جامعة الأمير سطام بن عبدالعزيز
PRINCE SATTAM BIN ABDULAZIZ UNIVERSITY

Public transit

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Introduction

Public Transit" is a new mobile app that makes using public transportation easier than ever. It helps you plan your journey from one place to another by showing you the best routes and schedules in real-time. You'll get updates on any delays or changes so you can adjust your plans accordingly. The app also lets you customize your preferences, like choosing the fastest route or the fewest transfers. With interactive maps and easy payment options, navigating and paying for your ride is simple and convenient. Plus, you can share your experiences and read reviews from other users to make informed decisions about your commute..

We Benefit From This App :

1. **Real-Time Journey Planning**: Enter your starting point and destination to instantly see available bus, train, or subway schedules in real-time.
2. **Live Tracking**: Track your bus or train on a map in real-time, so you always know where your ride is and can plan accordingly.
3. **Personalized Alerts**: Set up alerts for your regular routes to get notified about delays or changes to your journey instantly.
4. **Accessibility Features**: The app is user-friendly for everyone, with features like voice-guided navigation, compatibility with screen readers, and support for multiple languages.

Background

The Public Transit app was created to solve common problems commuters face when using public transport, like not having enough information, waiting a long time for rides, and dealing with inconvenient payment methods. Our development team worked closely with transportation experts to design an app that makes commuting easier and more user-friendly.

Scope

In simple words, the Public Transit app is your go-to tool for using public transportation. It helps you plan your trips, track your rides in real-time, and stay updated on schedules—all from your smartphone. Whether you're taking a bus, train, subway, or tram, this app has you covered, making commuting easier and more convenient than ever.

Aim

The aim is to improve the overall public transport experience for users by providing them with easy access to information, seamless journey planning, and convenient payment options. By offering these features, Public Transit aims to encourage more people to use public transport, leading to reduced traffic congestion and environmental benefits.

- Opportunities:

Public Transit has the chance to make a big difference in how people use public transportation. By providing better information and easier ways to travel, more people may choose to use public transport instead of driving, which can help reduce traffic and pollution in cities. This app aims to make urban commuting more convenient and sustainable for everyone.

- Problems:

However, the app may face challenges related to technical issues, data accuracy, user adoption, and accessibility. Overcoming these challenges will be crucial for the success of Public Transit in transforming the public transport experience.

Business Processes Comparison

- Previous Business Processes:

In the past, commuters relied on printed schedules, manual ticket purchases, and limited information sources for planning their public transport journeys.

- Is-Supported Business Processes:

With Public Transit, these processes are streamlined and enhanced, offering users real-time information, integrated payment options, and personalized journey planning features.

1. **Understanding User Needs** :

    - Identify who will use the app (like daily commuters or tourists).
    - Learn what users want, such as real-time updates on transit, easy route planning, and convenient payment methods.
    - Consider how to make the app accessible for users with disabilities.

2. **Transit Provider Requirements** :

    - Collect info about current transit schedules, routes, and ticket prices.
    - Understand what technologies transit providers use (like ticket systems and GPS tracking).
    - Know any rules or standards that need to be followed.

3. **Functional Needs** :

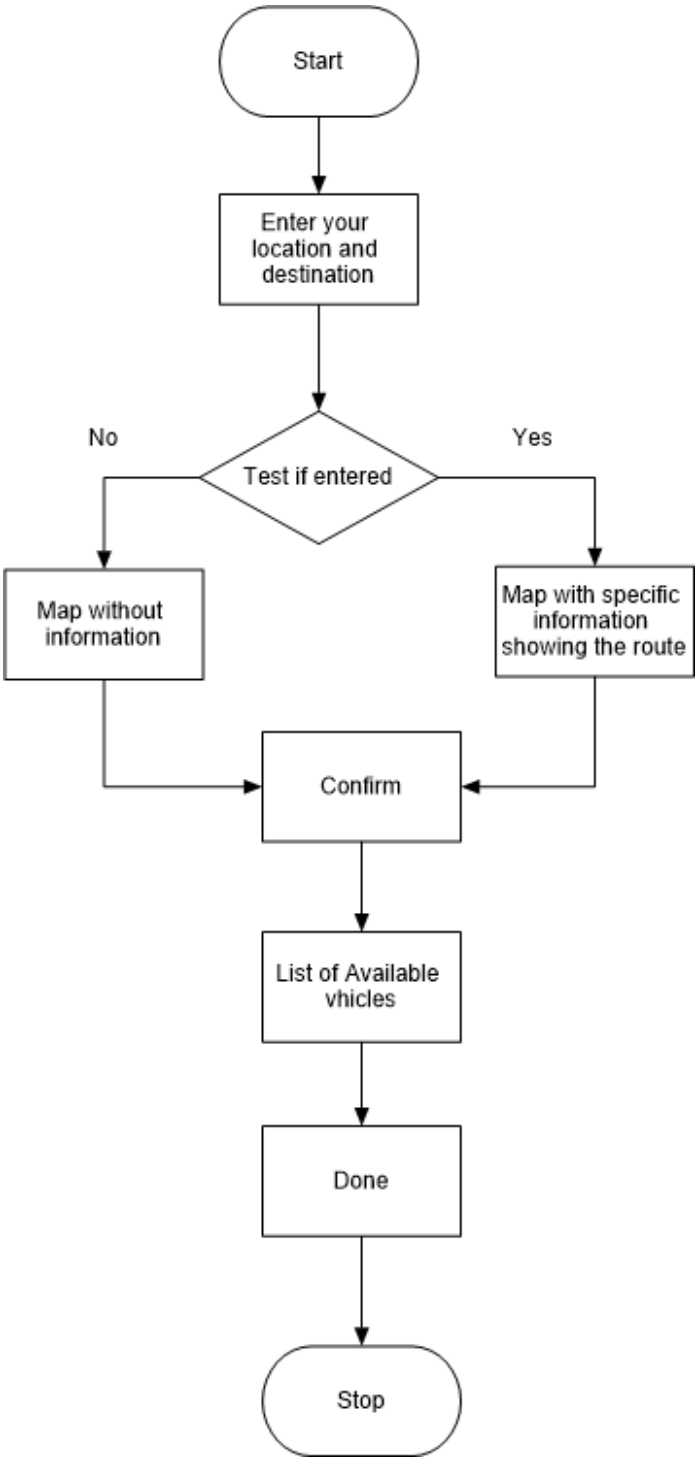
    - Provide real-time updates on transit (like arrival times and delays).
    - Offer route planning and navigation within the app.
    - Include easy payment options (like mobile tickets or linking to existing payment systems).
    - Ensure accessibility, such as wheelchair-friendly routes and audio announcements.

4. **Non-functional Considerations** :

    - Make sure the app responds quickly and works reliably.
    - Keep user data secure (using encryption and safe payment methods).
    - Plan for growth (so the app can handle more users and data over time).

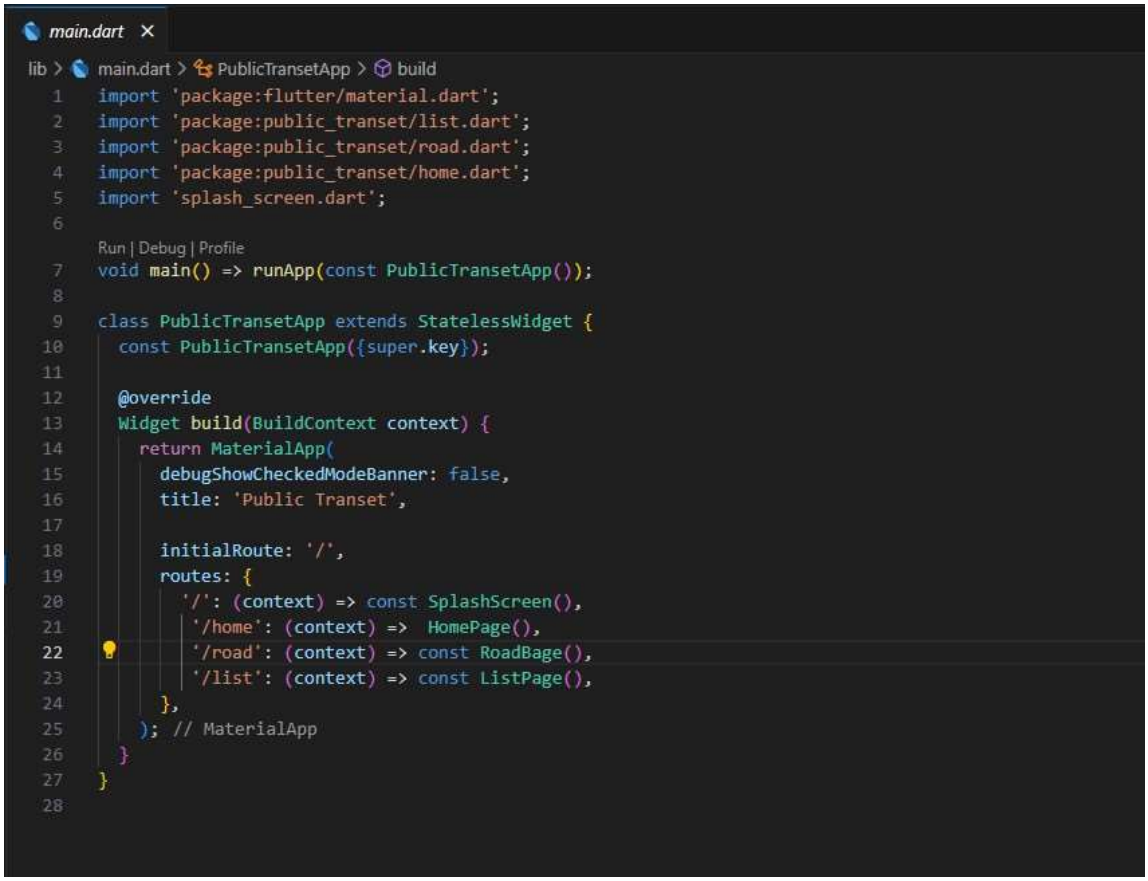
5. **Integration Requirements**:
    - Make the app work with existing transit systems and databases.
    - Ensure it runs on different devices and operating systems.
6. **User Experience (UX)**:
    - Design the app to be easy to use, with a simple layout and clear information.
    - Personalize the app (like saving favorite routes or stops).
7. **Regulatory and Legal Needs**:
    - Follow data protection laws (such as GDPR or CCPA).
    - Meet accessibility standards (like ADA compliance).
8. **Environmental Considerations**:
    - Encourage using public transit to reduce environmental impact.
    - Use energy-efficient technologies where possible.
9. **Budget and Timeline**:
    - Set a budget and timeline for the project based on the requirements.
10. **Stakeholder Input**:
    - Get feedback from key people involved, like transit authorities, governments, and potential users.

flowchart


Start
Enter your location and destination
Test if entered
No
Yes
Map without information
Map with specific information showing the route
Confirm
List of Available vhicles
Done
Stop

Pages Code

Main Page:

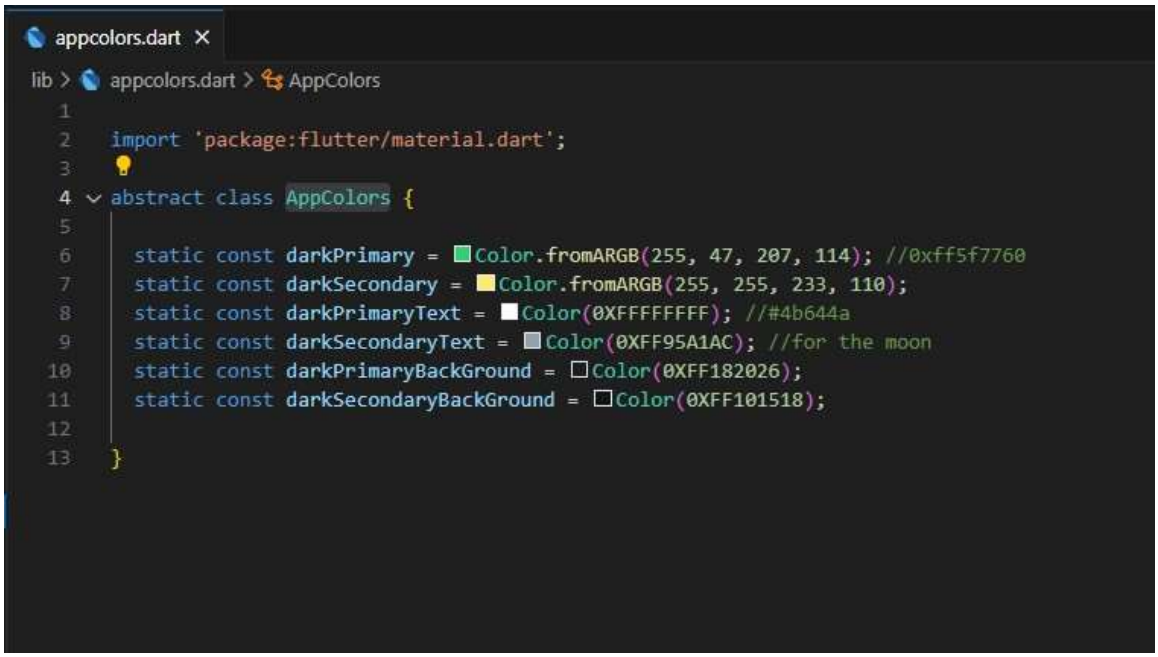


main.dart

lib > main.dart > PublicTransetApp > build

```dart
import 'package:flutter/material.dart';
import 'package:public_transet/list.dart';
import 'package:public_transet/road.dart';
import 'package:public_transet/home.dart';
import 'splash_screen.dart';

Run | Debug | Profile
void main() => runApp(const PublicTransetApp());

class PublicTransetApp extends StatelessWidget {
  const PublicTransetApp({super.key});

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      title: 'Public Transet',

      initialRoute: '/',
      routes: {
        '/': (context) => const SplashScreen(),
        '/home': (context) =>  HomePage(),
        '/road': (context) => const RoadBage(),
        '/list': (context) => const ListPage(),
      },
    ); // MaterialApp
  }
}
```

Appcolors Class:



Splash Screen:

splash_screen.dart

lib > splash_screen.dart > SplashScreen > build

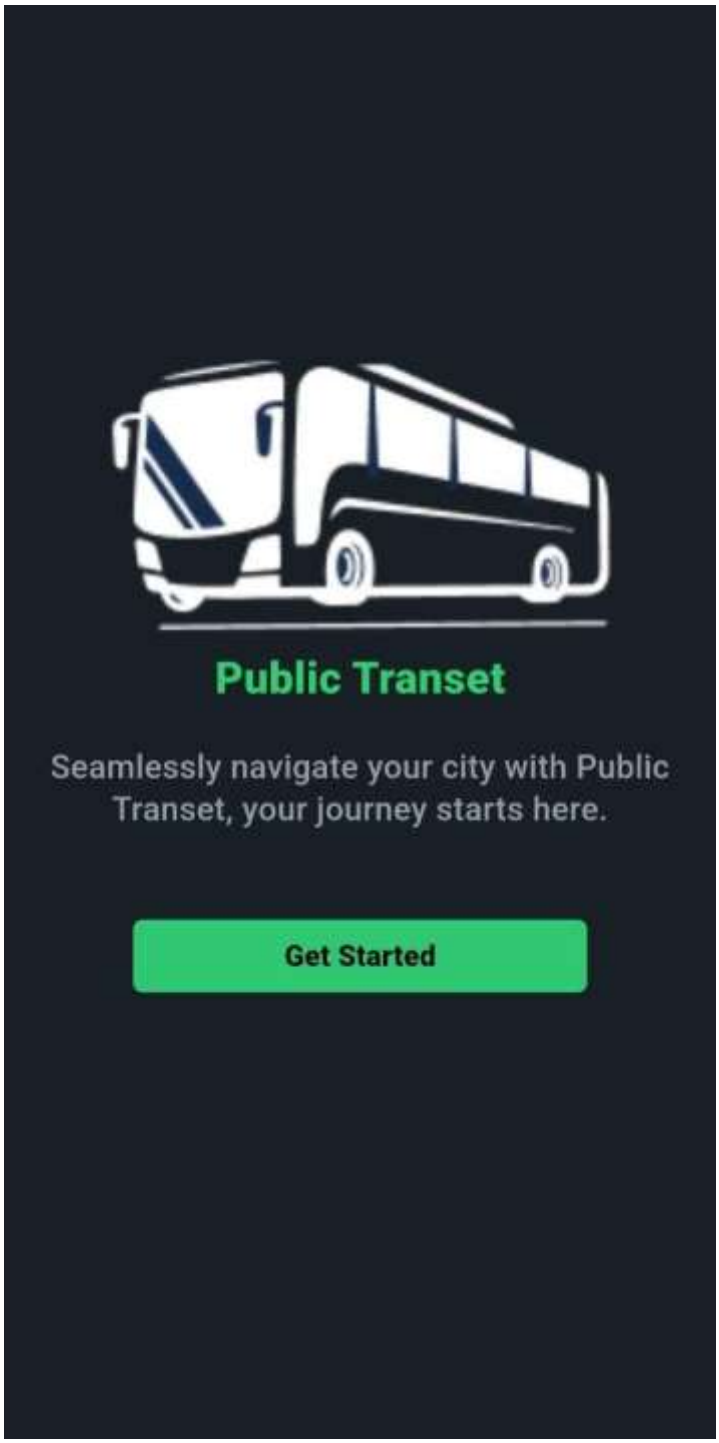
```dart

import 'package:flutter/material.dart';
import 'package:public_transet/appcolors.dart';

class SplashScreen extends StatelessWidget {
  const SplashScreen({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: AppColors.darkPrimaryBackGround,
      body: Center(
        child: Padding(
          padding: const EdgeInsets.symmetric(horizontal: 20),
          child: Column(
            mainAxisAlignment: MainAxisAlignment.center,
            children: [
              Image.asset(
                'assets/logo.png',
                height: 150,
                width: 450,
                fit: BoxFit.contain,
              ), // Image.asset
              const SizedBox(height: 10,),
              const Text(
                'Public Transet',
                style: TextStyle(
                  fontSize: 24,
                  color: AppColors.darkPrimary,
                  fontWeight: FontWeight.w900,
                  fontFamily: AutofillHints.birthdayYear,
                ), // TextStyle
```

```
            ), // TextStyle
          ), // Text
          const SizedBox(height: 20),
          const Text(
            'Seamlessly navigate your city with Public Transet, your journey starts here.',
            textAlign: TextAlign.center,
            style: TextStyle(
              fontSize: 18,
              color: AppColors.darkSecondaryText,
              fontWeight: FontWeight.w500,
              fontFamily: AutofillHints.birthdayDay,
              height: 1.3,
            ), // TextStyle
          ), // Text
          const SizedBox(height:50),
          SizedBox(
            height: 40,
            width: 250,
            child: ElevatedButton(
              style: ButtonStyle(
                backgroundColor: MaterialStateProperty.all<Color>(AppColors.darkPrimary),
                shape: MaterialStateProperty.all<RoundedRectangleBorder>(
                  RoundedRectangleBorder(
                    borderRadius: BorderRadius.circular(5),
                    side: const BorderSide(color: AppColors.darkPrimary, width: 2.0),
                  ), // RoundedRectangleBorder
                ),
              ), // ButtonStyle
              child: const Text(
                'Get Started',
```

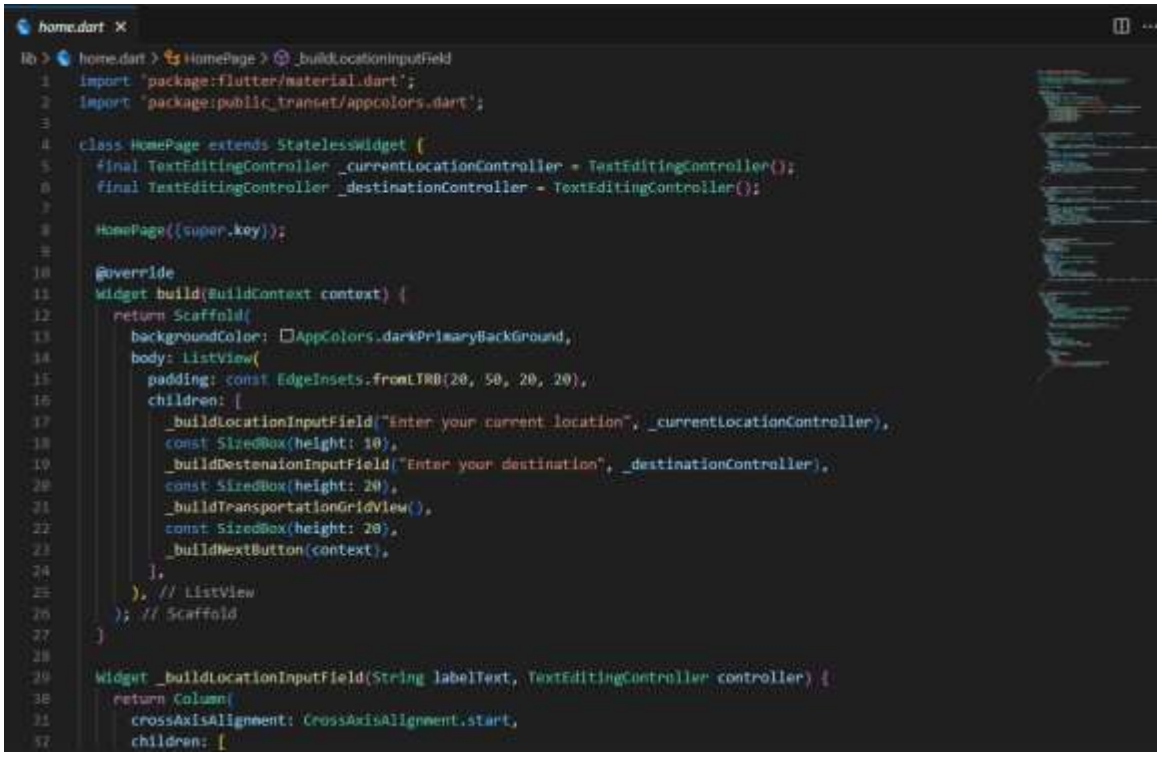
```
                style: TextStyle(
                  color: Colors.black,
                  fontWeight: FontWeight.w800,
                  fontFamily: AutofillHints.familyName,
                  fontSize: 16,
                ), // TextStyle
              ), // Text
              onPressed: () => Navigator.pushNamed(context, '/home'),
            ), // ElevatedButton
          ), // SizedBox
          const SizedBox(height: 20,)
        ],
      ), // Column
    ), // Padding
  ), // Center
); // Scaffold
  }
}
```

App Screenshot

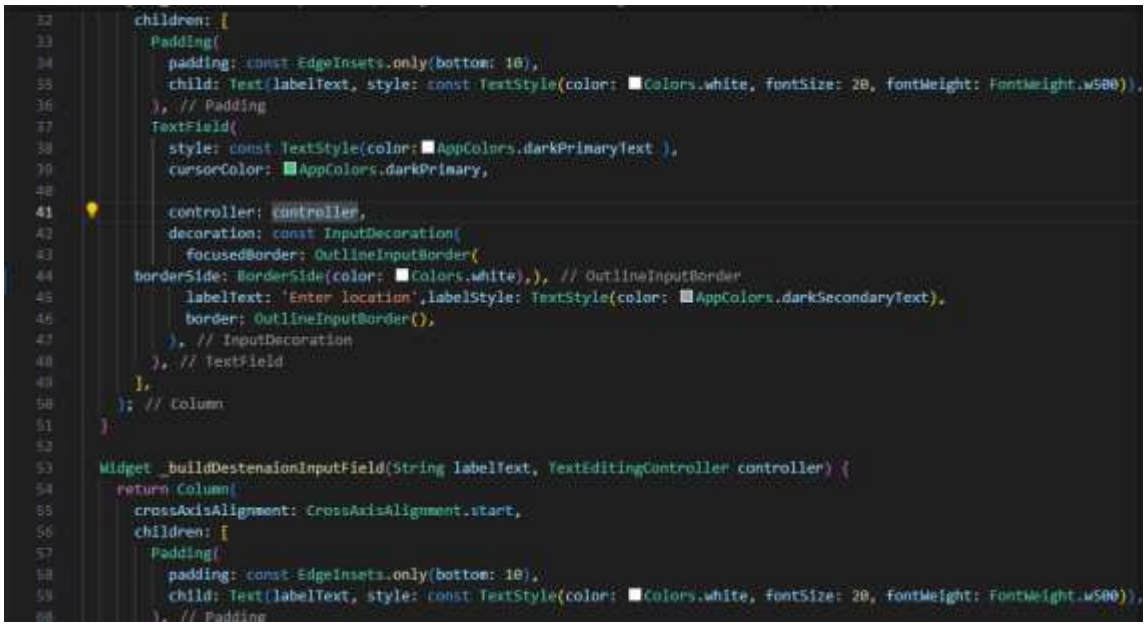
Splash Screen:



Home Page:



```dart
import 'package:flutter/material.dart';
import 'package:public_transet/appcolors.dart';

class HomePage extends StatelessWidget {
  final TextEditingController _currentLocationController = TextEditingController();
  final TextEditingController _destinationController = TextEditingController();

  HomePage({super.key});

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: AppColors.darkPrimaryBackGround,
      body: ListView(
        padding: const EdgeInsets.fromLTRB(20, 50, 20, 20),
        children: [
          _buildLocationInputField("Enter your current location", _currentLocationController),
          const SizedBox(height: 10),
          _buildDestenaionInputField("Enter your destination", _destinationController),
          const SizedBox(height: 20),
          _buildTransportationGridView(),
          const SizedBox(height: 20),
          _buildNextButton(context),
        ],
      ), // ListView
    ); // Scaffold
  }

  Widget _buildLocationInputField(String labelText, TextEditingController controller) {
    return Column(
      crossAxisAlignment: CrossAxisAlignment.start,
      children: [
```



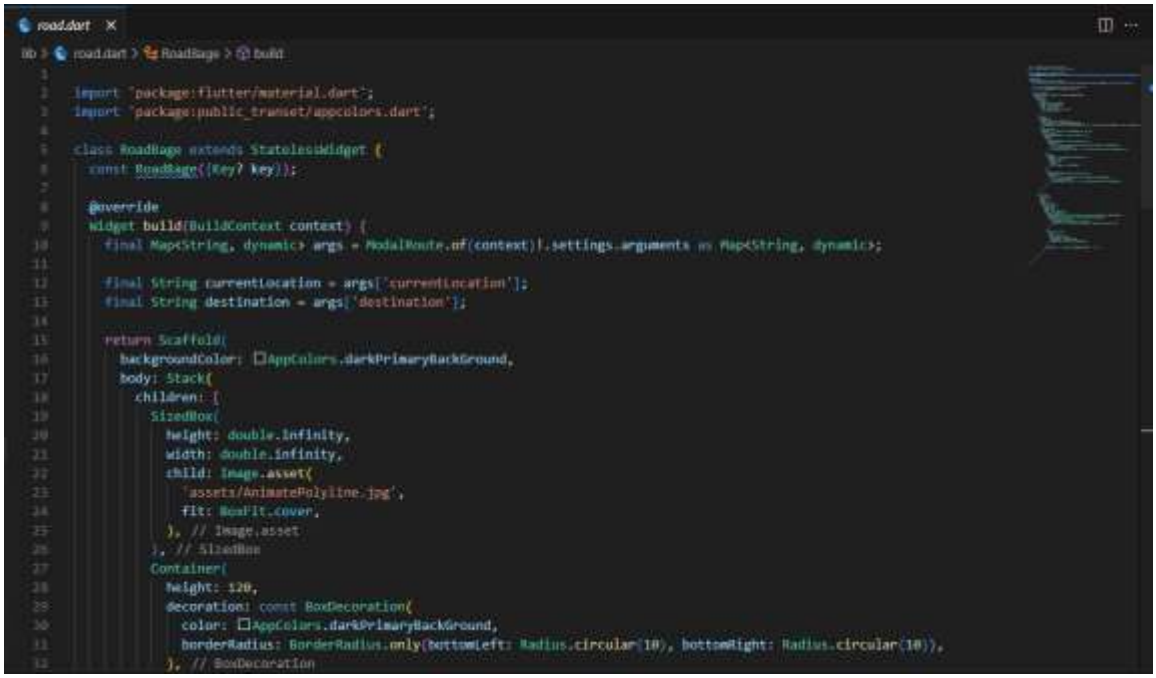
```dart
        children: [
          Padding(
            padding: const EdgeInsets.only(bottom: 10),
            child: Text(labelText, style: const TextStyle(color: Colors.white, fontSize: 20, fontWeight: FontWeight.w500)),
          ), // Padding
          TextField(
            style: const TextStyle(color: AppColors.darkPrimaryText ),
            cursorColor: AppColors.darkPrimary,

            controller: controller,
            decoration: const InputDecoration(
              focusedBorder: OutlineInputBorder(
        borderSide: BorderSide(color: Colors.white),), // OutlineInputBorder
              labelText: 'Enter location',labelStyle: TextStyle(color: AppColors.darkSecondaryText),
              border: OutlineInputBorder(),
            ), // InputDecoration
          ), // TextField
        ],
      ); // Column
    }

    Widget _buildDestenaionInputField(String labelText, TextEditingController controller) {
      return Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: [
          Padding(
            padding: const EdgeInsets.only(bottom: 10),
            child: Text(labelText, style: const TextStyle(color: Colors.white, fontSize: 20, fontWeight: FontWeight.w500)),
          ), // Padding
```

```
        TextField(
          style: const TextStyle(color: AppColors.darkPrimaryText ),
          cursorColor: AppColors.darkPrimary,
          controller: controller,
          decoration: const InputDecoration(
            focusedBorder: OutlineInputBorder(
      borderSide: BorderSide(color: Colors.white),), // OutlineInputBorder
            labelText: 'Enter Destenation',labelStyle: TextStyle(color: AppColors.darkSecondaryText),
            border: OutlineInputBorder(),
          ), // InputDecoration
        ), // TextField
      ],
    ); // Column
  }

  Widget _buildTransportationGridView() {
    return GridView.builder(
      gridDelegate: const SliverGridDelegateWithFixedCrossAxisCount(
        crossAxisCount: 2,
        crossAxisSpacing: 10,
        mainAxisSpacing: 10,
      ), // SliverGridDelegateWithFixedCrossAxisCount
      shrinkWrap: true,
      physics: const NeverScrollableScrollPhysics(),
      itemCount: 4,
      itemBuilder: (BuildContext context, int index) {
        return Container(
          height: 150,
          width: 150,
          decoration: BoxDecoration(
            borderRadius: BorderRadius.circular(20),
            color: AppColors.darkSecondaryBackGround,
          ), // BoxDecoration
          child: Image.asset('assets/${index == 0 ? 'train' : index == 1 ? 'bus' : index == 2 ? 'Car' : 'motor'}.png'),
        ); // Container
      },
    ); // GridView.builder
  }

  Widget _buildNextButton(BuildContext context) {
    return Center(
      child: SizedBox(
        width: 250,
        height: 40,
        child: ElevatedButton(
          style: ButtonStyle(
            backgroundColor: MaterialStateProperty.all<Color>(AppColors.darkPrimary),
            shape: MaterialStateProperty.all<RoundedRectangleBorder>(
              RoundedRectangleBorder(
                borderRadius: BorderRadius.circular(5),
                side: const BorderSide(color: AppColors.darkPrimary, width: 2.0),
              ), // RoundedRectangleBorder
            ),
            padding: MaterialStateProperty.all<EdgeInsetsGeometry>(
              const EdgeInsets.symmetric(horizontal: 20), // لتحديد هامش أفقي
            ),
          ), // ButtonStyle
          child: const Text(
```

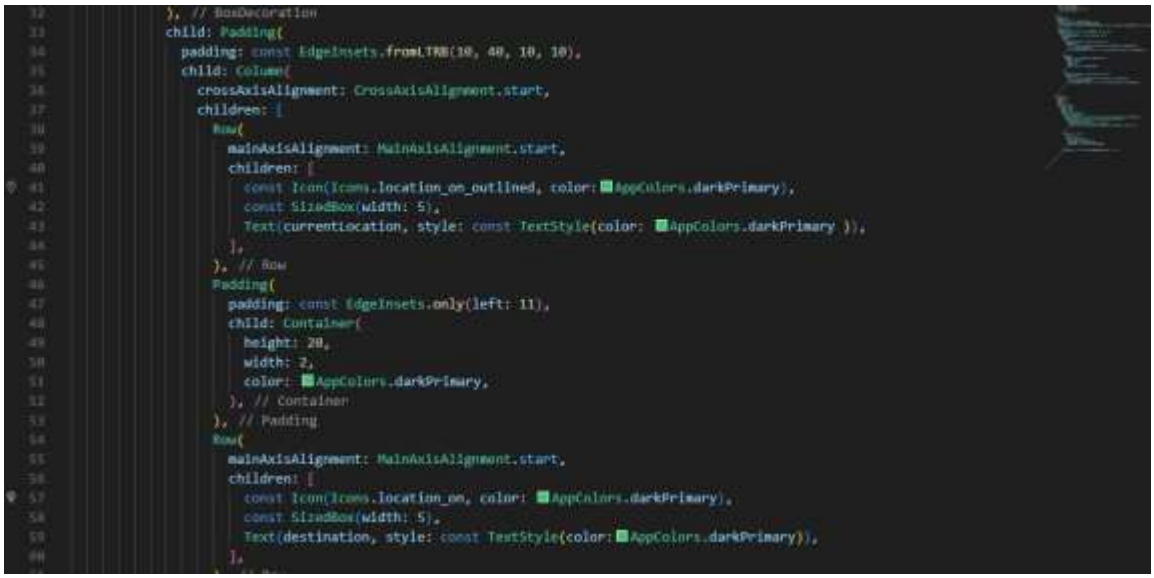
Home Page:


Enter your current location
Enter location
Enter your destination
Enter Destenation
Next

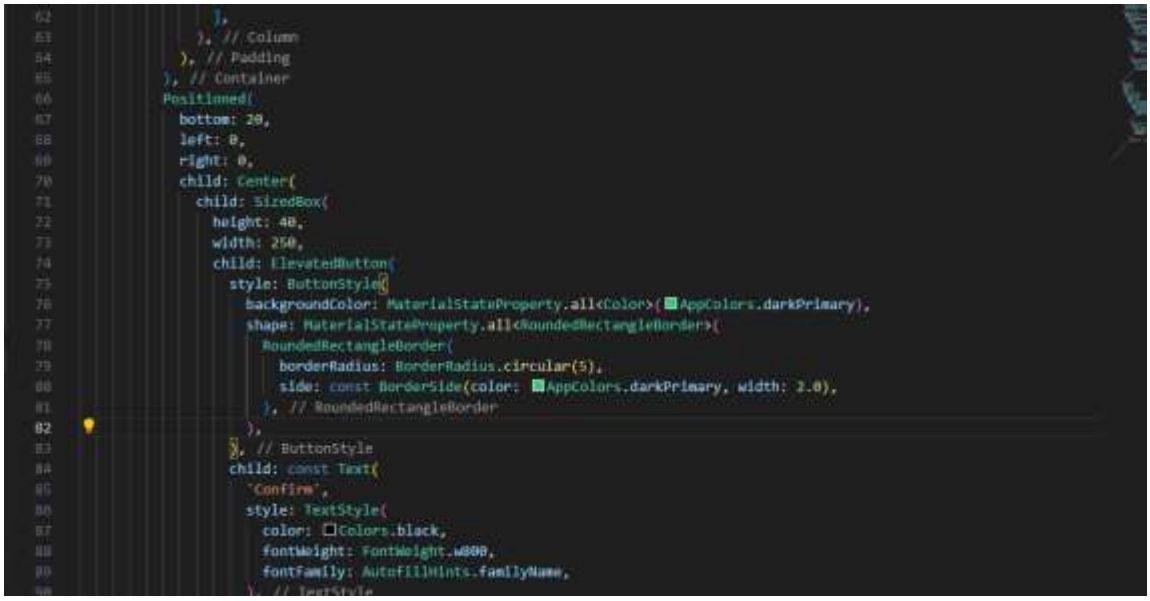
Road Page:



```dart
import 'package:flutter/material.dart';
import 'package:public_transet/appcolors.dart';

class RoadPage extends StatelessWidget {
  const RoadPage({Key? key});

  @override
  Widget build(BuildContext context) {
    final Map<String, dynamic> args = ModalRoute.of(context)!.settings.arguments as Map<String, dynamic>;

    final String currentLocation = args['currentLocation'];
    final String destination = args['destination'];

    return Scaffold(
      backgroundColor: AppColors.darkPrimaryBackGround,
      body: Stack(
        children: [
          SizedBox(
            height: double.infinity,
            width: double.infinity,
            child: Image.asset(
              'assets/AnimatePolyline.jpg',
              fit: BoxFit.cover,
            ), // Image.asset
          ), // SizedBox
          Container(
            height: 120,
            decoration: const BoxDecoration(
              color: AppColors.darkPrimaryBackGround,
              borderRadius: BorderRadius.only(bottomLeft: Radius.circular(10), bottomRight: Radius.circular(10)),
            ), // BoxDecoration
```



```dart
            ), // BoxDecoration
            child: Padding(
              padding: const EdgeInsets.fromLTRB(10, 40, 10, 10),
              child: Column(
                crossAxisAlignment: CrossAxisAlignment.start,
                children: [
                  Row(
                    mainAxisAlignment: MainAxisAlignment.start,
                    children: [
                      const Icon(Icons.location_on_outlined, color: AppColors.darkPrimary),
                      const SizedBox(width: 5),
                      Text(currentLocation, style: const TextStyle(color: AppColors.darkPrimary )),
                    ],
                  ), // Row
                  Padding(
                    padding: const EdgeInsets.only(left: 11),
                    child: Container(
                      height: 20,
                      width: 2,
                      color: AppColors.darkPrimary,
                    ), // Container
                  ), // Padding
                  Row(
                    mainAxisAlignment: MainAxisAlignment.start,
                    children: [
                      const Icon(Icons.location_on, color: AppColors.darkPrimary),
                      const SizedBox(width: 5),
                      Text(destination, style: const TextStyle(color: AppColors.darkPrimary)),
                    ],
```



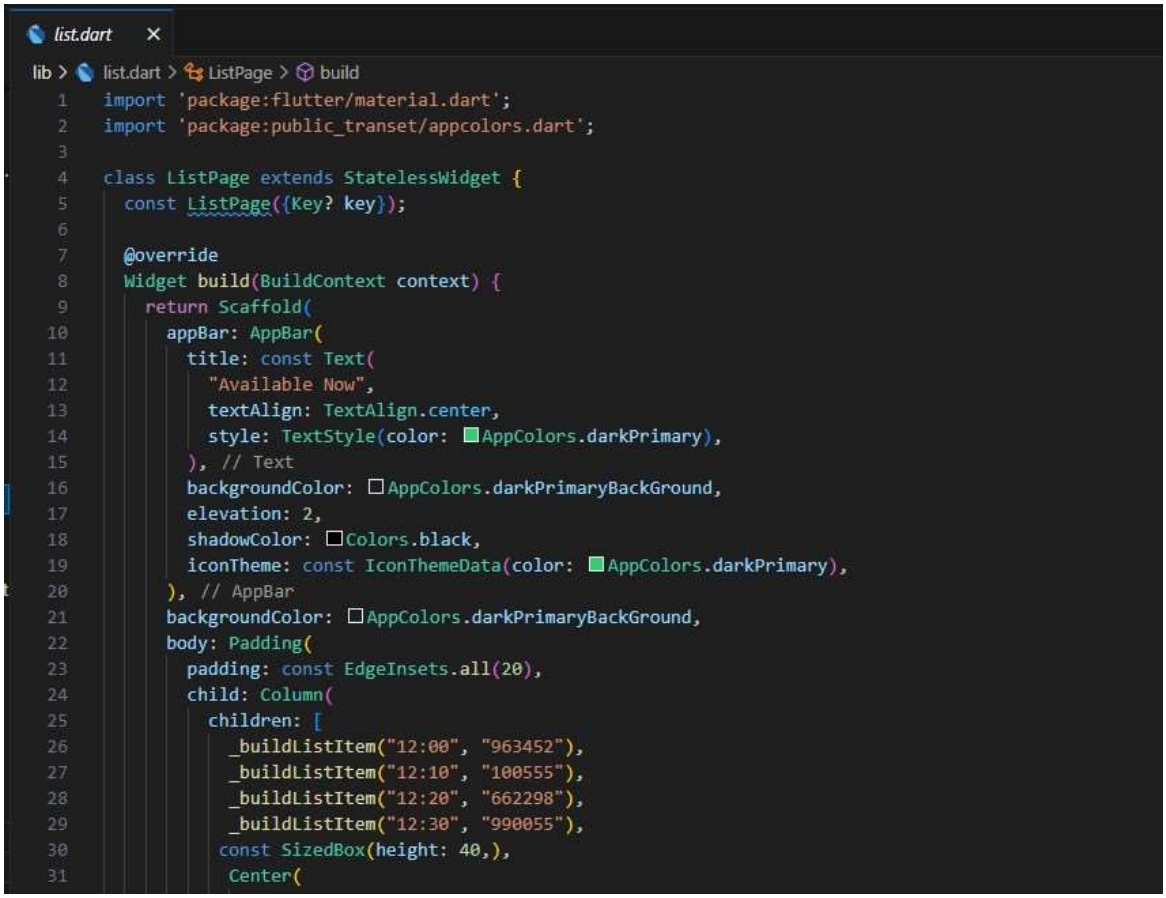
```
            ],
          ), // Column
        ), // Padding
      ), // Container
      Positioned(
        bottom: 20,
        left: 0,
        right: 0,
        child: Center(
          child: SizedBox(
            height: 40,
            width: 250,
            child: ElevatedButton(
              style: ButtonStyle(
                backgroundColor: MaterialStateProperty.all<Color>(AppColors.darkPrimary),
                shape: MaterialStateProperty.all<RoundedRectangleBorder>(
                  RoundedRectangleBorder(
                    borderRadius: BorderRadius.circular(5),
                    side: const BorderSide(color: AppColors.darkPrimary, width: 2.0),
                  ), // RoundedRectangleBorder
                ),
              ), // ButtonStyle
              child: const Text(
                'Confirm',
                style: TextStyle(
                  color: Colors.black,
                  fontWeight: FontWeight.w800,
                  fontFamily: AutofillHints.familyName,
                ), // TextStyle
```

```
                  fontFamily: AutofillHints.familyName,
                ), // TextStyle
              ), // Text
              onPressed: () => Navigator.pushNamed(context, '/list'),
            ), // ElevatedButton
          ), // SizedBox
        ), // Center
      ), // Positioned
    ],
  ), // Stack
); // Scaffold
  }
}
```

Road Page:


makka
daoha
Chợ Bà Chiểu
TAN DINH
Chùa Vĩnh Nghiêm
DA KAO
PHƯỜNG 7
Dinh Độc Lập
DO THANH RESIDENT
BẾN THÀNH
Chợ Hoa Hồ Thị Kỷ
Confirm

List Page:

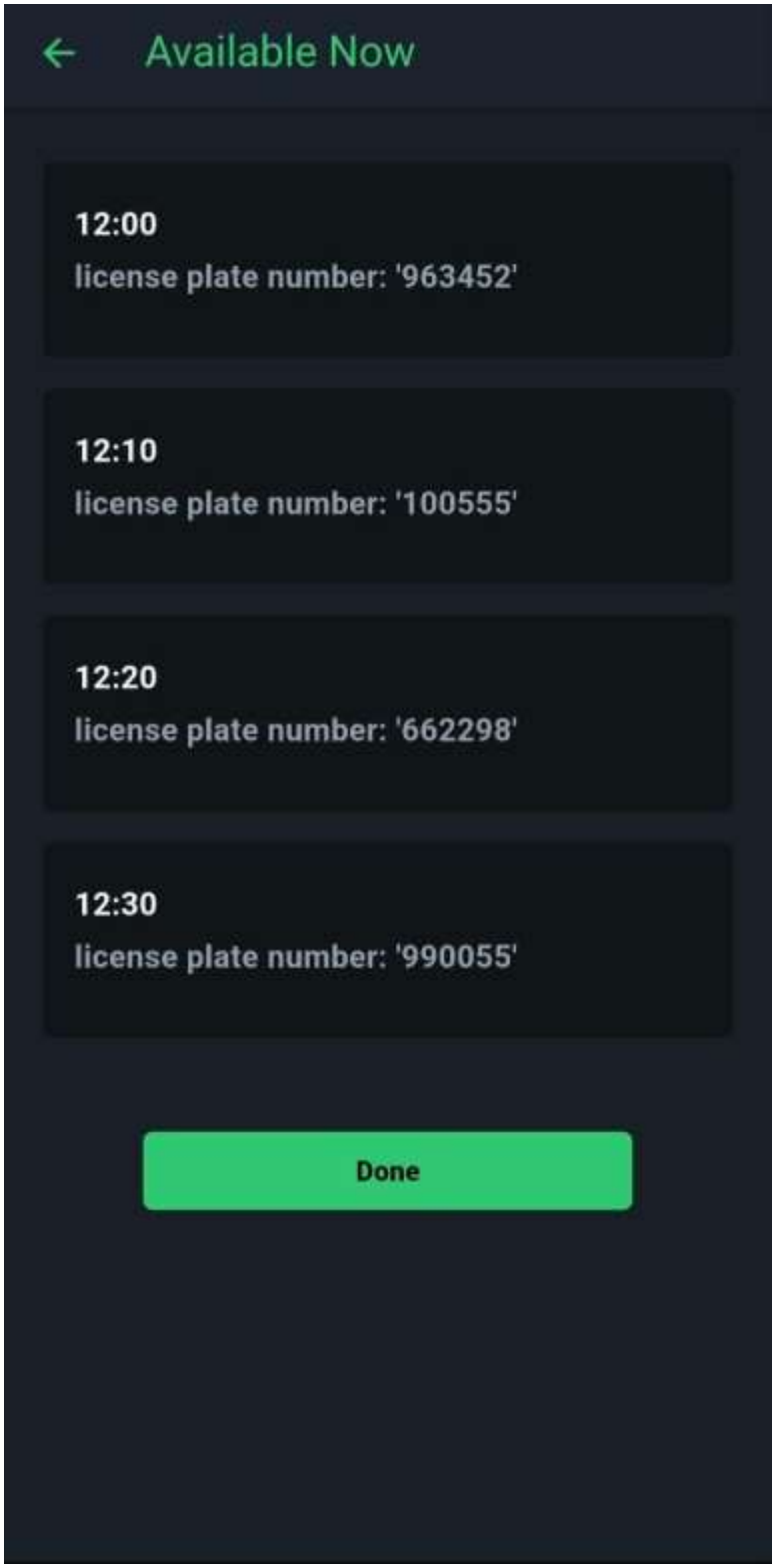


```dart
import 'package:flutter/material.dart';
import 'package:public_transet/appcolors.dart';

class ListPage extends StatelessWidget {
  const ListPage({Key? key});

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text(
          "Available Now",
          textAlign: TextAlign.center,
          style: TextStyle(color: AppColors.darkPrimary),
        ), // Text
        backgroundColor: AppColors.darkPrimaryBackGround,
        elevation: 2,
        shadowColor: Colors.black,
        iconTheme: const IconThemeData(color: AppColors.darkPrimary),
      ), // AppBar
      backgroundColor: AppColors.darkPrimaryBackGround,
      body: Padding(
        padding: const EdgeInsets.all(20),
        child: Column(
          children: [
            _buildListItem("12:00", "963452"),
            _buildListItem("12:10", "100555"),
            _buildListItem("12:20", "662298"),
            _buildListItem("12:30", "990055"),
           const SizedBox(height: 40,),
            Center(
```

```dart
              child: SizedBox(
                height: 40,
                width: 250,
                child: ElevatedButton(
                  style: ButtonStyle(
                    backgroundColor: MaterialStateProperty.all<Color>(AppColors.darkPrimary),
                    shape: MaterialStateProperty.all<RoundedRectangleBorder>(
                      RoundedRectangleBorder(
                        borderRadius: BorderRadius.circular(5),
                        side: const BorderSide(color: AppColors.darkPrimary, width: 2.0),
                      ), // RoundedRectangleBorder
                    ),
                  ), // ButtonStyle
                  child: const Text(
                    'Done',
                    style: TextStyle(
                      color: Colors.black,
                      fontWeight: FontWeight.w800,
                      fontFamily: AutofillHints.familyName,
                    ), // TextStyle
                  ), // Text
                  onPressed: () => Navigator.pushNamed(context, '/home'),
                ), // ElevatedButton
              ), // SizedBox
            ), // Center
          ],
        ), // Column
      ), // Padding
    ); // Scaffold
```

```dart
  }

  Widget _buildListItem(String time, String licensePlate) {
    return Container(
      width: double.infinity,
      margin: const EdgeInsets.symmetric(vertical: 8),
      padding: const EdgeInsets.symmetric(vertical: 20, horizontal: 16),
      decoration: BoxDecoration(
        color: AppColors.darkSecondaryBackGround,
        borderRadius: BorderRadius.circular(5),
      ), // BoxDecoration
      child: Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: [
          Text(
            time,
            style: const TextStyle(fontSize: 16, fontWeight: FontWeight.bold, color: Colors.white),
          ), // Text
          const SizedBox(height: 4),
          Text(
            "license plate number: '$licensePlate'",
            style: const TextStyle(fontSize: 16, fontWeight: FontWeight.bold, color: AppColors.darkSecondaryText),
          ), // Text
          const SizedBox(height: 10),

        ],
      ), // Column
    ); // Container
  }
```

List Page:


Available Now
12:00
license plate number: '963452'
12:10
license plate number: '100555'
12:20
license plate number: '662298'
12:30
license plate number: '990055'
Done

In conclusion, Public Transit represents a significant step forward in the evolution of public transport applications, offering a range of innovative features designed to enhance the user experience and make public transport more accessible and convenient for all.