

Progress of the GTX Project in Korea

13 May 2025

Ministry of Land,
Infrastructure and Transport

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Ⅰ. GTX – Overview

Background of the GTX Project

6:00 AM



Get up at 5:30 AM
→ Leave for work at 6:00AM

Express Bus → Subway transfer
→ Arrive at office by 8:30 AM

8:30 AM



9:00 PM



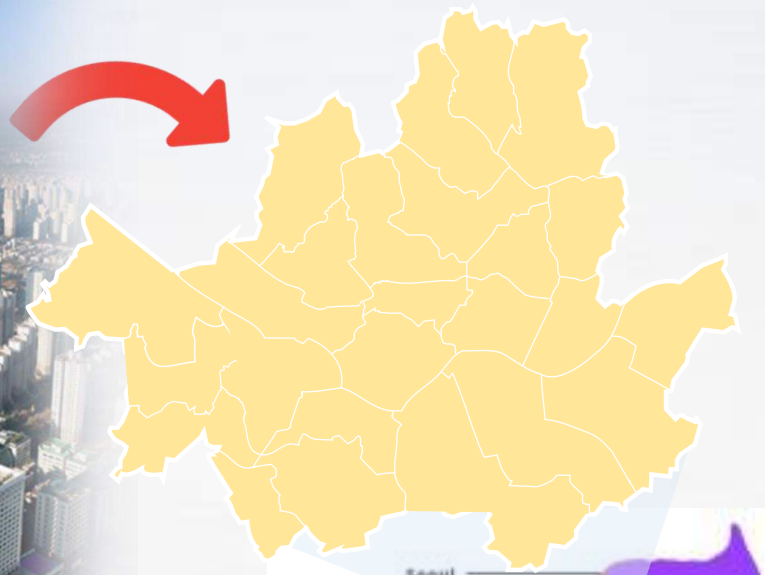
Even a slight delay after 6:00 PM
leads to missing multiple buses,
Get home around 9:00 PM



- The Seoul Capital region : 12% of land, Half of the population(26 million)
- Commuting time in the capital region average 90min(OECD Average 28min)
  - The rise in population in Seoul's outskirts leads to a continued increase in commuters with over 1-hour commute times

Why is the GTX Project necessary?







Now is the era of GTX

(Great Train eXpress)

With new city developments, population in the capital region continues to rise

For connecting downtown Seoul and its outskirts quickly,

We need the GTX



GTX Great Train Express

What is GTX?

Concept diagram





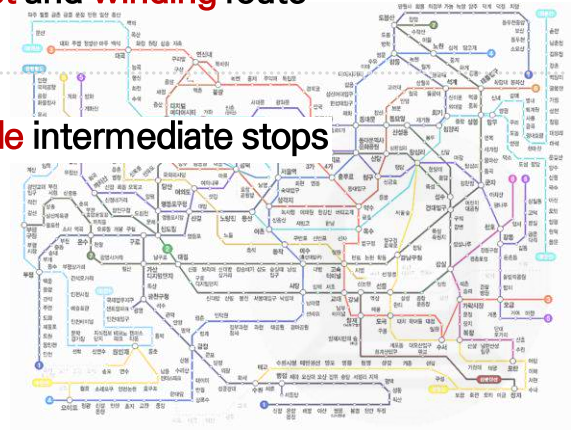
GTX overview

	Description
Purpose	• Ease traffic congestion in the capital region • Make commuting easier for people in the capital region
Concept	• Trains running in tunnels at minimum 40 m underground • Rapid regional/commuter rail system
Operating speed	• Max. 180 km/h
Expected benefits	• Link the capital region in under 30 minutes

GTX vs. Conventional Subways

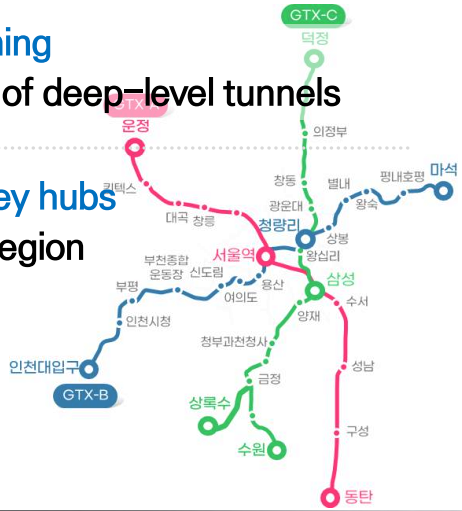
Conventional Subways

- Low speed
  Travel distance per hour : around 30km
- Indirect and winding route
- Multiple intermediate stops



Great Train eXpress

- 3 times faster than conventional subway
  Travel distance per hour : 90~100km
- Route straightening
  through the use of deep-level tunnels
- Connects only key hubs
  in Seoul capital region



GTX Great Train Express





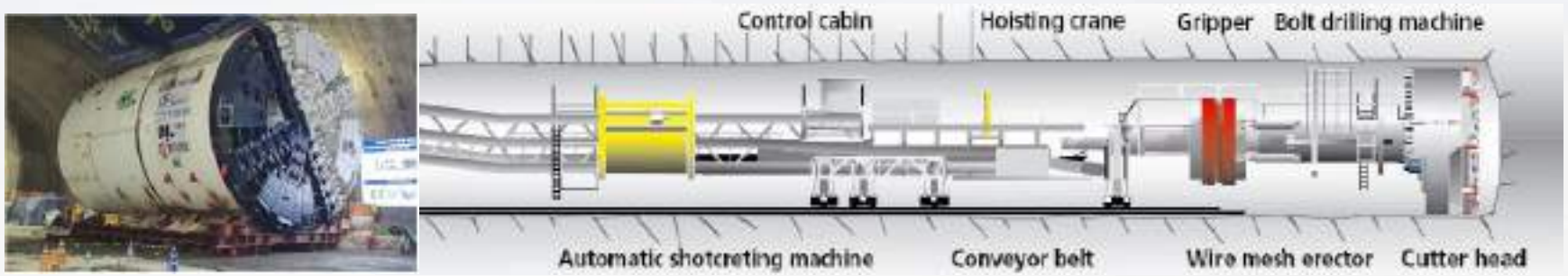

II. GTX – Key features

1. Tunneling method / 9
2. Stations / 11
3. Emergency evacuation / 12
4. Rolling stock / 13

1. Tunneling method

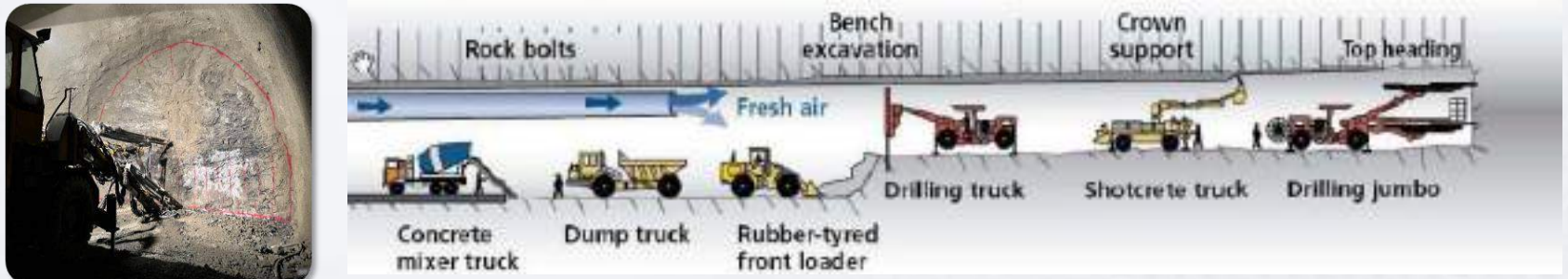
TBM (Tunnel Boring Machine)

- ✓ Machine with rotating cutter head that excavates tunnels
- ✓ TBMs used: Shield TBM for Hangang River section, gripper TBM for Mt. Bukhansan section



NATM (New Austrian Tunnelling Method)

- ✓ Explosives are placed in drilled holes for excavation followed by shotcreting and cast-in-place lining
- ✓ Widely used tunneling method



Tunneling method of GTX-A

✓ Selecting the optimal tunnel excavation method for securing stability by reflecting the ground conditions and surrounding conditions for each section



NATM Method

- Bad ground condition
- Flexible response to cross-sectional change section

Gripper TBM Method

- Core downtown section
- Minimize the impact of excavation through low vibration construction

Shield TBM Method

- The lower part of the Han River
- Stable excavation under high hydraulic pressure condition

2. Stations




혼잡방지를 위한 대규모 E/V홀


관통형 E/V를 활용한 승하차 동선분리

- ✓ Stations planned as tunnel-type to accommodate deep depths
- ✓ Same level transfers between GTXs for greater convenience
- ✓ High speed elevators installed for improved vertical movements
- ✓ Manage congestion in stations by separating boarding/alighting passenger movements with double-sided (front and rear doors) elevators

3. Evacuation from mainline

Ventilation shaft



Access tunnel + ventilation



Access tunnel + Ventilation



- ✓ Access tunnel and rescue facilities accessible by emergency vehicles for large-scale emergency evacuation
- ✓ Safe evacuation through staircase and elevators in the vertical shaft
- ✓ Efficiency of facility use enhanced by installation of ventilation ducts

4. GTX-A rolling stock





- ✓ Max. operating speed: 180 km/h
  (more than double the speed of conventional metro at 80 km/h)
- ✓ Specifications
  - Train formation: 8 cars per trainset
  - Length: 163.5 m/car
  - Number of trainsets: 20 trainsets, 160 cars (for GTX-A)
  - Passenger capacity: 1,062 pax.
    (at 100 congestion, 296 seated + 766 standing)
- ✓ Door type: Plug-in sliding doors
  (Superior airtightness for reduced noise at high speeds to enhance ride quality)
- ✓ Interior of GTX-A train
  - Seat dividers and wider seats (450 mm → 480 mm)
  - Air purification system and eco-friendly carpet
  - 37" large LCD display/indicator








Ⅲ. Status and Plans of the GTX

1. Current status / 15

2. Plans of the GTX / 20

Map of the current GTX line

GTX-A

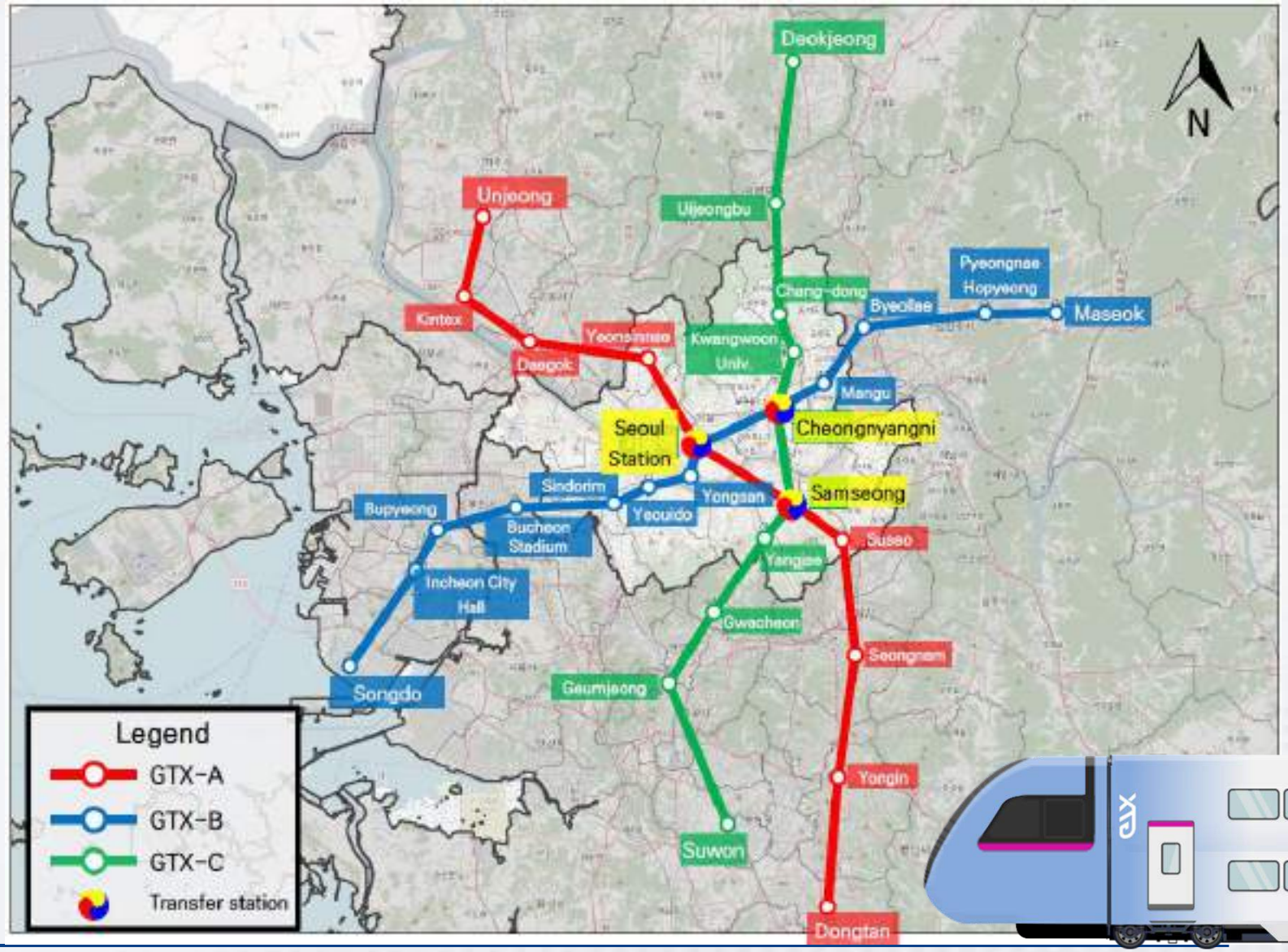
- October 2016 : Groundbreaking
- March 2024 : Opening of Suseo-Dongtan Section
- December 2024 : Opening of Unjeongjungang-Seoul Section
- 2028 : Complete Opening

GTX-B

- December 2023 : Groundbreaking
- 2030 : Scheduled opening

GTX-C

- 2025 : Construction begins
- 2030 : Scheduled Opening



GTX Great Train Express

1. GTX-A alignment



- Location

  Paju, Gyeonggi-do ⇔ Seoul ⇔ Hwaseong, Gyeonggi-do

- Funding/Financing method and project info
  - Government funded (Samseong-Dongtan)
    - Length: 39.5 km (new 9.8 km, shared 29.7 km)
    - Stations: 5
    - Construction: 2016 – 2024 (Suseo-Dongtan section opened in March 2024)
  - PPP BTO (Build-Transfer-Operate) scheme
    - Length: 46.0 km (new)
    - Stations: 6
    - Depot: 1 (Paju, Gyeonggi-do)
    - Project duration: Construction 60 months, operation 30 years
- Reduced travel time
  - Unjeong – Samseong: 90 min → 30 min
  - Samseong – Dongtan: 90 min → 25 min

2. GTX-B alignment



- Location

  Songdo, Incheon ⇔ Seoul ⇔ Namyangju, Gyeonggi-do

- Funding/Financing method and project info
  - Government funded (Yongsan-Sangbong)
    - Length: 19.9 km (new)
    - Stations: 4
    - Construction: 70 months (begun in December 2023)
  - PPP BTO (Build-Transfer-Operate) scheme
    - Length: 62.9 km (39.9 km new, 22.9 km shared with Gyeongchun Line)
    - Stations: 9 (6 new, 3 shared)
    - Depot: 1 (Namyangju, Gyeonggi-do)
    - Project duration: Construction 72 months, Operation 40 years

- Reduced travel time
  - Incheon Univ. Stn – Seoul Stn: 90 min → 27 min
  - Maseok Stn – Seoul Stn: 80 min → 25 min

3. GTX-C alignment



- Location

  Yangju, Gyeonggi-do ⇔ Seoul ⇔ Suwon/Ansan, Gyeonggi-do

- Funding/Financing method and project info

  - PPP BTO (Build-Transfer-Operate) scheme
    - Length: 86.5 km (37.95 km new construction between Chang-dong and Government Complex Gwacheon, 48.2 km shared*)
      * Gyeongwon Line 16.7 km, Gwacheon Line 14.2 km, Ansan Line 11.7 km
    - Stations: 14
    - Depot: 1 (Yangju, Gyeonggi-do)
    - Project duration: Construction 60 months, Operation 40 years

- Reduced travel time
  - Deokjeong-Samseong: 80 min → 27 min
  - Suwon-Samseong: 70 min → 24 min

GTX-A line Opening Impact and Ridership performance

Reduced travel time

✓ Unjeongjungang ⇔ Seoul station
(Paju, Gyeonggi-do) (Seoul)

66 min
Express bus

44 min reduction

22 min

✓ Suseo ⇔ Dongtan station
(Seoul) (Hwaseong, Gyeonggi-do)

75 min
Express bus

54 min reduction

21 min

Growth in passenger numbers

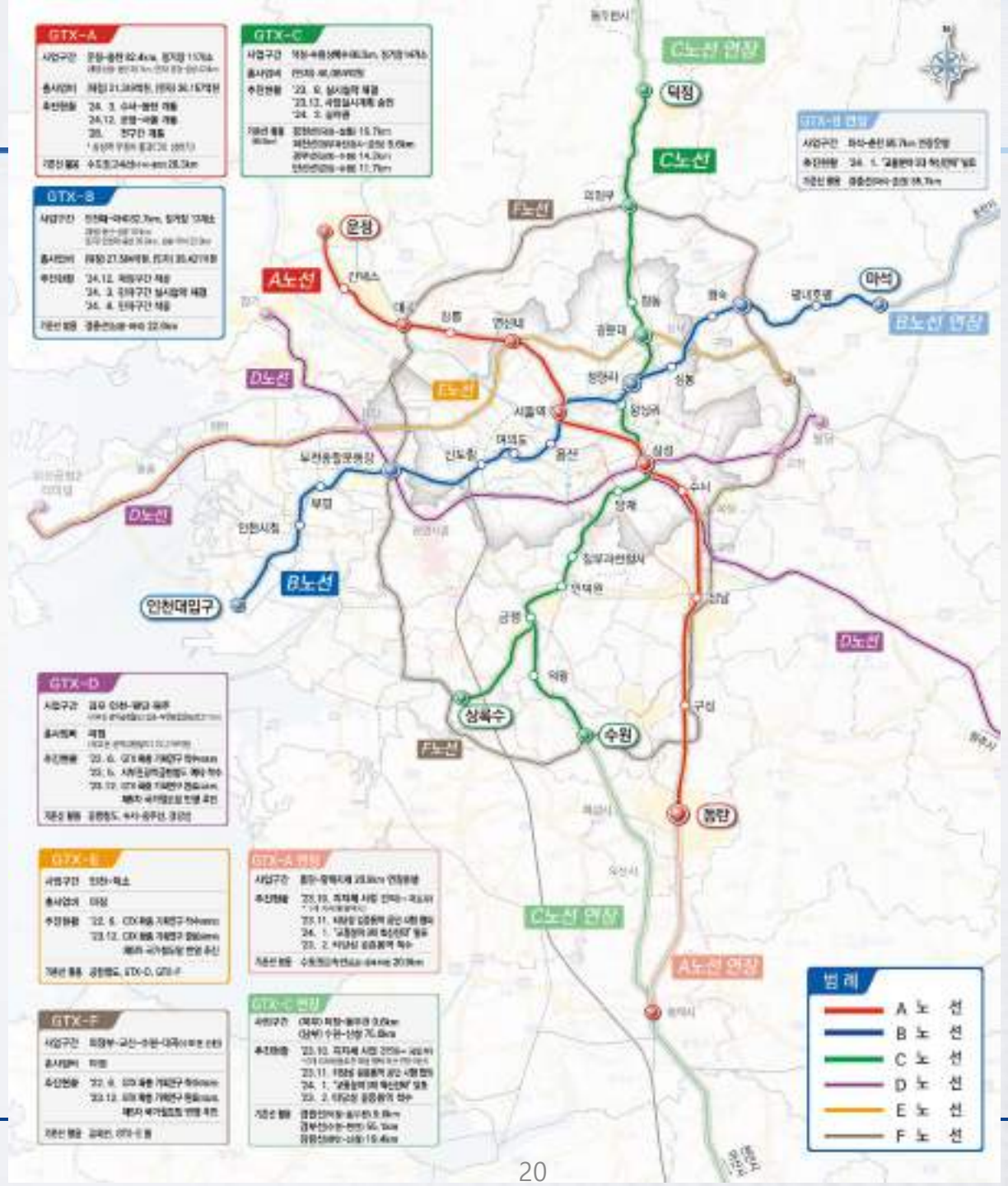


33,596 people per day
Early January 2025

60,296 people per day
Late April 2025

- Over 10 million passengers have used the GTX-A line since its opening('24.3)

III–2. GTX plans



GTX
Great Train Express

GTX Phase 2

Expanding Commuting Convenience and Satisfaction



Faster
commute

Doubling the 30-min commuting Zone



Comfortable
mobility

Maximizing user Convenience and Comfort



Balanced
Regional development

Developing GTX station areas as Regional Hubs

THANK YOU

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