

# Development Guidelines

## Code Structure Conventions

### Controller Pattern

```
// controllers/<feature>/<feature>.controller.js

exports.functionName = async (req, res) => {
  try {
    // 1. Extract parameters
    const { param1, param2 } = req.body;

    // 2. Validate input (AJV schema)
    const validate = ajv.compile(schema);
    if (!validate(req.body)) {
      return res.status(400).json({
        message: "Validation error",
        errors: validate.errors
      });
    }

    // 3. Business logic
    const result = await performOperation(param1, param2);

    // 4. Return response
    return res.status(200).json({
      message: "Success",
      data: result
    });

  } catch (error) {
    console.error(error);
    return res.status(500).json({
      message: "Internal server error"
    });
  }
}
```

```
});  
}  
};
```

## Route Pattern

```
// routes/<feature>.routes.js  
  
const controller = require('../controllers/<feature>/<feature>.controller');  
const { authJwt } = require('../middleware');  
  
module.exports = function(app) {  
  app.post(  
    '/api/<feature>/<action>',  
    [authJwt.verifyToken],  
    controller.functionName  
  );  
};
```

## Model Pattern

```
// models/<model>.model.js  
  
module.exports = (sequelize, Sequelize) => {  
  const Model = sequelize.define("model_name", {  
    id: {  
      type: Sequelize.INTEGER,  
      primaryKey: true,  
      autoIncrement: true  
    },  
    field1: {  
      type: Sequelize.STRING,  
      allowNull: false  
    },  
    created_at: {  
      type: Sequelize.DATE,  
      defaultValue: Sequelize.NOW  
    }  
  }, {  
    }, {
```

```
    tableName: 'table_name',
    timestamps: false
  });

  return Model;
};
```

# Naming Conventions

## Files:

- Controllers: `<feature>.controller.js`
- Models: `<model>.model.js`
- Routes: `<feature>.routes.js`
- Utilities: `<purpose>.util.js`

## Functions:

- camelCase for function names
- Descriptive names: `createWaybill`, `calculateFee`, `updateScan`

## Variables:

- camelCase for variables
- Constants: UPPER\_SNAKE\_CASE

## Database:

- Table names: snake\_case, plural
- Column names: snake\_case

# Error Handling

## Standard Error Response:

```
{
  "message": "Error description",
  "error": "Error code or type",
  "details": { /* additional context */ }
}
```

## HTTP Status Codes:

- 200: Success
- 201: Created
- 400: Bad Request (validation errors)
- 401: Unauthorized (authentication failed)
- 403: Forbidden (insufficient permissions)
- 404: Not Found
- 500: Internal Server Error

### Error Handler Middleware:

Location: `app/middleware/error_param_handler.js`

Usage: Automatically applied to all routes

# Input Validation

### AJV Schema Example:

```
// schemas/<feature>.schema.js

const createWaybillSchema = {
  type: "object",
  properties: {
    origin_code: { type: "string", minLength: 3 },
    destination_code: { type: "string", minLength: 3 },
    weight: { type: "number", minimum: 0 },
    service_type: { type: "string", enum: ["REG", "EXP", "CARGO"] }
  },
  required: ["origin_code", "destination_code", "weight", "service_type"],
  additionalProperties: false
};

module.exports = { createWaybillSchema };
```

### Usage in Controller:

```
const ajv = new Ajv();
const { createWaybillSchema } = require('../schemas/waybill.schema');

const validate = ajv.compile(createWaybillSchema);
if (!validate(req.body)) {
```

```
return res.status(400).json({
  message: "Validation failed",
  errors: validate.errors
});
}
```

# Database Best Practices

## Transactions:

```
const t = await db.sequelize.transaction();

try {
  // Multiple operations
  await Waybill.create(data, { transaction: t });
  await Scan.create(scanData, { transaction: t });

  await t.commit();
} catch (error) {
  await t.rollback();
  throw error;
}
```

## Query Optimization:

```
// Use specific fields instead of SELECT *
await Waybill.findAll({
  attributes: ['id', 'awb_number', 'status'],
  where: { status: 'BOOKED' },
  limit: 100
});

// Use includes for relationships
await Waybill.findOne({
  where: { id: waybillId },
  include: [
    { model: Scan, as: 'scans' },
    { model: Partner, as: 'partner' }
  ]
});
```

```
});
```

# Logging Best Practices

## Console Logging:

```
// Use cli-color for important logs
const clc = require('cli-color');

console.log(clc.green('Success: Waybill created'));
console.log(clc.yellow('Warning: Weight discrepancy detected'));
console.log(clc.red('Error: Database connection failed'));
```

## Morgan HTTP Logging:

Already configured in `ondeliv-backend.js` with custom colored format.

# Testing

## Manual Testing Scripts:

- `check_fee_test.js` - Test fee calculation
- `check_price.js` - Test pricing lookup
- `debug_provinces.js` - Debug location data

## Run Tests:

```
node check_fee_test.js
node check_price.js
```

# Git Workflow

## Branch Strategy (from README.md):

- `master/main` - Production branch
- `demo/trial` - Demo environment
- `development` - Development branch
- `hotfix` - Quick fixes from production
- `features` - New features
- `release` - Production-ready staging
- `experimental` - Experimental features

## Commit Messages:

feat: Add new courier partner integration  
fix: Resolve fee calculation bug  
docs: Update API documentation  
refactor: Improve waybill creation logic  
test: Add unit tests for scanning operations

# Code Review Checklist

Before submitting code:

- Code follows naming conventions
- Input validation implemented (AJV schemas)
- Error handling implemented
- Database transactions used where needed
- Authentication/authorization checked
- Logging added for important operations
- No sensitive data in logs
- No hardcoded credentials
- Comments added for complex logic
- Tested manually with sample data

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