This document is prepared as a status tracking document based on the 10-step process Shahid specified for going live for CCD by 1/1. For each step, a status update will be provided and updated regularly.

**1. Preparation of HL7 CCD XSD Schema [Required, no real option to circumvent it or “cut corners”] (Led by Gravity?)**

1. **Requirements Gathering (Gravity?)**
   * Understand what 1115 waiver data elements are essential via CCDs and define their constraints, data types, and business rules.
2. **Schema Design (Gravity?)**
   * Use the HL7 CCD template as the base schema for customization.
   * Identify the necessary additions, deletions, and modifications to meet the 1115 Waiver-specific requirements.
3. **Schema Definition (Gravity?)**
   * Create a new XSD schema or extend the existing HL7 CCD XSD.
   * Add new XML elements as needed to accommodate specific data fields required by the 1115 Waiver.
   * Define any extensions or custom attributes to address waiver-specific use cases.
   * Ensure compliance with HL7 CDA release 2, particularly for structured data.
4. **Schema Validation (Gravity?)**
   * Use XML validation tools (e.g., Oxygen XML, XMLSpy) to verify the correctness of the schema.
   * Validate against HL7 CCD specifications for conformance.

Work Status

* Received CCD schema specification XSD documents and an example XML file for SampleCDAQuestionnaireResponse from NYeC.
* Started to review the documents received from NYeC.
* Installed XMLSpy tool and used it to verify the correctness of the schema. Identified that the schema is a valid specification.
* Started to review the schema to identify if all the constraints, data types and business rules are specified in the schema in alignment with the SHIN-NY FHIR IG.
* Started to review the example to identify if all the required data elements are specified in the sample.

**2. Specification for CCD Data Exchange  [Required, no real option to circumvent it or “cut corners”] (Led by Gravity?)**

1. **Document CCD Data Requirements (Gravity?)**
   * Document data exchange requirements for SCNs (or CCD sources) to QEs and from QEs to TechBD.
   * Map CCD data fields to FHIR elements for subsequent translation.
     + Pay special attention to value sets and other FHIR fields that will cause errors in NYeC API Gateway if missed
   * Include information on required, optional, and repeating fields.
2. **Data Mapping Documentation (Gravity or NYeC staff/contractors or TechBD staff/contractors)**
   * Create a data mapping document that aligns CCD data fields with the FHIR structure used by TechBD (which matches NYeC FHIR IG).
   * This mapping should clearly indicate transformations, data type changes, and conditions and how it might differ from NYeC FHIR IG in case we want to cut corners early.

Work Status

* Once the schema is defined, need to start preparing mapping specification to map CCD data fields to FHIR elements based on SHIN-NY FHIR IG.
* Nearly completed the conversion of FHIR JSON resources to CCDA format, ensuring proper mapping for key elements.
* Refined the CCDA document to align with the FHIR IG example, focusing on accurate code system mappings.
* Ensured compliance with the 1115 Waiver requirements, updating relevant sections of the document.
* **Next step**: Cross-check the generated CCDA with the original FHIR Bundle resource for accuracy.
* Prepare a mapping document to identify elements that cannot be mapped from FHIR JSON to CCDA, or create a separate document where no compatible CCDA mapping exists.

**3. CCD Processing Pipeline Preparation [Highly recommended, but can “cut corners”] (Led by NYeC staff/contractors?)**

1. **Validation Rules Definition (Led by NYeC staff/contractors?)**
   * Define validation rules that the XML documents need to pass before further processing.
     + For example, which errors that XSDs will emit will we ignore?
   * Develop rules for required fields, correct data types, enumerated values, and business logic.
     + What custom rules might be required for value sets that FHIR needs to accommodate?
2. **Transformation Requirements (Led by NYeC staff/contractors?)**
   * Specify the CCD to FHIR translation requirements.
   * Discover and document any “difficult to map” parts of the CCD to FHIR IG v1.1.
3. **Set Up Integration Points**
   * Ensure integration points are set up for SCNs (or sources) to post CCDs to QEs.**(Led by QE)**
   * Define the interfaces for QEs to forward CCDs to TechBD for translation.**(Led by TechBD)**

Work Status

**4. Test Case Generation [Highly recommended, but can “cut corners”]  (Led by NYeC staff/contractors? TechBD can also help/lead)**

1. **Create Test Cases for Validation**
   * Create test cases based on schema validation rules.
   * Define positive test cases (correctly structured CCDs).
   * Define negative test cases (missing fields, incorrect data types).
2. **Test Cases for Data Flow**
   * Create test cases to simulate data exchange between SCNs (sources), QEs, and TechBD.
   * Define boundary test cases (e.g., maximum data lengths).
3. **Test Cases for FHIR Translation**
   * Develop test cases for TechBD to validate successful conversion from CCD to FHIR.

**5. Test File Generation [More than one should be created, but we can “cut corners” by only doing a single one mapped to sample FHIR IG] (Led by NYeC staff/contractors?)**

1. **Generate XML Test Files [need at least one]**
   * Create XML test files based on the newly created XSD schema that matches the FHIR IG example.
2. **Positive & Negative Test Files** **[can cut corners here]**
   * Create positive test files containing correctly structured CCD data.
   * Create negative test files with missing or erroneous data to test the validation rules.

**6. XML Validation Code at TechBD Endpoints [Required, no real option to circumvent it] (Led by TechBD)**

1. **Schema Validation**
   * Validate all test XML files against the XSD schema to ensure they comply with the CCD structure.
   * Use validation tools like xmllint or online validators for repeated testing.
2. **CCD Business Rules Validation**
   * Implement validation scripts to ensure that the business rules for CCD are adhered to.
   * These scripts should check for data consistency, required fields, data types, etc.

**7. CCD to FHIR Translation Implementation [Required, no real option to circumvent it] (Led by TechBD)**

1. **Translation Logic Development**
   * Develop CCD to FHIR translation logic using integration tools like Mirth Connect or custom Java code.
   * Implement translation based on the data mapping document.
2. **Testing CCD to FHIR Translation**
   * Test the translation logic using generated test files.
   * Validate the generated FHIR resources against official FHIR profiles.

**8. Testing the Workflow [Required for 1/1] (Coordinated by TechBD and QEs)**

1. **SCN (or “CCD Source”) to QE Testing**
   * Set up test endpoints at SCNs or sources and QEs.
   * Test with different scenarios (e.g., full data, partial data, erroneous data). **[can cut corners here to stay “minimal”]**
2. **QE to TechBD Testing**
   * Ensure the data from QEs is transmitted correctly to TechBD.
   * Simulate transmission failures and test error-handling procedures. **[can cut corners here to stay “minimal”]**
3. **TechBD Translation Testing**
   * Validate that CCD documents received by TechBD are correctly translated into FHIR bundles.
   * Ensure the resulting FHIR bundles are valid and conform to FHIR standards. **[can cut corners here to stay “minimal”]**

**9. Documentation [Strongly recommended, but can be delayed after 1/1] (Coordinated by Gravity/NYeC?)**

1. **Schema Documentation**
   * Document the XSD schema, elements, attributes, and data types.
   * Explain the extensions and modifications for the 1115 Waiver.
2. **Technical Implementation Guide**
   * Create a technical implementation guide for all stakeholders (SCNs, QEs, TechBD) detailing how to connect to the system, send CCDs, and handle errors.
3. **Testing & Validation Documentation**
   * Document all test cases, test files, and validation procedures.
   * Ensure the documentation clearly explains how to replicate tests.

**10. Deployment and Maintenance (Led by TechBD)**

1. **Deployment to Production [Required for 1/1, no real option to circumvent it]**
   * Once thoroughly tested, deploy the solution to the production environment.
   * Coordinate with SCNs (or sources), QEs, and NYeC to schedule deployment and test connectivity in production.
2. **Ongoing Maintenance [could be done after 1/1]**
   * Monitor incoming CCDs and outgoing FHIR bundles for any issues.
   * Provide periodic updates to the schema as requirements change.
3. **Support for Future Changes [could be done after 1/1]**
   * Make provisions for modifications in CCD, FHIR, or NYeC gateway specifications.
   * Implement version control strategies for the schema, transformation logic, and documentation.