

Impervious Coverage Code Amendment



City of Dallas

**Zoning Ordinance Advisory Committee
(ZOAC)
July 9, 2024**

Lori Levy, AICP, Senior Planner
Planning and Development Department
City of Dallas

Presentation Overview



- Background/History
- Purpose
- Issues/Operational or Business Concerns
- Updates
- Proposed Recommendations (Topics of Discussion)
- Case Studies/Operational Impacts
- Next Steps



Background/History



City Plan Commission authorized a public hearing on 7/22/2022 to consider amending Chapters 51 and 51A of the Dallas Development Code to consider developing appropriate standards associated with impermeability, permeability, pervious and impervious surfaces, including but not limited to definitions, paving, surfaces, materials, and applicability

Date	Action
March 22, April 8, May 5, 8, 25; June 13,14, 16, and July 5, 2023, June 5, 2024	Staff met with internal departments to get input
April 27, 2023	Staff met with Commissioner Hampton for intent of impervious coverage code amendment from the code amendment initiators
May 25, 2023	Staff conducted outreach meetings with industry representatives, Texas Real Estate Commission (TREC) and Dallas Builder's Association (DBA)
June 12, 2023	Staff met with directors of MetroTex Realtors and Apartment Association of Greater Dallas (AAGD)
August 1, 2023	Staff presented the Impervious Coverage Code Amendment for residential development at the Zoning Ordinance Advisory Committee (ZOAC)
September 8, 2023	Staff met to discuss design standards for the parking code amendment and decided to include the impervious coverage maximums for nonresidential parking lots with this code amendment
April 1 and 5, 2024	Staff presented recommendations to external stakeholders (TREC, DBA, NCTCOG, GDPC, GDRA, HANTX, 24HrDallas)
April 22 and 23, 2024	Staff conducted public listening sessions on both days
May 30 and June 5, 2024	Staff met with industry representatives from engineering firms that submit projects for engineering approval for feedback



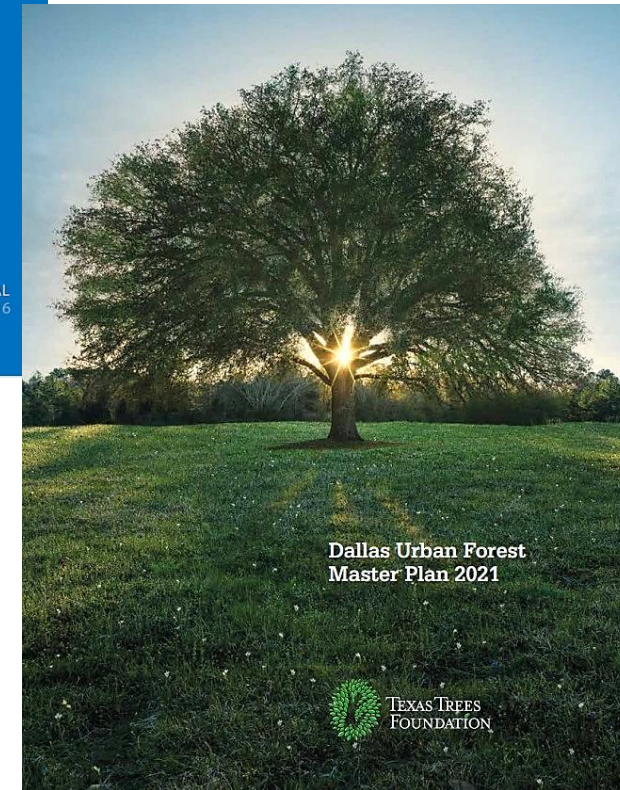
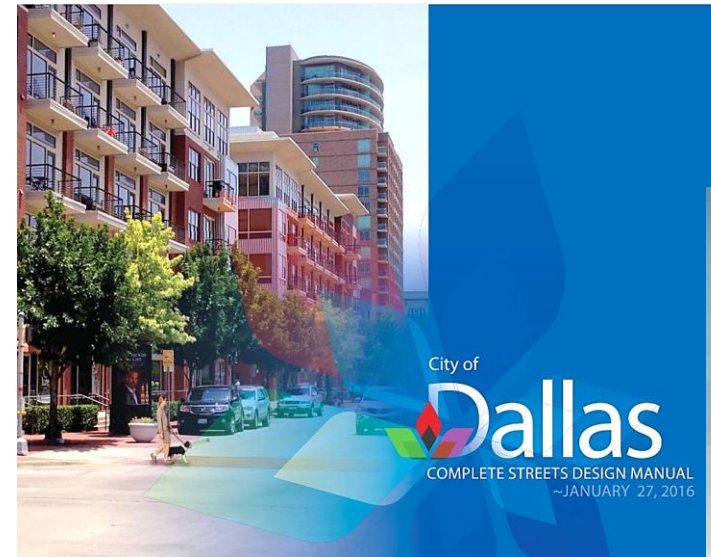
Purpose



The City Plan Commission requested staff to initiate a code amendment to the Dallas Development Code to limit impervious coverage for both residential and nonresidential uses.



Limiting impervious coverage aligns with several citywide plans and policies to reduce flooding and the heat island effect exacerbated by impervious surfaces.



Issues/Operational Concerns



- Resident's documented concerns spurred CPC's decision to initiate a hearing for a possible Code amendment
- Document described concerns regarding stormwater runoff, and the heat island effect
- Other concerns regarding compatibility of existing front yards of residential lots



Photo Credit: Dallas Resident



Issues/Operational Concerns



- Code requirements need to align with CECAP, and other City plans
- Goals to reduce environmental impacts of flooding and the heat island effect exacerbated by stormwater runoff from lack of soil infiltration from impervious surfaces
- Compatibility with existing neighborhoods



Photo Credit: David Nevarez, Transportation Development Services



Issues/Concerns



- **Flash Flooding** caused by lack of infiltration of rainwater into the soil onto streets, businesses, and homes
- **Pollutants** from stormwater runoff into fragile rivers and streams
- **Water quality degradation** caused by stormwater runoff
- **Flooding** events of rivers, streams and critical watersheds



- **Destruction** of property, wildlife habitat, and ecosystems



See photo credits on slide 43

Issues/Concerns



- **Scorching heat** absorbed by dark surfaces
- **Higher temperatures** experienced in urban areas from heat trapped in impervious surfaces and lack of shade
- **Health issues** for humans and animals from higher temperatures in urban areas



- **Air Quality** issues with few trees to filter the air we breathe



Dark Pervious

- 140.0 F
- 0.8 in

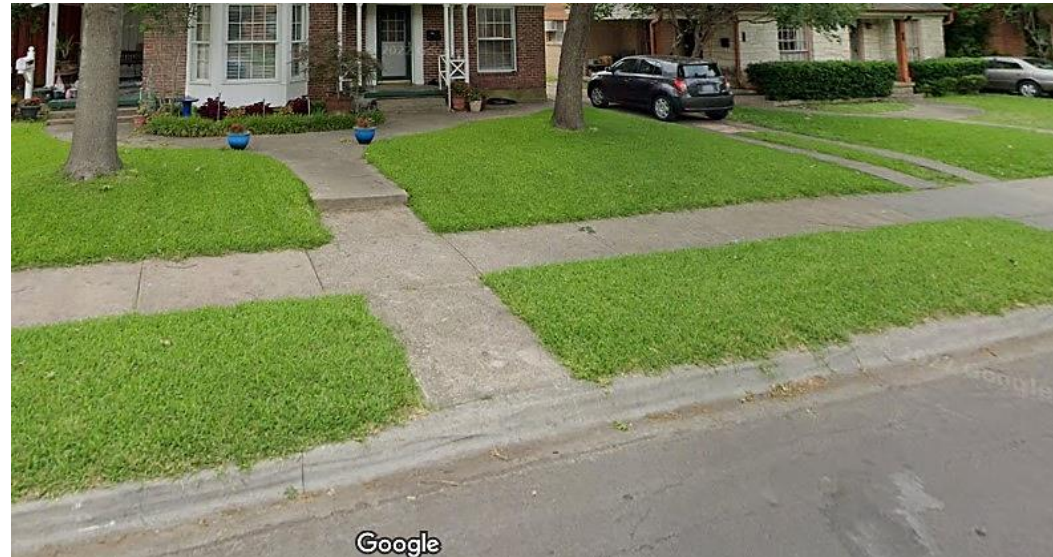


See photo credits on slide 43

Issues/Concerns - Residential



- 4 car driveway for duplex vs single car driveway (top right) and single car, ribbon driveway for single family (bottom right)



See photo credits on slide 43

Proposed Code Amendments



ALIGNMENT WITH CITY PLANS AND POLICIES



COMPLETE STREETS DESIGN MANUAL, AS AMENDED

- ✓ *Reduce Impervious Setbacks And Frontage*
- ✓ *Include Environmentally Sustainable Solutions*



CECAP

- ✓ *Goal 1: Dallas' Buildings Are Energy-Efficient And Climate Resilient*
B-13 – Establish urban greening factor requirements for new developments that quantify how projects contribute to urban greening for reduced stormwater runoff and urban heat island improvements
- ✓ *Goal 5: Dallas Protects Its Water Resources And Its Communities From Flooding And Drought*
- ✓ *Goal 6: Dallas Protects And Enhances Its Ecosystems, Trees, And Green Spaces That In Turn Improve Public Health*
- ✓ *Goal 8: All Dallas Communities Breathe Clean Air*



ForwardDALLAS COMPREHENSIVE PLAN (2006)

- ✓ *Goal 5: Dallas Protects Its Water Resources And Its Communities From Flooding And Drought*

ForwardDALLAS COMPREHENSIVE PLAN 2.0 (DRAFT)

- ✓ *Action Step 5: Update Development Code to reduce the percentage of impervious surface areas, where appropriate*
- ✓ *Action Step 7: Update Development Code to incorporate green infrastructure practices into land use and development, such as rain gardens, green roofs, permeable pavements, bioswales, and vegetated swales, providing incentives*



Topics of Discussion (Summary of Topics)



1. Sec. 51A-2.102 Definitions
2. Division 51A-4.110 District Regulations
3. Sec. 51A-4.407.1 Maximum Impervious Coverage
4. Sec. 51A-4.507 Neighborhood Stabilization Overlay
5. Sec. 51A-10.101 Definitions of Article X
6. Sec. 51A-10.121 Application of Division – Art. X
7. Sec. 51A-4.803 Site Plan Review
8. Sec. 51A-4.127 Urban Corridor Districts
9. Sec. 51A-13.703 Site Plan Review
10. Sec. 51A-13.304 Development Type



Updates



1. Sec. 51A-2.102 Definitions

- ❖ Minor revisions to definitions of Impervious Coverage and Impervious Surface

2. Division 51A-4.110 District Regulations

- ❖ Adding performance standards for certain nonresidential uses

3. Sec. 51A-4.407.1 Maximum Impervious Coverage

- ❖ Revising applicability of nonresidential from parking areas to site area, lots, or artificial lots including buildings

10. Sec. 51A-13.304 Development Type

- ❖ Adding impervious coverage to development types for Form Districts



Proposed Code Amendment



Topic 1. Sec. 51A-2.102 Definitions

(Updated) Proposed Definitions:

IMPERVIOUS COVERAGE means a percentage of **site** area, **lot**, or **artificial lot** that is covered by impervious surface.

IMPERVIOUS SURFACE means a surface that prevents or **substantially** impedes water from recharging groundwater. ~~This condition can be caused by a structure, paving, pavers, compacted soil or gravel or other feature that forms a barrier between precipitation and the earth's surface.~~



Proposed Code Amendments



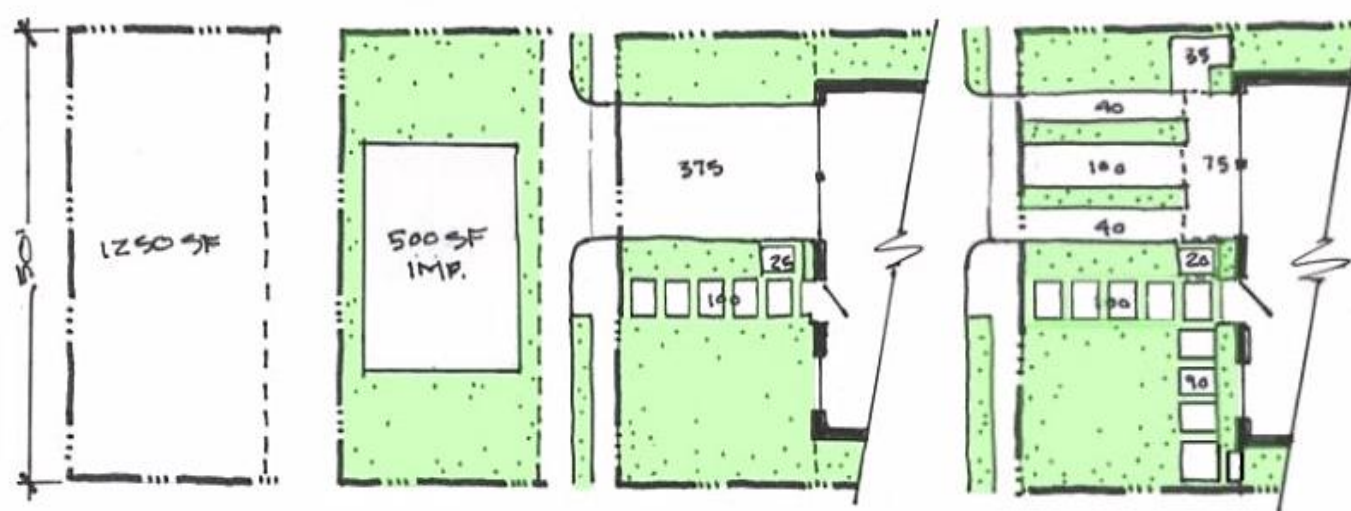
Topic 2. Division 51A-4.110 District Regulations

A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot and space regulations

Example:

Maximum impervious coverage percentage of required front yard for residential – 40%, except A(A) Agric. – 30%

SF 50' wide lot with 25' required FY



Proposed Code Amendments



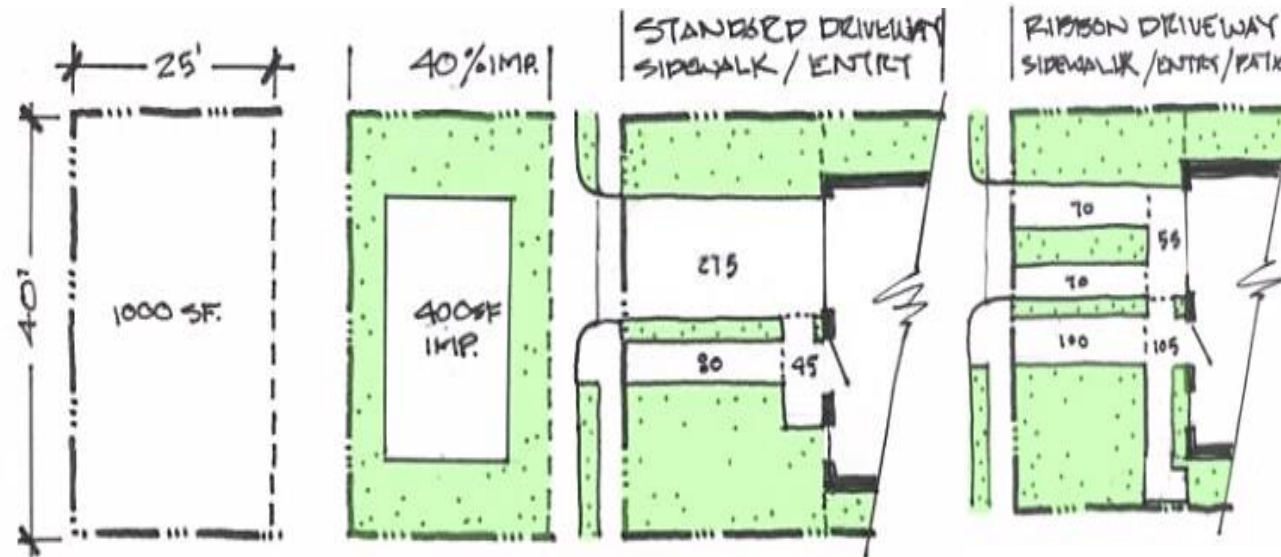
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Example:

Maximum impervious coverage percentage of required front yard for residential – 40%, except A(A) Agric. – 30%

SF 40' wide lot with 25' required FY



Drawings by Don Raines, Planning and Development Department

Proposed Code Amendments



IMPERVIOUS SURFACE CALCULATION

Impervious Surface Area Including Building: 27,518 sq. ft.
 Impervious Surface Area Excluding Building: 18,205 sq. ft.
 Total Site Area: 34,280 sq. ft.

Impervious Surface Percentage Including Building: 80%
 Impervious Surface Percentage Excluding Building: 53%

LEGEND

- Total Site Area For Calculation
- Concrete
- Decomposed Granite
- Building
- Stamped or Brick Sidewalk / Pathway
- Grass (or similar plantings)
- Landscape Bed
- Tree
- Shrubs

IMPERVIOUS AND PERVIOUS SURFACE CALCULATION

IMPERVIOUS SURFACES

Concrete: 14,680 sq. ft. - 43%

Building: 9,293 sq. ft. - 27%

SEMI-PERVIOUS SURFACES

Stamped or Brick Sidewalk / Pathway: 872 sq. ft. - 3%

GREEN SPACE

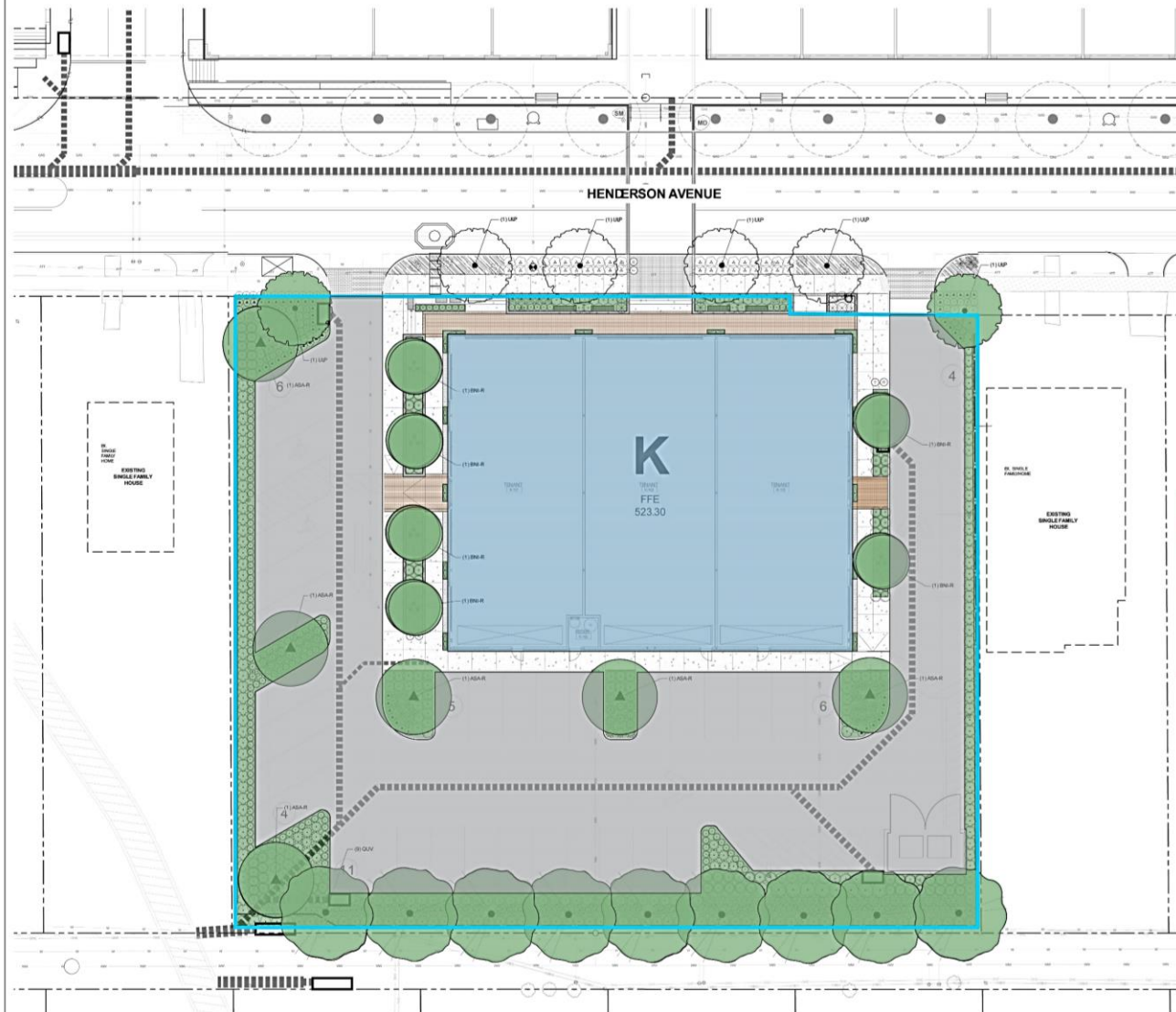
Landscaped Bed (shrubs/flowers etc.): 6,152 sq. ft. - 18%

Tree Coverage: 1,934 sq. ft. - 18%

Note: Can't determine on this plan whether the sidewalk/pedestrian path is pervious or impervious.

Also there appears to be small pockets of pervious surfaces along the building, but no label or legend symbol is there to verify

Note: The percentage total is greater than 100% since tree coverage overlaps with landscaping and other surfaces



THESE PLANS HAVE BEEN REVIEWED BY THE BUILDING INSPECTION DIVISION AND ARE APPROVED FOR THE START OF CONSTRUCTION. ANY DEVIATION FROM THESE PLANS SHALL BE APPROVED BY THE BUILDING OFFICIAL.

BU DATE: 7/12/2023
 By: Tina Standeford

THIS APPROVAL DOES NOT PERMIT THE VIOLATION OF ANY CITY ORDINANCE OR STATE LAW

PLANT SCHEDULE	
1	SHRUBS
2	TREES
3	LANDSCAPING
4	CONCRETE
5	STAMPED BRICK
6	DECOMPOSED GRANITE
7	BUILDING
8	GRASS
9	LANDSCAPED BED
10	SHRUBS
11	TREES
12	LANDSCAPING
13	CONCRETE
14	STAMPED BRICK
15	DECOMPOSED GRANITE
16	BUILDING
17	GRASS
18	LANDSCAPED BED
19	SHRUBS
20	TREES
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22	CONCRETE
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200	TREES

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gff

HENDERSON AVENUE MIXED USE DEVELOPMENT
 BUILDING K
 NORTH HENDERSON AVENUE,
 DALLAS, TEXAS 75206
 CONSTRUCTION DOCUMENTS

PLANTING PLAN

Topic 2.
 Division
 51A-4.110
 District
 Regulations
 (Cont'd)

Example:
 Maximum
 Impervious
 Coverage for
 Non
 Residential
 Uses – 80%,
 60% for site
 areas, lots, or
 artificial lots
 abutting
 parkway
 streets



Proposed Code Amendments

Topic 2. Division 51A-4.110 District Regulations

- A. Adding Maximum Impervious Coverage for all districts to the Yard, lot, and space Regulations
 - iii. 60% for non residential uses when abutting parkway streets

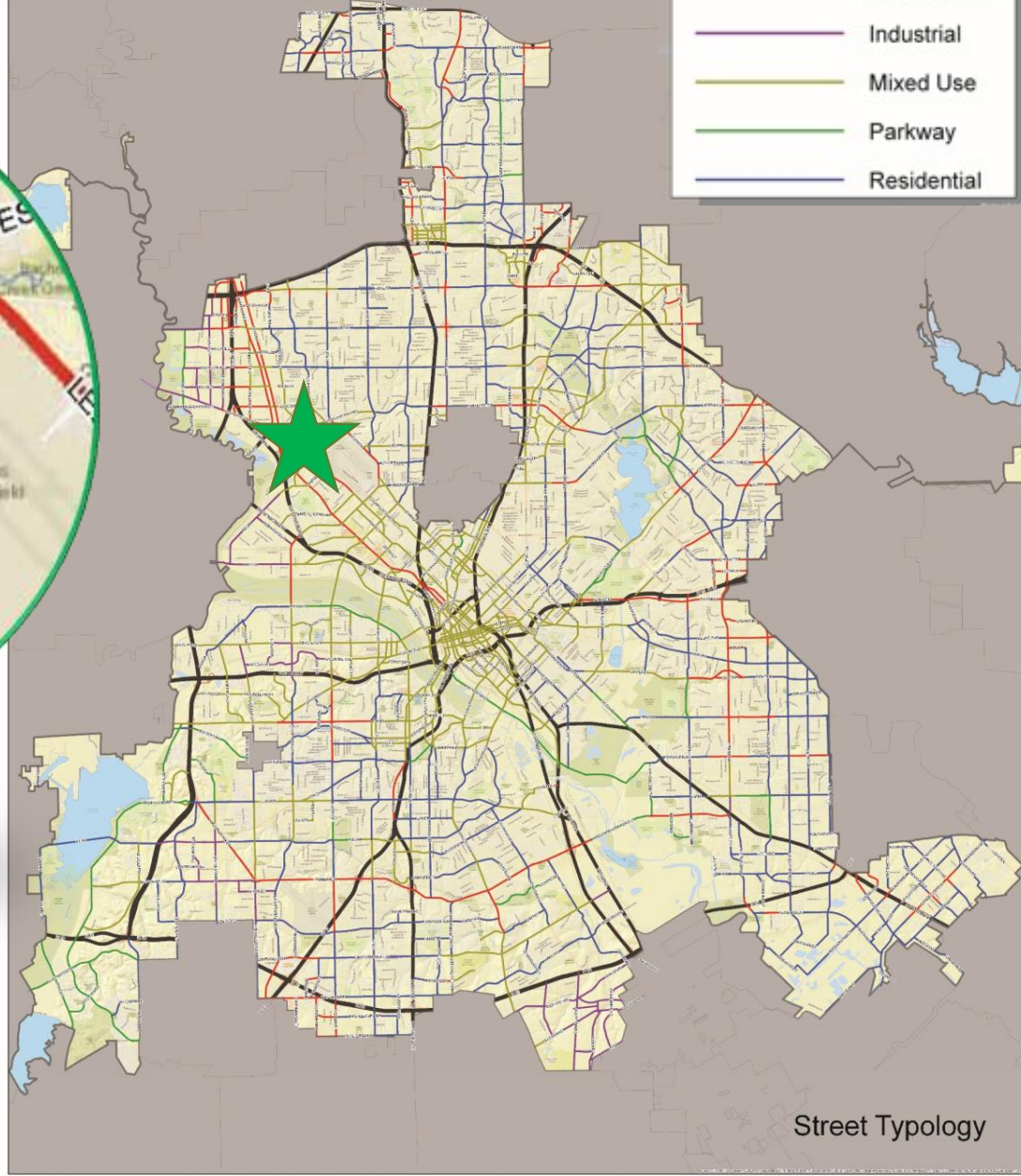


Complete Streets Vision Map

Legend

Street Typology

- Commercial
- Industrial
- Mixed Use
- Parkway
- Residential

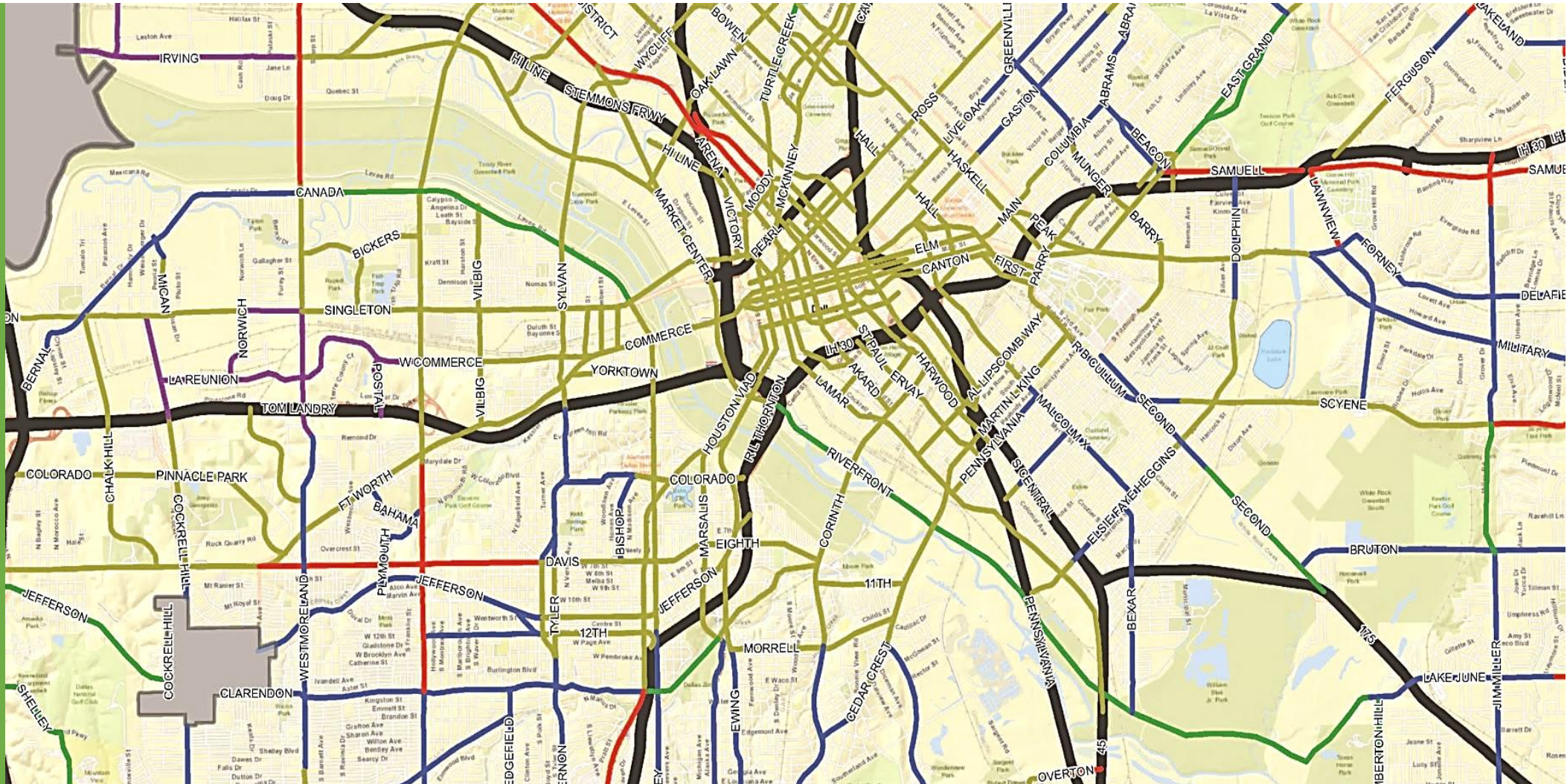


Complete Streets Map – Trinity River Watershed



Topic 2. Division
51A-4.110 District
Regulations

A. Adding
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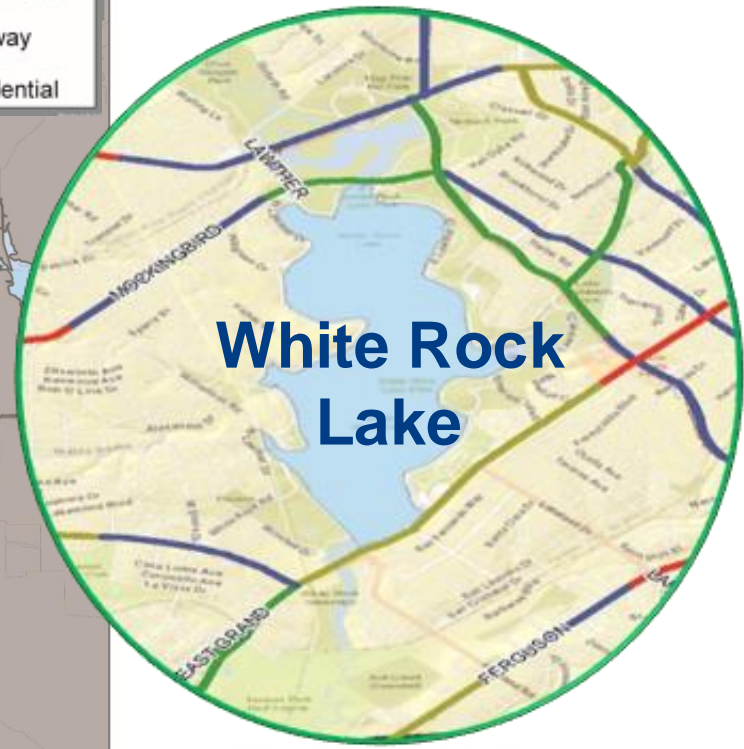
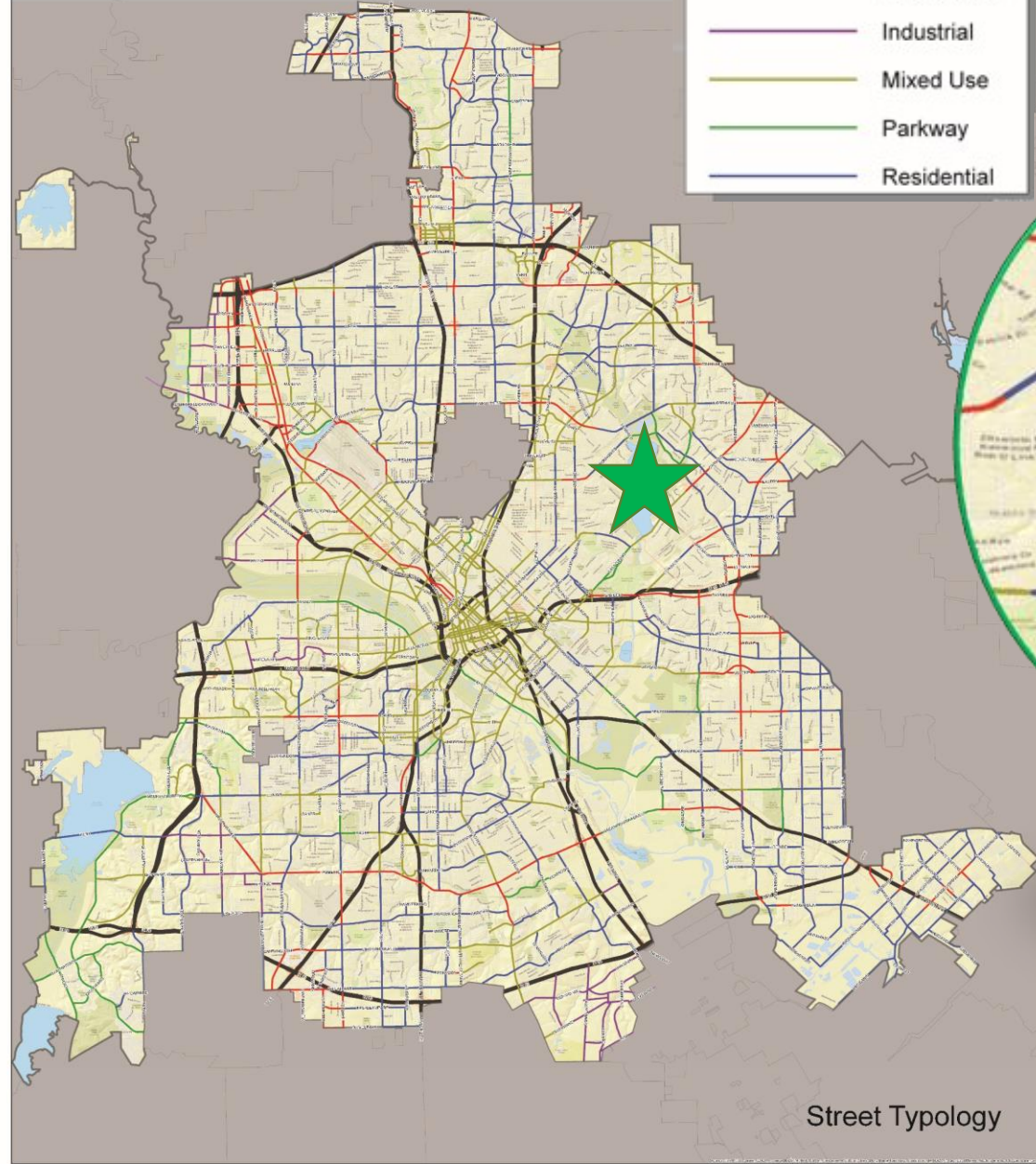


Complete Steets Vision Map

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Topic 2. Division 51A-4.110 District Regulations

- A. Adding Maximum Impervious Coverage for all districts to the Yard, lot, and space Regulations
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Street Typology

Proposed Code Amendment



Topic 2. Division 51A-4.110 District Regulations

A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot and space regulations

iv. Additional standards (performance standards) for truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces

1. Truck-related, vehicle-related, and nonresidential uses with more than 80 parking spaces must achieve a total of 10 points for any of the following greening factor, green (stormwater) infrastructure, or a combination thereof.

a. 30' Buffer Yard Adjacent to All Streets (5 pts)

- i. One large or medium canopy tree in a double staggered row every 30' linear feet for the total length of the perimeter;
- ii. 75% of the large or medium canopy trees must be evergreen;



Proposed Code Amendment



Topic 2. Division 51A-4.110 District Regulations

- A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot and space regulations
 - iv. Additional standards (performance standards) for truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces (**cont'd**)
 - 1. Truck-related, vehicle-related, and nonresidential uses with more than 80 parking spaces must achieve a total of 10 points for any of the following greening factor, green (stormwater) infrastructure, or a combination thereof.
 - a. **30' Buffer Yard Adjacent to All Streets (5 pts)**
 - iii. Buffer yard plant materials are required exterior and interior to the screening wall as applicable and along the full length of screening walls along the street r.o.w.;
 - iv. If the site area, lot, or artificial lot is adj. to streets on all sides, and all 30' Buffer Yards Adj. to all Streets are incorporated, 10 pts. may be awarded; and
 - v. Street r.o.w. may be included up to 25% of the required buffer yard (subject to city licensing, permit and tree location requirements of Art. X



Proposed Code Amendment



Topic 2. Division 51A-4.110 District Regulations

- A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot and space regulations
 - iv. Additional standards (performance standards) for truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces (**cont'd**)
 - 1. Truck-related, vehicle-related, and nonresidential uses with more than 80 parking spaces must achieve a total of 10 points for any of the following greening factor, green (stormwater) infrastructure, or a combination thereof.
 - b. **20' Buffer Yard Adjacent to All Other Properties or Across an Alley (5 pts)**
 - i. Min. 18 evergreen trees for every 100 linear feet along street R.O.W. or double staggered row of lg. evergreen shrubs along the front of the screening wall;
 - ii. Continuous shrub row along the front of the fence if fence is placed within 5' of property line. Grow to minimum height of six feet; and
 - iii. Lawn or groundcover is required for the buffer yard outside of shrub and tree planting areas.



Proposed Code Amendment



Topic 2. Division 51A-4.110 District Regulations

A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot and space regulations

iv. Additional standards (performance standards) for truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces (**cont'd**)

1. Truck-related, vehicle-related, and nonresidential uses with more than 80 parking spaces must achieve a total of 10 points for any of the following greening factor, green (stormwater) infrastructure, or a combination thereof.

c. **20' Buffer Yard (All Other Buffer Yards) (5 pts)**

- i. A large or medium canopy tree is required in a single row for the total length of the perimeter; and
- ii. Minimum of 75% of large canopy trees must be evergreen



Proposed Code Amendment



Topic 2. Division 51A-4.110 District Regulations

A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot and space regulations

iv. Additional standards (performance standards) for truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces (cont'd)

1. Truck-related, vehicle-related, and nonresidential uses with more than 80 parking spaces must achieve a total of 10 points for any of the following greening factor, green (stormwater) infrastructure, or a combination thereof.

All Buffer Yards (a-c above)

- i. Design must show plants by species, and in combination with other plants to provide growth and maintenance for the purpose of air quality control and aesthetic design according to its placement adjacent to the exterior or interior sides of the screening wall; and
- ii. Plant materials shall be considered based on horizontal depth of the buffer yard, differences in elevation, types and density of planting, existing woods on adj. property, and other combinations of man-made and natural.



Proposed Code Amendment



Topic 2. Division 51A-4.110 District Regulations

A. Adding Maximum Impervious Coverage percentage for all districts to the Yard, lot, and space regulations

iv. Additional standards (performance standards) for truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces (**cont'd**)

d. Green (Stormwater) Infrastructure with Tree Plantings (10 pts)

i. Bioretention and/or rain gardens with tree plantings within all parking rows or immediately adjacent to parking rows.

e. Green (Stormwater) Infrastructure (5 pts)

i. Bioretention and/or rain gardens within all parking rows or immediately adjacent to parking rows.

f. Cool Pavement Coating or Light Reflective, Paint (5 pts)

i. Cool pavement coating or light reflective paint for all off-street surface parking areas, including drive aisles, loading areas and vehicle maneuvering areas.



Proposed Code Amendment



Topic 3. Sec. 51A-4.407.1 Maximum Impervious Coverage

A. Applicability.

- i. Applicable to lots developed with residential uses when the cumulative area of impervious coverage is increased more than 200 square feet in the required front yard.
- ii. Applicable to **site** area, **lot**, or **artificial lots** developed with nonresidential uses when the cumulative area of impervious coverage increases by more than 2,000 square feet within a 24-month period.



Proposed Code Amendments



How Does This Affect My Property?

Existing Developed Property

No Affect

New Undeveloped Property

Ordinance Applies On Effective Date, If Approved (City Council)

Redevelopment

If Residential, Ordinance Applies When Cumulative Area of Impervious Coverage Is Increased More Than 200 Sq. Ft. In Required FY

If Nonresidential, Ordinance Applies When Cumulative Site Area, Lot, or Artificial Lot of Impervious Coverage Is Increased More Than 2000 Sq. Ft. Within A 24-Month Period

PD, Historic District, Conservation District

No Affect (unless regulations refer to Development Code)



Proposed Code Amendments



RESIDENTIAL USES

1. Examples of surfaces excluded from maximum impervious coverage calculations for residential development:



Photos from L to R: Townhomes with brick pavers; SF homes with pervious and impervious paving in the front yard.

Photo credits: Don Raines, Planning & Urban Design



Proposed Code Amendments



NONRESIDENTIAL USES

1. Examples of surfaces excluded from calculations of maximum impervious surface area for nonresidential development:



Photo Credit: L&R – Porous paver turf block; [Surface Guidebook Final 0727.pdf](#)

Proposed Code Amendments



NONRESIDENTIAL USES

2. Examples of surfaces excluded from calculations of maximum impervious surface area for nonresidential development:



Photo Credits: L & R - Multiuse occasional parking, Porous concrete (Walmart); [06_GGGChapter3.pdf \(coastalgadnr.org\)](https://www.coastalgadnr.org/06_GGGChapter3.pdf)

Proposed Code Amendment



Topic 3. Sec. 51A-4.407.1 Maximum Impervious Coverage

B. Bonus incentives for additional maximum coverage percentages.

- i. Up to 10% additional maximum impervious coverage percentage with design standards for residential.¹
- ii. Up to 10% additional maximum impervious coverage percentage with design standards for nonresidential.^{1,2}

¹ Site area, lots, or artificial lots abutting parkway street are Not eligible for bonus incentives

² Truck-related, vehicle-related or nonresidential uses with more than 80 parking spaces are Not eligible for bonus incentives



Proposed Code Amendments



Topic 3. Sec. 51A-4.407.1 Maximum Impervious Coverage - Residential Uses

B. Bonus Incentives for additional maximum impervious coverage – Up to 5% additional impervious coverage for any of the following (total of 10% maximum possible)¹:



¹ Additional impervious coverage percentage does Not apply to lots abutting parkway streets

Proposed Code Amendments



Topic 3. Sec. 51A-4.407.1 Maximum Impervious Coverage – Residential Uses

B. Bonus Incentives for additional maximum impervious coverage for Residential – Up to 10% additional impervious coverage for any of the following (total of 10% maximum possible)¹:



Photos from L to R: SF home with green infrastructure (rain gardens) in the front yard; SF home with trees in the front yard; SF home with rain garden and pervious pavers in the front yard
Photo on the left courtesy of Don Raines, Planning & Urban Design; Google Maps



¹ Additional impervious coverage percentage does Not apply to lots abutting parkway streets

Proposed Code Amendments



Topic 3. Sec. 51A-4.407.1 Maximum Impervious Coverage – Nonresidential Uses

B. Bonus Incentives for additional maximum impervious coverage for nonresidential - Max. 5% additional impervious coverage for any of the following (combined total of 10% max)^{1,2}:



¹ Additional impervious coverage percentage does Not apply to lots abutting parkway streets

² Additional impervious coverage percentage does Not apply to truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces



Proposed Code Amendments



Topic 3. Sec. 51A-4.407.1 Maximum Impervious Coverage - Nonresidential Uses

B. Bonus incentives for additional maximum impervious coverage – nonresidential

- Max. 10% additional impervious coverage for any of the following (total of 10% max)^{1,2}:

- ❖ Green infrastructure (Rain gardens, bioswales)
- ❖ Plantings abutting all off-street surface parking areas
- ❖ Solar PV trees, solar coatings, solar farms



¹ Additional impervious coverage percentage does Not apply to lots abutting parkway streets

² Additional impervious coverage percentage does Not apply to truck-related, vehicle-related, or nonresidential uses with more than 80 parking spaces



Proposed Code Amendments



Topic 4. – Sec. 51A-4.507 Neighborhood Stabilization Overlay (NSO)

A. Adding language to allow a lesser percentage of impervious coverage in NSO's

(e) Neighborhood stabilization overlay.

(1) In general.

...

(F) The yard, lot, and space regulations of the neighborhood stabilization overlay must be read together with the yard, lot, and space regulations in Division [51A-4.400](#). In the event of a conflict between the neighborhood stabilization overlay and Division [51A-4.400](#), the neighborhood stabilization overlay controls

(2) Front yard setback. ...

(3) Corner side yard setback. ...

(4) Interior side yard setback. ...

(5) Maximum Impervious Coverage. The maximum impervious coverage must be within the range between the maximum impervious coverage of the underlying zoning and the median impervious coverage of developments within the district. This range may allow for a maximum percentage of impervious coverage that is lesser than the maximum impervious cover of the underlying zoning. For example, if the maximum impervious coverage of the underlying zoning is 40 percent and the median maximum impervious coverage of the front yards within the district is 10 percent, the maximum impervious coverage selected must be between 40 percent and 10 percent.





Topics 5-9. – Revisions and Clarifications for Consistency

5. Sec. 51A-10.101 Definitions. Landscaping and Tree Conservation Regulations of Article X

A. Revising definitions to align with new definitions

6. Sec. 51A-10.121 Application of Division. (Article X)

A. Clarifying that Article X will apply when mechanical compaction of soil is applied or impervious coverage or porous surfaces on the lot or tract is increased by 2000 square feet within a 24-month period.

7. Sec. 51A-4.803 Site Plan Review

A. Revising several terms in Development Impact Review section to align with new definitions

8. Sec. 51A-4.127 Urban Corridor Districts (UC)

A. Removing permeable surface area requirement so that new regulations apply (Note: there is only one undeveloped parcel in Dallas zoned UC-2, no other UC-2 zoned properties exist in Dallas)

9. Sec. 51A-13.703 Site Plan Review

A. Revising definition to align with new definitions



Proposed Code Amendments



Topic 10. Sec. 51A-13.304 Development Type

10. Sec. 51A-13.304 Development Type

A. Adding impervious coverage maximum percentages to the Summary of Development Type Regulations to Form Districts

	Mixed Use Shopfront	Single-Story Shopfront	General Commercial	Apartment	Townhouse Stacked	Townhouse	Manor House	Single-Family House	Civic Building
	Mu	Ss	Gc	Apt	Ts	Th	Mh	Sf	Civ
Lot									
Area per unit or building (min sf)	none	none	none	none	1,200	1,200	depends on # of units	35,000	3,000
Area per building (max sf)	none	none	none	none	none	none	20,000	5,000	none
Width (min ft)	none	none	none	none	16	16	50	35	30
Width (max ft)	none	none	none	none	none	none	100	45	none
Lot Coverage (max)	100%	80%	80%	80%	80%	80%	60%	60%	60%
Impervious Coverage (% of Lot)	80% ¹	80% ¹	80% ¹	40% ¹	40% ¹	40% ¹	40% ¹	40% ¹	80% ¹

¹ Maximum Impervious Coverage for Nonresidential Uses in all districts with lots abutting a parkway street as shown on the Complete Streets Vision Map, and referenced in the Complete Streets Design Manual, as amended shall be 60 percent.





Results – Cool Pavement in Parking Lots – Phoenix, AZ

EXISTING CONDITIONS
Asphalt Pavement in need of preservation



COOL PAVEMENT
ALBEDO 0.27
SURFACE TEMP 125°F



- BENEFITS**
- Temperature Reduction
 - Carbon Savings

Esteban Park

Schools
Case Study: Robert L. Duffy High School, Phoenix





Results – Pervious Pavers, Bioswale, and PV Canopy in Parking Lots – Toronto, ON, CA



2.60 IN RAINFALL RETENTION CAPACITY



BENEFITS

- Temperature Reduction
- Stormwater Runoff Reduction
- Carbon Savings
- Power Generation

0.05 in
RAINFALL RETENTION CAPACITY

PROPOSED CONDITIONS

- | | |
|--------------------|------------------------|
| 24.5% | Permeable Pavement |
| 15% | Native Planting |
| 50% | Reduction in Asphalt |
| 85 | Shade Trees |
| 250 m ² | Biofiltration capacity |
| 0.7 km | Tile Drain |



RAINFALL RETENTION CAPACITY **3.40 in**

Case Study
16

Case Study
17





Results – Green (vegetative) roof, Cistern, and PV roof – Annapolis, MD



BENEFITS

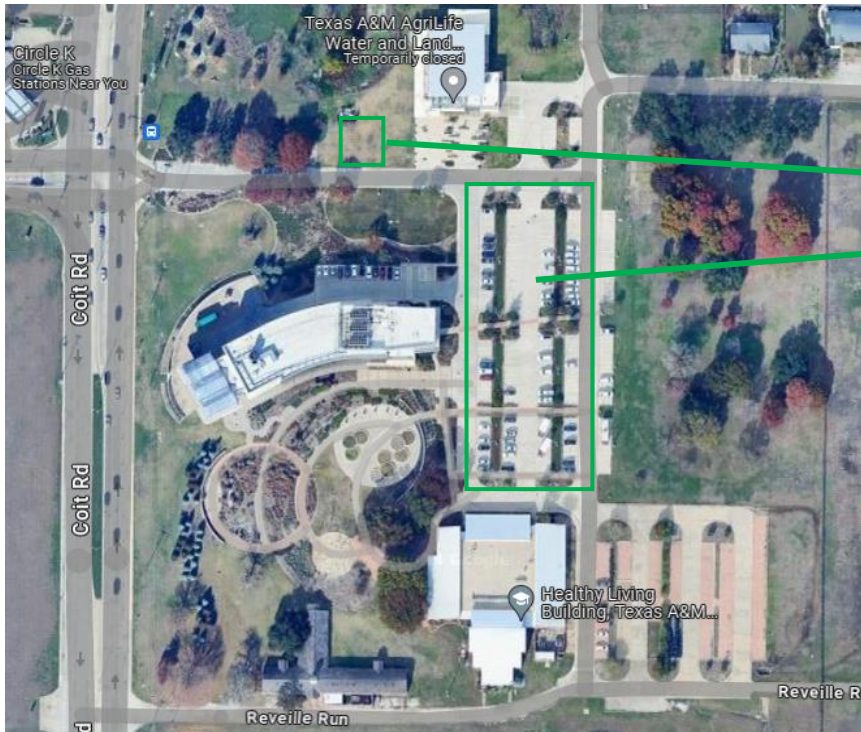
- Temperature Reduction
- Stormwater Runoff Reduction
- Carbon Savings
- Power Generation
- Biodiversity





Results – Clay Soils with Rain Garden/Bioretention Area and Bioretention in Parking Lot

Research Project in Dallas - TAMU



Rain Garden/Bioretention



Rain Garden (Bioretention) reduced runoff volume by 49%

Pollutant	Inflow	Outflow	% Reduction
NO3 (mg)	45,476	13,804	70%
Orthophosphate (mg)	10,351	565	95%
TSS (mg)	3,214,417	307,276	90%
E. coli (cfu)	31,855,184	11,489,962	64%



Photo Credits



Photo Credits

Photo Credits:

Slide #7: Top L - [Executive Summary](#); Top and bottom right - [Smart Surface Guidebook Final 0727.pdf](#)

Slide #8: Top L - <https://www.washingtonpost.com/washington-post-live/2023/07/24/jeff-goodell-heat-will-kill-you-first/>; Top and bottom right: [Smart Surface Guidebook Final 0727.pdf](#)

Slide #9:

Driveway photos courtesy of Sarah May, City of Dallas; Google Maps

Slide#32:

<https://www.bobvila.com/articles/best-rain-barrels/>

Slide #34:

[Smart Surface Guidebook Final 0727.pdf](#) ; [1 12 new commercial landscaping handout hollon.pdf \(austintexas.gov\)](#)

[Smart Surface Guidebook Final 0727.pdf](#)

<https://www.velopa.com/project-solution/structura-shelter-with-sedum-roof/#lg=1&slide=1>, [Smart Surface Guidebook Final 0727.pdf](#)

Slide #35:

[Smart Surface Guidebook Final 0727.pdf](#)

Google Maps; Tucson shaded sidewalk courtesy of ZOAC member Rieves

[Smart Surface Guidebook Final 0727.pdf](#)



Next Steps



- ❖ Forward ZOAC recommendation onto City Plan Commission public hearing, early Fall 2024.
- ❖ Forward City Plan Commission recommendation to City Council Committee, if necessary (early Fall).
- ❖ Forward City Council Committee recommendation to City Council, Winter 2024-2025.







Contact and More Information

Project webpage:

<https://dallascityhall.com/departments/pnv/Pages/impervious-coverage-code-amendment.aspx>

Contact us:

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- Sarah May, AICP
sarah.may@dallas.org

The screenshot shows a web browser displaying the City of Dallas website. The URL is <https://dallascityhall.com/departments/pnv/Pages/impervious-coverage-code-amendment.aspx>. The page features a dark blue header with navigation links for Mayor, City Council, City Manager, Departments, and Pay. The City of Dallas logo is prominently displayed, along with user options for Resident, Visitor, Business, and Government, and a search icon. A secondary navigation bar includes links for Home, Zoning, Preservation + Design, Plans + Planning, Code Amendments (which is highlighted), Advisory, and Maps + Resources. The main content area has a blue background with a cityscape illustration and a 'P+UD' logo. The text reads: 'Planning & Urban Design. Comprehensive plans, policies, and programs through effective community engagement.' Below this, the title 'IMPERVIOUS COVERAGE CODE AMENDMENT' is centered, followed by 'DCA No. 212-008'. The final line of text states: 'The City is considering an amendment to the yard, lot, and space requirements of Chapters 51 and 51A of the Dallas Development Code.'



Impervious Coverage Code Amendment



City of Dallas

**Zoning Ordinance Advisory Committee
(ZOAC)
July 9, 2024**

Lori Levy, AICP, Senior Planner
Planning and Development Department
City of Dallas