Texas Transit Needs Assessment and Performance Dashboard

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Presentation Outline

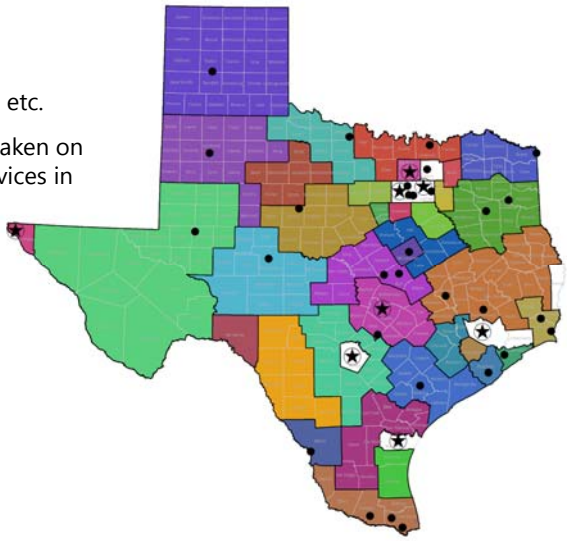
1. Public Transit in Texas
2. Project Overview
3. Dashboard Tour
4. Needs Assessment Method

Part 1. Public Transit in Texas

Public Transit in Texas

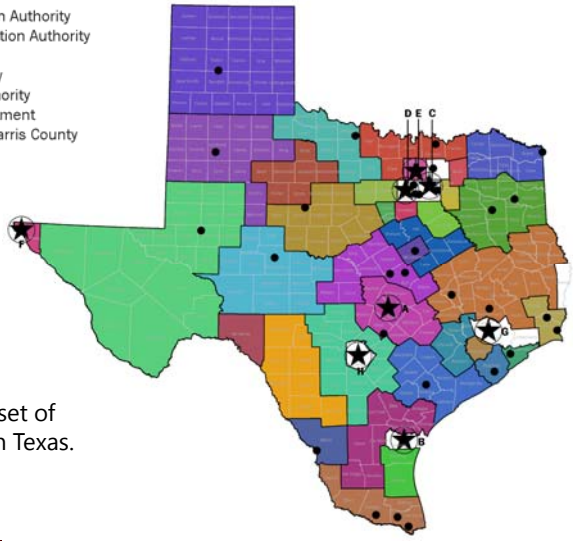
Plays an important role

- Used for work, medical appointments, errands, etc.
- Over 289 million trips taken on Texas public transit services in FY2016.



Transit Authority and Municipal Transit Department

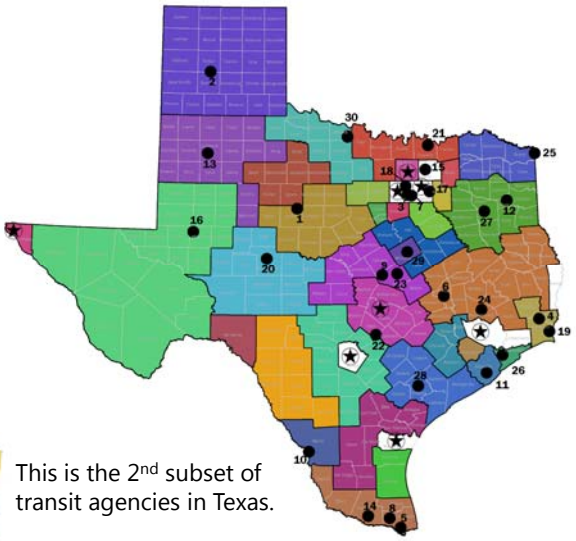
A Capital Metropolitan Transportation Authority
B Corpus Christi Regional Transportation Authority
C Dallas Area Rapid Transit
D Fort Worth Transportation Authority
E Denton County Transportation Authority
F City of El Paso Mass Transit Department
G Metropolitan Transit Authority of Harris County
H VIA Metropolitan Transit



This is the 1st subset of transit agencies in Texas.

Texas State-Funded Urban Systems

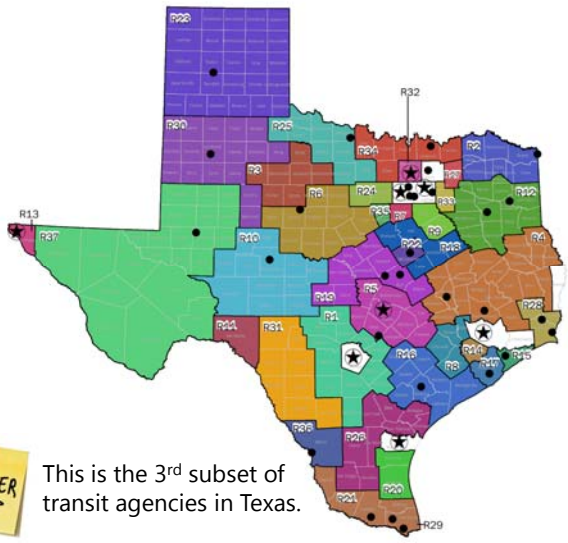
1 Abilene
2 Amarillo
3 Arlington
4 Beaumont
5 Brownsville
6 College Station–Bryan
7 Grand Prairie
8 Harlingen
9 Killeen
10 Laredo
11 Lake Jackson–Angleton
12 Longview
13 Lubbock
14 McAllen (Urbanized Area)
15 McKinney
16 Midland-Odessa
17 Mesquite
18 NETS
19 Port Arthur
20 San Angelo
21 Sherman
22 San Marcos
23 Temple
24 The Woodlands/Conroe
25 Texarkana
26 Texas City
27 Tyler
28 Victoria
29 Waco
30 Wichita Falls



This is the 2nd subset of transit agencies in Texas.

Texas State-Funded Rural Transit Systems

R1 Alamo Area Council of Governments
R2 Ark-Tex Council of Governments
R3 Aspermont Small Business Development Center
R4 Brazos Transit District
R5 Capital Area Rural Transportation System
R6 Central Texas Rural Transit District
R7 Cleburne, City of
R8 Colorado Valley Transit
R9 Community Services, Inc.
R10 Concho Valley Transit District
R11 Del Rio, City of
R12 East Texas Council of Governments
R13 El Paso, County of
R14 Fort Bend, County of
R15 Galveston County Transit District
R16 Golden Crescent Regional Planning Commission
R17 Gulf Coast Center
R18 Heart of Texas Council of Governments
R19 Hill Country Transit District
R20 Kleberg County Human Services
R21 Lower Rio Grande Valley Development Council
R22 McLennan County Rural Transit District
R23 Panhandle Community Services
R24 Public Transit Services
R25 Rolling Plains Management Corporation
R26 Rural Economic Assistance League, Inc.
R27 Senior Center Resources & Public Transit, Inc.
R28 South East Texas Regional Planning Commission
R29 South Padre Island, City of
R30 South Plains Community Action Association
R31 Southwest Area Regional Trans
R32 Span, Inc.
R33 STAR Transit
R34 Texoma Area Paratransit Syster
R35 The Transit System, Inc.
R36 Webb County Community Actior
R37 West Texas Opportunities, Inc.



This is the 3rd subset of transit agencies in Texas.

Part 2. Project Overview

Performance Dashboard

- Texas Transit Performance Dashboard is the continuing work of the transit district profiles released in early 2016.
- It is a website with interactive functions and designed to provides a one-stop information center on state-funded urban and rural public transportation providers in Texas.
- This project aims to enhance transparency in communicating Texas state-funded transit services and performances.

Building on Previous Work

2016

- Static profiles

2017

- Interactive website

Transit Needs Assessment

- Texas Transit Needs Assessment 2.0 is the continuing work of the Transit Service Needs Assessment in 2016.
- The previous assessment found that an estimated 35% of Texans do not have access to at least 12-hour weekday public transit service.
- Phase 2.0 of the project aims to further study the needs using a geospatial span analysis.

Building on Previous Work

2016

- Analyzed four types of need:
  - span of service,
  - urban and rural gaps,
  - inflation, and
  - population growth
- Span analysis did not account for actual transit service areas; assumed entire transit districts were covered.

2017

- Identify geographic coverage gaps using actual transit service areas
- Identify services where current span does not meet minimum thresholds
- Estimate inflation-adjusted costs for providing transit with common threshold for span to all Texans living outside transit authority boundaries

Data Sources

Main data sources used by both projects include the following:

Source 1
PTN-128 Data

Source 2
Data Collection Survey

Data Collection

- General transit district service area boundaries, including areas served under interlocal agreements and contracts;
- Bus routes, including local bus, flex bus, regional bus, and commuter bus routes;
- Service areas of demand-responsive services, including services for the general public and for limited eligibility riders (such as seniors or people with disabilities); and
- Operating days and hours for each transit service mode.

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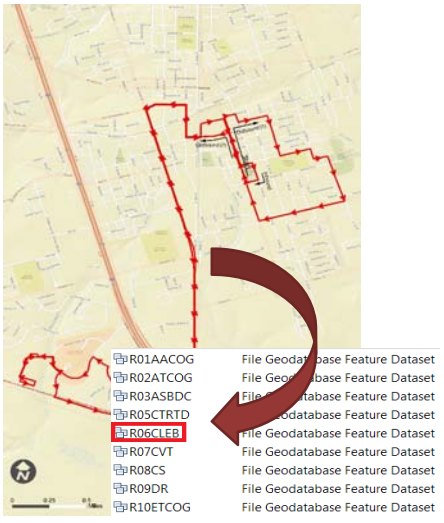
Data Mapping and Validation

- TTI digitized all provided service areas and routes.
- Transit districts confirmed accuracy of maps, service areas, and span hours.
- All transit services input into a master service shapefile geodatabase



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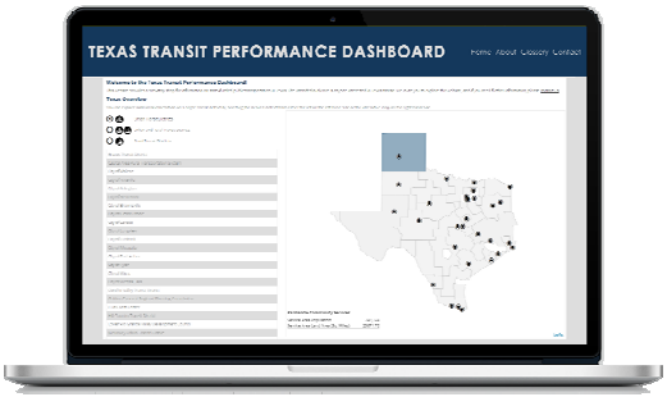
Part 3. Dashboard Tour

Performance Dashboard Tour

https://www.texastransitdashboard.com/



Part 4. Needs Assessment Method

Steps

1

Inventory Transit Service
Using data collected from the statewide survey, researchers inventory all transit services at state-funded transit districts.

Gap Analysis
Find areas without transit service and areas without service operating at the span threshold.

2

3

Cost Estimation
Estimate the costs of providing all Texans living outside of a transit-authority's service area with a standard span of service.

Transit Cost Inflation
Use NTD and PTN-128 data to project increases in average cost per revenue mile through FY2025.

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Step 2 | Possible Types of Gaps

- Type A: No Transit Outside a Transit District
  - Urban gap
  - Transit authority gap (excluding donut holes)
  - County gap
- Type B: No Transit Inside a Transit District
- Type C: Service Span Below Threshold

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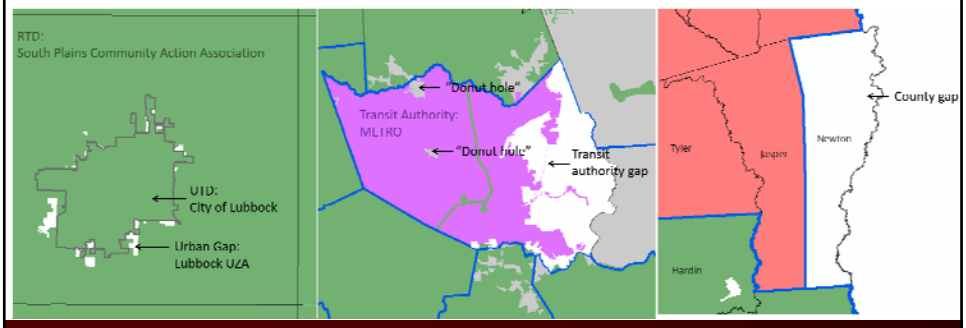
Step 2 | Example Type A Gaps

Type A: No Transit Outside a Transit District

- Urban gap
- Transit authority gap (excluding donut holes)
- County gap



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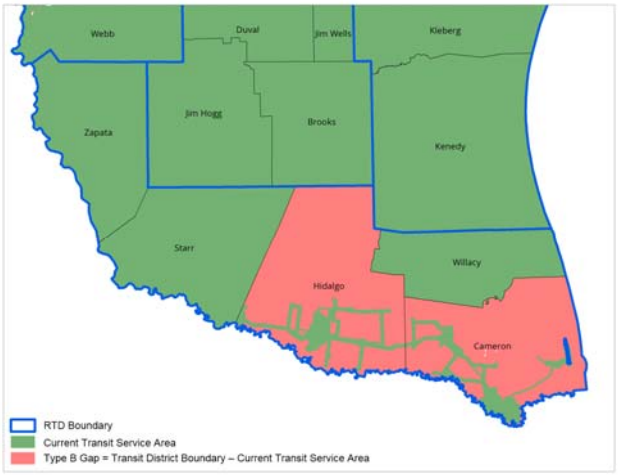
Step 2 | Example Type B Gap

Type B: No Transit Inside a Transit District



Step 2 | Four Span Models for Type C Gaps

Type C: Service Span Below Threshold

Model #	Title	Weekday Span Threshold	Saturday Span Threshold
1	12-hour weekday service	12 hrs.	0 hrs.
2	14-hour weekday service	14	0
3	12-hour weekday, 8-hour Saturday service	12	8
4	14-hour weekday, 8-hour Saturday service	14	8

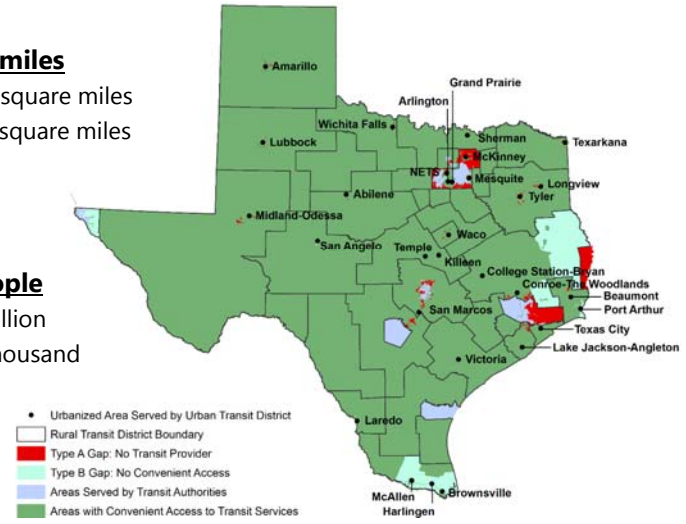
Step 2 | Results: Type A and Type B

13,400 square miles

- Type A: 3,800 square miles
- Type B: 9,600 square miles

3.5 Million people

- Type A: 2.6 million
- Type B: 925 thousand



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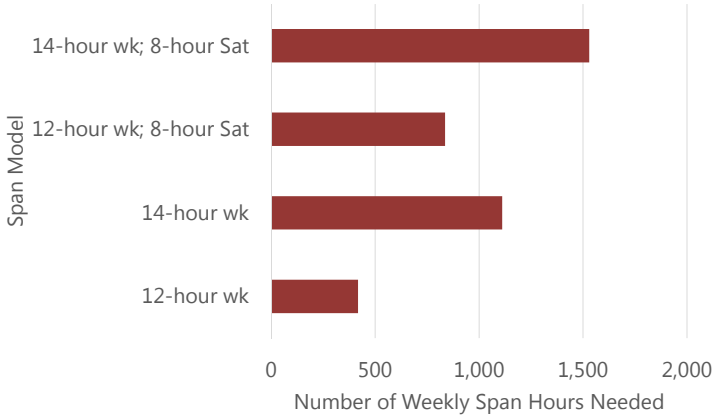
Step 2 | Results: Type C

Need between 417 and 1530 hours added per week.



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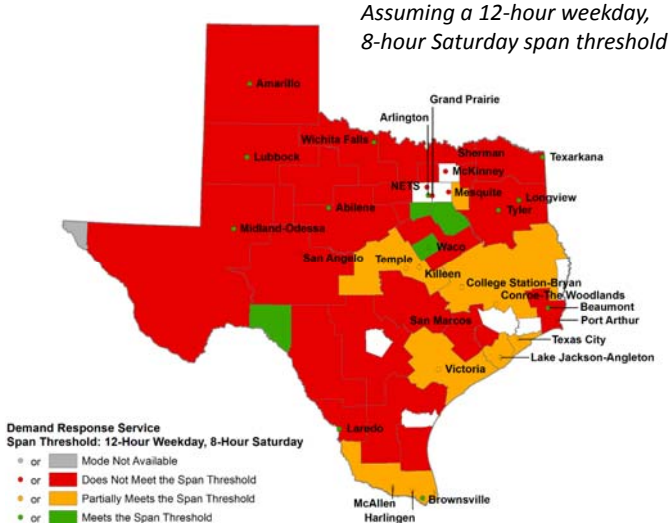
Step 2 | Results: Type C for Demand Response

Assuming a 12-hour weekday, 8-hour Saturday span threshold



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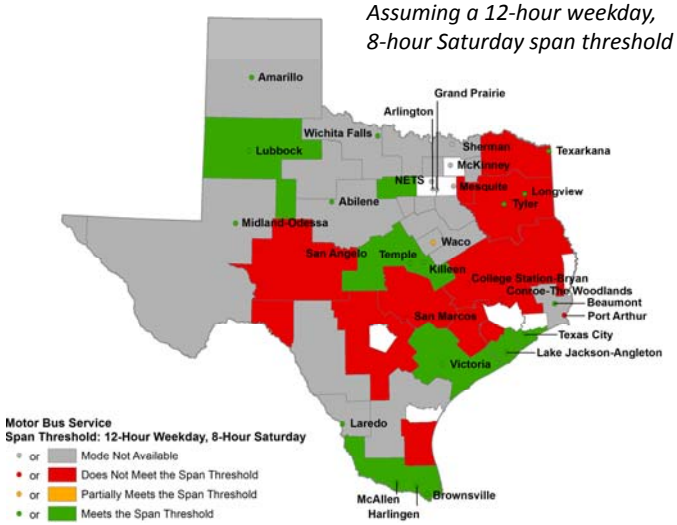
Step 2 | Results: Type C for Motor Bus

Assuming a 12-hour weekday, 8-hour Saturday span threshold



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Step 3 | Cost Estimation Procedure

- Estimate FY2016 costs to fill Type A and B gaps with full span general-public demand-responsive service, including:
  - Operating costs based on regional conditions
  - Capital costs for vehicle purchases
- Estimate FY2016 costs to fill Type C (span) gaps using existing operating data.

Step 3 | Cost Estimation Procedure

Type A and B Gaps

- Regional Conditions
  - Use average of adjacent transit district cost/population mile for GPDR.
- Number of Vehicles
  - $\#\ \text{vehicles} = 0.000017 * \text{operating costs} + 2.928$
  - Baseline of 3 vehicles; Add a vehicle for each $58,441 increase in operating expenses.

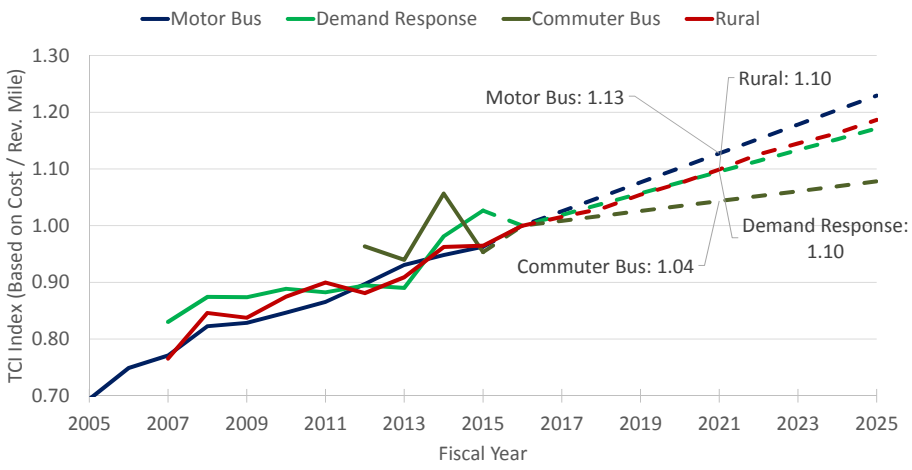
Step 4 | Transit Cost Inflation Indices

Example: MB Transit Cost Inflation Index 2005-2025

- Four indices:
  - Motorbus
  - Commuter bus
  - Demand response
  - Rural (PTN-128)

MB	Cost/Rev. Mile Index	Cost/Rev. Mile	Cost/Rev. Hour Index	Cost/Rev. Hour
2005	0.69	$6.02	0.74	$83.53
2006	0.75	$6.50	0.80	$89.22
2007	0.77	$6.69	0.82	$91.47
2008	0.82	$7.13	0.87	$97.82
2009	0.83	$7.19	0.88	$98.81
2010	0.85	$7.34	0.90	$101.25
2011	0.87	$7.51	0.91	$102.25
2012	0.90	$7.78	0.92	$102.75
2013	0.93	$8.07	0.93	$104.73
2014	0.95	$8.22	0.96	$107.26
2015	0.96	$8.35	0.96	$107.50
2016	1.00	$8.67	1.00	$112.15
2017	1.03	$8.89	1.02	$114.38
2018	1.05	$9.11	1.04	$116.61
2019	1.08	$9.34	1.06	$118.84
2020	1.10	$9.56	1.08	$121.07
2021	1.13	$9.78	1.10	$123.30
2022	1.15	$10.00	1.12	$125.52
2023	1.18	$10.22	1.14	$127.75
2024	1.20	$10.44	1.16	$129.98
2025	1.23	$10.66	1.18	$132.21

Step 4 | Transit Cost Inflation Indices



Cost-Benefit Analysis

Benefits of Meeting the Need:

- Transportation cost savings:
  Cost savings realized by riders, reducing transportation costs (e.g., vehicle ownership and operations costs)
- Low-cost mobility benefits:
  Benefits realized by riders for new transit trips and presently foregone trips due to transit gaps (i.e., latent demand)
- Economic multiplier for transit investments:
  Value of the economic activity generated by investment of state funds in public transit to close transit gaps

Cost-Benefit Analysis

Benefits Estimation Procedure:

- Transportation cost savings and low-cost mobility benefits
  - Estimate new ridership and assign value to each new trip
  - Ridership estimate based on current averages for each mode of transit
- Economic multiplier
  - *"Every dollar spent on public transportation in Texas generates $2.11 of economic activity"* -- TxDOT RMC Report 0-6194
- Use pro-rated vehicle purchase costs for cost-benefit ratio
  - Vehicles purchased to fill transit gaps have average expected useful life of 6 years
  - Pro-rate purchase cost using two years of six-year cost to align with two-year operating cost and two-year benefits estimate

Analysis Summary

- Statewide Inventory of transit service collected in geodatabase
  - Assisted researchers with both Transit Needs Assessment 2.0 and Transit Performance Dashboard.
- Gap Analysis
  - Took into account geographic coverage and service span.
- Transit Cost Inflation Indices
  - Utilized Operating cost per revenue mile, data from NTD and PTN-128.
- Cost Estimation
  - Used existing costs or regional peer transit district costs.
- Cost-Benefit Analysis
  - Performed cost-benefit analysis to emphasize importance of transit and addressing needs.

Thank you and Questions?

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