BUILDINGENERGY BOSTON

Mass Timber:
Strategies for Carbon, Cost, and Constructability

Billy Craig, BC Productions
John Dalzell, Boston Planning Dept.
David Robb, Turner Construction
Suzanne Robinson, LeMessurier

Curated by John Loercher

Northeast Sustainable Energy Association (NESEA) | March 24, 2026

NESEA
NORTHEAST SUSTAINABLE ENERGY ASSOCIATION

Mass Timber

Strategies for Carbon, Cost, and Constructability

March 24, 2026

Billy Craig

Owner, BC Productions

John Dalzell

Sr Architect, City of Boston Planning Department

Suzanne Robinson

Director of Sustainability, LeMessurier

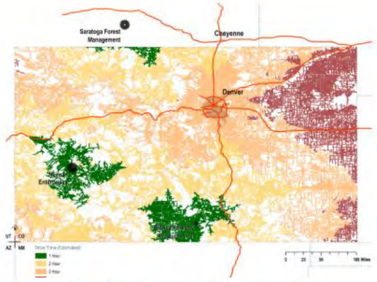
David Robb

Project Preconstruction Manager, Turner

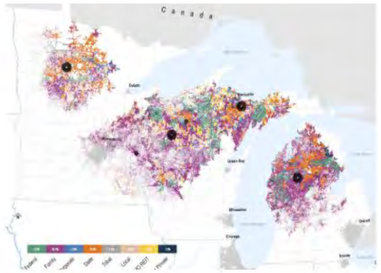
Forestry Supply Chain Analysis

North American Mass Timber

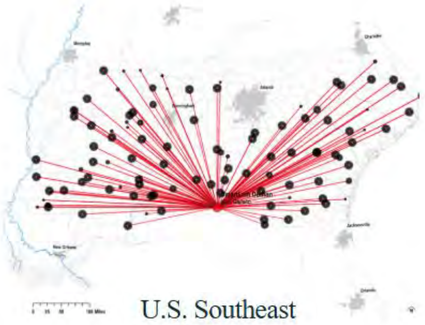
We chose forests to study in all three regions of the forests. These analyses of species, forest products industry infrastructure, certifications, ownerships and challenges examine each region's potential to play a role in the mass timber supply chain through sustainably grown wood products.



Rocky Mountain Colorado



Minnesota, Wisconsin, and Michigan



U.S. Southeast

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

https://www.woodworks.org/resources/mass-timber-in-three-regions-comparative-lca/

Mass Timber in Three Regions

Comparative Life Cycle Assessment Study

Author: LeMessurier

WOODWORKS
WOOD PRODUCTS COUNCIL

Rendering: SCB

Wood Innovation Grant Scope and Contributors

Minneapolis

Stick-Built

Denver

Cast-in-place concrete

Atlanta

Cast-in-place concrete

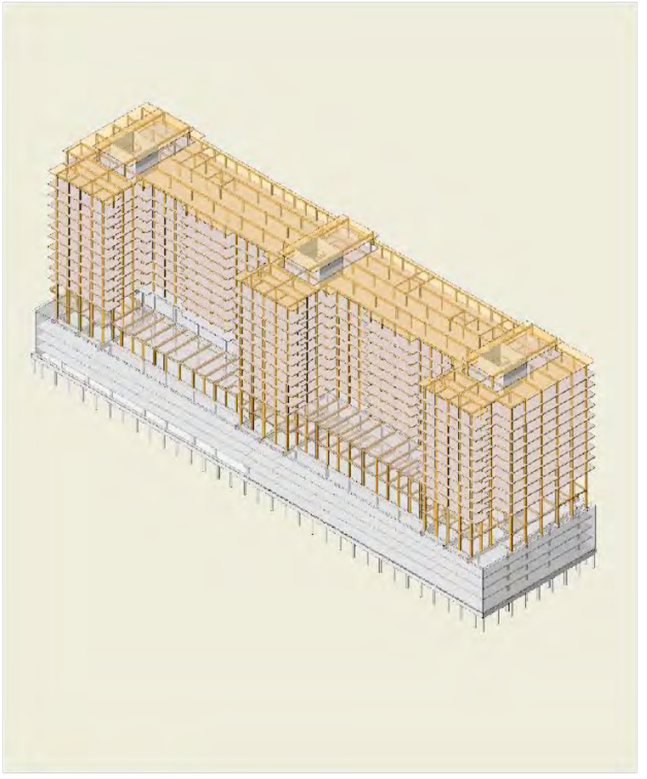
LeMessurier Turner BSA Minnesota Colorado AIAGA CLF MEYER BORGMAN JOHNSON KL&A DEPARTMENT OF NATURAL RESOURCES MICHIGAN STATE UNIVERSITY Michigan Technological University MISSISSIPPI STATE UNIVERSITY UNIVERSITY OF GEORGIA Olifant

Minneapolis

Type IV-C

Max # of stories	9 stories
Building height	85’
Allowable area	405,000 sf
Average area per story	45,000 sf
Amount of unprotected timber	100%
Primary structure	2 hr rated

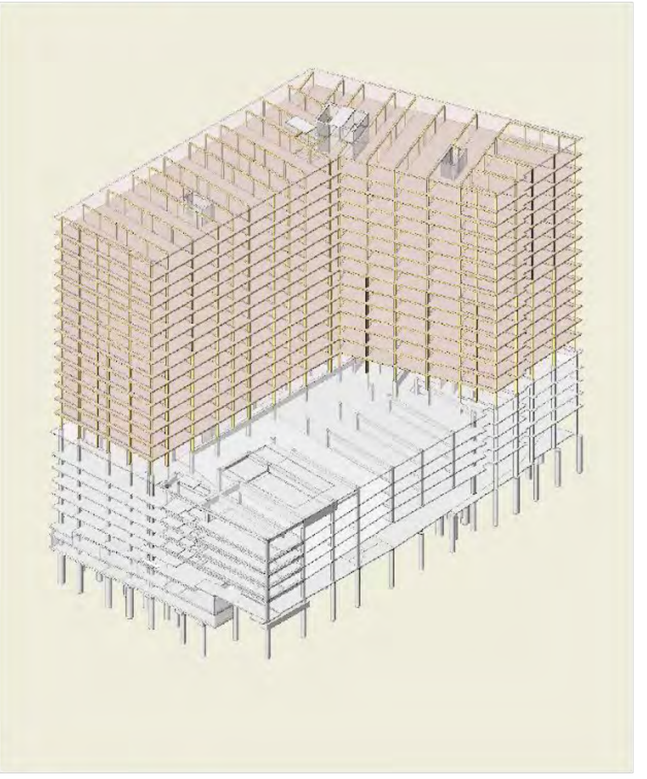
Denver



Type IV-B (IBC 2024)

Max # of stories	12 stories
Building height	180’
Allowable area	648,000 sf
Average area per story	54,000 sf
Amount of unprotected timber	100% ceiling 40% walls
Primary structure	2 hr rated

Atlanta

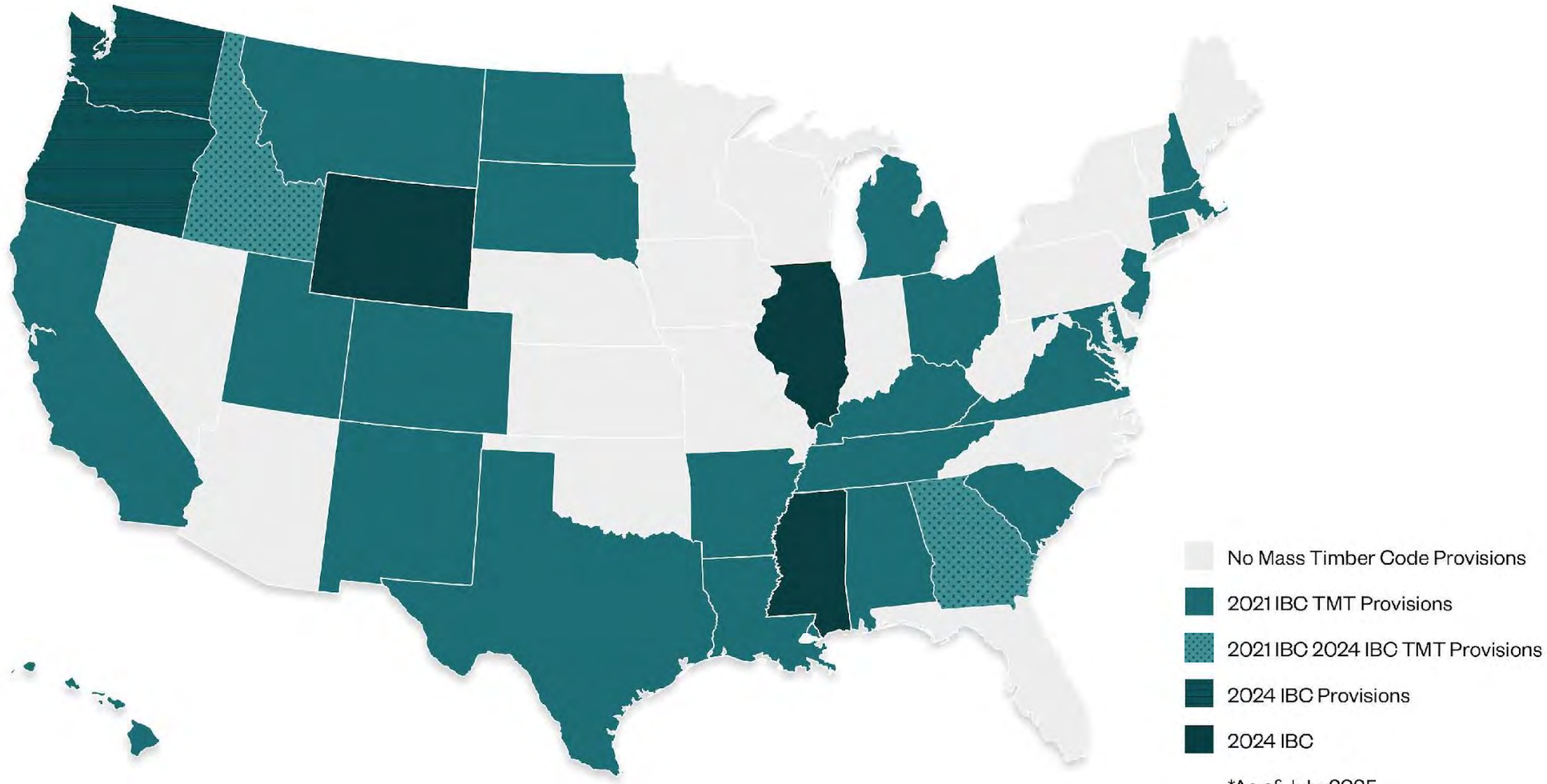


Type IV-A

Max # of stories	18 stories
Building height	270’
Allowable area	972,000 sf
Average area per story	54,000 sf
Amount of unprotected timber	0%
Primary structure	3 hr rated

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

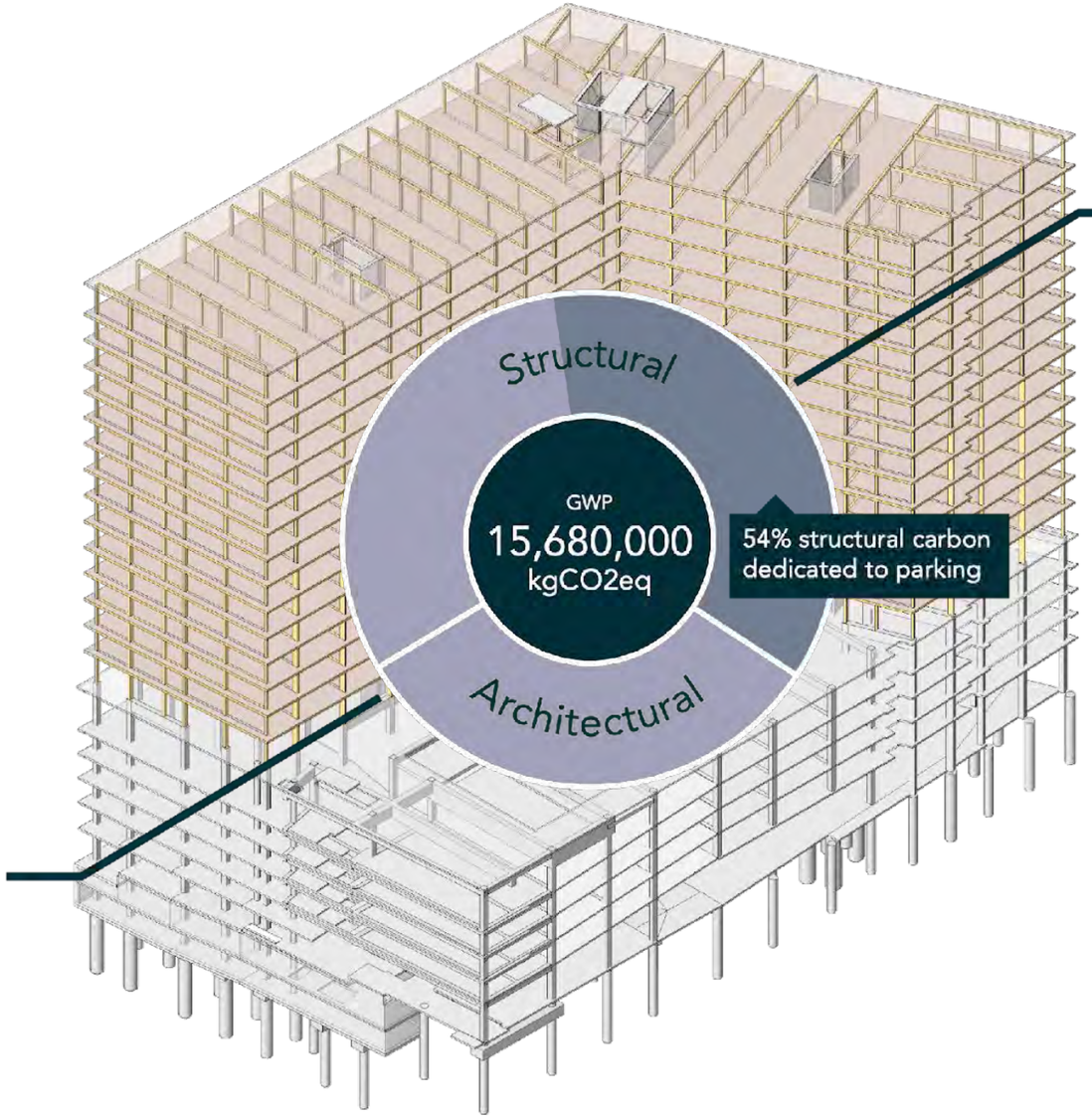
Tall Mass Timber Code Adoptions



LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Atlanta case study

IBC 2021 TYPE IV-A



-29%

decrease with mass timber

14,932,000 → 10,644,000

+31%

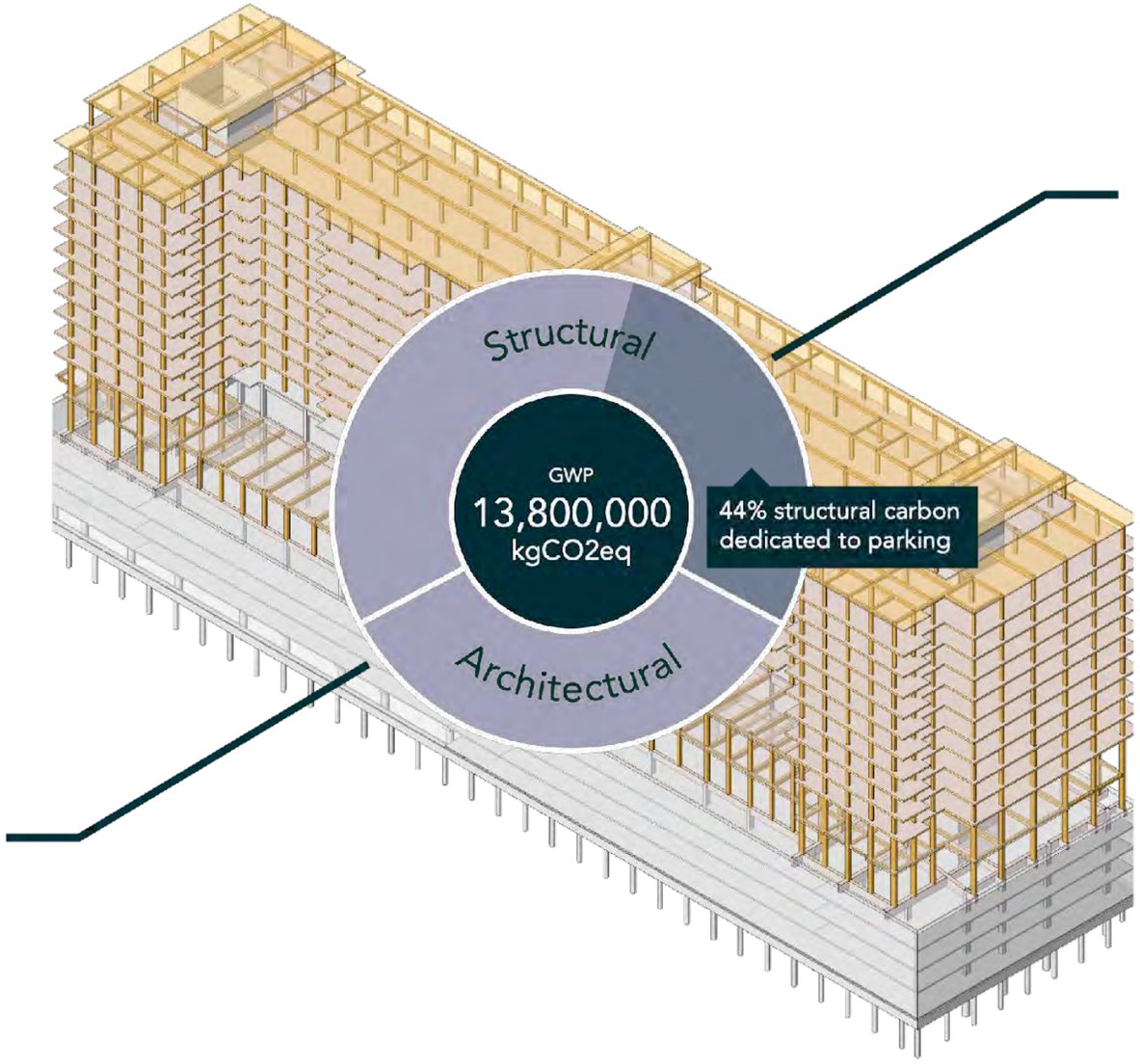
increase with mass timber

3,833,000 → 5,036,000

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Denver case study

IBC 2024 TYPE IV-B



-31%

decrease with
mass timber

13,144,000 → 9,049,000

+5%

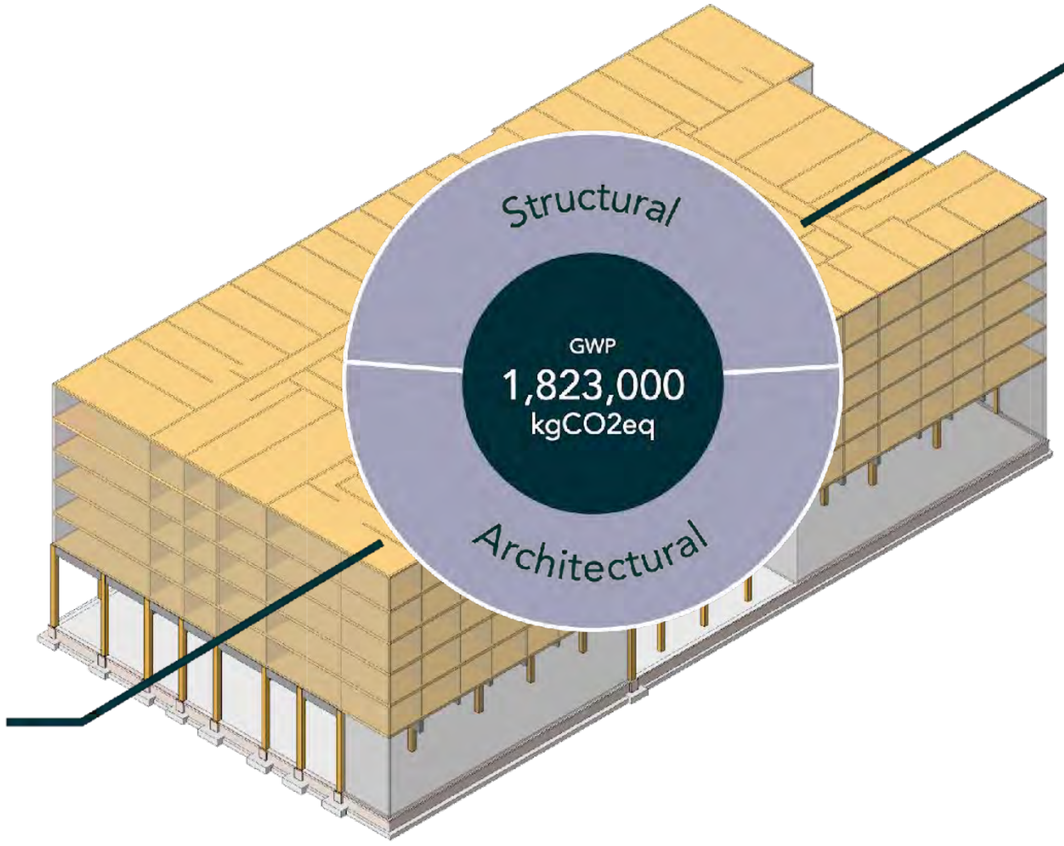
increase with
mass timber

4,518,000 → 4,752,000

LEARN MORE ABOUT THE DATA AND
METHODOLOGY HERE: OLIFANT.ORG

Minneapolis case study

IBC 2021 TYPE IV-C



-46%

decrease with mass timber

1,625,000 → 870,000

-38%

decrease with mass timber

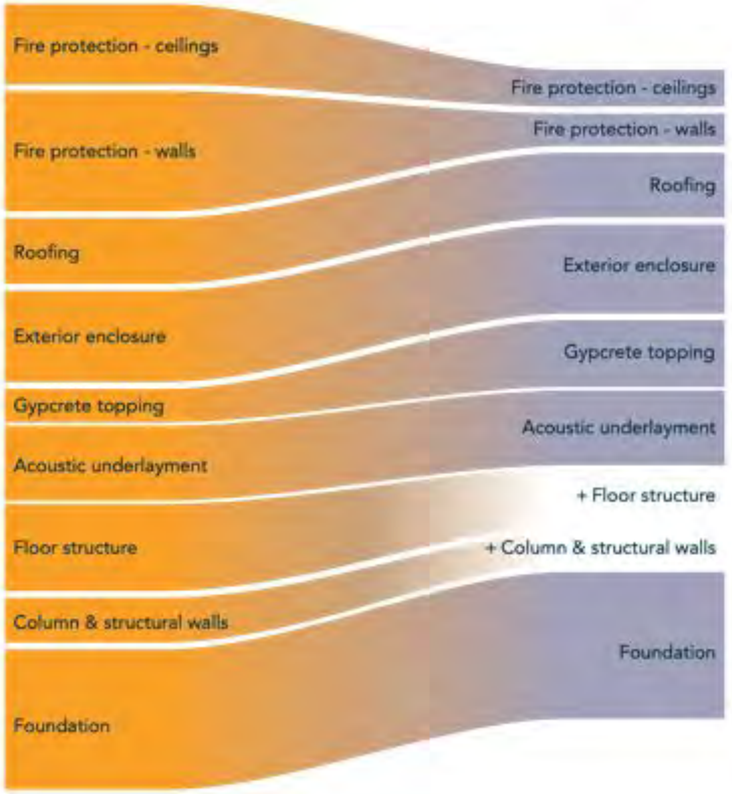
1,529,000 → 952,000

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Summary
GWP

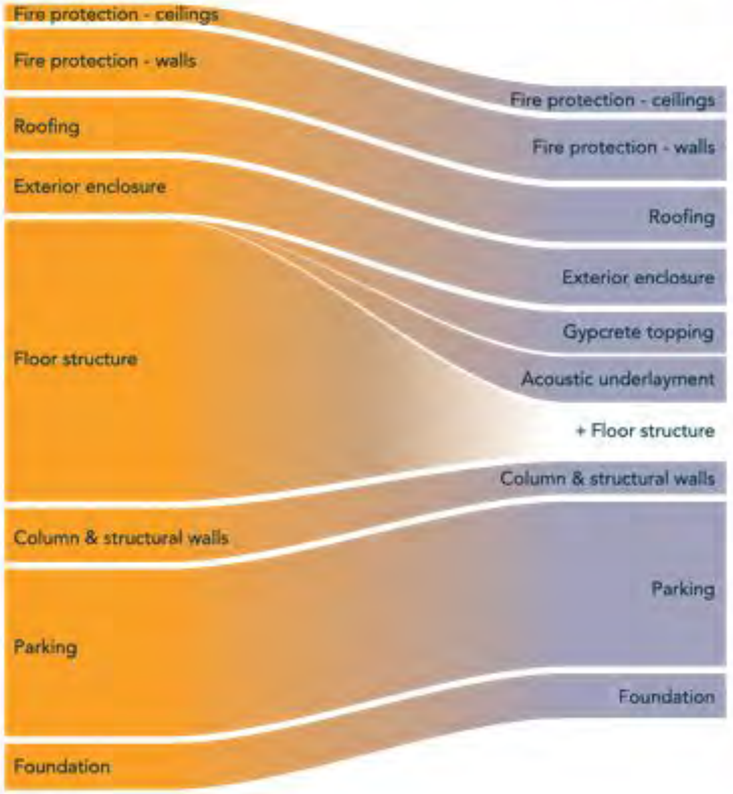
Minneapolis case study
42%
Total reduction
kgCO2eq

IBC 2021 TYPE III-A ON TYPE IA PODIUM → IBC 2021 TYPE IV-C



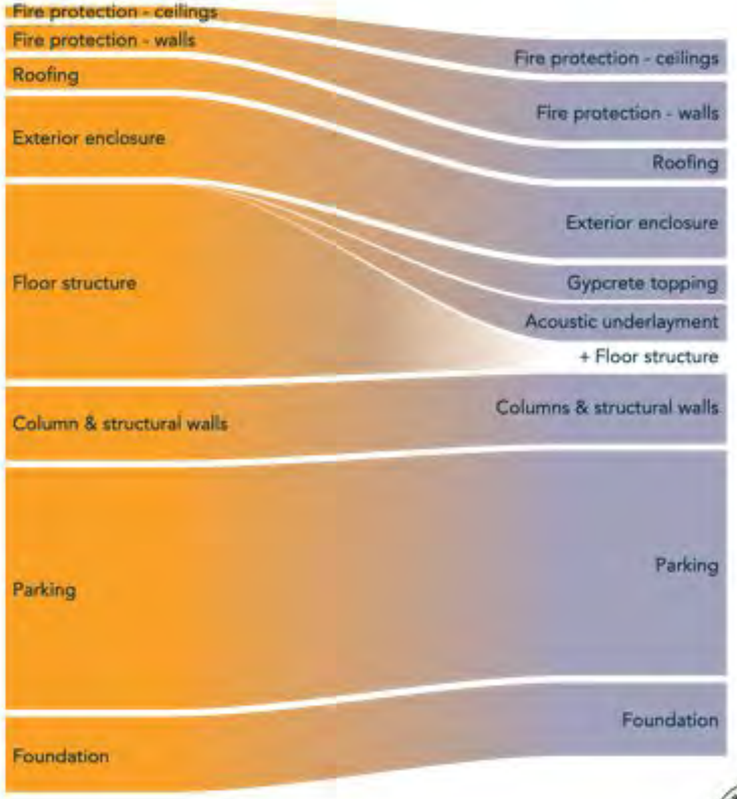
Denver case study
22%
Total reduction
kgCO2eq

IBC 2024 TYPE IA → IBC 2024 TYPE IV-B



Atlanta case study
16%
Total reduction
kgCO2eq

IBC 2021 TYPE IA → IBC 2021 TYPE IVA

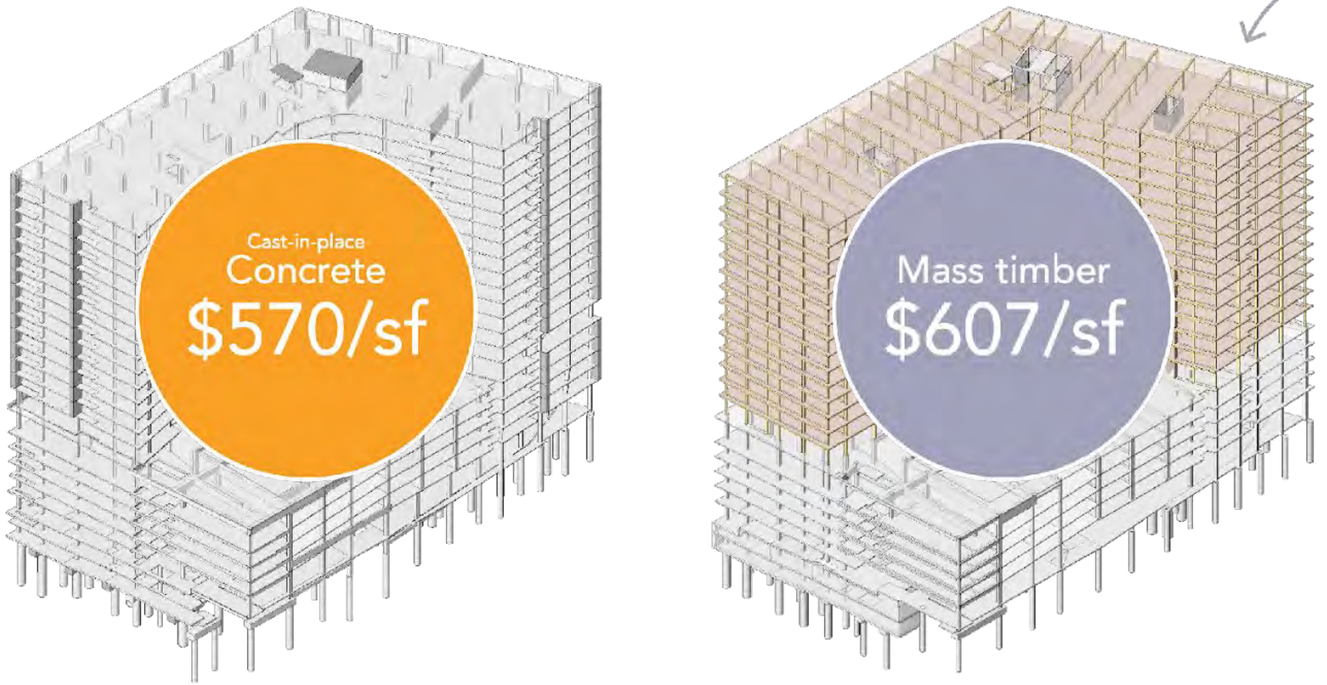


LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Atlanta case study

IBC 2021 Type IV-A

+$37/sf
(6% increase)



Cost comparison

Major cost drivers and impacts between superstructures of a cast-in-place concrete project and a mass timber project. Does not account for owner costs, such as schedule savings, time to market, etc. Costs are based on residential area only. Garage costs were excluded since they remained a constant in each scenario.

16 Stories
417,417 GSF of residential
340 Residential units

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Atlanta case study

IBC 2021 Type IV-A

Structural

Concrete structure
$30,139,000

Indirect costs[1]
$3,177,000

Structural

Mass timber structure
$31,468,000

Fire protection: floor plates
$5,507,000

Fire protection: beams & columns
$3,181,000

Floor build up
$3,671,000

Transfer structure
$543,000

Exterior envelope
$509,000

Indirect costs[1]
$4,546,000

Schedule savings
($1,750,000)

Cost comparison

Major cost drivers and impacts between superstructures of a cast-in-place concrete project and a mass timber project. Does not account for owner costs, such as schedule savings, time to market, etc. Costs are based on residential area only. Garage costs were excluded since they remained a constant in each scenario.

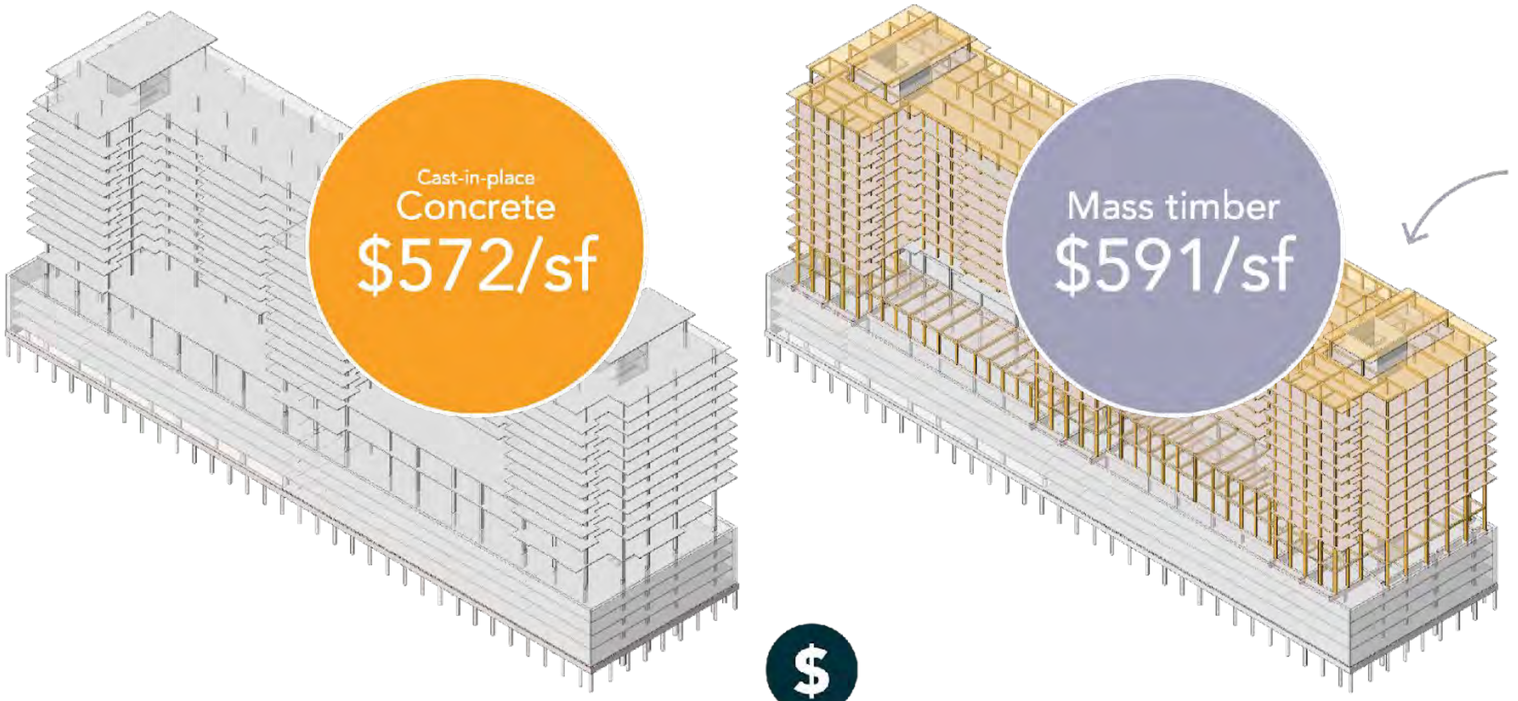
16 Stories
417,417 GSF of residential
340 Residential units

[1] INDIRECT COST: SUM OF SUBCONTRACTOR BONDS, CONSTRUCTION CONTINGENCY, INSURANCE, AND CM FEE; AS A VOLUME PERCENTAGE OF DIRECT PROJECT COST

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Denver case study

IBC 2024 TYPE IV-B



Cost comparison

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12 Stories
513,800 GSF of residential
395 Residential units

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Denver case study

IBC 2024 TYPE IV-B

IBC 2024 allows for more wood exposure, less cost, and less added carbon through additional materials.

Structural

Concrete structure
$45,828,000

Indirect costs[1]
$4,830,000

Structural

Mass timber structure
$36,009,000

Concrete
$8,969,000

Floor build up
$4,801,000

Fire protection: beams & columns
$3,364,000

Transfer structure
$2,810,000

Fire protection: floor plates
$1,201,000

Exterior envelope
$900,000

Indirect costs[1]
$5,832,000

Schedule savings
($1,750,000)

Interior ceiling finishes
($975,880)

$ Cost comparison

Major cost drivers and impacts between superstructures of a cast-in-place concrete project and a mass timber project. Does not account for owner costs, such as schedule savings, time to market, etc. Costs are based on residential area only. Garage costs were excluded since they remained a constant in each scenario.

12 Stories
513,800 GSF of residential
395 Residential units

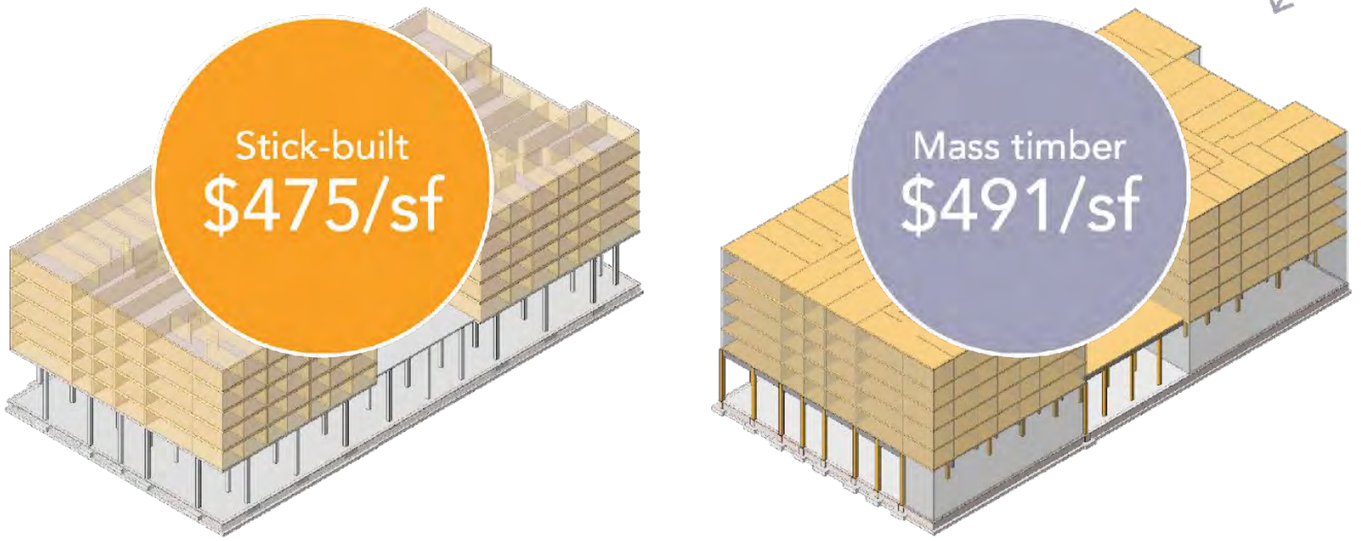
[1] INDIRECT COST: SUM OF SUBCONTRACTOR BONDS, CONSTRUCTION CONTINGENCY, INSURANCE, AND CM FEE; AS A VOLUME PERCENTAGE OF DIRECT PROJECT COST

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Minneapolis case study

IBC 2021 TYPE IV-C

+$16/sf
(3% increase)



Cost comparison

Major cost drivers and impacts between superstructures of a cast-in-place concrete project and a mass timber project. Does not account for owner costs, such as schedule savings, time to market, etc.

6 Stories
165,340 GSF of residential
130 Residential units

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Minneapolis case study

IBC 2021 TYPE IV-C

Structural

Structure
$8,692,000

Indirect costs[1]
$916,000

Structural

Mass timber structure
$13,620,000

Indirect costs[1]
$1,170,000

Interior ceiling finishes
($1,226,000)

Concrete foundation
($700,000)

Exterior envelope
($590,000)

Cost comparison

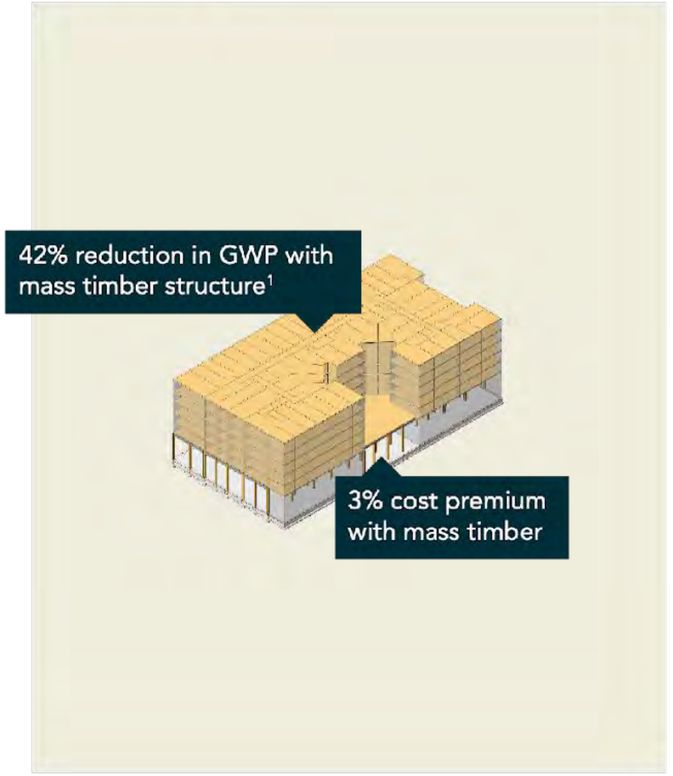
Major cost drivers and impacts between superstructures of a cast-in-place concrete project and a mass timber project. Does not account for owner costs, such as schedule savings, time to market, etc.

6 Stories
165,340 GSF of residential
130 Residential units

[1] INDIRECT COST: SUM OF SUBCONTRACTOR BONDS, CONSTRUCTION CONTINGENCY, INSURANCE, AND CM FEE; AS A VOLUME PERCENTAGE OF DIRECT PROJECT COST

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

Minneapolis

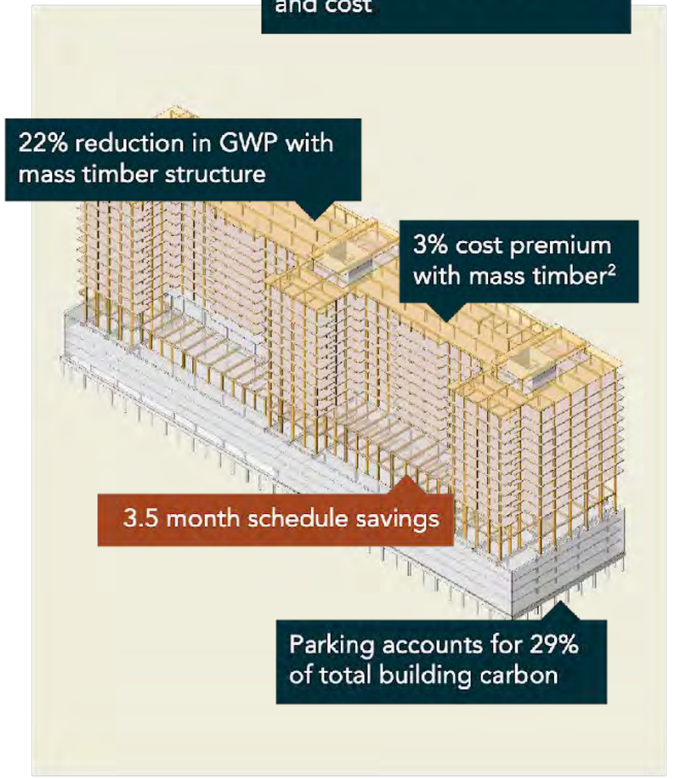


[1] Mass timber stores more carbon than a stick-built structure

+$16/sf | 8.05 kgCO2eq/sf reduction | 0 months saved

Denver

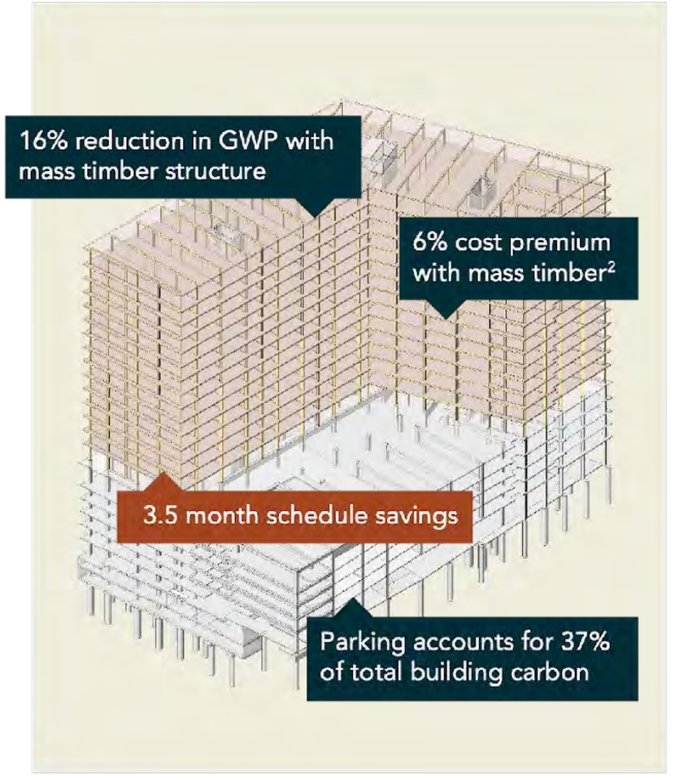
Colorado adopted IBC 2024, considerably reducing carbon and cost



[2] Cost likely to improve if building was originally designed for mass timber

+$19/sf | 5.11 kgCO2eq/sf reduction | 3.5 months saved

Atlanta



+$37/sf | 4.07 kgCO2eq/sf reduction | 3.5 months saved

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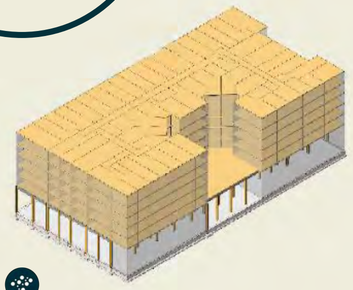
Type IV-C

Potential to replace Type III over Type I construction



42%

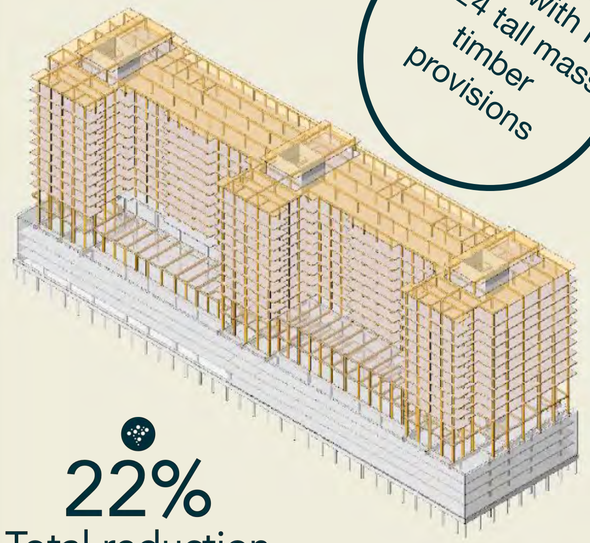
Total reduction

GWP
kgCO2eq

Max # of stories 9 stories

Type IV-B (IBC 2024)

Maximum benefit with IBC 2024 tall mass timber provisions



22%

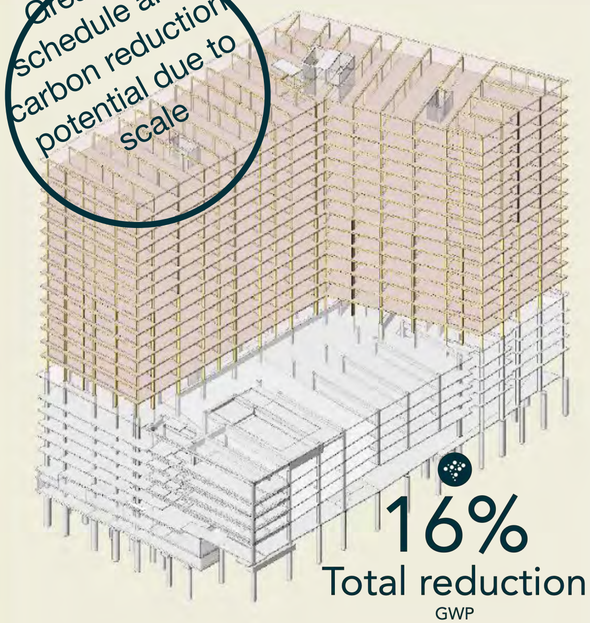
Total reduction

GWP
kgCO2eq

Max # of stories 12 stories

Type IV-A

Greatest schedule and carbon reduction potential due to scale



16%

Total reduction

GWP
kgCO2eq

Max # of stories 18 stories

7-12 story buildings Sweet Spot

LEARN MORE ABOUT THE DATA AND METHODOLOGY HERE: OLIFANT.ORG

https://www.woodworks.org/resources/mass-timber-in-three-regions-comparative-lca/

Mass Timber in Three Regions

Comparative Life Cycle Assessment Study

Author: LeMessurier

WOODWORKS
WOOD PRODUCTS COUNCIL

Rendering: SCB

MASS TIMBER MOTIVATIONS

American Repertory Theater
Harvard University
Haworth Tompkins / ARC
LeMessurier
Shawmut

Adidas North American Headquarters

LEVER Architecture

KPFF

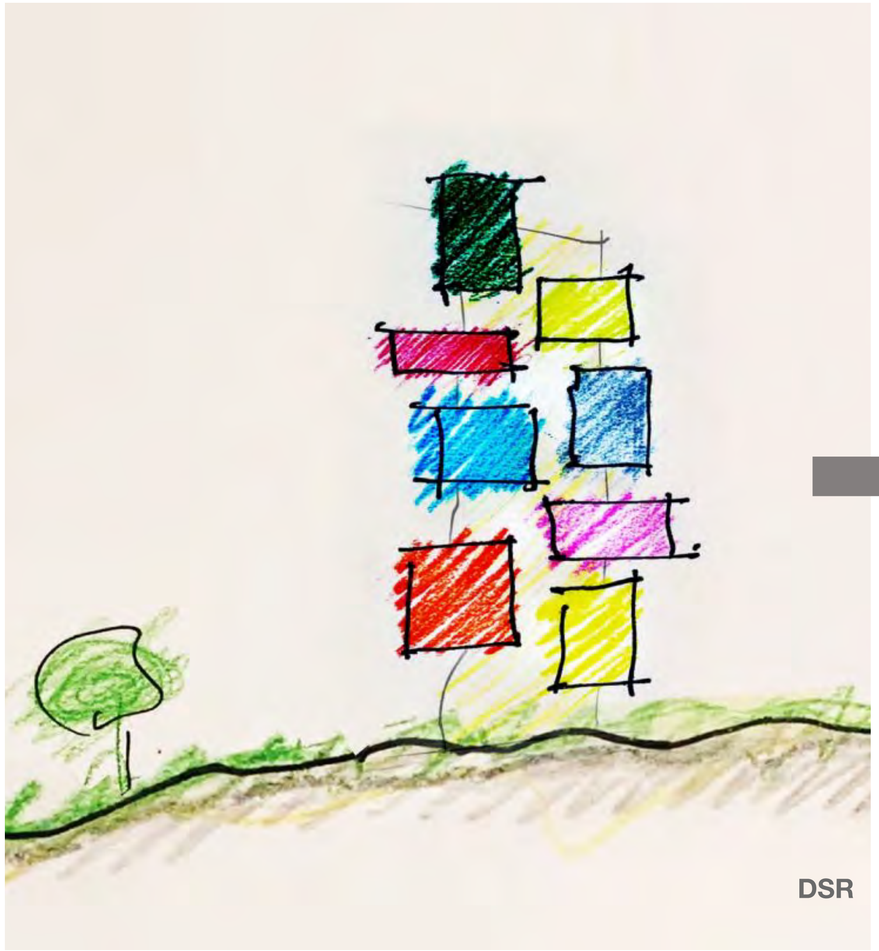
Turner

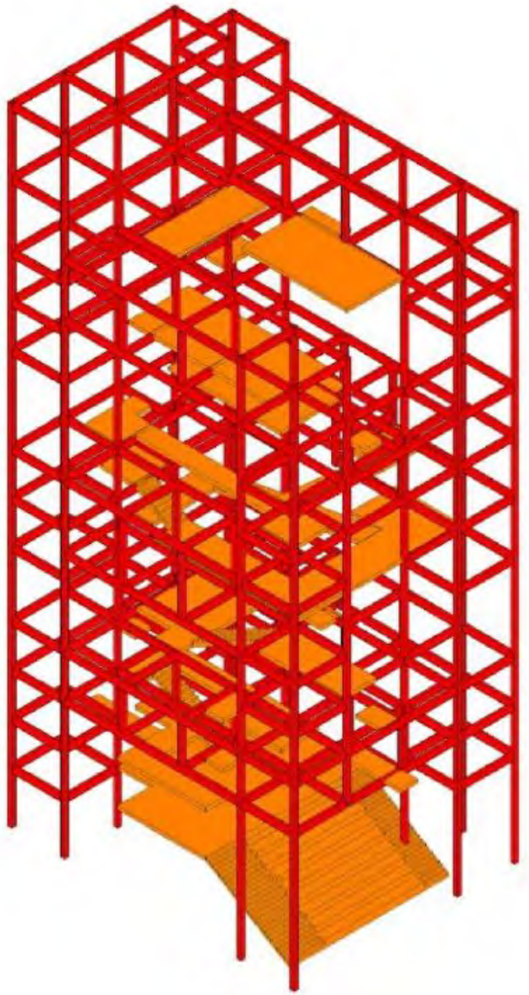
SCHEDULE, COST, RISK

Pardee School of Global Studies

Boston University
Diller Scofidio + Renfro
LeMessurier
Turner

Evolution of Design





Costs to Consider

HARD COSTS

- Mass timber – geometry/grid/spans
- Floor build-up (acoustics)
- Fire protection (encapsulation)
- Floor-to-floor height (envelope)
- Foundations
- Exposed timber - finishes savings

SOFT COSTS

- Front-loaded design cost (design assist)
- Builder’s Risk Insurance
- Fixed Property Insurance
- Increased market rates / rental values

SCHEDULE SAVINGS

- Reduced debt service / collateralized interest
- Quicker to market / derisking development

11 East Lenox, Boston

Boston Real Estate Collaborative
Monte French Design Studio
H+O Structural Engineers
Haycon

COLLABORATION, INNOVATION, AND DELIVERY

EUROPE

Binderholz
Unternberg, Austria
Burgbernheim, Germany
CLT, Glulam

KLH
Teufenbach-Katsch, Austria
CLT

Stora Enso
Ybbs, Austria
CLT

Mayr-Melnhof Holz
Leoben, Austria
CLT, Glulam

HASSLACHER NORICA
Carinthia, Austria
CLT, Glulam

Schilliger Holz
Küssnacht, Switzerland
CLT, Glulam

Wiehag
Altheim, Austria
Glulam, GLT

NORTH AMERICAN MASS TIMBER

USA

D.R. Johnson
Riddle, OR
CLT, Glulam

Freres Lumber
Lyons, OR
MPP

Smartlam
Columbia Falls, MT
Dothan, AL
CLT, Glulam

Sterling Structural
Phoneix, IL
Lufkin, TX
CLT

Mercer Mass Timber
Spokane, WA
Conway, AR
Okanagan, BC
CLT, Glulam

Vaagen Timber
Colville, WA
CLT, Glulam

Unalam
Unadilla, NY
Glulam

Western Structures
Veneta, OR
Glulam

South County Post and Beam
Kingston, RI
Glulam

Timberlab
Drain, OR
Glulam, CLT

CANADA

Element5
Ripon, QC
St. Thomas, ON
Glulam, CLT

Kalesnikoff Mass Timber
Thurms, BC
Glulam, CLT, GLT

Nordic Structures
Chibougamau, QC
Glulam, CLT

StructureCraft
Abbortsford, BC
Glulam, DLT

Silvaspan
New Lowell, ON
NLT

Goodfellow
Delson, QC
Glulam

Art Massif
Saint-Jean-Port-Joli, QC
Glulam, GLT

Multipurpose Athletics Facility

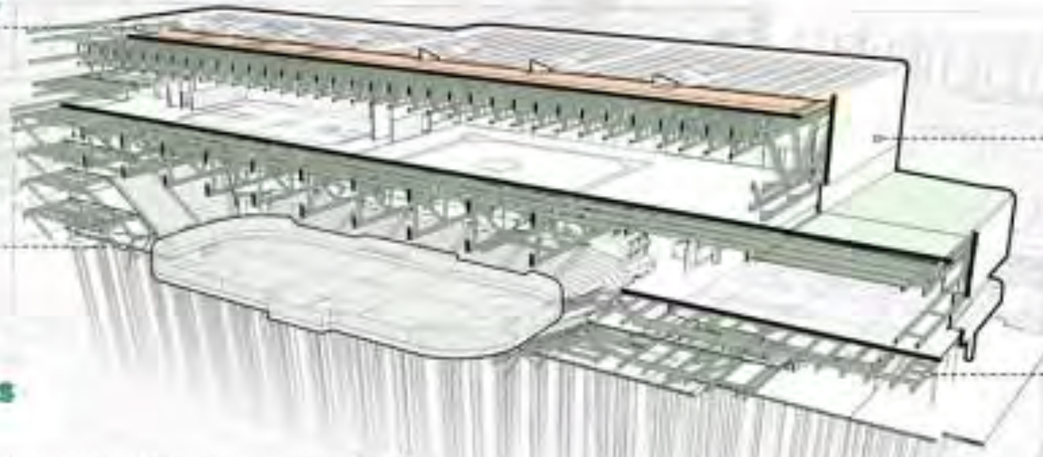
Northeastern University
Perkins + Will
LeMessurier
Suffolk

Embodied Carbon

Cross Laminated Timber Roof
Replaces 116 MT of Steel Deck

Crossed-Braced Frames
Reduces 725MT of Steel

Optimized H-Pile Foundations
Reduced 734 MT of Steel



Low-Carbon
Thermal Insulations And
Envelope Materials

Low-Carbon
Steel and Concrete

Reducing Embodied-Carbon Impacts

Baseline Case : Conservative benchmark for a comparable building's typical embodied carbon

23.41M kgCO2e

Current Design: Project-specific impacts assessed at the end of Design Development

17.24M kgCO2e ← 22 - 24% Reduction

Cross Laminate Timber Roof

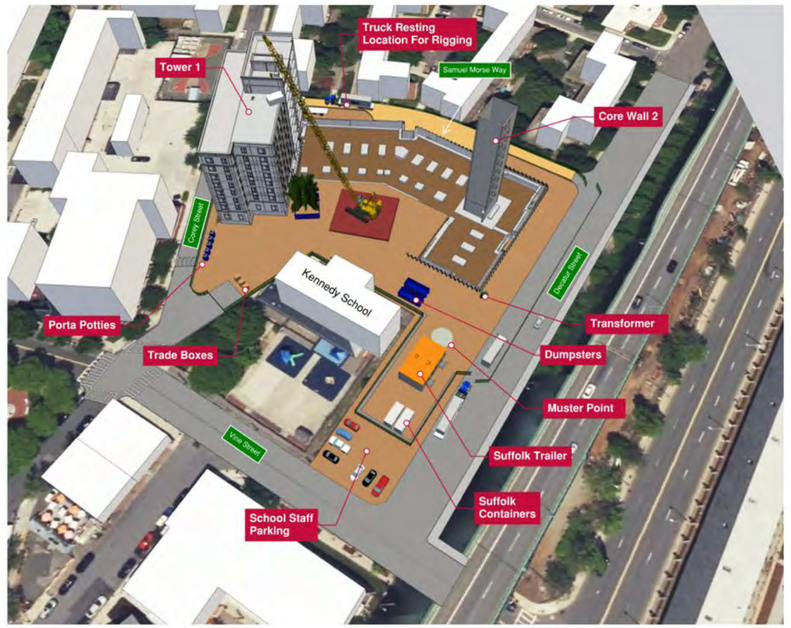
Low Carbon Steel And Concrete Construction

Bunker Hill, Building F

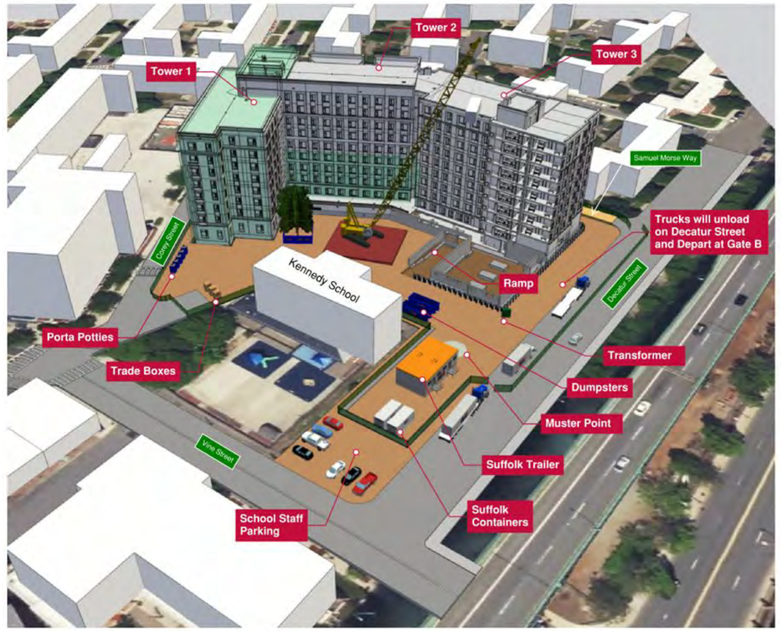
Leggat McCall Properties /
Boston Housing Authority
Stantec Architecture
McNamara Salvia
Suffolk Construction

Practice Innovation - Bunker Hill Housing Building F

CORE WALL 1 | Time Frame: Month 2



TOWER 1 | Time Frame: Months 4 - 5



TOWER 3 | Time Frame: Months 7 - 9

Multifamily Residential - 9 stories CLT on structural metal studs

Advanced Construction Practices:

- CLT and multi tower approach cuts construction schedule and costs.
- 2024 IBC allows 100% exposed mass timber in Type 4B Construction.
- Rockwool (mineral wool) allowed for fire protection in enclosed spaces.


THROUGH THE TREES


ARCHITECTS
STUDENTS
EARLY ADOPTERS
BUILDERS
ENGINEERS
It takes everyone
MANUFACTURERS
HARVESTERS
RESEARCHERS
DEVELOPERS
POLICY MAKERS
INVESTORS

Net Zero Carbon Zoning

Planning Department and Environment Department

Planning Department

CITY of BOSTON

CLIMATE SMART WOOD GROUP

Procurement Options:
Model Specifications

Q&A

Billy Craig

Owner, BC Productions

John Dalzell

Sr Architect, City of Boston Planning Department

Suzanne Robinson

Director of Sustainability, LeMessurier

David Robb

Project Preconstruction Manager, Turner


Thank You!