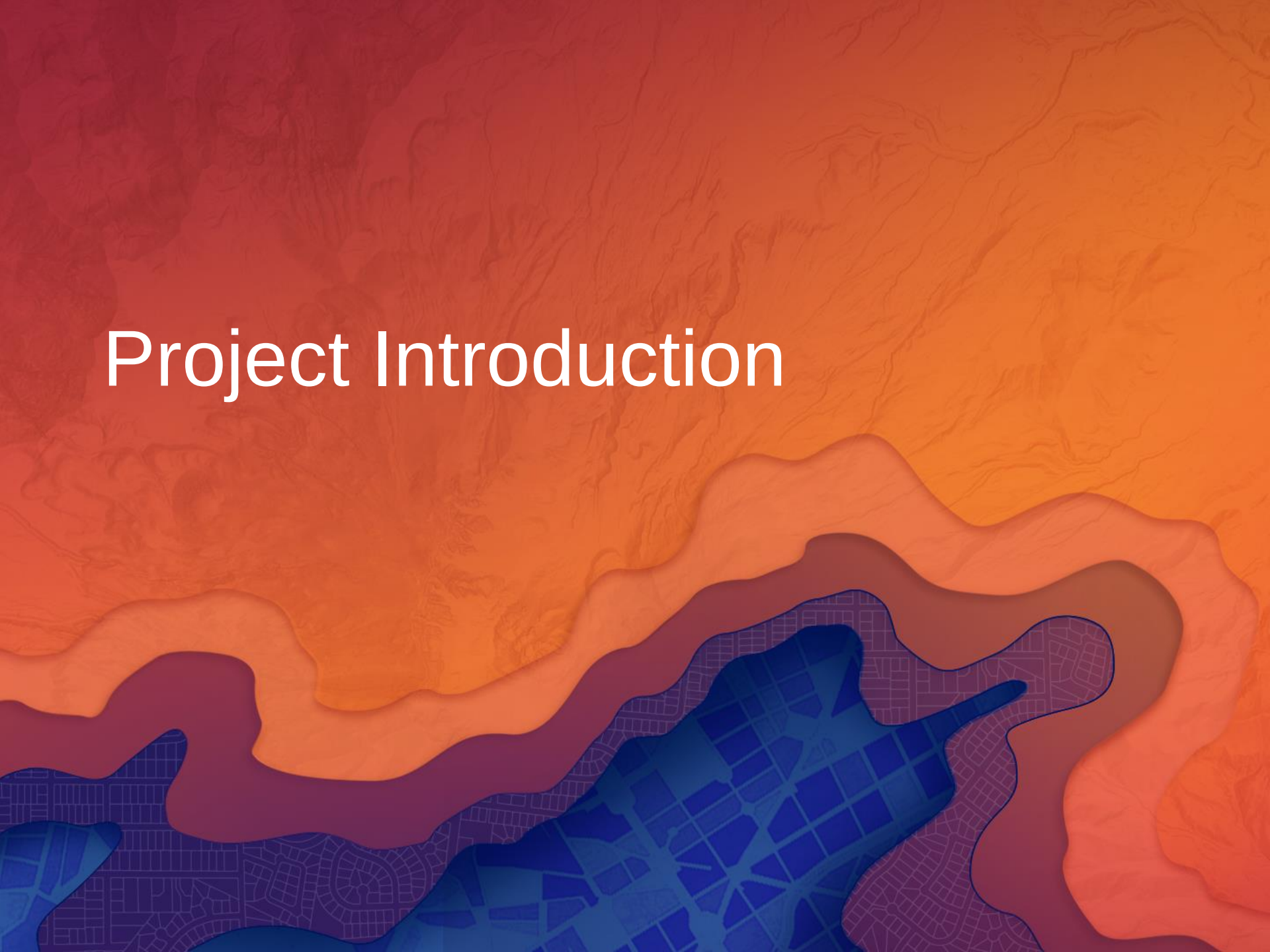
About me…

- Relatively new to GIS and an honor to present at the 2017 UC
- Received Certificate in GIS from UC Riverside Extension - 2014
- MS in GIS from Cal State University, Long Beach – 2016
  (this study was the Applied Research Project for my MS at CSULB)
- Recently joined the City of Moreno Valley Technology Services Division as a GIS Specialist

Project Introduction



Introduction

- Angel Stadium: over 50 years old, is tied for 4th oldest stadium in MLB (along with Oakland Colosseum, behind Dodger Stadium, Wrigley Field, and Fenway Park)
- Prior to the start of this project (in 2015) Angels management was in a dispute over stadium repairs and plans for adjacent development with the City of Anaheim
- Earlier this year, Angels management confirmed that the team is staying put…until 2029 (at least)

latimes.com

Angels to stay in Anaheim through at least 2029

Pedro Moura

2-3 minutes

Angels to stay in Anaheim through at least 2029

Angels outfielder Mike Trout acknowledges the fans after hitting a grand slam during a game against the Texas Rangers on July 26. (Kelvin Kuo / Associated Press)

In his first news conference since October 2015, Angels owner Arte Moreno said Saturday that his team is staying at Angel Stadium for the foreseeable future.

The franchise holds the right to opt out of its Angel Stadium lease in 2019 and has long been considering a move within Orange County around that. But no suitable location has been found, so they will stay.

Moreno said the club holds additional opt-out opportunities in 2028 and 2038, although, as written, the lease expires at the end of 2029 and then contains three three-year opt-in clauses, extending through 2038.

Introduction

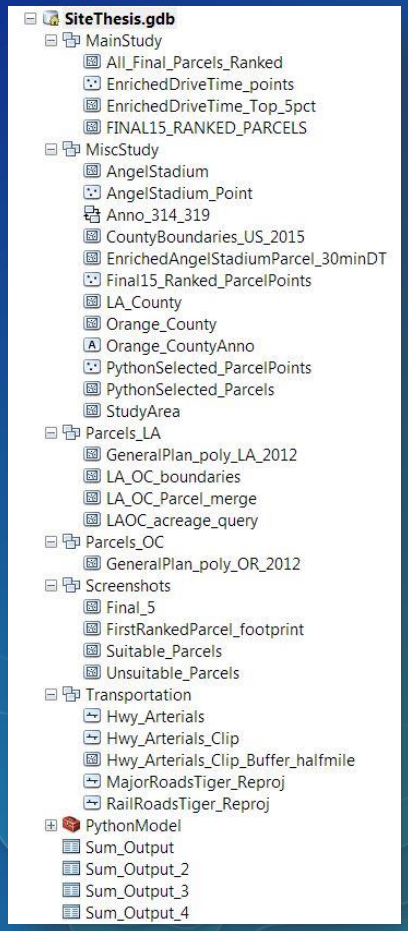
Project Study Area:

Name of data	Content	Source
US_Census_2010.gdb	2010 US Census, block groups, county subdivisions	United States Census Bureau
CensusCountyBoundariesUS2015	cb_2015_us_county_500k.shp	California State University, Long Beach, Department of Geography
LA_County	Census_2010 (BlkGrps, Blocks, Tracts), Communities.shp	California State University, Long Beach, Department of Geography
GeneralPlan_poly_SCAG_2012	General Plan polys for the following counties: Imperial, LA, Orange, Riverside, San Bernardino, Ventura	Southern California Association of Governments
2010 TIGER/line	LocalRoadsTiger.shp, MajorRoadsTiger.shp, RailRoadsTiger.shp	United States Census Bureau
USGS_OC_data	Shapefiles: county, Cleveland NF, MajRds, parks, places, etc.	United States Geological Survey
World Traffic	Ready-To-Use World Traffic Network Service	Esri ArcGIS Content Team
Population	2016 Total Population	Esri (ArcGIS Online)
Income	2016 Median Household Income	Esri (ArcGIS Online)
Age	Population ages 15 – 65	Esri (ArcGIS Online)
Education	2016 Education: Bachelor's Degree 2016 Education: Grad/Professional Degree	Esri (ArcGIS Online)
Jobs	2016 Unemployment Rate	Esri (ArcGIS Online)
Spending	Eating and drinking Sales, Apparel/Accessory Sales, Hotel/Lodging Sales, Movie/Amusement Sales	Esri (ArcGIS Online)
Business	Eating and drinking Businesses, Apparel/Accessory Businesses, Hotel/Lodging Businesses, Movie/Amusement Businesses Total Retail Sales Potential	Esri (ArcGIS Online)
Behaviors	Attend sports events: baseball games (MLB regular season), Listen to baseball: (MLB regular season), Watch sports on TV, Listen to sports on radio, Attend sports events, Watch on TV (MLB regular season), Watch on TV (MLB post season), Participated in baseball last 12 months, Interest: MLB Super Fan	Esri (ArcGIS Online)

Methodology

Methods

Data organization:



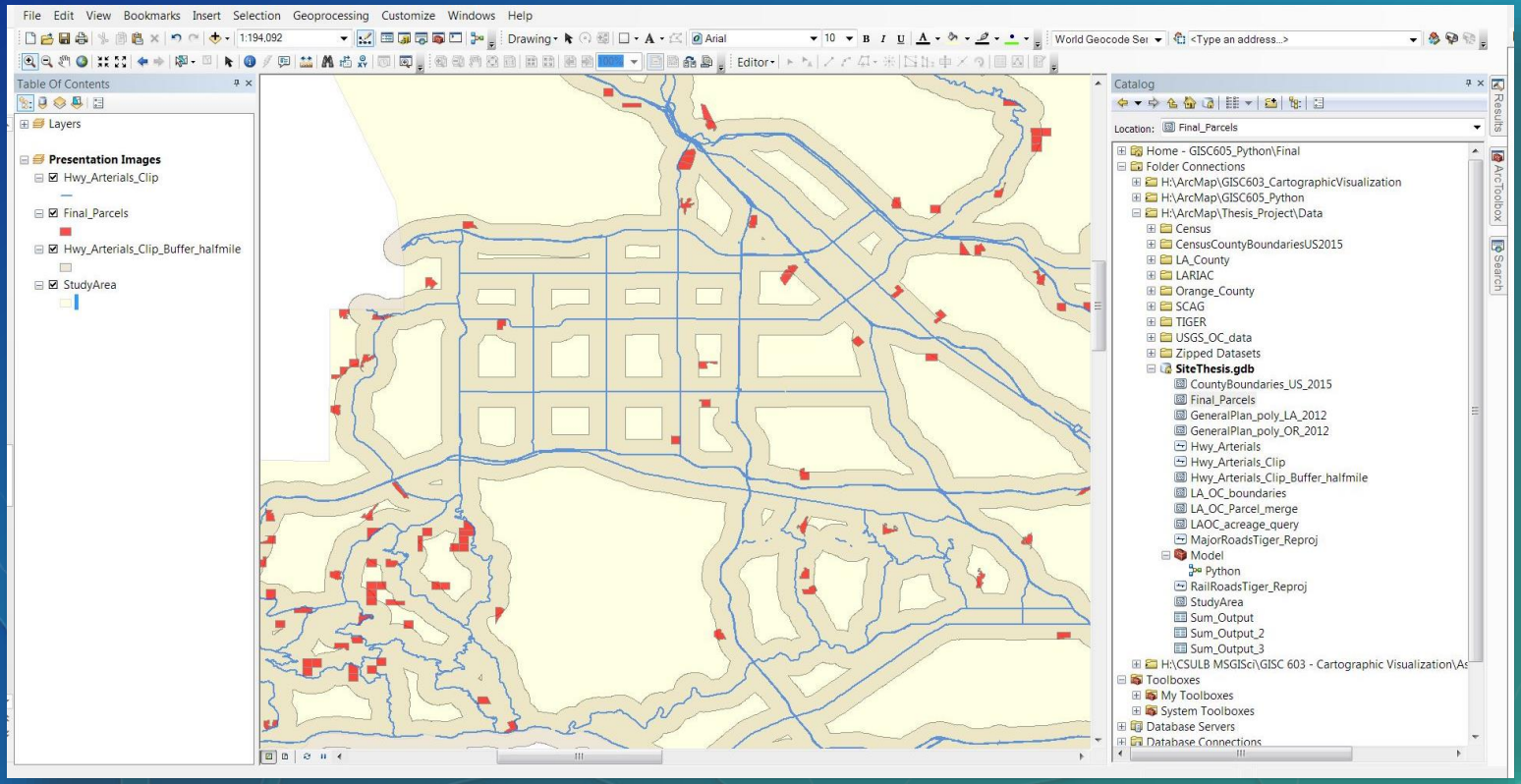
Organized local project data into a file geodatabase

ArcGIS Online data available via hosted services

Methods

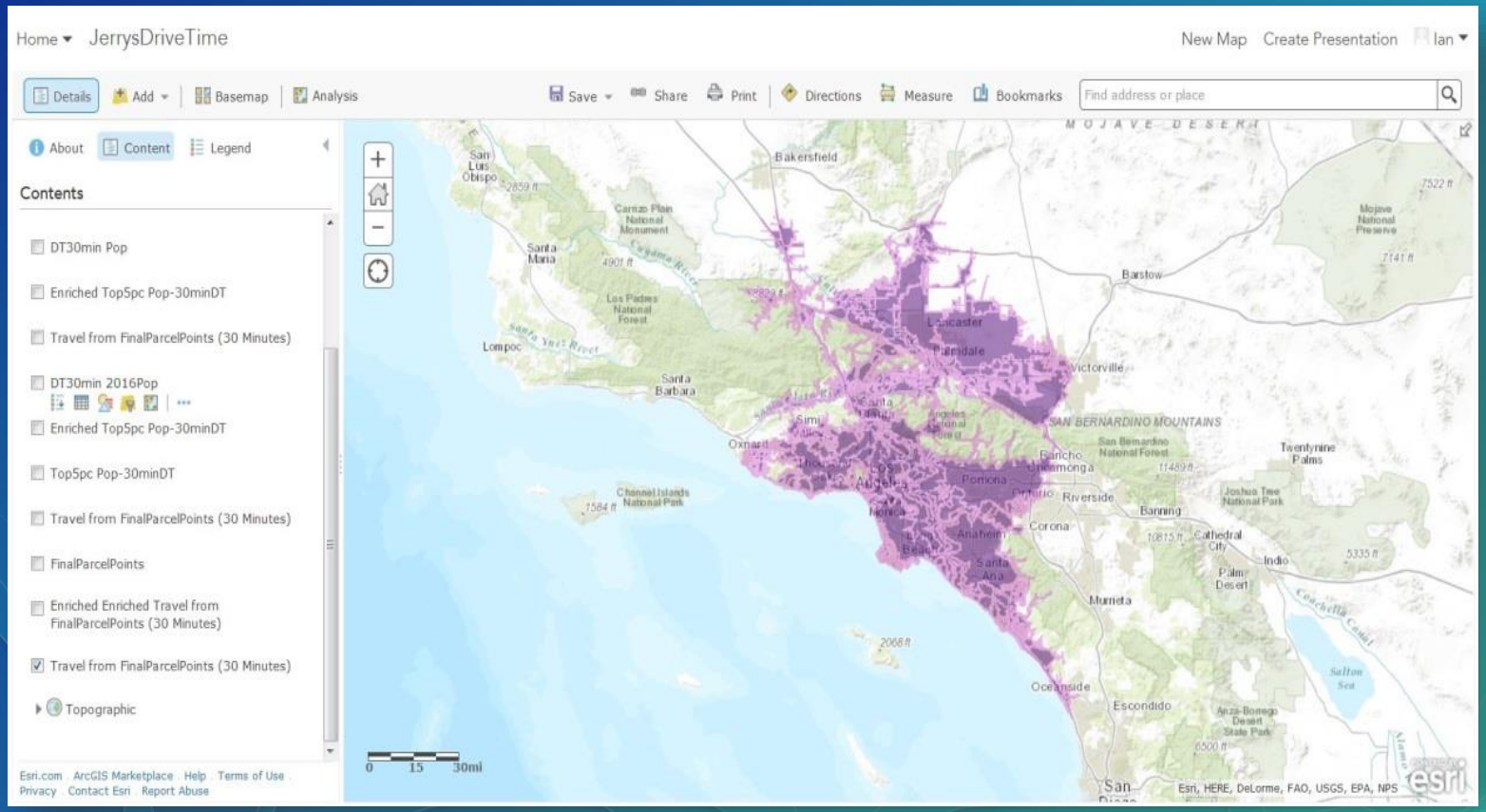
Created a simple Python script to identify suitable parcels (40 to 50 acres in area), within a half-mile of a major arterial or freeway

- Identified 735 parcels within the project study area



Methods

Created 30-minute drive-time polygons (using ArcGIS Online) for the parcels identified from running the Python script



Methods

Layer Enrichment Category	Enrichment Variable	Score (weighted by importance)
Population	2016 Pop. Ages: 15 – 65 (aggregated)	5
Behaviors	2016 Attend Sporting Events, MLB Regular Season	5
Population	2016 Total Population	4
Income	2016 Median Household Income	4
Spending	2016 Sport Events Admission (excluding trips)	4
Behaviors	2016 Attend Sports Events	4
Behaviors	2016 Listen to baseball (MLB Regular Season) on radio often	3
Behaviors	2016 Watch on TV: baseball (MLB Regular Season)	3
Behaviors	2016 Watch on TV: baseball (MLB Post Season)	3
Behaviors	2016 Interest: MLB 'Super Fan'	3
Business	2016 Total Retail Sales Potential	3
Business	Total Sales (aggregated)	3
Behaviors	2016 Watch sports on TV	2
Behaviors	2016 Listen to sports on Radio	2
Behaviors	2016 Participated in baseball within last 12 Months	2
Jobs	2016 Unemployment Rate	2
Business	Total Business (aggregated)	2
Education	2016 Education: Bachelor's Degree	1
Education	2016 Education: Grad/Professional Degree	1
	Total Possible Score:	56

- 'Enriched' drive-time polygons with 2016 total population data; chose the top 5% (37 parcels yielding population coverages between 3-5 million people)
- Further 'enriched' these 37 parcels with demographic data; created a weighted scoring matrix based on the most relevant variables (34 variables in total)

Methods

Using Excel and ArcMap, fields were sorted and aggregated; scores were entered based on the scoring matrix and only parcels containing scores were selected

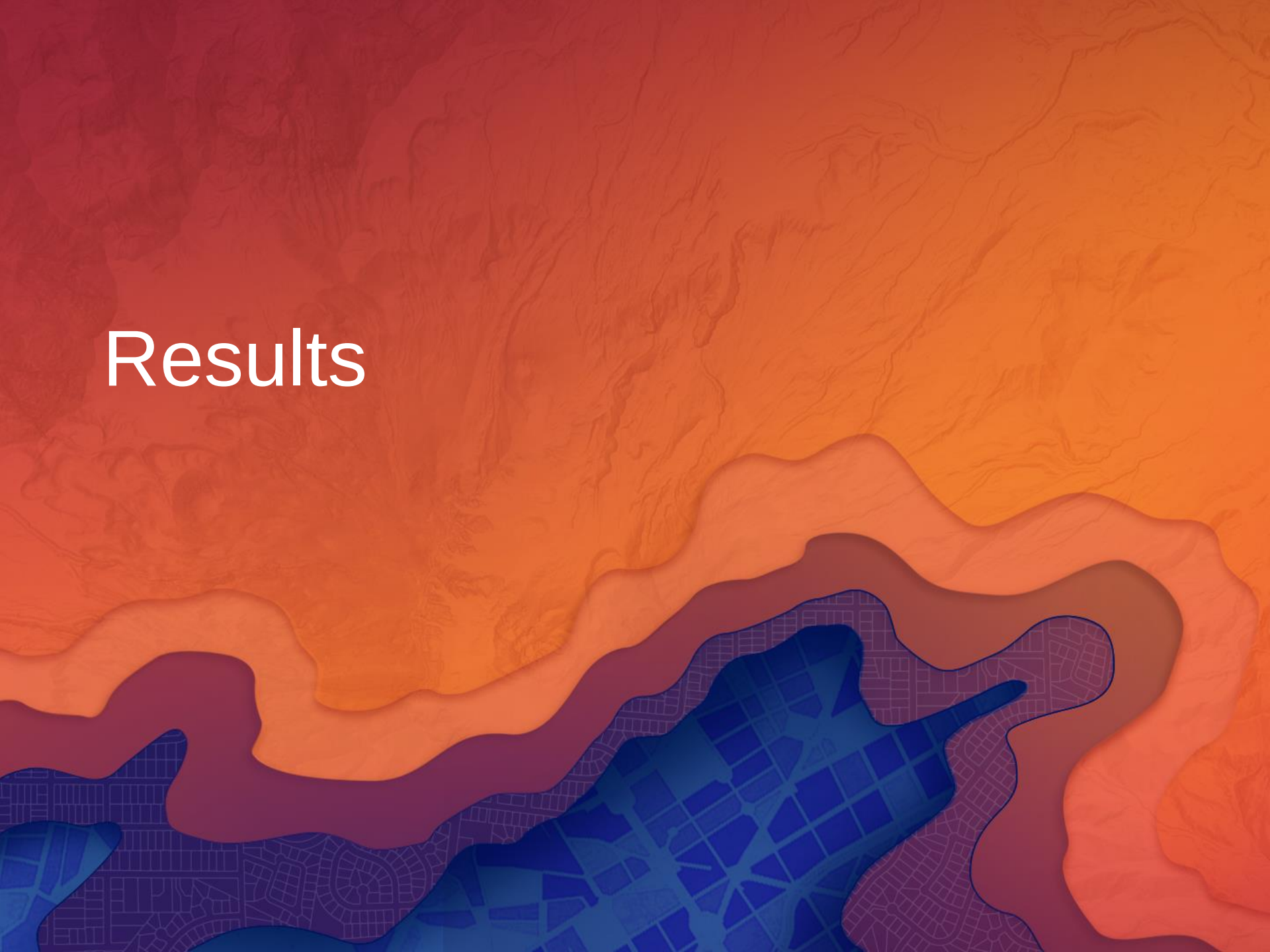
FID	1	2	3	4	5	6	7
CITY	Torrance	Glendale	Irwindale	Carson	Carson	Los Angeles	Carson
COUNTY	Los Angeles	Los Angeles	Los Angeles	Los Angeles	Los Angeles	Los Angeles	Los Angeles
ACRES	42.70086453	48.37288743	44.18245966	43.40834623	40.52068075	47.31683567	46.05462376
2016 Median Household Income	52178	51634	56209	54052	53750	47425	53806
2016 Population Age 60-64	154275	156118	156355	180151	202508	182836	190620
2016 Population Age 55-59	187005	184010	181866	217446	244295	216862	230090
2016 Population Age 50-54	202953	198379	192945	235171	263875	235607	248772
2016 Population Age 45-49	206678	201458	192528	237447	266754	243031	251492
2016 Population Age 40-44	212829	209652	196470	241252	272033	256097	256080
2016 Population Age 35-39	221258	218722	199034	245097	277411	271463	260427
2016 Population Age 30-34	247335	243127	218140	270397	307319	305123	287799
2016 Population Age 25-29	262952	247391	227441	289527	328809	313569	308178
2016 Population Age 20-24	268220	233307	222840	301277	339531	294923	320874
2016 Population Age 15-19	232357	191750	203364	272672	303430	242573	288183
Sport Events Admission excluding Trips	59187392	58426408	52554008	65045080	73120116	66162228	68586406
Attend sports events: baseball game - MLB reg seas	193448	207510	193836	217680	245580	231154	230251
Listen to baseball (MLB reg season) on radio often	55771	58206	53914	63963	72342	68968	67931
Watch sports on TV	1347572	1309282	1273939	1540383	1736577	1557000	1633579
Listen to sports on radio	311860	315636	311365	361906	406523	362934	383177
Attend sports events	447282	461953	435636	509152	572300	527966	538611
Watch on TV: baseball (MLB regular season)	456713	477640	458782	529647	595410	537046	560504
Watch on TV: baseball (MLB playoffs/World Series)	462709	484643	468108	536556	603923	544921	568344
Participated in baseball in last 12 mos	96041	92914	83845	105958	119671	112105	112401
Interest: MLB Super Fan	188306	204479	184023	213853	241708	244386	227256
2016 Education: Bachelor's Degree	358287	438087	353613	385627	439066	485511	408877
2016 Education: Grad/Professional Degree	199677	219790	186495	201067	228381	244801	212375
Eating & Drinking Businesses	7342	8375	7544	8027	9177	10183	8512
Apparel/Accessory Businesses	3170	3954	3973	2573	3364	5188	2838
Hotel/Lodging Businesses	678	556	486	697	765	693	729
Movie/Amusement Businesses	3336	4420	2454	2853	3337	5278	3065
Eating & Drinking Sales	5547402	5609586	5296899	6163145	6906859	6726335	6488653
Apparel/Accessory Sales	2748366	3457877	4536298	2834072	3382580	4765262	3031882
Hotel/Lodging Sales	1967793	1489557	1240135	1787532	1931386	1646722	1840419
Movie/Amusement Sales	8983488	11928713	4063401	5103637	7549064	14849821	5742512
2016 Unemployment Rate	6.3	6	5.7	6.3	6.3	6.2	6.3

Methods

Software used:

- ArcMap (v. 10.4) to create script, preform analysis, organize project data, and create 2D presentation map
- SketchUp, GEP to create a 3D animated and stadium location rendering
- ArcGIS Online (most the heavy lifting) and GEP (after exporting KML files of the ranked parcels) to create an Esri Story Map

Results

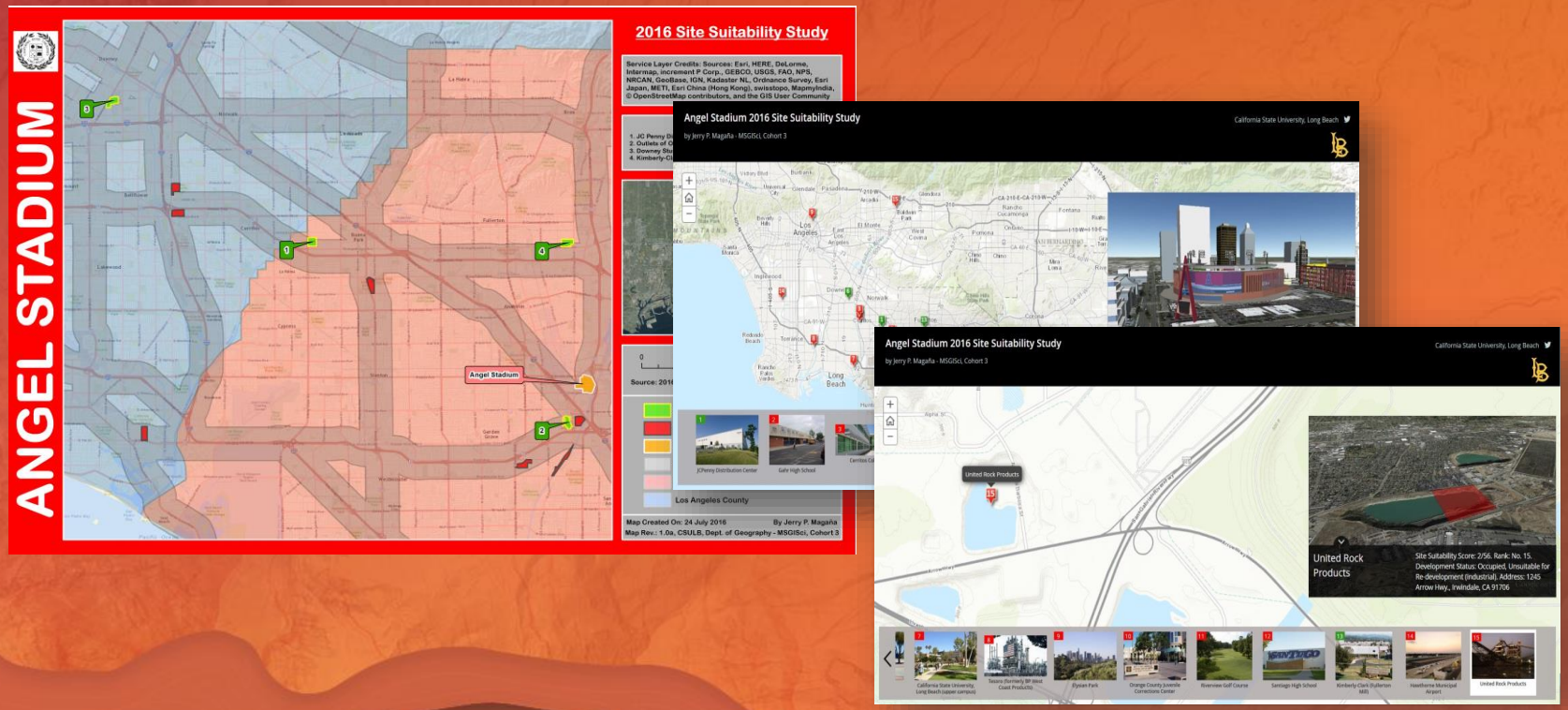


Results

Rank – Score / Total Possible Score	Unsuitable	Presently Occupied By
1 – 50 / 56		JCPenny Distribution Center
2 – 49 / 56	X	Gahr High School
3 – 48 / 56	X	Cerritos College
4 – 31 / 56	X	Knott's Soak City Waterpark
5 – 20 / 56		The Outlets of Orange
6 – 16 / 56		Downey Studios
7 – 15 / 56	X	CSU, Long Beach (upper campus)
8 – 14 / 56	X	Tesoro (petroleum refinery)
9 – 8 / 56	X	Elysian Park
10 – 8 / 56	X	Orange County Juvenile Hall
11 – 7 / 56	X	River View Golf Course
12 – 6 / 56	X	Santiago High School
13 – 4 / 56		Kimberly-Clark
14 – 2 / 56	X	Hawthorne Municipal Airport
15 – 2 / 56	X	United Rock Products

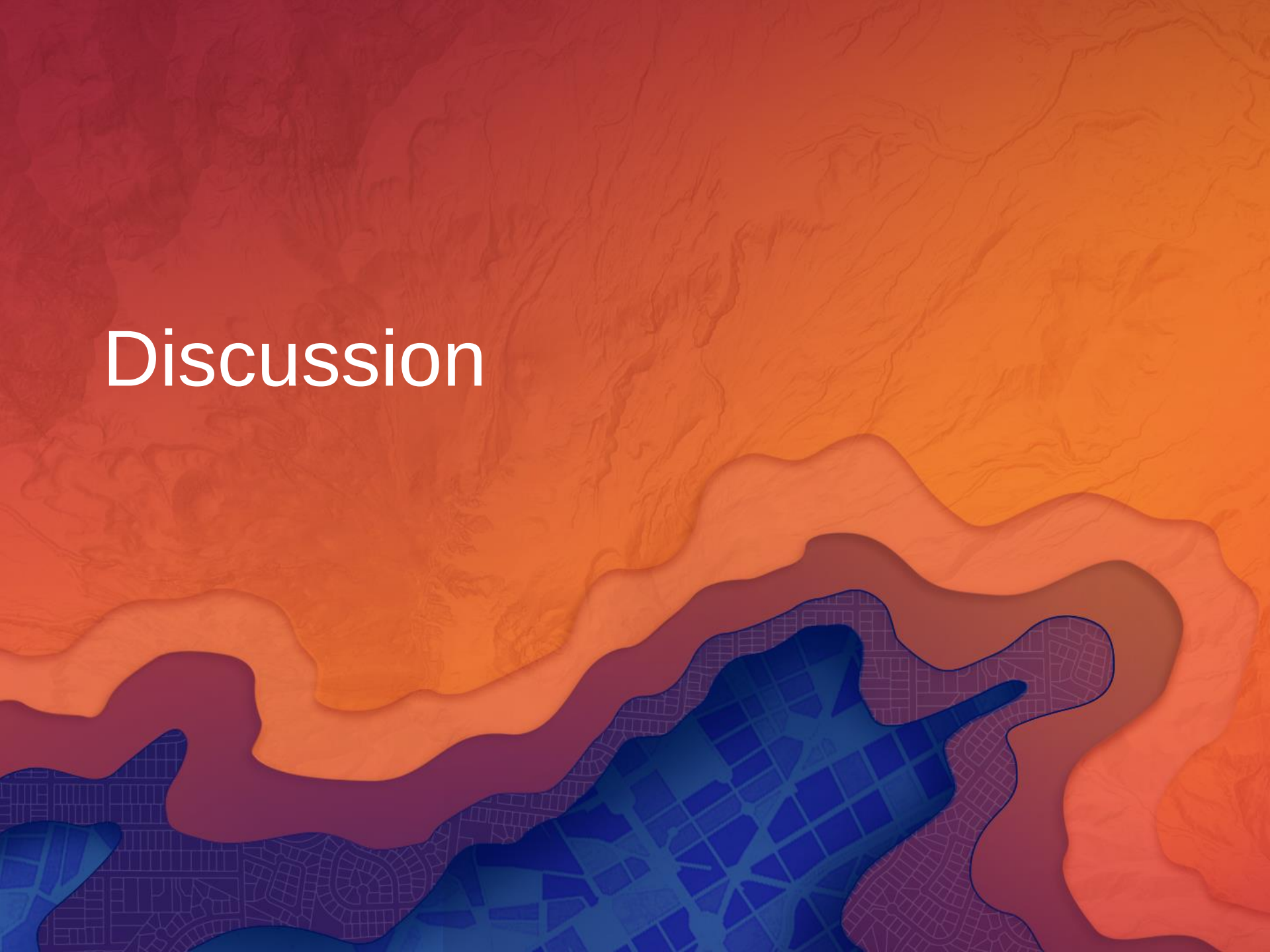
- A total of 15 ranked parcels in Los Angeles and Orange Counties, with scores ranging from 50 to 2
- Of these parcels, only 4 ***may*** be considered suitable for re-development
- Many of the ranked parcels were either currently designated for educational or industrial use, or they were physically incapable of 'containing' a stadium

Results



VIDEO ANIMATION WILL GO HERE

Discussion



Discussion

- Data collected from CSULB Department of Geography; good but a little out of date. City GIS portals ‘hit or miss’ (primarily in the OC).
- Extreme disparity between data sets found in either county of the study area.
- Data needs to be complete across both counties for the project to work as designed.
- 2016 UC was a ’project saving experience!
  - Discovered how to use ArcGIS Online for proximity (drive-time) analysis & layer enrichment with valuable and demographic data.
- Using ArcGIS Online provided ***current*** (as of the project year, 2016) and ***relevant*** data for the entire study area.

Discussion

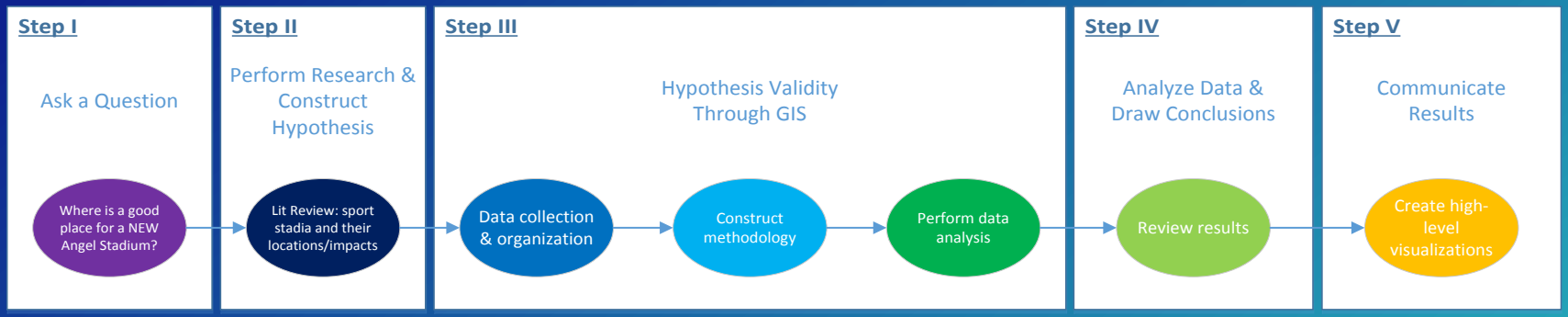
- Without complete public transit or infrastructure data across ***both*** counties, this study only focuses on demographically-based GIS analysis for site suitability.

- This iteration of the project represents a ‘good start’ to reaching comprehensive results (may be useful in high-level discussions).

- Significance includes discovery of new analysis methods; visualizations are designed for those without a significant background in either planning or GIS (high-level).

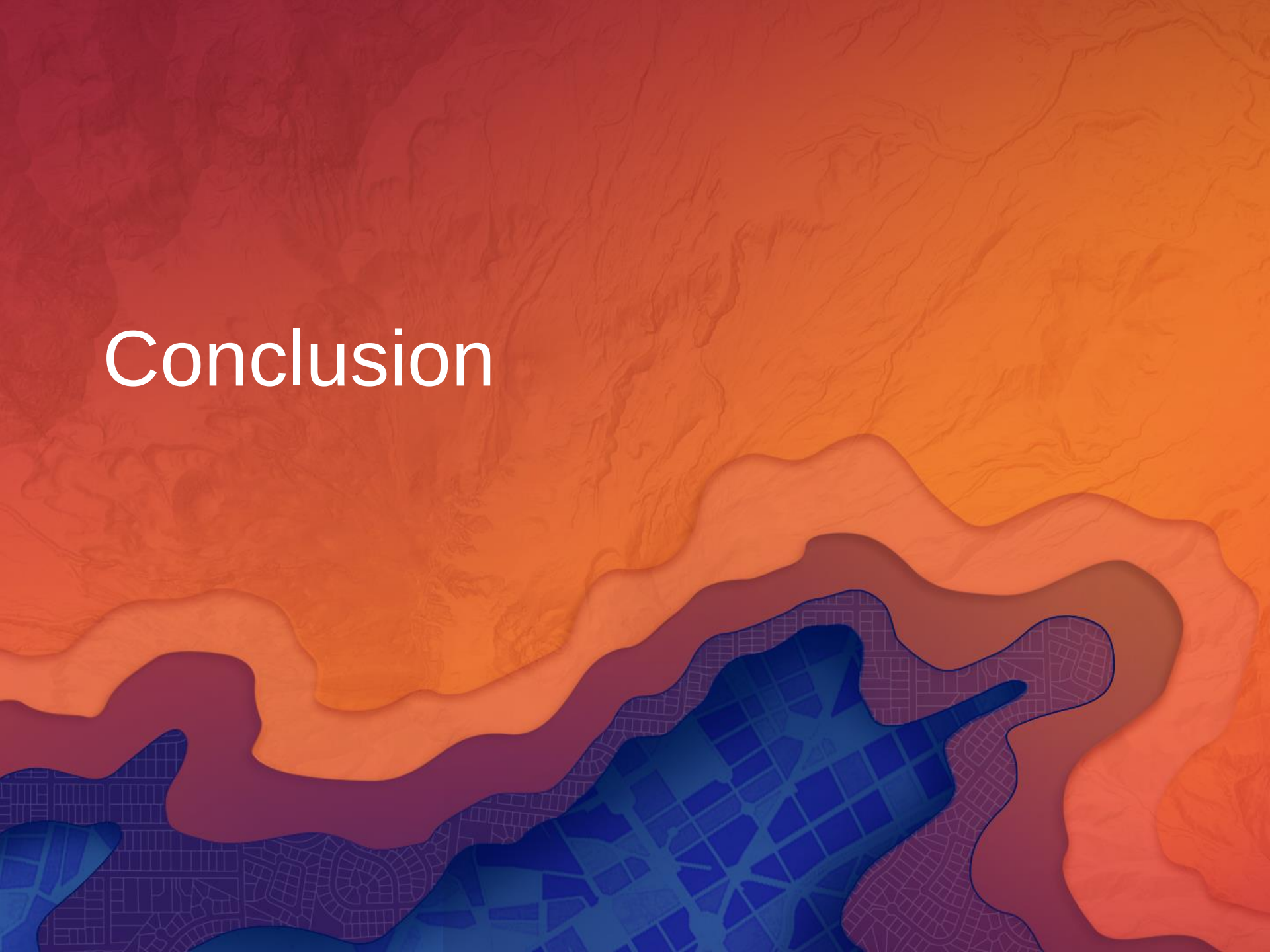
Project Management

Project Management



- Adhering to the project plan was challenging in the beginning, due to a lack of data; project was structured using the scientific method.
- Using ArcGIS Online is a credit-based service, credits are costly; this is where it helps to know somebody…
- Recommend spending time networking with other GIS professionals at events like this; more networking may help locate additional data required for a comprehensive study.

Conclusion



Conclusion

- I did not quite reach my final goal, but I did reach a reasonable conclusion.
- Without all the data across both counties, I only have results based on limited spatial and demographic analyses.
- Identified 15 parcels (4 of which may be suitable for re-development); all suitable candidate sites are between 1.3 to 13.7 miles away from present-day Angel Stadium.
- Performing the same analysis on the parcels Angel Stadium is located on today yielded a score of **8/56**; making it 4th overall out of 5 suitable sites!
- This being the case, is present-day Angel Stadium is fine where it is? Can a new stadium be constructed in the adjacent parking lot (like Globe Life Park in Texas, or present-day Yankee Stadium in the Bronx)?

- Future work:
  - Start earlier! Locate the missing spatial data for Orange County (transit & infrastructure) and use this iteration to compliment those findings.