Heartland Greenway
A Navigator CO2 Ventures LLC Project

www.heartlandgreenway.com
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About Navigator

Navigator Heartland Greenway LLC (a wholly-owned subsidiary of Navigator CO₂ Ventures LLC) is committed to building a more sustainable future while putting the communities and states we operate in on an accelerated path toward decarbonization.

Navigator’s Track Record

- $1.3B Capital Deployed
- >1,000 Miles of Pipeline Built Since 2012
- 215 Years of Combined Experience
- Strong, Proven Partnership with BlackRock
- Third Midstream Infrastructure Venture

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Project Overview

- ~1,300 miles of new liquid CO₂ pipeline
  - ~900 miles in Iowa
  - 36 Iowa counties
- Permanent storage in Illinois
- Up to 15 million metric tons/year
- ~20 receipt points: ethanol and fertilizer processors
  - Commercially anchored by Valero
- Financially backed by BlackRock

One of the most economical and actionable approaches to carbon capture and storage.
What is Carbon Capture and Storage?

**PRODUCTION**

CO₂ is produced as a byproduct of the manufacturing process

Industrial processes are responsible for ~25% of energy-related CO₂ emissions

**CAPTURE**

CO₂ is captured, dehydrated, and compressed into a liquid using equipment that can be added onto the facility without interrupting normal manufacturing operations

**TRANSPORTATION**

Liquid CO₂ is gathered from connected facilities and transported in a steel pipeline to the storage site

Pipelines are amongst the safest, most environmentally friendly and reliable methods of transporting the energy we use today

**STORAGE**

CO₂ is injected more than a mile below the ground, far below water resources used by communities and farms, for permanent storage
Industry leaders helping develop the storage field in Central Illinois, where similar projects are safely operating and planned because of region’s favorable geological properties.

Extensive geologic tests confirm the Mt. Simon sandstone formation will allow for safe, secure, and permanent CO$_2$ storage.

Pore space will cover approximately 30,000 acres and include construction of five injection wells and 15 monitoring wells.

Once operational, non-stop monitoring will ensure the long-term safety and integrity of the storage field.
Why CCS?

**CO₂ Emissions**
- Our customers produce some of the purest quality CO₂, making them great partners for CCS.
- We capture CO₂ that otherwise would’ve been emitted and store it safely and permanently.

**Commercial Model**
- A simple fee-based common carrier model.
- Economic incentives for emissions reductions remain with your local plants:
  - 45Q Tax Credit
  - Low carbon fuel programs
  - Emission offsets

**Unique Geology**
- Only certain areas across the corn belt have the geology necessary for this type of storage.
- The pipeline model is best suited to connect our partner facilities with these areas that have storage capacity.
Iowa Proposed Project Map
# Economic Benefits of Heartland Greenway

$1.6 Billion investment in the state of Iowa

<table>
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<th>Property Tax Revenue</th>
<th>Permanent Jobs</th>
<th>Construction Jobs</th>
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<tr>
<td>Iowa Totals</td>
<td>~$25M</td>
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<td>Project Totals</td>
<td>~$43M</td>
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Environmental Benefits

The carbon offset of the Heartland Greenway once fully expanded is equivalent to:

- GHG emissions from 3.2 Million Vehicles driven annually
- CO₂ emissions from 34.7 Million barrels of oil consumed
- 15 Million metric tons of CO₂ captured annually
- Annual CO₂ emissions from 1.8 Million homes’ energy use
- Annual carbon stored by 18.3 Million Acres of U.S. forests

Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
Anticipated Projected Timeline

October 2020 – October 2021
Route development and optimization

October 2021 – February 2022
Landowner outreach for survey authorization

November 2021 – January 2022
IUB Informational Meetings

May 2022
Projected IUB petition file date

Q2 2022 – Q1 2023
Route adjustments from landowners and stakeholder feedback, ROW easement acquisition

Q2 2022 – Q3 2022
Constructability and environmental surveys

Q3 2022 – Q4 2022
Federal permit applications and inter-agency consultations (USACE/USFWS/SHPO)

Second Half 2023
Anticipated receipt of State and Federal Permits

First Half 2024
Construction commences

Q4 2024 – Q2 2025
Phased start up and commissioning
Project Development and Execution Process

**Planning** begins years before any construction commences by determining commercial need and preliminary system options.

**Preparation and Permitting**
Landowners and regulator engagement, robust analyses, design, permitting, and ROW acquisition.

**Construction**
Survey, clearing, welding, x-ray, trenching, drain tile and irrigation measures, backfilling, erosion control installation.

**Inspection and Restoration**
Third party and stakeholder inspection, topsoil replacement, final restoration.
We are committed to working in good faith with all landowners throughout the ROW process to achieve mutually acceptable terms and conditions.

Right-of-Way (ROW) Process Explained:

- Mailed landowner information packet
- Phone call from ROW agents/company representatives, who are responsible for:
  - Answering all landowner questions to the best of our ability
  - Gathering and accounting for information specific to each landowner, tenant, tract
  - Seeking voluntary survey permissions
- Mailed notification of surveys
  - Conduct surveys in a manner to avoid/minimize impacts; repair, replace, or compensate for damages
- Utilize detailed market study to make easement offers based on regional, county, and township market values
- Account for unique landowner and tenant circumstances
Easement Options

Easement Configurations
- Expressly for CO₂ transportation
- Non-exclusive permanent easement
- 50’ Permanent
- 50’–75’ Temporary construction corridor

Easement Valuation
- Utilizing local/regional real estate market studies
- Negotiate terms of easement with an option
- 20% Paid after signing
- 80% Paid prior to construction

*Cancelation Terms (IA Code 479B.24)
- 7 business days to cancel after signed
- Form provided to all landowners
- Written, certified letter from date of signature

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Land Use Compensation

Local/Regional Agricultural Market Studies
- Utilize USDA National Agricultural Statistics Services data
- Identify crop types and percentage of land used for crops
- Account for CSR2 values for tillable acres and soil quality/productivity
- Current/historical crop yields
- Work with each landowner and tenant to address unique farming/ranching operations

3-Year Yield Loss Compensation Calculation
- Year 1 – 100% Yield
- Year 2 – 80% Yield
- Year 3 – 60% Yield

Paid Prior to Construction
Drain Tile Management

We understand and appreciate the importance of maintaining the integrity of drain tile systems and are committed to mitigating the impacts to agricultural fields across the project.

01 Locate and Identify

- Locate drain tile and identify type of system
- Landowner discussions
- Local/Regional subject matter expert
- Design 1’–2’ of separation from CO₂ pipeline

02 Proactive Solutions

- Install headers pre-construction to maintain field drainage
- Minimize damage to tile during construction
- Third party agricultural and county monitors to ensure compliance

03 Restore to Previous Condition

- Use local contractor or landowner’s choice
- Remove headers, reconnect to original system, restore gradient and alignment
- Tile disturbed or damaged will be repaired and tied back into the system
Construction Mitigation & Restoration

- Minimize impacts from surveys and construction
- Repair, replace, or compensate for all damages
- Protect and restore all affected lands
- Account for the unique conditions of regional landscapes and land use practices
- Retain specialized restoration companies to develop and execute construction mitigation and restoration plan
- Topsoil stripping, segregation, protection, and decompaction
- Restore land use and production as quickly as practical
- Implement NRCS recommendations and landowner preferences
- Address each landowner’s specific requirements from easement documents
- Robust monitoring and inspection program, 3rd party and county inspection

We are committed to ensuring impacts are temporary and returning the land to its pre-construction conditions or better
Pipeline Specifications

- **Design**: steel pipe expressly for liquid CO₂
- **Federal Regulation**: design, construct, operate to meet or exceed 49 CFR Part 195
- **Normal Operating Pressure**: 1,300 – 2,100 psig (MOP by design: 2,200 psig or ANSI 900)
- **Pipe Depth**: nominal 5’, 18–24” separation from existing lines/utilities
- **Pipe Diameter**: 6” – 24” outside diameter

- **Operating Temperature**: Pipeline: 40–80°F
- **Mainline Valves**: nominal 30’ x 70’, strategically located
- **Booster Stations**: 3–4, 10-acre mainline booster stations, location TBD
Pipeline Safety and Operations

Operational Philosophy
- 24/7 remote monitoring
- SCADA analyzing pressure, temperature, flow rate
- Redundant communications to avoid outages
- Cathodic protection equipment and monitoring

Pre-Commissioning
- Hydrostatic testing above max operating pressure
- Coordination with local first responders
- System-wide pre-startup and safety review

Damage Prevention & Public Awareness
- Weekly aerial surveillance, weather permitting
- #811 public awareness and damage prevention
- Meetings, training drills, and communication with local liaisons

Maintenance & Response
- Routine pipeline testing, calibration, and inspection
- Annual desktop & biannual field response simulations
- Contract with private responders located along route
Thank You

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