American Planning Association

-November 20, 2020-

Planning for Freight/Logistics and Industrial Development

George Kinney, AICP
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- ❑ Federal/State/Regional Resources
- ❑ Legal Limitations
- ❑ Driver Issues
- ❑ Technology Advances/Disrupters

Resources – All Modes

Federal – State - Region

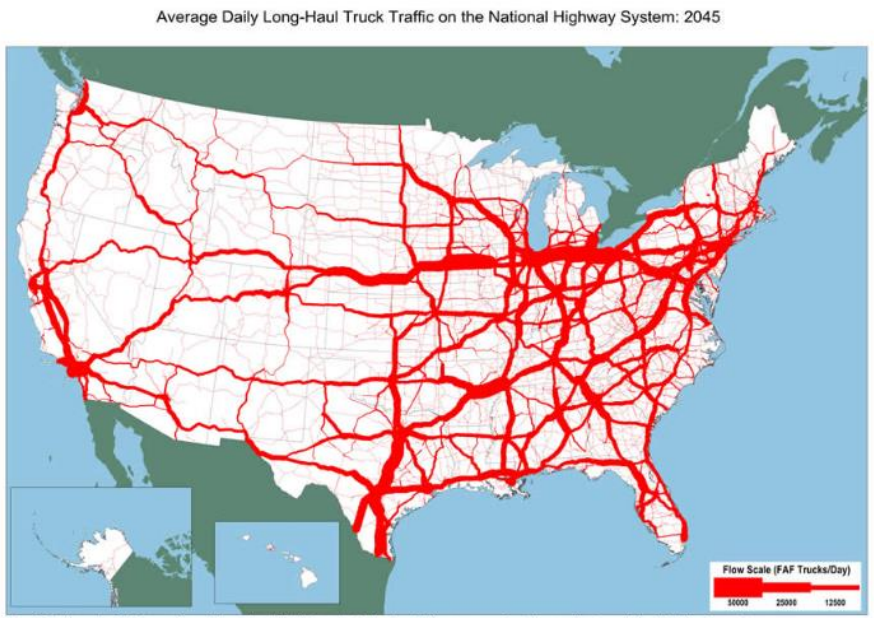
Federal Highways - https://ops.fhwa.dot.gov/Freight/freight_analysis/index.htm

- Freight Disruptions
- Freight Policy Studies
- Information by State
- National Statistics and Maps
- Performance Measurements
- Regional and Industry Studies

Average Daily Long-Haul Freight Traffic on the National Highway System: 2015 Map

Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty five FAF trucks per day and between places typically more than fifty miles apart.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 4.3, 2017.

Average Daily Long-Haul Freight Traffic on the National Highway System: 2045 Map



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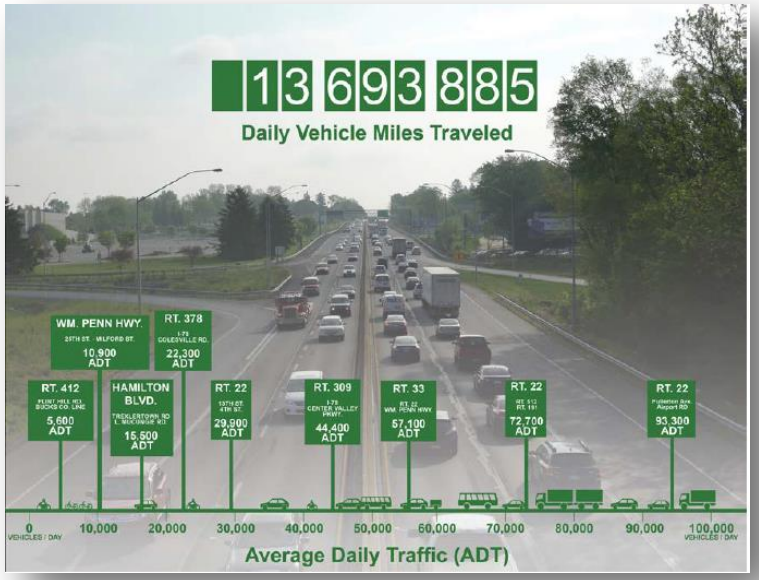
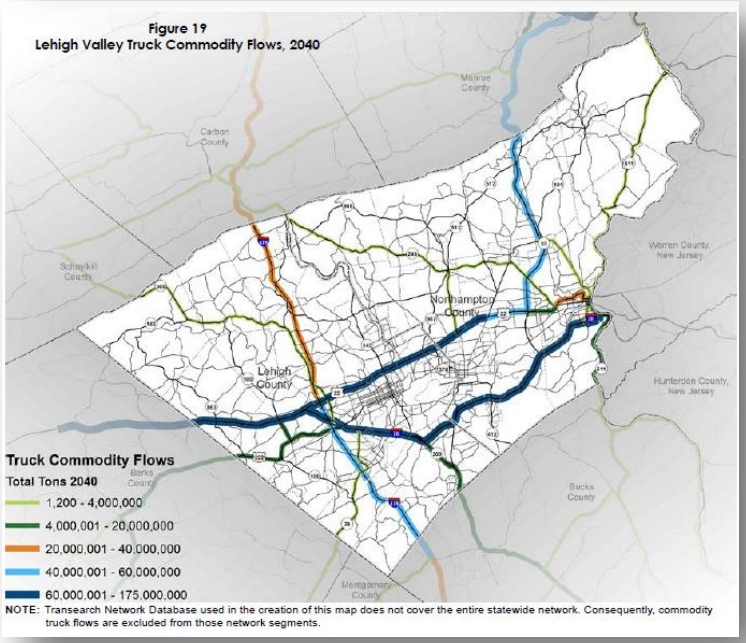
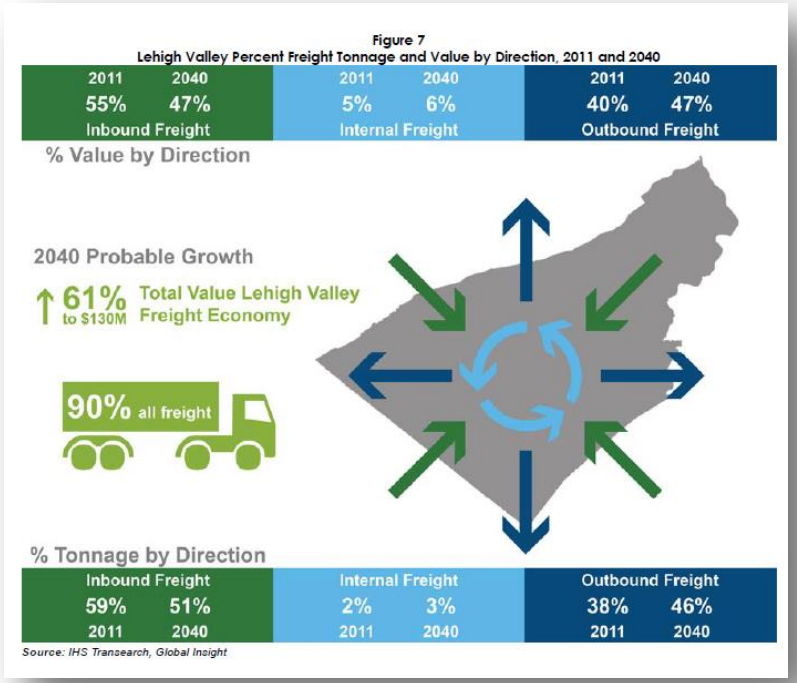
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 4.3, 2017.

Freight Data

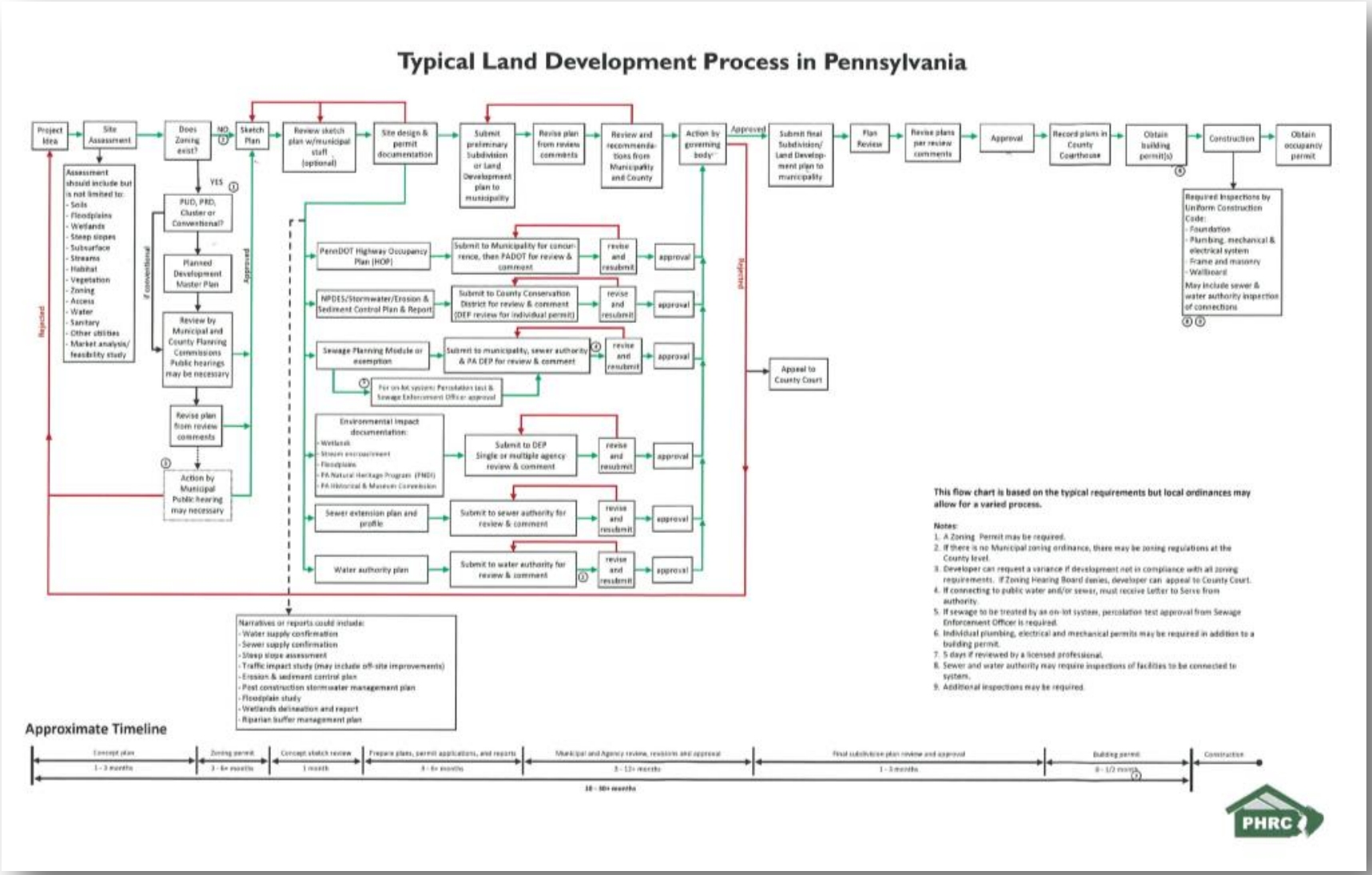
Network Info (Condition)
Travel Demand & Growth
Employment
Commodity Types and Movements
Forecasts
Travel Time Reliability (CMP)







PA Municipal Planning Code



MPC Limitations

All Land Uses Provided For (Multi-Municipal Plans)
Consistency…Not Concurrency
Off-Site Improvements (Transportation Impact Fee/HOP)

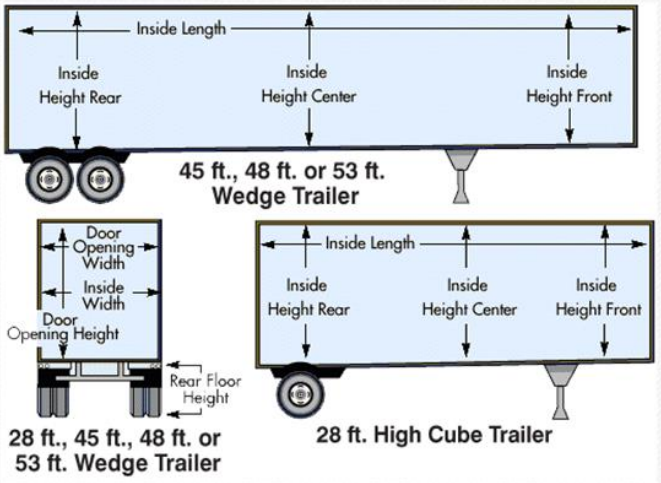
Legislation

102's on 4-Digit SR's
Motor Carrier Enforcement
Driver Hours

Summary of Hours of Service Regulations

The following table summarizes the HOS regulations for property-carrying and passenger-carrying drivers.

HOURS-OF-SERVICE RULES	
PROPERTY-CARRYING DRIVERS	PASSENGER-CARRYING DRIVERS
11-Hour Driving Limit May drive a maximum of 11 hours after 10 consecutive hours off duty.	10-Hour Driving Limit May drive a maximum of 10 hours after 8 consecutive hours off duty.
14-Hour Limit May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.	15-Hour Limit May not drive after having been on duty for 15 hours, following 8 consecutive hours off duty. Off-duty time is not included in the 15-hour period.
Rest Breaks May drive only if 8 hours or less have passed since end of driver's last off-duty or sleeper berth period of at least 30 minutes. Does not apply to drivers using either of the short-haul exceptions in 395.1(e). [49 CFR 397.5 mandatory "in attendance" time may be included in break if no other duties performed]	60/70-Hour Limit May not drive after 60/70 hours on duty in 7/8 consecutive days.
60/70-Hour Limit May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.	Sleeper Berth Provision Drivers using a sleeper berth must take at least 8 hours in the sleeper berth, and may split the sleeper berth time into two periods provided neither is less than 2 hours.



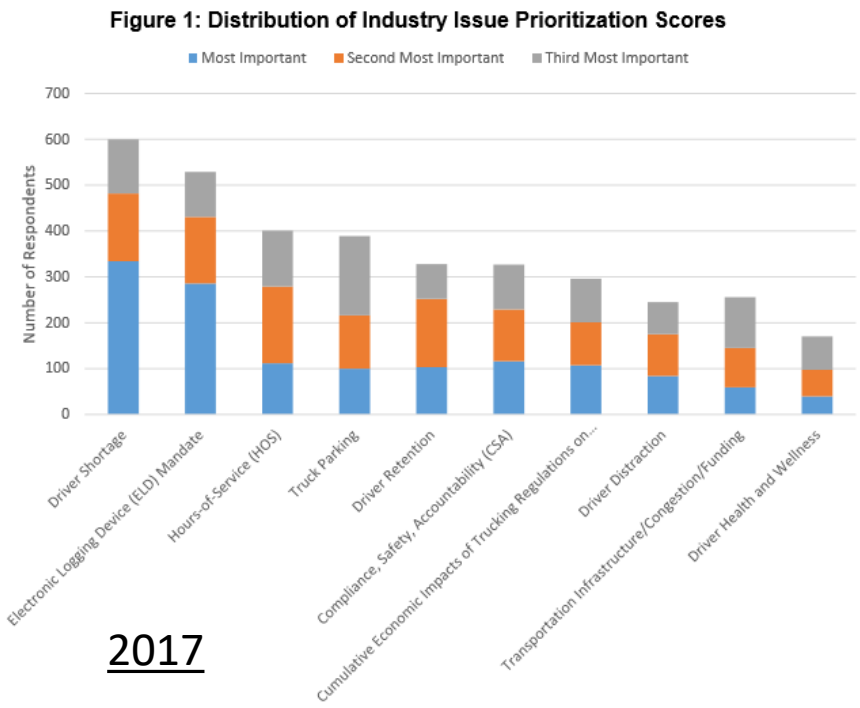
Semi-Trailer Dimensions

	Length	Inside Width	Inside Height Rear	Inside Height Center	Inside Height Front	Door Opening Width	Door Opening Height	Rear Floor Height	Cubic Capacity	Overall Width	Overall Height
28' High Cube	27'3"	100"	110"	109"	107"	93"	104"	47-1/2"	2029 cft	102"	13'6"
45' Wedge	44' 1-1/2"	93"	112"	109"	106"	87"	105-1/2"	50"	3083 cft	96"	13'6"
48' Wedge	47'3"	99"	112-1/2"	110-1/2"	108-1/2"	93"	105"	48-1/2"	3566 cft	102"	13'6"
53' Wedge	52'	99"	111"	110-1/2"	110"	93"	105"	49"	4050 cft	102"	13'6"
53'	52'	99"	110-1/4"	110-1/4"	110-1/4"	93"	105"	49"	4050 cft	102"	13'6"

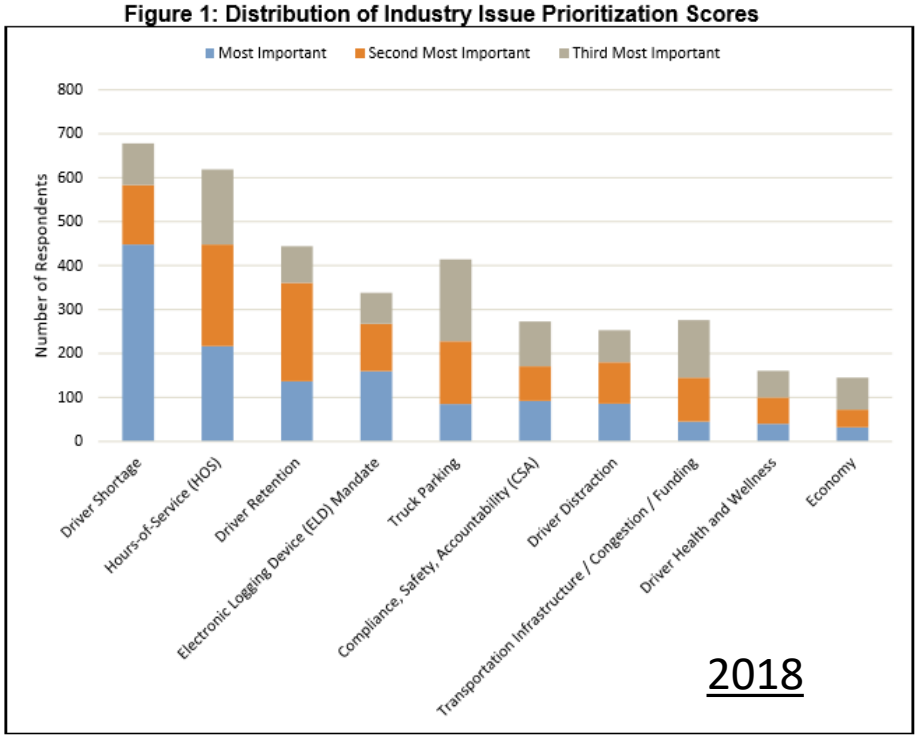
American Transportation Research Institute

Driver Shortage (#1)
Struggle to recruit and retain
ATA estimate shortage of 50,000 drivers
Pay, bonuses, and benefits boosted

Truck Parking (#4 and #5)(Driver #2)
Parking ELD implementation concern
Not able to preplan routes



2017



2018

Facility Design

FREIGHTWAVES

Driver amenities, poor relationships and pay, and ELD concerns among top driver frustrations

Brian Straight · 12/19/2018 · 2 · 105 · 2 minutes read

Driver Amenities	Require that showers, food services, sleeping areas, and entertainment and waiting areas are incorporated into facility design.

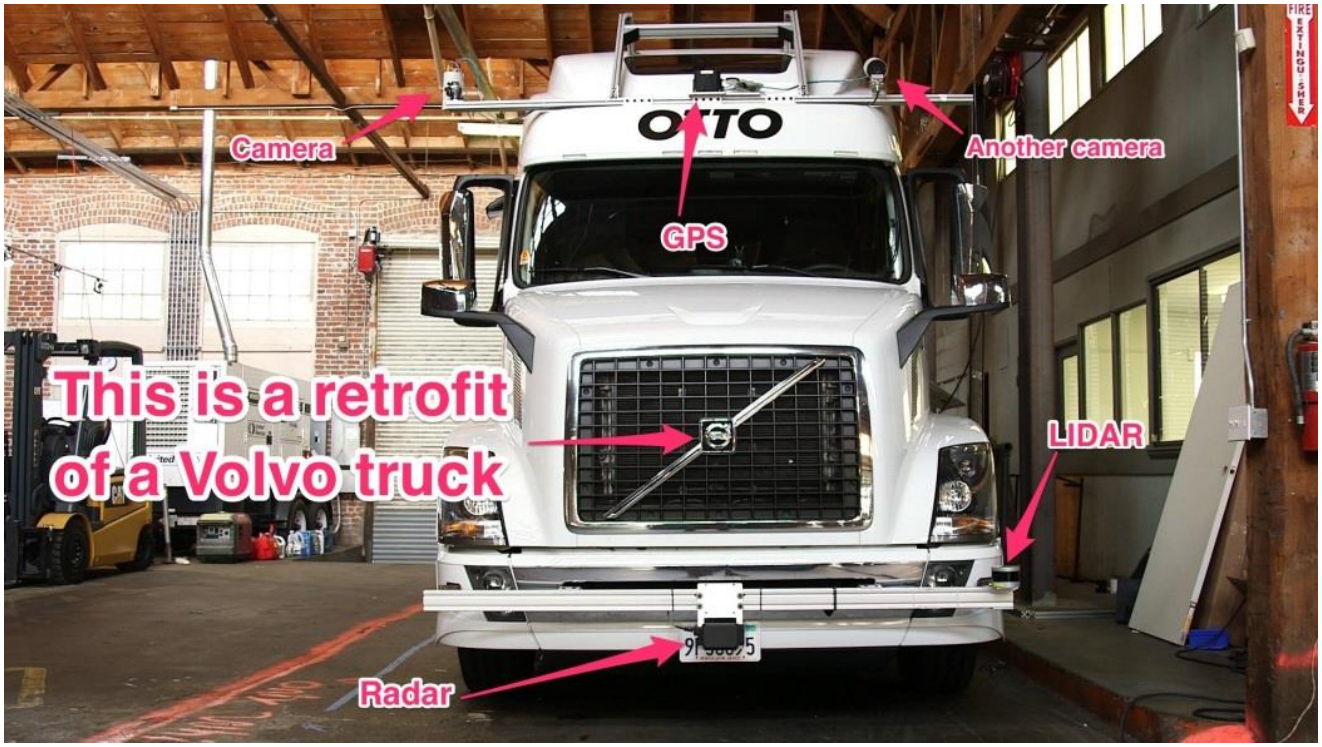
Technology. Help or Hindrance?

The Black Swan Theory
Main Aspects of the Theory

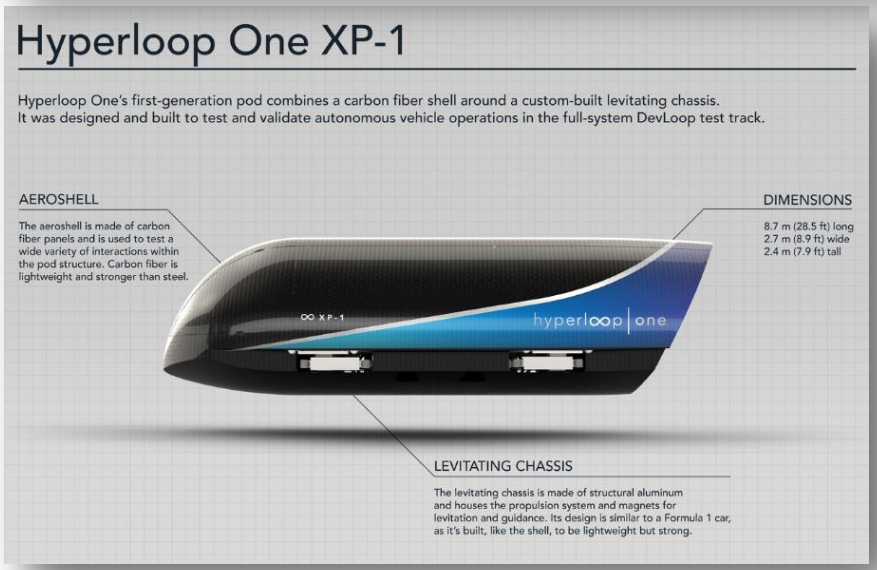
- Taleb believes that:
  - The more educated people are, the more likely it is that they incorrectly believe these unpredictable events are uncommon.
  - Information overflow in today's society blind us from relevant data about our life.
  - We don´t interpret data accurately and create correlations that are not relevant.

AV Technology

Reduced Accidents (Distracted/Drinking)
Disabled and Elderly Mobility
Congestion
Jobs, Expense, Insurance



Moving & Producing in New Ways



Jared

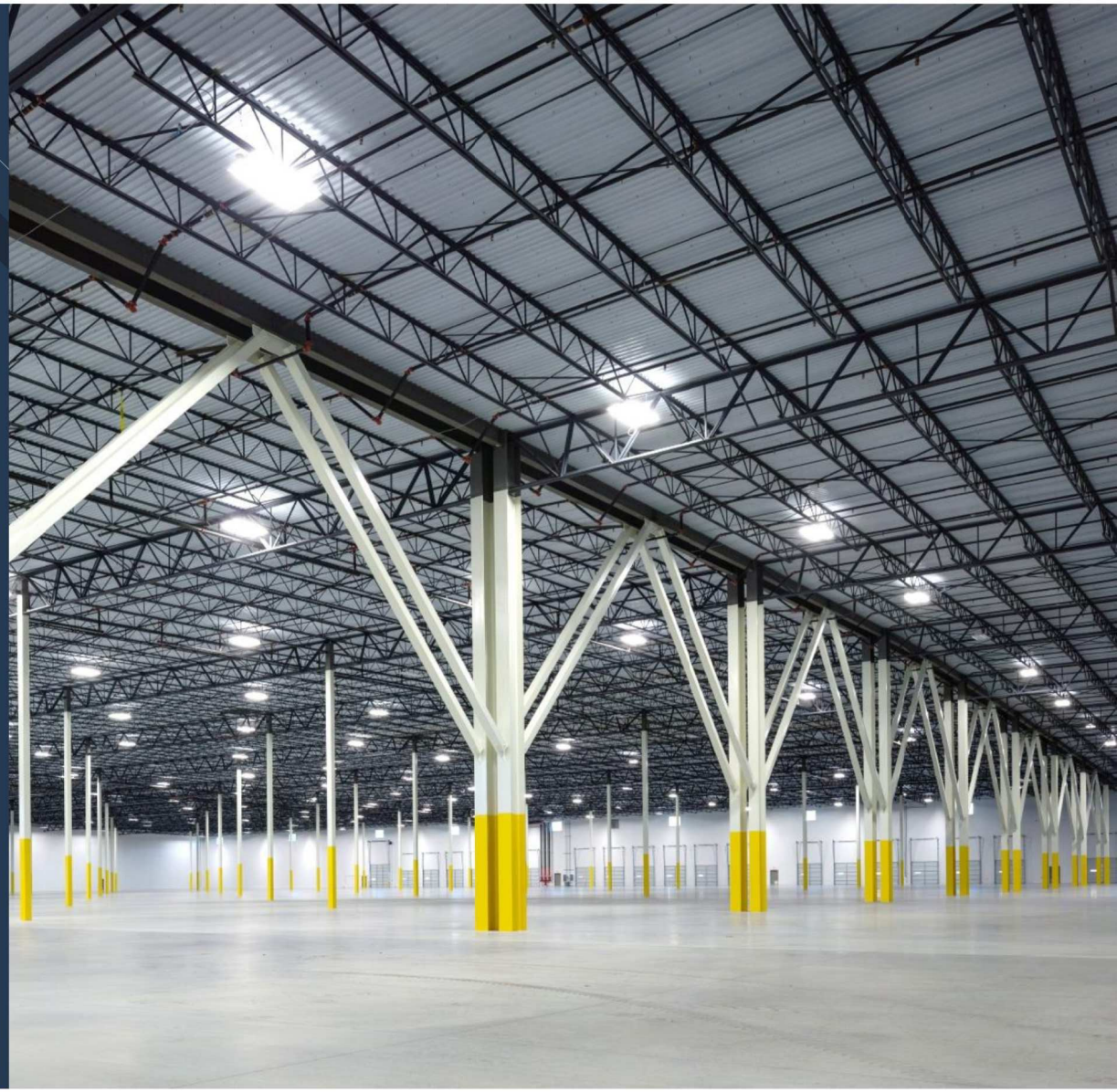
HILLWOOD
A PEROT COMPANY®

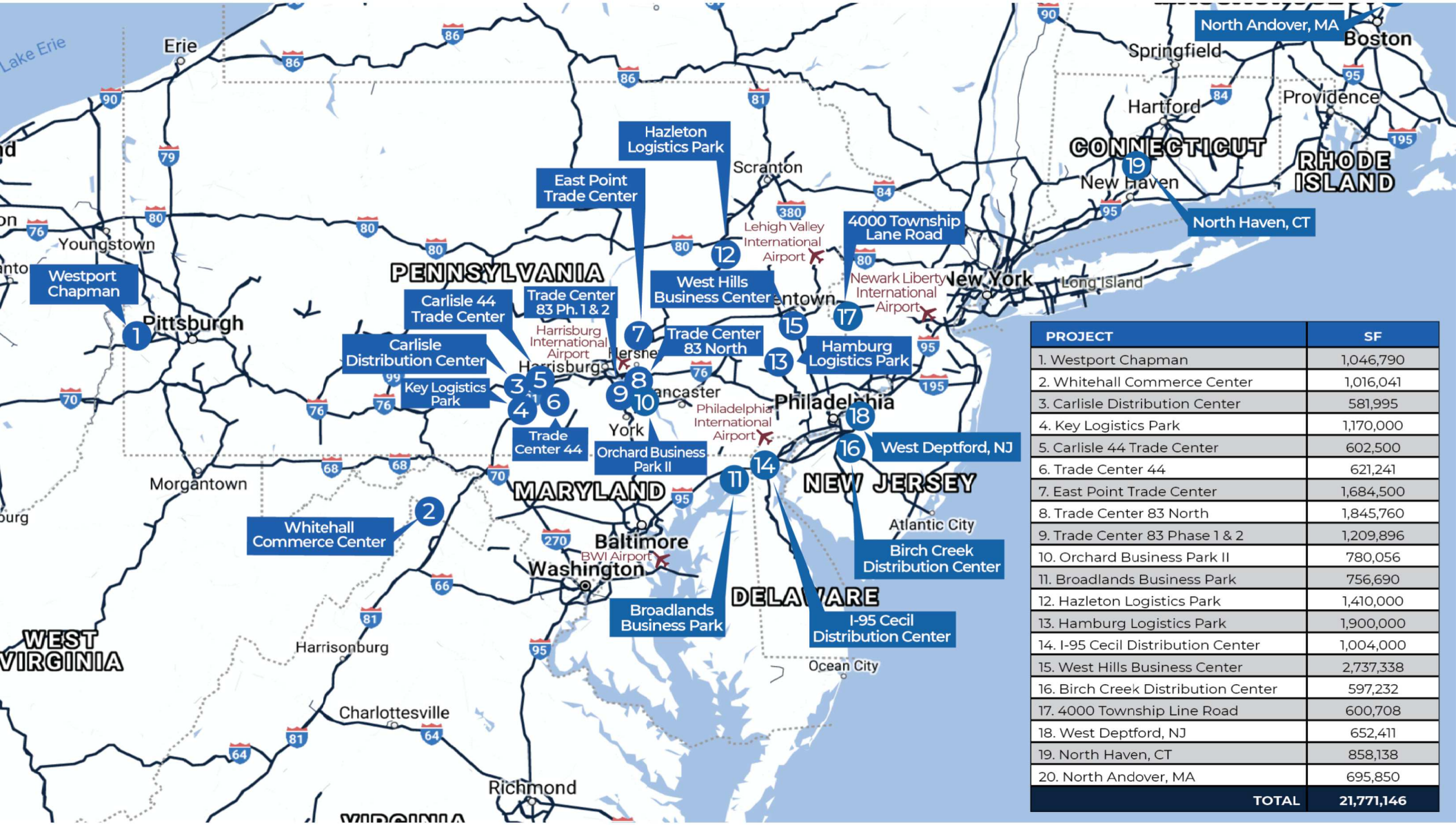
BUILDING INDUSTRIAL EXCELLENCE

NOVEMBER 2020

PREPARED FOR:

APA CONFERENCE

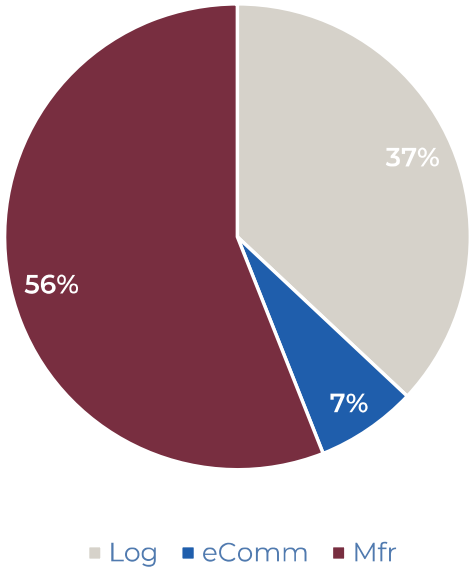




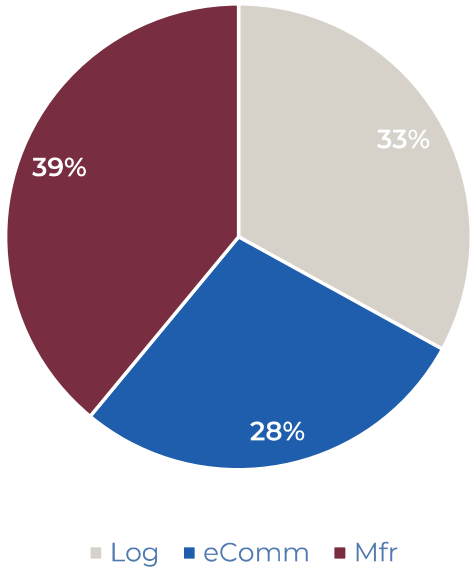
PROJECT	SF
1. Westport Chapman	1,046,790
2. Whitehall Commerce Center	1,016,041
3. Carlisle Distribution Center	581,995
4. Key Logistics Park	1,170,000
5. Carlisle 44 Trade Center	602,500
6. Trade Center 44	621,241
7. East Point Trade Center	1,684,500
8. Trade Center 83 North	1,845,760
9. Trade Center 83 Phase 1 & 2	1,209,896
10. Orchard Business Park II	780,056
11. Broadlands Business Park	756,690
12. Hazleton Logistics Park	1,410,000
13. Hamburg Logistics Park	1,900,000
14. I-95 Cecil Distribution Center	1,004,000
15. West Hills Business Center	2,737,338
16. Birch Creek Distribution Center	597,232
17. 4000 Township Line Road	600,708
18. West Deptford, NJ	652,411
19. North Haven, CT	858,138
20. North Andover, MA	695,850
TOTAL	21,771,146

LV/CPA BREAKDOWN BY SPACE

Lehigh Valley: Space Use



Central PA: Space Use



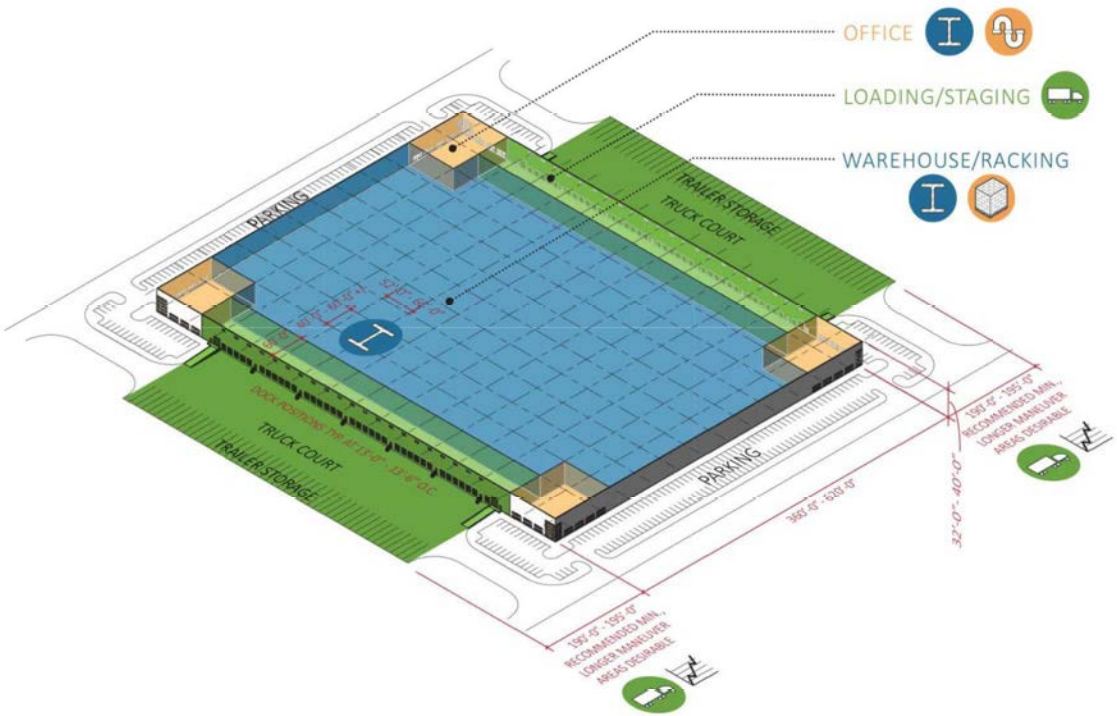
WHAT'S HAPPENING IN THE BOX?

- Manufacture chassis and axles for Commercial Truck Plant
- Commercial Furniture Assembly
- Manufacture HVAC components with office HQ
- On Demand Printing operation
- Manufacture corrugated packaging
- Storage/Distribution Tele/Com Equipment & assembly/repair clean room
- Manufacture pet food cans
- Manufacture residential doors
- Manufacture highway message boards
- Assemble HVAC custom filters and distribute
- Testing and packaging automobile batteries
- Admixture pharmacy
- Assemble and repair fire panels/Call Center/Admin office
- Make cleaning systems for the semiconductor industry
- Manufacture valves
- Manufacture conveyor systems
- Manufacture roofs for above ground storage tans and separator basins
- Storage/Distribution
- E-Commerce Fulfillment

CROSS DOCK BUILDING

- Flexible, multi-tenanted building
- Fulfillment and E-Commerce uses should consider expanded PARKING area capacity
- Common in greenfield areas

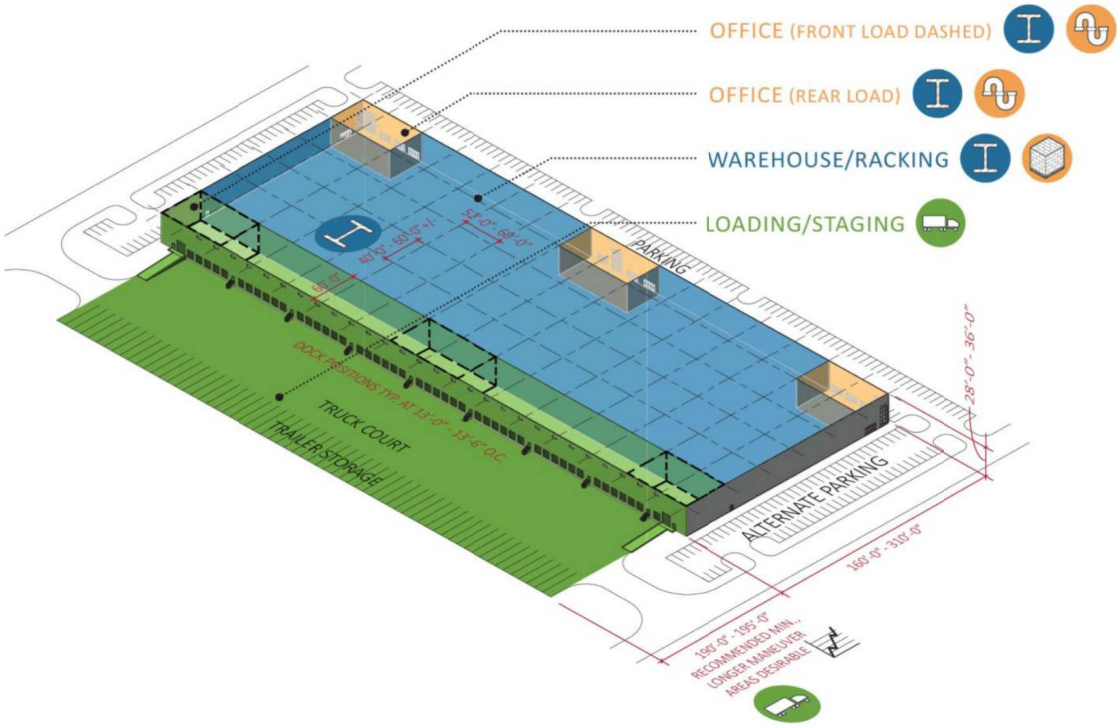
QUICK FACTS	
Depth	360'-0" – 620'-0"
Clear Height	32'-0" – 40'-0"
Docks	1/5000 SF
Dock Spacing	13'-0" – 13-6" o.c.
Column Spacing	Perpendicular to Loading Wall: 52'-0" – 60'-0" Parallel to Loading Wall: 40'-0" – 60'-0" (60'-0" at Staging Bay)
Trailer Storage	1 Trailer per Dock Minimum
Office	3-7% of Total Building SF
Car Parking	Varies; usually 0.5/1000 SF – 1/1000 SF
Notes	Fulfillment centers or E-commerce Facilities require greater car parking



SINGLE LOAD BUILDING

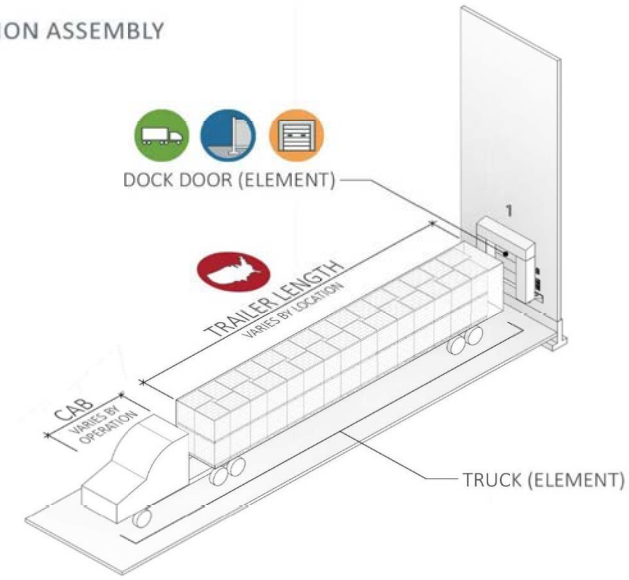
- Common, smaller multi-tenanted building typology
- Larger office to distribution ratio
- Common in a variety of sites, including both greenfields and urban areas

QUICK FACTS	
Depth	160'-0" – 310'-0"
Clear Height	28'-0" – 36'-0"
Docks	1/3500 SF – 1/6500 SF *Front Load: 1/6500 SF – 1/7500 SF
Dock Spacing	13'-0" – 13-6" o.c.
Column Spacing	Perpendicular to Loading Wall: 52'-0" – 60'-0" Parallel to Loading Wall: 40'-0" – 60'-0" (60'-0" at Staging Bay)
Trailer Storage	1 Trailer per Dock Minimum
Office	5-7% of Total Building SF
Car Parking	Varies; usually 0.5/1000 SF – 1/1000 SF
Notes	In Front Loading Buildings, locating the offices along the dock wall reduces dock efficiency

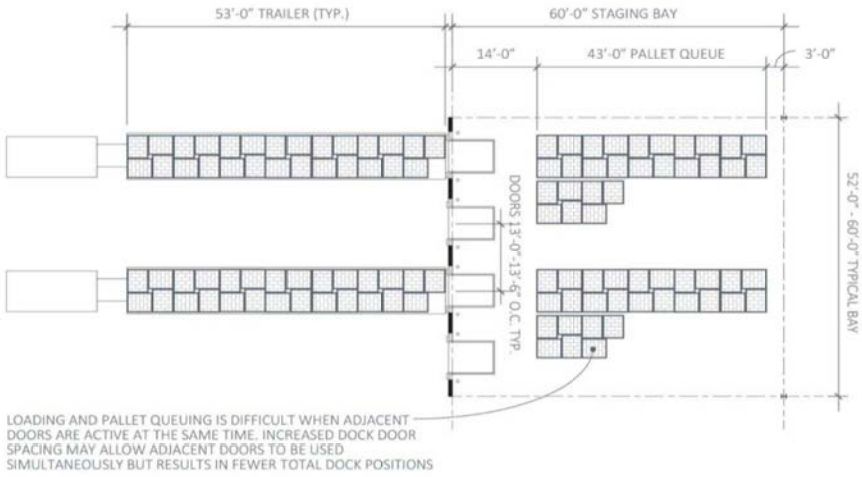


MAXIMIZING PALLETS PER TRUCK

DOCK POSITION ASSEMBLY



TRAILER PALLET CONFIGURATIONS AND STAGING



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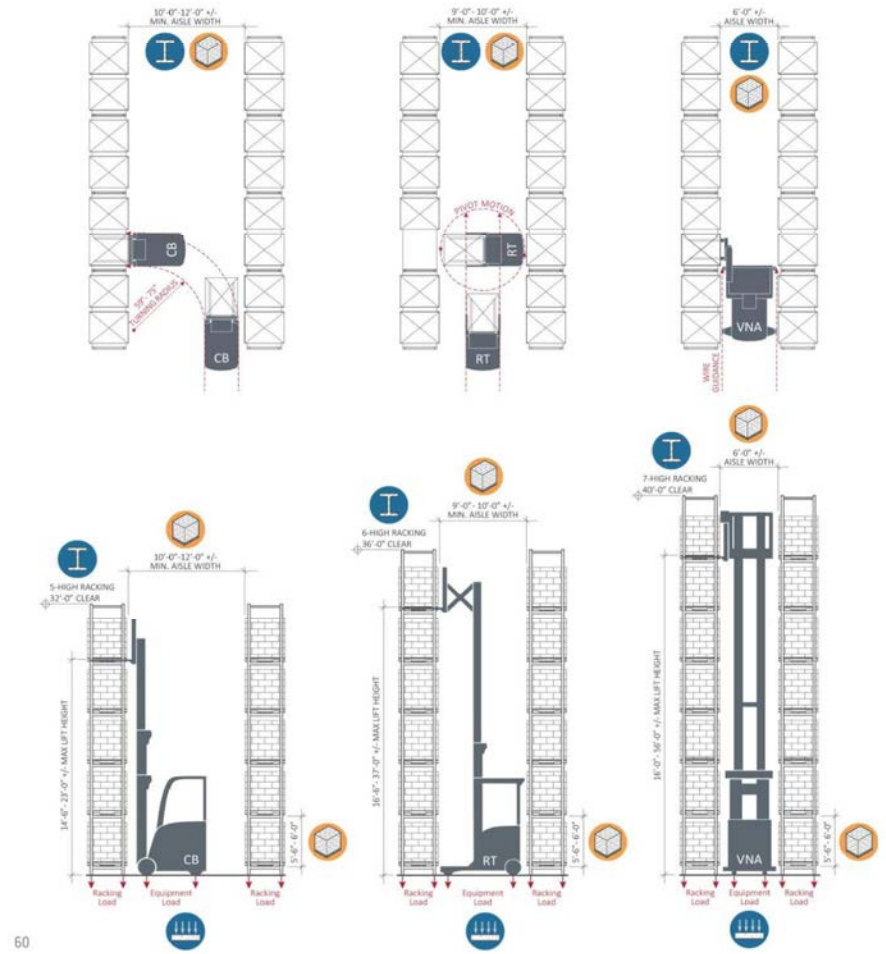
DOMINO EFFECT OF THE PALLET DESIGN



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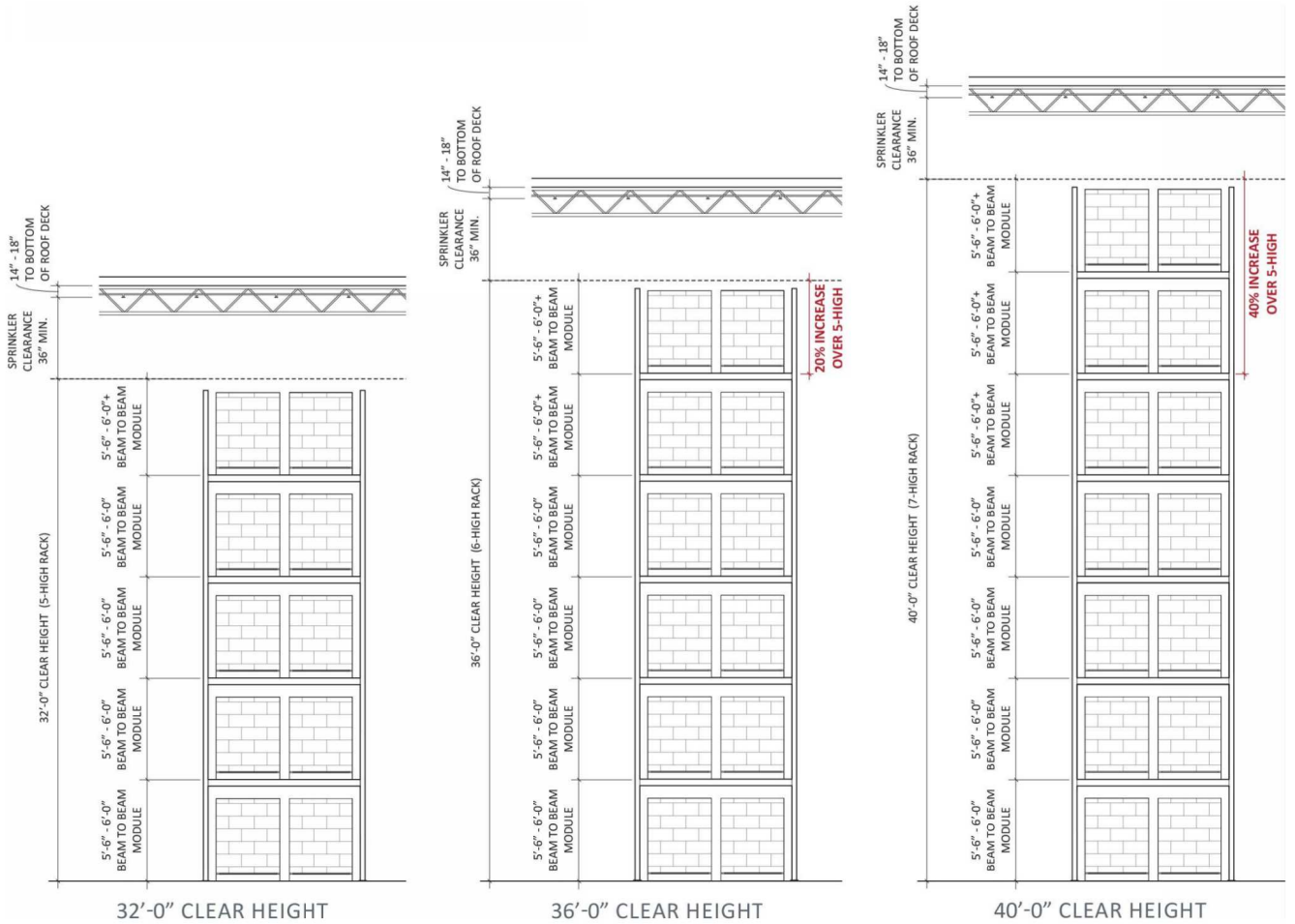
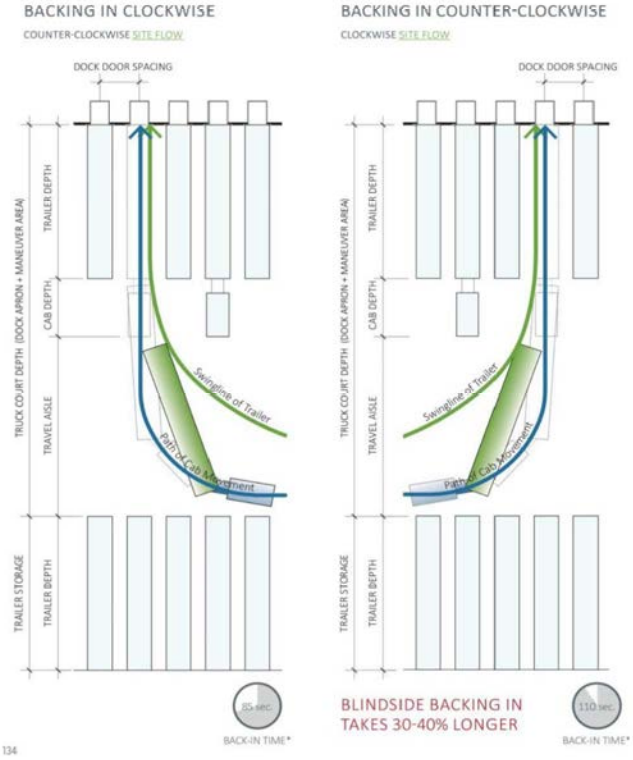
FORM FOLLOWS FUNCTION

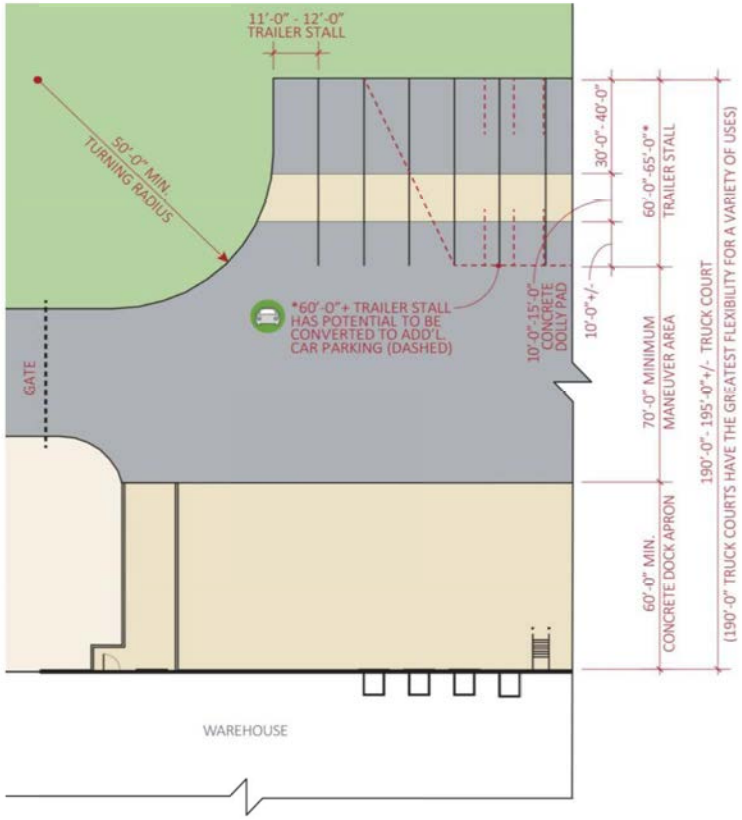
BUILDING CLEAR HEIGHT



SITE LAYOUT AND DIMENSIONS

QUICK FACTS	
Optimal Single Dock Apron and Trailer Storage Truck Court Depth	190’-0” – 195’0”
Optimal Entry Road Width	40’-0”
Optimal Internal Roadways	30’-0”
Other Considerations	• Queuing • Stacking Depths • Guardhouses • Dock Door Spacing

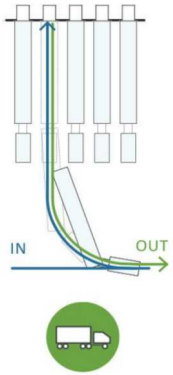


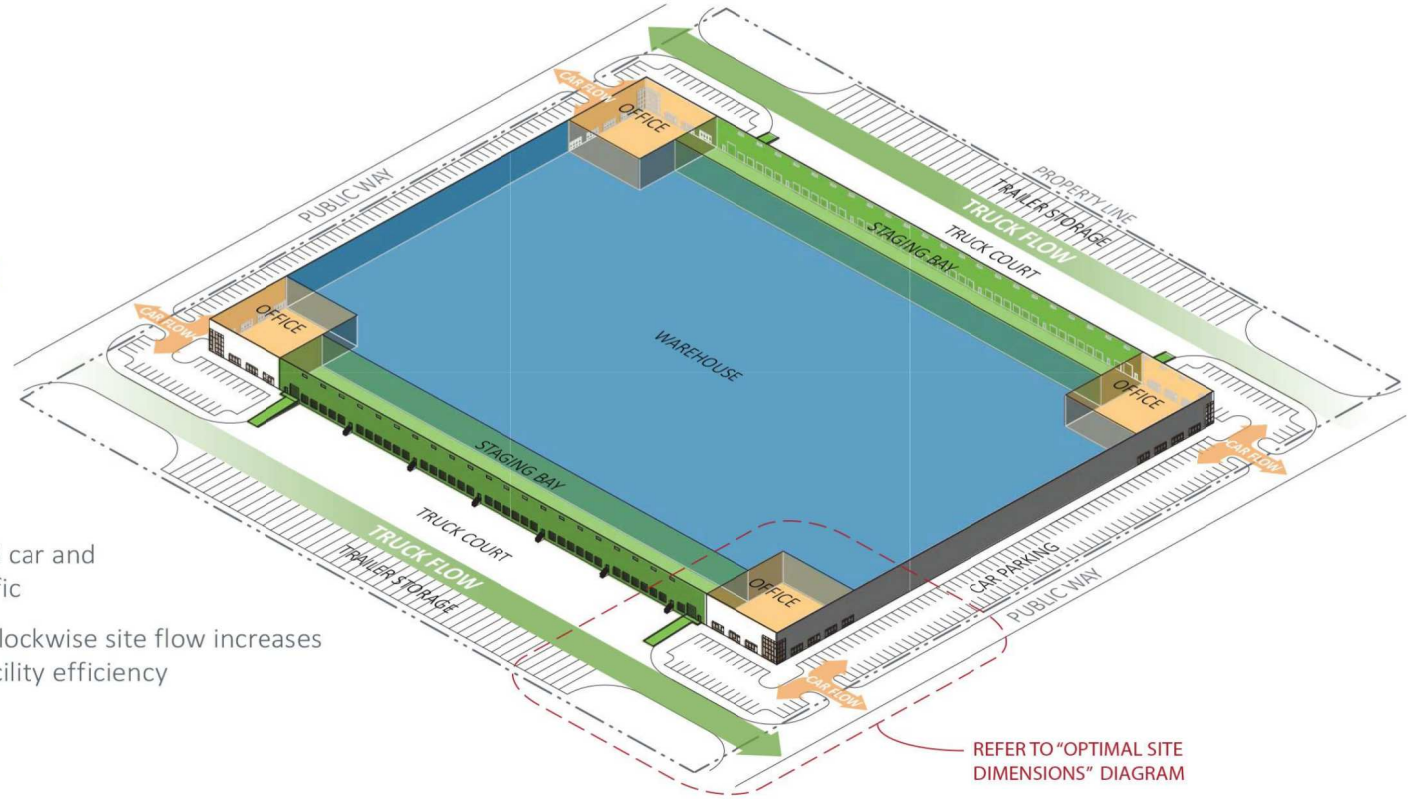


LAYOUT CONSIDERATIONS

OPTIMAL LAYOUT

COUNTER-CLOCKWISE SITE FLOW

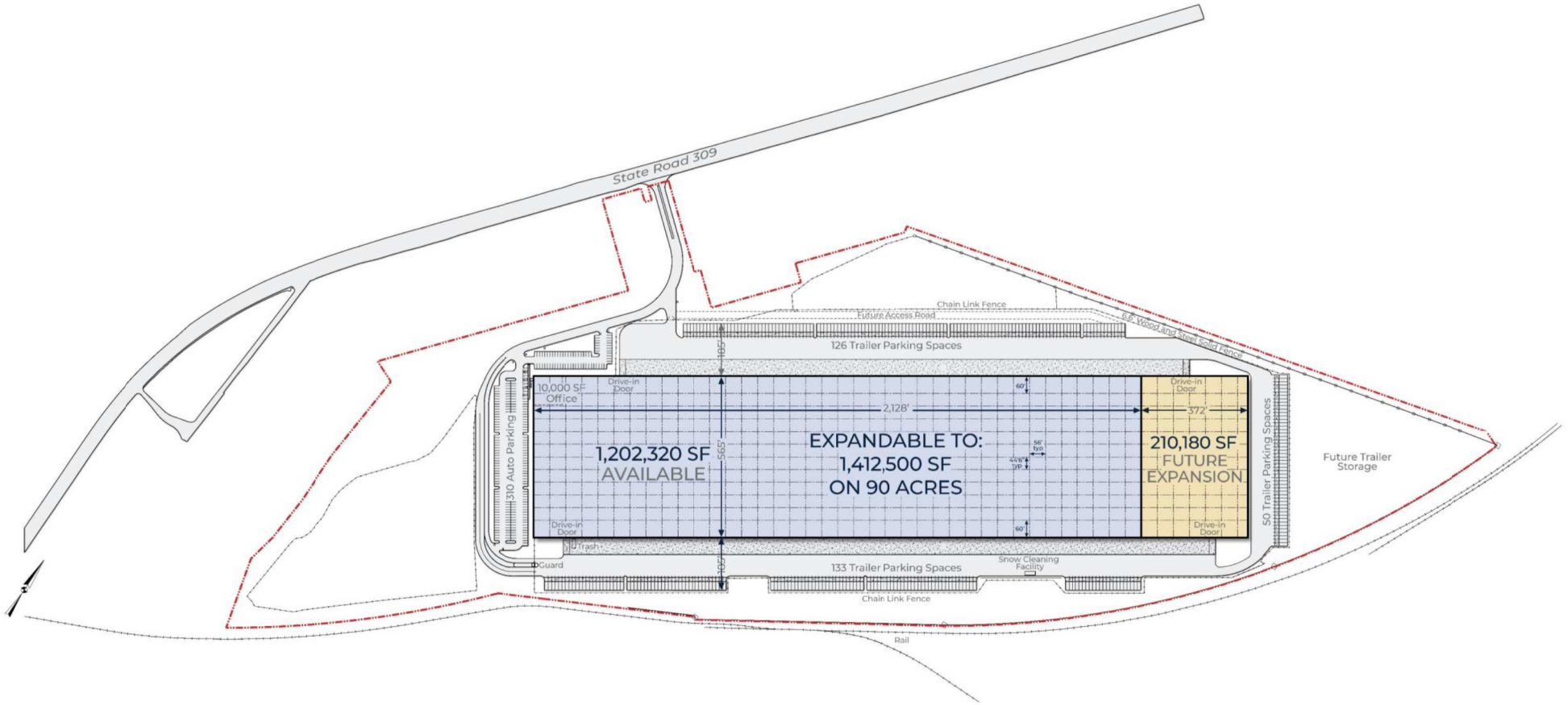




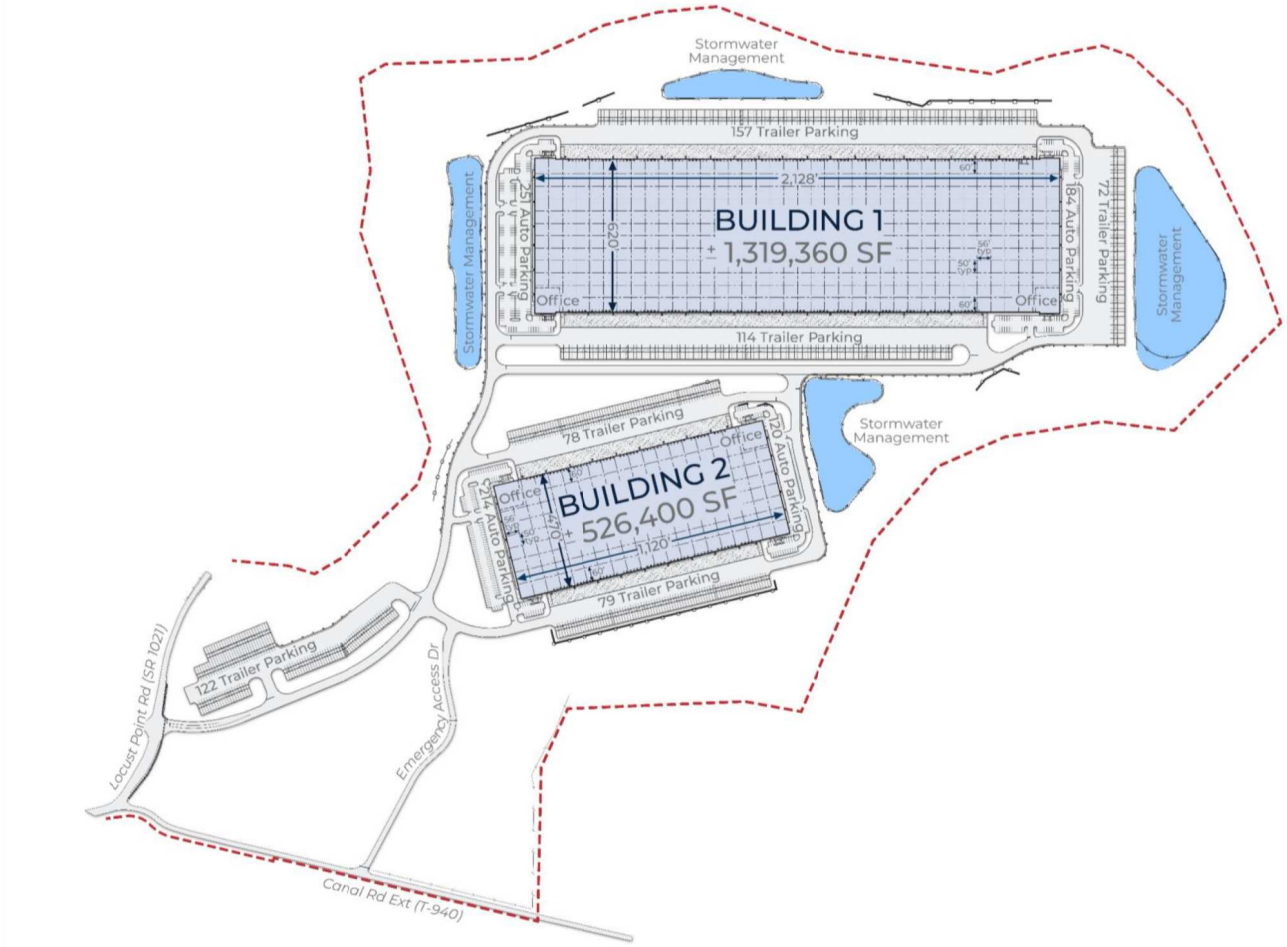
PROS

- Separated car and truck traffic
- Counter-clockwise site flow increases overall facility efficiency

HAZLETON LOGISTICS PARK



TRADE CENTER 83 NORTH



Sara

Planning for and Reacting to Warehouse Development. *Lessons Learned*

Concerns, approaches and solutions from Lower Macungie Township

Master Plan approach

- 500 ± acre site approved for 6 warehouse pads on a private street.
- Sufficient turnaround at the end of a long cul-de-sac was designed

Master Plan, Liberty II

Trucks Backing onto Township or State Roads

- Private street with loop cul-de-sac
- Emergency access required

Trucks Parking on local roads, blocking visual access for driveways and congesting the street.

- Parking areas required for truck and driver layovers
  - Feature a drivers lounge
  - Add electric hookups to prevent idling
  - Gate set back from entrance to permit sufficient stacking and prevent backing up waiting trucks on the streets

Truck parking court with door access for lounges

Mixing of delivery and loading with employee and visitor parking

- Loop road added to separate visitor and employee parking

Plan for transit or drop off at facilities

- Bus stop locations coordinated with LANTA at the design stage
- Bus stops connected to the buildings and building entrances with sidewalks
- Road frontage contains sidewalks and street trees for comfortable and safe pedestrian access.

Large buildings are unsightly and out of scale

- Work with site grading to lower the building pad
- Visual simulation of views from major roads and homes was performed
- Large berms with 3:1 slopes required to screen sensitive view sheds.
- Landscaping is layered including the top of the slope and sides

Landscaped berms to screen from nearby development

Lighting can be Intrusive

- Required downlighting/ dark sky compliant fixtures
- Timing of lights to be tied to the work hours with only safety lighting overnight
- Landscaping perimeter of truck courts
- Shade trees required in employee parking areas

Look for opportunities that benefit the community and look long term

- Tie into rail siding for future use
- Locate trails for employees and benefit the community
- Landscape sustainably – native plants, naturalized areas reduce maintenance.
- Storm water can be an amenity, opportunity to reproduce natural wetlands or provide entry statement (don’t design to hide behind a fence)

1 mile trail along Little Lehigh Creek

Trucks on Local and Rural Roads

- Limit turning movements out of the facility with “pork chop” island and signage prohibiting turns and directing trucks to the appropriate route.
- Post signs in the facilities instructing drivers on the appropriate route
- Designate truck routes and prohibited streets
- Weight restrictions on bridges
- Enforcement

Directional Signage Examples

Nate

Warehouse/ Logistics & Industrial Ordinance Provisions

Lower Macungie Township

How to Enact Best Practices & Lessons Learned into Zoning Ordinance?

- ADDRESS KNOWN PROBLEMS AND ISSUES
- 1. Location and process.
- 2. Unwanted off-site parking, idling, resting and other affects.
- 3. Minimizing on-lot traffic issues.
- 4. Mitigate offsite traffic and charge impact fees accordingly.
- 5. Properly screen/ buffer the use to protect abutters.
- 6. Offset stormwater impacts of the use on site and design to decrease use's footprint.

Location and Process

- MPC requires allowing for all uses. Define the use and designate where it is appropriate within the community.
- Limit zoning districts where use is allowed that matches adopted plan(s), or area appropriate for use.
- Establish Conditional Use process to ensure hearing and provisions/ conditions may be added to a development proposal.

Establishing Amenity Area Requirements:

- Required rest area parking spaces.
  - Set a dedicated 5% of truck parking spaces for rest/ idling to provide parking for legally mandated breaks. Ensure electric hook-ups are available.
- Required lounges with restroom facilities, vending areas, etc.
- Space amenity areas proportionately to size and scale of the facility.
- Require adequate queueing/stacking lanes at entrances to avoid backups onto public streets during delivery or pick-up times.
- Separate passenger vehicle traffic from truck traffic with different entrances, lanes and parking areas. Ensure design avoids mixing traffic.
- Trails on-site to promote recreation and interconnectivity with the community.

Properly Screen and Buffer to Size and Scale of Proposal

- Require 50 foot buffer yards filled with berming, evergreen trees, deciduous and flowering trees, shrubs, bushes, ornamental grasses, etc. to fully shield view of use in close proximity ad at distance.
- Creation of a “Class C Buffer” specifically points designers to visual guide and expectation of Township within ordinance and design guidelines.
- Lighting: Site lighting shall utilize shielding and not produce glare, minimize ambient light, not shine on abutters.

Class C Buffer Standard:

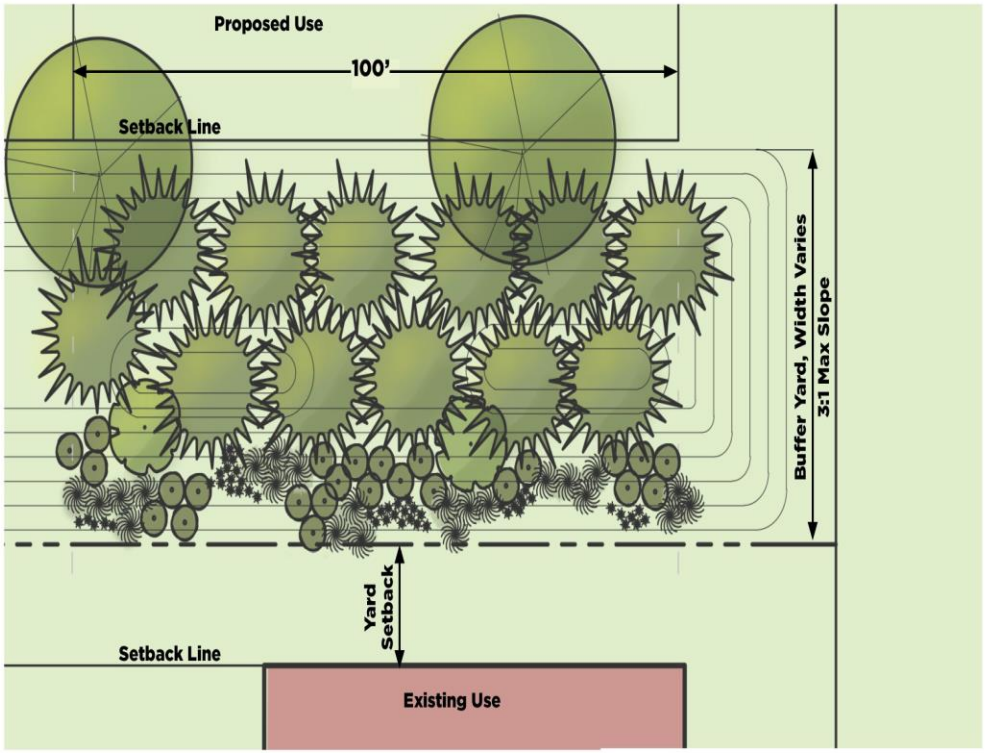
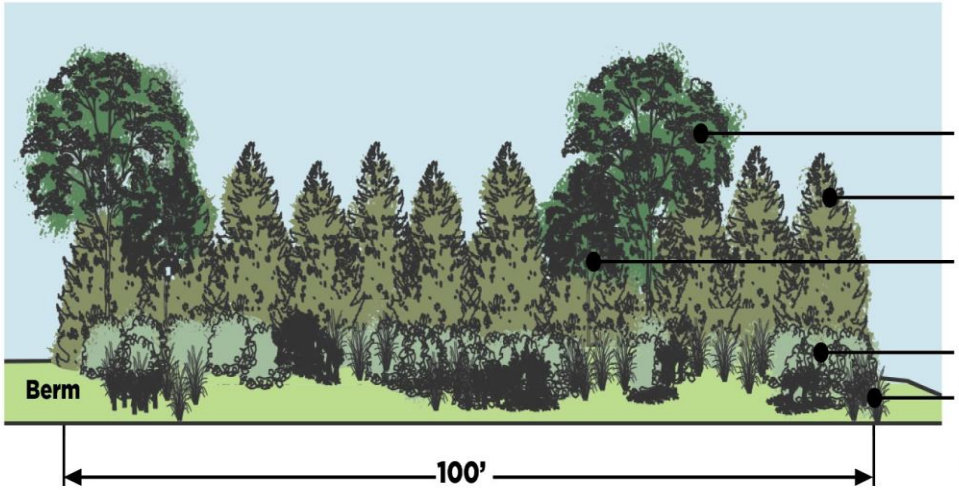


Figure 3C-1 Class C Buffer Plan

NOTE:
TREES ARE SHOWN APPROX. 10 YEARS AFTER PLANTING

- Evergreen Trees
- Canopy Tree
- Shrub
- Flowering Tree
- Tall Ornamental Grass
- Perennial

Class C Buffer Standard



NOTE:
TREES ARE SHOWN APPROX. 10 YEARS AFTER PLANTING

Figure 3C-2 Class C Buffer Elevation

Class C Buffer

- 1 Evergreen Per 20 Feet
- 1 Canopy Tree Per 50 Feet
- 1 Flowering Tree Per 30 Feet
- 7 Shrubs Per 30 Feet
- 22 Perennials or Tall Grass Per 30 Feet
- 1 Berm Varying 6'-8' in Height
- 3:1 Maximum Slope

Utilizing Adopted Design Guidelines to Influence Final Product

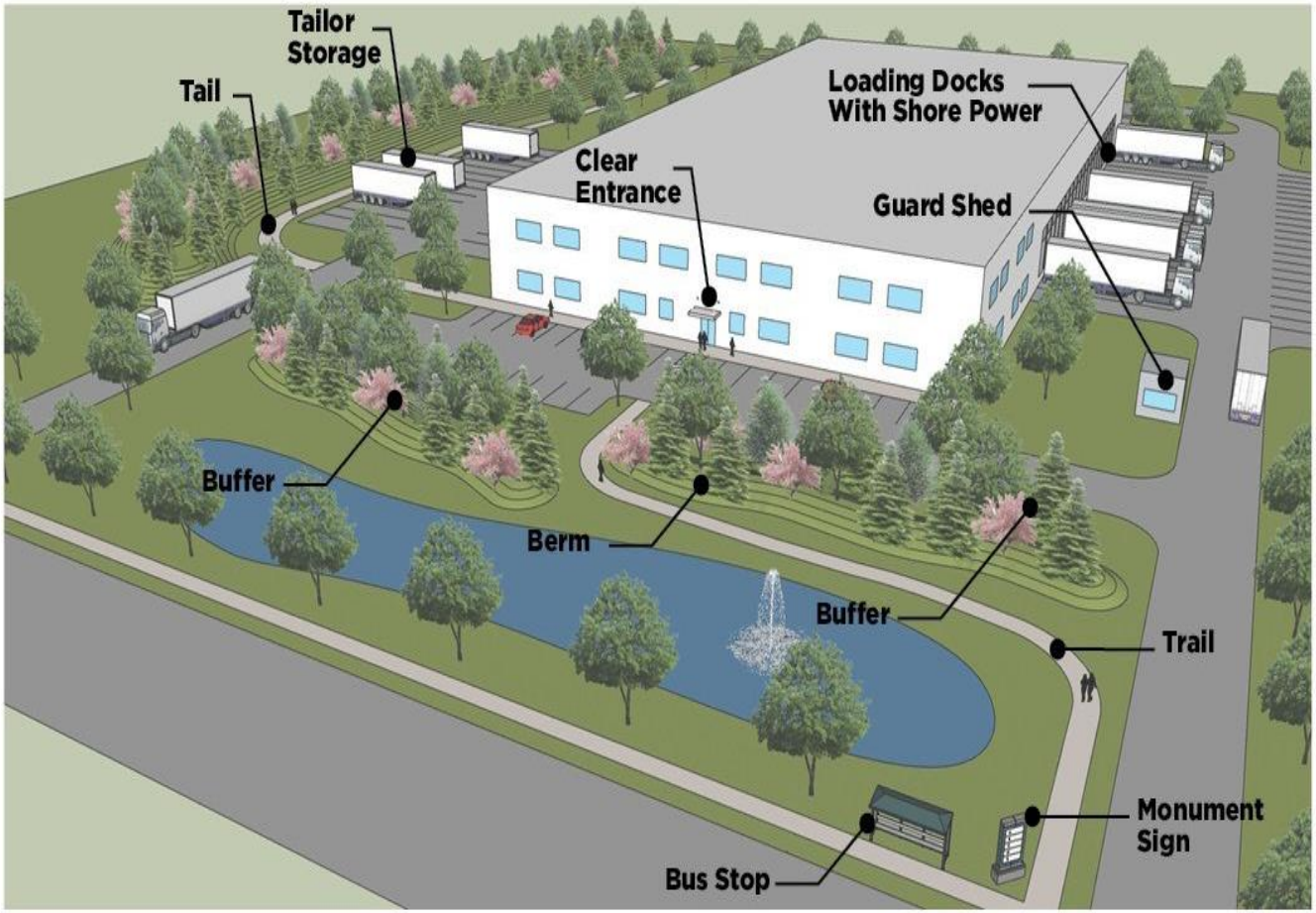


Figure 8A - ORLIC Uses and Light Industrial Uses

Utilizing Adopted Design Guidelines to Influence Final Product

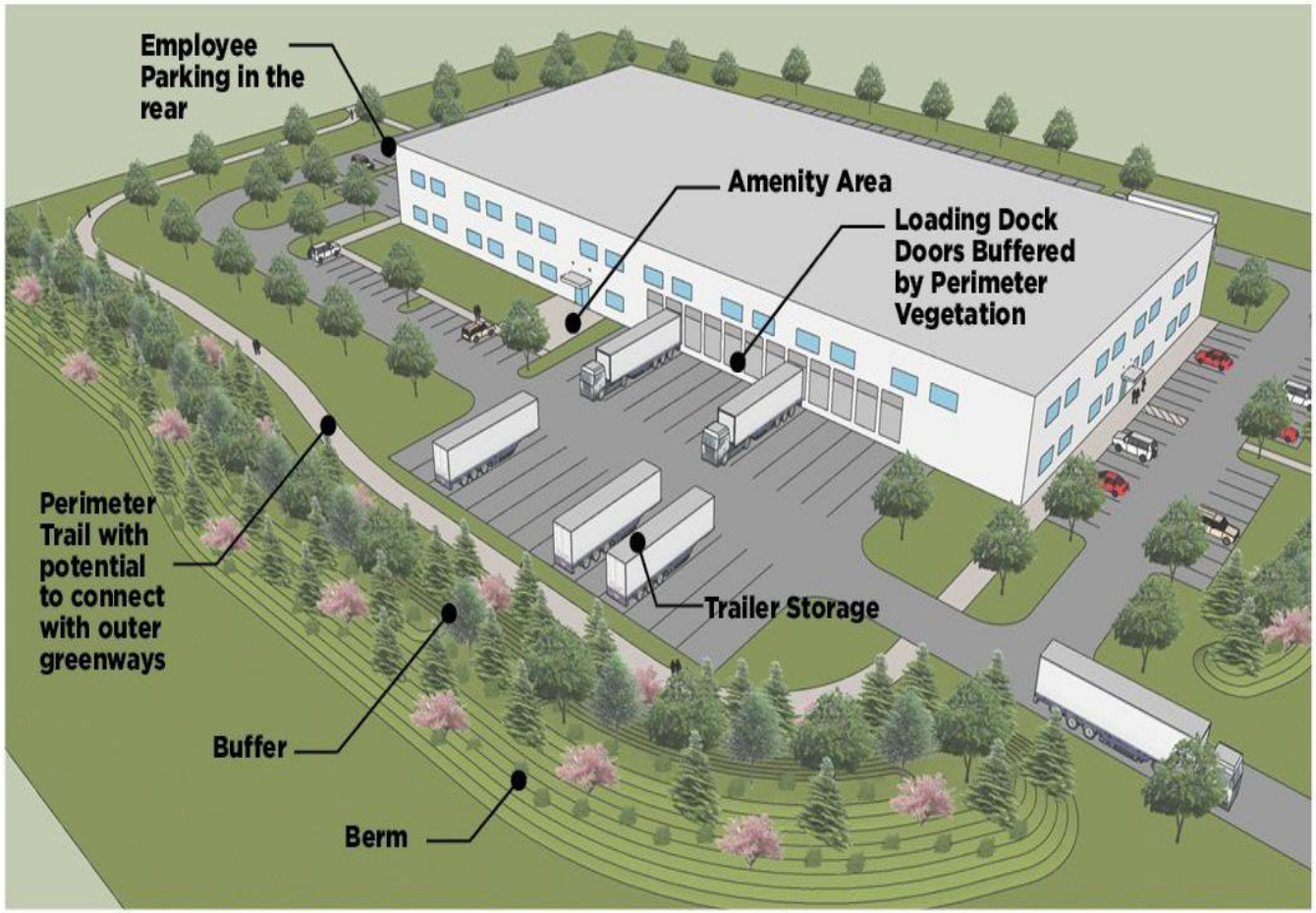


Figure 8B - Warehouses

Enhanced Stormwater Management Requirements to Minimize Impact.

- Naturalization of all management features-
  - Basins with natural grass and flower plantings.
  - Irrigation areas with natural grass and flower plantings.
  - Vegetated swales with seed and tree/ shrub plantings.
  - Mixing of grasses/ seeds as opposed to regular lawn grass:
    - Pollinator garden areas.
    - Diverse ground cover.
    - Habitat area.

Examples of Naturalization:

Photos courtesy of The Wildlands Conservancy

Examples of Naturalization:

Photo courtesy of The Wildlands Conservancy

Examples of Naturalization:

Photo courtesy of The Wildlands Conservancy

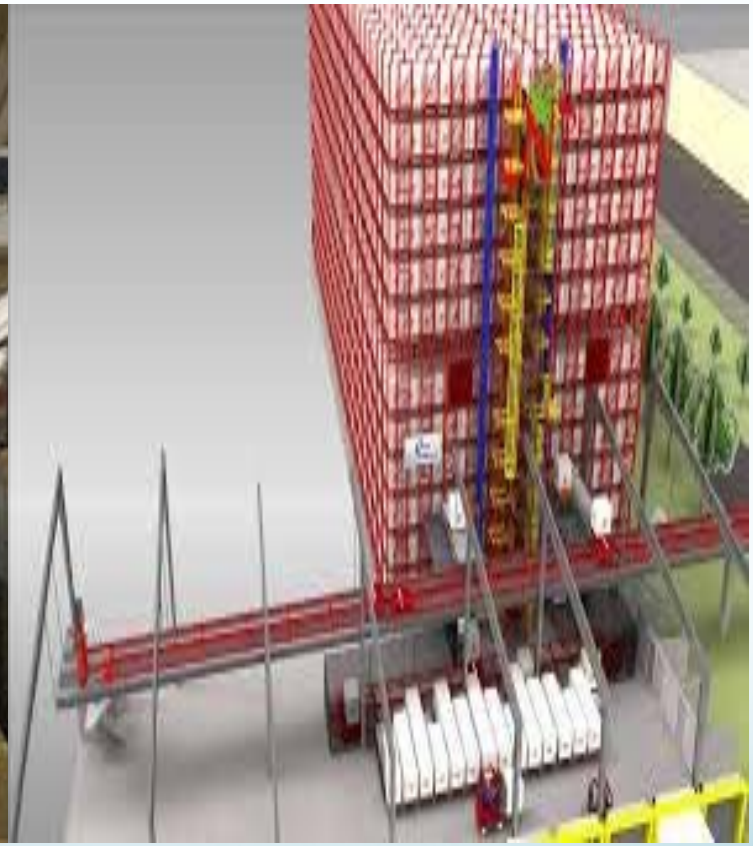
Coming Attractions

Automated and Rack Supported Warehouses

What is an automated warehouse?

- Use of robots and automated guided vehicles to retrieve and store products to maximize warehouse space.
- Reduced need for wide aisles to accommodate large pallets and pallet jacks and workers.
- Quicker retrieval and storage
- Compliments or replaces warehouse workers

Moving and storing with automation



What is a rack supported warehouse?

- Racking acts as the **structural support** for the walls and the weight of ceiling of the facility while still providing storage.
- Flexible application: installed inside or in addition to an existing warehouse or designed and built as an exterior structure.
- Combines construction and warehouse storage in one system with no need for columns that interrupt the interior space.
- Typically uses automated and semi-automated systems for inventory handling.

Ideal Applications

- Freezer or cooler exterior structures
- Maintenance shops
- Climate controlled storage warehouse
- Drive-thru building materials storage
- High-density dry storage
- Lumber storage

Planning Implications:

- **Traffic and Road Suitability:**
- High volume of materials and greater sorting speed = higher volume of truck traffic
- ITE classifications have been revised to include more than one warehouse type:

ITE classifications have been revised :

Code	Description	Unit of Measure	Trips per unit
110	General Light Industrial	1,000 SQ GFA	0.63
130	Industrial Park	1,000 SQ GFA	0.40
140	Manufacturing	1,000 SQ GFA	0.67
150	Warehousing	1,000 SQ GFA	0.19
151	Mini-Warehouse	1,000 SQ GFA	0.17
154	High-Cube Transload & Short-Term Storage Warehouse	1,000 SQ GFA	0.1
155	High-Cube Fulfillment Warehouse	1,000 SQ GFA	1.37
156	High-Cube Parcel Hub Warehouse	1,000 SQ GFA	0.64
157	High-Cube Cold Storage Warehouse	1,000 SQ GFA *GFA Ground floor area	0.12

Planning Implications

- **Economic:**
- Use of automation can mean less employment
- Vertical warehouse can have a smaller footprint, use a smaller site
- **Scale and Visual Impact:**
- Racked buildings height requests may be higher than 100 feet.
- Typical Zoning regulates building coverage, as does the ITE, not volume.
- Bulk requirements, increased setbacks, enhanced buffering and Visual Impact Analysis are appropriate tools to mitigating potential visual impacts and scale incompatibility.

Thank you!!!

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