

LDA Research Algorithm & Topics 2

LDA research allows us to process large amounts of text data (media reviews). LDA (Latent Dirichlet Allocation) is a generative statistical model or commonly referred to as a "Topic Model". After several variations we found having 30 topics gave us the most accurate results.

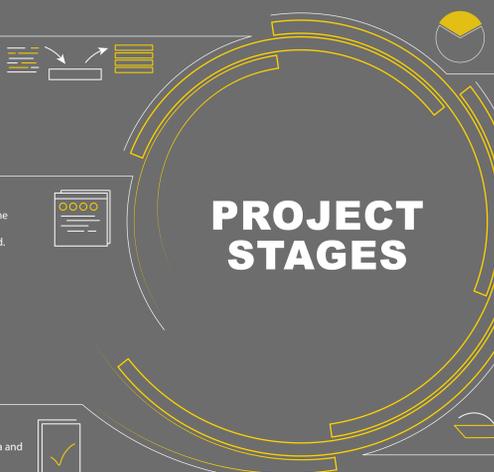
Data Mining & Processing 1

The first step in big data analysis is the gathering of data. Trip Advisor proved to be a valuable source for user data along the Strip. After gathering thousands of reviews on the Strip, the data needed to be curated to be better understood. Stop words, punctuation misspellings and other misleading terms needed to be thrown out to be better analyzed.

Source : Trip Advisor
Data : 20,000+ Reviews
Location : Las Vegas Strip
Average Review : 4.5 of 5
Time Period : Between 2008-2018

Performance Evaluation 6

The final step occurs post construction. The beauty in this, is its autonomy. Users will evaluate the new Strip and leave organic opinions. Later on, we can re-evaluate the data and choose to make changes to the strip if needed.



3 Goal Setting & Design Criteria

LDA can only get us so far. It then needed to interpret the data. This can be a little difficult if the interpreter is not familiar with the location. Destinations, street names, activities and events are all common amongst the topics. The first step to goal setting was categorizing each of the topics. For this study I choose to sort the 30 topics into 3 groups (Health & Safety - Define & Enhance - Energy & Expectation). Secondly, after sorting the topics we could start to define the 3 groups. Each group was then further broken into 6 parts (3x6=18 total). The 18 design criteria became the guidelines for future design.

4 Site Selection & Prototypes

Using the 18 definitions of design criteria, I studied the entire Las Vegas Strip to find a space that contained the most topics discussed. A quarter mile stretch was broken into 3 defining locations. After defining the 3 spaces, case study inspired designs formed 3 prototypes for a total of 9.

Prototypes were rated based on their 'potential' to meet design criteria & topic needs. Each criteria was scored between .00-1.00. All in, a perfect score is 18 points.

5 Stitch Prototypes Into Cohesive Design

After rating all prototypes, existing infrastructure and the site as a whole, it was clear which prototypes would have the greatest impact. This is similar to generative design, taking the best models and stitching them together. After looking at how the models could blend, a clear design solution formed.

LDA ALGORITHM & TOPICS

Night Scene

Description: Events, Diners, Shows, Parties and venues are just the start. Vegas is the real life "Choose your own adventure".
Important Words: See, Night, Place, Fun, Much, People, Great, Light, Walking, Hotel, Love, Day, Time, Show, Street, Casino
Example Review: "Love it. So much to see and do. Really big hotels and bright bright lights. The city that never sleeps is definitely the strip. Blow your partying. And friends are in town for a visit."
High Confidence (1.12)



TOPIC IMPORTANCE: Determined by ratio of positive to negative Trip Advisor reviews.

TOPIC CONFIDENCE: A validation of each topic using comparisons within the data set.

Bucket List

Description: Words typically associated with a visitors bucket list, what they come to expect, and many facinations along the strip.
Important Words: Standing, Relax, Magic, Lined, Venue, Outstanding, Traveled, Culture, Touring, Bucket, List, Michael, Jackson, Boat, Superb, Observe, Traveler, Celebration
Example Review: "Vegas strip is definitely one of those bucket list items. Lined with bars and casinos, there's always something to do."
Low Confidence (1.73)



Landmarks

Description: This topic creates a list of destinations that visitors might have visited or plan to visit.
Important Words: Venice, Highlight, Musician, Tower, Décor, Eiffel, Amusement, Forum, Art, Canal, Bellagio, Liberty, Statue, Fire, Landmark, Cleaner, Skyline, Important, Rome, Shape, Relaxing, Aquarium
Example Review: "The hucksters and busters are minimized now by the completion of the pedestrian bridges and safety railings along sidewalks."
Moderate Confidence (2.45)



Street Hucksters

Description: Performers and interesting characters spaces along the strip can be both interesting and disappointing.
Important Words: Wonder, Dream, Behold, Busker, Pavement, Brash, Cruising, Parked, Talking, Unbearable, Zoo, Entertainer, Wasted, Dazzle, Screen, Electrifying
Example Review: "The hucksters and busters are minimized now by the completion of the pedestrian bridges and safety railings along sidewalks."
Low Confidence (1.63)



Deceptive & Complex Scenes

Description: Feeling lost or disoriented due to confusing streetscape elements.
Important Words: Buzz, Surreal, Bothered, Perspective, Marathon, Insane, Deceptive, Glam, Appears, Bumping, Plentiful, Dodge, Threatening, Cautious
Example Review: "It isn't also deceptive in that it only looks 'over there' but due to the size of the buildings that is an hours walk. Great place to visit though."
Low Confidence (1.28)



Preparation & Exploration

Description: The strip can be a harsh experience if you are ill prepared. Good shoes, water and the right cloths are common suggestions from reviews.
Important Words: Corner, Driving, Stopping, Exercise, Exploring, Changing, Cooler, Afternoon, Overpass, Holiday, Sight-seeing, Strolling, Panhandler, Cold, Hear, Offered, Scene, Budget, Window, Limo
Example Review: "Please wear appropriate shoes when walking the strip...your feet will thank you later. Flip flops and heels will send you to the room easy! Other wise stay hydrated...and enjoy! A wonderful experience."
High Confidence (3.5)



Places & Weekdays

Description: Depending on the date and time you choose to walk the strip you may run into any number of problems. These suggestions are closely related to events, venues and destinations.
Important Words: Saturday, Friday, Cruise, Crosswalk, Overcrowded, Booth, Path, Sense, Land, Alcoholic, Flashy, Dazzling, Everyday, Avenue, Nasty, Challenge, Race
Example Review: "The strip assaults your senses at every turn - with brashness interspersed with glamour and glitz. Not to be taken for granted - enjoy the carnival!"
Moderate Confidence (2.31)



Nearby Site Seeing & Activities

Description: There are hundreds of activities to experience in Las Vegas, some are even outside of the strip. Day trips to the Grand Canyon or Hoover Dam are popular.
Important Words: Canyon, Dam, Canal, Hoover, Married, Cirque, Soleil, Helicopter, Harrah's, Planned, Extravagance, Pleasure, Mountain, Imagination, Crossed
Example Review: "Don't forget that nearby are distinct site-seeing opportunities such as Hoover Dam, mountains, hiking, deserts and municipal interests too."
Moderate Confidence (2.38)



Hustle & Bustle

Description: There is so much to do and see. Sometimes the experience can be overwhelming and exhausting.
Important Words: Hustle, Bustle, America, Porn, Gaudy, Moved, People, Company
Example Review: "Certainly a must do experience. The hustle and bustle of evening life. And all the lights and shows available."
Low Confidence (1.71)



Walking & Escalators

Description: Navigating the strip can be a challenge. Stairs, escalators and confusing corridors can add up to a unfriendly experience.
Important Words: Corner, Driving, Stopping, Exercise, Exploring, Changing, Cooler, Afternoon, Overpass, Holiday, Sight-seeing, Strolling, Panhandler, Cold, Hear, Offered, Scene, Budget, Window, Limo
Example Review: "Its a lot further when you walk it most days and the escalators arent working, the bus service is prompt as much as it can be when its bottle necked with traffic."
Low Confidence (1.55)



Annoying People & Distractions

Description: Pan handlers, beggars and solicitors are all expected and detract from a user's experience.
Important Words: Employee, Handed, Panhandling, Carnival, Drop, Bunch
Example Review: "Don't even look them in the eyes. Pretend they don't even exist. Prepare for the heat, or just walk through the casino."
Low Confidence (1.40)



Transportation Aids

Description: Between public transportation and handicap accessibility, there are mixed reviews on the accessibility along the strip.
Important Words: Worse, Scooter, Interior, Faster, Arrive, Scam, Mobility, Obvious, Shoved, Patio, Disappointed, Surprising, Led, Hurt, Horrendous
Example Review: "The strip itself is within walking distance wear comfy shoes many places to see and eat all price ranges we rented mobility scooters that were delivered to our hotel at less than \$20 a day the weather was great in the 70's"
Low Confidence (1.30)



Architecture Visual & Fakeness

Description: This topic shines a light on the dark façade that covers the strip. This façade is perceived as malicious and threatening to the common visitor.
Important Words: Lovely, Ship, Watcher, Bumper, Performance, Fake, Beggars, Popping, Smut, Luck, Madness, Clubbing, Weed, Differently, Kitsch, Afraid, Bizarre
Example Review: "Las Vegas strip is bright lights, crowds, massive traffic and fake monuments like the fake Eiffel tower at Paris Las Vegas and the fake Dopey's Palace at the Venetian."
Low Confidence (1.83)



Find Niche Places

Description: Suggestions on navigation, restful spaces, unique places and how to search them out.
Important Words: Valet, Replica, Cut, Thru, Patient, Dislike, Jaywalk, Attempt, Overlooking, Accommodation, nobody
Example Review: "Gitz and glamour. What about needing a quiet place for a few minutes to recharge yourself. Gardens and wildlife in back of the Flamingo might be in order, including benches to sit for awhile."
Low Confidence (1.45)



Safety Concern

Description: Feeling safe along the strip is an issue for many who visit.
Important Words: Nightlife, Excited, Shoulder, Safer, Ridiculous, Diversity, Beach, Journey, Entertain, Trek, Scary, Delicous, Footwear, Roaming, Stuck, Energetic, Slowly, Ultimate
Example Review: "The strip itself is dirty, hard to navigate, and an assult to the senses. Now that they've put up all the metal posts along the border between the street and the walkway, it may be safer but it feels even more claustrophobic."
Moderate Confidence (2.89)



Adult Activities

Description: Not for the faint of heart. Many feel uncomfortable and alienated from all the content
Important Words: See, Night, Place, Fun, Much, People, Great, Light, Girls, Walk, Walking, Amazing, Casino, Different, Adult
Example Review: "The strip itself is within walking distance wear comfy shoes many places to see and eat all price ranges we rented mobility scooters that were delivered to our hotel at less than \$20 a day the weather was great in the 70's"
Low Confidence (1.68)



People & Harassment

Description: People feel harassed and hurried by others along the strip.
Important Words: Pack, Surprise, Control, Advise, Regret, Rode, Outrageous, Returning, Lure, Harassed, Butt, Hassled, Sketchy
Example Review: "Be careful of the street hustler! Lots of people trying to make money, which was expected. I was publicly shamed and harassed by a man accusing me of being KKK because I didn't want his rap CD."
Moderate Confidence (2.68)



Dirty & Undesired

Description: The sanitation of the las Vegas strip is a concern. Associative words such as warned, recommendation, personally, and preferred, all suggest the reviews are warnings for new patrons.
Important Words: Pawn, Mono, Warned, Recommendation, Personally, Cheesy, Joint, Trash, Police, Preferred, Cleaning, Litter, Explored, Landscape, Propper
Example Review: "Burnt on every corner, traffic, urine smell, fecal smell, degenerate tourists with the social graces of scorpions, and an overwhelming sense of nauseous doom."
Moderate Confidence (2.80)



Family & Group Experiences

Description: This topic lists several group or family oriented destinations such as casinos, nightclubs, and restaurants. More importantly, this topic shares associative words such as unsafe, aggressive and push.
Important Words: Daughter, Drove, Son, Glamour, Excess, Freak, Birthday, Nighttime, Aggressive, Priced, Riding, Dine, Hated, Unsafe, Midnight, Solicitor, Push, Highway, Unusual
Example Review: "We went to the Vegas Strip to celebrate my son's 21st birthday. It was great. Met others there for the same thing. Good shoes are key. It is a blast."
Moderate Confidence (3.39)



Walkability Issues

Description: This topic represents access and navigation for a user on the strip. The correlating words such as closed, negative and trouble, suggest there are current issues around the existing design of the strip.
Important Words: Access, Naked, Ignore, Navigate, Allow, Ground, Level, Congested, Trouble, Easier, Designed, Watched, Younger, Closed, Partying, Reach, Cleaned, Negative
Example Review: "Lots to see and do. Sometimes hard to navigate on foot."
High Confidence (5.26)



Disturbing, Adult Content

Description: This topic refers the unsettling humanity of the strip. Beggars, Homeless, half naked workers and grievers line the sidewalks of the strip in wait of a quick buck.
Important Words: Flashing, Stripper, Blowing, Hooping, Annoying, Sale, Smoker, Crowded, Chaos, Touristy, Humanity, Handing, Forced, Topless, Asked, Sadly
Example Review: "hate the "PORN" HANDING everywhere, too much smokers, drugged and drunken dudes, too many "deal handing" people. DON'T BRING KIDS!"
High Confidence (4.11)



Begging, Handing, Harassment

Description: This topic refers people handing out call cards for cards, people asking for money and people advertising along the strip.
Important Words: Card, Handing, Guy, Constantly, Bother, Flyer, Pushing, Girl, Men, Passing, Call, Escort, Noisy, Pushy, Smoke, Wallet, Drug, Club, Dress
Example Review: "Lot of pan vendors, mobile billboards, dirbags. The old strip is a hellhole. Lot of freaks there. Beware with smiles."
High Confidence (7.91)



GOALS & DESIGN CRITERIA



Health & Safety

Health and Safety refers to the pedestrian experience on the strip. Visitors need to feel at ease with their surroundings and place in the landscape. Feeling lost, being swept up in the crowd or forced to walk through places and people against their will, can lead to a poor user experience. The Las Vegas Strip is a place in which the pedestrian needs to be king.



Define & Enhance

Define & Enhance refers to the selection and reformation of the more positive elements along the strip. Specific spaces such as the Bellagio fountain or Paris entrance should be left alone. This meant that surrounding spaces needed to compliment rather than compete. This involved a lengthy analysis on the existing elements and how they all relate. It is essential that this is understood from a pedestrian perspective. Intimately understanding the spaces is key.



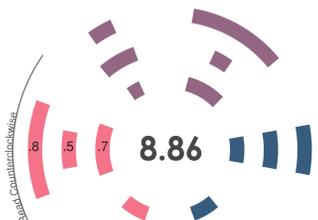
Energy & Expectation

Energy and Expectation is the heart of the Vegas experience. With 41 million visitors annually, the strip puts on a show of its own, every night. Visitors come expecting world class experience. Shows, events, dining and hotels are world class. The Streetscape experience should be a tightrope walk surrounded in anxiety. The Las Vegas Strip is the front door to every guests experience.

A SCORING SYSTEM BASED ON DESIGN CRITERIA

- Each of the 18 bars represents an individual design criteria
- Categories score from .00 to 1.0
- This scoring system helps us resolve the question, "How does any one prototype meet the categories of design criteria?."

Baseline score for The existing Las Vegas Blvd. This diagram illustrates an 8.86 score of 3 selected Las Vegas Blvd. sites, based on 18 categories of design criteria.



Health & Safety

- 1. Clear Lines of Sight**
Visitors must be able to easily orient themselves, see where they are headed and where they came from. A clear line of sight allows them to see paths, entrances, landmarks, and destinations ahead.
- 2. Open Spaces**
Pedestrians walking the strip need breaks and passive spaces to avoid fatigue. Open spaces can include furnishings, passive space, vegetation, landmarks and entertainment. All of which is an effort to reduce stress and exhaustion on those long walks along the strip.
- 3. Reduced Crowds**
Intersections, crosswalks and pinch points tend to group people into large masses. This causes anxiety and frustration among pedestrians. People need space. Designation between active and passive walkways can help.
- 4. Safe Crosswalks**
Most accidents along the strip happen in or around crosswalks. This calls for clear separation of vehicle and pedestrian corridors. Pedestrians crossing in groups will also add to the sense of "safety in numbers". Crosswalks should be clearly marked and visible from distance.
- 5. Traffic Calming**
Slower traffic speeds generally mean less casualties and accidents. Even when vehicle and pedestrian spaces are separated, high speeds equate to stress, anxiety and uncomfortable spaces for pedestrians. Simmer streets, curvature, and pedestrians in view will reduce speeds naturally.
- 6. Easy to Monitor & Maintain**
Complex and over designed spaces are difficult to maintain. Spaces that are difficult to monitor or maintain accrue debris. Hidden nooks, complex vegetation, and dark corners make for prime locations for homeless. These design challenges should not be met with hostile architecture solutions.

Define & Enhance

- 7. Effective Crossings**
Crossings need to be efficient and easy. Pedestrians crossing the strip need to understand from a distance where the crossings are, and how complex the journey will be. A crossing in which pedestrians are led through corridors, multiple flights of stairs, or a Casino makes for a poor experience.
- 8. Easy Driving**
Most drivers are new to the strip and need to easily understand the route ahead. Clear visibility and predictable turns allow for an enjoyable driving experience. Many drivers wish to show off their cars, view the strip, and utilize Casino entrances with ease.
- 9. Easy Walking**
Infrastructure must adequately support the flow of pedestrians at all speeds. Pedestrians should be free to walk at their own pace. Sidewalks and open spaces can be used to hold pedestrians at specific locations. Entrances, crossings, pinch points, bends, stairs, and viewing points will all impact the pace of pedestrian.
- 10. Great Views**
Known for its postcard worthy image, the strip's worth should amplify the Architecture and entertainment value. Easily accessible and highly visible open spaces are ideal for views. These spaces should be properly spaced out and clear of vehicles.
- 11. Great Spaces**
Spaces should be filled with light, activity and interest. The streetscape should compliment the Architecture in style and energy. Spaces should be built with lasting and up to date materials. Streetscape furnishings should be high quality and carry a consistent style throughout the strip.
- 12. Great Experiences**
Spaces can take an experience from good to great. Setting aside locations for performance, leisure, observation or activities can allow users the freedom to design their own experiences.

Energy & Expectation

- 13. Point to Point Transit**
It is essential that the strip facilitates easy transit. A user's experience relies on easy transit options. The strip should also support autonomous vehicles and ride share systems. Pedestrians and vehicles should flourish alongside one another.
- 14. Freedom to Explore**
Spaces should be well defined and easily understood. A combination of complex, diverse and familiar spaces allow users to enjoy their adventure on the strip.
- 15. Smooth Transitions**
When a pedestrian or vehicle changes course or travels through new areas there should be a sense of predictability and consistency. The strip requires stronger and more simplified transitions between spaces. Pedestrians traveling from A to B should not struggle with navigation.
- 16. Stunning/Interesting**
Users are always on the hunt for what's next. The "next" needs to be somewhat unfamiliar. It should inspire curiosity and drive users through spaces. Materials, forms and vegetation can drive a space to the next level.
- 17. Restful**
Though exciting and energetic, the Strip completely lacks options for rest. The strip should have designated passive spaces. Seating options such as lawns, platforms, benches or tables can be cooled by vegetation or light materials to give users a break from the activity.
- 18. Embodiment of the Strip**
Las Vegas is known for lights, performance, and unpredictable situations. Materials, forms, exhibitions and energy need to match or outperform those user expectations.



Site Location

S Las Vegas Blvd, NV
W Bellagio Drive - W Flamingo Rd

Length : .35 Miles
Size : 650,000 ft2
Longest Site Walk : 25 minutes
Restaurants : 150+
Attractions : 50+

Concept

The Las Vegas Strip is an anomaly among urban settings. The challenges it faces are many and complex. The Strip has incredible potential. Defining a successful outcome starts with understanding its people.

Big Data can send us on the right path and provide the critical framework needed to make insightful decisions.

REFLECTION



THE LAS VEGAS STRIP – INTRODUCING BIG DATA INTO PROJECT PLANNING FOR USER INFORMED DESIGN

EVAN LECY
PRIMARY ADVISOR JASON KOST
SECONDARY ADVISOR YANG SONG





CERAMIC TILE EXTERIOR
ISOLATED TURF SPACE
TROPICAL SHADE PLANTINGS
8" LIFTED PLATFORMS

- Passive Spaces (Oasis)**
- 2. Open Spaces
 - 11. Great Spaces
 - 12. Great Experiences
 - 14. Freedom to Explore
 - 16. Stunning/Interesting
 - 17. Restful



LINEAR SET PALMS

QUARIED MARBEL SLAB SEATING

DIRECTIONAL LED BOLLARD

CONSISTANT PAVING THROUGH CROSSING

- Active Walkway Corridors**
- 1. Clear Lines of Sight
 - 3. Reduced Crowds
 - 5. Easy to Monitor & Maintain
 - 9. Easy Walking
 - 13. Point to Point Transit
 - 15. Smooth Transitions
- Safe Crossings**
- 7. Effective Crossings
 - 8. Easy Driving
 - 9. Easy Walking



PRE-CAST CERAMIC TOP
LED UNDER LIGHTING

16 GAUGE MESH

GLOSSED FLAGSTONE

- Bar style tables & Seating**
- 11. Great Spaces
 - 10. Great Views
 - 12. Great Experiences



PRE-CAST CONCRETE PLATES
NATIVE GROUND COVER
PRE-CAST CONCRETE PLATES

- Sound Dampening Plated Design**
- 8. Easy Driving
 - 9. Easy Walking
 - 11. Traffic Calming
 - 13. Point to Point Transit
 - 16. Stunning/Interesting
 - 17. Restful

CRITERIA IN PRACTICE

4 SITE SELECTION & PROTOTYPES



A

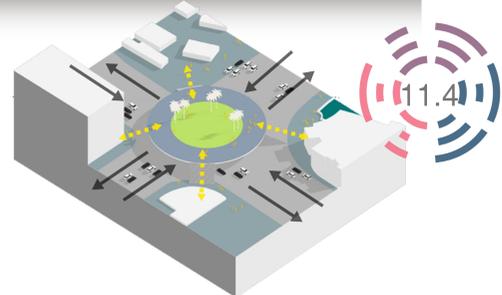


B

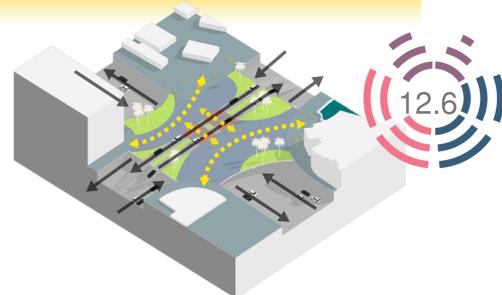


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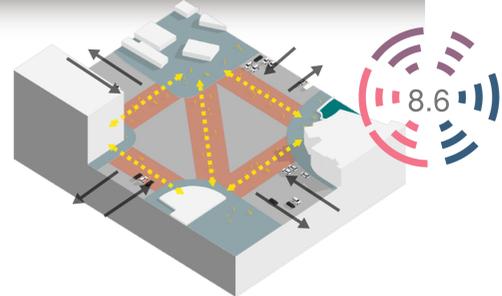
Central Elevated Crosswalk & Surface Intersection A.01



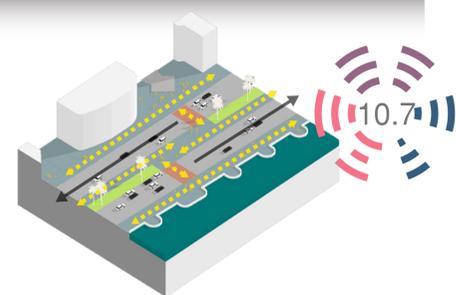
Multilayer Intersection & Surface Crossing A.02



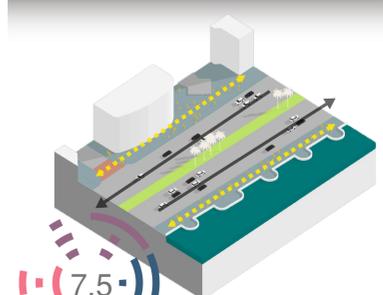
Surface Intersection & Surface Pedestrian Scramble A.03



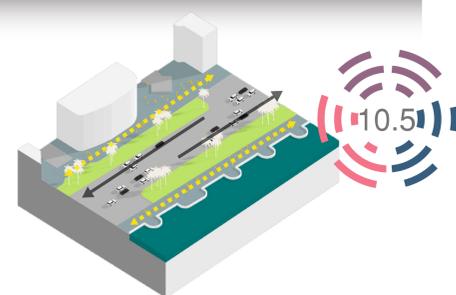
Central Pedestrian Thoroughfare Streetscape Corridor B.01



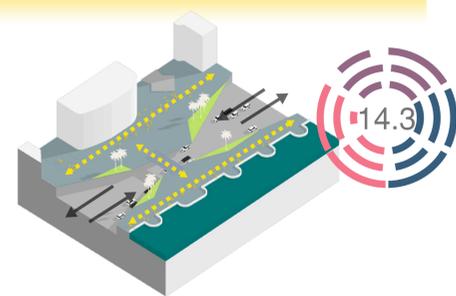
Existing Streetscape Corridor B.00



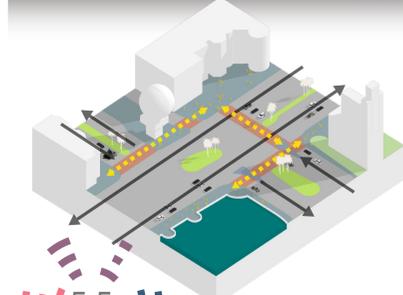
Transitional Streetscape Corridor B.02



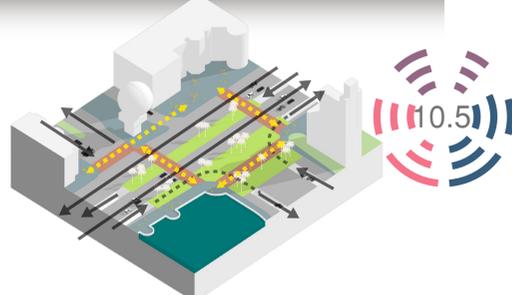
Surface level Corridor with Sub-grade Street B.02



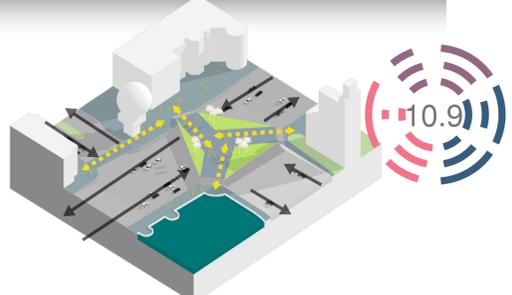
Existing Entrance & Crossing C.00



Partial Underground Entrance & Surface Crossing C.01



Surface Entrance & Overhead Crossing C.02



Complete Underground Entrance & Surface Crossing C.03



Challenges

- Heavy Traffic:** With 40 million annual visitors, the Las Vegas Strip has some of the busiest intersections ever. Each Prototype needed to meet these heavy traffic requirements before entering consideration
- Congested Overpasses:** The existing model relies on overpasses to shuffle pedestrians over the intersections. These overpasses are inefficient and usually unpleasant. Aside from the view, and simplicity there are few redeeming qualities.
- Casino Entrances:** Casinos benefit from the existing model. Pedestrians are often shuffled through Casinos in order to use crosswalks or avoid the crowded sidewalks. Prototypes must compliment entrances and celebrate their presence

Challenges

- Lack of Crossings:** Intersections and the occasional stop light with crosswalk can force pedestrians to walk half a mile to cross the road
- Disruptive Traffic:** Vehicles on the strip are noisy, fill the air with carbon dioxide and can make the strip feel unsafe. Slowing traffic or managing the cautionary aspects of it is a needed step.
- Thin Sidewalks:** Most days on the strip (even 3:00 AM) can have packed sidewalks. Each stop light or turn lane can force pedestrians to build up in groups and move together as a single unit. This causes the Strip to feel busier and chaotic.

Challenges

- Greenspace** The existing model is harsh for the pedestrian. No place to rest, no shade, and no protection from the masses of people.
- Several Destinations** Pedestrians have hundreds of different destinations. There is a need for faster crossings that allow pedestrians to get from A-B. If their journey is long, they may need a place to rest, something all prototypes tried to cover
- Traffic Buildup** After Studying this intersection, it became clear that pedestrian crossings are a massive disruption for the vehicle. Every 2 minutes a pack of 50-150 pedestrians cross this intersection, forcing vehicles to build up.